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I N T E R N A T I O N A L

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The editorial board during the formation of the eighteenth issue of the collection of scientific papers Theory and Practice of Forensic Science and Criminalistics adhered to the traditional editorial rubricating. It provided materials on the coverage of modern criminalistics problems, general issues solving of Forensic Science Theory, organization and legal regulation of forensic expert activity, as well as sections formed from works revealing theoretical and practical problems according to separate classes, kinds, types and subtypes of forensic examinations. Issues of expert practice are highlighted in the relevant sections of the main sections.

Representatives of forensic institutions, higher education institutions, law enforcement agencies not only from Ukraine, but also foreign countries took part in the preparation of articles for this collection.

We express our sincere gratitude to all authors who contributed materials for the publication in the collection, as well as to the specialists who took part in its publication, and invited scientists and practitioners to prepare papers for the next issue.

Executive Editor A. S. Tiapkin

The papers reviewed internally and externally

The address of the editorial board: 61177, Kharkiv city, Zolochivska, str. 8-A,
Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations
Phone.: +380573722001

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Authors' opinions may not coincide with Editorial Board opinion.

In case of reprinting the reference to the *Theory and Practice of Forensic Science and Criminalistics* research paper collection is obligatory,

Currently it is difficult to overestimate the role of forensics and forensic activity, not only in investigating and reviewing criminal proceedings, but also in other areas of law. The final decision in the case may depend on the forensic scientist conclusion.

Recognizing their high responsibility to society, practitioners and scientists of our country research institutions maintaining close contacts with foreign colleagues, refine their professionalism every day, working on vocation.

An important contribution to the field of forensics and forensics was the next issue of the scientific professional edition *Theory and Practice of Forensic Science and Criminalistics* reflecting the latest provisions and developments of domestic and foreign scientists.

During the year of hard work, we were able to collect in the edition 45 publications meeting requirements of world-known scientometric systems, including 15 the works of Doctors of Sciences, 26 articles of PhDs, as well as 3 publications of foreign scientists.

The collection contains information on scientific and communicative events, which were attended by scientists of our institute, in particular the Interdepartmental Scientific Workshop: *Issues of Appointment and conducting of Forensic Examinations* (January 16, 2019, Kharkiv), meetings of the round table *Forensic Science: Modernity and future* (25–26.01.2019, Lviv), meetings of the Ukrainian Working Group on Research on Psychoactive Substances within the framework of the *EU – Action project : EU Action on Drugs and Organized Crime* and many others.

We sincerely wish all authors, reviewers and readers unlimited inspiration and success in their new achievements.

Editorial board

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V. Yu. Shepitko,

Doctor of Law, Professor, Academician of National Academy of
Legal Sciences of Ukraine, Head of the Department of Criminalistics
at the Yaroslav Mudryi National Law University
ORCID: <https://orcid.org/0000-0002-0719-2151>
e-mail: kafkrim1@gmail.com

FORENSIC TACTIC TOPIC: FORMATION HISTORY, CONTENTS AND TRENDS

The history of the emergence of tactical beginnings in the investigation of the criminal for forensic purposes is considered and the further formation of the system of scientific knowledge in countering crime is tracked. A historical excursion to the emergence and development of criminal tactics and its role for other branches of forensic tactics has been undertaken. The formation of criminal tactics is conditioned using psychological knowledge in the context of crime counteraction. In the genesis of criminalistics tactics, the data of psychological science are traditionally attributed to its sources.

Attention is paid to changing the subject of forensic tactics in modern conditions and the causes of such changes are determined. The content and structure of forensic tactics are conditioned by the need to provide the tactical means of various subjects (investigator, detective, prosecutor, investigative judge, parties to criminal proceedings, court, etc.). The activity approach to criminalistics tactics is proposed and the necessity of isolation of its branches (advocacy, judicial, investigative, searching) is substantiated. Forensic data should be used not only by the prosecution but also by the defense. Arguments are given regarding the need to develop the scientific provisions of advocacy tactics (defense tactics or tactics of professional defense in criminal cases) and to consider it as a separate branch of forensic tactics. The expediency of separating the responding counter-investigation tactics as a structural part of criminalistics tactics was also emphasized.

The substantive side of criminalistics tactics is considered with the help of its structural elements (tactical techniques, tactical systems, tactical combinations, tactical operations, etc.). Changes in the legal field, the model of criminal proceedings, the “revision” of traditional criminal law institutions and the process have a significant impact on the content of criminalistics tactics.

Keywords: criminal tactics, criminal psychology, forensic tactics, investigative tactics, judicial tactics, trends in forensic tactics, means of forensic tactics, tactical technique, system of tactical techniques.

Formulation of Research Problem. Forensic tactics play an important role in the structure of forensics, which is due to its influence on the formation of various sciences.

Different parts (sections) of forensics were formed under the influence of one or another science: chemistry, physics, toxicology, medicine, biology, etc.

The rise of forensic tactics was significantly influenced by psychology; this science concerning soul, of the mental (about the laws and mechanisms of the psyche of a living person).

Analysis of recent researches and publications. The subject of forensic tactics has received some attention in forensic science¹. Hans Gustav Adolf Gross², in his scholarly writings, turns not only to the forensic science, the science of *realities of criminal law* but also to the criminal psychology³.

In his writings he not only examines the technique of investigating material evidence, but also offers some psychological methods for investigating crimes.

In particular, his Handbook for Forensic Investigators (Handbuch fur Untersuchungsrichter als System der Kriminalistik, 1892; Handbuch fur Untersuchungsrichter, Polizeibeamte, Gendarmen, 1893) addresses psychological issues and provides recommendations: when a witness wishes to tell the truth false observation due to arousal, false observation due to head injury, etc.); if the witness does not want to tell the truth (about the lie as a phenomenon).

In addition, issues such as changing the appearance of criminals, misstatement of rank and name, simulations of illnesses etc.⁴.

¹ See., E.g. : P. Lublinsky. The subject and significance of the study of evidence ... J. Stifen. Essay on evidence law. St. Petersburg: Senate Printing House, 1910; Weingart A. Criminal Tactics: A Guide to Crime Investigation. St. Petersburg: Vestn. police, 1912.293 s. ; Shtiber V., Shneikert G. A Practical Guide for Criminal Investigation Workers / Per. with him. Moscow: Gostekhizdat, 1925. S. 35–190; Yakimov I.N. A guide to criminal technology and tactics. Moscow, 1925.430 s. ; Yakimov I.N. Criminal tactics. 2nd ed. reslave. and add. Moscow: NKVD of the RSFSR, 1929.S. 3; Great Ukrainian legal encyclopedia: at 20 t. T. 20: Criminalistics, legal expertise, legal psychology / editorial. : V. Yu. Shepitko (head) and in. Kharkiv, 2018.S. 801, 802; Schur B.V. Tactics of neutralization of protections of zlochinov, organized by groups: monograph / as amended. V. Yu. Shepitka. Kharkiv: Grif, 2005.176 s. ; Gross H. Kriminal-Psychologie. 2.Aufl. Leipzig: F.C.W. Vogel, 1905. XII. etc.

² See.: Encyclopedia of forensics in persons / ed. V. Yu. Shepitko. Kharkov: Apostille, 2014.400 p.

³ Gross H. Kriminal-Psychologie. 2.Aufl. Leipzig: F.C.W. Vogel, 1905. XII. 701 s.

⁴ Gross G. A Guide for Trial Investigators as a Forensic System. New ed., Perepech. ed. 1908 Moscow: LexEest, 2002. 1088 p. ; Hans Gross: Works of the Scientist and Literature from the Funds of the Scientific Library of the Yuriy Fedkovych Chernivtsi National University: To the 100th Anniversary of the Death:

This **article purpose** is to investigate the genesis of the notion of forensic tactics and to express one's vision on the subject.

First attempts to use the means of influence on the person involved in the crime: suspect or accused were “inquisitorial” nature and were based on physical and mental violence, conducting certain experiments and tests based on the psychophysiology mechanisms and patterns of human organism (*Trial by ordeal* or *Trial by water*, *Red-hot iron*, *Rice trial*, etc.).

Indictments and confessions were obtained through torture and torment, as a rule, “good inquest” meaning interrogation using physical and mental influence were carried out.

This interrogation also took place using certain “scientific and technical (forensic) means”; special vises for thumbs, arms, *choke pear*, *Spanish boot*, rope winches for stretching the body, pillory, *breaking wheel*, etc.

Psychological mechanisms were used in demonstrating torture tools and explaining their purpose, in obtaining evidence in the room where the corpse is stored, etc.

Of course, such approaches contradict scientific beliefs about the possibility of a permissible psychological influence on another person in order to obtain objective testimony, admit guilt in the act, cause suffering and consequently violate human rights and freedoms.

Rise of forensic tactics is closely linked to the history of forensic science as a science that would provide answers to the following questions: *Quis, quid, ubi, quibus auxiliis, cur, quomodo, quando*¹.

According to Herberts Manns these questions, which have served as a reliable scheme for investigative activity for many centuries, do not lose their significance nowadays².

Historically, the process of criminalistics forming was associated with borrowing data from other sciences (natural, technical, humanitarian, etc.) to solve problems of counteraction to crime.

It was the attempts to apply the various sciences in the fight against crime that led to the emergence of integrated scientific knowledge corresponding to the term criminalistics; the use of advanced achievements of science and technology in the fight against crime.

Bibliog. show / Contribution: SI Nezhurbida, MP Dyachuk, ed. introduction. Article: SI Nezhurbida, K. Probst. Chernivtsi: Books — XXI, 2015. 222 p.

¹In fact, these are the answers to the following questions: Who, what, where, with whose help, why and for what purpose, how and when?

²Manns H. La criminalistique (police scientifique) comme science appliqué et objet de l'enseignement. Criminalistics as an applied discipline and subject of teaching: Sat. tr prof. and teach. state Irkutsk University. Irkutsk, 1921. Department 1. Issue. 2, pp. 139–164.

It was the attempts to apply the various sciences in the fight against crime that led to the emergence of integrated scientific knowledge corresponding to the term criminalistics; the use of advanced achievements of science and technology in the fight against crime¹.

From criminal tactic to forensic tactic. During the birth of forensic science as an independent field of knowledge, tactics were considered as part of police (criminal) technology.

E. Locar emphasizes that we will call the police technique a set of methods borrowed from biology, physics, chemistry, and in very small numbers from mathematics (cryptography theorems) and those that allow us to establish material evidence of crime.

It is striking that such a definition covers both forensic medicine, forensic chemistry, and the psychology of witness testimony².

P. I. Lublinskii identifies six divisions, one of which was formulated as doctrine of methods of the accomplishment of various crimes and the method of their detecting (criminal tactics)³.

A. Weingart outlined his opinions on criminal tactics in the paper Criminal tactics. Crime Investigation Guide⁴.

First ideas about criminal tactics were related to the consideration of the peculiarities of professional criminals, the investigation of secret ways of their communication, ways of committing crimes, information about the behavior of the offender before and after committing the crime, methods of disclosing crimes, the search and detention of criminals, as well as recommendations some investigative actions (scene inspection and tracing, search, questioning of defendants and witnesses, comparison of handwriting, etc.)⁵.

I. M. Yakimov emphasizes that criminal tactics study criminals and ways of committing crimes in order to develop the best methods of their

The Great Ukrainian Legal Encyclopedia: in 20 volumes. Vol. 20: Forensics, forensics, legal psychology / editorial. : V. Yu. Shepitko (Chairman) and others. Kharkov, 2018. P. 800.

E. Lokar Guide to forensics / trans. S.V. Poznyшева and N.V. Terzieva. Moscow: Jurid. Publishing House of the Narkomiust of USSR, 1941 p. 9.

³ P. I. Lublinsky, Subject and significance of the study of evidence ... J. Stifen, Essay on evidence law. St. Petersburg: Senate Printing House, 1910. p. XX.

⁴A. Weingart, Criminal tactics: a guide to crime investigations. St. Petersburg: «Vestn. Police, 1912. 293 p.

⁵ V. Shtiber, G. Shneikert, Practical Guide for Criminal Investigation Officers / Per. with him. Moscow: Gostekhizdat, 1925. p. 35–190; I. N. Yakimov, Guide to criminal technology and tactics. Moscow, 1925. p. 430.

disclosure, for which he uses scientific material collected and developed by criminal technique¹.

In the modern period, there are different approaches to the separation of criminal tactics and its importance.

In the modern period, there are different approaches to the separation of criminal tactics and its importance.

At the same time, forensic investigators need to take into account the peculiarities of criminal tactics during the conduct of procedural actions, the detection of traces of crime, the establishment of deliberately false testimony².

Noteworthy are the suggestions made by some scholars regarding the need to isolate such a sub-sector of forensic tactics as the tactics of neutralizing counteraction to the investigation of crimes³.

Today, the tactics of combating counter investigations remain underdeveloped.

In our opinion, the foregoing direction of forensic tactics can be presented in several blocks:

1) tactical means of overcoming false witnesses and exposing false statements;

2) tactical means of promoting investigative secrecy;

3) tactical means to protect the evidentiary information from its destruction and distortion;

4) tactical means to ensure the safety of participants in criminal proceedings;

5) tactical means that help prevent the occurrence of investigative (tactical, organizational, methodical) mistakes⁴.

Formation of criminal tactics is conditioned by the introduction of psychological knowledge in of combating crime field.

In the genesis of forensic tactics, the sources of psychological science have traditionally been attributed to its sources.

Its special role is determined by the fact that tactical techniques are directly or indirectly directed at a specific object — the human psyche; their

¹I. N. Yakimov, Criminalistics. Criminal tactics. 2nd ed. revised and supplemented. Moscow: NKVD of the RSFSR, 1929.p. 3.

²Great Ukrainian Legal Encyclopedia: in 20 volumes. Vol. 20: Forensics, forensics, legal psychology / editorial. : V. Yu. Shepitko (Chairman) and others. Kharkiv, 2018. p. 801, 802.

³B. V. Shchur Tactics of neutralization of counteraction to investigation of crimes committed by organized groups: monograph / ed. V. Yu. Shepitka. Kharkiv: Grif, 2005. 176 p.

V. Yu. Shepitko . Problem Lectures on Forensics (read at Immanuel Kant Baltic Federal University): textbook. allowance. Kharkov: View. Apostille Agency, 2012. pp. 137, 138.

development and construction are based on the psychological features of the processes of perception, memory, thinking, certain properties and states: their content and mechanism of realization are due to the need for psychological influence in order to establish psychological contact, actualization of the forgotten, exposure of falsehood in testimony, etc.¹

At the end of the XIX and the beginning of XX century, research on the psychology of the testimony of witnesses and accused emerges as an independent tendency in the development of Criminalistics.

Development of forensic tactics is characterized by unevenness and amplification of its individual parts.

In different periods of time there is a fascination with the tactics of criminal activity, the study of the person and type of offender, and then on the contrary, the roll occurred in the direction of investigative tactics, the development of methods of investigative activity².

The history of forensics is known in various terminological approaches to the designation of tactics (criminal tactics, investigative tactics, forensic tactics).

The changes were not only terminological but also essential.

Subject matter of forensic tactics and its transformation.

In modern forensics, there are different approaches to defining the concept of forensic tactics.

Moreover, this concept also includes different content load.

O. O. Exarchopulo notes that the term *forensic tactics* has recently been used in forensic science to refer to the relevant section of science and training.

Previously, this section of forensics was referred to as investigative tactics, since the proposed tactical recommendations were mainly developed in the framework of the preliminary investigation.

However, not only investigative practice but operative work and the activities of the judiciary required the scientific support for the choice of optimal policy³.

It is necessary to agree with V. I. Komisarov, who writes that forensic tactics for today is no longer just a scientifically grounded system of methods of preliminary (pre-trial) investigation, but an orderly structure of theories, scientific provisions and as a final result of theoretical

¹ V. Yu. Shepitko Theory of Forensic Tactics: Monograph. Kharkov: Griff, 2002. P. 37.

² V. Yu. Shepitko Forensic tactics (system-structural analysis): monograph. Kharkiv: Kharkiv Legal, 2007. P. 5.

³ A. A. Exarchopulo Forensics: a textbook. SPb., 2009. P. 445.

constructs: scientific and practical. a system of general and specific recommendations for the optimum conduct of procedural actions.

If we consider forensic tactics as an independent part of the forensic system, then it is advisable to distinguish two aspects:

- 1) tactics as content (theory);
- 2) tactics as a function (means) of regulating relationships in the field of justice.¹

In these circumstances, new definitions of forensic tactics emerge.

In particular, there is an opinion that forensic tactics are a system of scientific provisions and recommendations based on the organization and planning of preliminary (pre-trial) and judicial investigation (trial), determination of the line of conduct of the persons conducting evidence, and techniques of specific investigative and judicial ones. actions aimed at collecting and investigating evidence, establishing the causes and conditions conducive to the commission and concealment of crimes².

There is an opinion that forensic tactics is a section of the science of forensics, covering a system of theoretical provisions and practical recommendations for determining the optimal behavior of persons conducting preliminary investigations, as well as judicial review of criminal cases on the basis of the rules and principles of criminal proceedings³.

Other authors point out that forensic tactics, which is a section of forensics, examines the regularities of the organization and implementation of *forensic, investigative and expert activities* in order to develop in accordance with the law scientifically sound recommendations for improving its effectiveness⁴ (emphasis added: V. Sh.).

In modern conditions, scientists have actually abandoned the use of the term *investigative tactic*.

The use of the phrase *forensic tactics* is widely used in specialized literary sources.

V. I. Komissarov Criminalistic tactics: history, current state and prospects for development: monograph. Moscow: Jurlitinform, 2009. p. 87.

² T. V. Averyanova, Belkin R.S., Korukhov Yu. G., Rossinskaya E. R. Forensics: a textbook for high schools / ed. R. S. Belkin. Moscow: Norma, 2003. p. 453.

³ S. Yu. Yakushin Forensic tactics: questions of theory and practice: textbook. allowance. Kazan: Kazan. state Univ., 2010. p. 35.

⁴ Kurs kriminalistiki: V 3 t. T. 1. Obscheteoreticheskie voprosyi. Kriminalisticheskaya tehnika. Kriminalisticheskaya taktika / pod red. O. N. Korshunovoy i A. A. Stepanova. SPb. : Yuridicheskiy tsentr Press, 2004. S. 468.

It can be stated that in all textbooks on forensics there was a unification of forensic terminology and the use of the term: *forensic tactics*¹.

However, in many definitions the notion of forensic tactics remained the old meaning: limited only to investigative activities or the investigation of crimes.

There is some doubt about the definition of forensic tactics proposed by the Latvian forensic scientists V. N. Terehovich and E. V. Nimande.

The authors write that forensic tactics can be defined as a section of a special part of the theory of forensics, which describes and explains the regularities of conducting investigative actions².

At the same time, the mentioned criminologists emphasize that attempts to "integrate" into the terminology of criminology such terms as judicial tactics, prosecutorial tactics, lawyer tactics and other similar "novelties", have nothing to do with criminal investigation within the framework of the modern criminal process and have no criminal record do not apply³.

Applying this approach is evidence of its obsolescence and inconsistency with the current state of forensic science and legal practice.

It turns out that nothing has changed in the content of Criminalistics tactics except for the name and conversion of the term "investigative tactics" to *forensic tactics*.

The question is:

What is the point of changing the terms?

In this case, it is necessary to be in the positions of using the terms *investigative tactics* or *crime investigation tactics*.

The proposed definition does not take into account changes in the procedure for pre-trial investigation, the functions and powers of the investigator, detective, prosecutor, investigating judge or defense attorney in competitive criminal proceedings.

Understanding of the nature of forensic tactics by individual forensic scientists is objectionable and does not correspond to the objective situation.

Thus, S. V. Lavrukhin, who preaches a new model of forensics, restricts forensic tactics to only algorithms of investigative actions⁴.

In our opinion, forensic tactics cover not only problems of optimization of investigative (investigative) actions.

¹ See: Terekhovich VN, Nimande E. B. The essence of forensic tactics. Theory and Practice of Forensic Science and Forensic Science: Coll. of sciences. articles. Kharkiv: Law, 2018. P. 36.

² Ibidem p. 42

³ Ibidem

⁴ S. V. Lavrukhin The system of forensics. State and law. 1999. № 8. p. 31–36.

It is much broader in scope; its recommendations are not limited to the tactics of investigating crimes.

Tactics also cannot be limited by algorithms and programs.

Tactics is not always a ready-made scheme, it is dynamic, situationally dependent, individual in each case.

There are many techniques, methods, methods for their types, forms and internal content¹.

In its substantive content, forensic tactics consist of certain means.

The structure of forensic tactics can be traced to its elemental composition, which provides for the selection of those parts on which the tactics are based:

1) tactical reception as a method of carrying out a procedural action aimed at achieving its purpose;

2) tactical recommendation – scientifically substantiated and proven practice advice on the choice and use of tools, techniques and behaviors;

3) tactical techniques subsystem (system) – an ordered set of interrelated and interrelated techniques that are targeted in the implementation process (sometimes referred to as a tactical combination);

4) tactics of investigative (investigative) (judicial, operative-search) action, which covers the whole typical complex of possible implementation, realization;

5) system of investigative (search) or other actions (tactical operation), which is aimed at fulfilling the task of investigation in the relevant investigative situation².

One of the foremost tasks of forensics is to develop modern methods, techniques and tools aimed at improving the effectiveness of pre-trial investigation.

A particular role among this kind of scientific development is occupied by systems of tactical techniques as the most optimal means of obtaining evidentiary information and its use in forensic practice³.

The formation of systems of tactical techniques is very necessary, as such systems can provide invaluable organizational and methodological

¹ Shepitko V. Yu. Problemy strukturovaniya kriminalisticheskoy taktiki // Izbrannyye trudy. Harkov : Apostol, 2010. S. 152–155.

The Great Ukrainian Legal Encyclopedia: in 20 volumes. Vol. 20: Forensics, forensics, legal psychology / editorial. : V. Yu. Shepitko (Chairman) and others. Kharkov, 2018. p. 801.

³ Shepitko V. Yu., Zhuravel V. A. Tipovi sistemi taktichnih privomiv: problemi rozrobki ta efektyvnoho zastosuvannya. Pitannya borotbi zl zlochinnytstyu : zb. nauk. prats. Harkiv : Krossroad, 2009. Vip. 17. S. 237–251.

assistance to the investigator in restoring the gaps of his personal experience and in stimulating his professional creativity¹.

In current context, forensic tactics are not limited to the tactics of individual investigative (investigative) actions.

Typical tactical (forensic) operations most effective complexes of investigative actions, operative and search measures and other measures on intermediate tasks of investigation and investigative situations, occupy an important place in the system of tactical means.

The development and implementation of tactical operations should help to optimize the detection and investigation of crimes, as well as to establish interconnection and interdependence between individual investigative (investigative) actions, organizational and other measures.

The content of forensic tactics is influenced by changes in the legal field, the model of criminal justice, "revisions" of traditional institutions of criminal law and process.

This problem is of particular relevance in connection with the harmonization of the criminal procedural mechanism and its compliance with international and European standards, the introduction of the principle of parties' competitiveness, ensuring the proper balance of public and private interests.

Forensic science (and its forensic tactic section), in a sense, performs the function of a criminal or other litigation.

The development and implementation of forensic facilities depends on their particular consumer (investigator, investigating judge, prosecutor, defense lawyer, judge, etc.), the form of criminal proceedings, the procedure for conducting investigative (investigative) and judicial actions.

An important argument regarding the expediency of introducing the provisions of *competitive* forensic science is the existence of changes in the functional purpose of the investigator as a procedural figure, its legislative limitation only by *indictment function*.

This provision is already sufficiently clearly stated in the CPC of Ukraine (§ 2 of Chapter 3 of the Criminal Procedural Code of Ukraine).

In particular, in Art. 40 of the Criminal Procedural Code of Ukraine defines powers of the investigator as a party to the prosecution.

The role of an independent and procedurally independent investigator, who has to make responsible decisions and perform an important function of gathering and recording evidence (the function of investigation), is currently significantly limited by procedural mechanisms (judicial control, procedural guidance by the prosecutor, etc.).

¹ Goncharenko V. G., Sokiran F. M. Taktika psihologichnogo vplivu na popередnomu sldstvI : navch. poslbnik. KiYiv : Ukr. akad. vnutr. sprav, 1994. S. 22.

In this sense, the investigator is in fact transformed into an "auxiliary" procedural figure.

In the modern period there is a sharp scientific debate about *forensic advocacy*, *forensic support of the prosecutor's activity*, *forensic component of the court*.

In our opinion, it is appropriate at this time to ask the question of the formation of *competitive Criminalistics*.

These forensics should be used not only by the prosecution but by the professional defense.

Therefore, I. I. Kogutich rightly notes that, unlike in the past, the priority direction of state policy of the modern period has become *De jure* and increasingly becomes *De facto* protection of the individual.

Hence competitiveness acquires such features, which correspond to its essence¹.

The question: if forensic tactics should develop techniques, methods, and tools for advocacy or does it serve only the prosecution side?

The answer to this question lies in the purpose of the judiciary and the essence of competitive proceedings.

If advocacy is aimed at seeking truth, restoring justice, and eliminating social conflict, the answer must be positive.

Moreover, there is no other scientific knowledge that would provide the lawyer with scientific techniques, methods and means other than forensic science.

The most important areas of forensic advocacy should be:

- 1) technical forensic science;
- 2) tactical and organizational and methodical;
- 3) forensic expert (providing specific expertise).

Attempts to determine the nature of lawyer's tactics (or tactics of professional criminal defense) are of particular scientific interest.

In particular, it is believed that the tactics of professional protection in criminal cases is a subsystem of forensic tactics, which consists of a system of appropriate means (techniques, combinations, operations, recommendations) developed and developed on the basis of scientific provisions of forensic tactics, acceptable and rational presentation, investigation and use of information by a lawyer. that justifies or mitigates the responsibility of the client, secures the rights and interests of the latter in terms of potential or real, direct or indirect as opposition from individuals

¹ Kogutich, I. I. (2008). Kryminalistychni znannia, yikh sutnist i potreba rozshyrennia mezh vykorystannia. Lviv: Triada plus [in Ukrainian].

and organizations who oppose his defender in the implementation of the criminal procedure functions¹.

Conclusions

This article traces the development of forensic tactics in the period of the emergence of forensic knowledge, the transformation of scientific discipline from criminal tactics to forensic tactics.

The historical excursion made it possible to draw attention to some tendencies of the formation of the subject of forensic tactics and the significant influence of psychology on its internal content and certain tactical means (tactical techniques, systems of receptions, tactical operations, etc.).

During the formation of forensic tactics, the laws of psychological science were used. The role of psychological knowledge in the development of forensic tactics provides an opportunity to attribute it to the intellectual core of Criminalistics.

Attempts have been made to investigate the subject of forensic tactics in modern conditions.

The idea has been formulated and some arguments have been put forward as to the expediency of introducing the provisions of *competitive* Criminalistics.

According to the author, the provisions of forensic tactics and its means (tactical recommendations, tactical techniques, tactical combinations, tactical operations) should be used by different subjects of criminal proceedings (investigator, detective, prosecutor, investigating judge, judge, defense lawyer, expert).

Arguments have also been given as to the expediency of distinguishing advocacy tactics (or defense tactics) as an important area of forensic tactics.

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¹ Baev, M. O. (2004). *Takticheskie osnovyi deyatelnosti advokata-zaschitnika v ugovolnom sudoproizvodstve*. Voronezh: Voronezh. gos. un-t [in Russian].

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В. Ю. Шенітько

**ПРЕДМЕТ КРИМІНАЛІСТИЧНОЇ ТАКТИКИ:
ІСТОРІЯ ФОРМУВАННЯ, ЗМІСТ ТА ТЕНДЕНЦІЇ**

Розглянуто історичні передумови виникнення та формування криміналістичної тактики. Простежено становлення кримінальної тактики та її трансформації в тактику слідчу, а згодом й у криміналістичну. Визначено роль психології як важливого джерела у формуванні криміналістичної тактики. Приділено увагу змісту криміналістичної тактики, її структурним складовим та деяким тенденціям розвитку. Проаналізовано тенденції щодо змінення предмета криміналістичної тактики в сучасних умовах. Обґрунтовано необхідність виокремлення певних галузей та підгалузей криміналістичної тактики (судової, прокурорської, адвокатської та ін.).

Ключові слова: кримінальна тактика, кримінальна психологія, криміналістична тактика, слідча тактика, адвокатська тактика, судова тактика, тенденції криміналістичної тактики, історія криміналістичної тактики, засоби криміналістичної тактики, тактичний прийом, система тактичних прийомів.

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V. A. Zhuravel,

Doctor of Law, Professor, Academician of the National Academy of
Legal Sciences of Ukraine Chief Academic Secretary of the National
Academy of Legal Sciences of Ukraine,
ORCID:<http://orcid.org/0000-0001-8256-4333>,
Email: zhur.crim@gmail.com

METHODS IN CRIMINALISTICS

The genesis and current condition of scientific approaches to defining methods in criminalistics are considered. It is noted that, despite the significant importance for the formation of the methodology of criminalistics science, no separate doctrine of its methods has been created yet. Conversely, scientists offer different definitions and classification constructions of methods of this science. There is not always a justifiable division of criminalistics methods into research methods and methods of practical activity. It is emphasized that the introduction of a single, unified, consistent classification of methods in criminalistics science is a prerequisite for the further effective scientific research in this area of knowledge and the solution of praxeological tasks in the activity of judicial investigative bodies, expert institutions, operational units. Finding out established approaches to the classification of methods in science of criminalistics will contribute to the final formation of the modern scientific criminalistics paradigm.

In view of the results of the analysis of scientific approaches, it is proposed to divide the methods in forensics into two varieties, using the following terms: 1) methods of criminalistics that means methods of studying the subject of research of this field of knowledge, carrying out scientific research; 2) criminalistics methods, that is, the optimal methods of action of authorized subjects that are the result of the conducted research and recommended for practical use. Methods of criminalistics should be grouped into the following levels: philosophical, general scientific (methods of empirical research, methods of theoretical research, general logical methods), separate scientific (special) (borrowed, transformed, especially criminalistics). In turn, forensic methods can be divided into: methods of collecting, recording and investigating evidence; methods of using forensic and special techniques; methods of conducting individual investigative (search) actions; methods of designing and testing investigators, court, expert versions and construction of forecasting models, etc. The above points out that in the forensic scientific knowledge there is a complex, dynamic, subordinated system of numerous methods of different levels, spheres of action, directions, which are realized taking into account specific conditions and subject of research. At the same time, this system is open and constantly updated with new methods as a result of their development and renewing.

Keywords: methods in criminalistics, methods of criminalistics, criminalistics methods, classification constructions of methods in criminalistic.

Formulation of Research Problem. The key to the structure of the general theory of forensics is the doctrine of its methods.

This is no coincidence, since the development of any science directly depends on the volume and quality of the tools used to study the subject of study of a particular field of knowledge.

There is no exception to this rule and forensic science, whose scientific potential is determined by the arsenal used to solve subjective cognitive and practical problems.

At the same time, no separate doctrine of methods has been created so far in forensics and there is no single approach to classifying its methods. Forensic scientists have made various suggestions on this issue.

The introduction of a unified, consistent, consistent classification of methods in forensic science is a prerequisite for the further effective scientific search in this field of knowledge and the solution of praxeological tasks in the activities of judicial authorities, expert institutions, operational units.

Finding out established approaches to the classification of methods in forensic science will contribute to the final formation of the modern scientific forensic paradigm.

Analysis of recent researches and publications.

Significant contributions to the development of the foundations of certain forensic students (theories) were made by such scholars as R. S. Belkin, A. M. Vasiliev, A. I. Wienberg, A. Yu. Golovin, V. G. Goncharenko, A. O. Eisman, O. O. Exarkhopulo, G. O. Zorin, Z. I. Kirsanov, V. V. Klochkov, V. O. Konovalova, V. Ye. Kornoukhov, I. M. Luzgin, G. A. Matusovsky, S. P. Mitrichev, V. O. Obraztsov, M. O. Selivanov, V. G. Tanasevich, B. M. Shaver, V. Yu. Shepitko, M. P. Yablokov and others.

At the same time, the proposals, with rare exceptions (R. S. Belkin), were made mainly on the pages of academic forensic textbooks, were not of a systematic nature and were not researched at the monographic level.

There are practically no publications on the subject in the contemporary domestic specialized literature.

Article Purpose.

The purpose of the article is to analyze the approaches of forensic scientists to solve the problem of classification of methods in forensics, to provide their own suggestions on the possibility of their distribution.

This is a conceptual approach, in which the methods in forensics are considered in two aspects: as a means of carrying out scientific search and as a result, i.e. we are talking about methods of forensics (scientific methods) and forensic methods (practical methods).

Main content presentation

The problem of classification of methods is the most debatable in the general theory of criminology, which uses methods to know the laws that form the subject of its research.

It is a process of investigating, first and foremost, the patterns of the mechanism of crime, the emergence of information about the circumstances of the event of the criminal offense and the person who committed it, as well as the patterns of investigation of the crime.

For the first time methods in the general theory of criminology were most fully and precisely defined by R. S. Belkin in his fundamental writings¹.

According to the scientist, it is advisable to carry out the classification of forensic methods up to three levels.

The first level is a general method, in the structure of which are distinguished:

- a) categories and laws of dialectical logic;
- b) formal and logical methods of cognition (methods of both traditional and mathematical logic).

The second level is general (general) methods, which include observation, measurement, description, comparison, experiment, modeling, mathematical, cybernetic and heuristic research methods.

The third level is the special methods where they are distinguished:

- a) own-criminalistic methods (technical-criminalistic, structural-criminalistic);

The third level is special methods, which distinguish: a b) special methods of other sciences (physical, chemical, sociological, statistical, anthropological, anthropometric, etc.).

In the future, all other criminologists who turned to the study of this issue, in one form or another, interpreted the suggestions made by R. S. Belkin.

Thus, M. V. Saltevs'kyi shared the concept of the three-member classification of methods and distinguished the universal method, general scientific methods, including logical — analysis and synthesis, induction

¹ Div.: Belkin R. S. Kriminalistika: problemy, tendencii, perspektivy. Obshhaja i chastnye teorii. [Forensics: problems, trends, prospects. General and particular theories.] Moskva : Jurid. lit., 1987. S. 116–129; Belkin R. C. Kurs kriminalistiki: v 3-h t. T. 1: Obshhaja teorija kriminalistiki. [The course of forensics: in 3 vols. T. 1: General theory of forensics.] Moskva : Jurist, 1997; [in Russian] Saltevs'kij M. V. Kriminalistika [Forensics]: pidruchnik: u 2 ch. Ch.1. Harkiv : Konsum, Osnova, 1999; Shepit'ko V. Ju. Teoreticheskie problemy sistematizacii takticheskikh priemov v kriminalistike [Theoretical problems of the systematization of tactical techniques in forensics.] Har'kov : Original, 1995; Matusovskij G. A. Kriminalistika v sisteme nauchnyh znaniy. Har'kov : Vyshha shkola, 1976 ta in. [in Russian]

and deduction, analogy and version, as well as individual (special) methods with such groups as: methods of extraction information from personal sources (from people);

methods of obtaining information from personal sources (from people of establishing facts when investigating particular types of crimes; methods of crime prevention by forensic means.

At the same time, M. V. Saltevskiy emphasized that the proposed classification groups remain open, which allows them to attach to them new separate forensic methods that are being developed¹.

O. M. Korshunova and O. B. Serov in the classification of forensic methods distinguish general scientific and special, and to the latter group include methods borrowed from other sciences and methods developed by the forensic science itself (technical-forensic and structural-forensic), emphasizing, that research methods should not be equated with practical practices as a result of scientific development².

A. F. Volobuyev distinguishes philosophical, general and individual sciences among forensic methods.

He emphasizes the need to clearly distinguish between the methods of cognition used by forensic scientists and forensic investigators, and therefore distinguish forensic methods into:

- 1) methods of scientific (theoretical) cognition;
- 2) methods of practical knowledge in the investigation of crimes³.

According to V. Yu. Shepitko the most recognized is the classification of forensic methods according to three levels:

- 1) methods of dialectical and formal logic;
- 2) general scientific methods;
- 3) special forensic methods, which distinguish forensic science methods and methods of practical activity that are directly used by operative-search workers, investigators, prosecutors, lawyers, judges, and sources of formation of which are natural and technical sciences3) special forensic methods, which distinguish forensic science methods and methods of practical activity that are directly used by operative-search workers,

¹ Saltevskij M. V. Kriminalistika [Forensics]: pidruchnik: u 2 ch. Ch.1. Harkiv : Konsum, Osnova, 1999; S. 16–19. [in Russian]

² Kurs kriminalistiki: v 3 t. T. 1. Obshheteoreticheskie voprosy. Kriminalisticheskaja tehnika. Kriminalisticheskaja taktika [General theoretical issues. Forensic technology. Forensic tactics] / pod red. O. N. Korshunovoj i A. A. Stepanova. Sankt-Peterburg : Juridicheskij centr Press, 2004. S. 43–45. [in Russian]

³ Kryminalistyka [Forensics] : pidruchnyk / [V. D. Bernaz, V. V. Biriukov, A. F. Volobuiev] ; za zah. red. A. F. Volobuieva. Kharkiv : KhNUVS, 2011. S. 19–23. [in Ukrainian]

investigators, prosecutors, lawyers, judges, and sources of formation of which are natural and technical sciences¹.

Thus, most scholars are adherents of the three-tier classification of forensic methods, but with different interpretations and internal filling of this classification by certain methods.

The analysis of the approaches proposed in the philosophical and specialized literature to the understanding of methods of science give reason to reach the following conclusions, which are the basis for further proposals regarding the classification of forensic methods:

1) method as a way of knowing is a set of rules (for example, the set and sequence of certain operations), a method, tools that contribute to solving theoretical or practical problems;

2) the method is based on knowledge, it, after all, is knowledge, transformed into certain principles, rules of action.

The main purpose of any scientific method is to ensure, on the basis of appropriate principles (requirements, prescriptions), that certain cognitive or practical problems are solved, knowledge gained, the optimal functioning and development of certain objects is achieved;

The "Core" of the system of methodological knowledge is philosophy, since its principles, laws, and categories determine the strategy of scientific research, in a specific way embodied in specific forms;

4) philosophical methods are universal, that is, they are on the higher "floors" of abstraction.

Therefore, they are not described in clear terms of logic and experiment, they are not formalized and mathematized but set only the most general regulations of the study, its general strategy, but do not replace specific methods and do not determine the final result of cognition directly and directly²;

5) the analysis of modern scientific concepts of philosophical methods refutes the outdated notion that there are only two methods — dialectics and metaphysics, and affirms the idea of the multiplicity of philosophical methods, where along with dialectics (Hegel, Marx, Engels)

¹ Kriminalistika [Forensics] : pidruchnik : u 2-h t. T. 1. / [V. Ju. Shepit'ko, V. A. Zhuravel', V. O. Konovalova] ; za red. V. Ju. Shepit'ka. Harkiv : Pravo, 2019. S. 16–19. [in Ukrainian]

² Stepin V. S., Elsukov A. I., Goldberg F. I. Metody nauchnogo poznaniya / Gumanitarnaya jenciklopediya: koncepty. [Methods of scientific knowledge / Humanitarian encyclopedia: concepts.] Centr gumanitarnykh tehnologij, 2002–2019 (poslednjaja redakcija: 23.04.2019). URL : <https://gtmarket.ru/cosept/6874> (data zvernennia 24.06.2019). [in Russian]

there is a method of transcendental analysis (Kant), phenomenology (Husserl), hermeneutics (Martin Heidegger)¹;

6) general scientific methods are used in various fields of knowledge, have a universal character, provide knowledge of the world around and accompany any activity.

These methods are necessary for the rational knowledge of being and its specific types, serve the purpose of the implementation of correct abstract thinking.

It is necessary to distinguish philosophical methods from formal and logical ones.

As I. D. Andreev rightly pointed out, "the formal-logical method in the known sense is also universal because it is used in any cognitive process;

This does not mean that it is to some extent identical to the dialectical method of cognition.

The fact is that the laws of dialectics are known not only laws of thought, but also laws of being, laws of formal logic are only laws of thinking, laws of communication of thoughts in judgments².

Also, in our opinion, despite certain criticisms, it is advisable to distinguish empirical and theoretical methods in the system of scientific methods.

Yes, you can really agree with your opponents that there are neither theoretical nor empirical methods in their pure form.

Methods of empirical research are never implemented "blindly", and always theoretically loaded, driven by certain conceptual ideas.

As pointed out by R. S. Belkin, "any empirical method requires a meaningful human activity, logical statement of the problem and processing of the obtained results"³.

But this does not in any way indicate that they cannot be differentiated in the relevant classification constructions;

7) separate scientific (special) methods — are methods of technical, natural and socio-human sciences, which are used in one or more related fields of research of knowledge fields or developed in their specific field of knowledge their own cognitive tools.

¹ Filsofski metody : pidruchnyky onlain. [Philosophical Methods: Handbooks Online.] URL : [textbooks.net.ua/ content/view/5130/45/](http://textbooks.net.ua/content/view/5130/45/) (data zvernennia 24.06.2019). [in Ukrainian]

² Andreev I. D. O metodah nauchnogo poznaniia. [On the methods of scientific knowledge.] Moskva : Nauka, 1964. S. 86. [in Russian]

³ Belkin R. C. Kurs kriminalistiki [Forensics course]: v 3-h t. T. 1: Obshhaja teoriia kriminalistiki. Moskva : Jurist#, 1997. S. 345. [in Russian]

By nature, they can be borrowed or transformed into a particular field of research or specially designed (proprietary).

Based on these starting points, you can propose the following structure of forensic methods:

1. Philosophical methods.

2. General scientific methods of cognition:

methods of empirical research (observation, experiment, comparison, description, measurement);

methods of theoretical research (formalization, axiomatic method, hypothetical-deductive method, ascent from abstract to concrete);

general methods (analysis, synthesis, abstraction, idealization, generalization, induction, deduction, analogy, modeling, systematic approach, probably statistical methods).

Separate (special) methods, i.e. borrowed, transformed into the field of forensic research methods of technical, natural and socio-human sciences or developed in the field of forensic knowledge own cognitive tools.

It should be noted that, because forensic science is a separate branch of knowledge, its own methods for the general classification of methods of cognition can be defined as separate scientific.

At the same time, it is desirable to classify them in the classification of forensic methods as special (proper forensic), thus emphasizing the originality of these cognitive tools in the field of forensic research.

Among the scientific methods that certainly permeate all areas of forensic research, it is especially important to identify those that form the basis for the formation of new, modern cognitive approaches. It is primarily about formalization, systemic, structural-functional (structural) and probably statistical methods.

Thus, formalization as a reflection of meaningful knowledge in a symbolic and symbolic form in order to exclude the possibility of ambiguous understanding of it serves as a basis for introducing the basics of algorithmization and programming¹ into criminalistics.

На базі системного підходу розроблено криміналістичну систематику² і здійснено побудову системи тактичних прийомів¹.

¹ Zhuravel V.A. Problemy alhorytmizatsii ta prohramuvannia rozsliduvannia zlochniv [Problems of algorithmization and programming of crime investigation.]. Visn. Akad. prav. nauk Ukrainy. Kharkiv : Pravo, 2008. № 2(53). S. 191–200; Khan O. O. Teoretychni osnovy planuvannia ta prohramuvannia slidchykh (rozshukovykh) dii [Theoretical basis of planning and programming of investigative (investigative) actions] : avtoref. dys. ... kand. yuryd. nauk: spets. 12.00.09 / Nats. yuryd. un-t im. Yaroslava Mudroho. Kharkiv, 2016. 20 s. [in Ukrainian]

² Golovin A. Ju. Kriminalisticheskaja sistematika [Forensic taxonomy.]. Moskva : LeksJest, 2002. 336 s. [in Russian]

Структурний метод став підґрунтям для формування криміналістичної характеристики злочинів, а ймовірно-статистичний – для з'ясування характеру взаємовідносин між її елементами².

With regard to individual (special) methods, that is, forensics among all the sciences of the legal cycle is assigned the function of transformation, creative processing and adaptation of the achievements of different branches of knowledge to create a new scientific product and its introduction into jurisprudence.

According to the figurative statement of R. S. Belkin, forensic science provides for the *expansion* of natural and technical sciences into the judiciary³.

At the same time, “bringing to the forensics data of other branches of knowledge,” noted G. A. Matusovsky, “is not an end in itself”.

This process is aimed at achieving a higher degree of accuracy in its scientific research and practice in crime detection and investigation⁴.

So, on the basis of basic researches of physics, chemistry, microbiology, mechanics, such directions in forensics as optical, ultraviolet, infrared, luminescent, electron, X-ray, atomic microscopy are used, emission, spectral, chromatography, spectrometry etc⁵.

Modern sociological methods such as qualitative and quantitative document analysis (content analysis), questioning (questioning, interviewing) form the basis for criminologists to summarize empirical observations and to formulate appropriate recommendations for practice on this basis.

Forensic methods are addressed in the aspect of creation and implementation of the provisions of forensic prediction theory.

Anthropological and anthropometric methods are used in the study of problems of examination of living persons, corpses, and psychological

¹ Shepit'ko V. Ju. Teoreticheskie problemy sistematizacii takticheskikh priemov v kriminalistike [Theoretical problems of the systematization of tactical techniques in forensics.]. Har'kov : Original, 1995. 200 s. [in Russian]

² Kolesnichenko A. N., Konovalova V. E. Kriminalisticheskaja harakteristika prestupleni [Forensic characteristics of crimes] : ucheb. posob. Har'kov : Jurid. in-t, 1985. 92 s. [in Russian]

³ Belkin R. S. Kurs kriminalistiki [Forensics course]: ucheb posobie dlja vuzov. 3-e izd., dopolnennoe. Moskva : JuNITI-DANA, Zakon i pravo, 2001. S. 152. [in Russian]

⁴ Matusovskij G. A. Kriminalistika v sisteme nauchnyh znanij [Forensics in the system of scientific knowledge.]. Har'kov : Vyshha shkola, 1976. S. 11. [in Russian]

⁵ Osnovy estestvenno-nauchnyh znanij dlja juristov [Fundamentals of natural scientific knowledge for lawyers] / pod red. prof. E. R. Rossinskoj. Moskva : NORMA-INFRA-M, 1999. 600 s. [in Russian]

methods are used to formulate recommendations for establishing psychological contact with participants in criminal proceedings.

Forensic science has also developed its own cognitive tools, the specificity of which is determined by the identity of the objects and object of study.

This level includes: the method of constructing forensic versions (version),

the method of modeling the situation of the scene, the method of identification of the person in perfect traces,

the method of establishing correlation between the elements of the forensic characteristics and to build on this basis typical versions of the perpetrator and others.

Proposing the latter method, V. L. Sinchuk states that "its essence is that the analysis of the relationships between elements of a forensic characteristic allows, on the basis of deduction, to make assumptions about the existence of as yet unknown facts pertaining to the crime.

In other words, the detection of any element of the system with a degree of probability during the investigation may indicate the existence of another, not yet established element and determine the directions and means of its search.

It is in the possibility of disclosure of a specific crime with the use of generalized data on previously investigated similar crimes, and the practical instrumental significance of both the forensic characteristic itself and the method of establishing correlation dependencies between its elements lies"¹.

Along with forensic techniques, forensic methods are the result of theoretical and empirical research and ways of optimizing the activities of authorized entities to collect, investigate, and use evidence in criminal proceedings.

In forensic, expert, operational, search and other types of legal practice, forensic methods are implemented along with forensic techniques and means.

All forensic techniques developed and proposed by the practice must meet the following requirements:

1) lawfulness based on the norms of the current legislation, first of all criminal procedural law;

2) scientific development taking into account the modern achievements of science and technology;

¹ Synchuk V. L. Rozsliduvannya vbyvstv: shliakhy vdoskonalennia [Homicide investigations: ways to improve] : monohrafiia / za red. d-ra yuryd. nauk, prof. V. A. Zhuravlia. Kharkiv : Kharkiv yurydychnyi, 2005. S. 94. [in Ukrainian]

3) determination and conditionality of specificity of objects of knowledge, regularities of the subject of study;

4) efficiency and reliability the ability to ensure a positive outcome with a high degree of probability;

5) cost effectiveness the cost of creation should be less than the achieved results;

6) quality and accessibility the clarity and accessibility of each trained specialist;

7) reproducibility — the ability to use an unlimited number of times.

Among the forensic methods are the following groups: methods of collecting, fixing and investigating evidential information (physical and chemical methods of detection of invisible traces of fingers,

electrolytic methods of restoration of missing signs on metal objects, methods of establishing invisible and invisible texts);

methods of using forensic and special techniques (methods of forensic photography);

methods of conducting individual investigative (search) actions (concentric and eccentric methods of inspection of the scene);

methods of nomination and verification of investigative, judicial, expert versions and construction of predictive models, etc.

Conclusions

In forensic science there is a complex, dynamic, subordinated system of numerical methods of different levels, spheres of activity, directions, which are realized taking into account specific conditions and subject of research. This is a conceptual approach, in which the methods in forensics are considered in two aspects: as a means of carrying out scientific search and as a result, i.e. we are talking about methods of forensics (scientific methods) and forensic methods (practical methods).

Forensic methods should be understood to mean a scientifically balanced system of principles and imperatives, rules and norms, operations and procedures for the implementation of empirical and theoretical levels of research, which allows to obtain new knowledge, its verification and confirmation in the process of solving relevant subject-cognitive tasks.

Forensic methods this is a set of theoretical and empirical studies, a set of ways of optimal implementation of investigative, judicial, expert, operational and search activities aimed at obtaining information about the mechanism of the crime, its circumstances and the person who committed it.

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В. А. Журавель **МЕТОДИ В КРИМІНАЛІСТИЦІ**

Розглянуто генезу та сучасний стан наукових підходів щодо визначення методів у криміналістиці. Зазначено, що попри вагоме значення для формування методології науки криміналістики окремого вчення про її методи дотепер не створено.

З огляду на результати проведеного аналізу наукових підходів запропоновано методи в криміналістиці поділяти на два різновиди,

використовуючи такі терміни: 1) методи криміналістики, тобто методи вивчення предмета дослідження цієї галузі знань, здійснення наукового пошуку; 2) криміналістичні методи, тобто ті оптимальні способи дій уповноважених суб'єктів, які є результатом проведених наукових досліджень і рекомендовані практиці.

Ключові слова: методи в криміналістиці, методи криміналістики, криміналістичні методи, класифікаційні побудови методів у криміналістиці.

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V. M. Shevchuk,

Doctor of Law, Professor of the Department of Criminalistics of the
Yaroslav Mudryi National Law University, Kharkiv, Ukraine
ORCID:<https://orcid.org/0000-0001-8058-3071>,
Email: Shevchuk_viktor@ukr.net

CRIMINAL SITUATION AND ITS EFFECTS ON FORCING THE CONCEPT OF TACTICAL OPERATIONS

The problems of formation of scientific conception of tactical operations and its are investigated.

The problems of formation of the scientific concentration of tactical operations and its interrelation with the forensic situation are investigated. It is substantiated that at the present stage of the development of forensics, the problem of developing a separate forensic theory of tactical operations, taking into account the provisions of the forensic situation, is very relevant and important. It is proved that the investigative (judicial) situation exerts a direct managerial influence on a tactical operation, determines the need for its production, determines the specificity and substantive content, so in the procedure of preparing and deciding to conduct a tactical operation, the assessment of the current situation occupies one of the central places. Tactical operation is considered as a specific tactical means of solving the investigative and judicial situation. It is substantiated that studies of the forensic situation open up new perspectives and opportunities for successful formation of the scientific concept of tactical operations and implementation of its provisions in practical activity. Further researches of these issues will contribute to the enrichment of forensic theory, will provide prerequisites for the emergence of new approaches to the solution of important problems of forensic tactics and techniques aimed at improving the efficiency of criminal proceedings. Today the gradual process of formation of the corresponding scientific concept of tactical operations is traced, its interrelation with the forensic situation, which is transformed into an independent forensic theory. Prospective directions of further scientific developments of the considered problems are offered.

Keywords: forensic situation, situational approach to crime investigation, tactical operations, investigative and judicial situation, situational dependence of tactical operations, concept of tactical operations, forensic theory of tactical operations.

Formulation of Research Problem.

The current trends in the development of criminalistics and the reform of the criminal procedural legislation provide for the introduction of an effective system of counteraction to criminal offenses, the adoption of urgent measures aimed at improving the investigation and judicial activity, based on the latest achievements of science and technology.

Among such means, special attention is paid to various tactical and forensic complexes.

They act as an effective means of implementing methods of pre-trial investigation and court proceedings, solving specific tactical tasks and creating appropriate conditions for optimizing the activities of the investigator, prosecutor, court.

All this testifies to the importance and timeliness of the theoretical substantiation and development of the scientific concept of tactical operations, its interrelation with the forensic situation, and the further implementation of such scientific developments in the practical activity of investigating crimes and judicial review of criminal offenses.

The gradual process of forming the corresponding scientific concept of tactical operations, its interconnection with the forensic situation, which is transformed into an independent forensic theory (doctrine), which substantially enriches the scientific potential of forensics and practice of effective counteraction to modern criminal manifestations is traced today.

Therefore, at the present stage of the development of forensics, the problem of developing a separate forensic theory of tactical operations, taking into account the situation of the forensic situation, is quite relevant and important.

This kind of research opens new perspectives and opportunities for successful formation of the scientific concept of tactical operations and implementation of its provisions in practice.

Analysis of recent research and publications.

Important contribution to the development of theoretical foundations for the formation and implementation of tactical operations have made well-known forensic scientists: V. P. Bakhin, R. S. Belkin, A. V. Dulov, V. A. Zhuravel, I. M. Komarov, V. O. Konovalova, G. A. Matusovsky, V. O. Obratsov, O. O. Cheburenkov, V. V. Tishchenko, V. Y. Shepitko, V. I. Shikanov, B. V. Shchur and others¹.

¹ Bahin V. P. Sledstvennaja situacija i takticheskoe reshenie [Investigative situation and tactical decision.]. Specializirovannyj kurs kriminalistiki : uchebnik. Kiev : NI i RIO KVSh MVD, 1987. S. 198–202; [in Russian]. Belkin R. S. Ocherki kriminalisticheskij taktiki [Essays in forensic tactics] : ucheb. posobie. Volgograd : VSh MVD RF, 1993; Dulov A. V. Takticheskie operacii. Kriminalistika [actical operations. Forensics] : ucheb. posobie / A. V. Dulov, G. I. Gramovich, A. V. Lapin i dr. ; pod. red. A. V. Dulova. Minsk : NKF «Jekoperspektiva», 1996; [in Russian]. Zhuravel' V. A. Rozsliduvannja kradizhok. Kriminalistika [Investigation of thefts. Forensics] : pidruchnik: u 2 t. T. 2 / V. Ju. Shepit'ko, V. O. Konovalova, V. A. Zhuravel', V. M. Shevchuk ta in. / za red. V. Ju. Shepit'ka. Harkiv: Pravo, 2019; [in Ukrainian]. Obrazcov V. A. Kriminalisticheskoe uchenie o takticheskij operacii. Kriminalistika [Forensic doctrine of tactical operations. Forensics] / pod red. prof. V. A. Obrazcova. Moskva : Jurist, 1995; Cheburenkov A. A. Obshheteoreticheskie polozhenija i prakticheskie aspekty kriminalisticheskij taktiki [General theoretical provisions and practical aspects of forensic tactics]. Moskva : Jurlitinform, 2008; [in

At the same time, there are a number of theoretical and practical problems in the formulation of the concept of tactical operations that remain undeveloped or debatable.

In addition, the tendencies of theoretical developments from the practice of using tactical operations in criminal proceedings are traced.

At present, the issues that are decisive in the formation of the forensic theory of tactical operations, including the problem of developing a dissolved scientific concept, taking into account the provisions of the forensic situation, remain debatable.

Considering the problems of development and implementation of tactical operations and their situational conditionality in the investigation of crimes, it is necessary to take into account the basic provisions of the theory of investigative situations, which are relative to the problem of tactical operations *more general*¹.

In this regard, the conceptual provisions of the forensic situation and proposals for its classification in the general theory of forensic science (S. V. Velikanov, T. S. Volchetska, S. E. Voronin, L. Y. Drapkin, D. V.) deserve attention. Kim, G. A Matusovsky, M. P Yablokov and others)².

In our view, such an understanding of the current state of the theory of investigative situations reflects its methodological importance for forensics in general and allows us to clearly determine the place of this theory in the system of forensic science.

Russian]. Shepit'ko V. Ju. Kriminalistichna taktika (sistemno-strukturnij analiz) [Forensic tactics (system-structural analysis)]: monografiya. Harkiv: Harkiv juridichnij, 2007 ta in.; [in Ukrainian].

¹ Belkin R. S. Ocherki kriminalisticheskoy taktiki [Essays on forensic tactics]. Volgograd : VSh MVD RF, 1993. S. 70 [in Russian].

² Volcheckaja T. S. Kriminalisticheskaja situologija [Forensic Situation]: monografiya ; pod red. N. P. Jabloкова. Kaliningrad : Izd-vo Kaliningrad. un-ta, 1997; Volcheckaja T. S., Jablokov N. P. Predposylki formirovaniya kriminalisticheskoy situologii { Prerequisites for the formation of forensic situationalism.]. Vestn. Mosk. un-ta. Seriya 11. Pravo. 1997. № 3. S. 41–50; Voronin S. Je. Problemno-poiskovye sledstvennye situacii i ustanovlenie istiny v ugovnom sudoproizvodstve [Problem-searching investigative situations and the establishment of truth in criminal proceedings]: monografiya. Barnaul : Izd-vo Alt. un-ta, 2001; Drapkin L. Ja. Osnovy teorii sledstvennyh situacij[undamentals of the theory of investigative situations]. Sverdlovsk : Izd-vo Ural. un-ta, 1987; Kim D. V. Teoreticheskie i prikladnye aspekty kriminalisticheskikh situacij [Theoretical and applied aspects of forensic situations]: monografiya / pod red. prof. V. K. Gavlo. Barnaul : Izd-vo Alt. un-t, 2008 [in Russian]; Matusovsky H. A. Sytuatsiyni pidkhiid do rozsliduvannia zlochyniv. Kryminalistyka. Kryminalistychna taktyka ta metodyka [ituational Approach to Crime Investigation. Criminalistics. Forensic tactics and methodology] : pidruch. dlia vuziv / za red. V. Yu. Shepitka. Kharkiv : Pravo, 1998. S. 165–170 ta in [in Ukrainian].

As the results of scientific research have shown, the situational approach is characteristic of all sections of forensic science, and in each of them the investigative (judicial) situation is of particular importance for the deeper analysis of the regularities studied, the development of forensic recommendations adapted to specific conditions of activity¹.

These circumstances lead to the need for a comprehensive approach to the study of these issues and require fundamental work and further scientific development.

The **purpose** of the article is to investigate the problems of forming the scientific conception of tactical operations, its interrelation with the criminalistic situation and the further implementation of such scientific developments in the practical activity of investigation of crimes and judicial review of materials of criminal proceedings.

The conclusions and results of the study are aimed at the development and improvement of certain provisions of the forensic theory of tactical operations, the specifics of the construction of such organizational and tactical tools and the practice of their implementation in criminal proceedings.

Investigative and judicial situations are seen as decisive determinants of tactical operations that directly affect the practice of such operations.

Main Research Content Presentation.

For the formation of the theoretical concept of tactical operations and the practical implementation of its provisions, the situational approach, which gives the possibility to use in the investigative and judicial activity the information of the general nature, most adequate for the choice and adaptation of typical tactical decisions that provide optimal criminal proceedings.

Indeed, it is through the definition of investigative (judicial) situations, the implementation of their typing, the formulation of tactical tasks for them and the optimal means of solving them, can significantly raise the level of scientific development in the theory of tactical operations.

Investigation of the investigative situation as a determining factor-determinant of tactical operation should cover, in our opinion, the following three aspects:

- 1) definition of the concept of investigative situation;

¹ Volcheckaja T. S., Jablov N. P. Predposylki formirovaniya kriminalisticheskoy situologii [Prerequisites for the formation of forensic situationalism..] Vestn. Mosk. un-ta. Seriya 11. Pravo. 1997. № 3. S. 43–44 [in Russian]/

2) to find out the composition of the components of the investigative situation and the role of each of them in the process of constructing tactical operations;

3) identifying the possibilities of typing investigative situations into specific stages of investigation and court proceedings in order to identify tactical tasks and means of solving them.

In the specialized literature, the investigative situation is defined as the set of conditions in which the investigation is being conducted, that is, the situation in which the process of evidence is taking place, and which is determined by the presence or absence of adequate factual data that determine the system of direct tasks and directions of the investigator's activity¹.

At the same time, there is no consensus among forensic scientists about the notion of an investigative situation, much less such a new category as *judicial situation*.

It is defined as the set of conditions under which an investigation is currently under way²; as a set of circumstances in a case that may be favorable or unfavorable to any investigator's findings and actions; as a ³set of factual data that reflects the essential features of the event⁴; as a state of investigation of a crime, which is determined by the presence (absence) of evidentiary and prompt information about the circumstances of the subject of evidence and the components of the forensic characteristic, which determines the system of immediate tasks and direction of the investigation; as the degree of information awareness of the crime, as well as the state of the investigation process at any particular point in time, and which

¹ Zhuravel V. A. Sytuatsiia slidcha. Velyka ukrainska yurydychna entsyklopediia [Investigation situation. The Great Ukrainian Legal Encyclopedia]: u 20 t. Kharkiv : Pravo, 2016. T. 20 : Kryminalistyka, sudova ekspertyza, yurydychna psykholohiia / redkol. : V.Iu. Shepitko (holova) ta in. : Nats. akad. prav. nauk Ukrainy; In-t derzhavy ta prava im. V. M. Koretskoho NAN Ukrainy; Nats. yuryd. un-t im. Yaroslava Mudroho. 2018. S. 743–744 [in Ukrainian].

² Belkin R. S. Ocherki kriminalisticheskoy taktiki [Essays on forensic tactics]: ucheb. posob. Volgograd : VSh MVD RF, 1993. S. 67 [in Russian].

³ Gerasimov I. F. Principy postroenie metodiki raskrytiya prestuplenij. Voprosy kriminalisticheskoy metodologii, taktiki i metodiki rassledovaniya [Principles of building a technique for solving crimes. Questions of forensic methodology, tactics and investigation techniques]. Moskva: Jurlit, 1973. S. 82 [in Russian].

⁴ Gavlo V. K. O sledstvennoy situacii i metodike rassledovaniya hishchenij, sovershaemyh s uchastiem dolzhnostnyh lic. Voprosy kriminalisticheskoy metodologii, taktiki, metodiki rassledovaniya [On the investigative situation and investigation method of theft committed with the participation of officials. Questions of forensic methodology, tactics, investigation methods]. Moskva, 1973. S. 90 [in Russian].

assessment allows the investigator to make the most appropriate decisions in the case¹.

Currently in the forensic literature there are also different approaches to determining the structure of the investigative situation.

Thus, according to V. A. Obraztsov, the content of the investigative situation includes information, forensic, psychological, logistical, personnel, legal components².

In turn, I. O. Vozgrin distinguishes the following components in the structure of the investigative situation: the specificity of the crime committed, the peculiarities of information about the crime event, its completeness, reliability and relativity, the content of the investigation conducted to a certain point in time, its results, and the conditions of the investigation, ie the level of scientific organization and management of the investigative apparatus, the degree of security of criminalistics and special facilities, the employment of the investigator, etc.

Analyzing the structural components of the investigative situation, T. S. Volchetska proposes to divide them into three main groups, in particular:

1) factors relating to the event being investigated and determining the degree of reliability and completeness of the information model of the event being investigated up to the moment of the investigator's evaluation the situation;

2) factors characterizing the system of investigation itself, its procedural, tactical states, psychological relationships of participants of the preliminary investigation, etc .;

3) factors relating to the environment in which the investigation is conducted and determine the so-called investigative environment³.

The variety of approaches to defining the concept and structure of the investigative situation gave grounds for V. P. Bakhin to consider this forensic category in a broad and narrow sense.

In a broad sense, the investigative situation is a set of conditions that most fully characterize and reflect everything that influences and can influence the investigation of a crime, determining its peculiarities.

¹ Volcheckaja T. S. Kriminalisticheskaja situologija [Forensic Situology]: monografija pod red. N. P. Jabloкова. Kaliningrad : Kaliningrad. un-t, 1997. S. 46 [in Russian].

² Obraztsov V. A. Kriminalistika [Forensics] : ucheb. posobie. Moskva : Jurist', 1995. S. 56 [in Russian].

³ Volcheckaja T. S. Kriminalisticheskaja situologija [Forensic situational]: monografija; pod red. N. P. Jabloкова. Kalinigrad : Kaliningrad. un-t, 1997. S. 146 [in Russian].

In a narrow sense, an investigative situation is defined as a set of information that characterizes the state (situation) of an investigation at a certain stage¹.

In the forensic theory, attempts were made to classify investigative situations.

Thus, R. S. Belkin and M. P. Yablokov all investigative situations are divided into favorable and unfavorable for investigation².

Other forensic scientists have suggested dividing investigative situations into typical and specific ones; initial, intermediate and final; conflict-free and conflict-free³.

L. Ya. Drapkin identifies simple and complex investigative situations. Depending on the number, nature and content of the shaping factors, all complex situations are differentiated by the scientist into the following classification groups:

problematic (characterized by the contradiction between knowledge and ignorance, the specific relation of known and unknown, in which the search is not given and not directly contained in the source data, but is in ambiguous possible connection with already established facts, which to some extent limit and direct the search for a solution);

conflicts (the particular state of the system of interpersonal relations of two or more participants in a criminal trial who have conflicting interests and seek to achieve different goals in the context of information uncertainty that arises from the plans and intentions of the opponent);

tactical risk (defined as the specific relationship between the possible course of action of the investigator aimed at achieving the intended purpose and ambiguous, non-guaranteed results of their realization);

¹ Bahin V. P. Sledstvennaja situacija i takticheskoe reshenie. Specializirovannyj kurs kriminalistiki (dlja slushatelej vuzov MVD SSSR, obuchajushhihsja na baze srednego special'nogo juridicheskogo obrazovanija) [Investigative situation and tactical decision. Specialized course in forensics (for students of higher educational institutions of the USSR Ministry of Internal Affairs studying on the basis of secondary specialized legal education)]; uchebnik. Kiev : NI i RIO KVSh MVD SSSR, 1987. S. 196 –197[in Russian].

² Belkin R. S., Jablovkov N. P. Ponjatie i struktura sledstvennoj situacii. Kriminalistika socialisticheskikh stran [Concept and structure of the investigative situation. Forensics of the socialist countries]/ pod. red. V. Ja. Koldina. Moskva : Jurid. lit., 1986. S. 162 –163 [in Russian].

³ Bahin V. P. Sledstvennaja situacija i takticheskoe reshenie [Investigative situation and tactical decision // Specializirovannyj kurs kriminalistiki (dlja slushatelej vuzov MVD SSSR, obuchajushhihsja na baze srednego special'nogo juridicheskogo obrazovanija)]; uchebnik. Kiev : NI i RIO KVSh MVD SSSR, 1987. S. 198–202 [in Russian].

organizationally disordered (the ratio of the significant organizational and managerial difficulties of the investigation process and not enough to overcome the objective and subjective capabilities (resources) of the investigator);

combined (they may have inherent problems, conflicts, tactical risk and organizational disorder at the same time or in different combinations) or mixed situations¹.

In addition, the *standard*, the repetition of investigative situations and the corresponding ways of solving them, create the preconditions for their typing².

Identification of typical situations and development on this basis of recommendations on the methodology of investigation of certain types of crimes, including the formation of tactical operations necessary to determine the direction of further investigation, proper construction and verification of investigative versions, identifying circumstances relevant to the case, the choice of the complex and the sequence of investigative actions³.

At the same time, typical investigative situations are *result of the scientific generalization of investigative practice, highest degree of scientific abstraction, situation in which information structure is dominated by common, frequently recurring features*⁴.

In this connection, V. Yu. Shepitko is correct in stating that, with regard to typical situations, one can identify a certain course of action for an investigator in the process of obtaining evidentiary information.

Knowledge of typical situations makes it possible not only to predict their occurrence under appropriate conditions as natural, but also to choose such tactical techniques (tactical combinations) that are the most optimal⁵.

¹ Drapkin L. Ja. Osnovy kriminalisticheskoy teorii sledstvennykh situatsiy [undamentals of the forensic theory of investigative situations] : avtoref. dis. ... d-ra jurid. nauk : 12.00.09. Moskva, 1987. S. 9–11 [in Russian].

² Velikanov S. V. Kласifikatsiia slidchykh sytuatsii v kryminalistychnii metodytsi [Classification of investigative situations in forensic methodology] : avtoref. dys. ... kand. yuryd. nauk : 12.00.09. Kharkiv, 2002. S. 12 [in Ukrainian].

³ Jablov N. P. Kriminalisticheskaja harakteristika i tipichnye sledstvennye situatsii kak vazhnye faktory razrabotki metodiki rassledovaniya prestuplenij [Forensic characteristics and typical investigative situations as important factors in the development of crime investigation methods]: Voprosy bor'by s prestupnost'ju.1979. Vyp. 30. S. 121 [in Russian].

⁴ Vasil'ev A. N., Jablov N. P. Predmet, sistema i teoreticheskie osnovy kriminalistiki [Subject, system and theoretical foundations of forensic science]. Moskva : Izd-vo MGU, 1984. S. 139 [in Russian].

⁵ Shepitko V. Yu. Kryminalistychna taktyka (systemno-strukturnyi analiz) [Forensic tactics (system-structural analysis)] : monohrafiia. Kharkiv : Kharkiv yurydychnyi, 2007. S. 115 [in Ukrainian].

It should be borne in mind that typing investigative situations can be mainly on one of the main components.

Usually, such a condition is the availability of information about the event of the crime and its participants.

Typical situations are those faced by an investigator at the initial or subsequent stage of a crime investigation, depending on the completeness of the source data.

Typical investigative situations differ materially from the circumstances in which the crime was committed: obviousness or non-obviousness.

For example, in the investigation of premeditated murder, the following typical starting situations are identified:

- 1) the victim's identity and the perpetrator's identity are known;
- 2) the identity of the victim is known, the killer is unknown; 3) there is a suspect in the murder, the identity of the victim is unknown;
- 3) there is a suspect in the murder, the identity of the victim is unknown;
- 3) there is a suspect in the murder, the identity of the victim is unknown;¹.

Typical investigative situations can be distinguished in the next stage of the investigation if the suspect attitude to the suspected message is taken as the basis for typing.

In view of the above, it is possible to distinguish the following typical investigative situations:

- (a) the suspect agrees in full with the provisions of the notification of the suspected crime;
- (b) the suspect agrees in part to the terms set out in the notification;
- c) the suspect does not agree with the provisions of the notice of suspicion and does not admit his involvement in the criminal offense.

It should be noted that, depending on the investigative situation, some of these tactical operations may be end-to-end and be addressed at both the initial and subsequent stages of the investigation.

It depends on the decision (or not the solution) of the tactical tasks at a certain stage of the investigation, i.e. it is impossible to clearly link one or another tactical operation to the stage of investigation of the crime, since the implementation of such an operation is primarily due to the relevant investigative situation and a certain period of time of the investigation process during which an intermediate tactical task is solved.

¹ Ishhenko E. P. Kriminalistika [Forensics]: kratkij kurs. Moskva : «KONTAKT»: INFRA-M, 2003. S. 107–109 [in Russian].

Thus, "in cases where the offender has not been identified, or has been installed but has not yet been detained, the investigative situations of the initial proceed to the next stage of the investigation"¹.

This also applies to tactical operations that can be aimed at identifying the offender, finding the abducted, providing compensation for material damage, preventing the crime, etc.

In developing these provisions, V. M. Karagodin, in our opinion, rightly notes that the existence of a relationship between investigative situations on the one hand, and tactical operations on the other, provides an opportunity to develop typical tactical operations, which by the level of generalization can be arbitrarily split into two groups.

Typical tactical operations of the first, higher level of generalization are designed to be used in situations that are typical of crimes of various kinds.

These operations include the complexes of the search action and the exposure of the offender.

Typical tactical operations of the second group are developed taking into account the forensic characteristics of the crimes and the situations typical for their investigation.

These tactical operations are more specific because they specify their tasks.

We consider that they should be planned on the basis of more general operations of the first kind.

In particular, typical operations for identifying and overcoming the methods of concealing crimes are of the second level of commonality and should be developed depending on the particular methods of concealment².

Thus, the analysis of literary sources and judicial investigative practice gives grounds to claim that the investigative (judicial) situation is a systematic, rather complicated, multicomponent formation, the content of which is made up by different conditions, circumstances, factors that determine the situation (situation) of the investigation process. (litigation) at a certain stage and are important for the selection and implementation of optimal techniques, methods and tools, including tactical operations.

¹ Zhuravel V. A. Rozsliduvannia kradizhok. Kryminalistyka [Investigation of thefts. Forensic] : pidruchnyk: u 2-kh t. T. 2 / V. Yu. Shepitko, V. O. Konovalova, V. A. Zhuravel, V. M. Shevchuk ta in.: za red. V. Yu. Shepitka. Kharkiv : Pravo, 2019. S. 86 [in Ukrainian].

² Karagodin V. N. Takticheskie operacii v dejatel'nosti po raspoznavaniju i preodoleniju sposoba sokrytija prestuplenija. Takticheskie operacii i effektivnost' rassledovanija [Tactical operations in recognizing and overcoming the method of concealing a crime. Tactical operations and the effectiveness of the investigation]: sb. nauch. tr. Sverdlovsk : Sverdlov. jurid. in-t, 1986. S. 56–59 [in Russian].

The fact that the vast majority of scientists, exploring the notion of tactical operation, consider situational conditioning as one of the important features of this criminalistics category, confirms this.

This once again proves that there is a deep genetic connection between the investigative (judicial) situation and the tactical operation, which is that the tactical operation is formed in a specific investigative situation, depends on it both by the selection of the means and their content.

In this case, the ordering of investigative (judicial) situations, it is advisable to carry out on the basis of situational modeling, the essence of which is that a large number of specific situations, similar in any significant respect, "merges", combined into one or more generalized situations for which optimal decision-making and practice programs are being developed)¹

In view of the above, a comprehensive list of all components of the investigative (judicial) situation can hardly be drawn up, so it is advisable to point only to certain groups of them.

This approach simplifies the analysis of the content of the situation and at the same time allows practitioners to consider all the important components of the investigative (judicial) situation, to determine the possibilities of their optimal use for solving investigative tasks.

When examining the specifics of the "investigative (judicial) situation and so-called" operation, it is also necessary to assume that the relationship between the tactical operation and the investigative (judicial) situation is mutual and is bilateral, multilevel and dynamic.

In particular, the decision on the expediency of conducting a tactical operation is made on the basis of an assessment of the investigative (judicial) situation.

In the future, the structure and orientation of the tactical operation is determined by the nature of the investigative (judicial) situation that has developed at a particular stage of the investigation.

In this case, the complex of procedural and non-procedural actions and measures that determine the structure of the tactical operation may be modified (supplemented) depending on the situation.

For example, if the investigative situation at the time of the investigation is favorable, then these circumstances are simply used in the

¹ Drapkin L. Ja. Situacionnyj podhod v kriminalistike i programmirovaniye rassledovaniya. Problemy programmirovaniya, organizacii i informacionnogo obespecheniya predvaritel'nogo sledstva [Situational approach in forensics and investigation programming. Problems of programming, organization and information support of the preliminary investigation] : mezhvuz. nauch. sb. Ufa : Bashkir. un-t, 1989. S. 28–29 [in Russian].

application of the tactical operation, and its favorable parties are taken into account when planning and conducting such a tactical operation.

If the investigative situation is unfavorable, the tactical operation is intended first of all to change it for the better, to weaken its orientation, which counteracts the investigation, or to eliminate it altogether.

However, an unfavorable investigative situation may prompt the investigator to refuse to conduct a tactical operation at the moment or at all.

If, for example, the ill-advised actions of the investigator have given birth to the suspect, then the operation to detain him and his accomplices with physical evidence may become ineffective¹.

In addition, the adverse investigative situation directly affects the structure of the tactical operation, restricts the investigator in the selection of its elements, does not allow one or other investigative actions as elements of the tactical operation².

With respect to court situations that determine the expediency of using tactical operations as a means of resolving them, the following may be mentioned:

(a) the confirmation situation in the judge of the evidence gathered in the pre-trial investigation;

(b) the contradiction situation of and inconsistency of the evidence gathered during the pre-trial investigation and confirmed in the course of court proceedings;

(c) the situation during the course of the trial of new evidence requiring further verification, including by means of a tactical operation.

Some scholars³, pointing to the two-way relationship of tactical operation with the investigative situation, say that tactical operations are

¹ Belkin R. S. Kurs kriminalistiki [Forensic science course] : ucheb. posob. dlja vuzov. 3-e izd., dop. Moskva : JuNITI-DANA; Zakon i pravo, 2001. S. 397; Ishhenko E. P. Kriminalistika: kratkij kurs. Moskva, 2003. S. 107–109; Cheburenkov A. A. Obshheteoreticheskie polozhenija i prakticheskie aspekty kriminalisticheskoi taktiki [General theoretical provisions and practical aspects of forensic tactics]. Moskva : JurLitinform, 2008. S. 179–187, [in Russian]; Shevchuk V. M. Taktychni operatsii u kryminalistytsi [Tactical operations in forensics: theoretical foundations of formation and practice of realization]: teoretychni zasady formuvannia ta praktyka realizatsii : monohrafiia. Kharkiv : Apostyl, 2013. S. 254–269 ta in [in Ukrainian].

² Belkin R. S. Ocherki kriminalisticheskoi taktiki [Essays on forensic tactics]. Volgograd : VSh MVD RF, 1993. S. 70 [in Russian].

³ Ivchenko L. I. Taktika kontrolja i zapisi peregovorov i ispol'zovanie rezul'tatov jetogo sledstvennogo dejstvija v rassledovanii prestuplenij [Tactics of monitoring and recording negotiations and using the results of this investigative action in the investigation of crimes]. Moskva : JurLitinform, 2005. S. 66–67 [in Russian].

carried out mainly in the context of a conflict investigative situation, the purpose of which is to change it in the best way for investigation.

The conflict situation causes the application of a specific complex (system), a "set" of coordinated actions and measures.

We believe that this approach has some inaccuracies and requires some re-work.

First, tactical operations are conducted in investigating crimes not only in conflict situations but also in conflict-free situations.

Secondly, such separation of investigative situations is rather conditional, any conflict-free situation in the case of improper organization and investigation, errors of the investigator, can turn into a conflict.

In this case, it can be concluded that at the beginning of the investigation there was no need for tactical operations in a conflict-free situation, but subsequently the investigator turned such a situation into a conflict situation and artificially emerged the need for tactical operations.

Therefore, this approach is controversial.

In other cases, forensic scientists say that tactical operations are conducted in complex situations, which are usually characterized by an incomplete knowledge of the crimes, their circumstances and participants¹.

In particular, L. Ya. Drapkin² believes that the need for tactical operations increases, depending on the complexity of investigative situations.

For example, in a tactical risk situation, the reliability of even the right course of action is significantly reduced and depends on random, unforeseen factors.

In this regard, the problem of increasing the likelihood of achieving the goals becomes a key issue here, and tactical operations are the main means of optimizing the investigation.

In our opinion, it is essential to consider whether there is a real need (reason) for a tactical operation in a particular (judicial) situation.

The need for a tactical operation arises when a separate, isolated use of other tactical means is not effective enough to solve the tactical task, will result in loss of information associated with additional time or material resources.

¹ Karagodin V. N. Takticheskie operacii v dejatel'nosti po raspoznavaniju i preodoleniju sposoba sokrytija prestuplenija. Takticheskie operacii. Jefferektivnost' rassledovanija [Tactical operations in recognizing and overcoming the method of concealing a crime. Tactical operations. The effectiveness of the investigation] : sb. nauch. tr. Sverdlovsk : Sverdl. jurid. in-t, 1986. S. 56–59 [in Russian].

² Drapkin L. Ja. Osnovy teorii sledstvennyh situacij. Sverdlovsk [undamentals of the theory of investigative situations]: Izd-vo Ural. un-ta, 1987. S. 139 [in Russian].

The peculiarity of a tactical operation is that its content does not consist of a random set of investigative actions, but a holistic complex of internal unity, predefined, coordinated, coordinated and deliberately carried out in the optimum sequence of actions on the basis of a special program¹.

Therefore, the investigative (judicial) situation constantly exerts a certain managerial influence on any tactical operation.

Knowledge and consideration of this circumstance make it possible to increase the efficiency of tactical operations being developed.

Therefore, in the process of preparing and deciding to conduct a tactical operation, the situation assessment occupies one of the central places.

No wonder in the forensic literature that "the correct evaluation of investigative situations and the selection of investigative tactics on this basis are important conditions for the purposefulness of the investigation, making scientifically sound and optimal decisions of a tactical, methodological and technical forensic nature"².

In other words, the investigative (judicial) situation causes the conduct of tactical operations, which in turn are a means of tactically influencing the situation in order to change it for the better.

Thus, the tactical operation acts as a specific tactical means of resolving the investigative (judicial) situation.

The investigative (judicial) situation, as a complex multidimensional formation, combines not only the components of information-logical, tactical-psychological, managerial, organizational-technical and material orientation, but also reflects the originality of the relations and relations between them.

A comprehensive analysis of these relationships and relationships is important for determining the nature of the investigative situation, the precise choice of means and tactics for influencing it, but it is especially necessary to identify unknown elements in the context of a particular situation.

In this regard, it is advisable to consider how certain components of the investigative (judicial) situation find expression in the planning and conduct of tactical operations, how they affect the structure of the tactical operation.

¹ Dulov A. V. Takticheskie operacii. Kriminalistika [Tactical operations. Forensics] : ucheb. posobie / A. V. Dulov, G. I. Gramovich, A. V. Lapin i dr. ; pod. red. A. V. Dulova. Minsk : NKF «Jekoperspektiva», 1996. S. 13 [in Russian].

² Kriminalistika socialisticheskikh stran [Forensics of the socialist countries] / pod. red. V. Ja. Koldina. Moskva : Jurid. lit., 1986. S. 165 [in Russian].

Forensic recommendations for the preparation and conduct of tactical operations as a complex organizational complex of investigative, operational, search and other measures should also be developed taking into account material, technical and organizational factors that manifest themselves in a particular situation¹.

The content, scale, composition of executors, duration, effectiveness of the operation may depend, in particular, on the possibility of joining forces of employees of different law enforcement agencies, control structures and special services; involvement of specialists and support technical staff; use of special technical means; involvement in the operation of permanent operating investigative groups, etc².

In addition, taking into account the peculiarities of the investigative (judicial) situation, in particular, its procedural and tactical components such as the possibility of isolation from each other in the case, is important for the improvement of existing and development of new tactical operations. conducting a specific investigative (search) action or operative-search event, etc.

It is also necessary to take into account the components of the investigative (judicial) situation of material and organizational and technical nature, such as the presence of communications between the duty unit and the investigation team, the availability of means of information transfer, the possibility of mobile maneuvering available forces, means, etc.³

The forensic doctrine rightly states that scientific research into the problems of tactical operation should be carried out at a general, group and species level.

At the level of general approach, the concepts, scientific foundations, structure, classification of tactical operation, history of development, place of this teaching in the criminalistics system, connections with other branches of forensic and other scientific knowledge, practice and norms of law are considered.

The purpose of such research is to develop a general model of tactical operation in terms of its systemic characteristics.

At the group and species level, the peculiarities of the identified types and types of tactical operations, forms and possibilities of realization

¹ Cheburenkov A. A. Obshheteoreticheskie polozhenija i prakticheskie aspekty kriminalisticheskaj taktiki [General theoretical provisions and practical aspects of forensic tactics.]. Moskva : Jurlitinform, 2008. S. 185–187 [in Russian].

² Obratcov V. A. Kriminalistika: modeli sredstv i tehnologij raskrytija prestuplenij [Forensics: models of crime detection tools and technologies]: kurs lekcij. Moskva, 2004. S. 211–215 [in Ukrainian].

³ Churilov S. N. Kriminalisticheskaja metodika: istorija i sovremennost [Forensic technique: history and modernity].. Moskva : Marketing, 2002. S. 230 [in Russian].

of the acquired knowledge are studied in order to create and apply in practice appropriate models of the specified operations, carried out to solve typical problems of investigation in cases of different categories, Investigation of certain groups of certain similar species, particular types and varieties of socially dangerous acts.

The use of the information contained in such models enables investigators to effectively address common and situationally determined issues of organizing and conducting tactical operations in various categories of crimes¹.

We believe that the study of the conceptual foundations of tactical operations in forensics should be directed in two directions.

The first involves the study and study of the nature of tactical operations, scientific and methodological foundations, the history of development, structure and classification of tactical operations, the place of this theory in the criminalistics system, the relationship with other branches of forensic and other scientific knowledge, forensic practice.

The second level is peculiarities of formation of separate types and types of tactical operations, forms and possibilities of realization of the acquired knowledge in order to construct and put into practice the typical tactical operations, which are carried out to solve typical problems of investigation of particular types and groups of crimes, taking into account the provisions of the forensic situation.

Conclusions

Thus, forensic investigations open new perspectives and opportunities for the successful formation of the scientific concept of tactical operations and the implementation of its provisions in the practice of identifying, investigating crimes and judicial review of criminal proceedings.

In addition, the optimization and enhancement of the effectiveness of counteraction to criminal manifestations largely depends on how deeply developed the theoretical foundations for the formation and implementation of tactical operations.

The development of tactical operations is an urgent need for forensic theory and investigative practice.

This is quite natural, because tactical operations activate and organize the processes of interaction of law enforcement agencies, act as a means of implementing methods of investigation, solving individual tactical problems taking into account the situational approach.

¹ Obrazcov V. A. Kriminalisticheskoe uchenie o takticheskoy operacii. Kriminalistika [Forensic doctrine of tactical operations. Forensics] / pod red. prof. V. A. Obrazcova. Moskva : Jurist, 1995. S. 75 [in Russian].

Therefore, at the present stage of the development of forensics, the problem of researching a separate forensic theory of tactical operations, taking into account the provisions of the forensic situation, is quite relevant and important.

Further scientific developments on the issues raised will contribute to the enrichment of the theory of crime-science, provide prerequisites for the emergence of new approaches to solving important problems of forensic tactics and techniques aimed at improving the effectiveness of crime investigations and optimizing investigative activities.

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В. М. Шевчук

**КРИМІНАЛІСТИЧНА СИТУАЛОГІЯ ТА ЇЇ ВПЛИВ
НА ФОРМУВАННЯ КОНЦЕПЦІЇ ТАКТИЧНИХ ОПЕРАЦІЙ**

Досліджуються проблеми формування наукової концепції тактичних операцій та її взаємозв'язку із криміналістичною ситуалогією. Обґрунтовується, що на сучасному етапі розвитку криміналістики досить актуальною й важливою є проблема розробки окремої криміналістичної теорії тактичних операцій із урахуванням положень криміналістичної ситуалогії. Доведено, що дослідження криміналістичної ситуалогії відкривають нові перспективи і можливості для успішного формування наукової концепції тактичних операцій і реалізації її положень у практичній діяльності. Запропоновано перспективні напрямки подальших наукових розробок зазначеної проблематики.

Ключові слова: криміналістична ситуалогія, ситуаційний підхід у розслідуванні злочинів, тактичні операції, слідча та судова ситуація, ситуаційна обумовленість тактичних операцій, концепція тактичних операцій, криміналістична теорія тактичних операцій.

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M. V. Shepitko,

Associate Professor at the Department of Criminal Law Yaroslav
Mudryi National Law University, Doctor of Law, Senior Researcher
ORCID:<https://orcid.org/0000-0002-7164-8037>
e-mail: shepitko.michael@gmail.com

PROBLEMS OF DETECTION AND INVESTIGATION OF CRIMES AGAINST JUSTICE AFFECTED BY PROFESSIONAL LITIGANTS

The problems of detecting and investigating crimes against justice committed by professional participants in legal proceedings were researched. The commission of these crimes by a judge, prosecutor, lawyer or other professional participants in the legal proceedings significantly increases the degree of public danger, and also complicates the detection of such criminal behavior and subsequent investigation. This is due to the special professional status of such persons, their inclusion in pre-trial and judicial procedures, daily work with colleagues, who in the future should identify and investigate crimes against justice. That is why the article draws attention to the existing special procedures and problems of investigating crimes against justice, provided for professional participants in legal proceedings (production).

Particular attention was paid to the peculiarities of the procedures related to the need for investigating authorities in cooperation with the High Council of Justice, which is authorized by the relevant law to carry out the functions of removing judges from administering justice, giving consent to detain a judge, etc. It is also important to notify the judge of the suspicion that the General the prosecutor or his deputy. Also important is the need to notify the judge of a suspicion that the Attorney General or his deputy is conducting. It was also interesting that the direct requirement of the law is sometimes violated by ignoring it by representatives of law enforcement bodies, which entails various consequences (for the examples given in the article).

Keywords: crimes against justice, crime detection, crime investigation, professional participant in legal proceedings, judge, prosecutor, lawyer, procedural legislation.

Formulation of Research Problem.

Detection and investigation of crimes against justice perpetrated by professional litigants have, in practice, significant complications, which include specific criminal and judicial proceedings, the existence of preventive mechanisms against violations of the principles of such litigants.

Existence of certain incentives and counterbalances in this system does not, as a whole, give the expected result to the public regarding the transparency of the work of the judicial and law enforcement agencies, reducing the level of corruption in these bodies and clearing them of unprofessional personnel.

For problem accessing, it is necessary to pay attention to the availability of statistical data on the investigation of crimes against justice

committed by professional litigants and the practice of applying special procedural rules that ensure the independence of these persons.

Analysis of recent researches and publications.

In solving their problems the investigation of crimes against justice was addressed in their works O. Ya. Baev¹, S. A. Knizhenko², M. Kh. Mustafayev³, S. V. Nekrasov⁴ and others.

In general, this problem was not investigated in the context of the coverage of the investigation of crimes against justice committed by professional participants in the proceedings (proceedings). With the adoption of the Criminal Procedural Code of Ukraine(2012), the stage of initiation of criminal proceedings has become a particular problem, which is related to the detection of crimes against justice and the application of special procedures for professional litigants.

Some attention was paid to the study of these problems by S. E. Ablamsky, T. G. Fomin, R. P. Chicha, O. O. Yukhno and others.⁵

Research Purpose

The purpose of the study is to investigate the problems of detecting and investigating crimes against justice committed by professional litigants.

Presentation of Research Content.

The problems of initiating pre-trial investigation, investigative and procedural actions against professional litigants (proceedings) are related to the existence of specific procedures in the Criminal Procedural Code of Ukraine for some of them.

¹ Baev O. Ja. Metodicheskie osnovy i tipovye programmy rassledovaniya prinuzhdeniya k dache pokazaniy [Methodological foundations and typical programs for investigating coercion to testify]. Moskva : Jurlitinform, 2013. S. 90–169 [in Russian].

² Knyzhenko O. S. Osoblyvosti rozsliduvannia zlochyniv proty pravosuddia, shcho vchyniaiuetsia shliakhom porushennia poriadku vidbuvannia pokarannia abo poperednoho uviaznennia [Features of investigation of crimes against justice, which are committed by violation of the order of serving a sentence or pre-trial detention]. Forum prava. 2016. № 3. S. 121–125 [in Ukrainian].

³ Mustafaev M. H. Kriminalisticheskaja harakteristika prestupnoj dejatel'nosti protiv pravosudija, sovershennoj rabotnikami pravoohranitel'nyh organov [Forensic characteristics of criminal activity against justice committed by law enforcement official]. Problemy v rossijskom zakonodatel'stve. 2011. № 5. S. 196–202 [in Russian].

⁴ Rukovodstvo dlja sledovatelej [Guide for Investigators] / pod red. N. A. Selivanova, V. A. Snetkova. Moskva : INFRA-M, 1997. S. 711–726 [in Russian].

⁵ Osoblyvosti dosudovoho rozsliduvannia shchodo okremoi katehorii osib [Features of the pre-trial investigation into a particular category of persons]. Naukovo-metodychni rekomendatsii. Kharkiv : KhNUVS. 60 s [in Ukrainian].

The Criminal Procedural Code of Ukraine of Ukraine provides for 37 sections, which regulate the issues of criminal proceedings against certain categories of persons.

According to Art. 480 of the Criminal Procedural Code of Ukraine the special procedure of criminal proceedings applies to the following subjects of crimes against justice:

1) a judge, a judge of the Constitutional Court of Ukraine, as well as a juror while performing their duties in court, the Chairman, the Deputy Chairman, a member of the High Council of Justice, the President, Deputy Chairman, member of the High Qualifications Commission of Judges of Ukraine; 2) the lawyer; 3) the Prosecutor General, his deputy, the Prosecutor of the Specialized Anti-Corruption Prosecutor's Office; 4) Directors and employees of the National Anti-Corruption Bureau of Ukraine.

According to Art. 481 Criminal Procedural Code of Ukraine, in criminal proceedings, the following are subject to proof:

1) by a lawyer — by the Prosecutor General, his deputy, the head of the regional prosecutor's office within the limits of his powers;

2) the Prosecutor of the Specialized Anti-Corruption Prosecutor's Office, the Director or another NABU employee, the Deputy Prosecutor General — the Prosecutor General (acting Prosecutor General);

3) a judge, a judge of the Constitutional Court of Ukraine, a jury during his / her duties in court, the Chairman, the Deputy Chairman, a member of the High Council of Justice, the Chairman, the Deputy Chairman, a member of the High Qualification COMMISSION of Judges of Ukraine, the NABU employees – the Prosecutor General or his deputy;

Failure to notify suspected officials of the suspected procedure may lead to their acquittal on the appropriate charges.

An example would be the verdict handed down by the Svyatoshinsky District Court of Kyiv on April 8, 2016, alleging that a judge was deliberately unlawful in imposing an administrative penalty.

The judge was justified in that the defense party had been artificially restricted in the right to collect and present evidence on a par with the prosecution (violation of the principle of the speediness of criminal proceedings)¹ – no suspicion had been notified within a reasonable time.

¹The aforementioned mistake made at the stage of pre-trial investigation of a crime against justice can be attributed to procedural or tactical errors of the investigator and the prosecutor. It was the unsuccessful choice of time to notify a judge of suspicion and establish his status as a suspect that, in combination with other circumstances, led to the acquittal of the case.

In addition, it was found out at the hearing that the report on the suspicion of a professional judge had not been drafted or served by the Deputy Prosecutor General of Ukraine, who also did not have the status of a prosecutor in specific criminal proceedings.

According to the judge who upheld the conviction on charges of committing a crime against justice under Art. 375 of the Criminal Code of Ukraine, this led to the absence of real procedural control on the part of the Deputy Prosecutor General of Ukraine, which resulted in the incompleteness of the pre-trial investigation and violations of the procedural law which cannot be eliminated¹.

The practice of rendering acquittals in the above circumstances was violated with the Supreme Court attempt to change approaches in ignoring the requirements of the procedural law regarding notification of a judge's suspicion, which should be exercised under Art. 481 of the Criminal Code of Ukraine.

For example, in its 2018 Annual Report, the High Council of Justice noted that Prosecutor General or his deputy independently draw up reports of the judge's suspicion, but delegate it to another prosecutor.

It is interesting to note that the decision of the panel of judges of the Administrative Cassation Court in administrative case 800/536/17 found, which unjustifiably substantiated its position with the general provisions of Art. 36, 40 of the CPC of Ukraine, stating that the prosecutor is authorized to instruct the investigator, the body of pre-trial investigation, and the investigator is obliged to execute the prosecutor's order.

In the court's view, this indicates that there is no need to notify the Attorney General or his deputy of the suspicion. A similar position was taken by the panel of judges of the Supreme Administrative Court of Cassation in Administrative Case 9901/679/18².

It is clear that this approach of the Supreme Court not only contradicts the practice of judges dealing with criminal cases, but also leads to a disregard for the principles of legality, the rule of law and the independence of judges.

It is impossible to allow a special rule to be blocked in implementation because of the rationale that this provision is not formulated in a general rule.

It is clear that this approach of the Supreme Court in these decisions at least contains a grave error.

¹Archive of Svyatoshinsky District Court of Kyiv, Case № 759/15166/15–к

²Dyv.: Ofitsiyni sait Vyshchoi rady pravosuddia [The official site of the High Council of Justice] URL : http://www.vru.gov.ua/content/file/Щорічна_доповідь_за_2018_рік.pdf (data zvernennia 28.08.2019).

The peculiarities of the procedure for criminal prosecution, detention and election of a preventive measure are stipulated in Art. 482 of the Criminal Procedural Code of Ukraine.

Thus, in Part 1 of Art. 482 of the Criminal Procedural Code of Ukraine states that the detention of a judge or his detention in custody or arrest shall be carried out with the consent of the Supreme Council of Justice, and without the consent of the High Council of Justice, a judge may not be detained or detained in custody or sentenced to trial by court time or immediately after committing a grave or particularly grave crime.

Judge arrested on suspicion of criminal misconduct should be released immediately after finding out his identity, except:

1) if High Council of Justice has agreed to detain a judge in connection with such an act;

2) the detention of a judge during or immediately after committing a serious or particularly serious crime, if such detention is necessary to prevent the commission of the crime, to avert or prevent the consequences of the crime or to preserve the evidence of this crime.

The judge should be released immediately if the purpose of such detention (preventing the commission of the crime, preventing or preventing the consequences of the crime or ensuring the preservation of the evidence of that crime) is achieved¹.

The High Council of Justice according to Art.: 1, 2, Art. 59 of the Law of Ukraine *On the High Council of Justice* considers the submission of consent to the detention of a judge, his detention or arrest no later than five days from the day of receipt of the application, and consideration of the submission of consent to the detention of a judge, his detention or detention. arrest is carried out by the High Council of Justice without summoning a judge.

The High Council of Justice may, if necessary, summon a judge for clarification.

The date, time and place of the consideration of the request shall be notified immediately to the Prosecutor General or his deputy.

It is interesting that under Art. 60, 62 of the Law of Ukraine *On the High Council of Justice* the procedure for deciding whether to consent to the detention of a judge, to detain him in custody or to arrest is somewhat complicated, since such a decision is not only announced to the sitting at the

¹ Protokol. Yurydychnyi internet-resurs.URL : https://protocol.ua/ru/generalna_prokuratura_povidomila_vishchu_radu_pravosuddya_pro_svoyu_pravovu_pozitsiyu_shchodo_poryadku_zatrimannya_suddi_utrimannya_yogo_pid_vartoyu_chi_areshtom/ (data zvernennia 28.08.2019).

hearing, but must be delivered immediately to the Attorney General, his Deputy or authorized prosecutor.

In addition, such a decision may be appealed against in the manner prescribed by the criminal procedural law, as part of an appeal against the relevant order of the investigating judge to detain the judge, detain him in custody or arrest.

All of this can lead to the loss of the effect of suddenness in the pre-trial investigation of criminal offenses committed by judges.

The Supreme Court of Justice Annual Report on the State of Independence of Judges in Ukraine in 2017 indicated that in 2017, the Supreme Court of Justice received 14 submissions from the Prosecutor General Office to consent to the detention and/or detention of a judge.

Based on the above submissions, the Supreme Judicial Council gave consent to the detention of 8 judges, mainly on suspicion of committing corruption offenses¹ (Articles 190, 258–3, 358, 368, 369 of the Criminal Code of Ukraine). The lack of appeal to the High Council of Justice for consent to the detention and / or detention of a judge during the pre-trial investigation of crimes against justice may be explained by the unwillingness of persons conducting pre-trial investigations of this category of cases.

This conclusion is based on the fact that the number of recorded crimes against justice committed by judges is increasing.

Thus, according to the statistics of the Prosecutor General's Office of Ukraine, crimes under Art. 375 of the Criminal Code of Ukraine (ruling by a judge (judges) knowingly an unjust verdict, decision, decision or ruling): in 2015 — 206 (22 reported suspicion); in 2016 — 174 (7 reported suspicion); in 2017 — 285 (12 reported suspicion)².

Availability of appeals from the Deputy Prosecutor General, the head of the Specialized Anti-Corruption Prosecutor Office is linked to the specific profile of the newly created body.

The Supreme Council of Justice also temporarily removes a judge from the administration of justice in connection with criminal prosecution (Article 63 of the Law of Ukraine *On the Supreme Council of Justice*).

The Supreme Council of Justice may grant such suspension for a period not exceeding two months on the basis of a reasoned request from the Prosecutor General or his deputy.

¹ Dyv.: Ofitsiyni sait Vyshchoi rady pravosuddia [The official site of the High Council of Justice]. URL : http://www.vru.gov.ua/content/file/Щорічна_доповідь_за_2017_рік_.pdf (data zvernennia 28.02.2018) [in Ukrainian].

² Dyv.: Ofitsiyni sait Heneralnoi prokuratury Ukrainy [the official site of the Prosecutor General's Office]. URL : <https://www.gp.gov.ua/ua/statinfo.html> pdf (data zvernennia 28.02.2018) [in Ukrainian].

At the stage of court proceedings, the period of suspension is set before the entry into force of a court sentence or the closure of criminal proceedings.

Supreme Council of Justice shall consider the request for the temporary removal of a judge from the administration of justice in connection with criminal prosecution immediately, but not later than seven days from the date of receipt of the request.

The Supreme Court of Justice Annual Report on the State of Independence of Judges in Ukraine for 2017 stated that in 2017 the High Judicial Council considered 22 requests by the Deputy Prosecutor General for temporary removal of judges from criminal justice in connection with criminal prosecution.

In 18 cases, the Council decided to temporarily remove judges from office for the duration, taking into account the procedural time limits for pre-trial investigation¹.

At the same time, the Council of Judges of Ukraine drew attention to the discretionary powers of the Supreme Council of Justice regarding the disciplinary responsibility of judges.

Of concern is the fact that the discretionary powers may also relate to the powers of the High Council of Justice with respect to its other powers, which may influence decision-making in criminal proceedings.

The analysis of the provisions of the legislation on bringing a judge (judges) to criminal liability for committing crimes against justice indicates that there are specific procedures in conducting pre-trial investigation and judicial review.

Such special procedures provided for by the Criminal Procedural Code of Ukraine indicate the inequality of judges suspected of committing crimes in comparison with other suspects (accused).

At the same time, such necessity is caused by the overcoming of judicial immunity and immunity, which is dictated by the status of judges and allows to be independent in the administration of justice.

The issue of informing state and other bodies or officials about the application of a preventive measure and the adoption of a sentence is also regulated separately.

According to the Art. 483 of the Criminal Procedural Code of Ukraine of Ukraine are reported in relation to lawyers; respective bodies of advocate self-government, and in relation to other categories of persons provided by Art. 480 Criminal Procedural Code of Ukraine of Ukraine are

¹ Дyv.: Ofitsiynyi sait Vyshchoi rady pravosuddia [The official site of the High Council of Justice].: http://www.vru.gov.ua/content/file/Щорічна_доповідь_за_2017_рік_.pdf (data zvernennia 28.02.2018) [in Ukrainian].

the bodies and officials who have elected or appointed them or are responsible for replacing their positions.

Considering that the detection of crimes against justice has a particular complication, provided that they are committed by professional participants in the proceedings (proceedings), the need to refer to the official statistical sources of information regarding the results of the pre-trial investigation or trial.

Thus, according to the statistics of the Office of the Prosecutor General of Ukraine, criminal offenses in the field of justice committed by judges, including deliberately rendering an unlawful sentence, decision, decision or ruling – 11 (2015), 8 (2016), 5 (2017), bribery¹ under Art. 368-370 of the Criminal Code of Ukraine – 5 (2015), 7 (2016), 4 (2017), other criminal offenses in the field of judicial activity – 1 (2015), 0 (2016)), 2 (2017).

Thus, the statistics of the Prosecutor General's Office of Ukraine already attribute more crimes to the field of justice than provided for in Chapter XVIII of the Criminal Code of Ukraine.

This is confirmed by the materials of criminal proceedings, the qualification of the behavior of judges, which indicates that the purpose of committing such crimes was the justice field.

Thus, at the request of the High Council of Justice to temporarily remove a judge from Kyiv from the administration of justice and the materials attached to it, since October 18, 2017, an indictment is pending before the Shevchenkivsky District Court of Kyiv on the accusation of a judge, committed Part 2 of Art. 15, Part 3 of Art. 190 of the Criminal Code of Ukraine.

According to the materials of the indictment, the judge was accused of acting in a deliberate manner for the purpose of unlawfully seizing the victim's money by abuse of trust and assured him of having friendly relations (to influence the necessary decision) with the chairman and the appellate judge. whose case was pending before the case, as well as the judges of the Supreme Economic Court of Ukraine, and received money from the victim without intending to actually commit and such actions².

Such apparent links to the justice sector are also traced in other criminal proceedings, which accuse judges, first of all, of corruption

¹ The statistics of the Prosecutor General's Office of Ukraine imply actions related to undue gain.

Decision of the High Council of Justice "On the Temporary Removal of the Judge of the Kyiv City Economic Court L. Golovatyuk from the Execution of Justice in Respect of Criminal Proceedings" of 6.03.2018 No. 711/0 / 15-18.

offenses in other countries, directly referred to as crimes against justice, because they do not encroach on their official or other activities.

Identification of crimes against justice committed by professional judges may be indicated by data published by the Supreme Court of Ukraine.

The status of judicial proceedings in Ukraine shows some problems with the quality of work of judges.

Thus, the court of appeal overturned the verdicts of local courts (by number of persons) in 2015 — 5518 (of which: in respect of material violations of the requirements of the criminal procedural law — 2972, the law on criminal liability — 970 was incorrectly applied, there was a discrepancy between the imposed punishment of the gravity of the criminal offense and the defendant's person — 750; the court's findings were inconsistent with the facts of the case — 284); in 2016 — 5546 (of which: one significant violation of the requirements of the criminal procedural law — 3078, incorrectly applied the law on criminal liability — 1024, there is a discrepancy between the imposed punishment of the gravity of the criminal offense and the person of the accused — 662, the discrepancy with the findings of the indictment — 239)¹.

Such a significant difference between the number of criminal proceedings initiated on the basis of criminal offenses by judges and the abolition of sentences only by the appellate court may indicate a low professional level of judges, the need to improve the skills of judges of local and / or appellate courts, or to commit criminal offenses their encroachments on justice.

Of course, in such a situation, the duty to monitor such sentences and other judgments in order to detect crimes against justice should be vested in a specially designated pre-trial investigation body (providing a mechanism of checks and balances through the control of the High Council of Justice).

Conclusions.

Research on the problems of detecting and investigating crimes against justice by professional litigants has led to the conclusion that only a small proportion of them are identified and heard.

This is explained by the professional and professional status of such litigants (litigation), their legal knowledge, their tenure in the field of justice and their professional functions.

¹ Ofitsiyni sait Verkhovnoho Sudu Ukrainy [The official site of the Supreme Court of Ukraine]. URL : [http://www.scourt.gov.ua/clients/vsu/vsu.nsf/7864c99c46598282c2257b4c0037c014/06eaa6c32d8de08ac22580e400490afc/\\$FILE/Статистичний%20збірник%202016.pdf](http://www.scourt.gov.ua/clients/vsu/vsu.nsf/7864c99c46598282c2257b4c0037c014/06eaa6c32d8de08ac22580e400490afc/$FILE/Статистичний%20збірник%202016.pdf) (data zvernennia 28.02.2018) [in Ukrainian].

In addition, the current incentives and counterbalances for securing and safeguarding their activities become a significant problem in the detection and investigation of crimes against justice committed by professional litigants.

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М. В. Шенітько

ПРОБЛЕМИ ВИЯВЛЕННЯ ТА РОЗСЛІДУВАННЯ ЗЛОЧИНІВ ПРОТИ ПРАВОСУДДЯ, ЩО ВЧИНЯЮТЬСЯ ПРОФЕСІЙНИМИ УЧАСНИКАМИ СУДОЧИНСТВА (ПРОВАДЖЕННЯ)

Досліджено проблеми виявлення та розслідування злочинів проти правосуддя, що вчиняються професійними учасниками судочинства (провадження). Вчинення цих злочинів суддею, прокурором, адвокатом або іншим професійним учасником процесу суттєво підвищує рівень суспільної небезпечності, а також істотно ускладнює саме виявлення такої злочинної поведінки та подальше розслідування. Саме тому в статті звернено увагу на

наявні особливі процедури та проблеми розслідування злочинів проти правосуддя, вчинених професійними учасниками судочинства (провадження).

Ключові слова: злочини проти правосуддя, виявлення злочинів, розслідування злочинів, професійний учасник судочинства, суддя, прокурор, адвокат, процесуальне законодавство.

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V. N. Terehovich,

Doctor of Law, Docent, Advocate of the Latvian Collegium of Sworn
Advocates

E. V. Nimande,

Doctor of Law, Associate Professor at the Department of the Department
of Criminal and Legal Sciences of the University of Latvia

CRIMINALISTIC TECHNIQUE IN THE SYSTEM OF FORENSIC THEORY

The term “criminal investigation technique” has two meanings in the scope of Theory of Criminalistics. The first meaning of the term is used for disclosure of one of regulatory means in Criminalistics cognition – criminal investigation technique cognition. This meaning of Criminalistics technique is disclosing in the limits of structure of the process of Criminalistics cognition. The second meaning of the term “Criminalistics technique” is disclosing in the limits of description of the system of cognitive activity in the sphere of applying criminal law.

During disclosure of the second meaning of the term “Criminalistics technique” we are pointing out that, first of all, it is the system of knowledge, used for organization of investigation of the event of criminal offense, id est, knowledge necessary and sufficient for getting new knowledge about the event of criminal offense. Knowledge acquired and used during applying criminal law in Latvia is knowledge of substantiate but not of faith nature. This knowledge is collective (sociable) knowledge and manifests itself during rationalization of investigation of the event of criminal offense. Personal knowledge manifests itself only during the stage of optimization of investigation of the event of criminal offense.

It is necessary to differentiate knowledge about criminal offense as knowledge about theoretical construction in criminal law and knowledge about the event of criminal offense as knowledge about phenomenon of fragment of material reality, which is evaluated as criminal offense. Knowledge about criminal offense (about corpus delicti) and linked circumstances as theoretical constructions in criminal law is collective (common, social) knowledge. This knowledge is gained by the person investigating the event of the criminal act in the course of long legal education. Knowledge about the event of criminal offense is got during another cognition activity – investigation (cognition) of specific event of criminal offense. This knowledge is domain for other people, id est, collective (common, social) knowledge and it is fixed in the materials of criminal case.

Theoretical knowledge, necessary for reasonable process of investigation of the event of criminal offense, encloses two types of knowledge (primary and guiding) about rationalization of the activity. Criminalistics techniques (system of knowledge about organization of Criminalistics activity) as subbranch of Criminalistics theory is fulfilling methodological function for developing of techniques for organization of investigation of separate types of criminal offenses.

Keywords: Criminalistics theory, criminalistics techniques, organization of investigation of the event of criminal offense.

Formulation of Research Problem.

The correct understanding of the essence of forensic methodology is, first of all, connected with the definition of value landmarks within which the essence of this concept can be revealed.

The term *technique* is usually used to refer to specifically organized activity within human activity meaning cognitive or transformative.

So when we talk about any technique at all, we are first and foremost talking about things related to human activity.

By designating a particular technique as a *forensic technique* we point to the sphere of human activity in which they apply this technique.

In this case, the term *forensic technique* indicates that this technique belongs to the field of criminalistics (investigation of criminal acts).

Analysis of Current Researches.

Limited language capabilities allow the use of the same word to refer to objects with different subject and semantic meanings.

In such cases we are talking about the presence of homonymy, ie. about the presence of different in meaning, but identical in sound and writing units of language.

The term *forensic technique* has two meanings in criminalistics theory.

The first meaning of the term *forensic technics* is used to disclose the content of one of the regulatory tools of forensic cognition; the methodology of forensic cognition.

Authors have previously stated their position in disclosing this meaning of the concept of *forensic technics*.

The second meaning of the term *forensic technique* is disclosed within the description of the system of human cognitive activity in the field of criminal enforcement.

The concept of human activity is the basic concept in the description and explanation of the *second nature*, ie. a world whose appearance and existence is unthinkable without the productive activity of human civilization.

It is generally accepted to regard human activity as the unity of the spiritual and material aspects of Dasein¹.

For the spiritual side of human activity is characterized by knowledge of the world, for the material side is its transformation.

Human activity is a necessary condition for the existence of society and includes four basic elements: purpose, means, result and the process of activity itself.

Investigating the event of a criminal act is not a transformative human activity, but a cognitive human activity.

¹ Podr. sm. : Vedin I.F. Bytie cheloveka: dejatelnost i smysl [Podr. sm. : Vedin I.F. Bytie cheloveka: dejatel'nost' i smysl. Riga : Zinatne, 1987]. Riga : Zinatne, 1987 [in Russian].

Any system of cognitive human activity is explained and described by a set of three subsystems: the system of objects of cognition, the system of cognitive actions and the system of knowledge.

Reflection on individual systems and their various combinations allows to carry out ontological, praxiological, logical, epistemological and methodological analysis, as well as to control the process of specific cognitive activity.

These circumstances are the answer to the question: “Why should a Particular theory of a Specific Cognitive Human Activity contain only three sections?”

– Because they describe nothing but the system of objects of knowledge, the system of cognitive actions and the system of knowledge of specific cognitive activity.

The **article purpose** is to outline the problematic aspects of the concept of *forensic technics* and to outline the parameters of theoretical knowledge about the investigation of the crime.

Main content presentation. Criminalistics is a theory about the cognitive activity of man, which is called the investigation of criminal acts.

Therefore, the Special (Subject) part of this theory should contain and contain only three sections:

1. The Forensic technique¹ section describing the system of cognition objects (the appearance of traces of criminal activity);

2. The *Forensic Tactics* section² describing the system of cognitive actions (investigative actions)

3. The Forensic technics section describing the system of knowledge necessary for the implementation of cognitive activities (investigation of the event of a criminal act; obtaining new knowledge).

Specificity of a sensible inquiry into the event of a criminal act lies in the realization of the aforementioned structural subsystems as value orientations and their follow-up in this cognitive activity.

Investigation of an event of a criminal act is a specific human productive cognitive activity, in the course of which a person pursues the main purpose — to establish the circumstances of the event of the crime and the circumstances associated with, ie. gaining new knowledge.

¹ Terehovich V. N. Sushhnost kriminalisticheskoy tehniki [The essence of forensic technology]. Teorija ta praktika sudovoї ekspertizi i kriminalistiki : zb. nauk. prac. Harkiv, 2017. Vip. 17. S. 29–39 [in Russian].

² See: Terekhovich VN, Nimande E. B. The essence of forensic tactics. Theory and Practice of Forensic Science and Forensic Science of sciences. articles. Kharkiv, 2018. Issue 18. P. 35 35.

The volume and content of this knowledge should be sufficient for a criminal-law evaluation of the knowledge gained about the event under investigation.

The criminal law assessment of the knowledge gained is carried out by means of theoretical criminal law constructs: the composition of the criminal act; circumstances excluding criminal liability; Circumstances mitigating or aggravating criminal liability and circumstances that may lead to a release from criminal liability and punishment.

The totality of specific descriptions of these criminal legal structures¹ is contained in the criminal law of the State in whose territory this law is in force.

This totality may change over time in the lawmaking process of this state.

Revealing the second meaning of the term *forensic technics*, we point out that it is, above all, a system of knowledge that is used to organize the process of investigating the event of a criminal act, ie. knowledge of the necessary and sufficient to obtain new knowledge about the event of criminal act.

What is knowledge?

In what form is this knowledge used in the knowledge (investigation) of a specific event of a criminal act?

Знание – это результат познания.

Cognition is a specific awareness of reality carried out within the framework of cognitive activity².

Realizing reality implies acquiring certain knowledge.

Such acquisition is accompanied by the intentionality of cognition (focus on a particular subject, object of cognition), attention and self-report of the knower in his own cognitive actions.

Human being not only knows the world, but also acts on the basis of the knowledge gained.

Knowledge refers not only to truth or falsehood as categories of reason, but also to good and evil, beautiful and ugly, as categories of moral and aesthetic.

To know means to have a clear, well-founded idea not only of what is, but also of what was and will be.

What should be the knowledge used in the investigation of a criminal act?

¹ Terehovich V. N. Teorija kriminalistiki [Theory of forensics]. Obshhaja chast : monografija. Riga, 2015. S. 60–98 [in Russian].

² Vedin Ju. P. Poznanie i znanie [Cognition and knowledge].. Riga : Zinatne, 1983. S. 37 [in Russian].

First, depending on the nature of knowledge, knowledge is divided into knowledge based on faith and knowledge based on experiential or logical justification.

As early as the end of the 19th century, the former president of the Royal Society of London, T. Hexley (1825-1895) formulated the basic principle of the nature of modern scientific knowledge:

"By taking something for granted, science commits suicide."

Therefore, knowledge in the field of science is knowledge based on logical or experienced reasoning.

Knowledge in the field of religion is knowledge based on faith.

Such a dichotomous difference in the nature of knowledge is the answer to the question.

"Why cannot the means of science prove or disprove the existence of God?"

The knowledge received and used in Latvia criminal law enforcement is knowledge that is justified.

For example, in Part 2 of Article 203 of the Federal Rules of Criminal Procedure of Latvia it is specified that in the conclusion the expert specifies the reasoned answers to the posed questions or the reasons for which it is impossible to give an answer; in part 1 of article.318 of the Federal Rules of Criminal Procedure of Latvia it is specified that in the pre-trial investigation the person conducting the process, accepts and makes in writing the motivated decisions; Part 3 of Article 328 of the Federal Rules of Criminal Procedure of Latvia states that officials involved in the criminal process, but not the persons leading the process, take reasoned decisions on issues within their competence; in Part 2 of Article 511 of the Federal Rules of Criminal Procedure of Latvia it is specified that the sentence should be lawful and *justified*.

Argumentation, motivation, justification are words that indicate the acquisition of knowledge in the form of judgments, which are based on facts (arguments), obtained either experimentally or logically.

Second, in the process of cognitive activity, a person uses a set of two types of knowledge: *collective (public) knowledge and personal knowledge*.

Collective (public) knowledge is called such knowledge, which is a universal property, it is evaluated and discussed by different people, communicated by one people to another, or transmitted from one people to another through training¹

¹ Lektorskij V. A. Jepistemologija klassicheskaja i neklassicheskaja [Epistemology is classical and non-classical]. Moskva : Jeditorial URSS, 2001. C. 188 [in Russian].

Different people may have the same knowledge, i.e. collective knowledge, thanks to a specific medium of communication, namely language. Law is the regulator of public relations.

The exercise of the right relates to the public sphere of human activity.

Therefore, historically, in criminal law (and in all jurisprudence), collective knowledge always has a verbal nature; manifested in the form of natural and artificial languages.

This is the secret of the emergence of the basic principle of jurisprudence: “word for the weight of gold”.

The use of language in jurisprudence always has a fixed form, namely: legal text.

For example, contract, agreement, order, law, protocol, ruling, sentence, etc.

Collective knowledge in jurisprudence is the basis for the existence of legal relations between people.

People can engage in social relations (including criminal-legal relations) only within the scope of collective knowledge, i.e. public knowledge.

It is necessary to distinguish between knowledge of a criminal act as knowledge of a criminal-law theoretical construction and knowledge of an event of a criminal act as knowledge of the phenomenon of a fragment of material reality which is assessed as a criminal act.

Knowledge of a criminal act (knowledge of the composition of a criminal act) and the circumstances associated with it, as a criminal-law theoretical construct, is knowledge of the collective (public).

This knowledge is gained by the person investigating the event of the criminal act in the course of long *legal* education.

Knowledge about the event of a criminal act is obtained in the course of another cognitive activity in the process of investigation (knowledge) of a specific event of a criminal act.

Knowledge about an event of a criminal act is meaningful only if the knowledge of the investigated event of the criminal act makes the person conducting the investigation of the criminal act not personal knowledge (for the purposes of personal consumption), but the property of other people, i.e. collective (public) knowledge in the form of criminal case materials.

The materials of the criminal case are of the nature of the written language (all the basic materials of the criminal case are in the form of written texts). This achieves the socialization of knowledge about the event of a criminal act, i.e. in this form, knowledge of the event of a criminal act begins to exist independently of the person who investigated the event of a

criminal act. This knowledge can be used by all parties to criminal law enforcement.

Knowledge recorded in texts, i.e. reflected in the materials of the criminal case are the basis of the criminal legal claims of the prosecution against the other party to the criminal dispute.

Therefore, one of the means of counteracting the fair settlement of criminal-law relations is the destruction of the materials of the criminal case through the fault of interested persons.

Personal knowledge usually exists in a non-linguistic form.

In linguistic form, personal knowledge is manifested not explicitly, but in the form of analogies, allegories, etc.

In professional activity, the use of only collective knowledge is called *professionalism*.¹

In professional activity, the use of a set of collective knowledge and personal knowledge is called craftsmanship.

Craftsmanship is manifested in obtaining such a quality product, which in practice cannot be obtained using only collective (public) knowledge.

It is convenient to use the principle of complementarity in explaining this phenomenon.

In order to become a master in addition to collective knowledge, a professional must have personal knowledge.

There is a concept of *know-how*.

This is nothing but the inaccessibility of other people's personal *master's* knowledge.

In the system of vocational education there is an element, namely: industrial practice.

The subject-subject relations of this kind of activity are realized within the system of the intern.

Essence of this form of education lies in the fact that, after obtaining a certain amount and content of the collective knowledge necessary to perform a specific practical task, the opportunity to experience not only the truth of the knowledge obtained, but also the opportunity to acquire the personal *master's* knowledge.

Therefore, in the process of professional education of future employees of the prosecutor's office, investigative units, expert institutions, courts, trainees, as a rule sent to the *master*, i.e. to a prosecutor, an expert institution etc., possessing not only sufficient professional (collective) knowledge, but also possesses mastery in his profession.

¹In this case, the authors do not consider the second component of professionalism — skills.

As a rule, the presence of mastery is evidenced by the high positive *industrial* performance of a particular employee.

Mastering know-how in cognitive activity is nothing more than an additional acquisition of collective knowledge of personal knowledge.

Personal knowledge is shown only at the stage of activity optimization.

So when we talk about rationalizing an activity, we are talking about using collective knowledge, and when we are talking about optimizing an activity, we are talking about using personal knowledge as well.

This explains the fact that no criminology textbook, as a collection of collective knowledge, contains knowledge about optimizing the investigation of a specific crime event, i.e. personal knowledge.

The development of our knowledge about the investigation rationalization¹ of criminal acts occurs in the process of the transition of personal knowledge into collective (public) knowledge.

This lengthy and ambiguous process takes place using such a means of knowledge transfer as language.

The cumulative development of forensic knowledge is expressed in the development of forensic terminology.

How difficult and ambiguous is the process of introducing new forensic terminology, that is, the transition of personal knowledge to collective knowledge can be convinced by examining the forensic literature of the last 20 years.

As a rule, such work is demonstrated by individual authors with the publication of numerous textbooks, glossaries, dictionaries, reference books (desk) books of a criminalist, investigator, prosecutor, expert.

The poor terminology in these publications testifies, first of all, to the differing views of many authors about the essence of the process of investigating a criminal act.

Rationalization and optimization are the main characteristics of a methodological analysis of activities. Rationalization is the process of increasing the degree of rationality of activity. The rationalization of activity necessarily implies the presence of the following parameters of activity: legality, focus, expediency and effectiveness. The rationality of the activity is manifested in the extent to which the degree to which the implementation of this activity contributes to the achievement of the goal of the activity is "useful" to it. Criteria of rationality are set by the goals of the activity. The rationality of the activity is manifested in the presence of necessary and sufficient actions that are carried out in the process of this activity. Optimization is the process of choosing the best (from the point of view of the purpose of the activity and given conditions and restrictions) set of actions from among the possible and rationally justified.

The result of speculative speculation about the nature of the investigation of the event of a criminal act is the generation of many *phantoms, fakes* of criminalistics.

For example, such as the forensic characteristics of crimes, the forensic classification of crimes, the forensic characteristics of a criminal case, the forensic characteristics of a trial, forensic forensics, forensic surveillance, forensic situationology, forensic classification of forensics, forensic reflection, forensic modeling, forensic diagnosis, forensics, the mechanism crime, the mechanism of crime, the disclosure of crime, crime prevention, crime prevention such *dummies* of criminalistics.

These and other *phantoms* of forensics are born in the minds of people who are unfamiliar with the theoretical intricacies and practices of criminal-law regulation of public relations.

Third, the investigation of a crime event is related to the acquisition of new, unknown knowledge of the crime event. Any cognitive activity is possible only if there is any prior, initial knowledge.

This is explained by the principle of sufficient basis: «*ex nihilo nihil fit*» meaning nothing comes from nothing

Any empirical knowledge, including the investigation of a specific event of a criminal act, presupposes the existence of certain preliminary theoretical premises without which it is simply impossible.

In this connection, Popper wrote that the idea that science evolves only from observation to theory is still quite widespread.

However, the belief that we can begin scientific research without something similar to theory is absurd.

K. Popper gives the following example in support of this statement: I began my lecture with the following words: "Take a pencil and a paper, carefully observe and describe your observations!"

Students asked him, "What exactly should they watch?"

It is clear that simple instruction: "Watch!" is absurd."

Observation is always selective.

It is necessary to choose an object, a certain task, to have some interest, a point of view, a problem.

Observation description involves the use of a discrete language with words that capture the corresponding properties; such language implies similarity and classification, which in turn suggest interest, point of view, problem.¹

¹ Devjatova S.V., Kupcov V. I. Osobennosti processa nauchnogo poznaniya [Features of the process of scientific knowledge.]. Filosofija i metodologija nauki / pod red. V. I. Kupcova. Moskva : Aspekt Press, 1996. S. 181 [in Russian].

Therefore, any conscious investigation into the event of a criminal act necessarily implies that the person conducting the investigation has certain theoretical knowledge that determines the setting on the intentionality (focus) of his activity.

More primitive theoretical knowledge in the field of forensics of the person conducting the investigation of the crime, easier it is for him to maintain the illusion that he is a true professional in this field and his activities are as rational as possible.

Theoretical knowledge necessary for a rational process of investigating a criminal act involves two types of knowledge about the rationalization of that activity.

The first kind of knowledge is the knowledge needed to initiate the process of investigating a criminal act.

Such knowledge is not only an impetus for the beginning of cognitive activity, but it is also necessary to save the material, human and other resources of law enforcement agencies. We call this theoretical knowledge the *initial theoretical* knowledge of the investigation of a criminal act.

The second kind of theoretical knowledge about rationalization of the investigation of the crime event is called directing theoretical knowledge of the investigation of the crime.

Such knowledge ensures the intentionality (focus) of all activity on the achievement of the main goal, namely: establishing the circumstances of the event of the criminal act and the circumstances related to.

What is the initial theoretical knowledge in the investigation of a criminal act¹?

What is nature of this knowledge?

To answer this question it is necessary to make a small digression.

In social science, the basic terms are the individual (personality) and society.

The political form of organization of civil society is called the state.

When we say that we are investigating the event of a criminal act, we indicate that we only indicate the direction of our cognitive activity, and not the knowledge of a criminal act as a fragment of reality. In Latvia, the final criminal law assessment of the investigated event is given by the court. Until the final court decision, we do not know (we can only assume) that the event investigated by us is assessed as a criminal act. If the court finds the investigated event a criminal offense, i.e., that corresponds to the description of the specific structure of the criminal offense, then it shall pass a conviction (in the absence of circumstances precluding criminal liability). If the court evaluates the investigated event as inconsistent with the description of the specific composition of the criminal act then it shall issue an acquittal.

Historically, civil society has delegated to the state basic functions that ensure the fulfillment of the main task of society as a self-organizing and self-regulating system meaning reproduction (in the broad sense of the word).

In democracies, the performance of these functions is organized and controlled by a specific state structure — the Cabinet of Ministers (Government), which provides political leadership and state support. The composition of the Cabinet of Ministers reflects the priority areas of state activity in a particular state.

Therefore, the composition of the Cabinet of Ministers may change over time.

The basis of all protests and dissatisfaction on the part of civil society with respect to the activities of the state is the creation by the state of insufficient favorable conditions for the reproduction of civil society as a system.

Human society as a system is reproduced and exists due to the positive activity of its members.

Activity of members of society aimed at destroying society as a system or impeding the reproduction of society as a system is assessed as destructive, negative, dangerous to society.

Member activities of a society considered dangerous to society have historically been called criminal activity or crime.

Crime (the basic term of criminology) is a natural property of the members of any society to generate criminal¹, i.e. acts dangerous to society.

The utopian views of the *complete eradication of crime* are but a fiction and a means of declaring naive populism in politics.

Therefore, one of the tasks of the state is only to minimize the dangerous (criminal) activities of individual citizens and their communities, ie. maximally secure the conditions of existence and reproduction of society as a system.

Traditionally, one of the means of solving such a problem is *criminal law enforcement* involving use of criminal law for this purpose.

This means that a particular state first of all determines the list of dangerous for the public (for public relations) types of behavior of members of the society and declares these types of behavior criminal and prohibited under the threat of criminal punishment.

This list is referred to as criminal acts, which are codified as being described in a specific part of the criminal law of a particular state.

¹ В теории уголовного права преступные деяния содержат четыре обязательные элемента — противозаконность, опасность, виновность и наказуемость [in Russian].

The list of criminal acts in the Special part of the Criminal Code of Latvia is organized into the following groups:

1) Crimes against humanity, peace, war crimes, genocide. (Chapter IX);

2) Crimes against the State (Chapter X);

3) Criminal acts against the environment (Chapter XI);

4) Deprivation of Life (Chapter XII);

5) Criminal acts against the health of a citizen (Chapter XIII);

6) Criminal acts against the health of a citizen (Chapter XIV);

7) Criminal acts against the health of a citizen (Chapter XV);

8) Criminal acts against the health of a citizen (Chapter XVI);

9) Criminal acts against the health of a citizen (Chapter XVII);

10) Criminal acts against the health of a citizen (Chapter XVIII);

11) Criminal acts against the health of a citizen (Chapter XIX);

12) Criminal acts against the health of a citizen (Chapter XX);

13) Criminal acts against the health of a citizen (Chapter XXI);

14) Criminal acts against the health of a citizen (Chapter XXII);

15) Criminal Offenses Against Jurisdiction (Chapter XXIII); 16) Criminal acts in the field of public service (Chapter XXIV);

17) Criminal acts against the health of a citizen (Chapter XXV).

The title of the chapters of the Special Part of the Criminal Law of Latvia is nothing more than an indication of such spheres of public relations that are most important for the existence of Latvian society as a system at this historical stage of its development, i.e. certain encroachments on the spheres of public relations specified in the Criminal Law of Latvia are dangerous for the Latvian society, therefore they are recognized as criminal.

Changing the content of a specific part of the criminal law occurs in the process of criminalizing the lawful behavior of members of society and decriminalizing criminal acts.

The basis of such systematization of criminal acts in Latvia is the sphere of public relations as the object to which the criminal encroachment is directed.

In the theoretical criminal-legal construction of *composition of a criminal act* such a sphere of social relations is called the object of the composition of a criminal act.

This means that encroachments only on these spheres of public relations (in the presence of other elements of the composition of a criminal act specified in the law) in Latvia are recognized as criminal offenses.

Thus, in Latvia the problem of determining the primary sign of criminal encroachments on public relations is solved. initial theoretical knowledge necessary to initiate the process of investigating a criminal act.

This means that the absence of this sign in the behavior of members of society, ie. encroachments on public relations not specified in the Special Part of the Criminal Code of Latvia, gives sufficient grounds for refusing the request to open a criminal case and initiate an investigation.

Initial theoretical knowledge of the investigation of the event of the criminal act, i.e. knowledge of the object of a criminal act is a special, legal knowledge.

The object of a criminal act is a criminal-legal theoretical construction (abstraction).

Knowledge of this and other criminal legal abstractions should be obtained by the person conducting the investigation of the criminal act in the course of long *legal* education.

“Why is it advisable to study forensic theory after studying the basics of criminal law theory and the criminal process?”

What should be the guiding theoretical knowledge of the investigation of a criminal act?

The following circumstances must be borne in mind to answer this question.

First, directing theoretical knowledge about the investigation of an event of a criminal act is manifested in the form of methodical instructions, ie. in the form of production regulations in a certain sequence of necessary cognitive actions.

These prescriptions dictate such a course of action by the person conducting the investigation of the event of the criminal act, which can lead to a foreseeable result, i. gaining new knowledge, the volume and depth of which makes it possible for a criminal-law evaluation (qualification) of this event.

Secondly, the concepts of activity, action, operation are the concepts of one logical series of human activity and are, respectively, in relation to subordination as general – private – single.

This means that every activity involves actions, every action involves operations.

Trivial operation is such a human activity that does not require methodological reflection on it. For example, switching on a gas stove, opening a door, filling a glass with a drink, smoking a cigarette, producing simple arithmetic calculations, etc.

Comparative analysis of the concepts operation, action, activity is of practical importance only in the process of evaluating the logical relationships between these varieties of human activity. Therefore, the description of these concepts is general; must include the purpose, means, outcome and process of a particular type of human activity.

The result of the generalization of the term operation is the concept of action, i.e. the set of production of certain operations forms a concrete action.

For example, the action *heating water* is the totality of the production of the following operations: filling the vessel with water, switching on the gas stove, setting the tank with water on fire.

The purpose of the operation (for example, to include a gas stove) and the purpose of the action *heat the water* are in relation to subordination as the intermediate goal and the ultimate goal of the action.

Achieving a set of intermediate goals can lead to the end goal.

The purpose of the action and the purpose of the activity are also related to subordination as an intermediate goal and an ultimate goal of the activity.

Therefore, in the description of activities, a necessary element will be to describe the production of a set of actions that are necessary and rationally justified to achieve the purpose of a particular activity.

Therefore, in the description of activities, a necessary element will be to describe the production of a set of actions that are necessary and rationally justified to achieve the purpose of a particular activity.

The purpose of the activity *establishing the circumstances of the event of a criminal act* is to obtain such knowledge about a fragment of material reality that would allow a comparative assessment of it with a description of the specific composition of the criminal act specified in a special part of the criminal law, i.e. a description of a specific theoretical construct, namely: *composition of the criminal act*.

In order to establish the composition of a criminal offense in an event, it is necessary to establish four mandatory elements (attributes) of the composition of the criminal offense in it: the object of the criminal offense, the objective side of the criminal offense, the subject of the criminal offense, the subjective side of the criminal offense, i.e. to achieve the totality of the four intermediate goals of this cognitive activity.

This means that the establishment of each of the above elements of the criminal offense in the activity “establishing the circumstances of the event of a criminal offense” is the achievement of intermediate goals, while the ultimate goal of all this activity is the establishment of the event of a criminal offense, i.e. the totality of a specific object (sometimes also an object), the objective side, the subject and the subjective side of a specific corpus delicti.

The logic of establishing the circumstances surrounding the event of a criminal act is such that in this process we obtain knowledge of the

unknown by comparing and evaluating it with the already known knowledge.

The knowledge about the structures of theoretical criminal law structures built in a special way acts as well-known knowledge: from individual, initial elements of the criminal legal structure to more general criminal legal concepts.

For example, knowledge about the structure of the composition of the criminal act, the object, the subject, the objective side, the subjective side of the crime, etc.¹ and the mapping of their elements in material reality.

This allows us to speak about the possibility of truth in the process of establishing the event of a criminal act, since the truth is never infinite and uncertain.

The content condition of truth is connected with the intentional attribution of the cognitive image to the real or imagined object existence, and the formal conditions of truth are connected with the logical correctness of thinking².

The truth is always to us in the form of a chain of consecutive finite things, i.e. things whose meaning is defined so that it is possible to distinguish and distinguish these things from each other.

The truth in establishing the event of the criminal act and the circumstances surrounding it is manifested in the presence of such a volume and depth of new structured knowledge that would make it possible to assess it for compliance with certain criminal legal structures described in the criminal law.

The person conducting the investigation of the criminal act, i.e. establishing the circumstances of the event of the criminal act and the circumstances related to it, in the course of its activities deliberately makes the selection and description of established facts.

The basis for this are the criteria for the significance of the facts established before the investigation of the criminal act. Such criteria are elements of theoretical criminal law constructs.

This circumstance is a prerequisite for any successful investigation of a criminal act.

The investigation of an event is recognized as successful not only in the case of justified confirmation of the assumption of a possible criminal act, but also in the case of justified confirmation of the absence in the investigated event of signs of the composition of the criminal act.

¹ Terehovich V. N. *Teorija kriminalistiki* [Theory of forensics]. Obshhaja chast' : monografija. Riga, 2015. S. 59–101 [in Russian].

² Vedin Ju. P. *Poznanie i znanie* [Cognition and knowledge]. Riga : Zinatne, 1983. S. 5–6 [in Russian].

Therefore, in the criminal case materials, as a rule, there is only knowledge of the facts pertaining to the particular investigated event of the criminal act and the circumstances related to it, ie. knowledge corresponding to descriptions of certain theoretical criminal law constructs.

Conclusion.

In any developed branch of science, there are three main methodological levels:

- 1) industry methodology;
- 2) sub-sector methodology;
- 3) a specific technique.

The updating of the methodology of science is manifested at the level of a specific methodology, which provides a direct connection of this science with a particular sphere of reality.

In some branches of science, the internal methodological hierarchy is sometimes not limited to the three levels mentioned above.

More detailed methodological subordination is possible at the level of methodology of the sub-sector of science.

It all depends on the development of the structure of a certain scientific theory.

The methodological hierarchy in a particular branch of science corresponds to the subordination of individual theories within a given branch of science.

Therefore, the theory performs a methodological function in relation to the knowledge of the relevant sphere of reality.

Methodology is the focus of a particular theory on improving the knowledge of a particular reality area¹

For example, theories of criminal law and criminal procedure are a methodology for the theory of forensics; the theory of forensics is a methodology for the theory of forensic technology, the theory of forensic tactics and theory of forensic techniques; theory of forensic technology is a methodology for the theory of trace evidence, theory of trace evidence performs a methodological function for specific methods of trace evidence research, etc.

Therefore, it will be correct to speak not of a private (general) forensic methodology (private (general) method of investigating certain types of criminal acts (crimes)², but of a specific method of investigating a separate type of criminal acts.

¹ Vedins I. Zinātne un patiesība. Rīga : Avots. 2008. 131–136.lpp.

² Kriminalistika [Forensics] : uchebnik / pod red. prof. A.G. Fillipova. Moskva : Jurisprudencija. 2000. S. 241; Gavrilin Ju. V., Shuruhnov N. G. Kriminalistika. Metodika rassledovaniya otdel'nyh vidov prestuplenij [Criminology.

Forensic methodology (the system of knowledge about the organization of forensic activity¹) as a sub-branch of forensic theory performs a methodological function for the development of methods for organizing the investigation of certain types of criminal acts.

In the correct method of investigation of a specific type of criminal act must always be reflected *visible* reality, i.e. in this form, the investigation of a specific type of criminal act can be "seen with the eyes", it is even possible to *hold it in your hands* (to take such a methodical edition in your hands, flick it, find the necessary paragraph or section of the process description).

In other words, in this way, the investigation of a particular type of criminal act becomes accessible to our senses, a visual object.

Only in this way, the methodology of investigation of a particular type of criminal act fulfills a methodical function and an objective basis of reflection over practical activity, namely: investigation of a specific event of a criminal act.

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¹ Forensic activity is a kind of scientific and cognitive activity, the object of which is to establish the circumstances of the event of the criminal act and the circumstances associated with.

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В. М. Терехович, Е. В. Німанде
КРИМІНАЛІСТИЧНА МЕТОДИКА В СИСТЕМІ ТЕОРІЇ
КРИМІНАЛІСТИКИ

Термін «криміналістична методика» в теорії криміналістики має два значення. Перше значення терміна «криміналістична методика» використовується для розкриття змісту одного з регулятивних засобів криміналістичного пізнання — методики криміналістичного пізнання. Це значення криміналістичної методики розкривається в межах структури процесу криміналістичного пізнання. Друге значення терміна «криміналістична методика» розкривається в межах опису системи пізнавальної діяльності людини в галузі кримінального правозастосування.

Розкриваючи друге значення терміна «криміналістична методика», ми вказуємо на те, що це, перш за все, система знання, яка використовується для організації процесу розслідування події злочинного діяння, тобто знання, необхідного і достатнього для отримання нових знань про подію злочинного діяння. Знання, яке отримують і використовують у кримінальному правозастосуванні Латвії, є знанням, яке має природу обґрунтування, а не віри. Це знання є колективним (суспільним) знанням і проявляється в процесі раціоналізації процесу розслідування події злочинного діяння. Окреме знання проявляється тільки на стадії оптимізації процесу розслідування події злочинного діяння.

Слід розрізняти знання про злочинне діяння, як знання про кримінально-правову теоретичну конструкцію, і знання про подію злочинного діяння, як знання про явище фрагменту матеріальної дійсності, яке оцінюється як злочинне діяння. Знання про злочинне діяння (знання про склад злочинного діяння) і обставин, пов'язаних з ним як кримінально-правових теоретичних конструкціях, є знанням колективним (суспільним). Це знання особа, яка розслідує подію злочинного діяння, отримує в процесі тривалої юридичної освіти. Знання про подію злочинного діяння отримують у процесі іншої пізнавальної діяльності — в процесі розслідування (пізнання) конкретної події злочинного діяння. Це знання є надбанням інших людей, тобто колективним (суспільним) знанням і воно фіксується в матеріалах кримінальної справи.

Теоретичне знання, необхідне для розумного процесу розслідування події злочинного діяння, включає в себе два види знання (вихідне і направляюче) про раціоналізацію цієї діяльності. Криміналістична методика (система знань про організацію криміналістичної діяльності) як підгалузь теорії криміналістики, виконує методологічну функцію для розробки методик організації розслідування окремих видів злочинних діянь.

Ключові слова: теорія криміналістики, криміналістична методика, організація процесу розслідування події злочинного діяння.

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O. Yu. Bululukov,

PhD in Law, Associate Professor at the Department of Criminalistics
of Yaroslav Mudryi National Law University, Kharkiv, Ukraine
ORCID:<https://orcid.org/0000-0003-1598-0542>
E-mail: oblehrer@gmail.com

BACKGROUND TO TACTICAL DECISIONS IN CRIMINALISTICS

The main factors are considered, the appearance and existence of which is the information basis for the emergence of tactical decisions in criminalists. It is noted that these issues in the forensic literature are considered fragmentarily.

Purpose. The purpose of this article is to identify and disclose the factors that influenced the occurrence of tactical decisions in criminalists.

When considering the history of tactical decisions in criminalists, analysis and synthesis methods were used.

The article focuses on the clarification of information sources (factors) that contributed to the emergence of a New concept in criminalists and criminalists tactics. It is noted that these factors, in relation to the emergence of the concept of tactical decision in criminalists, are of a general and private Nature. These factors are divided into two groups that are associated: 1) with the emergence and development of decision theory; 2) with the emergence and development of criminalists tactics and its means. Interest in the study of decision-making problems was caused by the development of society, the increase in industrial production and the emergence of large enterprises. The Need to perform complex tasks contributed to the scientific search for ways to solve them. When considering the first group of factors, attention is focused on works related to the study of probability theory and mathematical statistics, as well as game theory. Particular attention is paid to the work of Y. Kozeletsky, "Psychological Theory of Decision Making". The consideration of the second group of factors related to the development of criminalists tactics and its means was carried out by analyzing literary sources from the beginning of the 19th century. Particular attention is paid to the works of Y. I. Barshev and an analysis of their contents is made, regarding the tactics of investigative actions. The conclusions of the article focus on the fact that the development of criminalists tactics is carried out by developing New tools and improving existing ones. The article concludes about the decisive role of decision theory and criminalists tactics in the formation of the concept of tactical decision.

Keywords: criminalists tactics; tactical decision; decision theory; criminal offense.

Formulation of Research Problem.

A tactical decision in forensic science involves the use of tactical means in the investigation of criminal offenses.

The use of forensic tactics in the investigation is conditioned by the behavioral factor of persons interested in concealing information about the offense from the investigation.

The use of forensic tactics in the investigation is conditioned by the behavioral factor of persons interested in concealing information about the offense from the investigation.

The choice of forensic tactics, determining the time and place of their use, sequence and intensity is made by making tactical decisions.

Tactical decisions are a variety of decisions that people make.

It cannot be said that these decisions can only be used in the investigation of offenses.

They are used in the science of management¹, and in game situations, and in other cases related to human activity.

However, tactical decisions in the investigation of criminal offenses have some specificity, which is determined by the scope of their use.

Regulation of the said sphere by criminal procedural law fills the said decisions with special content peculiar only to them. A number of factors contributed to the emergence of the concept of "tactical decision" and its introduction into the terminological apparatus of forensic tactics. To date, this issue, while considering tactical solutions in forensics, has been investigated only fragmentarily.

At the same time, leaving aside the background of the emergence of tactical decisions in forensics, does not allow to carry out a full study of their theoretical foundations.

Analysis of recent researches and publications.

Consideration of some issues related to the prehistory of the emergence of tactical decisions in forensics, we find in the works of R. S. Belkin², V. M. Bykov, O. Yu. Golovin, A. V. Dulov, Yu. I. Novik, S. I. Tsvetkova, S. Yu. Yakushin and others.

¹ Kuz'mina L. P. Razvitie teorii prinjatija reshenij v menedzhmente [Development of the theory of decision making in management]. Vestnik Kazanskogo jenergeticheskogo universiteta, 2009. №2. S. 53 [in Russian].

² Belkin R. S. Kurs sovetskoj kriminalistiki [The course of Soviet forensics]: v 3 t. T. 3. Kriminalisticheskie sredstva, priemy i rekomendacii. Moskva : Akad. MVD SSSR, 1979. S. 91; Belkin R. S. Kriminalistika: problemy, tendencii, perspektivy. Ot teorii – k praktike [Forensics: problems, trends, prospects. From theory to practice]. Moskva : Jurid. lit., 1988. S. 104–136; Belkin R. S. Kriminalistika: problemy segodnjashnego dnja. Zlobodnevnye voprosy rossijskoj kriminalistiki [Forensics: the problems of today. Topical issues of Russian forensics]. Moskva : NORMA, 2001. S. 160–162; Belkin R. S. Kriminalisticheskaja jenciklopedija [Criminalistic Encyclopedia]. Moskva : Megatron HHI, 2000. 2-e izd. dop. S. 219; Belkin R. S. Kurs kriminalistiki: v 3 t. T. 3 Kriminalisticheskie sredstva, priemy i rekomendacii [Forensic tools, techniques and recommendations]. Moskva : Jurist, 1997. S. 156–201; Bykov V. M. Takticheskoe reshenie sledovatelja. Ugolovno-pravovye i processual'nye garantii zashhity konstitucionnyh prav grazhdan [Tactical decision of the investigator. Criminal law and procedural guarantees for the protection of constitutional rights of citizens]. Kalinin, 1980. S. 114; Golovin A. Ju. Kriminalisticheskaja sistematika [Forensic taxonomy]. Moskva : LeksJest, 2002. S. 253; Dulov A. V., Novik Ju. V. Ponjatie i struktura takticheskogo reshenija, prinimaemogo sledovatelem pri proizvodstve sledstvennogo dejstvija [The concept and structure of a tactical decision made by an

These scientists have highlighted various aspects of tactical decisions, supplementing scientific knowledge with new data on the object under research.

Article Purpose.

The purpose of this article is to identify and uncover the factors that influenced the emergence of tactical solutions in forensics, the realization of which is achieved through the analysis and synthesis of scientific works and other literary sources on this subject.

Presentation of Research Content.

The prehistory of the emergence of tactical decisions in forensic science is associated with the existence of a number of factors that contributed to the emergence of a new concept in forensic science and forensic tactics.

These factors are inherent in the general and distinct character in relation to the emergence of the concept of a tactical decision in forensics.

Let's consider them in more detail.

Factors that contributed to the emergence of tactical decisions in forensic theory are related to:

- 1) with the emergence and development of the general theory of decision making;
- 2) with the origin and development of forensic tactics and their tactics.

Let's consider the first group of factors related to the emergence and development of decision theory.

Due to the fact that this information is represented by a large number of scientific works, we will limit ourselves only to the main ones that are of conceptual importance in the development of decision theory.

investigator during an investigative action]. Teoreticheskie problemy kriminalisticheskoy taktiki. Sverdlovsk, 1981. S. 47; Novik Ju. I. Nauchnye osnovy prinjatija takticheskij reshenij pri proizvodstve sledstvennyh dejstvij [Scientific basis for the adoption of tactical decisions in the production of investigative actions]: avtoref. dis. ... kand. jurid. nauk. Minsk, 1979, S. 3–20; Cvetkov S. I. Sostojanie i perspektivy ispol'zovanija dannyh nauki upravlenija v kriminalistike [State and Prospects of Using the Data of the Science of Management in Criminalistics]: avtoref. dis. ... kand. jurid. nauk. Moskva, 1977. S. 8–9; Cvetkov S. I. Kriminalisticheskaja teorija prinjatija takticheskij reshenij [Forensic theory of tactical decision making] : avtoref. dis. ... d-ra jurid. nauk. Moskva, 1992. 41 s. URL: <https://mydisser.com/ru/catalog/view/6/349/9027.html> (data zvernennja 05.09.2019); Jakushin S. Ju. Takticheskie reshenija sledovatelja i sredstva ih realizacii pri rassledovanii prestuplenij: ishodnye polozenija chastnoj kriminalisticheskoy teorii [Tactical decisions of the investigator and means of their implementation in the investigation of crimes: initial provisions of a private forensic theory.]. Uchenye zapiski Kazanskogo gos. un-ta, 2008. T. 150. Kn. 5. S. 240 [in Russian].

The term decision theory was introduced into the scientific circulation by E. L. Lehmann in 1950, but some aspects of the theory began to form much earlier, even in the middle of the seventeenth century.

Probability theory and mathematical statistics are considered to be the basis of this theory.

It is to the study of these areas of knowledge turned to the French mathematicians B. Pascal and P. Fermat, exploring the mathematical model of the probability of consequences in gambling (games of dice and roulette)¹.

At about the same time the works of H. Huygens, Ya. Bernoulli, A. de Moivre, P.-S. Laplace, K. F. Gauss, and S. D. Poisson, who were also concerned with the probabilities of a certain outcome in decision making².

On the basis of developments in the field of probability theory, scientific works on mathematical statistics began to appear.

Johann Carl Friedrich Gauss was the first among mathematicians who in 1795, investigated and substantiated the least-squares method that was used to process astronomical data. Significant contributions to mathematical statistics have been made by such scientists as: K. Pearson, R. Fisher, A. M. Kolmogorov, M. V. Smirnov, A. Wald³.

Interest in the study of decision-making was caused by the development of society, the growth of production and the emergence of large enterprises that need effective management. The need to solve complex and multilevel problems contributed to the scientific search for ways to their solving.

In the first half of the twentieth century, mathematical methods of decision-making were further developed in the works of American scientists J. von Neumann and O. Morgenstern.

In 1944 they prepared the *Game Theory and Economic Behavior* monograph which outlined the basic provisions of mathematical game theory and laid the foundations of the theory of economic behavior⁴.

With regard to decision-making, this game theory implies a description of the optimal decision making processes.

At the same time, in the situation of uncertainty and the existing conflict between the opposing parties, the focus is always on the decisions made by the conscious and purposeful.

¹ Kostikova A. V. Istoricheskie aspekty razvitiya teorii prinjatija reshenij [Historical aspects of the development of decision theory]. *Filosofija nauki*. 2012. №4 (55). S. 88 [in Russian].

² Ibidem

³ Ibidem

⁴ Kostikova A. V. Zaznach. pracija. S. 89. [in Ukrainian].

Developments in decision making theory that were just beginning to be put into practice were used during World War II.

The experience gained has shown the effectiveness of the scientific approach in making decisions of all kinds.

Thus, during the war in England, a team of scientists at the scientific level addressed the issue of optimal placement of civilian defense objects, firing positions, optimization of the depth of detonation of anti-submarine bombs and convoys of transport caravans at the seaside¹.

After the war, scientists analyzed the losses and lost opportunities due to making the wrong decisions. It should be noted that scientific research at that time led to the creation of a formal basis for decision theory.

As a result of a scientific search, independent scientific fields have emerged, now known as *operation research* and *cybernetics*².

This theory of games until the early 50's of the twentieth century remained a formal theory in mathematics, which mainly considered the economic models of development of production of material goods.

However, as early as the 1950s, methods of game theory began to be applied not only in economics, but also in biology, cybernetics, and technology.

The main prerequisites for the formation of elements of decision theory, according to A.V. Kostikova, are the following:

1) increasing the complexity and cost of measures that promote the development of scientific methods that allow to evaluate in advance the results of each decision, to exclude inadmissible options in advance and recommend the most successful;

2) scientific and technological progress, rapid development of technology and technologies that facilitated the use of advanced mathematical apparatus in design;

3) reducing the time for decision making and increasing responsibility for its results, which facilitated the use of methods of analysis and evaluation of options for the development of the situation and the choice of the most effective option in the existing conditions³.

The need to control the processes that took place in economics, politics and the social area contributed to the search and development of new approaches in decision making.

¹ Litvak B. G. Razrabotka upravlencheskogo reshenija [Development of a managerial decision]. Moskva : Delo, 2003. S. 35 [in Russian].

² Krjuchkovskii V. V., Petrov Je. G., Sokolova N. A., Hodakov V. E. Vvedenie v normativnuju teoriju prinjatija reshenij. Metody i modeli [Introduction to the normative theory of decision making. Methods and models] : monografija. Herson : Grin' D. S., 2013. S. 12 [in Russian].

³ Kostikova A. V. Zaznach. pracja. S. 87 [in Ukrainian].

Difficulties in solving problems, as well as the lack of the right to make mistakes when solving them, became an important argument for new research. The origin and development of decision theory can be divided into stages.

Apparently, the origins of decision theory can be traced back to the mid-seventeenth century.

The first stage of development begins with Blaise Pascal's famous work, *Thoughts on Religion and Other Objects* (1670), in which the author describes the expected value of whether or not a person believes in God.

This stage is characterized by a descriptive (descriptive) approach to decision making. Scientists of that time directed their efforts to determine the process of decision-making by man. Various methods were used in the research, among which psychology was preferred. The completion of the first stage can be attributed to the 40's of the twentieth century.

The second stage was characterized by regulatory approaches in decision making. These approaches consist in defining decision making situations and developing certain standards when adopting them to solve emerging problems.

The beginning of the second stage of development of the theory of decision-making can be correlated with the preparation in 1944 of J. Neumann and O. Morgenstern monograph, referred to earlier.

In addition to this work, in 1948 published a book by the American scientist Norbert Wiener *Cybernetics, or Management and Communication in Animal and Machine*, which initiated new approaches to the management of various systems: technical, biological and social¹.

It should be noted that theoretical advances in the development of systems analysis and cybernetics combined with the successes of the development of discrete computing and other tools have opened a wide perspective of automation of virtually all spheres of human activity².

At the same time, in practical use, the normative approach in decision theory in many cases did not allow to solve the problem.

In our opinion, this phase ends in the mid-60s.

The third stage in the development of decision theory begins with the emergence of the concept of fuzzy set introduced by Lotfi Aliasker Zadeh in 1965 in the article *Fuzzy Sets* in the journal *Information and Control*, and continues to this day.

L. Zadeh extended the classical notion of the set, assuming that the characteristic function of the set (called by Zadeh as membership function

¹ Kuz'mina L. P. Zaznach. prajca. S. 52 [in Ukrainian].

² Krjuchkovskij V. V., Petrov Je. G., Sokolova N. A., Hodakov V. E. Zaznach. prajca. S. 12 [in Ukrainian].

for the fuzzy set) can take any values in the interval $[0, 1]$ and not just the values 0 or 1¹.

Deriving and formulating this concept has opened up new opportunities for effective decision-making in economy.

This stage is characterized by a systematic approach to decision making by a certain person.

To make a decision, a person is instructed to master certain methods and techniques of decision theory that can be used by him to solve the task².

In this context, it is necessary to point out two more works that greatly expanded the knowledge of decision theory at the beginning of the third stage.

This is the work of Yu. O. Tikhomirov's "Management Decision", which was published in 1972, and the work of Y. Kozeletsky, *Psychological Decision Theory* published in 1977 in Warsaw, and reprinted in 1979 by the Progress Editor.

Due to the fact that the decision-making of tactical decisions in criminalistics, while investigating the offenses has a psychological basis, we consider it expedient to consider the content of Y. Kozeletsky's work in more detail.

The value of this work lies in the author's study of decision-making psychology in the context of mathematical methods and means of acts of choosing the necessary decision.

Thus, the main focus of the study is to consider issues related to the relevant epistemological, psychological and neurophysiological mechanisms of human activity.

The author wrote the following about the content of the book:

"In this work, I insist on the functional point of view, according to which a person is a system that seeks for a certain purpose, and at the same time is a system of knowing, which processes information about the world"³.

Yu. Kozeletsky assesses the theory of making rational decisions and summarizes that a rational decision depends on the structure of the problem. The last clearly determine the optimal reaction (solution).

To a large extent, this theory is a decision theory that lacks those who make those decisions⁴.

¹ Vikipedija. URL : https://ru.wikipedia.org/wiki/Нечеткое_множество (data zvernennja 05.06.2019) [in Ukrainian].

² Kostikova A. V. Zaznach. pracja. S. 87–88 [in Ukrainian].

³ Kozeleckij Ju. Psihologicheskaja teorija reshenij [Psychological decision theory]. (Perevod s polsk. G. E. Minca i V. N. Porusa). Moskva : Progress, 1979. S. 31–32 [in Russian].

⁴Papers mentioned above

However, the author, along with the consideration of methodological rationality performs the research on subjective rationality.

Such approaches in the study are observed in the transition from *descriptive* questions of psychological decision theory to *normative*.

According to the author, the theory of rational decisions has had an important influence on the development of psychological studies of decision making processes.

While performing such research, psychologists tried to answer the following descriptive questions: how do people actually make the choice?

How do they actually solve the tasks that require decision-making?

Does their behavior satisfy the elementary tenets of methodological rationality¹?

The so-called "subjective factor", which containing idea of the task, is considered in sufficient detail by the author.

It is this factor that is the main subject of the analysis carried out by Yu. Kozeletsky.

The development of decision-making theory has had an effective influence on the formulation of tactical decision-making in forensics. This is evidenced by the fact that the concept of "tactical decision" was introduced into the terminological apparatus of forensic tactics in 1977.

This does not mean that prior to the formalization of the tactical decision as a concept, it was not used by practitioners in the process of detecting and investigating offenses.

Tactical decisions were made by investigators at all times when such investigations were conducted, but they did not think about making such decisions.

Let's consider the second group of factors that contributed to the emergence of tactical decisions in the theory of forensic science is development of forensic tactics and its tactical tools.

The development of forensic tactics took place simultaneously with the development of recommendations for the conduct of individual investigative actions.

Already in the first half of the XIX century, in 1833, M. Orlov's book *Experience of a short guide for the production of investigations with evidence of decent approvals* was published, which contained separate recommendations for the tactics of interrogation, the face rate, presentation for identification of persons. suspected of committing a crime².

¹Paper mentioned abovep. 19–20.

² Ishhenko E. P. Kriminalistika [Forensics]: uchebnik. 3-e izd. ispr. i dop. Moskva : Volters Kluver, 2011. S. 36 [in Russian].

Через 5 років у Німеччині, Л. фон Ягеманн – відомий німецький юрист, в 1838–1841 рр. видає двотомне «Керівництво з судового вчення щодо розслідування»¹.

In his work L. von Jagemann pays considerable attention to the development of scientific techniques for the detection and investigation of crimes. One of the main points of his work is the recommendations concerning the questioning.

A special place in the work is the interrogation of the accused, aimed at swift receipt from the interviewed confession of his guilt.

At the same time, the use of torture is questioned².

The existence of recommendations for conducting the investigation as a whole, as well as conducting individual investigative actions, give reason to consider the said work as the basis of the scientific foundations of Criminalistics.

In 1841, Ya. I. Barshev, exploring the basics of criminal justice, makes recommendations for the interrogation of the accused, emphasizing that "the best way should be that interrogation, in which a gradual transition from more general questions to the most separate ones is made, so that thus giving the accused the opportunity to express himself and the circumstances of the crime, also when the material of the following questions is borrowed from the immediate answers ...

If the interviewee is inclined to confess, prudence advises to listen to him without interrupting, and after that he skillfully asks him for explanations about what seems unclear and what is missing for full recognition"³.

The reference to the need to *interrogate* skillfully the interrogated explanation implies the adoption of appropriate decisions on the question on the substance of the event.

As for the necessity of making tactical decisions during the search, Ya. I. Barshev states this as follows:

"... The purpose of the search can only be achieved by the prior unknown of him and the special art, dexterity and splendor of the

¹ Sokol V. Ju. Ljudvig fon Jageman — osnovatel' nauchnoj sistemy rassledovanija prestuplenij i kriminalistiki [Ludwig von Jagemann - the founder of the scientific system of crime investigation and forensics]. Vestnik Krasnodarskogo universiteta MVD Rossii. 2012. №2 (16). S. 63 [in Russian].

² Sokol V. Ju. Zaznach. tvir. S. 64 [in Ukrainian].

³ Barshev Ja. I. Osnovaniya ugovnogo sudoproizvodstva, s primeneniem k rossijskomu ugovnomu sudoproizvodstvu. Sankt-Peterburg [Foundations of criminal proceedings, with application to the Russian criminal proceedings] : Tipografija II otdelenija Sobstvennogo Ego Imperatorskogo Velichestva kanceljarii, 1841. S. 143–145 [in Russian].

investigator... must be carried out unexpectedly, with all the care and attention of the people living in the searched house”¹.

In fact, the fact that a decision was made at a certain point in the investigation was replaced by the characterization of the investigator's qualities, which was inherent in scientific research of that time.

The next period of development of forensic science and forensic tactics was marked by the development and systematization of the means and methods of gathering evidence, the recommendations for the organization and planning of the investigation, and related to the name of Hans Gustav Adolf Gross (1847–1915)².

Hans Gross worked as a forensic investigator for a long time and his work in the field of criminology was embodied in scientific work – “A Guide for Forensic Investigators, Gendarmerie and Police” (1893).

In 1911 published a book by R. A. Reiss "Scientific Techniques for the Investigation of Crimes" edited by S. M Tregubov³.

In the same year, German scientist A. Weingart for the first time in his work, provided a rationale for the term *tactics* regarding the possibility and expediency of its use in crime investigation activities.

“The book should give the forensic practitioner all of the things that strategy and tactics give to the military.

That is why I call this guide to methodical investigation of crimes a “criminal tactics”⁴.

In 1915, S. M Tregubov's book *Fundamentals of Criminal Technology: Scientific and Technical Techniques for Investigating Crimes*⁵ was published; it essentially became a supplementary version of the book by R. A Reis, published three years earlier.

¹ Barshev Ja. I. Zaznach. pracija. S. 99 [in Ukrainian].

² Aver'janova T. V., Belkin R. S., Koruhov Ju. G., Rossinskaja E. R. Kriminalistika [Forensics]. Uchebnik / pod red. R. S. Belkina. Moskva : Norma-Infra-M, 1999. S. 3[in Russian].

³ Rejs R. A. Nauchnaja tehnika rassledovanija prestuplenij [Scientific technique of crime investigation]. URL : <https://www.twirpx.com/file/1273874/> (data zvernennia 05/09/2019).

⁴ A. Weingart, Criminal tactics: a guide to crime investigations. St. Petersburg: Vestn. Police, 1912.. 293 p.

⁵ Tregubov S. N. Osnovy ugolovnoj tehniki [Fundamentals of criminal technology]. Nauchno-tehnicheskie priemy rassledovanija prestuplenij. Prakticheskoe rukovodstvo dlja sudebnyh dejatelej. Petrograd : Izd. Jurid. kn. sklada Pravo, 1915. 336 s [in Russian].

The book of Tregubov became the first practical manual of its kind and introduced the reader to a wide range of forensic tools, techniques and recommendations at the level of science of the time¹.

A significant place in the development of forensic tactics belongs to B. L. Brazol.

In the work *Essays on the investigative part. History. Practice*² included consideration of specific issues of investigative tactics, which expanded the knowledge of this issue.

At the same time, considering the tactics of the review, Brazil is not limited to specifying the methods of its conducting.

It describes in detail the psychological qualities of an investigator necessary for a productive review, his ability to think logically, putting forward versions of what happened³.

In 1925 I. M. Yakimov published the work: *Criminalistics. A Guide to Criminal Technology and Tactics*, in which the author outlines the most expedient methods and techniques for investigating crimes, which is a prototype of modern forensic techniques (including tactical ones)⁴.

The most significant work of IM Yakimov was the publication in 1929 of the textbook *Criminalistics. Criminal tactics*⁵.

The book outlines the methods, techniques and means of investigation that made this work particularly meaningful in theoretical, practical, and methodological terms⁶.

In 1934, S. Golunsky and G. K. Roginsky published a book *Techniques and Methods for Investigating Crimes* and argued more categorically that in criminalistics three components should be distinguished:

- criminal technique that explores the ways in which crimes of the achievements of the natural sciences are used in the investigation of crimes: physics, chemistry, etc.;

- criminal tactics, which examines the tactics of the investigation and, in particular, how to conduct individual investigative actions more

¹ Belkin R. S. *Istoriya otechestvennoj kriminalistiki* [History of native Forensics]. Moskva : Norma, 1999. S. 12 [in Russian].

² Brazol' B. L. *Ocherki po sledstvennoj chasti* [Essays on the investigative part.]. *Istoriya. Praktika*. Petrograd : Gos. tip., 1916. 215 s [in Russian].

³ Belkin R. S. *Zaznach. tvir*. S. 13 [in Ukrainian].

⁴ V. Yu. Shepitko *Forensic tactics (system-structural analysis): monograph*. Kharkiv: Legal Kharkiv , 2007. p. 9.

⁵ Yakimov I. N. *Kriminalistika. Ugolovnaja taktika* [Criminal tactics]. Moskva : Narodnyj komitet vnutrennih del RSFSR, 1929. 312 s [in Russian].

⁶ Яблоков Н. П. Иван Николаевич Якимов – один из основателей отечественной криминалистики как науки и учебной дисциплины. Вестник Московского университета. Серия 11. Право. 2014. №4. С. 9.

properly and appropriately, how to place all investigative actions in their mutual connection;

– an investigation technique that examines the best techniques for investigating particular categories of cases¹.

Thus, from the mid-30's of XX century in Criminalistics began the formation of its more developed system, where criminal tactics and methods of investigation of crimes, along with technology were defined as independent parts of this science.

As early as the 1970's, forensic tactics, as an independent section of forensic science, was widely recognized.

The ultimate purpose of forming that section was the need to assist the investigation in solving the problems of intensifying investigative activities.

The development of forensic tactics was developing in the direction of developing new tactics, as well as improving existing ones. The investigation of crimes has urgently required the development of new tactics and recommendations for their use in investigative activities.

Trends in the optimization of investigative activities have contributed to the emergence of requirements for the correct, error-free use of forensic tactics.

Situation forensic tactics required new developments, one of which was the introduction of the concept of *tactical decision*.

The tactical decision includes in its content the choice made by the person in the criminal proceedings which is so necessary for the correct and timely application of the means of forensic tactics.

Conclusions.

The factors considered played a crucial role in the emergence of a tactical decision.

This role is due to the presence of certain information components that have become *catalysts* of the formation of the concept of *tactical decision*.

New advances in decision theory and, in parallel, the emergence and development of forensic tactics have led to the implementation of scientific research and the introduction of the concept of *tactical decision* in the forensic apparatus of forensic science.

¹ Jablov N. P. Ivan Nikolaevich Jakimov — odin iz osnovatelej otechestvennoj kriminalistiki kak nauki i uchebnoj discipliny [Ivan Nikolaevich Yakimov is one of the founders of Russian forensics as a science and academic discipline]. Vestnik Moskovskogo universiteta. Serija 11. Pravo.2014. №4. S. 9 [in Russian].

These factors tend to be constantly updated, which is reflected in new studies of tactical decision-making in criminal theory, the determination of the place and role of tactical decisions in the process of investigation (trial) of criminal offenses.

Consideration of the background of the emergence of tactical decisions in the theory of forensic science has allowed to determine the objective prerequisites for the emergence of their concept and added new knowledge of theoretical foundations of tactical decisions in forensic science.

Ephemerality of the tactical decision, on the one hand, and its effectiveness when applied on the other, make it possible to conclude that it is necessary to research it further.

One of these areas is the factors identified in the paper, the development of which is an inexhaustible source of information on new research into tactical decisions.

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О. Ю. Булдуков

**ПЕРЕДІСТОРІЯ ВИНИКНЕННЯ ТАКТИЧНИХ
РІШЕНЬ У КРИМІНАЛІСТИЦІ**

Розглянуто основні фактори, поява та існування яких вважаються інформаційною основою виникнення тактичних рішень у криміналістиці.

Акцентовано увагу на з'ясуванні інформаційних джерел, які сприяли появі нового поняття в криміналістиці і криміналістичній тактиці. Наголошено на існуванні низки факторів, що мають загальний і окремий характер по відношенню до виникнення поняття «тактичне рішення» в криміналістиці. Указані фактори поділяються на дві групи, пов'язані: 1) із зародженням і розвитком теорії прийняття рішень; 2) із зародженням і розвитком криміналістичної тактики та її засобів.

Ключові слова: криміналістична тактика; тактичне рішення; теорія прийняття рішень; кримінальне правопорушення.

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I. V. Parfyo,

Postgraduate Student at the Department of Criminalistics at Yaroslav
Mudryi National Law University
Kharkiv, Ukraine

ORCID:<http://orcid.org/0000-0001-5788-2268>

e-mail: parfyo.igor@gmail.com

FALSIFICATION AND CIRCULATION OF FALSIFIED MEDICINAL PRODUCTS: DISCLOSURE OF CRIMES AND BEGINNING OF CRIMINAL PROCEEDINGS

The article explores the problems of detecting features of falsification and trafficking of counterfeit medicines and the beginning of criminal proceedings.

The purpose of the article is to study the criminalistic nature and significance of the beginning of criminal proceedings as a structural element of the crime investigation methodology, to determine the features of the beginning of the investigation of falsification and trafficking of counterfeit medicines and to determine their influence on the effectiveness of pre-trial investigation of this category of crimes.

It is substantiated that the systematization of the characteristics of the crime under investigation should be carried out according to the criterion of reason for entering information in the Unified Register of pre-trial investigations. Based on the results of the summarization of the materials of the forensic and investigative practice, special attention should be paid to revealing the signs of the investigated crime from the materials of the operative-search activity, reports of the State Service of Medicines and Drug Control, statements of the victims. This gives grounds to claim that criminal procedural and organizational and tactical features of the beginning of criminal proceedings are essential for the effective investigation of counterfeiting and trafficking of counterfeit medicines.

It was established that the specifics of the beginning of the criminal proceedings of the investigated crime, first of all, is manifested in the features of the systematization of signs of falsification or trafficking of counterfeit drugs, the need for the investigator to interact with the State Drug Service and drug control, which is due to the regulatory system of pharmaceutical activity in Ukraine. Based on the specifics of the crime under investigation, the need to highlight the identification of the characteristics of the crime in question and the features of the initiation of pre-trial investigation as an independent structural element of the forensic methodology of investigating falsification and trafficking of counterfeit medicines is substantiated.

Keywords: Falsification and circulation of falsified medicinal products: identification of features of falsification and turnover of counterfeit medicines, sources of detection of signs of crime, organizational and tactical features of the beginning of criminal proceedings, systematization of signs of adulteration and turnover of counterfeit medicines.

Formulation of Research Problem.

The effectiveness of investigating counterfeiting and trafficking of counterfeit medicines depends to a large extent on the timely initiation of criminal proceedings, complete and objective investigation of the

background information about the crime, as well as the conduct of investigative (investigative), unspoken investigative (investigative) actions and tactical operations.

It is at the beginning of the investigation that the foundation is laid for establishing the circumstances of the criminal offense, the guilt of a particular person, and a considerable amount of evidential information is identified and collected.

As a result of such activity, the investigation versions are put forward and the tasks of the investigation are determined, appropriate decisions are made, their execution is ensured¹.

The stage of gathering and verifying primary information is a must for the proper classification of crimes and the choice of areas of investigation, which primarily depends on the quality, timeliness, optimality and overall effectiveness of criminal proceedings².

Analysis of recent researches and publications.

The problem of initiation of criminal proceedings has been sufficiently elaborated in the special literature, in particular, the study of this issue was undertaken by: Yu. P. Alenin, V. A. Zhuravel, MV Kapustina, G. A. Matusovsky, O. V. Oderiy, K. O. Spasenko, V. V. Tishchenko, V. Y. Shepitko and others³.

¹ Pchelina O. V. Struktura metodyky rozsliduvannia zlochyniv u sferi sluzhbovoi diialnosti [Structure of methodology of investigation of crimes in the sphere of professional activity]. Naukovyi visnyk mizhnarodnoho humanitarnoho universytetu. 2014. Vyp. №10–2. S. 124 [in Ukrainian].

² Pchelina O. V. Struktura metodyky rozsliduvannia zlochyniv u sferi sluzhbovoi diialnosti [Structure of methodology of investigation of crimes in the sphere of professional activity]. Naukovyi visnyk mizhnarodnoho humanitarnoho universytetu. 2014. Vyp. №10–2. S. 124 [in Ukrainian].

³ Alenin Yu. P. Pochatok dosudovoho rozsliduvannia za KPK Ukrainy 2012 roku [The beginning of the pre-trial investigation under the CCP of Ukraine in 2012]. Yurydychnyi chasopys Natsionalnoi akademii vnutrishnikh sprav. 2013. Vyp. № 1. S. 198–203; Zhuravel V. A. Problemy periodyzatsii dosudovoho rozsliduvannia [Problems of periodization of pre-trial investigation]. Visnyk Natsionalnoi akademii pravovykh nauk Ukrainy, 2014. Vyp. № 2. S. 136–144; Kapustina M. V. Pochatok dosudovoho rozsliduvannia: problemy vnormuvannia [Initiation of pre-trial investigation: problems of normalization]. Naukovyi visnyk Khersonskoho derzhavnoho universytetu. Seriya : Yurydychni nauky. 2015. Vyp. 5 (4). S. 45–49 [in Ukrainian]; Matusovskij G. A. Jekonomicheskie prestuplenija: kriminalisticheskij analiz [Economic crimes: forensic analysis]. Har'kov : Konsum, 1999. 480 s. [in Russian]; Oderij O. V. Pochatok dosudovoho rozsliduvannia kriminal'nih pravoporushen' proti dovkillja: teoretiko-organizacijnij aspekt [The beginning of pre-trial investigation of criminal offenses against the environment: theoretical and organizational aspect]. Kriminalistika i sudebnaja jekspertiza. 2014. Vyp. 59. S. 177–187; Spasenko K. O. Osoblivosti vidkrittja kriminalnogo provadzhennja shhodo porushen' pravil bezpeki pid chas vikonnannja robit z

At the same time, in the theory of criminalistics and the practice of investigating crimes, a number of problems of investigating the initiation of criminal proceedings as a structural element of the method of investigation of particular types of crimes remain debatable today.

It should be emphasized that in the modern forensic literature, the formation of the methods of investigation of falsification and trafficking of counterfeit medicines, the detection of signs of crime and the beginning of criminal proceedings, are not considered or considered at all in relatively reduced form.

The above confirms the relevance of the topic and the need for further research on the subject.

The **purpose of the article** is to study the forensic nature and significance of the beginning of criminal proceedings as a structural element of the methods of investigation of crimes, to determine the features of detecting signs of crime and the beginning of the investigation of counterfeiting and trafficking of counterfeit medicines, to find out their impact on the effectiveness of detection and investigation of this category of crimes.

Main Research Content Presentation.

It should be noted that in the forensic field today the issue of distinguishing the features of the beginning of criminal proceedings as an independent stage of investigation of crimes and, accordingly, a structural element of the forensic methodology is debatable.

In this context, it is worth agreeing with V. V. Tishchenko that there can be no single established structure of crime investigation methodology, since from the information point of view the methodology is a certain body of knowledge, and from the point of view of use it is a certain algorithm of actions; in addition, the structure of the technique is influenced by its functional orientation.¹

Concerning the opening of criminal proceedings as an independent stage of pre-trial investigation, V. A. Zhuravel notes that the expediency of its separation is conditioned by the specificity of the procedural actions, from which the pre-trial investigation begins, by the circle of subjects involved in carrying out these actions (investigator, prosecutor, the

pidvishhenouju nebezpekoju [Features of the opening of criminal proceedings for breaches of security rules during the execution of work with high risk]. Teorija ta praktika sudovoï ekspertizi i kriminalistiki. Harkiv : Pravo, 2014. Vip. 14. S. 128–134 [in Ukrainian]; Tishhenko V. V. Korystno-nasil'stvennye prestuplenija. Kriminalisticheskij analiz [Self-serving-violent crimes. Forensic Analysis]: monografija. Odessa : Jurid. lit. 2002. S. 231–236 ta in [in Russian].

¹ Tishhenko V. V. Korystno-nasil'stvennye prestuplenija. Kriminalisticheskij analiz [Self-serving-violent crimes. Forensic Analysis]: monografija. Odessa : Jurid. lit. 2002. S. 270 [in Russian].

applicant, etc.), the nature of the initial tasks to be solved, the need to identify the main areas of activity of the investigator¹.

In agreement with this opinion, K. O. Spasenko adds to the listed factors that determine the peculiarities of the beginning of criminal proceedings as a separate element of the methodology, adds the peculiarities of the regulatory regulation of the so-called *departmental* investigation².

Analyzing the above views, we believe that the selection of features of the beginning of pre-trial investigation as an independent structural element of the method of investigation of counterfeiting and trafficking of counterfeit medicines is due to the following factors:

1) the specifics of the procedural steps leading to the initiation of pre-trial investigation related to professional pharmaceutical activity;

2) the features of the detection sources and the reasons for initiating criminal proceedings;

3) specifics of actions regarding the primary gathering of information about a crime event;

4) determining the directions of the investigation and the scope of the investigator's tasks that are put at the beginning of criminal proceedings.

Investigating the procedural features of the initiation of criminal proceedings, it is necessary to pay attention to the specifics of the stage of pre-trial investigation, from which criminal prosecution begins today.

To date, the forensic literature has expressed a rather ambiguous attitude to the changes introduced with the adoption of the Criminal Procedure Code of Ukraine in 2012, in particular emphasizing the need for a preliminary, verification, filtration stage before the main proceedings³ and in its turn overly simplified procedure for opening a criminal case. not only on legal, moral, ethical but also organizational aspects.

In particular, the entry in the Unified Register of Pre-trial Investigations of all statements and communications containing only general information leads to a significant increase in the amount of material that is being investigated.

¹ Zhuravel V. A. Problemy periodyzatsii dosudovoho rozsliduvannia [Problems of periodization of pre-trial investigation]. Visnyk Natsionalnoi akademii pravovykh nauk Ukrainy, 2014. Vyp. № 2. S. 142 [in Ukrainian].

² Spasenko K. O. Osoblivosti vidkrittja kriminalnogo provadzhennja shhodo porushen' pravil bezpeki pid chas vikonannja robot z pidvishhenomu nebezpekoju [Features of the opening of criminal proceedings for breaches of security rules during the execution of work with high risk]. Teorija ta praktika sudovoï ekspertizi i kriminalistiki. Harkiv : Pravo, 2014. Vip. 14. S. 130 [in Ukrainian].

³ Alenin Yu. P. Pochatok dosudovoho rozsliduvannia za KPK Ukrainy 2012 roku [Beginning of pre-trial investigation under the CCP of Ukraine in 2012]. Yurydychnyi chasopys Natsionalnoi akademii vnutrishnikh sprav. 2013. Vyp. № 1. S. 199 [in Ukrainian].

In turn, the intensification of the work of the investigator, the prosecutor does not contribute to the objectivity and completeness of the process of investigating the received information due to elementary unnecessary workload¹.

While agreeing with this position, it should be noted that the need to verify criminal complaints and reports is also confirmed by the statistical information on the status of the pre-trial investigation of criminal proceedings recorded by the Office of the Prosecutor General of Ukraine.

In particular, 2 % of all criminal proceedings for adulteration or trafficking in counterfeit medicines were closed due to the absence of an event or the composition of the criminal offense.

The foregoing clearly indicates that a significant portion of the information is entered in the Unified Register of Pre-trial Investigations on the basis of unsubstantiated or erroneous statements and communications.

However, the current criminal procedural legislation requires the adoption and subsequent registration in the Unified Register of pre-trial investigations of any information about a criminal offense, taking into account the following features:

1) the information should relate to a criminal offense, not to an administrative, disciplinary or other offense;

2) prior to the commencement of the pre-trial investigation, the existing criminal procedural legislation does not provide for the verification of information on a criminal offense².

In view of the above, criminal manifestations of falsification and circulation of counterfeit medicines should be distinguished from administrative offenses, in particular, the sale of over-the-counter medicines in cases prohibited by law (Article 42-4 of the Code of Administrative Offenses), with non-compliance with the requirements of standards, norms, rules and technical conditions. the time of production, storage, transportation, sale or use of medicinal products (Articles 167, 168-1, 170 of the Code of Administrative Offenses), failure to comply with the legal requirements of officials of state bodies for the quality control of medicinal products and the conditions for their production in order to remedy breaches

¹ Zhuravel V. A. Pochatok dosudovoho rozsliduvannia: deiaki protsesualni ta orhanizatsiino-taktychni problemy [Beginning of pre-trial investigations: some procedural and organizational-tactical problems]. Visnyk Luhanskoho derzhavnoho universytetu vnutrishnikh sprav imeni E. O. Didorenka. 2015. Vyp. 1. S. 252 [in Ukrainian].

² Vapnarchuk V. V. Pochatok dosudovoho rozsliduvannia. Kryminalnyi protses [Initiation of pre-trial investigation. Criminal process] : pidruch. za red. O. V. Kaplinoi, O. H. Shylo. Kharkiv : Pravo, 2018. S. 272 [in Ukrainian].

of the legislation on medicinal products or to impede the activities of these bodies (Article 188-10 of the Code of Administrative Offenses)¹.

Structurally, the initial phase of the investigation includes the following activities:

- 1) identification of the crime or lack thereof;
- 2) carrying out procedural actions regarding the primary gathering of information about a crime event².

Let's look at each of them in more detail.

Analysis of the practice of investigating counterfeiting and trafficking of counterfeit medicines showed that the generalizing, sources of detecting signs of counterfeiting and trafficking of counterfeit medicines are:

- 1) the health sector, including materials from the departmental inspection of the State Service for Drugs and Drug Control, medical staff of a hospital or clinic, pharmacy staff;
- 2) customs authorities of the State Fiscal Service of Ukraine, State Border Service of Ukraine;
- 3) enterprises of the pharmaceutical industry and trade;
- 4) consumers of counterfeit medicines;
- 5) open source, such as social networking sites and forums;
- 6) operational units of the National Police of Ukraine, in particular the Department for Combating Drugs Crime, its territorial units, etc.

Filing information in the Unified Register of Pre-trial Investigations involves first identifying the signs of a crime, therefore, it is necessary to investigate the question of delimitation of the concepts of *detection* and *establishment* of crimes, as well as identifying sources of information from which the investigator, prosecutor will find out about the criminal offense and which is the reason for entering the Unified Register of Pre-trial Investigations³.

Criminal literature refers to the activities of law enforcement agencies aimed at obtaining information from individuals or legal entities about a crime.

¹ Pro zatverdzhennia Instruktsii z oformlennia materialiv pro administratyvni pravoporushennia zakonodavstva Ukrainy shchodo zabezpechennia yakosti likarskykh zasobiv : nakaz MOZ Ukrainy vid 26.10.2001 № 428. Ofitsiinyi visnyk Ukrainy vid 08.02.2002. № 4 [in Ukrainian].

² Lobunec E. S. Naznachenie i sodержaniya etapov rassledovaniya prestuplenij [Appointment and content of the stages of the investigation of crimes: monograph.] : monografiya. Moskva : Jurlitinform, 2015. S. 45 [in Russian].

³ Kapustina M. V. Pochatok dosudovoho rozsliduvannia: problemy vnormuvannia [The beginning of pre-trial investigation: problems of normalization.]. Naukovyi visnyk Khersonskoho derzhavnogo universytetu. Seriya : Yurydychni nauky. 2015. Vyp. 5(4). S. 49 [in Ukrainian].

This process differs from crime detection in that it involves an active and purposeful activity in establishing information about the facts of the crime¹.

In this regard, it should be noted that the successful establishment of signs of falsification or trafficking of counterfeit medicines, first of all, requires the definition of forensic features of crime, as well as its systematization.

Thus, in the specialized literature, the criminalistic sign of a crime is understood to be a fact that acts as a result of a criminal act, which more or less likely indicates the event of the crime, its circumstances².

Regarding the systematization of the features of crimes in the investigation of certain types of crimes, the most common criteria today are: general and individual features of crimes; stages (stages) of crime development; the way of being in the surrounding reality; the place of possible detection of signs³.

At the same time, in our opinion, the systematization of the signs of falsification and circulation of counterfeit medicines should be carried out by the criterion of the reason for entering information in the Unified register of pre-trial investigations.

Therefore, the reasons for entering information on falsification and circulation of counterfeit medicines in the Unified Register of Pre-trial Investigations can be:

- 1) notification of victims;
- 2) notification of officials, who became aware of the fact of falsification or circulation of counterfeit medicines during the performance of their official duties;
- 3) notification of pharmaceutical companies, pharmacy establishments — subjects of input control of medicinal products;
- 4) notification of the State Service for Drugs and Drug Control;

¹ Petrosian V. H. Kryminalistychne ta operativno-rozshukove zabezpechennia vyjavlennia zlochyniv, vchynenykh subiektamy hospodariuvannia z oznakamy fiktyvnosti [Forensic and Operational-Investigative Support for Identification of Crimes Committed by Business Entities with Signs of Fictitiousness]: avtoref. dys. ... kand. yuryd. nauk. Nats. un-t derzh. podatk. sluzhby Ukrainy, Irpin, 2012. S 12 [in Ukrainian].

² Matusovskij G. A., Dudnikov A. L. Kriminalisticheskaja sistematizacija priznakov hishhenij [Forensic systematization of theft signs.]. Rassledovanie hishhenij gosudarstvennogo i obshchestvennogo imushchestva (problemy taktiki i metodiki). Harkiv, 1987. S. 28 [in Russian].

³ Matusovskij G. A. Jekonomicheskie prestuplenija: kriminalisticheskij analiz [Economic crimes: forensic analysis]. Har'kov : Konsum, 1999. 480 [in Russian].

5) detection by the investigator or prosecutor of signs of falsification or circulation of counterfeit medicines from materials of operative-search activity;

6) detection by the investigator or prosecutor of the signs of the investigated crime from information received from the customs bodies of the State Fiscal Service of Ukraine, the State Border Service of Ukraine;

7) detection by the investigator or prosecutor of the signs of the investigated crime from mass media, forums, websites;

8) detection by the investigator or prosecutor of the signs of the investigated crime during the investigation of other crimes.

Let's look at them in more detail.

As we have seen from our research, the most common reason for entering information on falsification and circulation of counterfeit medicines is to identify signs of falsification or circulation of counterfeit medicines from materials of operational and search activities.

Today, the body that conducts investigative measures in this category of crime is the Department of Combating Drug Crime of the National Police of Ukraine and its territorial units.

Pre-trial investigation in the specified category of crimes is carried out by investigators of the National Police of Ukraine.

Signs indicating the falsification or circulation of counterfeit medicines in this case may be:

a) absence of a license for production of medicines, wholesale and retail trade of medicines, import of medicines;

b) the expiration of the license;

c) cancellation or suspension of the license;

d) availability of licenses issued to another person;

e) inconsistency of the actual economic activity of the license, failure to comply with the requirements for the licensed type of activity;

e) violation of conditions of licensing activity; lack of state registration of a legal entity, an individual entrepreneur;

f) violation of rules, technical regulations for the manufacture of medicines;

g) sale of medicines outside pharmacies, including on the Internet;

h) violation of the rules for writing off and disposal of unfit medicines;

i) violation of the rules of workflow; i) violation of accounting and tax reporting.

It should be noted that the materials of the operative-search activity can be the basis for starting a pre-trial investigation only if they have information about the circumstances, which may indicate a criminal offense.

Such materials must be legalized by the operational unit and transmitted in due course to the investigator or prosecutor¹.

Regarding the legalization of the materials of the operative-search activity, it should be noted that this is the specific activity of the operative and investigative units for granting legal force and introduction into the criminal process of the materials of the operative-search activity².

In case of detecting signs of crime, the operative unit, which conducts the search and search activity, is obliged to immediately send the collected materials, which record the factual data about the unlawful acts of individuals and groups, responsible for which are provided by the Criminal Code of Ukraine, to the relevant body of pre-trial investigation initiation and conduct of pre-trial investigation in the manner prescribed by the Criminal Procedure Code of Ukraine³.

The next most common reason for entering information on counterfeit medicines in the Unified Register of Pre-Trial Investigations is a notification from the State Service for Medicinal Products and Drug Control about the existence of an offense in the course of a departmental inspection.

This is explained by a number of peculiarities related to the specifics of the regulatory framework in this field, as well as by the unconditional need to possess special knowledge for successful completion of the initial tasks of initiating criminal proceedings.

The State control over the quality of medicines is carried out by the State Service for Drugs and Drug Control, State Services on Medicines and Drug Control in the region and

in Kyiv by checking the compliance of economic entities with the requirements of the legislation on the quality of medicines and in the defined by the legislation cases of laboratory analysis of drug samples⁴.

¹ Pohoretskyi M. A. Poniattia ta sutnist lehalizatsii operatyvno-rozshukovoi informatsii [The concept and essence of legalization of operative-search information]. Visnyk Luhanskoho derzh. un-tu vnutr. sprav im. E. O. Didorenka. Luhansk : Vyd-vo LDUVS, 2010. Spets. vyp. № 4. S. 34 [in Ukrainian].

² Humenna N. Osoblyvosti vykorystannia rezultativ operatyvno-rozshukovoi diialnosti v rozshukovii roboti slidchoho [Peculiarities of using the results of the operative-search activity in the investigative work of the investigator]. Natsionalnyi yurydychnyi zhurnal: teoriia ta praktyka. Respublika Moldova, 2014. Vyp. № 4. S. 217 [in Ukrainian].

³ Pro operatyvno-rozshukovu diialnist: Zakon Ukrainy [About operative-search activity: Law of Ukraine] vid 18.02.1992 № 2135–XII. Vidomosti Verkhovnoi Rady Ukrainy vid 02.06.1992 r., № 22 [in Ukrainian].

⁴ Deiaki pytannia derzhavnoho kontroliu yakosti likarskykh zasobiv : postanova Kabinetu Ministriv Ukrainy [Some Issues of State Control of the Quality of Medicines: Resolution of the Cabinet of Ministers of Ukraine] vid 03.02.2010 № 260. Ofitsiyni visnyk Ukrainy vid 19.03.2010, № 17 [in Ukrainian].

Thus, the initiation of criminal proceedings is possible as a result of receiving a report on the commission of a criminal offense, which was established in the course of both scheduled and unscheduled inspection by the bodies of the State Service of Ukraine for Drugs and Drug Control¹.

Scheduled inspections are carried out in accordance with the annual plan of implementation of state supervision (control) measures by the State Service for Medicinal Products and Drug Control for the respective calendar year.

Unscheduled inspection is carried out on the grounds stipulated by the Law of Ukraine "On basic principles of state supervision (control) in the sphere of economic activity".

The content of such checks is to be carried out by the officials of the aforementioned bodies:

- 1) verification of supporting documents for the series of medicines;
- 2) selective visual inspection of the compliance of medicinal products with the requirements of the quality specification.

In case of non-compliance of the medicinal product with the requirements of specification of quality based on the results of visual inspection, detection of discrepancies in the accompanying documents to the series of medicinal products, or violation of the established conditions for the manufacture of the medicinal product at the prescription pharmacy, storage, transportation and sale of the medicinal product, which may adversely affect its quality, authorized persons make a decision on the selection of samples for laboratory analysis, the results of which conclude as medicines.

On the basis of the results of the conclusion on the quality of samples of medicinal products issued by the laboratory, an order is issued to suspend the circulation of the corresponding series or all series of medicinal products in the region or throughout the territory of Ukraine and an urgent notification of the detection of counterfeit medicinal products.

The State Service of Ukraine for Drugs and Drug Control, in compliance with the provisions of the Memorandum of Cooperation between the State Service of Drugs and Drug Control and the National Police of Ukraine, dated July 3, 2017, immediately sends to law enforcement authorities inspection materials containing signs of

¹ Pro zatverdzhennia Polozhennia pro Derzhavnu sluzhbu Ukrainy z likarskykh zasobiv ta kontroliu za narkotykamy : postanova Kabinetu Ministriv Ukrainy [About the consolidated Regulation on the State Service of Ukraine for Medicinal Drugs and Drug Control: Decree to the Cabinet of Ministers of Ukraine] vid 12.08.2015, № 647. Ofitsiyni visnyk Ukrainy vid 18.09.2015, № 72 [in Ukrainian].

manufacturing counterfeit medicines, purchase, transportation, transfer or storage for sale or illicit sale of counterfeit medicines.

Signs indicating the falsification or circulation of counterfeit medicines in this case may be:

a) availability of a negative opinion on the quality of the medicinal product; b) issuing a prescription for stopping the circulation of a medicinal product in the region or throughout the territory of Ukraine;

c) detection of violations of technological regulations for the production of counterfeit medicines;

d) drawing up protocols on administrative offense, bringing to administrative responsibility.

The current situation has several aspects that have both a positive and a negative impact on the investigation process.

In particular, experts who test drug for falsification actually give pre-qualification of the event prior to criminal proceedings, which significantly reduces the possibility of false or unjustified criminal offense, and significantly facilitates the investigator's work to verify the commission of a crime.

Obtaining information on falsification or trafficking of counterfeit medicines in accordance with the procedure of notification of the State Service of Ukraine for Drugs and Drug Control has documentary confirmation, in particular, as part of the inspection materials, the investigator is provided with:

1) acts on the results of verification of compliance by the business entity with the requirements of the legislation on quality assurance of medicinal products;

2) acts of sampling of medicinal product for laboratory testing of their quality;

3) an order imposing a ban on a medicinal product; 4) urgent reports on the detection of counterfeit medicines;

5) a prescription on elimination of violations of the legislation of Ukraine on medicines.

At the same time, it should be borne in mind that since the inspection itself is rather lengthy, the notification of the offense is received after a considerable period of time.

In this regard, it is unacceptable for investigators to await the results of the review of the State Service of Ukraine for Drugs and Drug Control, as this may affect the amount and quality of information retained about the crime and, ultimately, the quality of the investigation as a whole.

Statements and notifications are a common reason for reporting crime.

Signs indicating falsification or circulation of counterfeit medicines in this case may be: a) the presence of appeals, letters, complaints, citizens' statements regarding the quality of medicines;

b) incidents between medical staff and patients;

c) fixation in the medical records of patients' abnormal reactions to drugs.

When examining allegations or reports of adulteration or trafficking in counterfeit medicines as a pretext for initiating a pre-trial investigation, it should be noted that the primary basis for such notification is the *detection* of something unusual, inconsistent, or incorrect in the medicinal product by the pharmaceutical industry.

For example, patients may find the difference (appearance, smell, taste, sensation of touch, impact of the product) between the counterfeit product and the drug they are familiar with through consumption¹.

The most common features that should be addressed in the presence of suspected adulteration are:

a) spelling errors in the instructions;

b) font differences;

c) violation of the integrity of the packaging; d) unclear quality of engraving or printing;

e) lack of information on the country of the manufacturer or the manufacturer's factory;

f) absence of marking, registration number; e) no expiry date.

First of all, it is necessary to study the packaging of the medicinal product, to evaluate its quality, font and the presence of spelling errors, which may be on the packaging itself and in the instructions for use.

The materials of which the packaging and instructions are made must be of high quality, the colors are rich, the text is clearly visible, without gaps. The instructions should be printed, not copied.

As practice shows, the common reason for entering information on falsification and circulation of counterfeit medicines is also the notification of authorized employees of pharmacy establishments (retailers) and authorized employees of enterprises (entities of wholesale trade), conditioned by the quality control in Ukraine. medicines upon receipt, carried out by visual inspection or laboratory examination of the quality of the medicinal products at the time of their receipt².

¹ IRACM. A practical guide for EU Investigations on Falsified Medicines. Draft guide version 20 – 2014. URL : <http://www.globalforumljd.org> (data zvernennia 12.07.2019).

² Pro zatverdzhennia Poriadku kontroliu yakosti likarskykh zasobiv pid chas optovoi ta rozdribnoi torhivli : nakaz Ministerstva okhorony zdorovia Ukrainy [About Confirmation of the Procedure for the Control of Medicinal Brightness

During the visual examination, the authorized person checks the conformity of the obtained medicinal products with the accompanying documents regarding the quantity, dosage, batch numbers, expiration date, registration status, name, dosage form, manufacturer.

Each batch of medicinal product must be accompanied by copies of the quality certificate of the batch of medicinal product issued by the manufacturer (for imported medicinal products by the importer (manufacturer or person representing the manufacturer of medicinal products in the territory of Ukraine)), the conclusion on the quality of imported medicinal products in Ukraine (for medicinal products). means of foreign production) and the conclusion on compliance of biological drugs with the requirements of national and national and international standards (for medical immunobiological preparations), certified by the seal of a cheap supplier.

In case of establishment of pharmacy establishments and enterprises by employees during such control of violations, the act on the detected defects of medicines in respect of which there are suspected of falsification, as well as the falsified medicines, shall be forwarded to the State Service for Drugs and Drug Control together with a simultaneous notification law enforcement agencies on detected signs of adulteration or trafficking of counterfeit medicines.

Signs indicative of falsification or circulation of counterfeit medicines in the following circumstances may be: lack of complete documentary support for the circulation of medicines; the presence of individual errors in the shipping documents; defects in the packaging or labeling of the medicinal products described above; suspicion of the fictitiousness of the legal person – the seller, in particular, the absence of statutory or other primary accounting documents.

Information received from the customs authorities of the State Fiscal Service of Ukraine, the State Border Service of Ukraine may give rise to criminal proceedings regarding suspected possession of counterfeit medicines found at the customs border of Ukraine.

Specificity of such goods as medicines makes it impossible for the customs authorities to directly check their quality¹. Considering the

Having Hacked a Pid Hour of Wholesale and Distribution Tornovly: a Directive of the Ministry of Health of Ukraine] vid 29.09.2014 № 677. Ofitsiyni visnyk Ukrainy vid 16.12.2014, № 98 [in Ukrainian].

¹ Volkova N. V. Mytni orhany v systemi derzhavnoho kontroliu yakosti likarskykh zasobiv [Customs authorities in the system of state quality control of medicines]. Visnyk Akademii mytnoi sluzhby Ukrainy. Seriya : Pravo, 2009. № 2. S. 68 [in Ukrainian].

peculiarities of the order of movement of medicines, the possible forms of customs control should be recognized:

1) verification of supporting documents and other information for customs control;

2) consumers of counterfeit medicines;

3) oral questioning of citizens and officials of enterprises;

4) accounting for moving drugs;

5) перевірка системи звітності та обліку ліків, що переміщуються через митний кордон України;

6) inspection of territories and premises of temporary storage warehouses, customs licensed warehouses and other places where medicines are located¹. The head of the relevant customs authority or his deputies having considered the materials on violation of the customs rules and having established the presence of sufficient data indicating the signs of falsification and circulation of counterfeit medicines, shall transfer the collected materials to the body of pre-trial investigation for the initiation of pre-trial investigation.

Therefore, signs that may indicate fraud or circulation of counterfeit medicines found at the customs border of Ukraine can be:

a) availability of deficiencies in the accompanying documents and other information subject to customs control;

b) availability of defects in appearance of medicines, packaging, marking;

c) absence of medicinal products subject to customs clearance in the register of medicinal products of Ukraine;

d) the negative opinion of the laboratory on the quality of the medicinal product and others.

The media often cover the facts of the offenses, including the falsification and trafficking of counterfeit medicines.

In case of self-disclosure by the investigator or prosecutor in the media of reports of detected facts of falsification or trafficking of counterfeit medicines or consequences of use of medicines suspected of falsification, this is a reason for submitting information to the Unified Register of Pre-trial Investigations and to commence criminal proceedings.

Conclusions.

¹ Shevchuk O. M. Osoblyvosti zdiisnennia mytnoho kontroliu za peremishchenniam likarskykh zasobiv cherez mytnyi kordon [Peculiarities of implementation of customs control over the movement of drugs across the customs border.]. Visnyk Kharkivskoho natsionalnoho universytetu vnutrishnikh sprav. 2011. № 4. S. 318 [in Ukrainian].

The above gives grounds to claim that there are criminal procedural and organizational and tactical features of the beginning of criminal proceedings concerning the investigation of falsification and trafficking of counterfeit medicines and the possibility of considering it as a separate element of the structure of the relevant forensic methodology.

The specifics of the initiation of criminal proceedings of the investigated crime are primarily manifested in the features of systematization of signs of falsification or trafficking of counterfeit medicines, the need for interaction of the investigator with the State Drugs Service and drug control, which is conditioned by the system of regulatory regulation of pharmaceutical activity in Ukraine.

Knowledge of the investigators of the complex features of committing falsification and trafficking of counterfeit medicines will allow to ensure the timely opening of criminal proceedings, promptness in conducting investigative (investigative) and silent investigative (investigative) actions and will contribute to the effectiveness of pre-trial investigation and solving criminal cases.

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І. В. Парфіло

**ФАЛЬСИФІКАЦІЯ ТА ОБІГ ФАЛЬСИФІКОВАНИХ ЛІКАРСЬКИХ
ЗАСОБІВ: ВІЯВЛЕННЯ ОЗНАК ЗЛОЧИНУ ТА ПОЧАТОК
КРИМІНАЛЬНОГО ПРОВАДЖЕННЯ**

У статті досліджуються проблеми виявлення ознак фальсифікації та обігу фальсифікованих лікарських засобів й початку кримінального провадження. Виходячи з результатів узагальнення матеріалів судової та слідчої практики, особлива увага приділяється виявленню ознак досліджуваного злочину з матеріалів оперативно-розшукової діяльності, повідомлень Державної служби з лікарських засобів та контролю за наркотиками, заяв потерпілих. Обґрунтовується роль та вагоме значення кримінально-процесуальних та організаційно-тактичних особливостей початку кримінального провадження для ефективного розслідування фальсифікації та обігу фальсифікованих лікарських засобів.

Ключові слова: фальсифікація та обіг фальсифікованих лікарських засобів, виявлення ознак фальсифікації та обігу фальсифікованих лікарських засобів, джерела виявлення ознак злочину, організаційно-тактичні особливості початку кримінального провадження, систематизація ознак фальсифікації та обігу фальсифікованих лікарських засобів.

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O. M. Kliuiev,

Doctor of Law, Professor, Honored Lawyer of Ukraine, Director of
KhRIFE, Kharkiv, Ukraine

ORCID: <https://orcid.org/0000-0002-8722-4781>

e-mail: hniise@hniise.gov.ua

IMPROVEMENT OF FORENSIC SUPPORT FOR JUSTICE: THEORETICAL, LEGAL AND ORGANIZATIONAL ASPECTS

The article purpose is to determine conceptual foundations and directions of the formation of the modern paradigm of forensic justice.

The problems affecting the quality and effectiveness of forensic examinations include the following: untimely arrival of forensic experts at the scene that subsequently often leads to unsuitability of research objects; lack of an adequate arsenal of forensic methods; lack of high-tech equipment that can be used to perform certain types of forensic researches; insufficient generalizations of international positive and negative experience for organizing forensic activities; imperfection of legal acts regulating forensic activities, etc.

In order to solve the problems of timely receipt of research objects by a forensic expert, in addition to resolving issues of their prompt withdrawal and providing them for a forensic examination, it is necessary to update the development of theoretical and applied principles for the technology of performing certain types of traditional and innovative forensic researches; to develop a developed system of scientific and practical seminars (trainings) including at the appropriate training grounds in relevant areas of forensic science activity.

An important factor in improving the expert provision of justice in Ukraine is consideration of the requirements of European Commission for the Efficiency of Justice (CEPEJ Guidelines) and further cooperation with ENFSI.

As an important criterion for the effective development of expert support for justice, one can also single out the need for more precise legislative regulation of guarantees for the provision of forensic expert activity.

Implementation of the proposed measures will ensure the forensic expert independence, optimize forensic activities and significantly increase its effectiveness.

Keywords: legal proceedings, forensic science, standardization, paradigm, scientific revolution, expertology.

Formulation of Research Problem.

A study of the global experience on the effectiveness of justice indicates that one of the means of creating a system of human rights and freedoms is to formulate a paradigm for the integrated effective use of traditional and new types of judicial expertise based on the active use of the Council of Europe's international legal instruments on justice.

This is not possible without comprehensive research on the basis of a systematic approach to forensic activities.

Analysis of recent researches and publications.

First of all, issue relevance proposed for consideration is determined by the need to clarify the contemporary content of the theoretical, legal and organizational paradigm of forensic activity.

During the years of Ukrainian independence excluding separate publications¹ and publications, fundamental and applied scientific developments aimed at rethinking ideas about the content of the theoretical foundations of forensic expertise and the use of specific expertise in the legal proceedings were clearly insufficient.

The above and requirements of the international community on the standardization of forensic expertise actualize the need to formulate the theoretical and legal foundations of the organizational paradigm of forensic justice.

The analysis of scientific researches in the field of theoretical and legal and organizational and methodical principles of judicial-expert support of justice shows that certain attention is paid to the problems of development of theoretical principles of forensic science, methods of conducting certain types of judicial examinations².

¹ Див., наприклад, окремі публікації у випусках електронного наукового періодичного видання «Експерт: парадигми кримінальних наук і державного управління»; Симаків-Єфреміан Е. Б. До питання про взаємозалежність європейських інтеграційних процесів і тенденції інтеграції спеціальних знань в Україні [On the issue of interdependence of European integration processes and tendencies of integration of special knowledge in Ukraine]. Теорія та практика судової експертизи і криміналістики. Вип. 17. Харків : Право, 2017. С. 152–158; Сопільник Р. Л. Експертне забезпечення правосуддя у контексті європейських інтеграційних процесів [Expert Justice in the Context of European Integration Processes]: Криміналістичні вісники. №1 (23), 2015. С. 39–44; Спітська Н. О., Бєлєтська С. О. Шляхи питання формування нової парадигми теорії та практики судової експертизи в Україні [On the Formation of the Newest Paradigm of Forensic Theory and Practice in Ukraine.]. Актуальні питання судової експертизи і криміналістики : зб. матеріалів міжнарод. наук.-практ. конф., присвяченої 150-річчю з дня народження Засл. проф. М. С. Бокаріуса (Харків, 18–19 квіт. 2019 р.). Харків : KhNDISE, 2019. С. 63–65; Клиуєв О. М. Міжнародні стандарти та міжнародне співробітництво у сфері судово-експертної діяльності в Україні [International Standards and International Cooperation in the Field of Forensic Expertise in Ukraine]. Актуальні питання судової експертизи та криміналістики : матеріали міжнарод. наук.-практ. конф., присвяченої 95-річчю створення Харківського науково-дослідного інституту судових експертиз ім. Засл. проф. М. С. Бокаріуса (м. Харків, 10–11 жовтня 2018 р.). Харків : Право, 2018. С. 5–8 [in Ukrainian].

² Климченко Н. І. Загальна теорія судової експертології: поняття і місце в системі наукового знання [The General Theory of Forensic Expertology: Concept

Creation of a model of forensic activity should be based on the study of historical experience and systematic approach to combating crime¹.

During the years of independence in Ukraine scientists published scientific works and protected dissertations for the degree of Doctor of Law, including the works of I. A. Aliyev (1990)², F. M. Javadov (2001)³, A. V. Ishchenko (1995)⁴, S. V. Evdokimenko (2017)⁵, O. M. Moiseev

and Place in the System of Scientific Knowledge]. Zb. nauk.prats Iripnskoi finansovo-yurydychnoi akademii (ekonomika, pravo). Vyp. 2. 2013. S. 101–106 [in Ukrainian].

¹ Shynkarenko I. R., Spitsyna H. O. Istorychni vytoky ta perspektyvy rozvytku teorii ta praktyky sudovoi ekspertyzy [Historical origins and prospects of the development of the theory and practice of forensic examination..] Aktualni pytannia sudovoi ekspertyzy ta kryminalistyky : zb. materialiv mizhnarodnoi naukovo-praktychnoi konferentsii, prysviachenoj 95-richchiu stvorennia Kharkivskoho naukovo-doslidnogo instytutu sudovykh ekspertyz im. Zasl. prof. M. S. Bokariusa (10–11 zhovtnia 2018 r). Kharkiv : Pravo, 2018. S. 20–22; Shynkarenko I. R., Spitsyna H. O. Shchodo zaprovadzhennia yevropeiskyykh standartiv zabezpechennia prav i svobod liudyny u sudovo-ekspertnii diialnosti [On the introduction of European standards for the protection of human rights and freedoms in forensic activities]. Aktualni pytannia dosudovoho rozsliduvannia ta tendentsii rozvytku kryminalistychnoi metodyky : tezy dopovidei Vseukrainskoi mizhnarod. nauk.-prakt. konf., 21 lystopada 2018 r. Kharkiv : KhNUVS, 2018. S. 211–213; Yevdokimenko S. V. Stanovlennia nauky pro sudovu ekspertyzu: istorychnyi aspekt [Formation of the science of forensic science: historical aspect] : Forum prava. 2009. №2. S. 145–149. URL : http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?Z21ID=&I21DBN=UJRN&P21DBN=UJRN&S21STN=1&S21REF=10&S21FMT=njuu_all&C21COM=S&S21CNR=20&S21P01=0&S21P02=0&S21COLORTERMS=0&S21P03=1&S21STR=EJ000026%2F2009%2F2 (data zvernennia 20.08.2018.); Stolitnii shliakh sudovoi ekspertyzy v Ukraini (1918–2018 rr.) [Hundred Years of Forensic Examination in Ukraine (1918–2018)] : monohrafiia / avt.-ukl. : O. M. Kliuiev, O. P. Uhrovetskyi, E. B. Simakova-Yefremian ta in.; za red. O. M. Kliuieva. Kharkiv : Zoloti storinky, 2018. S. 7 [in Ukrainian].

² Alyev Ydrys Aly Ohly. Problemy sudbeno-ekspertnoi profylaktyky [Problems of forensic prevention] : avtoref. dys. ... d-ra yuryd. nauk : 12.00.09. Kyev. hos. un-t ym. T. H. Shevchenko. Kyev, 1990. 32 s [in Russian].

³ Dzavadov Fuad Musa Ogly. Konceptual'nye osnovy razvitiia sudbenoi jekspertizy v sovremennykh usloviyakh [Conceptual basis for the development of forensic examination in modern conditions]: dis. ... d-ra jurid. nauk : 12.00.09. Kiiv : NAVS Ukraini, 2000. 373 s [in Russian].

⁴ Ishchenko A. V. Metodolohichni ta orhanizatsiini problemy rozvytku kryminalistychnykh naukovykh doslidzhen [Methodological and organizational problems of development of forensic scientific researches]: dys. ... d-ra yuryd. nauk: 12.00.09. Kyiv : Ukrainska akademiia vnutrishnikh sprav, 1996. 415 s [in Ukrainian].

⁵ Yevdokimenko S. V. Sudovo-ekonomichna ekspertyza: teoretyko-metodolohichni zasady i praktyka realizatsii [Forensic and economic expertise: theoretical and methodological foundations and practice of implementation] :

(2011)¹, I. A. Petrova (2012)², I. V. Pyrih (2015)³, E. B. Simakova-Efremyan (2017)⁴, M. G. Shcherbakovskiy (2016)⁵ and other scientists.

In addition to the aforementioned works, theoretical and applied questions of the use of special knowledge in the detection and investigation of crimes on the facts of their offenses were considered in 60% of dissertations of forensic science.

In the last two years, dissertations have appeared in the field of civil and economic orientation, which deal with the problematic issues of conducting judicial examinations in the framework of these proceedings.

At the same time, the mentioned works do not reveal the whole spectrum of theoretical and procedural and organizational problems in the specified field.

The **article purpose** is to determine the directions of formation of the modern paradigm of forensic justice, to identify the problems that need to be solved to ensure the formation of an effective model of judicial expertise based on deepening existing approaches to the complex solution of problems of proceedings and the formation of a modern traditional term system according to traditional and innovative provisions of forensic theory and practice.

Presentation of Research Content.

Studying the current legislation¹ of the results of previous scientific studies obtained by scientists allows us to state a number of existing

avtoref. dys. ... d-ra yuryd. nauk: 12.00.09. Kharkiv : KhNUVS, 2017. 44 s [in Ukrainian].

¹ Moisieiev O. M. Ekspertni tekhnolohii: teoriia formuvannia i praktyka zastosuvannia [Expert Technologies: Formation Theory and Application Practice] : monohrafiia, Kharkiv : Apostyl, 2011. 424 s [in Ukrainian].

² Petrova I. A. Teoretyko-pravovi ta orhanizatsiino-metodolohichni zasady rehuliuвання sudovo-tovarnavchykh ekspertyz spozhyvchykh tovariv [Theoretical-legal and organizational-methodological principles of regulation of forensic examination of consumer goods] : dys. ... d-ra yuryd. nauk: 12.00.09. Kharkiv : KhNUVS, 2012. 541 s [in Ukrainian].

³ Pyrih I. V. Teoretyko-prykladni problemy ekspertnoho zabezpechennia dosudovoho rozsliduvannia [Theoretical and applied problems of expert support of pre-trial investigation]: monohrafiia, Dnipropetr. derzh. un-t vnutr. sprav. Dnipropetrovsk : Lira, 2015. 430 s [in Ukrainian].

⁴ Simakova-Yefremian E. B. Teoretyko-pravovi ta metodolohichni zasady kompleksnykh sudovo-ekspertnykh doslidzhen [Theoretical and methodological foundations of complex forensic research]: dys. ... d-ra yuryd. nauk: 12.00.09. Kharkiv: Nats. yuryd. un-t imeni Yaroslava Mudroho, 2017. 503 s [in Ukrainian].

⁵ Shcherbakovskiy M. H. Teoretyko-metodolohichni ta prakseolohichni zasady sudovykh ekspertyz u kryminalnomu protsesi [Theoretical-methodological and praxeological foundations of judicial expertise in criminal proceedings]: avtoref. dys. ... d-ra yuryd. nauk: 12.00.09. Kharkiv : KhNUVS, 2016. 40 s [in Ukrainian].

problems of theoretical and legal and organizational content regarding the formation of a modern paradigm of forensic expertise in accordance with the standards of the European Union and the creation of a system of forensic justice.

First of all, these are the problems that affect the qualitative and temporal characteristics of the examinations, namely:

- not the timely arrival of specialists and experts at the scene;
- unsuitability of objects for research;
- lack of techniques for conducting forensic researches;
- lack of equipment that can be used for conducting certain types of forensic researches;
- lack of specialized knowledge and professional skills of the staff of the relevant forensic institution on the work on certain types of equipment;
- lack of international reviews of positive and negative experience in the organization of forensic activities;
- lack of normative documents, etc².

The problem, in our opinion, is the problem of access of experts to the scene.

The reasons for this situation are the lack of theoretical and applied developments and measures of a particular focus, namely:

- methodological foundations of technology of conducting certain types of traditional and innovative expert researches;
- definition of modern theoretical principles, perspectives and tendencies of the development of forensic theory;
- relatively advanced system of training and training that would be used both in the preparation of a future forensic expert and in the training of practitioners; interdepartmental scientific and practical seminars on relevant areas of forensic expertise, which are conducted in order to establish interaction between judicial experts and law enforcement investigators.

¹ Kryminalnyi protsesualnyi kodeks Ukrainy [Criminal procedural code of Ukraine]. Vidomosti Verkhovnoi Rady Ukrainy. 2012. № 3–4. St. 21. URL : http://search.ligazakon.ua/l_doc2.nsf/link1/T124651.html (data zvernennia 27.05.2019); Pro sudovu ekspertyzu : Zakon Ukrainy. Vidomosti Verkhovnoi Rady Ukrainy (VVR). 1994. № 28. St. 232. URL : <http://zakon2.rada.gov.ua/laws/show/4038-12> (data zvernennia 27.05.2019) [in Ukrainian].

² Sviderskyi O. O. Shliakhy podolannia problem provedennia sudovykh ekspertyz (za materialamy uzahalnennia ekspertnoi praktyky) [Ways of overcoming problems of carrying out judicial examinations (according to the materials of generalization of expert practice)]. Aktualni pytannia sudovoi ekspertyzy i kryminalistyky : zb. materialiv mizhnarod. nauk.-prakt. konf., prysviachenoi 150-richchiu vid dnia narodzhennia Zasl. prof. M. S. Bokariusa (Kharkiv, 18–19 kvit. 2019 r.). Kharkiv : KhNDISE, 2019. S. 93–96, S. 94 [in Ukrainian].

In particular, as a positive experience of using polygons and conducting trainings can be called the practice of educational activities at the f Yaroslav Mudryi National Law University where the Department of Forensics opened a unique forensic training ground, which is used by the department to ensure the acquisition of future jurists skills in the tsarina videography, trace evidence, forensic ballistics and explosives, other fields of forensic technology, tactics of conducting individual investigators (search) operations, investigating crimes of various kinds and so on.

In terms of the organization of scientific and practical seminars it is possible to give examples of conducting by Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations Interagency Scientific and Practical Seminar for Criminal Police Employees *Problematic Issues of Appointment and Conducting of Forensic examinations* (January 16, 2019) or Interagency Scientific and Practical Seminar *Problematic Issues for Appointment and Conducting of Forensic examinations in Criminal Proceedings for Corruption* (July 12, 2019) etc.

According to the results of the workshop, an appropriate collection of materials was published¹.

According to the practice and analysis of the opinions of scientists², the next group of problematic issues of forensic examinations is compliance with international standards of expert activity, which are defined by the following European normative acts:

1. Guidelines of the European Commission on the Effectiveness of Justice (hereinafter — CEPEJ Guidelines) on the role of court-appointed experts in the proceedings of Council of Europe member states (adopted at

¹ Дyv.: Особливостi пiдготoвки матерiалiв длiя призначення судовиx експертiв [Features of preparation of materials for the purpose of forensic examinations] : навч. наочн. посiбн. длiя пратсiвникiв правоохоронникiв орханiв / уклад. : О. П. Ухроветський, В. В. Аброскин та iн. / МIуУ ; Kharkivskyi naukovo-doslidnyi instytut судовиx експертiв iм. Засл. проф. М. С. Бокарiуса. Kharkiv : KhNDISE ; Promin, 2019. 180 с.; Особливостi пiдготoвки матерiалiв длiя призначення та проведення судовиx експертiв у криминальних проваджених за коруптiйними злочинами [Peculiarities of preparation of materials for appointment and carrying out of judicial expertise in criminal proceedings on corruption offenses] : матерiали мiзхвiдом. наук.-практ. семiнару «Проблемнi питання призначення та проведення судовиx експертiв у криминальних проваджених за коруптiйними злочинами» (Kharkiv, 12 липня 2019 р.). Kharkiv : KhNDISE ; Konstanta, 2019, 260 с [in Ukrainian].

² Дyv., напр.: Stepanova S. V. Yevropeiskii standarty prava na spravedlyvyyi sud ta yikh implementatsiia u natsionalne zakonodavstvo Ukrainy: konstytutsiino-pravove doslidzhennia [European standards for the right to a fair trial and their implementation in Ukrainian national law: a constitutional legal study] : dys. ... kand. yuryd. nauk : 12.00.02. DVNZ «Uzhhorodskyi natsionalnyi universytet», Uzhhorod, 2018. 264 с [in Ukrainian].

the Commission's 24th plenary session, Strasbourg, 11-12 December 2014)¹. In Art. 138 of the CEPEJ Guidelines provide that, in accordance with the principles set out in this document, each member state of the Council of Europe must either introduce the proposed legislative rules regarding the rights and responsibilities of experts in litigation, or monitor or check for compliance with existing governing CEPEJ principles set minimum standards for the rules of conduct of experts in this country.

2. Conclusions of the Council and the Plan of future activities, taking into account the developed conclusions of the Council of the European forensic science.

3. Guide to good practices in civil judicial expertise in the European Union: published in October 2015.

The recommendations state that they are the result of more than ten years of research, debate and discussion between stakeholders across Europe for the sake of litigation and increasing the confidence of citizens and businesses in the justice sector, both in EU Member States and in living or working in another country, when dealing with cross-border issues.

For nearly two years, with the financial support of the European Justice Department (EGLE : Guide to good practices in civil judicial expertise in the European Union), leading judges, lawyers, forensic experts, scholars and legal students regularly held discussions on the main aspects of forensic examinations in the civil process with the aim of improving the various existing systems and providing a working basis for best practices in Europe².

This requirement becomes relevant in connection with the accreditation of KhRIFE laboratories according to the international standard ISO 17025: *General requirements for the competence of testing and calibration laboratories* and the planning for the current year of accreditation of three more laboratories to this standard, as well as three laboratories to ISO 17020:

¹ Yevropeyski ta mizhnarodni standarty u sferi sudochynstva, Kyiv, 2015.708 c. Basic Principles on the Independence of the Judiciary. United Nations Human Rights. Office of the High Commissioner. URL : <http://www.ohchr.org/EN/ProfessionalInterest/Pages/IndependenceJudiciary.aspx> (data zvernennia 19.06.2019). [in Ukrainian].

² Chechil Yu. Mizhnarodni standarty sudovo-ekspertnoi praktyky u svitli hlobalizatsiinykh protsesiv [International standards of forensic practice in the light of globalization processes.]. Vyp. 2. 2019. URL : http://vjhr.sk/archive/2019_2/part_2/28.pdf (data zvernennia 19.06.2019) [in Ukrainian].

Conformity assessment. Requirements for the operation of various types of bodies performing inspection in the field of crime scene investigation¹.

According to the specified international normative acts and normative acts of Ukraine, the Research Institute of the Ministry of Justice of Ukraine conducts research in more than 90 forensic specialties².

Taking into account the needs of expert practice and in order to expand the types of expert specialties, KhRIFE experts submitted proposals and introduced in accordance with the legislation 6 new types of forensic examinations and 10 expert specialties:

explosive-technical examination

– area of specialization: research on circumstances and mechanism of anthropogenic explosions;

Forensic examination of materials, products, and goods

– area of specialization

Researches on harmful substances pesticides in the environment;

electrical engineering transport examination

– area of specialization

urban electric transport research;

examination of the technical condition of elevators

– area of specialization

Research on technical condition of elevators and conditions of their safe operation;

Gemological examination –

areas of specialization:

gemstone research;

diamond research;

research on gemstones of organogenic origin;

research on semi-precious stones; research of decorative stones;

Forensic veterinary examination

– area of specialization

¹ Navodytsia za: Poltavskyi A. O. Do pytannia shchodo tekhnolohii v kryminalistytsi skriz pryzmu mizhnarodnoi standartyzatsii [To the issue of technologies in forensics everywhere through the lens of international standardization]. Aktualni pytannia sudovoi ekspertyzy i kryminalistyky : zb. materialiv mizhnarod. nauk.-prakt. konf., prysviachenoi 150-richchiu vid dnia narodzhennia Zasl. prof. M. S. Bokariusa (Kharkiv, 18–19 kvit. 2019 r.). Kharkiv : KhNDISE, 2019. S. 133–137 [in Ukrainian].

² Dodatok 6 do Polozhennia pro ekspertno-kvalifikatsiini komisii ta atestatsiiu sudovykh ekspertiv [Subclause 6 to the Regulation on expert-qualification commissions and certification of ship's experts]: zatv. nakazom Ministerstva yustytzii Ukrainy vid 04.03.2015 № 301/5 (iz zminamy ta dopovnenniamy) [in Ukrainian].

Forensic veterinary;

Prospective ways of improving the efficiency of forensic justice are the use of innovative technologies developed by scientific institutions of the National Academy of Sciences on scientific, scientific, technical, expert and information and analytical activities.

To this end, the following measures should be implemented based on the use of national scientific and technical potential:

- to develop the domestic instrument and technology for human DNA research; equipment for the search for bodies of missing persons under the surface of the earth and in the aquatic environment;
- methods of searching for living persons in different landscape, temperature and weather conditions;
- development of geophysical device for searching buried objects of origin.

Considering the experience of European countries and other countries of the world, one of the areas of joint development of research judicial institutions of the Ministry of Science of Ukraine and research institutions of NASUe may be “Development of innovative technologies for identification of personality and individual characteristics of a person based on the study of gene pools of regions of Ukraine”.

This activity should be carried out in cooperation with ENFSI (European Network of Forensic Expertise Network), established in 1995 to improve the exchange of information in the field of forensic expertise and to improve the quality of forensic expertise in the world.

There are 17 expert working groups within the ENFSI on different fields and types of forensic examinations.

Recently, ENFSI has been recognized by the European Commission as one of the leading forensic organizations.

Membership in the European Network of Forensic Science Institutes (ENFSI) gives new opportunities for international cooperation and communication of forensic experts, as well as allows the use of the experience of the expert institutions of other countries in the development of the expert research system in accordance with the modern achievements of science.

Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations has been a member of this organization since 2017.

Participation in ENFSI gives prospects for access to European databases, which is essential to improve the efficiency of forensic experts.

Mutual training and advanced training of experts are quite promising in terms of ENFSI membership.

At the annual meeting of the European Network of Judicial and Expert Institutions (ENFSI), held on May 29-31, 2019 in Rome (Italy), topical issues of fingerprint research were discussed; problems of globalization and internationalization of crime; issues of harmonization of scientific inventions in the field of forensic science and forensic science; the issue of improving the effectiveness of investigations into specific categories and types of crimes; tactical and technical techniques and means of forensic examination; special knowledge as a tool for implementation of modern science achievements in the pre-trial investigation and trial of crimes; discussion questions about conducting various expert studies, etc.¹.

Thus, the emergence of new types of expertise and, consequently, the expansion of expert specialties requires the implementation of scientific research in order to formulate a methodology and scientifically sound algorithms for the use of expertise in the relevant proceedings.

These studies should be related to the delimitation of the functions and powers of the forensic units of law enforcement agencies and research institutions of judicial examinations with the adaptation of the international standard ISO 21043 on Detection, recording (fixing), collecting (removing), transporting and storage of objects which have potential legal significance).

According to the world practice of forensic expert activity, as an important direction of development of expert support of justice, it is possible to emphasize the need for clearer legislative regulation of guarantees for ensuring the activity of a forensic expert.

At present, although a legal expert has legal safeguards to carry out forensic expert activity, they are clearly insufficient to fulfill all of its functions provided for by law.

At the same time, the findings of forensic experts in the vast majority of criminal proceedings and other types of litigation play the role of the most important evidence without which it is practically impossible to resolve a particular case.

Instead while performing the functions assigned by law to a forensic expert, as well as the results of a forensic expert's research, he or she is pressured and other unlawful actions in order to persuade the forensic expert to deliver a deliberately false opinion or testimony, refusal to give a conclusion or testimony, etc.

There are frequent cases when a forensic expert during the study of the location of the object is subjected to unlawful acts by the parties to the case, the bodies (persons) who appointed the forensic expertise or hired a forensic expert.

¹ ENFSI Annual Meeting in Rome 29–31 May 2019. Roma: Stampa a cura della Tipografia dell, 2019. 8 p.

At the same time, the remedies for the protection of a forensic expert against unlawful acts and their security are not fully enshrined in the legislation.

So, forensic expert is often summoned as a witness in proceedings in connection with the issues of his forensic examination in violation of the current legislation; during the interrogation, they are pressed against him in cases where the results of the forensic examination do not suit the prosecution or defense party; require a forensic expert to obtain his opinion, which he has provided in other proceedings or in the form of legal proceedings; repeated cases and the use of physical and moral violence, threats against him, his family members.

At the same time, as far as security is concerned, for example, a lawyer (advocate), the Law of Ukraine *On the Bar and Legal Practice* provides a large arsenal of measures to guarantee the performance of advocacy.

In view of the above, we propose to amend the legislation of Ukraine in order to clarify the rules on guarantees of activity of a forensic expert, namely:

I. Amend the Law of Ukraine On Judicial Examination with a new Article 3¹, with the following wording:

“Article 3 1. Guarantees of activity of forensic expert

1. The professional rights, honor and dignity of a court expert are guaranteed and protected by the Constitution of Ukraine, this Law and other normative legal acts of Ukraine, in particular:

1) any interference and obstacles to the performance of a forensic expert are prohibited;

2) it is forbidden to require from the court expert, as well as from the person for whom the right to engage in forensic activity has been terminated or suspended, to provide information that became known to her during the course of forensic activity.

3) conducting of investigative measures or investigative actions in criminal proceedings concerning the unlawful acts of an expert in the performance of his/her functional duties, which may be performed solely with the permission of the court, shall be carried out on the basis of a court decision made at the request of the Prosecutor General, his deputies, the prosecutor of the Autonomous Republic of Crimea, the region, the city of Kiev and the city of Sevastopol;

4) it is prohibited to inspect, divulge, demand or remove documents related to carrying out forensic expert activity, except in cases provided by law;

5) forensic expert involved in the defense, the prosecution party, investigating judge, court or the participant of the case shall be guaranteed equality of rights, observance of the principles of independence of forensic activity, principles of competitiveness and freedom in presenting evidence and proving their persuasiveness in any type of justice;

6) the life, health, honor and dignity of the forensic expert and his family members, their property is protected by the state, and encroachment upon them entails the responsibility stipulated by law;

7) forensic expert is guaranteed the right to security while participating in criminal and other types of justice in the manner prescribed by law;

8) it is forbidden to involve a forensic expert in confidential cooperation during the conduct of investigative measures or investigative actions, if such cooperation will be connected or may lead to the disclosure of information that became known to the forensic expert while carrying out forensic activity;

9) interference with the forensic expert communication with the client of forensic examination, carried out in accordance with the procedure established by law is prohibited;

10) it is forbidden to submit the submission to the investigator, the prosecutor, as well as the issuance of a separate court decision regarding the court expert, unless it is proved in the procedure established by law that his conclusion is false, unsubstantiated and goes beyond the competence of forensic expert;

11) it is forbidden to interfere with the position of a forensic expert in providing them with an opinion;

12) a body or officials who have detained a forensic expert who is an employee of a state specialized institution or have applied a preventive measure to it, who are obliged to immediately notify the head of that institution; and in the case of detention of a court expert who is not an employee of a state specialized institution, or the application of a preventive measure to him, shall be obliged to immediately inform the representative of the regional branch of the All-Ukrainian Public Association of Forensic Experts of which he is a member;

13) the notification of suspicion of a court expert in committing a criminal offense committed in the performance of his / her functional duties may be made exclusively by the Prosecutor General, his / her deputy, the prosecutor of the Autonomous Republic of Crimea, the region, the city of Kiev and the city of Sevastopol;

14) it is forbidden to bring to court criminal or other legal responsibility of a court expert (the person in respect of which the right to

carry out forensic expert activity has been terminated or suspended) or to threaten the use of liability in connection with the forensic expert activity according to the law;

15) they cannot be grounds for bringing a court expert to legal account of his public statements, statements in the media, unless the professional duties of the court expert are violated;

16) it is forbidden to identify a forensic expert with the client of forensic examination;

17) disciplinary proceedings against a court expert are carried out in a special manner.

The peculiarities of conducting individual investigative and criminal proceedings in relation to a court expert are set out in Part Two of this Article.

2. In the case of a search or inspection of a dwelling, other possession of a forensic expert, premises where he carries out forensic activities, temporary access to things or documents belonging to a forensic expert, or related to the forensic expert's activity, investigating judge, court in its decision without fail specifies the list of things, documents, which are to be found, identified or removed during the investigation or application of the measure of criminal proceedings, and also takes into account the requirements of paragraphs 2-4 parts of the first of this article.

During the search or inspection of the dwelling, other possession of the forensic expert, premises where he carries out forensic activities, temporary access to things and documents belonging to the forensic expert or related to the forensic expert activity, a representative should be present of state specialized institution where a court expert works, or a representative of a regional branch of the All-Ukrainian public association (public organization) of forensic experts, a member of which, is a court expert who does not work except in the cases provided for in the fourth paragraph of this part.

In order to ensure the participation of the said representative, an official who will conduct the relevant investigative action or apply a measure of criminal proceedings shall inform in advance the relevant state specialized institution or regional branch of the All-Ukrainian public association (public organization) of judicial experts at the place of such procedural action.

In order to ensure compliance with the requirements of this Law on non-disclosure of information that became known to a court expert during the process of judicial examination during the conduct of the said procedural actions to a representative of a state specialized institution or a representative of a regional branch of an all-Ukrainian public association

(public organization) of forensic experts which is a forensic expert is given the right to ask questions, submit observations and objections to the procedure; it shall be indicated in the minutes.

Failure of a representative of a state specialized agency or a representative of a regional branch of the All-Ukrainian public association (public organization) of judicial experts, of which a court expert is a member, subject to early notification of a state specialized institution or regional branch of the All-Ukrainian public association (public organization) of judicial experts impedes appropriate procedural action.

3. Subjects of forensic expertise on a voluntary basis are united in public organizations to protect their rights and professional interests.

4. State authorities, local self-government bodies, their officials and officials in relations with judicial experts are obliged to comply with the requirements of the Constitution of Ukraine and the laws of Ukraine, European Convention on Human Rights (ECHR) on 1950 and the protocols thereto, the consent of which is binding, provided by the Verkhovna Rada of Ukraine, European Court of Human Rights.

In our opinion, it is also necessary to strengthen in the Criminal Code of Ukraine criminal liability for any pressure on a court expert from the prosecution, defense or other persons in order to persuade him to deliver a deliberately false conclusion and to testify or refuse to give his opinion or testimony.

In order to correspond with the norms of the Criminal Procedural Code of Ukraine with the rules of the Law of Ukraine *On Judicial Examination* it is necessary to make corresponding amendments to Art. 69 of the Law of Ukraine *On Judicial Examination*.

Conclusions.

On the basis of the above, the following provisions can be distinguished in order to formulate the newest paradigm of expert support of justice in Ukraine.

First of all, these are the problems that affect the qualitative and temporal characteristics of the examinations, namely:

- not the timely arrival of specialists and experts at the scene;
- unsuitability of objects for research;
- lack of techniques for conducting forensic researches;
- lack of equipment that can be used for conducting certain types of expert studies;
- lack of specialized knowledge and professional skills of the staff of the relevant forensic institution on the work on certain types of equipment;
- lack of international reviews of positive and negative experience in the organization of forensic activities;

– lack of normative documents, etc.

In order to solve problems of timely receipt of objects of research by a forensic expert, in addition to resolving the issues of their timely removal and providing for forensic examination, it is necessary to update: development of theoretical and applied provisions on the methodological foundations of technology for conducting certain types of traditional and innovative expert studies; definition of modern principles, perspectives and tendencies of the development of forensic theory; the formation of an advanced system of conducting scientific and practical seminars (trainings), including on the corresponding training grounds.

Important factors for improving the judicial expertise in Ukraine are the compliance with the requirements of the European Commission for Justice Effectiveness Guidelines (CEPEJ Guidelines) and further cooperation with ENFSI.

According to the world practice of forensic expert activity, as an important direction of development of expert support of justice, it is possible to emphasize the need for clearer legislative regulation of guarantees for ensuring the activity of a forensic expert.

Implementation of the proposed measures will allow to ensure the independence of the court expert, to optimize forensic activity and to significantly improve its efficiency.

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О. М. Ключев

УДОСКОНАЛЕННЯ ЕКСПЕРТНОГО ЗАБЕЗПЕЧЕННЯ ПРАВОСУДДЯ: ТЕОРЕТИЧНІ, ПРАВОВІ ТА ОРГАНІЗАЦІЙНІ АСПЕКТИ

Вимоги світового співтовариства щодо стандартизації судово-експертної діяльності актуалізують необхідність формування її теоретико-правових засад та створюють передумови реформування експертного

забезпечення правосуддя. У статті на підставі аналізу наявних наукових досліджень та сучасного стану експертного забезпечення правосуддя виокремлено основні елементи його парадигми, у тому числі — адаптація до міжнародних стандартів (зокрема, в аспекті найшвидшого вилучення, транспортування та збереження об'єктів судової експертизи); функціональне розмежування напрямків діяльності спеціалізованих установ різних відомств; проведення взаємних стажувань, тренінгів експертів тощо.

Ключові слова: судово-експертне забезпечення правосуддя, кримінальне судочинство, судова експертиза, стандартизація, наукова революція, експертологія.

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E. B. Simakova-Yefremian

Doctor of Law, Senior Researcher, Deputy Director for Academic
Affairs at the KhRIFE, Kharkiv, Ukraine
Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0002-8246-7688>

e-mail: simakova@hniise.gov.ua

ABOUT THE NEED FOR IMPROVEMENT OF LEGISLATION REGARDING IMPLEMENTATION OF FORENSIC SCIENCE ACTIVITIES IN UKRAINE

The issue of reforming forensic expert support for justice and the need to improve the legislation of Ukraine regarding forensic science activity were investigated. Despite the fact that in recent years, the norms of the laws of Ukraine have been actively subjected to quite significant changes, some issues remain to be resolved on the legal regulation of forensic expert support for justice in the state. The analysis of the specialized literature and relevant legislation confirms the relevance of this issue. On the basis of studying the norms of the basic and procedural legislation regarding forensic science, proposals for its improvement are presented. So, in order to improve the legislation governing forensic science and the unambiguous application of the conceptual apparatus in this field, it is proposed to change the title of Article 1 of the Law of Ukraine On Judicial Examination and introduce the basic terms used in this Law in the the Criminal Procedural Code of Ukraine, Civil Procedural Code of Ukraine, Code of Administrative Proceedings of Ukraine. Improving the regulatory framework for the appointment and performing forensic examinations, as well as the legal status of a forensic expert on the basis of creating the proper legal status and legal support for organizing activities of the system of state forensic expert institutions, as well as forensic experts who do not work in these institutions; increasing the role of legitimate ways to motivate forensic experts; combating corruption in the field of forensics is one of the most important tasks of forensic expert support in the state. The implementation of the proposed measures will be a powerful lever of influence on the processes of improving forensic activities.

Keywords: forensic science, forensic science activity, improvement of the legislation of Ukraine; appointment of forensic examination, forensic expert conclusion.

Formulation of Research Problem.

Especially in recent years, forensic science plays such an important role in the judiciary that the proportion of criminal proceedings and cases in other types of judiciary could not be effectively investigated and considered by the court without using its results.

Among the fundamental issues of reforming forensic activity today are the following:

Improvement of normative regulation of issues of appointment and carrying out of judicial examinations, legal status of judicial expert on the basis of

creation of proper legal status and legal provision of organization of activity of the system of state judicial-expert institutions, as well as judicial experts who do not work in these institutions; enhancing the role of legitimate ways to motivate forensic experts; counteracting corruption in the field of forensic science.

2. Development of international cooperation in the field of forensic expertise in order to strengthen the position of Ukrainian forensic science in the world, expanding the knowledge base of experts, development of new technological complexes, including, through the fastest adaptation of modern foreign techniques to the practical area, implementation of modern Ukrainian methods in practice expert laboratories of the world.

3. Reorganization of forensic institutions on the basis of improved legislation and their accreditation in accordance with international standards.

These measures should be implemented in order to create conditions for reducing the time frames for the execution of examinations, raising their scientific level by introducing the latest technologies and equipment, improving the efficiency of the judicial bodies and improving the quality of judicial acts in part, which depends on timely and qualitative carrying out of forensic examinations.

Analysis of Current Researches.

The issue of reforming the legislation of Ukraine on the appointment and conduct of judicial examinations is receiving active attention from scientists, including the author of this work¹.

¹ Dyv., napr.: Simakova-Yefremian E. B. Do pyttannya udoskonalennia deiakykh polozhen normatyvno-pravovykh aktiv shchodo ekspertnoho zabezpechennia pravosuddia Ukrainy [On the issue of improvement of some provisions of legal acts on expert support of justice of Ukraine]. Aktualni pyttannia sudovoi ekspertyzy ta kryminalistyky : materialy mizhnar. nauk.-prakt. konf., prysviach. 90-richchiu stvorennia KhNDISE im. Zasl. prof. M. S. Bokariusa (Kharkiv, 7–8 lystop. 2013 r.). Kharkiv, 2013. S. 36–38; Lozovyi A. I., Simakova-Yefremian E. B. Aktualni pyttannia reformuvannia zakonodavstva u sferi sudovo-ekspertnoi diialnosti v Ukraini [Topical issues of legislative reform in the field of forensic expertise in Ukraine]. Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky. Kharkiv, 2014. Vyp. 14. S. 157–166; Lozovyi A. I., Simakova-Yefremian E. B. Shliakhy vyrishennia problem naukovo-metodychnoho zabezpechennia ekspertnoi diialnosti v Ukraini [Ways of solving problems of scientific and methodological support of expert activity in Ukraine]. Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky. Kharkiv, 2015. Vyp. 15. S. 149–156; Simakova-Yefremian E. B. Do pyttannia pro pryznachennia ta provedennia sudovoi ekspertyzy u kryminalnomu protsesi Ukrainy [On the issue of appointment and conduct of judicial examination in the criminal process of Ukraine]. Suchasni napriamy rozvytku sudovoi ekspertyzy ta kryminalistyky: tezy dop. nauk.-prakt. konf., prysviach. pamiaty Zasl. prof. M. S. Bokariusa (m. Kharkiv, 20 hrudnia 2016 r.). Kharkiv, 2016. S. 254–256; Simakova-Yefremian E. B. Problemy normatyvnoho rehuliuвання sudovo-ekspertnoi diialnosti v novomu zakonodavstvi Ukrainy

At the same time, the authors analyze the gaps in the legislation of Ukraine that need to be eliminated.

Despite the wide range of research on the subject, some issues remain unresolved.

It should be noted that there is no consensus among scholars and practitioners regarding the terminological apparatus of forensic examination, in particular, the definition of the notion of forensic examination, rules on primary, additional, repeated, commission and comprehensive forensics; grounds for forensic examination, guarantees of forensic scientist activity, etc.

Article Purpose.

On the basis of the analysis of the norms of the legislation of Ukraine, to make proposals for its improvement in the aspect of forensic activities.

[Problems of regulatory regulation of forensic activity in the new legislation of Ukraine]. Kryminalistyka ta sudova ekspertolohiia: nauka, navchannia, praktyka: 14 mizhnarodnyi konhres (Odesa, 13–14 veresnia 2018 r.). Odesa : NU «OluA», 2018. Tom 2. S. 411–426; Simakova-Yefremian E. B. Deiaki problemni pytannia zastosuvannia novykh norm z pytan pryznachennia ta provedennia sudovoi ekspertyzy [Some problematic issues of the application of new rules on the appointment and conduct of judicial expertise]. Visnyk Odeskoho naukovo-doslidnogo instytutu sudovykh ekspertyz: naukovo-praktychne elektronne vydannia. Vyp. 3. Odesa : ONDISE, 2018. S. 114–120; Simakova-Yefremian E. B. Zminy do pidzakonnnykh normatyvnykh aktiv pro sudovu ekspertyzu ta yikh spivvidnoshennia iz zakonamy [Changes to the by-laws on judicial expertise and their correlation with the laws]. Aktualni pytannia sudovoi ekspertyzy ta kryminalistyky: zb. materialiv mizhnar. nauk.-prakt. konf., prysviach. 105-richchiu z dnia narodzhennia Zasluzhenoho profesora M. S. Bokariusa (Kharkiv, 18–19 kvitnia 2019 r.). Kharkiv : KhNDISE, 2019. S. 43–45; Ripenko A. Sudova ekspertyza: yaki zminy chekaiemo naprykintsi roku? [Forensic examination: what changes do we expect at the end of the year?] URL : <http://blog.liga.net/user/aripenko/article/28826.aspx> (data zvernennia 12.06.2019); Bezzub I. Reforma protsesualnogo zakonodavstva v Ukraini: otsinky ekspertiv [Reform of procedural legislation in Ukraine: expert assessments] URL : <http://Nbuviap.gov.ua/index.php?option=comcontent&view=article&id=3009:reforma-protsesualnogozakonodavstva-v-ukrajini-otsinki-ekspertiv&catid=8&Itemid=350> <http://blog.liga.net/user/aripenko/article/28826.aspx> (data zvernennia 06.06.2019); Kurilo V. I., Samokhin A. V. Pravove rehuliuivannia ekspertnoi diialnosti v Ukraini: problemy ta shliakhy rozvytku [Legal regulation of expert activity in Ukraine: problems and ways of development]. Visnyk Mariupolskoho derzhavnogo universytetu seriia: Pravo, 2013. Vyp. 6. S. 66–72; Starodubov I. V., Polishchuk I. Yu. Pryiniattia novoho Kryminalnogo protsesualnogo kodeksu Ukrainy: osnovni zminy ta novovvedennia, shcho stosuiutsia sudovoi ekspertyzy [Adoption of the new Criminal Procedure Code of Ukraine: major changes and innovations concerning forensic examination]. Arotskerivski chytannia : zb. mater. zased., prysv. 85-richchiu vid dnia narodzhennia vydatnogo vchenoho kryminalista L. Yu. Arotskera (Sumy, 1–2 lyst. 2012 r.). MfU, KhNDISE. Kharkiv : KhNDISE, 2012. S. 32–34 toshcho [in Ukrainian].

Main content presentation.

In view of this goal, let us consider the norms of the current legislation, highlighting the positions of the legislator, for whom during the law enforcement practice there are certain difficulties. In this aspect, the Law of Ukraine dated 03.10.2017 No. 2147a “On Amendments to the Economic Procedure Code of Ukraine, the Civil Procedure Code of Ukraine, the Code of Administrative Judiciary of Ukraine and other legislative acts”¹ introduced certain amendments to the Law of Ukraine “On Forensic Examination” (hereinafter — the Law)², the proportion of which needs improvement. In particular, the following wording of Article 1 of the Law is in force:

“Article 1. Concept of forensic science

Forensic examination provides for “conducting research on the basis of special knowledge in the field of science, technology, art, crafts, etc., objects, phenomena and processes in order to provide an opinion on matters that are or will be subject to judicial review.”³.

It should be noted that in our opinion the current version is inadmissible because in the proposed form the definition has lost the direct research subject (forensic expert).

It should also be emphasized that phrase: “that is or will be the subject of a trial” needs clarification, since the forensic investigations conducted at the pre-trial stage by, for example, the defense party as well as the expert conclusion, ordered by the party involved (civil, economic, administrative), may or may not become subject to judicial review.

In the end, in order to improve the legislation governing forensic activities and to ensure the unambiguous use of the conceptual apparatus in this field, we repeatedly made proposals to change the name of the article and to introduce in it the main terms used in the Law of Ukraine *On Judicial Examination*, in the *Criminal Procedural Code of Ukraine*, the

¹ Pro vnesennia zmin do Hospodarskoho protsesualnoho kodeksu Ukrainy, Tsyvilnoho protsesualnoho kodeksu Ukrainy, Kodeksu administratyvnoho sudochynstva Ukrainy ta inshykh zakonodavchykh aktiv : Zakon Ukrainy [On Amendments to the Commercial Law of Ukraine, the Code of Civil Procedure of Ukraine, the Code of Administrative Procedure of Ukraine and other legislative assets: the Law of Ukraine] vid 03.10.2017 r. № 2147–VIII. Vidomosti Verkhovnoi Rady (VVR). 2017, № 48. St. 436 [in Ukrainian].

² Pro sudovu ekspertyzu [On forensic examination]: Zakon Ukrainy vid 25.02.1994 r. № 4038–KhII. Vidomosti Verkhovnoi Rady Ukrainy (VVR). 1994. № 28. St. 232 (iz zminamy ta dopovnenniamy) [in Ukrainian].

³ Stattia 1 iz zminamy, vnesenymy zghidno z Zakonamy vid 09.09.2004 № 1992–IV, vid 13.04.2012 № 4652–VI; tekst statti 1 v redaktsii Zakonu vid 03.10.2017 № 2147–VIII [in Ukrainian].

*Commercial and Procedural Code of Ukraine, the Code of Administrative Proceedings of Ukraine*¹.

In view of the above, we propose to set forth Article 1 of the Law of Ukraine “On Judicial Examination” in the following wording:

“Article 1. The concept of forensic science and other basic terms used in this law

1. The following basic concepts are used in this Law:

forensic examination is research by a forensic expert on the basis of special knowledge in the field of science, technology, art, craft, etc. of material (materialized) objects with the purpose of establishing factual data (facts) and circumstances of certain phenomena and processes relevant to criminal proceedings, decisions civil, commercial, administrative, administrative offense or enforcement of court decisions;

expert research is the process of cognitive activity of a forensic expert;

samples for expert research: objects of the material world (their fragments, particles, prints, etc.) reflecting peculiarities of a living person, a corpse, an animal, a plant, a substance, an object, a document, etc., are required in accordance with the procedure established by law and providing expert conclusion;

qualification of forensic expert meaning amount of knowledge and skills necessary for conducting forensic expertise in the relevant expert specialty, which is established by attestation of a forensic expert in the manner determined by this Law;

forensic procedure is the result of scientific work, containing a system of methods that are used in the course of successive actions of an expert in order to perform a specific expert task;

¹ Дyv., напp.: Симакoвa-Єфpeм'ян Є. Б. Пpоблeмy судoвo-єкcпepтнoї дiяльнocтi. Вiсник OНДIСЄ: нaукoвo-пpакtyчнe eлeктpoннe вyдaння [Ppоблeмc of forensic activity]. Вyп.1. Oдeca, 2017. С. 63–69; Симакoвa-Єфpeм'ян Є. Б. Дo пyтaння пpо нopмaтывнo-пpавoвe рeгyлювaння судoвo-єкcпepтнoї дiяльнocтi в yмoвax судoвoї рeфopмy в Укpaїнi [On the issue of legal regulation of forensic activity in the conditions of judicial reform in Ukraine]. З нaгoдy 100-риччя вiд днiя нaрoдзхeння пpofecopa М. В. Сaлeвcкoгo: зб. мaтepiaлiв кpyхлoгo cтoлy, м. Kharkiv, 30 зhoвт. 2017. Kharkiv : Пpавo, 2017. С. 68–70 тa in [in Ukrainian].

forensic activity is a type of activity related to the organization and physical evidence, derivatives of physical evidence, specimens, documents, body and condition of the human psyche, corpses (their particles), animals (their particles), plants (their particles), buildings, structures, areas of land, etc., as well as information recorded in case files and other media;

subject of forensic examination — the facts and circumstances of the case, relevant to the criminal proceedings, the decision of a civil, economic, administrative case, an administrative offense case or the execution of court decisions, established on the basis of the expert knowledge of a forensic expert;

specific expertise means professional knowledge and skills of a specialist in the relevant field of science, technology, arts, crafts, etc. (except knowledge of the field of law), acquired by him in the course of training and practical activity in the relevant specialty (profession); conduct of forensic and other expert studies in order to provide justice with an independent, qualified and objective expertise focused on maximizing the use of science and technology;

specialty of a forensic expert is a separate area of special knowledge that determines the competence of a forensic expert to conduct a certain type of expert research, according to which the qualification of a forensic expert is assigned.

2. Other terms used in this Law are defined by special rules in this Law and other laws of Ukraine

The following proposal relates to Article 7 of the Law. It is in force as follows:

“Article 7. Subjects of Forensic Examination

Forensic expert activity is carried out by state specialized institutions, as well as forensic experts who are not employees of these institutions, and other specialists (experts) in the relevant fields of knowledge in the manner and under the conditions specified by this Law¹.

The state specialized institutions include:

Forensic science institutions of the Ministry of Justice of Ukraine;

Forensic science institutions, forensic medical and forensic psychiatric institutions of the Ministry of Healthcare of Ukraine;

expert services of the Ministry of Internal Affairs of Ukraine, Ministry of Defense of Ukraine, Security Service of Ukraine, State Border Guard Service of Ukraine.

¹ Chastyna persha stat'ii 7 v redaktsii Zakoniv vid 03.10.2017 № 2147–VIII, № 187–IX vid 04.10.2019 [in Ukrainian].

Only specialized state institutions carry out forensic expertise related to forensic examinations, forensic medical and forensic psychiatric examinations¹.

The current wording of Article 7 needs to be amended in several respects:

- regarding its norm which establishes the carrying out of forensic activities by state specialized institutions, because the expert's opinion is drawn up not by an institution but by a judicial expert of that institution.

At the same time, as a positive point, it should be noted the changes already made regarding the elimination of the previously established norm, which enshrined the monopoly of state specialized institutions for expert examination in criminal proceedings;

- need to exclude from the list of subjects of forensic expert activity of the expert services of the Ministry of Defense of Ukraine, as they are absent;

- need to exclude from the list of subjects of forensic expert activity of the expert service of the State Border Service of Ukraine, since the latter belongs to the sphere of administration of the Ministry of Internal Affairs of Ukraine, as stated in the same article of the Law;

- in the editorial plan as for *other professionals*, because it is not clear that they are professionals.

In addition, part three of the article on the implementation of exclusively state specialized institutions of forensic expertise related to the conduct of forensic, forensic and forensic psychiatric examinations has a keen debate character, since it leaves the right to their conduct by those experts who are not employees of state specialized institutions.

After all, in other types of justice, the examination may be ordered by the party directly (civil, economic, administrative) and has an equal procedural status with the expertise performed by court order.

In addition, in criminal proceedings, there is often a need to involve experts in the fields of specialist knowledge that are not available in a state forensic science institution.

In this connection, there is a problem of involving such a specialist in criminal proceedings, since, as we have already stated, according to the current Law of Ukraine *On Judicial Examination*, forensic science activity in criminal proceedings is carried out only by state specialized institutions.

In view of the above, we propose to set forth Article 7 of the Law of Ukraine *On Judicial Examination* in the following wording:

«Стаття 7. Суб'єкти судово-експертної діяльності

¹ Chastynu chetvertu stat' 7 vykliucheno na pidstavi Zakonu vid 03.10.2017 № 2147–VIII [in Ukrainian].

Forensic expert activity is carried out by state specialized institutions, as well as forensic experts who are not employees of these institutions, and other specialists (experts) in the relevant fields of knowledge in the manner and under the conditions specified by this Law.

The state specialized institutions include:

Forensic science institutions of the Ministry of Justice of Ukraine;

Forensic science institutions, forensic medial and forensic psychiatric institutions of the Ministry of Healthcare of Ukraine;

expert services of the Ministry of Internal Affairs of Ukraine, Security Service of Ukraine.

Only specialized state institutions carry out forensic activities related to the study of objects prohibited and controlled by the state.”

Thus, according to part four of Article 8 of the Law “... the Ministry of Justice of Ukraine provides the publication of interdepartmental scientific and methodological collection *Criminalistics and Forensics*”¹.

It should be noted that in addition to the collection mentioned in the current wording of part four of Article 8 of the Law, for almost the 20th year the professional publication, namely: Research paper collection: *Theory and Practice of Forensic Science and Criminalistics* has been published, which is a powerful platform for the publication of advanced opinions in the field of forensic science of both scientists and practitioners of Ukraine and foreign scientists in the field of forensic science.

Therefore, it is necessary to amend the fourth part of Article 8 of the Law in view of this fact.

Our suggestions for editing part four of eighth article:

“... The Ministry of Justice of Ukraine provides the publication of the interdepartmental scientific and methodological collection: *Criminalistics and Forensics* and the Research paper collection: *Theory and Practice of Forensic Science and Criminalistics*.”

The following proposal relates to the provision of part two of ninth Article of the Law according to which court experts certified in accordance with this Law are included in the State Register of Certified Forensic Experts, whose responsibility is vested in the Ministry of Justice of Ukraine.

The person or body that appoints or orders a forensic examination may commission it to be carried out by those forensic experts who have been entered in the State Register of Certified Forensic Experts, or other

¹ Nazva statti 8 v redaktsii Zakonu vid 09.09.2004 № 1992–IV [in Ukrainian].

specialists in the relevant fields of knowledge, unless otherwise provided by law¹.

The above mentioned wording of the second paragraph of ninth Article needs clarification, since it does not contain terminology, such as “ordering forensic expertise” (current legislation uses terms such as *appointment of forensic examination, involvement of forensic expert*).

In view of the remarks made to Article 7 of the Law, it is necessary to clarify this provision regarding the involved *other* professionals.

Our suggestions for editing part four of ninth article:

“... The person or body that appoints or orders a forensic examination may commission it to be carried out by those forensic experts who have been entered in the State Register of Certified Forensic Experts, or other specialists in the relevant fields of knowledge, unless otherwise provided by law.”

Article 15 of the Law on Financing Forensic Expertise is in force, the second part of which provides as follows:

“Carrying out of forensic examinations by state specialized institutions in criminal proceedings on the instructions of the investigator, prosecutor, court and in cases of administrative offenses is carried out at the expense of funds earmarked for these purposes by these expert institutions from the Government Budget of Ukraine².

It should be noted that in accordance with the requirements of Article 122 of the Criminal Procedural Code of Ukraine of Ukraine:

“... Performing forensic examination on behalf of the investigating judge ... is carried out at the expense of funds earmarked for these purposes from these institutions from the Government Budget of Ukraine.”

That is why the norm of part two of Article 15 of the Law contradicts the requirements of Article 122 of the Criminal Procedural Code of Ukraine.

Taking in account the fact that under Article 1 of the Criminal Procedural Code of Ukraine, the procedure of criminal proceedings in the territory of Ukraine is determined only (emphasis added) by the criminal procedural legislation of Ukraine, the specified norm of the Law of Ukraine *On Judicial Examination* requires bringing it into compliance with the requirements of the Criminal Procedural Code of Ukraine:

¹ Chastyna druha statti 9 v redaktsii Zakonu vid 03.10.2017 № 2147–VIII [in Ukrainian].

² Chastyna druha statti 15 v redaktsii Zakonu vid 13.04.2012 № 4652–VI [in Ukrainian].

After the words “... investigator, prosecutor, ...”, add the words: *Examining magistrate*” to the second part of Article 15 and read it in the following wording:

“... Carrying out of forensic examinations by state specialized institutions in criminal proceedings on the instructions of the investigator, prosecutor, court and in cases of administrative offenses is carried out at the expense of funds earmarked for these purposes by these expert institutions from the Government Budget of Ukraine”.

“Carrying out forensic examinations, research and investigations in criminal proceedings by state specialized institutions, forensic science and forensic psychiatric institutions on the order of the suspect, accused, convicted, acquitted, their defenders, legal representative, victim, carried out at the expense of the customer”¹.

Since the current Criminal Procedural Code of Ukraine does not provide for judicial examinations to be ordered (independently) by the victim, his or her representative, then the current norm does not meet the requirements of the Criminal Procedural Code of Ukraine.

As mentioned, under Article 1 of the Criminal Procedural Code of Ukraine, the procedure for criminal proceedings in the territory of Ukraine is determined only by the criminal procedural legislation of Ukraine.

On this basis, it is imperative to amend the Criminal Procedural Code of Ukraine by providing in Articles 242 and 243 of the Criminal Procedural Code of Ukraine to carry out forensic examinations, investigations and investigations in criminal proceedings by state specialized institutions, forensic and forensic institutions at the request of the victim, his representative at the expense of the customer.

The issue of implementation of the current norm of part two of Article 18 of the Law is extremely urgent, according to this part

“... Employees of state specialized institutions (non-military personnel and those who do not have rank of rank and command staff) who have the qualification of a court expert shall be assigned a salary. not less than 10 minimum subsistence allowances set for able-bodied persons on January 1 of the calendar year ...”

Unfortunately, the budget legislation of Ukraine for 2018, 2019, the effect of the specified norm ceases. It is necessary to state the fact that today the salary of a court expert is 6123 UAH.

In some businesses, the wage bill is several times higher.

¹ Stattiu 15 dopovneno novoju chastynoiu zghidno iz Zakonom vid 13.04.2012 № 4652–VI [in Ukrainian].

Top-level scientists with a forensic expert's qualification, a Ph.D. degree, and a professor's rank have been awarded a salary of around eight thousand UAH.

This does not take into account the risks that are present in the work of forensic experts: difficult working conditions, corruption risks, the uniqueness of their work, huge responsibility and so on.

Thus, the multimillion population of Ukraine of judicial experts of the Ministry of Justice of Ukraine has just over one thousand people !!!

It's for the whole country !!!

As a result of inadequate remuneration, unique professionals are looking for more decent wages and are dismissed from judicial review institutions, which is a hindrance to the proper level of justice in Ukraine, causing unprecedented expert workload and the accumulation of unfulfilled forensic examinations.

In some departments, dozens or even hundreds of expert proceedings are conducted simultaneously by a court expert, and the time limits for their execution exceed all admissible standards.

Implementation of part two of Article 18 of the Law of Ukraine *On Judicial Examination* would have a positive effect, since the work of a forensic expert would be given the status of prestigious and one that the best specialists, including the talented youth, and the elite of experienced scientists would seek.

This is not a complete list of problematic issues regarding the need to improve the current legislation of Ukraine but taking in account the scope of this article, they may be the subject of research in our next publication.

Conclusions.

Summarizing the results of the above study we can draw the following conclusions.

Improvement of the normative regulation of the issues of appointment and conducting of judicial examinations, and the legal status of a judicial expert on the basis of creation of a proper legal position and regulatory legal support for the organization of the activity of the system of state judicial-expert institutions, as well as judicial experts who do not work in these institutions; enhancing the role of legitimate ways to motivate forensic experts; counteracting corruption in the field of forensic expertise is one of the most important tasks of expert justice in the country.

The implementation of the proposed measures will be a powerful lever of influence on forensic science improving.

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Е. Б. Сімакова-Єфремян
ПРО НЕОБХІДНІСТЬ УДОСКОНАЛЕННЯ ЗАКОНОДАВСТВА ЩОДО
ЗДІЙСНЕННЯ СУДОВО-ЕКСПЕРТНОЇ ДІЯЛЬНОСТІ
В УКРАЇНІ

Досліджено питання реформування судово-експертної діяльності та необхідності вдосконалення законодавства України про судово-експертну діяльність. Незважаючи на те, що в останні роки норми законів України активно піддаються досить суттєвим змінам, залишаються не вирішеними окремі питання нормативно-правового регулювання експертного забезпечення правосуддя в державі. Аналіз спеціальної літератури та відповідних норм законодавства підтверджує актуальність даного питання. На підставі дослідження норм базового та процесуального законодавства про судову експертизу запропоновано пропозиції з удосконалення останнього.

Ключові слова: судова експертиза, судово-експертна діяльність, удосконалення законодавства України; призначення судової експертизи, висновок експерта.

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I. A. Petrova,

Principal Researcher of KhrIFE

Kharkiv, Ukraine

ORCID: <http://orcid.org/0000-0002-1652-6715>

e-mail: ekobezpeka.ira@gmail.com

REGARDING THE ISSUE OF OBJECTIVE NECESSITY AND IMPORTANCE OF BUSINESS EVALUATION OF EMPLOYEES OF FORENSIC SCIENCE INSTITUTIONS

The article is devoted to the issues of objective necessity and importance of forensic staff business evaluation. Taking into account the researches of scientists it is proved that in each structural subdivision of the forensic expert institution the estimation of employees can be carried out differently with the orientation on the specificity of their work.

It is emphasized that the business evaluation of the employees will always facilitate the development of the staff of the forensic science institution, taking into account a number of principles, which are defined in the article with the relevant characteristic. The article emphasizes that among the main requirements for staff evaluation it is advisable to highlight such as: accessibility of information, not contradiction of assessments, accompanying organization and social situation, timeliness of assessment, systematic assessment, accessibility and promptness of evaluation of the employee's activity and his personal qualities, authority of the subject of evaluation. It is emphasized that the most comprehensive system of evaluation of the staff of the court-expert institution is manifested in the complex evaluation of each of the employees and the structure of the complex evaluation of the staff of the court-expert institution is presented.

Keywords: forensic institution, staff, employee, evaluation, business qualities, efficiency.

Formulation of Research Problem.

Transformation of market relations in Ukraine requires new methodological approaches to the problem of more complete use of the human factor by intensifying the activity of staff, creating effective incentives and motives in the mechanism of certain activities.

Insufficient professionalism in modern conditions sometimes becomes a limiting factor, which prevents organizations and enterprises from realizing their potential opportunities, in practice leads to a mass alienation of people from the results of their activities, reduction of social activity of performers, impersonality, inertia of most employees.

The establishment of a life-giving team that ensures the proper functioning of an institution or enterprise plays a significant role in the evaluation of staff, whose purpose is not only to select the best specialists currently, but also to influence the renewal and development of each particular organization.

Analysis of recent researches and publications.

Many economists and managers have been studying the methods of personnel assessment and their application in the work with staff. Foreign scientists have been dealing with this issue for almost two centuries.

At the present stage, theoretical and methodological issues of personnel assessment are actively engaged in and Ukrainian scientists among them: L. V. Balabanov, O. V Sardak, A. M Kolot, N. Yu. Butenko, A. E Cherpak, M. L. Tsukan, A. V Shapernikov, H. V Shchekin and others¹.

Institutional staff evaluation issues are also covered in a number of monographs.

Thus, in the S. E. Zelinskyi monograph the questions of theoretical foundations and methodological support of complex evaluation of civil servants are considered.

In addition, it has developed evaluation algorithms that form quantitative assessments of qualification and educational level, personality and competence and key performance indicators of civil servants and presents a procedure for the formation of quantitative integrated assessment through a single system of walls to which the results of testing the qualities and properties of public officials².

Along with him, A. P. Rachinsky exploring the theoretical and methodological foundations of strategic personnel management in public authorities in the context of modern Western European approaches, analyzed the strategic activity of the head as one of the levels of implementation of strategic personnel management in public authorities, developed basic models of strategic management building activity of the head, gave an estimation of expediency of application of specific technologies of strategic personnel management in public authorities and

¹ Dyv., napr.: Balabanova L. V., Sardak O. V. Upravlinnia personalom [Personnel management] : pidruchnyk. Kyiv. Tsentrl navchalnoi literatury, 2011. 468 s.; Butenko N. Yu., Cherpak A. Ye. Treninh upravlinnskykh kompetentsii [Management training of competencies]: navch. posib. Kyiv : KNEU, 2011; Tsukan M. L. Innovatsiini mekhanizmy upravlinnia rozvytkom personalu korporatyvnykh pidpriemstv intehrovanykh kholdinhiv [Innovative mechanisms of personnel development management of corporate enterprises of integrated holdings]: dys. ... kand.. ekon. nauk : 08.00.04. Mariupol, 2017. 210 s.; Shapernikov A. V. Intehrovana otsinka personalu banku [Integrated assessment of bank staff] : avtoref. dys. ... kand.. ekon. nauk : 08.06.01. Kyiv, 2006. 24 s. Shchekyn H. V. Osnovy kadrovoho menedzhmentu. Uchebnyk. 4-e yzd., yspr. Kyiv : MAUP, 2004. 280 s [in Ukrainian].

² Zelinskyi S. E. Teoretyko-metodolohichni zasady kompleksnoho otsiniuvannia derzhavnykh sluzhbovtziv [Theoretical and methodological foundations of complex evaluation of civil servants]: monohrafiia. Kyiv : NADU, 2016. 296 s [in Ukrainian].

introduced the system of strategic personnel management in public authorities in crisis conditions¹.

O. V. Banit in the monograph presented the results of theoretical and methodological study of the systems of professional development of managers in transnational corporations of Germany and Poland and substantiated methodological approaches and principles of professional development of personnel, analyzing the system of training managers, as well as regulatory, programmatic and organizational, pedagogical support of this process.

In addition, on the example of well-known German multinational corporations, he characterized the corporate education system, its role and importance in ensuring the professional development of managers².

We should agree with P. V. Nikiforenko, who states that the combination of theory and practice of personnel management will help to form a competitive specialist, able to effectively use modern technologies of work with personnel and management of them in the relevant area of professional activity³.

In view of such interest in the quality assessment of personnel, it should be noted that some aspects of it were left out of the attention of scientists, so we consider it expedient to highlight them in this work.

Article Purpose.

The purpose of this work is to outline the theoretical foundations of objective necessity and the importance of business evaluation of the staff of forensic institutions.

Outline of the main research material.

Staff is the main resource of any organization, not exception and forensic institutions.

Its professional development, level of qualification, own abilities and acquired skills depend on both the development and the efficiency of the institution.

¹ Rachynskyi A. P. Stratehichne upravlinnia personalom v orhanakh derzhavnoi vlady (teoretyko-metodolohichniy analiz) [Strategic Personnel Management in Public Authorities (Theoretical and Methodological Analysis)]: monohrafiia. Kyiv : NADU, 2009. 316 s [in Ukrainian].

² Banit O. V. Systemy profesiinoho rozvytku menedzheriv u transnatsionalnykh korporatsiiakh: dosvid Nimechchyny i Polshchi [Systems of Professional Development of Managers in Transnational Corporations: The Experience of Germany and Poland]: monohrafiia. Kyiv : Tsent, 2018. 414 s [in Ukrainian].

³ Nykyforenko V. H. Upravlinnia personalom [Personnel management] : navch. posib. 2-he vydannia, vypravlene ta dopovnene. Odesa : Atlant, 2013. 275 s [in Ukrainian].

It should be noted that it is practically impossible to determine the suitability of an employee for expert or scientific work and his / her professionalism only on the educational documents.

That is why in forensic institutions use the evaluation of employees, which serves as a criterion for their professional abilities, reveals personal qualities and promising opportunities.

It should also be emphasized that an objective assessment of an employee's activity not only gives him or her an idea of how his/her work has been assessed, but also significantly influences the motivation of his / her further activity in a forensic institution.

Improving the recruitment and placement practices, motivating and moving employees directly depends on an objective, scientifically sound assessment of their performance.

This assessment applies to all categories of forensic staff, although its relevance to different categories is different.

The objective of a business evaluation is to identify the potential of the employee of the institution, the degree of use of his abilities, the suitability of the position or readiness to take another job, determining the value of the employee for the institution and institution for the employee.

Scientists argue that the important task of such an assessment is to form effective feedback, as each employee needs to know how they evaluate the results of their activities and the effort to perform their duties qualitatively¹.

It should be noted that in modern, well-functioning organizations, the assessment of staff is perceived as an opportunity to openly discuss the results of each employee's work, to choose ways to improve it.

To study the process of business evaluation and to determine its role in the development of the staff of the institution, it is not superfluous to analyze in detail the concept of *staff evaluation* which were cited by different scientists at different time.

Thus, L. V. Balabanova defines the concept of “personnel evaluation — a purposeful process of establishing the conformity of qualitative characteristics of staff (abilities, properties) with the requirements of a position or workplace².

In turn, M. F. Golovaty, M. P. Lukashevich and H. A. as staff evaluation means the procedure by which the degree of conformity of the

¹ Kolot A. M. Motyvatsiia personal [Personnel motivation]: pidruchnyk. Kyiv : KNEU, 2006. 340 s [in Ukrainian].

² Balabanova L.V., Sardak O. V. Upravlinnia personalom [Sardak OV Personnel management]: pidruchnyk. Kyiv : Tsentr navchalnoi literatury, 2011. S. 67 [in Ukrainian].

employee's qualities, his or her work behavior, and the results of activity to certain requirements is revealed¹.

H. H. Zavinovskaya points out that staff evaluation is a planned, formalized characteristic of work activity, staff efficiency².

In his works, O. A. Kirichenko concludes that the staff evaluation is used to determine the employee's compliance with the vacancy or workplace (position) he is currently occupying³.

At the same time, A. M. Kolot emphasizes that the assessment of the staff is to determine the extent to which each employee achieves the expected results of work and meets the requirements that follow from his production tasks⁴.

V. A. Savchenko defines the assessment of staff as a procedure that is carried out in order to identify the degree of conformity of professional, business and personal qualities of the employee, quantitative and qualitative results of his work activity to certain requirements⁵.

I. O. Skopilatov and O.Yu. Efremov stated that business evaluation of personnel is a component of personnel diagnostics, a purposeful process of establishing the conformity of quantitative and qualitative professional characteristics of personnel with the requirements of the position (workplace), unit and organization as a whole⁶.

Fedulova L. I. argues that the business evaluation of staff means a purposeful process of establishing the quality characteristics of staff to the requirements of the position and workplace⁷.

Shegda A. V., when presenting the evaluation of the staff, determines the level of qualification of employees, the level of knowledge,

¹ Holovatyi M. F., Lukashevych M. P., Dmytrenko H. A. *Upravlinski aspekty sotsialnoi roboty [Management aspects of social work]: kurs leksii*. Kyiv : MAUP, 2004. S. 145 [in Ukrainian].

² Zavinovska H. T. *Ekonomika pratsi [Labor economics]: navch. posib*. Kyiv : KNEU, 2003. 432 s [in Ukrainian].

³ Kyrychenko O. A. *Menedzhment zovnishnoekonomichnoi diialnosti [Management of foreign economic activity]: navch. posib*. Kyiv : Znannia-Pres, 2002. 384 s [in Ukrainian].

⁴ Kolot A. M. *Motyvatsiia personal [Personnel motivation]: pidruchnyk*. Vyd. 2-ge, bez zmin. Kyiv : KNEU, 2006. S. 294 [in Ukrainian].

⁵ Savchenko V. A. *Upravlinnia rozvytkom personal [Management of personnel development]: navch. posib*. Kyiv : KNEU, 2002. 280 s [in Ukrainian].

⁶ Skopylatov I. A., Efremov O. Ju. *Upravlenie personalom [Personnel management]*. Sankt-Peterburg : Izd-vo Smol'nogo universiteta, 2000. 400 s. [in Russian].

⁷ Fedulova L. I., Stadnyk V. V., Yokhna M. A., ta in. *Menedzhment orhanizatsii [Organizations management] : pidruchnyk*. Kyiv : Lybid, 2004. 448 s [in Ukrainian].

skills, abilities, as well as gives an idea of business and moral traits of the individual¹.

Thus, based on the opinions of scientists, it is possible to outline the general features of the concept of *staff evaluation* which are also inherent in the evaluation of staff of forensic institutions:

- the procedure carried out with the purpose of revealing the degree of conformity of professional, business and personal qualities of the employee, quantitative and qualitative results of his work activity to certain requirements;
- establishment of conformity of qualities of the employee, requirements for the position or workplace;
- planned, formalized characteristics of work activity, staff efficiency;
- is carried out to determine the level of qualification of employees, the level of knowledge, skills, abilities, gives an idea of business and moral traits of the individual.

Scientists emphasize that the evaluation of employees of institutions (self-assessment and external evaluation) performs at least 2 main functions: orientation and stimulating.

The guiding function is that each employee, through evaluation by management and other employees, and through self-assessment, is aware of himself, his condition and behavior, is given the opportunity to choose directions and ways of further activity.

The incentive function of evaluation is that it gives rise to an employee's experience of success or failure, confirming the correctness or wrongness of the chosen behavior, encourages the person to take activities in a certain direction.

Therefore, in order for employees to be positive about their assessment, it is necessary to prove to them their purpose, namely — every employee must receive a salary according to his / her qualification².

Considering the research of scientists, it can be noted that in each structural subdivision of the judicial and expert institution, the evaluation of

¹ Shehda A. V. Menedzhment [Management] : pidruchnyk. Kyiv : Znannia, 2004. 687 s [in Ukrainian].

² Stakhiv O. Provedennia otsinky personalu na pidpriemstvi z metoiu stymuliuвання pratsivnykiv do pidvyschennia kvalifikatsii [Carrying out an assessment of the personnel at the enterprise in order to encourage employees to improve their skills]. Ukraina: aspekty pratsi. 2007. №1. S. 32. URL : http://nbuv.gov.ua/portal/soc_gum/Uap/2007/ Number_1_2007/Stahiv.pdf/ (data zvernennia 18.06.2019); Koppek V. S. Piat oshybok pry provedenny attestatsyy personala [Five errors in personnel certification]. Upravlenye chelovecheskym potentsyalom. 2009. № 1. S. 78–80 [in Ukrainian].

employees may be carried out differently, depending on the specificity of their work.

However, regardless of this specificity, it should be mandatory that such an assessment should cover the assessment of theoretical knowledge and practical skills to accomplish specific tasks.

Theoretical knowledge includes not only the specialist knowledge of the employee, but also the knowledge of regulations, regulations, instructions, etc., which regulate his activities.

Summarizing the above, it can be argued that the employee's assessment consists of the assessment of his knowledge, which is often conducted by the survey, and the evaluation of the results of work through observation of employees in the work process and assessment of the quality of the tasks.

Equally important is the requirement to make the assessment effective and its substance understandable to both the evaluator and the recipient, so the evaluation process must be tailored to the main content of the employee's activities, in those aspects directly related to his or her professional qualification.

Another important task of employee evaluation is to provide feedback as the employee has to understand how his or her performance is evaluated.

Assessment should be conducted openly and impartially when the well-known evaluation criteria are known to the staff of the forensic institution, the employee's achievements and ways of improving their performance are necessarily discussed.

Such peculiarities at one time were pointed out by M. I. Murashko and S. S. Nemykin, who also emphasized that workers should know what mistakes were due to their fault, and which depend on the conditions of organization of work in the institution.

This allows you to adjust both the behavior of employees and their working conditions¹.

The construction of a staff evaluation model in each forensic institution should be carried out in accordance with the purpose, tasks and elements of the employee evaluation process, as this is an extremely important and responsible matter.

Some scholars believe that the staff rating system should consist of several blocks¹.

¹ Murashko M. I. Menedzhment personal [Personnel management] : navch. posib. Kyiv : T-vo «Znannia», KOO, 2008. S. 57. Nemykina S. S. Sutnist i zavdannia otsinky personalu. Ekonomika i marketynh v XXI storichchi. Ch. 2. 2006. S. 45–47 [in Ukrainian].

Given the experience of scientists, it can be assumed that in general, the system of evaluation of the employee of the forensic institution should include blocks that describe:

- the assessment content (the object of analysis, the specific qualities of the employee, his behavior in the process of work, performance indicators that require evaluation);
- system of evaluation criteria and features of their measurement;
- a system of assessment methods, methods and tools;
- an evaluation procedure that determines the procedure, venue, subjects, terms and frequency, as well as the technical and organizational tools used in evaluating the employee's activity.

Scientists note that business evaluation of staff is a deliberate process of establishing the quality of staff (abilities, motivations and attributes) to the requirements of a position or workplace².

With this in mind, it should be emphasized that forensic institutions need the greatest attention to evaluate employees in the positions of forensic experts and in the positions of researchers, since their activities have their own peculiarities.

In addition, it is necessary to distinguish between two main types of business evaluation: the evaluation of candidates for the vacant position and the current periodic evaluation of the staff of the judicial expert institution...

Business evaluation of employees will always facilitate the development of the staff of the court-expert institution, subject to a number of principles, including:

- objectivity, which involves the use in the process of evaluation of sufficiently substantiated criteria and a system of indicators of evaluation of the employee's business and personal qualities, the complexity of the tasks and the effectiveness of their performance;
- promptness and periodicity, ensuring timeliness and regularity of assessment for a long time;
- confidentiality, which guarantees that the results of the evaluation are provided only to the employee, his manager and employees of the

¹ Didur K. M. Suchasni metody otsinky personal [Modern staff assessment methods]. *Efektivna ekonomika*. 2011. №11. S. 32. URL : <http://www.economy.Nayka.com.ua/index.php?operation=1&iid=776> (data zvernennia 18.06.2019); Systema otsinky personalu ta yii vydy. Model kompleksnoi otsinky personal [Staff evaluation system and its types. Model of comprehensive staff assessment]. URL : http://www.osvita-plaza.in.ua/publ/menedzhment_personalu/sistema_ocinki_personalu_ta_jiji_vidi_model_kompleksnoji_ocinki_personalu/161-1-0-8492 (data zvernennia 18.06.2019) [in Ukrainian].

² Krushelnytska O. V., Melnychuk D. P. *Upravlinnia personalom* [Personnel management]: navch. posib. Kyiv : Kondor, 2006. 308 s [in Ukrainian].

personnel department in order to prevent the deterioration of the social and psychological climate in the team;

- comprehensiveness, which contributes to the involvement in the evaluation of the employee of his manager, colleagues, equal in rank and subordinates for the evaluation of all aspects of human activity and personality;

- unity of requirements and commonality, which provides for the assessment of all employees holding the same positions, on the same system of indicators and the same methods and procedure of evaluation;

- economy, clarity and accessibility, which require consideration of financial and material resources in the assessment of employees, high qualification level of appraisers when evaluating the employee;

- effectiveness, which ensures that timely measures for the rational transfer and placement of staff are taken as a result of the evaluation, promotes staff development and provides material incentives.

At the same time, it should be emphasized that adherence to the above principles makes it possible to use staff assessment to recruit and recruit new employees; forecasting the promotion of employees; rationalization of techniques and methods of work with staff (management procedures); building an effective system of work motivation; assessing the performance of individual employees and the workforce as a whole.

The organizational procedure for preparing the business evaluation of employees of forensic and expert institutions taking into account the achievements of scientists¹ should provide for the implementation of mandatory measures, including:

- development of business valuation methodology;

- formation of staff evaluation commission;

- determination of time and place of business evaluation of employees;

- working out the issues of documentary and information support of the business evaluation process;

- determination of the procedure for summarizing the results of employee evaluation.

A high-quality system for evaluating the performance of each employee's job functions will increase the efficiency of personnel management of the forensic institution, as it will provide:

- positive impact on the motivation of the employees of the institution, since the feedback has a positive effect on the formation of

¹ Saveliyeva V. S., Yeskov O. L. Upravlinnia personalom [Personnel management]: navch. posib. Kyiv : VD «Profesional», 2005. 336 s [in Ukrainian].

sustainable motivation of each employee, allows him to adjust his behavior in the workplace and achieve increased productivity;

- vocational training planning, where staff assessment makes it possible to identify deficiencies in the qualification level of each employee and to anticipate remedial measures;

- career planning and careers, provided that the assessment of employees reveals their weak and strong professional qualities and allows timely preparation of individual development plans and effective career planning;

- decisions on remuneration, promotion or dismissal, given that regular and systematic evaluation of employees provides management of the court and expert institution with the information necessary to make sound decisions about salary increases (rewarding the best employees has a motivating effect on them and theirs colleagues); promotion or dismissal.

In the latter case, the existence of documented records of systematic maladministration by the employee of his or her duties significantly facilitates the position of the institution in the event of a judicial review of its complaint against management actions;

- establishment of standards and norms of assessment for which the management of a court-expert institution needs to determine what shapes an employee's success in the job and that can destroy this success, that is, to identify critical factors;

- choice of assessment methods, in order to effectively evaluate the work of the employee, it is necessary to have easy to use, reliable and well-defined critical factors of assessment.

Like other organizations, forensic institutions are occasionally confronted with the fact that the current employee performance appraisal system requires major changes that can be implemented in different ways, choosing one of which institution management can:

- fully copy the evaluation system adopted at another forensic institution;

- to develop an evaluation system on its own;

- to invite consultants to develop a system of employee evaluation in accordance with the requirements of the institution.

Create an evaluation system that is equally balanced with respect to the requirements of accuracy, objectivity, simplicity and comprehensibility.

However, to date, there are several staff assessment systems, each with its own advantages and disadvantages, and the most commonly recognized staff appraisal system, which also works in forensic institutions.

The periodicity and requirements for certification of forensic experts and research assistants of forensic institutions are legally defined.

In addition, it cannot be ignored that the effectiveness of evaluation also depends on compliance with requirements that are geared to continued professional development of employees.

Among the main requirements are the following:

- *information accessibility*, since isolation of the object of evaluation from its results gives rise to a negative attitude to evaluations, the search for unofficial sources of evaluative information that cannot be objective in such circumstances;

- *consistency of assessments*, given that conflicting assessments, as a rule, determine the orientation of the employee to those of them that confirm his or her self-esteem;

- *favorable organizational and social situation*, which is a prerequisite for increasing the employee's sensitivity to assessments of his personality and the results of his activity;

- *timeliness of assessment*, which involves the use of a certain type of assessment in certain time periods and taking into account the patterns of professional development of a particular employee;

- *systematic assessment* taking into account the fact that employees whose activities have not been evaluated for a long time or have been formally assessed are doomed to occupational deformity and personal regression;

- *availability and timely evaluation* of the employee's activity and his personal qualities on individual requests, as a rule, such assessment is associated with sensitive periods of personality development;

- *authority* of the evaluating entity and the sources of information should be combined with their orientation in accordance with the direction of the activity of the evaluated employee.

The most comprehensive system for evaluating the staff of a forensic institution is manifested in the comprehensive assessment of each employee and should be developed for all categories of staff of the institution.

The structure of a comprehensive evaluation of the staff of a forensic institution can be presented in the form of a model consisting of three blocks, which have special properties that reflect the individual traits of the employee.

These blocks include:

- professional qualities of the employee, which include: individual-psychological features, qualifications, vocational training, professional skills;

- work behavior that reflects actions, functions, approaches, attitude to work; influence on the staff and colleagues on work, attitude towards customers;

– results of activities that are to establish achievements in obtaining quantitative and qualitative results of work.

It should be emphasized that the business evaluation of forensic experts is relevant to all categories of personnel, although at present there are no ideal methods of personnel evaluation in the domestic and foreign practice, while the scientists and practitioners most often hold opposite opinions regarding the expediency and objectivity of the methods of evaluation. staff, however, they unanimously argue that the worst kind of assessment is the lack of evaluation methodology.

For this reason, it is considered appropriate to direct further research to the development of methodological recommendations for the evaluation of the staff of forensic institutions.

Conclusions.

Therefore, the effectiveness of the activity of a judicial expert institution is largely determined by the degree of compliance of the employees who work in it, the workplace occupied by each employee.

It is only in this context that the forensic institution and its staff achieve the highest goal of their development.

It is possible to determine the degree of compliance of employees with the requirements of their jobs in the evaluation process, which is one of the key functions of personnel management.

The necessity and importance of staff valuation are increasing many times in the current conditions of market transformation of the economy.

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І. А. Петрова

**ДО ПИТАННЯ ОБ'ЄКТИВНОЇ НЕОБХІДНОСТІ ТА ЗНАЧЕННЯ
ДІЛОВОЇ ОЦІНКИ ПРАЦІВНИКІВ СУДОВО-ЕКСПЕРТНИХ УСТАНОВ**

Оглядова стаття

Стаття присвячена питанням об'єктивної необхідності та значення ділової оцінки працівників судово-експертних установ. Спираючись на дослідження вчених, доведено, що у кожному структурному підрозділі судово-експертної установи оцінка працівників може проводитися по-різному із орієнтацією на специфіку виконуваних ними робіт. Підкреслено, що ділова оцінка працівників завжди буде сприяти розвитку персоналу судово-експертної установи за умови урахування низки вказаних принципів. Серед головних вимог щодо оцінювання персоналу виділено такі: доступність інформації, несуперечливість оцінок, сприятлива організаційна та соціальна ситуація, своєчасність оцінювання, систематичність оцінювання, доступність і оперативність оцінювання діяльності працівника та його особистісних якостей, авторитетність суб'єкта оцінювання. Акцентовано увагу на тому, що найповніше система оцінки персоналу судово-експертної установи проявляється в комплексній оцінці кожного із працівників; наведено структуру комплексної оцінки персоналу судово-експертної установи.

Ключові слова: судово-експертна установа, персонал, працівник, оцінка, ділові якості, ефективність.

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M. G. Shcherbakovskiy,

Doctor of Law, Associate Professor, Head of the Department of
Criminal Procedure, Forensic Science and Expertology, Kharkiv

National University of Internal Affairs,

Kharkiv, Ukraine

ORCID: <http://orcid.org/0000-0002-8413-9311>

E-mail: shcherbakovskiy@gmail.com

D. V. Kurylenko,

PhD in Law, Prosecutor at the Kharkiv Local Prosecutor's Office №1

Kharkiv, Ukraine

e-mail: kurilenkodima89@gmail.com

EXPERT WITNESSES IN UKRAINIAN LEGAL PROCEEDINGS

The concept of Expert Witness is not covered by the procedural legislation of Ukraine, although it has become widespread in research papers of professional scientists. In scientific publications, scholars are fragmentarily considering certain categories of versed persons, formulate the notion of special knowledge that they possess, but the types of specialists, their functions and competence still remain controversial and ambiguously interpreted by lawyers.

The purpose of this article is to define the general concept and functional purpose of expert witnesses in any type of legal process, their classification, to clarify expertise structure.

This article proves that expert witnesses can have special (non-legal) expertise and expertise in the field of law. The purpose of involving expert witnesses is to assist the authorized participants of the process in the performance of their functions. Expert witnesses include: forensic expert; legal expert; specialist; translator, sign language interpreter, persons testifying on the basis of their expertise; medical examiner, teacher, psychologist, doctor, psychiatrist, auditor; inspectors; experts of the Scientific Advisory Board of the Supreme Court; consultants pre-investigate facilities, screening and forensic facilities and persons according to criminal records. There are two grounds for the classification of expert witnesses in legal proceedings: the first is the direct or indirect way of participation in the proceedings; the second is the degree of legal regulation of the process and results of the activities of expert witnesses.

Expert witness in legal proceedings is subject owning expertise (non-legal) in a particular field of human activity or legal knowledge, skills in their application is not a professional participant in the process, is involved directly or indirectly in a procedurally regulated or non-regulated form or at the discretion of an authorized person (body) to assist in the resolution of the tasks of the judiciary and the information and documents provided by him are used as sources of evidence or background information serving grounds for procedural, tactical and organizational decisions.

Keywords: legal proceedings, expert witnesses, specific expertise, forms and purpose specialist involvement, classification of expert witnesses.

Formulation of Research Problem.

Proceedings in administrative, economic, criminal and civil proceedings require the use not only of professional legal knowledge

possessed by a court, prosecutor, investigator, lawyer, but also of specialized knowledge.

The timely use of specialized knowledge largely depends on the effectiveness of the proceedings.

Improving the procedure for the use of specialized knowledge is an important component of judicial reform in Ukraine, since in the context of increasing requirements for the process of evidence in the judiciary, they are called upon to provide objective reliable evidence, as well as the information needed to make procedural decisions by authorized persons (bodies).

It is quite obvious that the effective use in the judiciary of specialized knowledge depends directly on their content and carriers, that is, the persons who possess them and are called *Expert witnesses*.

As V. V. Sedniev correctly emphasizes, the concept of special knowledge is inseparable from the concept of the expert witness, because the concept of *specific* describes the areas of human activity in their differentiation, and *expert* characterizes the subject who possesses such information¹.

The *expert witness* term first appeared in Articles 112, 325-328 of the Criminal Procedure Statute of 1864.

However, the concept of *expert witness* is not covered by any procedural legislation of Ukraine, although it has become widespread in the scientific works of processional scientists, criminologists, and forensic experts.

Persons possessing specialized knowledge and are involved in the process are recognized as aware.

In numerous scientific publications, scientists formulate the notion of special knowledge, fragmentarily consider certain categories of expert witnesses, but so far the essence of special knowledge, types of specialists, their functions remain debatable and ambiguously interpreted by lawyers.

Analysis of recent research and publications.

The increasing possibilities of incorporating the achievements of science and technology into the process of proof, the need to more rationally organize the involvement of expert witnesses causes the continued attention of scientists and practitioners to the problems of the use of special knowledge of knowledgeable persons in various forms.

¹ Sedniev V. V. Ontolohiia obiznanoi osoby. Visnyk Luhanskoho derzh [Ontology of the knowledgeable person]. un-tu vnutr. sprav imeni E. O. Didorenka. Luhansk, 2014. Spets. vypusk № 1. S. 38 [in Ukrainian].

For many years, domestic and foreign scientists have been paying attention to this problem¹.

¹ Averjanova T. V. Subekty jekspertnoj dejatel'nosti [Subjects of expert activity]. Vestnik kriminalistiki. Moskva : Spark, 2001. Vyp. 2. S. 29–37; Arsen'ev V. D. Zablockij V. G. Ispol'zovanie special'nyh znanij pri ustanovlenii fakticheskikh obstoitel'stv ugovnogo dela [Use of special knowledge in establishing the actual circumstances of a criminal case]. Krasnojarsk : Krasnojarskij gos. un-t, 1986. S. 45–75; Goncharenko V. I. Ispol'zovanie dannyh estestvennyh i tehniceskikh nauk v ugovnom sudoproizvodstve [Use of data from natural and technical sciences in criminal proceedings] Kiev : Vishha shkola, 1980. S. 105–145 [in Russian]; Gora I. V. Viktoristannya special'nih znan advokatom [Use of specialist knowledge by a lawyer]. Kiiv : Precedent, 2013. S. 15–61 [in Ukrainian]; Grishina E. P. Svedushhie lica v ugovnom sudoproizvodstve: teoreticheskie problemy dokazyvaniya i pravoprimeritel'naja praktika [Knowledgeable Persons in Criminal Proceedings: Theoretical Problems of Evidence and Law Enforcement Practice]. Moskva : Juridicheskij in-t MIITa, 2012. S. 130–147 [in Russian]; Demydova Ye. Ye. Taktyka dopytu obiznanykh osib [Tactics of interrogation of knowledgeable persons]: avtoref. dys. ... kand. yuryd. nauk : 12.00.09 / Nats. un-t «Iurydychna akademiia Ukrainy imeni Yaroslava Mudroho». Kharkiv, 2013. S. 8–9 [in Ukrainian]; Isaeva L. M. Kriminalisticheskoe uchenie o special'nyh znanijah svedushhih lic [Forensic doctrine of the special knowledge of knowledgeable persons] : avtoref. dis. ... d-ra jurid. nauk: 12.00.09 / S.-Peterb. gos. un-t MVD Rossii. Sankt-Peterburg, 2009. S. 20–21 [in Russian]; Kovalenko V. V. Zastosuvannia naukovy-tehnychnykh zasobiv spetsialisty pry provedenni slidchykh dii [Application of scientific and technical means by specialists in carrying out investigative actions]. Luhansk: Luhanskyi derzh. un-t vnutr. sprav, 2007. S. 49–78 [in Ukrainian]; Lisichenko V. K., Cirkal' V. V. Ispol'zovanie special'nyh znanij v sledstvennoj i sudebnoj praktike [Tsirkal' V.V. Use of special knowledge in investigative and judicial practice]. Kiev : Kievskij. gos. un-t, 1987. S. 34–56; Mahov V. N. Ispol'zovanie znanij svedushhih lic pri rassledovanii prestuplenij [The use of knowledge of knowledgeable persons in the investigation of crimes]: monografija. Moskva : Ros. un-t druzhby narodov, 2000. S. 50–62 [in Russian]; Romaniuk B. V. Suchasni teoretychni ta pravovi problemy vykorystannia spetsialnykh znan u dosudovomu slidstvi [Modern theoretical and legal problems of the use of special knowledge in pre-trial investigation] : dys. ... kand. yuryd. nauk: 12.00.09 / Nats. akad. vnutr. sprav. Kyiv, 2002. S. 24–68 [in Ukrainian]; Selina E. V. Primenenie special'nyh poznanij v ugovnom processe [The use of special knowledge in criminal proceedings]. Moskva : Jurliginform, 2002. S. 79–115; Telegina T. D. Ispol'zovanie special'nyh znanij v sovremennoj praktike rassledovaniya prestuplenij [The use of special knowledge in the modern practice of crime investigation]. Moskva : Jurlitinform, 2011. S. 73 –101; Shapiro L. G. Processual'nye i kriminalisticheskie aspekty ispol'zovaniya special'nyh znanij pri rassledovanii prestuplenij v sfere jekonomicheskoy dejatel'nosti [Procedural and forensic aspects of the use of special knowledge in the investigation of crimes in the field of economic activity]. Moskva : Jurlitinform, 2007. S. 44–64; Shherbakovskij M. G., Kravchenko A. A. Primenenie special'nyh znanij pri raskrytii i rassledovanii prestuplenij [Application of special knowledge in the disclosure and investigation of crimes]. Har'kov : Un-t vnutr. del, 1999. S. 10–73 [in Russian].

Over the past four years, a number of dissertations have been conducted in Ukraine, which examined the general and specific problems of the use of specialized knowledge of knowledgeable persons in criminal proceedings: P. Yu. Kravchuk (2015)¹, A. M. Lazebnyi (2016)², K. A. Sadchykova (2017)³, D. V. Kurylenko (2017)⁴, O. V. Shevchenko (2017)⁵, H. S. Bidniak (2018)⁶, Ye. V. Kovalevska (2018)⁷, Ye. O. Danich (2018)⁸, N. V. Tymofieieva (2018)⁹, A. V. Sidielnikov (2019)¹⁰.

¹ Kravchuk P. Yu. Vykorystannia spetsialnykh znan pid chas rozsliduvannia hrabezhiv i rozboiv [Use of Special Knowledge in Investigation of Robberies and Robberies]: dys. ... kand. yuryd. nauk: 12.00.09 / Skhidnoievropeyskyi nats. un-t im. Lesi Ukrainky. Luts'k, 2015. 260 s [in Ukrainian].

² Lazebnyi A. M. Vykorystannia spetsialnykh znan pry rozsliduvanni kryminalnykh pravoporushen proty hromadskoho poriadku [The use of special knowledge in the investigation of criminal offenses against public order]: dys. ... kand. yuryd. nauk: 12.00.09 / Un-t derzh. fiskalnoi sluzhby Ukrainy. Irpin, 2016. 227 s [in Ukrainian].

³ Sadchykova K. A. Vykorystannia spetsialnykh znan na stadii dosudovoho rozsliduvannia (protsesualnyi aspekt) [Use of special knowledge at the stage of pre-trial investigation (procedural aspect)]: dys. ... kand. yuryd. nauk: 12.00.09 / Odeskyi derzh. un-t vnutr. sprav. Odesa, 2017. 233 s [in Ukrainian].

⁴ Kurylenko D. V. Instytut obiznanykh osib u zmahalnomu kryminalnomu provadzhenni [Institute of Knowledgeable Persons in Competitive Criminal Proceedings]: dys. ... kand. yuryd. nauk: 12.00.09 / Kharkivskyi nats. un-t vnutr. sprav. Kharkiv, 2017. 258 s [in Ukrainian].

⁵ Shevchenko O. V. Vykorystannia spetsialnykh tovaroznavchyykh znan pid chas dosudovoho rozsliduvannia [Use of special commodity knowledge during pre-trial investigation]: dys. ... kand. yuryd. nauk: 12.00.09 / Natsionalna akad. vnutr. sprav. Kyiv, 2017. 317 s [in Ukrainian].

⁶ Bidniak G. S. Viktoristannia spetsial'nykh znan' pri rozsliduvanni shahrajstv [The use of special knowledge in fraud investigations]: dis. ... kand. jurid. nauk: 12.00.09 / Dnipropetrovskij derzh. un-t vnutr. sprav. Dnipro, 2018. 250 s [in Ukrainian].

⁷ Kovalevska Ye. V. Vykorystannia spetsialnykh medychnykh znan pid chas rozsliduvannia zlochyv [The use of special medical knowledge in the investigation of crimes]: avtoref. dys.... kand. yuryd. nauk: 12.00.09 / Mizhrehionalna akad. upravlinnia personalom. Kyiv, 2018. 24 s [in Ukrainian].

⁸ Danich Ye. O. Vykorystannia spetsialnykh znan pid chas provedennia slidchoho eksperymentu [he use of special knowledge during the investigative experiment]: dys. ... kand. yuryd. nauk: 12.00.09 / Nats. akad. vnutr. sprav. Kyiv, 2018. 238 s [in Ukrainian].

⁹ Tymofieieva N. V. Vykorystannia spetsialnykh znan pry rozsliduvanni zlochyv proty bezpeky vyrobnytstva [Use of Special Knowledge in Investigating Crimes Against Production Security]: dys. ... kand. yuryd. nauk: 12.00.09 / Nats. akad. vnutr. sprav. Kyiv, 2018. 214 s [in Ukrainian].

¹⁰ Sidielnikov A. V. Spetsialni znannia v diialnosti advokata-zakhysnyka [Special knowledge in the activity of defense lawyer]: dys. ... kand. yuryd. nauk: 12.00.09 / Akad. advokatury Ukrainy. Kyiv, 2019. 271 s [in Ukrainian].

In general, the authors adhere to the traditional approach to the structure and forms of use of specialized knowledge, but the list of knowledgeable persons is limited and does not correspond to the content of the Criminal Procedural Code of Ukraine, Code of Administrative Proceedings of Ukraine, Civil Procedural Code of Ukraine, Civil Procedure Code of Ukraine so Commercial and Procedural Code of Ukraine.

The purpose of the article is to define the general concept and functional purpose of knowledgeable persons in any type of legal process, their classification, to clarify the structure of special knowledge.

Main Research Content Presentation.

Researchers have repeatedly considered a person who possesses special knowledge and its properties.

Here are some definitions that accumulate the basic views of scientists about knowledgeable individuals.

I. Ya. Fojnitsky considered *expert witnesses* as persons involved in the case for the purpose of observing and establishing circumstances, the knowledge of which required the use of special knowledge in science, art, craft or other field and giving opinion or expressing their opinion¹.

From the point of view of V. M. Makhov, expert witnesses in the criminal procedure have specific expertise and skills of their application, are not interested in solving the case and are involved by the investigator and the court in order to assist in establishing the truth in the case in the cases and forms specified by law².

According to A. F. Volobuyev, a expert witness is a person who is not interested in the results of the case possessing specialized knowledge in a particular field and is involved in the investigation and investigation of crimes to solve special issues³.

O. A. Bondarenko identifies expert witnesses as competent persons who are not interested in the case, who possess special knowledge in a particular field of science, technology, arts, crafts and experience of their use and involved investigator, prosecutor, court (judge) to participate in

¹ Fojnickij I. Ja. Kurs ugolovnogo sudoproizvodstva [Course of criminal proceedings]: v 2 t. / pod red. A. V. Smirnova. Sankt-Peterburg : Al'fa, 1996. T. 2. S. 284 [in Russian].

² Mahov V. N. Ispol'zovanie znanij svedushhih lic pri rassledovanii prestuplenij [Use of knowledge of knowledgeable persons in the investigation of crimes]: monografiia. Moskva : Rossijskij un-t družby narodov, 2000. S. 54 [in Russian].

³ Volobuiev A. F. Problemy metodyky rozsliduvannia rozkradan maina v sferi pidpriemnytstva [Problems of methodology of investigation of property theft in the field of business] : monohrafiia. Kharkiv : Un-t vnutr. sprav, 2000. S. 250 [in Ukrainian].

criminal matters for the purpose of assisting them in resolving issues requiring the use of specialized knowledge and practical skills¹.

K. A. Savchenko believes that expert witnesses are any non-interested competent persons who possess special knowledge in a particular field of science, technology, arts, crafts and experience of their use and are involved in criminal proceedings by a court (judge) to participate both before the start and during the criminal proceedings, in order to assist in the resolution of issues requiring the use of specialized knowledge and practical skills².

O. V Selina formulates the concepts of expert witnesses in a broader sense as persons possessing the specialized knowledge of the required type and structure, called by the investigator, prosecutor, court, and in the cases specified in the law — involved by a lawyer to assist in the appropriate form of criminal justice assistance use of specialized knowledge³.

L. M. Isaieva calls expert witnesses possessing special knowledge, skills and skills, disinterested in the case, involved in the operative-search activity and criminal process in accordance with the established law in order to facilitate the detection, disclosure, investigation of crimes in the execution of justice criminal cases⁴.

O. A. Kravchenko, by a knowledgeable person, means a person who possesses vital, publicly available or scientific knowledge acquired as a result of daily work activity, personal experience, or general or special education.

Expert witness applies his knowledge in the manner prescribed by law⁵.

¹ Bondarenko O. O. Protsestualnyi status obiznanykh osib ta yikh pravovidnosyny z diznavachem i slidchym u kryminalnomu sudochynstvi Ukrainy [Procedural status of informed persons and their legal relations with the investigator and investigator in the criminal proceedings of Ukraine]: dys. ... kand. yuryd. nauk: 12.00.09 / Nats. un-t vnutr. sprav. Kharkiv, 2004. S. 31. [in Ukrainian].

² Sadchukova K. A. Vykorystannia spetsialnykh znan na stadii dosudovoho rozsliduvannia (protsestualnyi aspekt) [Use of special knowledge at the stage of pre-trial investigation (procedural aspect)]: dys. ... kand. yuryd. nauk: 12.00.09 / Odeskij derzh. un-t vnutr. sprav. Odesa, 2017. S. 31 [in Ukrainian].

³ Selina E. V. Primenenie special'nykh poznanij v rossijskom ugolovnom processe [The use of special knowledge in the Russian criminal process]: avtoref. dis. ... d-ra jurid. nauk: 12.00.09 / Kubanskij gos. un-t. Krasnodar, 2003. S. 10–11 [in Russian].

⁴ Isaieva L. M. Kriminalisticheskoe uchenie o special'nykh znanijah svedushhih lic [Forensic doctrine of the special knowledge of knowledgeable persons]: avtoref. dis. ... d-ra jurid. nauk: 12.00.09 / Sankt-Peterb. gos. un-t MVD Rossii. Sankt-Peterburg, 2009. S. 38 [in Russian].

⁵ Kravchenko O. A. Zastosuvannia spetsialnykh znan pid chas zbyrannia, doslidzhennia ta vykorystannia rechovykh dokaziv [Application of Special

Despite some differences in the wording of the definition of *expert witnesses*, there is no significant controversy among the scientists in clarifying the meaning of this concept.

We believe that the term "knowledgeable person" should be considered in two aspects: etymological, which reveals its meaning, and procedural — to establish a list of persons to whom the term applies.

In the etymological sense, the *expert witness* term means a person who knows something, is well acquainted with something¹.

In procedural aspect, persons whose expertise is opposed to legal (legal) expertise that should be possessed by professional participants of the process: judge, investigator, prosecutor, defense attorney², are considered to be aware.

Summarizing the existing perspectives in the literature on the general concept of knowledgeable persons, we can distinguish the following essential features: the presence of special knowledge and skills of their application; disinterest in the results of the proceedings; involving the parties or the court in procedural or non-procedural forms; assisting in proving or assisting in resolving special issues.

Each of these properties requires refinement.

In the specialized literature, one of the problematic issues, whose solution defines the circle and competence of knowledgeable persons, is to determine the structure of special knowledge that they possess.

The opinions of scholars have diametrically opposite directions and range from the inclusion in the specialty of all legal knowledge or particular branches of law to the complete exclusion of any legal knowledge from the scope of the special.

We stick to the point of view of those scholars who do not view legal knowledge as specific one in the procedural sense.

Another approach inevitably leads to the possibility of a judicial expert resolving legal issues, which is directly prohibited by law (Art. 242 of Criminal Procedural Code of Ukraine, Art. 102 of Civil Procedural Code of Ukraine, Art. 101 of Code of Administrative Proceedings of Ukraine, Art. 98 of Commercial and Procedural Code of Ukraine).

Knowledge in Collecting, Researching and Using Physical Evidence] : dys. ... kand. yuryd. nauk: 12.00.09 / Kласychnyi pryvatnyi un-t. Zaporizhzhia, 2012. S. 41 [in Ukrainian].

¹ Slovnyk ukrainskoi movy: v 11 t. Kyiv : Naukova dumka, 1974. T. 5. S. 505 [in Ukrainian].

² Grazhdanskij process [Civil process]: uchebnik / pod red. M. K. Treushnikova. Moskva : «Spark», Juridicheskoe bjuro «Gorodec», 1998. S. 197 [in Russian].

However, it is impossible to conclude conclusively that legal knowledge is not applied in the judiciary by knowledgeable persons.

Thus, one of the tasks of a specialist involved in the first stages of litigation is to provide oral advice or written explanations to assist in the search for new evidence and to facilitate the investigation and evaluation of evidence already available (Articles 71, 360 of the CCP, Article 74 of the Code of Civil Procedure, Article 70 of the CAS; Article 71 of the Code of Civil Procedure).

Unlike forensic expert, for legal clarification, it is not forbidden to ask a specialist of legal issues and provide appropriate consultations¹.

These considerations also apply to the range of interests of the inspector, who, by the results of commodity, technical, economic, obstetric and gynecological, ecological, construction, fire-technical and other inspections, makes the relevant acts (Article 99 of the Criminal Procedural Code of Ukraine).

The latest editions of the procedural codes of Ukraine have the same novelty about a new participant in the process: *forensic expert in law*" (Article 73 of the Civil Procedural Code of Ukraine, Article 69 of the Code of Administrative Proceedings of Ukraine, Article 71 of the Commercial and Procedural Code of Ukraine).

It defines a recognized specialist in the field of law, and the purpose of its involvement — to provide advisory assistance in complex legal situations.

The current legislation provides for the possibility of providing legal assistance to the court in the cassation stage of the proceedings by specialists of the Scientific Advisory Board at the Supreme Court (Art. 434-2 of Criminal Procedural Code of Ukraine, Art. 404 of Civil Procedural Code of Ukraine, Art. 347 of Code of Administrative Proceedings of Ukraine, Art. 303 of Commercial and Procedural Code of Ukraine).

According to the Regulations on the Scientific Advisory Board of the Supreme Court of Ukraine, it is formed from among highly qualified specialists in various fields of law.

These informed persons include the preparation of scientific conclusions on the interpretation and application of the rules of law.

The explanations prepared by experts help to make a legitimate and justified decision in difficult situations of law enforcement.

¹ Shcherbakovskyi M. H. Sutnist, struktura ta tsili vykorystannia spetsialnykh znan v sudochynstvi [The essence, structure and purposes of the use of special knowledge in litigation]. Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky. Kharkiv : Pravo, 2018. Vyp. 18. S. 189 [in Ukrainian].

We believe that the advisory functions of a specialist, an expert on the issues of law in the first stages of litigation, and the activities of specialists of the Scientific Advisory Board during the proceedings in the Supreme Court of Ukraine are essentially identical.

Thus, in litigation, the term "knowledgeable person" is a general concept that brings together all persons who satisfy the needs of litigation in special (non-legal) and legal knowledge.

Of course, these experts do not include professional participants in the process: judge, prosecutor, investigator, lawyer.

Another trait that knowledgeable individuals share is their lack of interest in the outcome of the proceedings.

This requirement is due to the need to objectively establish the circumstances of the crime and a reasoned procedural decision.

It should be noted that this characteristic is provided only for the expert, specialist and translator (Article 79 of the Criminal Procedural Code of Ukraine, Article 38 of the Civil Procedural Code of Ukraine, Article 38 of the Code of Administrative Proceedings of Ukraine, Article 37 of the Commercial and Procedural Code of Ukraine).

Thus, a suspect, accused and the victim during interrogation may express conclusions and opinions based on specialized knowledge and recognized by the evidence in accordance with Art. 95 of the Commercial and Procedural Code of Ukraine.

Meanwhile, the victim, the suspect, the accused are persons who defend their rights or represented interests in proceedings. The peculiarity of the testimony of the suspect, accused, victim as a means of proof provided on the basis of the use of specialized knowledge is that they come from a person directly interested in the results of criminal proceedings.

Second example. According to Art. 212 of the Criminal Procedural Code of Ukraine, persons who provide detained medical care and record any bodily injury or deterioration of health upon request may be admitted to a specific person who is entitled to practice medical activities.

Such a person may be relatives, subordinates or other dependent and non-detained health care professionals.

Another interested knowledgeable person is the inspector performing audits of subordinate individuals or legal entities and drafts the relevant acts (Article 99 of the Criminal Procedural Code of Ukraine).

The said examiner cannot be recognized as an impartial person.

Thus, the claim of disinterest is not common and cannot be put forward to all expert witnesses.

Researchers are looking at different forms of using specific expertise in legal proceedings, or, what is the same, the ways of engaging expert witnesses¹.

Determining the forms of use of specific expertise in legal proceedings is of great theoretical and applied importance, since its correct elucidation determines the procedure for the use of specific expertise, establishing the special procedural status of subjects possessing such expertise and ultimately, probative value of the results specific expertise application².

The essence of the differences is that some authors list the forms of use of specialized knowledge, without indicating any reasons, others propose to classify on different grounds, taking into account the subject, which uses special knowledge, the probative value of the results obtained, by type of activity, purpose use, etc.

Various classifications of forms specific expertise using are given in the literature, while in the opinions of legal practitioners a rather wide "dispersion" of such forms can be traced.

However, most scholars share ways of engaging expert witnesses into two main forms: procedural and non-procedural³. In criminal proceedings, the procedural form is the legal regime of criminal procedural activity including compliance with legal procedures, the fulfillment of certain procedural conditions and provision of guarantees in criminal proceedings⁴.

According to O. V. Selina, the criminal-procedural form of the use of specific expertise is a system of rules of application in the preliminary

¹ Revaka V. M. *Formy vykorystannia spetsialnykh piznan v dosudovomu provadzhenni* [Forms of using special knowledge in pre-trial proceedings]: dys. ... kand. yuryd. nauk: 12.00.09 / Nats. yuryd. akad. Ukrainy imeni Yaroslava Mudroho. Kharkiv. 2006. S. 30–32. Spitsyna H. O., Bidniak H. S. *Formy vykorystannia spetsialnykh znan. Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky*. Kharkiv : Pravo, 2018. Vyp. 18. S. 240–248 [in Ukrainian].

² Mahov V. N. *Ispol'zovanie znanij svedushhih lic pri rassledovanii prestuplenij* [Use of knowledge of knowledgeable persons in the investigation of crimes]: monografija. Moskva : Ros. un-t druzhby narodov, 2000. S. 72 [in Russian].

³ Prokopanych H. K. *Vykorystannia spetsialnykh znan v kryminalnomu, tsyvilnomu ta hospodarskomu protsesi Ukrainy* [Use of special knowledge in criminal, civil and economic process of Ukraine]. *Uchenye zapysky Tavrycheskoho nats. un-ta ym. V. Y. Vernadskoho. Seryia «Iurydycheskye nauky»*. Tom 26 (65). 2013. № 1. S. 267 [in Ukrainian].

⁴ *Kryminalnyi protses* [Criminal proceedings]: pidruchnyk / za red. V. Ya. Tatsiia, Yu. M. Hroshevoho, O. V. Kaplinoi, O. H. Shylo. Kharkiv : Pravo, 2013. S. 14 [in Ukrainian].

investigation and judicial consideration of criminal cases of specific expertise of expert witnesses, enshrined in the criminal procedure law¹.

It should be noted that not all the methods of attracting knowledgeable persons specified in the procedural laws fully meet the requirements of the procedural form and are equally regulated.

With regard to the expert, specialist, translator, the person giving the testimony on the basis of specialized knowledge, the order of their involvement, rights, duties, responsibilities, are clearly defined.

In other cases, well-known persons only mention or indicate the results of their activities, and legal personality is not regulated.

The analysis of the criminal, civil, administrative, economic judiciary of Ukraine leads to the conclusion that directly or indirectly in the procedural laws it is possible to distinguish knowledgeable persons who are involved directly, their participation in the proceedings is regulated with different degree of completeness, and such professionals who are indirectly involved, then indirectly proceedings use the results of their activities, which are not regulated by procedural law.

Therefore, we believe that there are two main reasons for differentiating forms of involvement of knowledgeable persons in the process: the first is a way of participating in the proceedings — direct or indirect, that is, the use of finished results of their work; the second is the degree of legal regulation of the process and results of the activities of knowledgeable persons.

It should be noted that the law provides for cases of mandatory involvement of certain specialists (mandatory examination, involvement of a translator, etc.).

In addition to the above expert, specialist, translator, testifying person, the knowledgeable persons directly involved in the proceedings include:

- forensic expert, in addition to conducting forensic examination, which is involved in examination, examination, forensic examination (Articles 206, 238, 238, 239, 241 of Criminal Procedural Code of Ukraine, Article 342 of Civil Procedural Code of Ukraine);
- pedagogue, psychologist, in addition to conducting psychological examination, participating in investigative (search) actions involving minors or minors (Articles 226, 227, 228, 354, 491 of the Criminal Procedural Code of Ukraine);

¹ Selina E. V. *Primenenie special'nyh poznanij v ugovnom processe* [The use of special knowledge in criminal proceedings.]. Moskva : Jurlitinform, 2002. S. 79 [in Russian].

– doctor who can replace a forensic expert and participate in the interrogation of a suspect or accused minor (Articles 226, 227, 238, 241, 354, 491 of the Criminal Procedural Code of Ukraine);

– psychiatrist, in addition to conducting psychiatric examination, to which he participates in a court hearing regarding the compulsory referral of an individual to forensic psychiatric examination and the provision of psychiatric assistance under compulsory procedure (Articles 298, 341 Civil Procedural Code of Ukraine).

Based on the rules of procedural laws, you can indicate knowledgeable persons who do not have legal status, indirectly involved in the proceedings, and the results of their activities are reflected in documents (certificates, acts, conclusions, protocols) or oral information.

The indicated persons are:

the auditor and the examiner, drawing respectively conclusions and acts (Article 99 of the Criminal Procedural Code of Ukraine);

- a medical professional, a doctor, who provide medical assistance to a detainee and fix any personal injury to him; provide medical documents concerning the morbidity of the suspect, the participant in the case, the presence of a person with a mental activity disorder or mental illness, the need for compulsory hospitalization to the anti-tuberculosis institution or the extension of the duration of the compulsory hospitalization, the health status of the applicant, the child's health physical and mental development; participate in a court hearing regarding the application to the convicted compulsory treatment or its termination (Articles 212, 280, 509, 539 of Criminal Procedural Code of Ukraine, Articles 252, 311, 312, 344 CCP, 236 of Code of Administrative Proceedings of Ukraine);

– psychiatrists, in addition to conducting psychiatric examination, who make a written statement or conclusion justifying the need to continue, change or discontinue compulsory medical measures; the continuation of compulsory outpatient psychiatric care, the compulsory hospitalization, its continuation (Articles 514, 515 of Criminal Procedural Code of Ukraine, Articles 339, 340 of Civil Procedural Code of Ukraine);

– specialists of the Scientific Advisory Board of the Supreme Court, who provide a scientific opinion on the application of the rule of law (Art. 434-2 of Criminal Procedural Code of Ukraine, Art. 404 of Civil Procedural Code of Ukraine, Art. 347 of Code of Administrative Proceedings of Ukraine, Art. 303 of Commercial and Procedural Code of Ukraine).

Although V. K. Lisichenko and V. V. Tsirkal, B. V. Romanyuk¹ strongly oppose the non-procedural form of the use of specific expertise in

¹ Lisichenko V. K., Cirkal' V. V. Ispol'zovanie special'nyh znaniy v sledstvennoj i sudebnoj praktike [Use of special knowledge in investigative and

criminal proceedings, the practice is convincing that establishment of investigated criminal event circumstances is secured not only in the course of proving as a separate type of cognition, which has a well-defined procedural mode but also by conducting a wide range of expert witnesses of various actions which results are not of probative value.

The analysis of literary sources, investigative and judicial practice allows to identify knowledgeable persons whose activities and results are not regulated by law: consultants carry out preliminary research of objects, check objects and persons on criminal records.

Scientists view the purpose of attracting expert witnesses with varying degrees of detail, and are mainly associated with the use of scientific, technical and forensic tools, to obtain results that are of probative value¹.

However, it is known that the results of the use of specific expertise is to obtain not only evidential but also orienting (organizational-tactical) information².

The evidentiary information includes information about the circumstances to be proved in the proceedings and is obtained only in a regulated manner.

Guidance information can be obtained in both regulated and unregulated ways.

It is used for organizational and tactical purposes in the proceedings (drafting versions, determining directions for investigation or case consideration, planning of procedural actions, predicting possible course of behavior of participants in the process, etc.), as well as for examining evidence³. Taking into account the general tasks of any kind of judiciary (Article 2 of the Civil Procedural Code of Ukraine, Article 2 of the Code of Administrative Proceedings of Ukraine, Article 2 of the Commercial and Procedural Code of Ukraine of Article 2 of the Commercial and Procedural Code of Ukraine), based on the provisions of the Constitution of Ukraine, it can be argued that in the process of solving these problems the purpose of

judicial practice]: posobie. Kiev : Kievsk. gos. un-t, 1987. S. 48. Romanjuk B. V. Suchasni teoretichni ta pravovi problemi vikoristannja special'nih znan' u dosudovomu slidstvi : dis. ... kand. jurid. nauk: 12.00.09 / Nac. akad. vnutr. sprav. Kiev, 2002. S. 70 [in Russian].

¹ Lazareva L. V. Special'nye znanija i ih primenenie v dokazyvanii po ugovnomu delu [Special knowledge and their application in evidence in a criminal case.]. Moskva : Jurlitinform, 2009. S. 70 [in Russian].

² Belkin R. S., Vinberg A. I. Kriminalistika i dokazyvanie [Forensics and Proof]. Moskva : Jurid. literatura, 1969. S. 66–67 [in Russian].

³ Shcherbakovskiy M. H. Provedennia ta vykorystannia sudovykh ekspertyz u kryminalnomu provadzhenni [Conducting and using forensics in criminal proceedings]: monohrafiia. Kharkiv : V dele, 2015. S. 81–83 [in Ukrainian].

attracting knowledgeable persons is to assist authorized participants in the performance of their functions.

These include not only obtaining evidence but also forming an internal conviction of authorized participants to make a well-founded procedural decision.

Therefore, any person with special and legal knowledge and skills involved in the proceedings, regardless of their rights and responsibilities, is aware.

Based on the above, we can formulate the following general definition.

In legal proceedings *expert witness* is subject owning expertise (non-legal) in a particular field of human activity or legal knowledge, skills in their application is not a professional participant in the process, is involved directly or indirectly in a procedurally regulated or non-regulated form or at the discretion of an authorized person (body) to assist in the resolution of the tasks of the judiciary and the information and documents provided by him are used as sources of evidence or background information serving grounds for procedural, tactical and organizational decisions.

An important cognitive value for understanding the range of knowledgeable persons involved in litigation is their classification.

In view of the above considerations, it is possible to propose the following classification of specialists.

1. Expert witnesses directly involved in the proceedings:

a) activity is fully procedurally regulated: expert (Article 69 of the Criminal Procedural Code of Ukraine, etc.); Law expert (Art. of 73 Civil Procedural Code of Ukraine. Art. 69 Code of Administrative Proceedings of Ukraine, Art. 71 Commercial and Procedural Code of Ukraine), Specialist (Art. 71 of 360 Criminal Procedural Code of Ukraine. Art. 74 of Civil Procedural Code of Ukraine. Art. 70 of CAS; Art. 71 Commercial and Procedural Code of Ukraine);, translator (Art. 68 Code of Administrative Proceedings of Ukraine. Art. 75 of Civil Procedural Code of Ukraine. Art. 71 Code of Administrative Proceedings of Ukraine. Art. 72 of Commercial and Procedural Code of Ukraine); suspect, accused, witness, victim, possessing special knowledge (Article 95 of the Criminal Procedural Code of Ukraine);

b) activity is partially procedurally settled: forensic medical examiner except for performing forensic medical examination (art. 206, 238, 238, 239, 241 of Criminal Procedural Code of Ukraine art 342 Civil Procedural Code of Ukraine), teacher, psychologist, except for performing psychological examination (art. 226, 227, 228, 354, 491 of Criminal Procedural Code of Ukraine), doctor (art. 226, 227, 238, 241, 354, 491 of

Criminal Procedural Code of Ukraine), Psychiatrist except for performing mental state examination (MSE) (art. 298, 341 of Civil Procedural Code of Ukraine).

2. Expert witnesses indirectly participating in proceedings:

a) results of the activities are partially procedurally regulated: the auditor and the examiner (Article 99 of the Criminal Procedural Code of Ukraine), medical officer, doctor (Articles 212, 280, 509, 539 of Criminal Procedural Code of Ukraine, Articles 252, 311, 312, 344 of the Civil Procedural Code of Ukraine, 236 of Code of Administrative Proceedings of Ukraine), psychiatrist, in addition to conducting a psychiatric examination (Articles 514, 515 Criminal Procedural Code of Ukraine, Art. 339, 340 of Civil Procedural Code of Ukraine), specialists of the Scientific Advisory Council at the Supreme Court (Art. 434-2 Criminal Procedural Code of Ukraine, Art. 404 Civil Procedural Code of Ukraine, Art. 347 Code of Administrative Proceedings of Ukraine, Article 303 of Commercial and Procedural Code of Ukraine).

b) Activity and its results are not regulated in a procedural way: the consultants carry out preliminary object investigations, check the objects and persons on forensic records.

Conclusions.

In any type of litigation, problematic situations arise that involve knowledgeable persons.

Expert witnesses are any professionals other than professional participants in the process who possess special (non-legal) and legal knowledge.

The purpose of involving knowledgeable persons is to assist the court, the prosecutor, the investigator, the lawyer in the collection, investigation and evaluation of evidence, and the formation of grounds for making sound procedural, organizational and tactical decisions.

Regardless of the type of litigation for the classification of knowledgeable persons, it is advisable to distinguish two grounds.

The first is a way for experts to participate in the proceedings: direct or indirect, when using ready-made results of their work.

The second is the degree of procedural regulation of the process and results of the activities of expert witnesses: fully regulated, partially regulated, not regulated.

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М. Г. Щербаковський, Д. В. Куриленко
ОБІЗНАНІ ОСОБИ У СУДОЧИНСТВІ УКРАЇНИ

Оглядова стаття

У статті доведено, що обізнані особи можуть володіти спеціальними (неправовими) знаннями та знаннями в галузі права. Метою залучення обізнаних осіб до процесу є сприяння уповноваженим учасникам процесу у виконанні їх функцій. До обізнаних осіб віднесені: експерт; експерт з питань права; спеціаліст; перекладач, сурдоперекладач; особи, які дають показання на підставі спеціальних знань; судово-медичний експерт; педагог; психолог; лікар; психіатр; ревізор; перевіряючий; фахівці Науково-консультативної ради при Верховному Суді; особи, які надають консультації, попередньо досліджують об'єкти, перевірку об'єктів та осіб за криміналістичними обліками.

Ключові слова: судочинство, обізнані особи, спеціальні знання, форми та мета залучення фахівців, класифікація обізнаних осіб.

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Ye. M. Popovich,

Doctor of Law, Docent, Honored Lawyer of Ukraine, Principal

Researcher at the KhRIFE, Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0002-7167-6855>

e-mail: E.Popovich@i.ua

UNITY OF SCIENCE AND PRACTICE IN FORENSIC SCIENCE ACTIVITIES

The formation of Ukraine as a rule of law state, the improvement of the legal regulation of the use of special knowledge in order to properly and efficiently protect the rights and legitimate interests of individuals and legal entities and the state, eliminating the inconsistency of the provisions of the law regarding examination, objectively require an analysis of the current state of science and practice in forensic science activity. Forensic science covers a considerable number of scientific disciplines and actual problems of teaching expert science. The scientific article proposes to use the scientific potential of expert institutes, educational institutions and research institutions engaged in applied research. Cooperation between institutions involved in expert research, due to their scientific achievements and methodological developments, can increase professional ability in the investigation of certain categories of crimes, and will also contribute to the integration of forensic activities and will lead to the harmonization and improvement of national legislation, theoretical foundations of forensic activities, international recognition of its individual components and, in general, will increase professional masters of experts. Ways to improve the professional education of future judicial experts are analyzed. In this paper, the ideas for solving the urgent problem of unity and interaction of education, science and practice have been expressed, and hopefully they will be taken into account.

Keywords: specific expertise, forensic expert; higher education; educational process; professional thinking; forms of educational preparation; scientific activity; scientific workers; research institute; advanced training; professional qualities; scientific and methodological activity; specialized scientific council.

Formulation of Research Problem.

Generalization of expert practice indicates that forensic examination covers almost all fields of human life.

Work of a forensic expert is directly related to the science and education of future professionals.

As a component of the justice system, it shapes the level of professionalism, responsibility, right to independent and qualified, focused on the use of the latest achievements of the science and technology of forensic expertise.

Research institutes in Ukraine possesses enormous potential.

Today, we have a significant amount of scientific work and techniques that are being commissioned and successfully implemented, with the highest level of expertise being held.

In this article, ideas about the forms of productive exchange of ideas, reconciliation of theoretical positions and scientific work of specialists should be covered; to find unity of science, education and expert practice; provide guidance on how to tackle the three fundamental foundations of forensic science activity.

Analysis of recent research and publications.

Issues of unity of science and practice in forensic activity in their works were investigated by domestic and foreign scientists: O. M. Kliuiev, E. B. Simakova-Yefremian, N. I. Klymenko, V. Iu. Shepitko, V. V. Yusupov, M. L. Tsybal, L. M. Derecha, M. V. Skoryk, M. Ya. Sehai, N. M. Tkachenko, M. M. Skrypnik, E. V. Bashynskiy, V. S. Sadovska, V. A. Remyzov, V. V. Semenov, Ye. R. Rosynska, O. I. Usov, M. T. Bilukha, O. V. Feldi, S. V. Yevdokimenko, V. Hoshovskyi and others¹.

¹ Dyv., napr.: Simakova-Yefremian E. B. Do pytannia pro vzaiemozalezhnist yevropeiskyykh intehtratsiinykh protsesiv i tendentsii intehtratsii spetsialnykh znan v Ukraini [On the question of the interdependence of European integration processes and tendencies of integration of special knowledge in Ukraine.]. Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky. Vyp. 17. Kharkiv : Pravo, 2017. S. 152–158; Sopilnyk R. L. Ekspertne zabezpechennia pravosuddia u konteksti yevrointehtratsiinykh protsesiv [Expert Justice in the Context of European Integration Processes]: Kryminalistychnyi visnyk. №1 (23), 2015. S. 39–44; Spitsyna H. O., Belevtsova S. O. Shchodo pytannia formuvannia novitnoi paradyhmy teorii ta praktyky sudovoi ekspertyzy v Ukraini [On the Formation of the Newest Paradigm of Forensic Theory and Practice in Ukraine]. Aktualni pytannia sudovoi ekspertyzy i kryminalistyky : zb. materialiv mizhnarod. nauk.-prakt. konf., prysviachenoi 150-richchiu z dnia narodzhennia Zasl. prof. M. S. Bokariusa (Kharkiv, 18–19 kvit. 2019 r.). Kharkiv : KhNDISE, 2019. S. 63–65; Kliuiev O. M. Mizhnarodni standarty ta mizhnarodne spivrobitnytstvo u sferi sudovo-ekspertnoi diialnosti v Ukraini [International Standards and International Cooperation in the Field of Forensic Expertise in Ukraine]. Aktualni pytannia sudovoi ekspertyzy ta kryminalistyky : materialy mizhnarod. nauk.-prakt. konf., prysviachenoi 95-richchiu stvorennia Kharkivskoho naukovo-doslidnoho instytutu sudovykh ekspertyz im. Zasl. prof. M. S. Bokariusa (m. Kharkiv, 10–11 zhovtnia 2018 r.). Kharkiv : Pravo, 2018. S. 5–8; Klymenko N. I. Zahalna teoriia sudovoi ekspertolohii: poniattia i mistve v systemi naukovoho znannia [The General Theory of Forensic Expertology: Concept and Place in the System of Scientific Knowledge]. Zb. nauk.prats Iripinskoi finansovo-yurydychnoi akademii (ekonomika, pravo). Vyp. 2. 2013. S. 101–106; Shynkarenko I. R., Spitsyna H. O. Istorychni vytoky ta perspektyvy rozvytku teorii ta praktyky sudovoi ekspertyzy [Historical origins and prospects of the development of the theory and practice of forensic examination]. Aktualni pytannia sudovoi ekspertyzy ta kryminalistyky : zb. materialiv mizhnarodnoi naukovo-praktychnoi konferentsii, prysviachenoi 95-richchiu stvorennia Kharkivskoho naukovo-doslidnoho instytutu sudovykh ekspertyz im. Zasl. prof. M. S. Bokariusa (10–11 zhovtnia 2018 r.). Kharkiv : Pravo, 2018. S. 20–22 ta in [in Ukrainian].

In our opinion, the experience of previous generations is very important, but with the development of society, a look into the future of the science of forensic science, we need to form new ideas on this issue. The scientific work presents methods of obtaining special knowledge, their teaching and application in the practical activity of experts in forensic science.

Article Purpose.

The purpose of this article is to discuss the issues of improving the process of obtaining special education in certain types of expert specialties, training and training of future specialists; the importance of educating a professional generation of forensic experts is analyzed; coverage of the problem of providing the future researcher with the knowledge on organization and carrying out of scientific work, formation of skills in carrying out such work; determining the forms and methods of professional development of practitioners; encouraging practitioners to participate in research.

Ideas on the interaction of science, education and practice in the field of forensic expertise are offered.

Main content presentation.

According to Article 1 of The The Law of Ukraine *On Judicial Examination* defines forensic expertise as research based on specific knowledge in the field of science, technology, art, craft, etc. of objects, phenomena and processes in order to reach a conclusion on issues that are or will be the subject of litigation¹.

According to part 1 of Article 5 of the Law of Ukraine: *On Higher Education* of December 28, 2014 № 76-VIII, in the current version of 09.08.2019 the second (master's) level of higher education corresponds to the eighth level of the National Qualifications Framework, and provides for the acquisition of advanced theoretical and / or practical knowledge, abilities, skills in the chosen specialty (or specialization), general principles of methodology of scientific and / or professional activity, other competences, sufficient for effective performance of tasks of innovative character of the appropriate level of professional activities².

Special education is obtained by the Institute of Law and Postgraduate Education of the Ministry of Justice of Ukraine; under the specialty training programs — NDUSE and at the corresponding faculty of

¹ Pro sudovu ekspertyzu [On forensic examination] : Zakon Ukrainy vid 25.02.1994 roku № 4038-KhII. URL : <https://zakon.rada.gov.ua/laws/show/4038-12> (data zvernennia 24.06.2019) [in Ukrainian].

² Pro vyshchu osvitu [About higher education]: Zakon Ukrainy vid 28.12.2014 roku № 76-VIII. URL : <https://zakon.rada.gov.ua/laws/show/1556-18#n77> (data zvernennia 24.06.2019) [in Ukrainian].

training of forensic experts of the Kiev National University of Internal Affairs. It is the only educational institution in the Ministry of Internal Affairs system, which prepares applicants for forensic science (higher education: *bachelor* in the *law* Area of specialization) for units of the National Police of Ukraine, as well as for applicants for higher education "Master" in the specialty "Law" Special education is obtained by the Institute of Law and Postgraduate Education of the Ministry of Justice of Ukraine; under the specialty training programs — NDUSE and at the corresponding faculty of training of forensic experts of the Kiev National University of Internal Affairs. It is the only educational institution in the Ministry of Internal Affairs system, which prepares applicants for forensic science (higher education "bachelor" in the specialty "law") for units of the National Police of Ukraine, as well as for applicants for higher education *Master* in the *Law* Area of specialization *Forensic Science* for the units of the Expert Service of the Ministry of Internal Affairs of Ukraine.

The professionalization of forensic expert activity is based on the fundamental training of the future Forensic Expert in Institution of higher education where for the applicants for the Master's degree majoring in 081 *Law* certification programs are performed for training of experts of the Ministry of Internal Affairs of Ukraine in the following areas:

- Forensic Engineering;
- Forensic drug examination;
- Forensic computer technical examination;
- Forensic molecular genetic examination;
- Forensic merchandising
- forensic transport and trace evidence examination;
- comprehensive exam.

use of specific expertise in criminal proceedings; forensic chemistry; forensic support of pre-trial investigation; technical and forensic support of investigation of crimes related to the use of ammunition, firearms, explosives (devices) and technological explosions; digital technology.

Problems arise in obtaining specific expertise by students.

Teaching of *Forensic expertology* is a holistic view of the procedural, organizational, methodological, scientific and tactical bases of the appointment of judicial expertise, their current types and capabilities, as well as developing skills in the preparation, appointment of forensic expertise and evaluation of expert's findings in the investigation.

Main tasks of studying the discipline of Forensic Expertise are to consolidate the theoretical knowledge gained by the students at lectures and as a result of independent work, as well as to acquire practical skills in the

appointment of forensic expertise and the assessment of expert opinions; but the lack of modern textbooks complicates the process of cognition.

This tutorial will contain a comprehensive analysis of the regulatory framework and procedural issues related to appointment and performing forensic examinations, evaluation of forensic scientist conclusions, as well as the specifics of prevailing types of research in civil and economic proceedings.

From 2016 for the same purpose, but on a different procedural and practical basis, a training manual Forensic Science in administrative proceedings is being developed, and from 2018, the participation as co-executors in the preparation of a tutorial Forensic Science in criminal proceedings is planned.

The success of teaching depends largely on the availability of technical training, that is, a multimedia textbooks and manuals, and therefore the level of clarity and quality of perception of the material.

In our opinion, the aforementioned tutorials will become a solid didactic basis for forensic scientist training at the modern level of Forensics Science development.

We believe that it would be advisable to conclude agreements on scientific and practical cooperation between the departments of various higher education institutions, bureau of forensic and scientific institutes in the organization and improvement of the educational process, joint development and implementation of measures aimed at improving the level of student learning.

Equally useful would be the involvement of practitioners in practical training.

We believe that professional thinking is important, namely the professional thinking of an expert, which is formed in the early stages of higher education and professional specialization.

This thinking is not just a certain amount of knowledge that, of course, needs to be constantly updated, it is also the use of them in practical activity, it is a process of consciously structuring the skills for the necessary and unnecessary and forming a structure of priorities.

In our opinion, it is necessary to educate students of higher educational institutions *forensic thinking* that can be called *conceptual* which is a process of perception, understanding of information, ability to interpret, combine in ideas, to draw a number of conclusions from certain data or perceived information.

Thanks to this skill, they will be able to identify or detect, through research using the knowledge gained, some information not found in the original source.

Components of this psychological process are:

At first, a sensory system that allows you to perceive and process information that a person receives through sight and hearing;

Second, the working memory in which information is processed and integrated at the time it is received;

Third, long-term memory is the primary function of which is to store mental schemas through which we can exercise thoughtful thinking.

Therefore, the professionalization of expertise should be based not primarily on the retraining of specialists in certain fields of knowledge, not on the system of advanced training (although this case is quite important and necessary) but on the basic education of a future forensic expert.

We offer the use of a whole range of different forms of educational and vocational training for students, namely:

updating e-learning professional education:

m-learning;

u-learning;

f-learning;

blended-learning, which uses interactive and computer-based learning technologies, as well as the use of case studies as case studies; debate; business games; case study; trainings; video conferences; *brain storm*; focus groups; role games; group discussions; method of projects; scientific conferences and seminars; Web conferencing; individual work with experts of expert activity; scientific experiments; educational practice; study tours for students of law and medical universities in the office-museums of research institutes, for example, in the office-museum of Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations, etc.

Also, we consider it advisable for students to develop, on the basis of higher education institutions, together with the Forensic science Institute of, a certification educational program called *Forensic Science Activities*.

To involve not only leading teachers of universities, but also well-known practitioners in the field of forensic expertise both from Ukraine and from abroad, to teaching disciplines.

Upon completion of training in the chosen program to issue the appropriate certificates, which will be taken into account in future employment;

or create a joint master's program of double diploma together with foreign universities or research institutes in the framework of international cooperation in the field of forensic science.

Forensic examinations in state specialized forensic science institutions of the Ministry of Justice of Ukraine are performed by

specialists possessing qualification of forensic expert in the relevant specialization and are researchers.

The issues of providing the future researcher with knowledge of management and carrying out of scientific work, formation of skills in carrying out such work are often left unanswered. Such knowledge is acquired independently during research, i.e. in the process of self-study.

It should be noted that on several occasions attempts were made in various higher education institutions to include in the curricula of some areas of specialization (mainly technical ones) the Research Fundamentals discipline.

Several textbooks and manuals have been prepared and published in this discipline, but mastering such a discipline without practice does not produce high results.

Such manuals are designed to provide the very basics of knowledge on research, and this is obviously not enough for an employee of a forensic science institution.

Therefore, there is an urgent need to establish a systematic work in the Institute of Forensic Expertise, aimed at familiarizing researchers with the system of organization of scientific work, methodological bases of scientific knowledge, information support of research.

We believe that it is necessary to start such work during the preparation of employees for the passing of the relevant qualification exams.

As part of the system of such training should be training to improve not only the professional but also the scientific level of employees. It should also be added that Article 19 of the Law of Ukraine "On Scientific and Scientific and Technical Activities" specifies that the main forms of training of scientific personnel are postgraduate and doctoral studies. At the Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations which is a state specialized scientific institution belonging to the sphere of administration of the Ministry of Justice of Ukraine, and, in accordance with the legislation of Ukraine, in 2018 opened a postgraduate / doctoral study program for training of higher qualification of the third (educational-scientific) higher education level.

The Institute is one of the oldest state forensic institutions of Ukraine with sufficient experience in personnel training.

One of the main indicators of the Institute work is the preparation and defense of dissertations by its staff.

Throughout its existence, the Institute was concerned with the training of highly skilled scientific personnel, because it is a guarantee of obtaining qualitative, thorough conclusions of the examinations.

The creation of a specialized scientific council for the dissertation on the basis of this postgraduate study allows to enrich the expert staff with specialists of higher qualification (PhD).

The Institute carries out scientific, forensic, scientific, technical, scientific-organizational and educational activities in the field of forensic, criminalistics and law.

Institution scientific activity is manifested in the development of theoretical and methodological provisions of forensic examination, (according to annual plans approved by the Ministry of Justice of Ukraine for all state specialized forensic science institutions that are within the scope of its management).

Institute staff takes part in research works and according to the results, original, unique author's works of theoretical and methodological orientation are created.

It is safe to say that the leadership in the number and importance of scientific development belongs to the KhRIFE: more than half of all subjects of the judicial and expert institutions of the Ministry of Justice of Ukraine are being developed⁶.

The KhRIFE research consists of scientific topics on theoretical and organizational issues of forensic activity. Work on the monograph. "Improving Forensic science classification"¹.

Through the efforts of scientists and practitioners in the field of forensic graphology, a technique is developed to study handwritten records made in Latin.

For the first time in Ukraine, an algorithm for studying records written with letters of the Latin alphabet will be created. It is a non dominant writing system in Ukraine but more and more actively used in circulation in recent times.

Linguistic direction is also in the area of scientific search, and recently the work on the method of linguistic research of offensive expressions has been completed.

Questioned document examination (QDE) in the aspect of scientific topic is related to development of a methodology for research on new banknotes of Ukraine, as well as with the participation of our

¹ Klymenko N. I. Osnovni vydy diialnosti Kharkivskoho NDI sudovykh ekspertyz i napriamy yikh udoskonalennia [Main types of activity of the Kharkov Research Institute of Forensic Expertise and directions of their improvement], 2018 r. URL : http://www.hniise.gov.ua/user_files/File/sbornik/2018/%d0%9a%d0%be%d0%bd%d1%84_%d0%90%d0%ba%d1%82%20%d0%bf%d0%b8%d1%82%d0%b0%d0%bd%d0%bd%d1%8f%20%d1%81%d1%83%d0%b4%20%d0%b5_2018.pdf (data zvernennia 24.07.2019) [in Ukrainian].

Dnipropetrovsk colleagues on the diagnostic study of extinguished cash receipts.

Trace evidence analysis is presented by the development of methods for diagnostic and identification studies of animal tracks — this topic has aroused interest from British colleagues.

Ballistics in the scientific subjects of the KhRIFE is accordingly presented by the method of determining the properties of balls after bounce. Expertise of materials, substances and products has a wide object spectrum, in which scientists of KhRIFE are engaged in the development of different methods: this is the study of binary and complex mixtures of petroleum products and the study of meat and meat products.

In the field of scientific development of experts in the field of transport engineering – a comprehensive method for detecting a person who was driving a motorcycle or other motor vehicle during an accident; development of parameters of braking of freight trains in different road conditions and expert assessment of road transport situations involving vehicles with special signals continue.

In the field of Construction and Technical examinations forensic scientist efforts are aimed at creating reliable methodological approaches to determining the criteria of capital construction objects.

A full range of scientific developments in life safety is related to method development of integrated Engineering Technological examinations; researches on electrical injuries, as well as the determination of conditions for safe elevator operation.

As computer technology is developing rapidly, conducting its expert research requires rapid improvement. In this direction, experts are developing a technique for establishing the facts of destruction and recovery of information on digital media⁷.

This is not full range of scientific topics that are developed at the Institute, demonstrates the high potential of its staff and the possibility of scientific progress in the field of forensic science of justice in Ukraine.

We consider that Performing conferences (including international ones), seminars, round tables that is one of the forms of scientific work of the Institute. Only in the past year in this kind of activities organized by the Institute was attended by representatives of Ukraine and many countries near and far abroad.

Another form of scientific activity is the publication of its results in various publications, for example, monographs, articles, manuals, abstracts, papers, declarative patents, etc.

As the already noted, State specialized research institutions of forensic examinations of the Ministry of Justice of Ukraine are characterized by a certain specificity in personnel selection.

As these organizations have the status of research institutions, they also include scholars in addition to the positions of forensic experts (judicial expert, senior judicial expert, leading judicial expert, chief forensic expert).

The researchers also include persons who have a degree and work in a specialty according to a group of specialties in the branches of sciences, according to which a degree⁵ has been awarded.

In addition, it should be noted that it is precisely the foreseen qualification of the posts of employees of research institutes of forensic examinations of the Ministry of Justice of Ukraine established the rule that as scientific workers who have the qualifications of a judicial expert, on the instructions of the leadership NDUSE conducting forensic examinations (expert studies) with the use of scientific methods of forensic science and forensic examination, as well as forensic experts in accordance with the technical tasks, carry out scientific work on the creation of methodologies (methodological recommendations) conducting forensic examinations.

In our opinion, such an approach is optimally correct, because it combines the theory and practice of forensic examination.

During the performance of the functions of a court expert, professionals work in tense conditions that are related to such peculiarities of their work: complex scientific nature and intensity of intellectual work, its unregulated duration in the conditions of performing urgent and especially important tasks for expert support of justice; socially influential consequences of the importance of work, high social responsibility for their work and its results; constant moral and psychological load and tension, performance of official duties during the conduct of forensic expert activity in stressful situations; systematic staying on business trips, including trips to places of committing crimes, while performing official duties with a risk to health and life; manifestations of moral and psychological pressure, threats and immediate threats against a forensic expert in connection with the performance of his duties.

These actors perform their duties in the conditions of a shortage of time, influence on them of particularly strong stimuli and the dominance of negative emotions in the absence of positive, increased responsibility in making decisions and the need for immediate action, etc.¹.

¹ Tkachenko N. M. Do pytannia profesiinoyi pidhotovky sudovoho eksperta [On the issue of forensic expert training], 2018. URL : http://www.hniise.gov.ua/user_files/File/sbornik/2018/%d0%9a%d0%be%d0%bd%d1%84_%d0%90%d0%ba%d1%82%20%d0%bf%d0%b8%d1%82%d0%b0%d0%b

As in any other profession, the expertise of forensic experts lies in the possession of appropriate means skills and work operations.

In the current state of forensic activity, the profession of subjects of forensic expertise becomes especially relevant.

Professional diagram is a certain set or system of skills and abilities, psychological qualities necessary for the successful pursuit of professional activity.

Thus, V. O. Konovalov, examining the professional qualities and psychology of persons conducting proceedings in the case, distinguished among the professionally necessary qualities such qualities as creative thinking, communication skills, volitional qualities, organizational abilities, ability to withstand negative emotions.

In addition, she points to the need for constant work on themselves, in order to prevent professional deformation.

In particular, it is proposed to make a mutual exchange of positive experience, self-control, self-criticism, and strive to creatively solve professional problems¹.

Scientists have proposed other qualities which a professional expert must possess on a par with the development of a generalized reference model of a modern expert-professional.

When developing the profession of a subject of forensic expertise, we consider it necessary to take into account the provisions of the Guide to the qualification characteristics of the positions of employees of the research institutions of forensic examinations of the Ministry of Justice of Ukraine.

In the Professional diagram it is possible to consolidate the knowledge of normative legal acts regulating forensic expert and scientific activity; methodologies and special literature on conducting forensic examinations in the field of research; modern achievements of science and technology in the relevant field of knowledge, including the use of special equipment; rules and norms on occupational safety and safety, fire safety; rules of internal labor regulations.

d%d0%bd%d1%8f%20%d1%81%d1%83%d0%b4%20%d0%b5_2018.pdf (data zvernennia 24.06.2019) [in Ukrainian].

¹ Perlin S. I., Baranov P. Yu. Problemy naukovo-metodychnoho zabezpechennia ekspertnoi diialnosti [Problems of scientific and methodological support of expert activity]. 2018 r. URL : http://www.hniise.gov.ua/user_files/File/sbornik/2018/%d0%9a%d0%be%d0%bd%d1%84_%d0%90%d0%ba%d1%82%20%d0%bf%d0%b8%d1%82%d0%b0%d0%bd%d0%bd%d1%8f%20%d1%81%d1%83%d0%b4%20%d0%b5_2018.pdf (data zvernennia 24.06.2019) [in Ukrainian].

In addition, the professiogram of the subject of forensic expert activity should also include requirements for his personal qualities and abilities.

Particular attention should be paid to the issue of forensic experts' training provided by the Institute of Law and Postgraduate Education of the Ministry of Justice of Ukraine.

In order to improve the qualification of employees of the judicial and expert institutions of the Ministry of Justice of Ukraine, representatives of research institutes of judicial expertise should take part in relevant thematic training courses and trainings.

The main purpose is to update and develop the knowledge and skills of professionals necessary to effectively solve the problems of professional forensic activities.

The topics of the course may include, for example, the training of forensic experts in theoretical, organizational and procedural matters.

We offer a remote process of professional development of certain types of forensic examinations.

For example, by performing web conferencing ; listening to audio recordings of lectures; passing proficiency tests and co-operation skills (such tests were developed and implemented in the justice system of the Ministry of Justice of Ukraine for examinations in order to obtain (confirm) the qualification of a forensic expert, but due to lack of funds equipment of the corresponding rooms, equipped as exam computer classes, the idea could not be put to life, but in the modern world, mini-computers are available in every On on hand, which simplifies the possibility of passing the training tests); participation of practitioners in the educational process of students, as guest lecturers, etc.

Since the vast majority of forensic researches is of a unique creative nature.

The creativity of a forensic expert allows him to solve creative expert tasks.

Many judicial experts lack the motivation, and often the conditions, to engage in scientific and methodological activities.

The scientific and methodological activity of a forensic expert is an activity aimed at providing forensic experts with new knowledge that contributes to solving expert problems.

Based on this concept, this activity is an important component of the expert activity, because the expert's conclusions are always new to the decision-maker (judge, investigator, lawyer).

As a result of such activity, new knowledge is created not only for the client of expertise, but also for colleagues, namely: forensic experts⁹.

To achieve a high level of scientific and methodological activity of forensic experts, it is necessary to achieve a high level of motivation, that is, to create such conditions under which the expert would have a persistent need for creative reasoning.

The level of scientific and methodological activity motivation should reflect one of the most significant criteria for evaluating the performance of a forensic expert.

In this regard, a system of evaluative modeling of the level of motivation of a forensic expert to the scientific and methodological activity is being developed and implemented at the Kharkiv Scientific and Forensic Expert Center of the Ministry of Internal Affairs of Ukraine.

The main parameters in the developed qualimetric evaluation model are: the level of participation in the development of techniques; in the examinations corresponding to the category of difficult; in the preparation of reports at scientific and methodological conferences; authorship of publications in scientific publications; the number of references to scientists for author's works, etc.⁹.

In order to encourage practitioners to participate in the scientific and methodological activity; it is necessary to find free publication options, and even more, options with subsequent honorarium.

Unfortunately, many periodicals are now published, publishing authors' materials only for a fee.

In our opinion, this is unacceptable from different points of view, and, first and foremost, because an intellectual intellectual product must have value and therefore value.

If the product is to be paid for by the author, then this product has no value or copyright infringement.

It should also be noted that the subject of stimulation should be not the number of formal factors (number of publications, speeches, etc.), but also the importance and level of expert participation in the scientific and methodological activity which results in new fruitful ideas that qualitatively improve the expert activity.

Considering that each forensic expert is capable of creative activity due to the specifics of the expert activity; it is necessary to take into account the individual personality traits of the expert that can prevent him from practicing scientific and methodological activity.

lack of experience in writing articles, experience in speaking at conferences, developing manuals, etc.

These formal reasons often prevent the expert from expressing himself in the scientific and methodological activity, despite the presence of significant creative abilities.

One way to encourage employees to participate in the scientific and methodological activity is to develop a specialized academic board as a whole from forensic expertise and through specific specializations (sections) with involvement of participants in the presence of creative potential.

The only specialized scientific council in Ukraine created at the Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations.

We believe that the institution has created the conditions under which practitioners seek to participate in the work of sections of the Academic Council. However, recognition of scientific achievements in the form of the thesis defense is of great stimulating importance.

This requires the encouragement of experts to participate in the writing of scientific articles, abstracts and more.

False practices should be avoided when the author has to pay the publisher for the publication of his intellectual product¹.

One of the significant factors for expert participation in scientific and methodological activity is co-authorship in the development of techniques for complex and up-to-date expert research.

Availability of such techniques, which have been tested in leading expert institutions and received regulatory status, greatly increases the effectiveness and validity of research.

An important role is played by the growing role of the expert that is author of the tried and tested method.

It is necessary to expand the use of international forensic science activity.

Unfortunately, the normative base of expertise in Ukraine in fact precludes this, including the application of international standards.

To simplify access to scientific and methodological activities and motivation, we propose to declare ourselves, to announce a new philosophy of work between experts, academics and students of higher educational institutions.

Together with practicing experts, create quality, up-to-date and useful products, services and tools for the experts themselves, academics and students to take education and science to the next level.

We believe that this requires the creation of an online platform that will provide free services and tools for work, self-education of forensic

¹ Ofitsiyni sait Kharkivskoho NDI sudovykh ekspertyz im. Zasl. prof. M. S. Bokariusi [Official site of Kharkiv NDISE] URL : <http://www.hniise.gov.ua/14333-asprantura-ta-doktorantura.html> (data zvernennia 24.07.2019) [in Ukrainian].

experts, such as: conferences, video lectures, tests, online workshops, material library, news, test and work designer, use of personal blogs etc.

By creating your own account, blogging, practicing expert scientists will be able to place free of charge their own, author's scientific and methodological researches in the form of abstracts, articles and more.

For our high level of professionalism, active use of services and tools, and for the achievement of outstanding results, we believe that practitioners and scholars should be encouraged to receive documentary honors free of charge, such as publication certificates, some of which can be considered as personal development trainings.

The value of such award papers will be that they are not purchased but issued solely for a high professional and scientific level.

Such a platform will allow open collaboration between practitioners and academics, academics and university students.

Conclusions.

Many suggestions for resolving existing issues are outlined in the text of this article.

Summing up, we can say that the analysis of scientific publications of the modern period of formation of the Ukrainian School of Forensic Theory on the influence of science on the development of practical activity testifies to the regularity of integration of scientific knowledge of different branches of scientific knowledge and the formation of innovative approaches to solve existing problems.

In our opinion, solution of the forensic theory to the field of legal science seems to lie in the plane of an integrative approach to scientific knowledge (the theory of information dissemination in social systems, etc.).

In our opinion, each component of the innovation process consists of a relevant chain: — education: fundamental knowledge (state and law theory, criminal law, constitutional law, etc.), professional knowledge (forensics, forensics, etc.), knowledge testing (trainings, role-playing games), practice); science: fundamental — applied research of problems of forensic activity, approbation of the obtained knowledge; transfer of knowledge into practical activities: development of proposals on creation of a system of state and non-state judicial-expert institutions; determining the place of forensic activity in criminal, administrative, economic, civil processes; definition of functions-tasks of authorized judicial-expert institutions; creation of innovative technologies for research of separate objects and development of scientifically-grounded methods of expert researches; practical activity: realization of knowledge in practical forensic activity.

Thus, the effectiveness of forensic activities depends on the implementation of innovative technologies in educational and research processes and, as a consequence, the formation of an effective organizational model of expert institutions.

This determines the need for a more detailed appeal to modern views on the development of the theory of forensic science as an area of applied legal science and the main characteristics of scientific knowledge, as well as the peculiarities of its formation in the framework of integration into European forensic science.

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Є. М. Попович

**ЄДНІСТЬ НАУКИ ТА ПРАКТИКИ В СУДОВО-ЕКСПЕРТНІЙ
ДІЯЛЬНОСТІ**

Становлення України як правової держави, вдосконалення правового регулювання використання спеціальних знань з метою належного та ефективного забезпечення захисту прав і законних інтересів фізичних та юридичних осіб і держави, усунення неузгодженостей положень законодавства в частині проведення експертиз, об'єктивно вимагають аналізу сучасного стану науки та практики в судово-експертній діяльності. Судова експертиза охоплює значну кількість наукових дисциплін і актуальних проблем викладання експертної науки. У статті пропонується використовувати науковий потенціал експертних інститутів, навчальних закладів і дослідницьких установ, які займаються прикладними дослідженнями. Співробітництво між установами, що займаються експертними дослідженнями, завдяки їх науковим досягненням і методичним розробкам, може підвищити професійну здатність у розслідуванні окремих категорій злочинів, а також сприятиме інтеграції судово-експертної діяльності в європейський простір і призведе до гармонізації та удосконалення національного законодавства, теоретичних основ судово-експертної діяльності, міжнародного визнання окремих її складових та в цілому підвищить професійну майстерність експертів. Проаналізовано шляхи вдосконалення професійної освіти майбутніх судових експертів та запропоновано ідеї проблеми єдності, взаємодії освіти, науки та практики, які, сподіваємось, будуть взяті до уваги.

Ключові слова: спеціальні знання; судовий експерт; вища освіта; навчальний процес; професійне мислення; форми освітньої підготовки; наукова діяльність; наукові працівники; науково-дослідний інститут; підвищення кваліфікації; професійні якості; науково-методична діяльність; спеціалізована вчена рада.

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V.V. Khosha,

PhD in Law, Head of Department at the KhRiFE
Kharkiv, Ukraine

ORCID: <https://orcid.org/0000-0003-0467-9826>,
e-mail: khosha@hniise.gov.ua

DEFINITION OF ADMINISTRATIVE PROCEDURES REGARDING ACCREDITATION OF FORENSIC SCIENCE INSTITUTIONS OF UKRAINE

With the declaration of independence of Ukraine, a new stage of the state has begun, accompanied by radical changes in all areas of public life. A person, his life and health, honor and dignity, integrity and security are determined by the highest social value. Therefore, the main duty of the state proclaims the assertion and protection of human rights and freedoms, for which a whole mechanism is created and functioning, each of which elements performs separate tasks in order to achieve a common goal. Forensic institutions are part of the relevant system and contribute to the establishment of objective truth in cases of violation of law, the rights and freedoms of participants in the process through an objective and fair trial or an objective basis for evaluating the results of pre-trial investigation bodies. In addition to performing these tasks, forensic institutions in Ukraine have a number of necessary conditions for carrying out conformity assessment activities, and therefore, with some transformations of the management system, technical and other improvements to meet the requirements of national standards, harmonized with relevant international and European standards in the field of assessment compliance, state specialized agencies can be accredited for compliance with the requirements of the standard ISO/IEC 17025 (as well as ISO/IEC 17020) and carry out conformity assessment activities in a specific industry.

The article is devoted to the definition of administrative procedures for the accreditation of forensic institutions of Ukraine. Attention is focused on understanding the essence of administrative procedure and their place in the process of accreditation of conformity assessment bodies. The author analyzes the scientific approaches to considering the classification of the category “administrative procedure”.

According to the results of the study, it can be stated that the administrative procedures for the accreditation of forensic institutions of Ukraine characterizes the procedure for authorized entities (national accreditation body of Ukraine) to carry out legally significant actions, the totality of which constitutes the legal process of accreditation; procedural requirements for these entities.

Keywords: accreditation, conformity assessment, forensic institutions, administrative procedures.

Formulation of Research Problem.

With the proclamation of Ukraine's independence, a new stage of state formation has been launched, accompanied by radical changes in all spheres of public life.

A person, his life and health, honor and dignity, integrity and safety are determined by the highest social value.

Therefore, the main duty of the state is proclaiming the assertion and protection of human rights and freedoms, for which a whole mechanism has been created and functioning, each of which elements performs separate tasks in order to achieve a single purpose.

Forensic institutions (hereinafter referred to as the ECJ) are part of the relevant system and contribute to the establishment of objective truth in cases of violation of law, the rights and freedoms of participants in the process through an objective and fair trial or objective basis for evaluating the results of pre-trial bodies investigation. In addition to fulfilling these tasks, FSIs in Ukraine have a number of conditions necessary for carrying out activities regarding compliance testing (hereinafter referred to as CT), and consequently, under certain changes of the management system (hereinafter referred to as JI), technical and other improvements to comply with the requirements of national standards harmonized with the relevant international and European standards in the field of CT, FSIs of Ukraine should be accredited to the international standard ISO / IEC 17025 (as well as ISO / IEC 17020) and carry out activities with CT in certain areas¹.

For this purpose, FSIs should be accredited to the international standard ISO / IEC 17025 (as well as ISO/IEC 17020) and further strictly adhere to them, which will ensure the implementation of a single technical policy in the field of CT; consumer confidence in OA activities; create conditions for mutual recognition of the results of the activities of accredited bodies at the international level; to increase the dynamics of development of their methodological support through differentiation of scientific researches, to organize a wide information exchange (including information-reference arrays of samples) on a single methodological basis, etc².

Analysis of Current Researches.

Nature and peculiarities of administrative procedures were considered in the scientific works of domestic and foreign legal scholars: V. B. Averianov³, D. M. Bakhrakh, O. M. Bandurka, N. V. Halitsyna,

¹ Khosha V. V. Administrativno-pravove zabezpechennia akredytatsii sudovo-ekspertnykh ustanov Ukrainy [Administrative and legal support of accreditation of judicial and expert institutions of Ukraine] : avtoref. dys. ... kand. yuryd. nauk. Kharkiv, 2017. S. 1. [in Ukrainian].

²Ibidem

³ Administrativne pravo Ukrainy [Administrative law of Ukraine]. Akademichnyi kurs : pidruchnyk. U 2 t. / red. Kolehii: V. B. Averianov (holova). Kyiv. Yuryd. Dumka. 2004. T. 1. Zahalna chastyna. 2004. 584 s.; Admynystrativnoe pravo : uchebnyk [dlia vuzov] / D. N. Bakhrakh, B. V. Rossynskiy, Yu. N. Starylov. 3-e yzd., peresmotr. y dop. Moskva. Norma. 2007. 816 s.; Bandurka O. M., Tyshchenko M. M. Administrativnyi protses [Administrative

Ye. F. Demskyi, O. V. Kuzmenko, O. S. Lahoda, O. I. Mykolenko, E. V. Talapina, V. P. Tymoshchuk, V. K. Shkarupa and others.

However, the administrative procedures for the accreditation process of conformity assessment bodies (hereinafter referred to as CABs) remain uncertain.

The purpose of the article is to analyze the legal and regulatory acts that regulate both the accreditation procedure of CTBs and the activities of the FSIs of Ukraine in order to determine the appropriate administrative procedures in this field.

Main content presentation.

When considering the administrative procedures for the accreditation of the ECA of Ukraine, it is first of all necessary to define the concept of “administrative procedure”. In the dictionary, the term “procedure” is defined as “the officially established or customary procedure for the implementation, execution or execution of anything”¹.

With regard to jurisprudence, in the opinion of O. V. Kuzmenko, the procedure determines the procedure for the implementation by the subjects of legal relations of legally significant actions, the totality of which constitutes a legal process.

process]; pidruchnyk dlia vyshchykh navchalnykh zakladiv. Kyiv : Litera LTD, 2002. 288 s.; Halitsyna N. V. Administratyvna protsedura yak instytut administratyvnoho protsesu [Administrative procedure as an institute of administrative process]. Forum prava. 2010. № 4. S. 163–177; Demskyi E. F. Administratyvne protsesualne pravo Ukrainy [Administrative procedural law of Ukraine]; navchalnyi posibnyk dlia vuziv. Kyiv : Yurinkom Inter, 2008. 495 s.; Kuzmenko O. V. Teoretychni zasady administratyvnoho protsesu [Theoretical foundations of the administrative process]; monohrafiia. Kyiv : Atika, 2005. 352 s.; Lahoda O. S. Administratyvna protsedura: teoriia ta praktyka zastosuvannia [Administrative procedure: theory and practice of application] : avtoref. dys. ... kand. yuryd. nauk. Irpin, 2007. 21 s.; Mykolenko O. I. Mistse administratyvnoho protsedurnoho prava v systemi yurydychnykh znan ta systemi prava Ukrainy [The place of administrative procedural law in the system of legal knowledge and system of law of Ukraine] : dys. ... kand. yuryd. nauk. Zaporizhzhia, 2011. 40 s.; Administratyvna protsedura ta administratyvni posluhy [Administrative procedure and administrative services]. Zarubizhnyi dosvid i propozyzii dlia Ukrainy / avtor-uporiadnyk V. P. Tymoshchuk. Kyiv : Fakt, 2003. 496 s.; Shkarupa V. K., Lahoda O. S. Administratyvna protsedura, yii znachennia ta mistse v administratyvno-protsesualnii diialnosti [Administrative procedure, its importance and place in administrative and procedural activity.]. Pravo Ukrainy. № 4. 2006. S. 12–14 [in Ukrainian]; Talapina Je. V., Tihomirov Ju. A. Administrativnye procedury i pravo [Administrative procedures and law]. Zhurnal rossijskogo prava. 2002. № 4. S. 3–13 [in Russian].

¹ Velykyi tlumachnyi slovnyk suchasnoi ukrainskoi movy [A large explanatory dictionary of modern Ukrainian] / uklad. i holov. red. V. T. Busel. Kyiv, Irpin : Perun, 2005. S. 1179 [in Ukrainian].

Therefore, the procedure can be considered an initial form of regulation in the activities of certain bodies, which, if necessary, grow into a form called a process¹.

A. V. Filatova notes that the procedure is a legal model of certain types of activities, so *administrative procedure* is understood as the normative-legal consolidation of those activities that are implemented within the administrative legal relations and are expressed in the legal form established by law².

V. V. Galunko and co-authors define administrative procedures as the procedure established by law for consideration and resolution by public administration bodies of individual administrative cases in order to ensure the rights and freedoms, legitimate interests of individuals and legal entities, the normal functioning of civil society and the state³.

According to V. V. Ratnikov, administrative procedure is a procedural form of legal activity of authorized entities to achieve the normatively predicted result⁴.

Under the procedural form P. E. Nedbaylo and V. M. Gorshenov consider a set of homogeneous procedural requirements that are imposed on the actions of participants in the process and aimed at achieving a specific substantive legal result.

In other words, the procedural form should be understood as a specific legal structure aimed at embodying the principle of the most appropriate procedure for the exercise of certain powers⁵.

Також у юридичній літературі адміністративні процедури визначені як порядок діяльності¹ або послідовно здійснювана діяльність².

¹ Т. Тарасов В. А. Охрана прав граждан в пенсионном обеспечении [Protection of citizens' rights in pensions]. Moskva : Izd-vo MGU, 1978. S. 40–41 [in Russian].
арасов В. А. Охрана прав граждан в пенсионно обеспечении. Москва : Изд-во МГУ, 1978. С. 40–41.

² Filatova A. V. Reglamenti i procedury v sfere realizacii gosudarstvennogo kontrolja (nadzora) [Regulations and procedures in the field of implementation of state control (supervision)]: monografija / pod red. N. M. Konina. Saratov : Nauch. kniga, 2009. S. 92 [in Russian].

³ Administratyvne pravo Ukrainy [Administrative Law of Ukraine] : navch. posib. : u 2 t. [V. V. Halunko, V. I. Olefir, M. P. Pykhtin ta in.] ; za zah. red. V. V. Halunka. Kherson : PAT «Khersonska miska drukarnia», 2011. T. 1: Zahalne administratyvne pravo. S. 276 [in Ukrainian].

⁴ Ratnikov V. V. Administrativnaja procedura akkreditacii v sfere vysshego obrazovanija [Administrative accreditation procedure in the field of higher education]: avtoref. dis. ... kand. jurid. nauk. Cheljabinsk, 2012. S. 11 [in Russian].

⁵ Juridicheskaja processual'naja forma: teorija i praktika [Legal procedural form: theory and practice] / pod obsbh. red. P. E. Nedbaylo, V. M. Gorsheneva. Moskva : Jurid. lit-ra, 1976. S. 13–14 [in Russian].

Отже, адміністративні процедури акредитації СЕУ України характеризують:

1) procedure for carrying out legally significant actions by the authorized person (the national body of Ukraine on accreditation), the totality of which constitutes the legal accreditation process;

2) procedural requirements imposed on the subjects.

Порядок проведення акредитації національним органом України з акредитації (далі – НОУА) визначений нормами Закону України «Про акредитацію органів з оцінки відповідності»³ і конкретизований у настанові з управління Національного агентства з акредитації України (далі – НААУ) від 09 лютого 2016 р. Аналіз цих нормативно-правових актів дозволяє виділити такі етапи процедури акредитації ООБ:

1) application for accreditation or extension of the scope of accreditation by the applicant;

2) consideration of documents and information annexed to the application;

3) forming the composition of the accreditation group and informing the applicant;

4) analysis of the information and documentation provided;

5) drawing up a plan and informing the applicant thereof;

6) проведення оцінки на місці (далі – ПОМ);

7) analysis of the collected materials, preparation of reports and the act of assessment on the spot;

8) evaluating the results of accreditation work, making recommendations and making decisions.

Therefore, the basis for the start of the administrative procedure of accreditation of the FSIs of Ukraine is the submission of the application of the established form to the NAF together with the necessary list of documents, which is formed depending on the type of future CTB.

The list and application forms are published on the NAF website⁴.

¹ Demskyi E. F. Administratyvne protsesualne pravo Ukrainy [Administrative procedural law of Ukraine]: navch. posib. Kyiv : Yurinkom Inter, 2008. S. 134–135 [in Ukrainian].

² Talapina Je. V., Tihomirov Ju. A. Administrativnye procedury i pravo [Administrative procedures and law]. Zhurnal rossijskogo prava. 2002. № 4. S. 4 [in Russian].

³ Pro akredytatsiiu orhaniv z otsinky vidpovidnosti [On the accreditation of conformity assessment bodies] : Zakon Ukrainy vid 17.05.2001 r. № 2407–III. Ofitsiyni visnyk Ukrainy. 2001. № 24. S. 9. St. 1056 [in Ukrainian].

⁴ Podannia zaiavky na akredytatsiiu [Submission of application for accreditation]. URL : <http://naau.org.ua/podannya-zayavky-na-akredytatsiyu/> (data zvernennia 28.06.2019) [in Ukrainian].

The following documents shall be submitted with the application for accreditation of FSI in accordance with the requirements of ISO/IEC 17025:

1) statutes (Statutes and Regulations, copies of certificates on state registration of legal entity and registration of the payer of value added tax);

questionnaire, including general information about the FSI (name; name of the responsible person; address; form of ownership; management body, etc.); information on cooperation with other laboratories (institutions); presence of valid accreditation certificates, authorization for such on the declared field of work in other accreditation systems; the number of expert studies in the areas of the FSI activity conducted during the one year prior to the application submission, etc. ;

FSI passport;

4) *Areas of accreditation* project;

5) documentation of the control system in accordance with DSTU ISO / IEC 17025: 2017 (list of documentation, complete set of procedures and others);

6) location information of the applicant's premises in the city;

7) layout of FSI and adjacent premises with equipment layout;

8) copies of diplomas or other documents certifying the qualification of the head, his deputies and persons entitled to sign protocols and specimen signatures;

9) copies of the original test reports (studies) for each activity;

10) a questionnaire stating: classification of accreditation (primary, repeated, extension of scope, etc.); information about the SEA and the person who drew up the questionnaire; generalization of the scope of accreditation; the number and item of the document that fulfills the requirements of DSTU ISO / IEC 17025: 2017;

data on evaluation of test methods (researches).

The application and the aforementioned list of documents must be accompanied by the relevant cover letter which is registered in the records of Administrative and Accounting Department and archives department of the NAF Planning.

Acceptance, entry control and registration of the application is carried out in accordance with the methodology M-08.08.03, approved by the order of NAAU of July 31, 2014 № 185-I, designed to ensure the effective and efficient functioning of processes that operate in the agency.

After registration, the said package of documents is first submitted to the NAF management for decision; then to the accreditation department for further processing in the established order (registration of the received application in paper and electronic form, assignment of its serial number and verification of completeness of documents, etc.).

In case of deficiencies in filling in the application or in the formation of a set of documents, the applicant (responsible representatives of the FSI) must finalize the submitted materials within a period not exceeding 120 days.

It should be noted separately that during the review of the Accreditation Areas project, the NAAU SEU performs resource analysis in accordance with ISO / IEC 17011, which states in paragraph 7.3 that the accreditation body must analyze its ability to assess the CAB applying for accreditation under its own conditions. its own policy, its competence and the availability of relevant assessors and experts.

In the absence of adequate resources (for example, experts with relevant technical knowledge), NAAU has the right to refuse the SEA the further accreditation process.

To make a decision on the application under consideration, a responsible (executor) is appointed, who, by the consequences of checking the availability of all necessary documents, completeness and sufficiency of information in them, prepares a protocol of consideration and a draft decision, the correctness of which is checked by the head of the accreditation department.

Further, the correctness of the conclusions drawn and the draft decision are verified by the Head of the accreditation department and approved by the First Deputy Chairman for accreditation of NAF.

The next step in the administrative procedure for the accreditation of the ECA of Ukraine is: forming the composition of the accreditation audit team and informing the applicant in advance; drawing up, verification and signing of the accreditation agreement; drafting and approval of the Accreditation Program group formed; an analysis by the audit team of the information provided in the documents.

The Head of the accreditation department of the NAF CTB after submitting to it an application of the FSI with a set of documents by the department for accreditation, registration and issuance of certificates of accreditation, appoints the responsible executor of the relevant department of accreditation and transmits the documents in paper and electronic form to the head of the accreditation auditing team contacts between members of the group, about which an appropriate entry is made in the Accreditation Program.

The technical and terminological analysis of the information provided by the FSI is carried out by a group of auditors in accordance with the approved NAAU methods: *Conducting the analysis of the information and documentation provided by the applicant laboratory* M-08.01.09, approved by the Order of the NAF dated January 27, 2014 No. 177-I (with accreditation according to with the requirements of ISO/IEC 17025) and *Conducting analysis of information and documentation provided by the*

applicant (certification body, inspection body) M-08.03.11, approved by NAF Order No. 183-Y on June 20, 2014 (accredited according to with requirements standard ISO / IEC 17020).

According to the results of the analysis of documents, an act is sent and sent to the FSI.

In case of negative results of the analysis, the applicant must finalize the documents within a period not exceeding 90 days and send them for re-analysis with the conclusion of an additional agreement.

If the period of completion is exceeded, the application shall be canceled.

Based on the act of analysis by the group of auditors of the information and documentation provided by the SEA (together with the accreditation auditors' reports), the NAF accreditation department prepares a draft decision in two copies, approved by the NAF Chairman, and with the act is sent to the applicant in one copy (the second copy is left to the other).

In the case of positive results of the audit by the audit team of the information and documentation provided by the FSI, the next step in the administrative procedure is the OSA based on the relevant plan, which agrees with the applicant and contains information on accreditation criteria based on standards, ILAC/IAF/EA documents, etc.

The on-site assessment is performed in order to establish the conformity of the SEU with the accreditation requirements and is carried out in accordance with the plan in accordance with the methods of *Conducting on-site laboratory evaluation* M-08.01.14, approved by the NAF Order No. 189-I of October 17, 2014 (accreditation in accordance with ISO / IEC 17025) and *On-site Assessment by Certification and Inspection Bodies* M-08.03.15, approved by NAF Order No. 184-I on July 7, 2014 (accredited in accordance with ISO/IEC standard 17020).

The main stages of on-site assessment are: holding a preliminary meeting with the management of the SEU; reviewing, collecting evidence and observing the assessment to obtain objective information on the compliance of the SEA with the accreditation criteria; analysis of objective data collected and determination of conformity (non-compliance) of SEA with accreditation criteria; holding a final meeting with the management of the SEU to discuss the results of the evaluation and drafting and signing of the minutes of the meeting, defining the terms of elimination of the identified discrepancies¹.

During the preliminary meeting, which is held and recorded with the attendance registration (in 2 copies): the members of the SEA management are presented to the management of the audit team by their manager,

¹ Metodyka «Provedennia otsinky laboratorii na mistsi» [Methodology "Conducting on-site laboratory evaluation"] : nakaz Nats. ahentstva z akredytatsii Ukrainy vid 17.10.2014 r. № 189-Ia. URL: https://naau.org.ua/files/Metodiki/M-08_01_14.pdf (data zvernennia 28.06.2019) [in Ukrainian].

establishing official contacts, reviewing the scope and tasks of the assessment and briefing on the appropriate methods, reporting etc; communicates to the responsible representatives of the SEU information on the conditions under which the evaluation may be terminated, the procedure for lodging appeals regarding the conduct or conclusions of the evaluation; the issues of confidentiality, the Evaluation Plan, the date and time of the final meeting and, if necessary, the intermediate meetings are agreed; the Head of the Audit Team informs the SEA of the deadline for completing the appropriate monitoring forms and the questionnaire (no later than five days after the NAAU receives the decision on the evaluation results); the members of the audit team are instructed by an authorized SEA officer on safety rules.

While FSI accreditation in accordance with the requirements of ISO / IEC 17025 assesses the functioning of the SU, both in terms of policy and its practical application, the presence of the basic elements reflected in DSTU ISO / IEC 17025: 2017, and the practical implementation of technical requirements and methods of expert research.

In order to ensure that a sufficient number of objective observations and evidence of the compliance of the SEA activities with the requirements of accreditation are collected, the head of the audit team constantly monitors their work and adjusts sources of information, which may include: direct observation of the activity, working conditions and working environment of the SEA; analysis of working documents (orders, job descriptions, procedures, plans, personnel records, etc.); analysis of work records (expert reports, meetings, monitoring reports, etc.); SEA website and analytical databases.

The accreditation of FSIs in accordance with the requirements of ISO / IEC 17020 shall use the CT schemes defined in such a general document as *Criteria for evaluation and acceptance of conformity assessment schemes* ZD-08.08.29, approved by NAF Order No. 183 of June 20, 2014 -I. The specific reference in the FSI documents is checked.

Specific reference in the FSI documents is checked.

Sources of information are defined in ISO 19011: 2011, subp. 6.4.6 which states that, during the audit, information related to the audit objectives, area and audit criteria, including information regarding the interaction between units, activities and processes, should be collected through appropriate sampling and verified.

Audit confirmation should only include verifiable information. Audit certificates must be registered. If the audit team becomes aware of any new or changed risks, the audit team should consider and take appropriate actions¹.

¹ ISO 19011:2011. Guidelines for auditing management systems. Valid from 2011–11–15. Geneva : ISO, 2011. 44 p.

The results of the observations made during the assessment shall be heard at the final meeting, which shall be attended by members of the audit team, the representatives of the FSI and, if desired, other interested parties.

One copy of the minutes of the summary meeting, which contains the conclusions of the evaluation group together with the non-conformance protocols, shall remain in the FSI.

If any discrepancies identified by the audit team of the relevant Protocol are identified in the course of the assessment, the FSI is invited to make adjustments to remedy them within 3 months from the end of the assessment.

Also, within 3 working days, the Head of the Audit Team draws up and submits to NAF information in the form of a service record of the non-conformities established during the FSI assessment.

Corrective action and other pertinent information that could assist in determining compliance with the requirements and competence of the SEA is provided to the audit team in a documented manner as confirmation of the non-compliance, followed by full or partial additional (re) assessment on the spot within no more than 2 business days.

The Head of the Accreditation Audit Team, after compiling and submitting to the OSA Members (in paper and electronic form), within a period not exceeding 10 working days, draws up the relevant OSA Act that together with the Reports is submitted to the NAF within a period not exceeding 14 business days from the end of the assessment.

In assessing the results of the work of the SEA accreditation, if necessary (eg, in case of different interpretations, etc.), NAAU may ask for discussion and consideration by the TKA Presidium (hereinafter referred to as PTCA), which provides a specialist in the relevant field for carrying out such work.

The results of the process of evaluation of accreditation works by a representative of TKAP are formulated in the form of a recommendation according to the approved form of NAF.

The decision is made after receiving the OSA Act, the whole set of documents and, if necessary, the recommendations of the TKAP:

1) Responsible executor who checks the completeness of the case, the correctness of records (availability of dates and signatures);

2) Head of the department, who checks the completeness and implementation of the evaluation program and all aspects of FSI accreditation (including observations, accreditation criteria, use of relevant EA/ILAC/IAF recommendations), identified inconsistencies and corrective actions;

3) Head of the accreditation department who is responsible for the correct execution of the draft decision on accreditation. He is also responsible for presenting the case to the Chairman for a final conclusion;

4) first Deputy Chairman for accreditation, who is responsible for verifying the correctness of the recommendations and conclusions made¹.

The final decision is made and approved in accordance with the current legislation of Ukraine by the NAF Chairman, after which: the accreditation certificate is issued and issued for a period of 5 years; SEA information is entered in the register of accredited CTB; General Agreement between NAF and FSI is concluded, which contains their rights and obligations.

Following the completion of the FSI accreditation and the receipt of the relevant certificate, administrative procedures also include: conducting monitoring through the supervision and extraordinary assessments of the activities of the accredited FSI; expanding or limiting the scope of accreditation; suspension or cancellation of accreditation certificate.

Supervision always involves OSA, the term of which is determined by the audit plan.

The frequency of scheduled inspections is not affected by the number of extraordinary assessments of the FSI, which, if necessary are made after consideration of NAF appeals or complaints related to the activities of the accredited FSI received in accordance with the procedure established by law, as well as on the instructions of the central executive authorities, requirements state control and law enforcement agencies, obliged to comply with the current legislation, in accordance with the methodology *Monitoring organization and conducting of through the implementation of extraordinary assessment*².

According to the accredited NAF accreditation procedure, a re-evaluation is carried out every 5 years.

For the purpose of monitoring by means of re-evaluations, the SEU must submit, within 6 months before the expiration of the validity of the accreditation certificate, a set of documents on paper and electronic media.

If the FSI did not apply to the NAF with a request for re-accreditation within the specified period; the evaluation procedure must be performed in accordance with the requirements of the initial assessment.

Monitoring of NAF (if necessary with involvement of specialists of other organizations) is carried out:

- for activity of accredited FSIs in accordance with the requirements of ISO / IEC 17025 in accordance with the methodology "*Monitoring*

¹ Poriadok akredytatsii [Accreditation order]. URL : <http://naau.org.ua/dokumenty-dlya-akreditatsiyi/poryadok-akreditatsiyi/> (data zvernennia 28.06.2019) [in Ukrainian].

² Metodyka «Orhanizatsiia ta provedennia monitorynhu shliakhom zdiisnennia pozacherhovoi otsinky» [Methodology "Organization and monitoring carried out with a slut for a posture of a rough draft"] M-08.00.19, redaktsiia 08 vid 17.05.2018. URL : http://naau.org.ua/wp-content/uploads/2014/04/M-08.00.19_red_06_Monitoring_COOV.pdf. (data zvernennia 28.06.2019) [in Ukrainian].

organization and conducting through the supervision of accredited laboratories and extraordinary assessments" (M-08.01.12) that is developed in accordance with the requirements of the Law of Ukraine "On accreditation of bodies Conformity Assessment ", ISO / IEC 17011 and EA-3/09 Special Document *Surveillance and Reassessment of Accredited Organizations* for the continued compliance established during accreditation;

– for activities of accredited FSIs in accordance with the requirements of ISO/IEC 17020 in accordance with the methodology *Organization and carrying out of monitoring by supervision of accredited certification bodies, inspection bodies and extraordinary assessments* (M-08.03.13) that is developed in accordance with the requirements of the Law of Ukraine "On Accreditation of Conformity Assessment Bodies" and requirements of European and International Documents (ISO / IEC 17011: 2004, IAF / ILAC-A4: 2004, IAF / ILAC A5: 11/2013, IAF GD 5: 2006, IAF GD 24 : 2009 and EA-3/09).

The process of carrying out monitoring by means of supervision and monitoring by means of carrying out extraordinary assessment of activity of accredited NAF testing and calibration laboratories for compliance with the requirements of DSTU ISO / IEC 17025: 2017 in accordance with Art. 11 of the Law of Ukraine: *On Accreditation of Conformity Assessment Bodies* is carried out in the following succession:

1. Supervision planning.
2. Drawing up and approving the schedule of supervision.
3. Analysis of FSI documents to be monitored and results of previous evaluations.
4. Evaluation program development.
5. Formation of the composition of the group of auditors on accreditation.
6. Making of contracts with SEA and auditors.
7. Drawing up an assessment and information plan for the SEA.
8. The evaluation plan shall be based on a developed and approved oversight program.
9. Signing of the contract and OSA (observation).
10. Analysis of collected materials, evaluation of evaluation results.
11. Decision making by NAF management and informing about the results of FSI assessment.

In the event that the facts of non-compliance with the accreditation criteria are identified, NAF has the right to request from the FSI the introduction of corrective measures (the elimination period is 1 month after the on-site assessment is completed).

In addition, in the event that the FSIs are not identified and the requirements for competence in a particular area of accreditation are not complied with, NAF has the right to limit the scope.

The FSI has the right to apply for the extension of the scope of accreditation, the decision of which is made by NAF after the measures of verification of CTB competence.

NAF conducts an extraordinary assessment of accredited FSIs upon receipt of appeals and complaints filed in the statutory cases, related to the activities of accredited laboratories and identified violations of accreditation requirements.

In the absence of evidence of prior appeal, in the case of admissibility, the NAF proposes in writing to the applicant to address the laboratory directly to the laboratory, with the exception of consideration of requests (appeals) of the People's Deputies of Ukraine, the requirements of law enforcement and state control bodies.

Extraordinary assessment may be carried out in case the NAF receives requests from the central executive authorities, requests from state control and law enforcement agencies, which establish the fact or available information about the FSI committing gross violations of its duties (clause 1.2 of the Methodology *“Organization and Conducting of Monitoring by Exercise extraordinary assessment”*¹).

NAF extraordinary assessment of accredited FSIs is conducted in a similar sequence oversight procedure, except for the first two steps, which are the consideration of an appeal or complaint and the ordering of an appropriate assessment as a result of a positive consideration of NAF applications or complaints.

In some cases, it is a temporary suspension (cancellation) of the accreditation certificate.

If necessary, as observers, within the limits of their powers, representatives of local executive authorities and local self-government bodies, law enforcement agencies and other bodies of their control may be involved in carrying out the extraordinary evaluation.

In order to verify the facts that led to the violation and became the basis for the FSI supervision, the program of this measure contains only the requirements of the sections of the regulatory documents that need to be verified.

If the FSI members of the group of auditors are not allowed to hold an on-site assessment on the spot or the authorized representative of the FSI does not sign the relevant documents, prepared by the group, the audit leader shall record this fact in the minutes of the preliminary meeting, which is signed by all members of the group of auditors.

¹ Metodyka «Orhanizatsiia ta provedennia monitorynhu shliakhom zdiisnennia pozacherhovoi otsinky» [Methodology “Organization and monitoring carried out with a slut for a posture of a rough draft”] M-08.00.19, redaktsiia 08 vid 17.05.2018. URL : http://naau.org.ua/wp-content/uploads/2014/04/M-08.00.19_red_06_Monitoring_COOV.pdf. (data zvernennia 28.06.2019) [in Ukrainian].

The members of the group of auditors are also entitled to record the process of conducting an extraordinary assessment on the spot or each individual action by audio and video equipment without hindering such an audit.

The Head of the Accreditation Audit Team, after compiling and submitting to the Members within a period not exceeding 2 working days, draws up the relevant Act for early on-site assessment, which together with a set of documents is submitted to NAF for a period not exceeding 3 working days, business days from the date the assessment was completed.

In case of a negative decision, these issues are considered by the relevant commission, upon which the NAF Chairman makes the final decision.

Upon approval by the Chairman of the negative opinion and taking into account the decision on the results of consideration of complaints (complaints), the department of accreditation, registration and issuance of certificates of accreditation, the relevant information is entered in the register of accredited CTBs, of which the complainant is informed in writing (in some cases, by the decision of the NAF stakeholders).

This information is also available on the NAAU's official website.

In case of gross violations of the accreditation criteria (eg detection and non-elimination of SEA discrepancies, incorrect use of the accreditation mark, preventing SEU members of the group of auditors from conducting an extraordinary assessment on the spot, the negative result of consideration of appeals (SEU) during the decision of the SAA, etc. Certificate of accreditation for a period of 1 year.

It is prohibited to carry out work in the field of its activity with reference to the national accreditation mark in case of temporary suspension of the FSI.

If the FSI does not remedy the discrepancies within the term of the Decision on suspension of the certificate, it shall be canceled without the possibility of its renewal.

The general algorithm of administrative procedures of accreditation of the SEU of Ukraine is shown in fig. 1.

Conclusions.

Therefore, the administrative procedures for accreditation of the FSIs of Ukraine are characterized by:

- 1) the procedure for carrying out legally significant actions by the authorized by the subject (NOUA), the totality of which constitutes the legal accreditation process;

- 2) procedural requirements imposed on the subjects.

In addition to the administrative procedure for accreditation of SEA of Ukraine, monitoring of accredited SEA of Ukraine through supervision and re-evaluation is of key importance for conformity assessment activities.

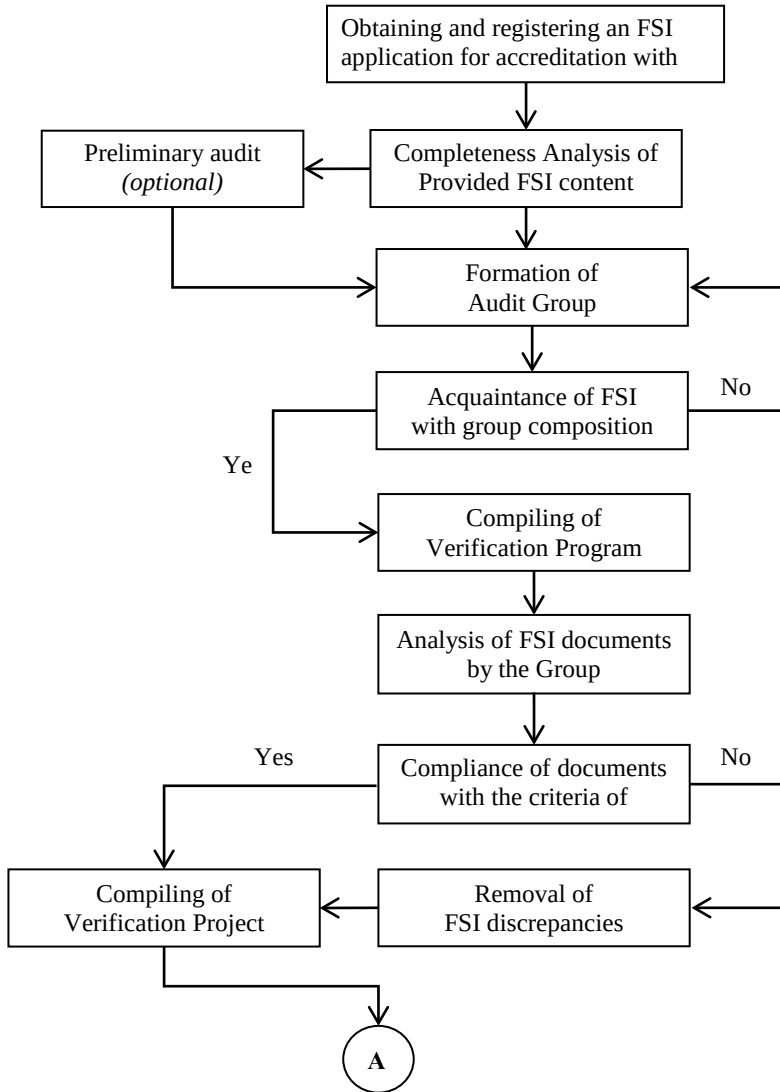


Fig.– General algorithm of administrative procedures of accreditation of the FSI of Ukraine

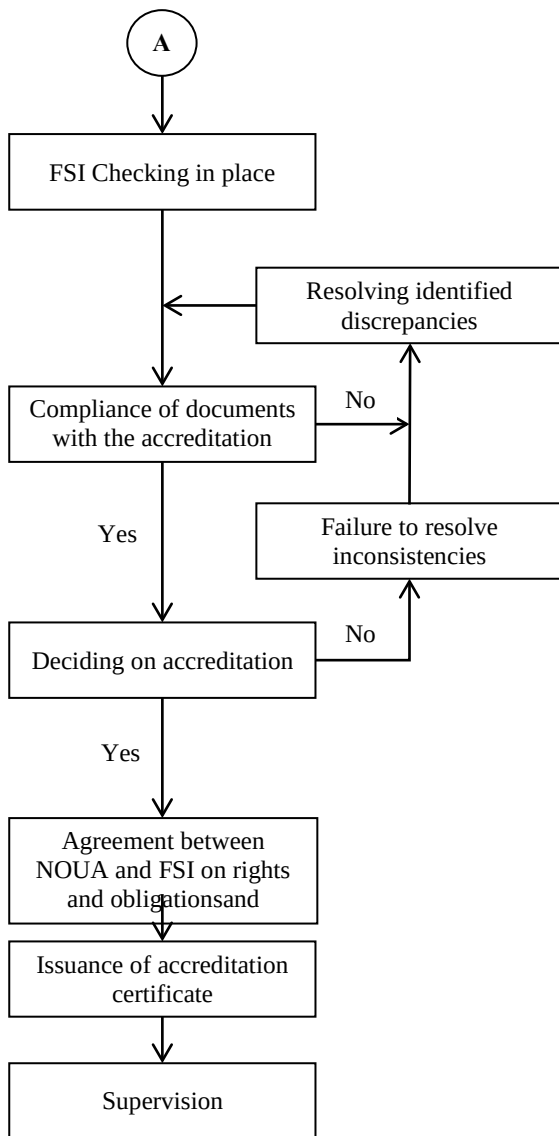


Fig.– General algorithm of administrative procedures of accreditation of the FSI of Ukraine

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В. В. Хоша

ВИЗНАЧЕННЯ АДМІНІСТРАТИВНИХ ПРОЦЕДУР АКРЕДИТАЦІЇ СУДОВО-ЕКСПЕРТНИХ УСТАНОВ УКРАЇНИ

Статтю присвячено визначенню адміністративних процедур акредитації судово-експертних установ України. Акцентовано увагу на розумінні суті адміністративних процедур та їх місця в процесі акредитації органів з оцінки відповідності. Проаналізовано наукові підходи до розгляду питання класифікації категорії «адміністративна процедура».

За результатами проведеного дослідження можна констатувати, що адміністративні процедури акредитації судово-експертних установ України характеризують порядок здійснення уповноваженим на те суб'єктом (національним органом України з акредитації) юридично значущих дій, сукупність яких складає юридичний процес акредитації; процедурні вимоги, які пред'являються до вказаних суб'єктів.

Ключові слова: акредитація, оцінка відповідності, судово-експертні установи, адміністративні процедури.

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V. S. Sezonov,
PhD in Law, Senior Forensic Expert of Kharkiv SRFC
of MIA of Ukraine
ORCID:<http://orcid.org/0000-0002-2580-2953>
e-mail: sv26031985@gmail.com

FEATURES OF PREPARATION AND ASSIGNMENT OF FORENSIC EXAMINATION OF VEHICLES AND REGISTRATION THE DOCUMENTS

The article analyzes the features of the preparation and appointment of forensic examination of vehicles, procedural and tactical requirements for this examination. The vehicle is a special object of forensics, which imposes certain restrictions on its preparation for examination.

Specific requirements for the tactics of investigative actions with this object are intended to ensure the legality and admissibility of evidence for criminal proceedings. The vehicle is also an object for conducting expert studies of various types. The issue of changing the identification numbers (body, engine), determining the year of manufacture, replacing the data carriers about the car (number and code plates, etc.) are resolved by means of traceability. To solve the issue of replacing the body number by replacing the panel with a number plate, a complex forensic chemical (paintwork research) and trace evidence examination are appointed.

The issue of re-equipment of the vehicle is solved by complex trace evidence and commodity expertise, etc. The complexity of the study of the vehicle and the accompanying documents requires the appointment of directly comprehensive examinations of various types.

In the investigation of unlawful acts related to the illegal movement of vehicles across the customs border of Ukraine, auto-merchandising and transport-merchandising examinations can also be carried out to solve the problems associated with determining the market value of wheeled vehicles, their components, as well as the amount of the cost of material losses caused to the owner or to the owner of wheeled vehicles, their components due to damage to the latter. The indicated examinations are quite often appointed in conjunction with the trace evidence examination.

The fulfillment of certain procedural requirements is designed to ensure the legality and admissibility of evidence obtained in the course of investigative actions and the results of forensic examinations conducted by them.

Keywords: criminal proceedings, vehicle, comprehensive examination, forensic examination, identification number.

Formulation of Research Problem.

Criminal proceedings provide for the use of specialized knowledge in two forms: procedural and non-procedural.

Forensic examination is one of the most common forms of obtaining evidence that is based on the scientific knowledge and skills of specially authorized persons and consists of conducting appropriate investigations using the necessary methods and means.

The Law of Ukraine: *On Judicial Examination* defines forensic expertise as research based on specific knowledge in the field of science,

technology, art, craft, etc. of objects, phenomena and processes in order to reach a conclusion on issues that are or will be the subject of litigation¹.

This method of retrieving information allows you to establish factual data that cannot be otherwise established.

Аналіз останніх досліджень.

P. D. Bilenchuk², A. P. Gel, V. H. Goncharenko³, I. V. Gora, S. I. Kobzar, I. V. Piryh, H. S. Semakov, M. A. Fedoseev, M. G. Shcherbakovskyi and others devoted their researches to this problem at different times.

The **article purpose** is to determine that the peculiarities of the process of preparation and assignment of judicial expertise of vehicles are a combination of procedural and organizational actions aimed at collecting, preparing and processing materials for judicial examination in order to make the most effective use of specialized knowledge in criminal proceedings.

Main content presentation.

Appointment of forensics is a complex process that results from the exercise of both the powers of the court and the initiative of the persons involved in the case.

¹ Pro sudovu ekspertyzu [On forensic examination] : Zakon Ukrainy vid 25 liutoho 1994 roku № 4038–XII. URL:<http://zakon3.rada.gov.ua/laws/show/4038-12> (data zvernennia 14.01.2019) [in Ukrainian].

² Bilenchuk P. D., Hel A. P., Semakov H. S. Kryminalistychna taktyka i metodyka rozsliduvannia okremykh vydiv zlochyniv [Forensic tactics and methods of investigation of certain types of crimes]: navch. posib. Kyiv : MAUP, 2007. 512 s.; Ekspertyza u sudovii praktitsi [Judicial expertise] : nauk.-prakt. posib. / za zah. red. V. H. Honcharenka. 2-he vyd., pererob. i dopovn. Kyiv : Yurinkom Inter, 2010. 400 s.; Ekspertyzy u sudochynstvi Ukrainy [Expertise in the Judiciary of Ukraine] : nauk.-prakt. posib. / za zah. red. V. H. Honcharenka, I. V. Hory. Kyiv : Yurinkom Inter, 2015. 504 s. [in Ukrainian]; Kobzar S. I. Organizacija naznachennija kriminalisticheskikh jekspertiz i ispol'zovannija ih rezul'tatov v rassledovanii prestuplenij [Organization of the appointment of forensic examinations and the use of their results in the investigation of crimes]: ucheb. posob. Lugansk: RIO LGUVD, 2007. 256 s [in Russian]; Piryh I. V. Teoretyko-prykladni problemy ekspertnoho zabezpechennia dosudovoho rozsliduvannia [Theoretical and applied problems of expert support of pre-trial investigation]: monohrafiia. Dnipropetrovsk : Dniprop. derzh. un-t vnutr. sprav ; Lira LTD, 2015. 432 s.; Bilenchuk P. D., Hel A. P., Semakov H. S. Kryminalistychna taktyka i metodyka rozsliduvannia okremykh vydiv zlochyniv : navch. posib. Kyiv : MAUP, 2007. 512 s.; Fedoseiev M. A. Provedennia kompleksnoho doslidzhennia transportnykh zasobiv i dokumentiv, shcho yikh suprovodzhuiut, pid chas rozsliduvannia zlochyniv, poviazanykh z nezakonnym peremishchenniam avtotransportu cherez mytnyi kordon Ukrainy [Carrying out a comprehensive investigation of vehicles and their accompanying documents during the investigation of crimes related to the illegal movement of vehicles across the customs border of Ukraine]. Kryminalistychnyi visnyk. 2013. № 1 (19). S. 133–138; Shcherbakovskyi M. H. Pryznachennia ta provadzhennia sudovykh ekspertyz. Xarkiv : Faktor, 2011. 400 s [in Ukrainian].

³ Shcherbakovskyi M. H. Pryznachennia ta provadzhennia sudovykh ekspertyz. Xarkiv : Faktor, 2011. 400 s [in Ukrainian].

Therefore, in determining whether or not there are grounds for ordering a forensic examination, the courts should not ignore the position of the persons involved in the process.

The forensic literature identifies the factual and legal grounds for the appointment of forensic expertise in criminal proceedings. Thus, Mykhailo Grigorovych Shcherbakovskiy notes that the factual basis for the appointment of the examination is the need for special knowledge to establish the circumstances of the crime under investigation.

In each case, these circumstances are determined by the investigator who appoints the examination.

The legal basis for the examination is the relevant decision of the investigator.

Procedural relations are formed between the investigator and the expert in conducting the forensic examination¹.

However, at present, due to changes in certain norms of the Criminal Procedural Code of Ukraine; the procedural decision of the investigating judge is a legal basis for the appointment of forensic examination.

Thus, the Part 1 of Art. 242 of the Criminal Procedural Code of Ukraine states that the examination is conducted by expert institution, expert or experts on the instructions of the investigating judge or court provided at the request of the party of criminal proceedings or if special knowledge is needed to clarify the circumstances relevant for criminal proceedings.

Thus, the legal basis for the appointment of forensic expertise in criminal proceedings is the decision of the investigating judge, made at the request of the investigator, prosecutor, victim, his legal representative, suspect, his defense lawyer or legal representative.

It should be noted that although the legal bases have changed, however, the factual ones, in fact, have remained the same, that is, when identifying objects whose research requires special knowledge, the investigator decides on the need for a judicial examination, prepares materials and performs other preparatory actions.

It should be supported by the opinion of those scientists who believe that the preparation of materials for examination is a system of procedural, organizational, tactical and technical actions for the collection, preparation and execution of the objects of expert research necessary for the examination.

Some scholars even talk about the need to develop tactics for the appointment of forensics, because the process is often quite difficult and time-consuming.

Under this tactic I. F. Krylov understands the system of methods and techniques of science and practice that must be applied on the basis of procedural law in the preparation, appointment and conduct of expertise for

¹ Ibidem p. 189

the most effective use of specialized knowledge in resolving issues that are relevant for establishing the truth in the case under investigation.

I. V. Pyrih considers the process of involving an expert as a separate investigative (search) action.

It defines its content, dividing it into stages: preparatory, working and final.

To the preparatory stage, the scientist attributes the following actions:

- 1) the decision of the investigator to conduct experts;
- 2) the choice of an expert institution or a private expert;
- 3) determination of the type of examination and subject of research;
- 4) determining the order of appointment of examinations in relation to the same objects;
- 5) choice of appointment time of the examination.

In the working phase of engaging an expert, he believes that the following should be considered:

- 1) selection of objects for examination, including samples and samples;
- 2) making a decision on the appointment of the examination.

The final stage, in turn, consists of the following stages:

- 1) determination of the number of persons who may be present during the examination;
- 2) sending the resolution and necessary materials to the expert institution¹.

Taking into account the views of researchers and the norms of the Criminal Procedural Code of Ukraine, it can be argued that the process of preparation and appointment of judicial expertise is a set of procedural and organizational actions aimed at collecting, preparing and processing the materials for judicial examination in order to most effectively use specialized knowledge in criminal proceedings.

In general, the process of assigning forensic expertise to vehicles involves the following set of procedural and organizational measures:

- removal of objects and deciding on the need to involve a forensic expert;
- determination of the type of forensic examination and its tasks;
- preparation of materials for forensic examination;
- correct and timely choice of the moment of appointment of the forensic examination;
- formulating expert questions;
- choice of expert institution or expert;
- request for the appointment of a forensic examination.

¹ Pyrih I. V. Teoretyko-prykladni problemy ekspertnoho zabezpechennia dosudovoho rozsliduvannia [Theoretical and applied problems of expert support of pre-trial investigation]: monohrafiia. Dnipropetrovsk : Dniprop. derzh. un-t vnutr. sprav ; Lira LTD, 2015. S. 233–248 [in Ukrainian].

The decision of the investigator on the need to involve a forensic expert and to conduct a forensic examination occurs when identifying specific objects, the research of which requires the use of specialized knowledge.

Therefore, such a decision is made in the course of investigative (investigative) actions, such as inspection of the scene, inspection of the object (vehicles, documents that accompany them), search, investigative experiment, etc.

Having identified specific objects, the investigator analyzes them either individually or, if necessary, with the help of a specialist and determines the circumstances that need to be clarified, and provides the kind of special knowledge that can be applied to these objects.

As mentioned above, in the investigation of certain types of crimes against the safety of traffic and operation of transport, crimes related to the illegal movement of transport across the customs border of Ukraine, crimes in the field of circulation of excisable goods, as well as many other types of crimes in the mechanism of which they appear vehicles, there is a need to study such objects.

However, the production, use and operation of vehicles are inextricably linked to the relevant documents that must accompany them.

Therefore, the research of such objects should be carried out in a complex, which will greatly simplify and shorten the time of preparation and conducting of judicial examinations.

At present, in the process of investigating such criminal proceedings, the investigator has to assign several separate types of expertise on the specified objects, or even several examinations on the same object.

Therefore, when deciding on the need for an examination, the investigator must clearly represent its subject as a system that includes: objects of study; the purpose (purpose) of research; methods and techniques used to solve the tasks¹.

Taken in account that main subject of investigation in the criminal category under consideration is vehicles, their units and units, which left traces at the scene or were the subject of a criminal attack and were subjected to criminal influence by destruction or alteration, there is a need to designate a number of trace evidence analyses.

In particular, the examination of vehicle traces, the main tasks of which are the identification (identification) of a specific vehicle unit by parts and traces left behind by its parts; diagnostics (establishment of properties and condition of objects) and situational task (establishment of mechanism of trace formation, mechanism of interaction of the vehicle with other objects).

¹ Kobzar S. I. Organizacija naznachenija kriminalisticheskikh jekspertiz i ispol'zovanie ih rezul'tatov v rassledovanii prestuplenij [Organization of the appointment of forensic examinations and the use of their results in the investigation of crimes]: ucheb. posob. Lugansk: RIO LGUVD, 2007. S. 9-10. [in Russian].

It should be noted that, in addition to the aforementioned expertise, similar tasks are also solved by one of the types of engineering and transport expertise — transport and traceology.

The latter also allows identification of the traces left by the vehicle, its specific specimen or its type, model; determine the relative position of vehicles at the time of contacting them; determine the places of collision of vehicles and the location of the oncoming obstacle (pedestrian), establishing the mechanism of formation of tracks; determines the location of vehicles relative to the roadway at the time of contact.

Thus, it has been established that the transport-trasological examination is essentially more forensic than engineering.

Therefore, the separation of these two types of expertise is done artificially, not caused by the need to involve different classes of specialist knowledge.

This again confirms the feasibility of forming a forensic examination of vehicles as an independent subspecies of expertise.

In addition, in some cases, there is a need to design an examination of embossed signs, the object of which can be recovered sawn (hammered), visually impaired numbers and other embossed images on various products.

The examination determines the fact and the way of changing the images.

This expertise is intended in criminal proceedings for the unlawful taking of vehicles for the purpose of which criminals interrupt the identification numbers of units and units.

Subsequently, such vehicles are either operated on the territory of Ukraine or exported abroad.

In the investigation of unlawful acts related to the illegal movement of transport across the customs border of Ukraine, automotive and transport expertise can also be carried out, which solve problems related to determining the market value of wheeled vehicles, their components, and the value of material goods. damage to the owner or the owner of the wheeled vehicles, their components as a result of damage to the latter.

It should be noted that these examinations are often assigned in combination with trace evidence examinations.

In addition to vehicles, compulsory expert examination is subject to the documents that accompany them.

Depending on the type of document, its purpose, method of production, they may be the object of study of various types of technical examination of documents (examination of requisites of documents, examination of printing forms and examination of documents).

Scientific and methodological recommendations on the preparation and assignment of forensics and expert studies determine the main tasks that can be solved by these types of forensic examinations.

Of course, it would be more convenient for law enforcement and judicial authorities to assign not a few disparate examinations of the

vehicles and the documents accompanying them, but one comprehensive examination of these objects.

After all, as M. A. Fedoseyev points out, such expertise would allow not only to establish the fact of changing the numbers of the vehicle and the falsification of the documents accompanying them, but also to determine the method of falsification or change of primary designations, the conformity of the numbering to the requirements of the manufacturer and printing methods. documents available samples, set standards and requirements, etc.¹.

However, at present, there is a need to assign several forensic examinations to these objects in investigative and judicial practice.

In general, the vehicle is subject to a pathological examination, for example, when it is necessary to resolve the issue of change (or lack thereof) of identification numbers (body, engine), establishment of the year of issue, replacement of the vehicle data carriers (license plates and code plates, etc.).

However, to solve the question of replacement of the body number by replacing the panel with the number pad is assigned a complex forensic (study of paint and varnish coating) and trace evidence analysis.

Questions about replacement of units and units and re-equipment of the vehicle are solved by a comprehensive tracing and automotive expertise.

Therefore, research complexity of the vehicle and the documents accompanying it is further compounded by the need to appoint directly comprehensive examinations of different types.

This requires the investigator to carefully analyze the criminal proceedings to make the right decision.

Preparation of materials for investigation is that during the course of investigative actions (inspection, search, seizure, investigative experiment) the investigator receives information about the circumstances of the event, as well as objects, things, documents, other objects that are important for the correct the resolution of a criminal case.

Analyzing the material obtained, the investigator determines which issues related to the case under investigation are to be identified through expert research and whether the material available in the case is sufficient to address these issues².

¹ Fedosieiev M. A. Provedennia kompleksnoho doslidzhennia transportnykh zasobiv i dokumentiv, shcho yikh suprovodzhuiut, pid chas rozsliduvannia zlochyniv, poviazanykh z nezakonnym peremishchenniam avtotransportu cherez mytnyi kordon Ukrainy [Carrying out a comprehensive investigation of vehicles and their accompanying documents during the investigation of crimes related to the illegal movement of vehicles across the customs border of Ukraine]. Kryminalistychnyi visnyk. 2013. № 1 (19). 1'36 s [in Ukrainian].

² Bilenchuk P. D., Hel A. P., Semakov H. S. Kryminalistychna taktyka i metodyka rozsliduvannia okremykh vydiv zlochyniv [Forensic tactics and methods of investigation of certain types of crimes]: navch. posib. Kyiv : MAUP, 2007. S. 111 [in Ukrainian].

In addition, during the preparation of the materials, the investigator may consult with the expert involved in the investigative actions, the future expert, if he or she has already been identified, or another competent person.

Specify the type and sequence of examinations, formulate questions, determine the range of material evidence that should be sent to the study, the number of sample comparisons, the content of the source data, the expert institution in which the examination will be conducted, or a private forensic expert¹.

In the course of the investigation, there is a need for specific expertise in the vehicles and the documents accompanying them to identify and investigate other traces.

For example, it may not always be possible or appropriate to remove traces such as micro-traces, traces of hands, traces of biological origin, certain materials and substances from the scene.

Therefore, the investigator must correctly determine the order of appointment and conduct of different types of forensic examinations. It is advisable, first of all, to appoint those examining the traces that can be easily destroyed, or the option of a comprehensive examination may be considered.

It should be emphasized that the success of the examination is largely due to the completeness of the materials collected, which are sent to the expert:

- correct removal, procedural fixation of objects of study — physical evidence;
- quality, quantity and comparability of samples needed for comparative study;
- availability of case files containing information relevant to the subject matter of the examination[6., 10].²

As noted above, the identification of objects that are sent for examination is preceded by a decision to conduct a forensic examination.

Such objects, in addition to the vehicles, may have traces of them, vehicle registration documents as well as documents confirming the ownership of the vehicle.

However, in addition to direct objects of study, additional materials may need to be sent to the expert in some cases.

a) procedural documents: inspection reports and annexes (photographic tables and diagrams), interrogation protocols, conclusions of preliminary examinations, if repeated or comprehensive examination is appointed, etc.;

¹ Priakhin Ye. V. Slidcha taktyka [Investigative Tactics]: navch. posib. Lviv : LvDUVS, 2011. S. 109 [in Ukrainian].

² Kobzar S. I. Organizacija naznachenija kriminalisticheskikh jekspertiz i ispol'zovanija ih rezul'tatov v rassledovanii prestuplenij [Organization of the appointment of forensic examinations and the use of their results in the investigation of crimes]: ucheb. posob. Lugansk: RIO LGUVD, 2007. S. 10. [in Russian].

b) information documents: certificates or acts of repair work, installation of additional equipment on the vehicle, its processing, etc. ;

c) experimental samples: traces of tires, tools and tools, printing and reproduction equipment, stamps and stamps, etc. ;

d) additional objects (depending on the type of expertise, for example, when assigning complex trace evidence and forensic vehicle examination).

Of course, the type and volume of such materials depend on the type of expertise and the type of expertise (diagnostic, identification, or situational).

For example, when designing a transport and trace examination, the expert must be provided with the trace-forming objects themselves (tires, protruding parts, etc.) or the experimental molds of these objects (experimental prints of tires on paper); objects that have traces of these objects, or casts (large-scale photographs) of those traces, as well as the site inspection protocols with all the annexes thereto.

Whenever vehicles are subjected to road-freight and trucking expertise, expert vehicles are provided with wheeled vehicles and documentation related to their registration, materials of investigation of the event that led to the material damage, as well as documents that record other initial data necessary to resolve the question. .

Originals shall be provided for the purpose of conducting a study to establish the fact of making changes to the original content of documents, to identify seals, stamps (including facsimiles) and to establish the time of printing of stamps, stamps, date of production of the document.

Conclusions.

To sum up, it should be noted that the process of preparation and assignment of judicial expertise is a set of procedural and organizational actions aimed at collecting, preparing and processing materials for judicial examination in order to make the most effective use of specialized knowledge in criminal proceedings.

The process of assigning forensic expertise to vehicles includes the following procedural and organizational measures:

Removal of objects and deciding whether to involve a forensic expert;

- determination of the type of forensic examination and its tasks;
- preparation of materials for forensic examination;
- the correct and timely choice of the moment of appointment of the forensic examination;
- formulating expert questions;
- choice of expert institution or expert;
- request for the appointment of a forensic examination.

The objects for which the examination will be assigned should comply with the procedural and tactical requirements. Procedural requirements include the following:

1) observance of the general requirements for conducting investigative investigative actions, during which the objects of examination

are obtained: the legality of the grounds for conducting the investigative action; adherence to the procedure of investigation; complete and correct fixation of the process of investigation; communication to all participants of their rights and responsibilities; respect for human rights and citizens, etc. ;

2) observance of the procedural rules of work with objects and traces revealed in the course of investigative actions: use of legitimate methods for detection of the specified objects; adherence to the rules of fixation of the specified objects in the protocols of investigative actions by additional means; adherence to the rules for removal of detected objects; adherence to the rules for packaging and storage of identified objects (which do not call into question the accuracy of these objects).

Fulfillment of such procedural requirements is intended to ensure the legality and admissibility of the evidence obtained during the investigative (investigative) actions and the results of the forensic examinations conducted thereunder.

Tactical requirements also provide complete and high-quality information when researching such objects.

1) application of methods and means in the detection of objects and traces that do not damage the objects and traces;

2) number of objects removed is sufficient to solve the expert tasks;

3) proper packing and storage of these objects, which enables them to be investigated for the purpose of solving expert tasks.

In some situations, it is impossible to deliver a number of forensic objects to a state expert institution for the following reasons:

– the object is too bulky;

– the object of study cannot be removed;

– There are too many objects.

In these cases, the investigator must not only provide the expert with unhindered access to the facility, but also provide the opportunity for research and create appropriate working conditions.

In the first place, this means ensuring the safety of the object of study.

If the objects of study are outside the open air, the most important condition for the success of the forensic examination is the promptness of its appointment.

Considering the specificity of the objects of the examination of vehicles, the above provisions are extremely relevant.

If they cannot be delivered to an expert institution, such facilities must be stored in the territory of the law enforcement agency or other protected area.

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В. С. Сезонов

**ОСОБЛИВОСТІ ПІДГОТОВКИ ТА ПРИЗНАЧЕННЯ
КРИМІНАЛІСТИЧНОЇ ЕКСПЕРТИЗИ ТРАНСПОРТНИХ ЗАСОБІВ ТА
РЕЄСТРАЦІЙНИХ ДОКУМЕНТІВ**

У статті проаналізовано особливості підготовки та призначення криміналістичної експертизи транспортних засобів, процесуальні та тактичні вимоги щодо зазначеної експертизи.

Транспортний засіб є одночасно об'єктом для проведення різного виду експертних досліджень. Питання про зміну ідентифікаційних номерів, встановлення року випуску, заміну носіїв даних про автомобіль вирішуються трасологічною експертизою. Питання про переобладнання транспортного засобу вирішуються комплексною трасологічною й автотоварознавчою експертизою та ін. Комплексність дослідження транспортного засобу вимагає призначення безпосередньо комплексних експертиз різних видів.

Ключові слова: кримінальне провадження, транспортний засіб, комплексна експертиза, судова експертиза, ідентифікаційний номер.

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O. V. Agapova,

PhD in Law, Head of Department at the KhRiFE

ORCID: <https://orcid.org/0000-0003-1024-0238>

E-mail: agapova-lena@ukr.net

LEGAL EXAMINATION PLACE IN CASES MILITARY ADMINISTRATIVE OFFENSES INVOLVED BY MILITARY SERVICES NATIONAL GUARD OF UKRAINE

Scientific problem definition. The article is devoted to the investigation of types of military administrative offenses committed by servicemen of the National Guard of Ukraine and the possibility of specific expertise use while hearing such cases. The author analyzed the judicial practice, which became the basis for concluding the possibility of appointing different types of forensic examinations in the proceedings on cases of military administrative offenses provided for in Chapter 13-B Code of Ukraine on Administrative Offenses.

The purpose of the article is to determine forensic examination as a means of establishing the truth in cases of military administrative offenses committed by servicemen of the National Guard of Ukraine.

Main research results. Working out various scientific works concerning the problem of establishing the responsibility of servicemen of the National Guard of Ukraine for military administrative offenses, allowed to determine the object of military administrative offenses provided for in art. 172-10–172-17, 172-19–172-20 Code of Ukraine on Administrative Offenses. The author emphasizes the fact that not all subjects of forensic expert activity, listed in art. 7 of the Law of Ukraine «On Forensic Examination» carry out forensic expert activity in cases on military administrative offenses, in case the offender in the case serves a serviceman of the National Guard of Ukraine.

Conclusions. It was emphasized that in cases concerning military administrative offenses committed by servicemen of the National Guard of Ukraine, can be assigned /ordered to conduct forensic, commodity, military expertise, as well as forensic medical expertise in individual cases.

Keywords: military administrative offenses, servicemen, National Guard of Ukraine, subjects of forensic expert activity, forensic examination.

Formulation of Research Problem.

When it comes to building an effective management system for law enforcement agencies, research into the factors that constrain these processes has become a matter of concern in the work of many scholars.

It should be noted that war crimes and crimes are those obstacles that affect the state of military discipline and law and order in the National Guard of Ukraine (hereinafter referred to as – NGU).

In this article, we propose to focus on two interrelated issues: the investigation of the basic types of military administrative offenses committed by NSU servicemen on the one hand, and the role of forensic expertise as one of the means of establishing real facts and truth in such cases on the other.

In our opinion, this causes not only theoretical but also practical interest in solving the announced issue.

Analysis of recent researches and publications.

As is well known, representatives of various branches of legal science have repeatedly paid attention to the issues of legal responsibility of military personnel.

We consider it advisable to cite the individual approaches of administrative scholars to the determination of military administrative responsibility.

We share the opinion of M. Turkota, that public relations in the sphere of military (military) security of Ukraine are protected by criminal, administrative and disciplinary sanctions, which are applied with the purpose of general and special prevention of offenses¹.

We state that the object of military administrative offenses under Art. 172-10 -172-17, 172-19 -172-20 Code of Administrative Offenses made by the servicemen of NGU is established the procedure of passing the service in the ranks of NGU.

According to O. I. Ostapenko, who devoted his research to the issues of granting legal qualifications to military administrative offenses, the procedure established by the legislature for passing military service obliges servicemen and persons equal to them:

- comply with orders and other legal requirements of commanders and commanders;
- not to leave the military units or place of service without authorization;
- to handle military property with care and care; to use the powers of a military official for official purposes only;
- abide by the rules and procedures for military service and behavior during and outside the service².

We support the views of V. L. Babich, who considered the administrative responsibility of conscripts and conscripts as a change in the legal status of these entities, carried out by an authorized body (official), in the absence of relations of official subordination as a result of the use of only certain for this category (special sub ' of administrative penalties and manifests itself either in the restriction of the rights of conscripts and conscripts, or in the imposition of additional duties for committing certain

¹ Turkot M. S. Rozmezhuвання administratyvnoi i dysyplinarnoi vidpovidalnosti viiskovosluzhbovtiv [Distinguishing administrative and disciplinary responsibility of servicemen]. Visnyk Natsionalnoi akademii prokuratury Ukrainy. №1(47). 2017. S. 41 [in Ukrainian].

² Ostapenko O. I. Pro yurydychnu kvalifikatsiiu viiskovykh administratyvnykh pravoporushen [On the Legal Qualification of Military Administrative Offenses]. Visnyk Natsionalnoho universytetu «Lvivska politehnika». Yurydychni nauky. 2016. № 837. S. 96 [in Ukrainian].

administrative offenses, in the manner and under the conditions stipulated by the rules of administrative law¹.

We have reason to point out that the overwhelming majority of scientists are united in their approaches to considering the issue of administrative responsibility of conscripts and conscripts.

The purpose of the article is to determine the place of judicial expertise as a means of establishing the truth in cases of military administrative offenses committed by servicemen of the National Guard of Ukraine.

Main content presentation.

According to Art. 14 of the Law of Ukraine of 13.03.2014 №. 876 *On the National Guard of Ukraine* for committing unlawful acts and inaction of servicemen of the NSU bear disciplinary, material, civil, administrative and criminal responsibility in accordance with the law².

The administrative responsibility of NGU servicemen for committing military administrative offenses is stipulated by the Administrative Code and the Disciplinary Statute of the Armed Forces of Ukraine.

Thus, Article 15 of the Code of Administrative Offenses establishes that, for committing military administrative offenses, servicemen, as well as servicemen and reservists, during the course of the meeting, shall be held liable under Chapter 13-B of the Administrative Code, provided that such offenses do not entail criminal responsibility³.

At the same time, clause 45 of the Disciplinary Statute of the Armed Forces of Ukraine stipulates that for committing administrative offenses, servicemen shall bear disciplinary responsibility, except in cases stipulated by the Code of Administrative Offenses.

Servicemen are also responsible for committing corrupt administrative acts or other corruption-related offenses, in accordance with the Code of Administrative Offenses⁴.

In the context of the consideration of military administrative offenses, attention should be paid to Art. 19 of the Constitution of Ukraine,

¹ Babych V. L. Administratyvna vidpovidalnist viiskovozoboviazanykh ta pryzovnykiv za porushennia vymoh Zakonu Ukrainy «Pro viiskovy oboviazok ta viiskovu sluzhbu» [Administrative responsibility of conscripts and conscripts for violation of the Law of Ukraine "On Military Duty and Military Service"]. Chasopys Kyivskoho universytetu prava. 2013/3. S. 135 [in Ukrainian].

² On the National Guard of Ukraine: Law of Ukraine dated 13.03.2014 No. 876 – VII. Information of the Verkhovna Rada of Ukraine. 2014. № 17. Art. 594.

³ Kodeks Ukrainy pro administrativni pravoporushennia [Code of Ukraine on Administrative Offenses]: Zakon Ukrainy vid 07.12.1984 № 8073–X. Vidomosti Verkhovnoi Rady Ukrainy. 1984. № 51. St. 1122 [in Ukrainian].

⁴ Dystsyplinarnyi statut Zbroinykh Syl Ukrainy [Disciplinary Statute of the Armed Forces of Ukraine] : Zakon Ukrainy vid 24.03.1999 № 551–XIV. Vidomosti Verkhovnoi Rady Ukrainy. 1999. № 22. St. 197 [in Ukrainian].

which acts as a kind of guarantor of ensuring the legal order in the state and the proper behavior of officials during the exercise of their powers.

Yes, this constitutional provision stipulates in particular that state and local authorities, their officials are obliged to act only on the basis, within the powers and in the manner provided by the Constitution and laws of Ukraine¹.

It should be noted that this constitutional provision also applies to military officials to a certain extent, since the efficiency of functioning and organization of the activity of the state apparatus of military administration, in particular, the Main Directorate of NGU, territorial departments of NGU, units, military units, higher educational institutions, depends on the exercise of their powers. institutions, educational military units (centers), bases, establishments and institutions of NGU, etc., as well as timely and fair resolution of social problems, ensuring the implementation of constitutional rights and freedoms of servicemen and other citizens, legal interests of legal entities.

Undoubtedly, committing administrative offenses by NGU servicemen is a destabilizing factor, which testifies to mistakes made in the organization of the management system and in the work with personnel.

It should be noted that positive developments in the direction of moral and psychological support for military discipline have been undertaken by the administrations of all territorial departments of the NGU of the relevant educational measures.

Thus, the atmosphere created by the inevitability of punishment for committing an offense in the units of military units had a positive effect on the state of military discipline and law and order.

The commanders ceased to conceal criminal offenses committed by personnel and began to take the necessary measures to identify and prosecute those responsible.

As an effective form of influence on offenders, active involvement of military servicemen in military administrative responsibility, as well as severe disciplinary penalties: lowering in military rank and position, deprivation of military rank and dismissal from the ranks of NGU.

Thus, changing systematic approaches to the evaluation and prevention of offenses contributed to a 5-fold reduction in the number of committed administrative and criminal offenses between 2015 and 2016.²

We propose to list the main types of military administrative offenses envisaged by the Code of Administrative Offenses, which are committed by NGU military personnel:

¹ Konstytutsiia Ukrainy [Constitution of Ukraine] vid 28 chervnia 1996 roku. Vidomosti Verkhovnoi Rady Ukrainy. 1996. № 30. St. 141 [in Ukrainian].

² Natsionalna hvardiia Ukrainy [National Guard of Ukraine]. Bila knyha. 2016. S. 57–59. URL : <http://ngu.gov.ua/ua/bila-knyga-nacionalnoyi-gvardiyi-ukrayiny>. (data zvernennia 10.05.2019) [in Ukrainian].

1) refusal to fulfill the legal requirements of the commander (chief) (Articles 172-10 of the Code of Administrative Offenses);

2) unauthorized abandonment of a military unit or place of service (Art.172-11 of the Administrative Code);

3) careless destruction or damage to military property (art. 172-12 of the Administrative Code);

4) abuse of military authority or authority (Articles 172-13 of the Code of Administrative Offenses);

5) exceeding by a military official of authority or official authority (Article 172-14 of the Administrative Code);

6) negligent attitude to military service (Articles 172-15 of the Administrative Code);

7) inaction of the military authorities (Articles 172-16 of the Administrative Code);

8) violation of the rules of combat duty (Article 172-17 of the Administrative Code);

9) violation of the rules for handling weapons, as well as substances and objects that pose an increased danger to the environment (Articles 172-19 of the Code of Administrative Offenses);

10) drinking alcoholic, low-alcoholic beverages or using narcotic drugs, psychotropic substances or their analogues (Articles 172-20 of the Code of Administrative Offenses)

During the trial, the judge in the proceedings of which a military administrative offense is committed by a serviceman of NGU establishes the presence or absence of such an offense, causation, guilt of the person in his act and other circumstances that are relevant for the adoption of the correct and a positive decision on the case.

Such data, according to Art. 251 of the Code of Administrative Offenses are established by a protocol on an administrative offense, explanations of the person who is held administratively liable, victims, witnesses, physical evidence, testimony of technical devices and technical means having the functions of photo and filming, video recording, expert's opinion, as well as other expert evidence.

We propose to elaborate on the evidence used by the court in establishing the truth in a military administrative offense case.

The case-law was used as a benchmark for establishing an approximate list of evidence by which it is possible to establish the guilt of a NSU military officer in committing a military administrative offense.

Thus, to the evidence in cases of military administrative offenses committed by servicemen of NGU we shall include:

1) the protocol on military administrative offense, which is drawn up for the relevant offense provided for in Chapter 13-B of the Administrative Code;

2) orders of commanders of the military unit in which the serviceman of the NGU is serving;

3) the conclusion of the official investigation into the commission of a military administrative offense;

4) written explanations, reports;

5) information (for example, accounting records and fixing of weapons (ammunition located at the operational point (checkpoint)),

6) copies of books, magazines (for example, a copy of the magazine of the Evening List of personnel for the respective month and year);

7) the official and medical characteristics of a serviceman who has committed a military administrative offense;

8) functional responsibilities of the NGU serviceman;

9) contract for the passage of military service to the National Guard by the citizens of Ukraine; 10) expert opinion and other documents.

In the context of the issues raised at the beginning of the study, we consider it appropriate to pay particular attention to such evidence as the expert opinion on military administrative offenses provided for in Chapter 13-B of the Administrative Code.

Indeed, where there is a need for specialized knowledge, including to determine the extent of property damage caused by a military administrative offense, the authorized body or official has the right to appoint a judicial review.

However, it should be emphasized that military administrative offenses are inherently specific and practically no such evidence as forensic evidence is used to establish objective truth in such cases.

As a rule, the court, a military prosecutor or an official of the NSU, when considering / shaping an administrative case, independently assess or determine the guilt of a person in a military administrative offense, without the use of special knowledge.

Forensic examination is intended only if there is a genuine need for specialized knowledge to establish the factual data included in the subject of evidence, ie when the expert's opinion cannot be replaced by other means of proof¹.

Neglecting such a means of proving in our opinion may affect the degree of objectivity in considering specific military administrative offenses (eg, Articles 172-12 of the Code of Administrative Offenses inadvertently destroying or damaging military property; Articles 172-19 of the Code of Administrative Offenses, also substances and objects that are of high danger for the environment; Articles 172-20 of the Code of Administrative Offenses of drinking alcoholic, low alcoholic beverages or the use of narcotic drugs, psychotropic substances or their analogues) and the correctness of taking the answer a court order.

¹ Pro deiaki pytannia praktyky pryznachennia sudovoi ekspertyzy [Some questions about the practice of appointment of forensic examination]: postanova Vyshchoho hospodarskoho sudu vid 23.03.2012 № 4. Visnyk hospodarskoho sudochynstva. 2012. №3. S. 15 [in Ukrainian].

It should be noted that the following persons who have the right to appoint or order a judicial expertise in cases of military administrative offenses committed by NGU servicemen include: a judge, a military prosecutor, an official of the NGU, a serviceman of the NGU who is subject to an administrative case.

At the same time, the judge and the military prosecutor are the subjects of the appointment of forensic examination, and the official of the NSU and the serviceman of the NSU in the case of the administrative offense are the subjects who have the right to order the judicial examination in private.

As a rule, forensic activities in the proceedings in administrative offenses are carried out by:

1) State Specialized Forensic science institutions of the Ministry of Justice of Ukraine;

2) expert services of the Ministry of Internal Affairs of Ukraine, SBU and SBGS;

3) research institutions of judicial examinations, forensic and forensic psychiatric institutions of the Ministry of Health of Ukraine;

4) Certified forensic experts who are not employees of state specialized institutions and other specialists (experts) in the relevant fields of knowledge in the manner and under the conditions specified by the Law of Ukraine: *On Forensic Examination*¹.

However, not all of these entities carry out forensic expertise in military administrative offenses when the NGU military officer is the offender in the case.

In view of this, we suggest that the subjects directly involved in conducting judicial examinations and expert investigations into military administrative offenses committed by NGU military personnel be:

1) State Specialized Forensic science institutions of the Ministry of Justice of Ukraine;

2) expert services of the Ministry of Internal Affairs of Ukraine

3) certified court experts who are not employees of state specialized institutions; 4) forensic science institutions, forensic medical institutions and forensic psychiatric establishments of the Ministry of Healthcare of Ukraine, in individual cases.

Particular attention should be paid to the research institutions of judicial expertise of the Ministry of Justice of Ukraine.

Appointment and carrying out of judicial examinations and expert researches by judicial experts of state specialized research institutions of judicial examinations of the Ministry of Justice of Ukraine their duties, rights and responsibilities, organization of carrying out of examinations and registration of their results shall be carried out in accordance with the

¹ Pro sudovu ekspertyzu [On forensic examination] : Zakon Ukrainy vid 25.02.1994 № 4038–XII. Vidomosti Verkhovnoi Rady Ukrainy. 1994. № 28. St. 232 [in Ukrainian].

procedure established by the Code of Administrative Offenses, Law of Ukraine “On Forensic Examination”, Order No. 53/5 of the Ministry of Justice of 08.10.1998 “On Approval of the Instruction on Appointment and Conduct of Expertise and Expert Research and Scientific and Methodological Recommendations on the preparation and Assignment of forensic examinations¹ and Expert Research, as well as other legal acts on forensic science activity.

Research institutions of judicial expertise of the Ministry of Justice of Ukraine may carry out different types of expertise, which are stipulated by the order of the Ministry of Justice of Ukraine No. 53/5 of 08.10.1998 *On Approval of the Instruction on the Assignment and Conducting of forensic examinations and Expert research and Scientific and Methodological Recommendations on Preparation and the appointment of forensic examinations*², in particular: forensic, commercial, environmental, psychological, military forensic examinations, etc.

Having analyzed the dispositions of military administrative offenses envisaged by Chapter 13-B of the Code of Administrative Offenses, we propose to identify those types of judicial expertise that are intended to clarify the circumstances of military administrative offense committed by a NGU military officer. Thus, in order to provide an expert opinion on military administrative offenses provided for in Art. 172–10 –172–17, 172–19, 172–20 of the Code of Administrative Offenses, special knowledge in the field of forensic, commodity and military expertise is used.

In addition, within these military administrative offenses, in addition to military expertise, the relevant entities have the right to appoint forensic and commodity expertise under Art. 172-12 of the Administrative Code, and for the offense provided for in Art. 172-20 of the Code of Administrative Offenses in some cases forensic examination may be ordered.

In terms of demand for expertise in military administrative offenses, it should be noted that, today, unfortunately, in order to establish the truth in this category of administrative cases in comparison with other types of administrative offenses, only in exceptional cases are authorized entities appointed or ordered to carry out forensic examinations and expert research.

In spite of this, we believe that the expert support of high-quality, substantiated and objective judicial expertise of the NGU as a military unit with law enforcement functions in military administrative offenses can affect the course and outcome of the trial.

¹ On approval of the Instruction on the appointment and conduct of judicial examinations and expert studies and Scientific and methodological recommendations on the preparation and appointment of forensic examinations and expert studies: Order of the Ministry of Justice of Ukraine dated 08.10.1998 No. 53/5. Official Bulletin of Ukraine. 1998. № 46. Art.1715.

² Ibidem

Conclusions.

Summarizing the above, the NGU expert support can be defined as the activity of the subjects of forensic activity aimed at providing this military formation with law enforcement functions, independent, high-quality and objective judicial expertise focused on the maximum use of the achievements of science and technology.

In view of the above, we propose to formulate the following conclusions:

1. We consider that the provision of judicial expertise in cases of military administrative offenses, to which a participant of the NGU servicemen should act, should be carried out when there is a real need for such research, and also if the results of such research can affect the course and results of the case.

2. The conducted analysis of the provisions of the current The Law of Ukraine *On Judicial Examination* made it possible to establish that not all of the listed in Art. 7 subjects carry out forensic expertise in military administrative offenses in cases where the NGU military officer is the offender in the case.

3. In cases of military administrative offenses committed by NGU military personnel, forensic, commodity, military, as well as forensic examination may be ordered / ordered.

Appropriately forensic psychiatric examination of all types of military administrative offenses is used to check the status of conviction.

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О. В. Агапова

**СУДОВА ЕКСПЕРТИЗА У СПРАВАХ
ПРО ВІЙСКОВІ АДМІНІСТРАТИВНІ ПРАВОПОРУШЕННЯ,
ЩО ВЧИНЮЮТЬСЯ ВІЙСЬКОВОСЛУЖБОВЦЯМИ
НАЦІОНАЛЬНОЇ ГВАРДІЇ УКРАЇНИ**

Статтю присвячено дослідженню видів військових адміністративних правопорушень в Національній гвардії України та розглянуто можливість використання спеціальних знань під час розгляду таких справ.

Мета публікації полягає у визначенні судової експертизи як засобу встановлення істини у справах про військові адміністративні правопорушення. Підкреслено, що далеко не всі суб'єкти здійснюють судові експертизи у справах про військові адміністративні правопорушення у випадку, коли правопорушником у справі виступає військовослужбовець НГУ.

Встановлено, що можуть бути призначені різні види експертиз.

Ключові слова: військові адміністративні правопорушення, Національна гвардія України, судова експертиза.

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S. V. Rohalin,
Researcher of Kharkiv RIFE,
ORCID: <https://orcid.org/0000-0002-1934-8977>
e-mail: rohalin@i.ua

APPLICATION OF THE MODELING METHOD IN

When researching objects, in some cases there are certain difficulties when obtaining a categorical opinion on an expert task is not always possible. One of the problems that hinders the intention of a forensic expert in ensuring the completeness of the study is the inability to directly study the object of study. The solution of the theoretical and practical aspects of this problem is very important, but so far this problem has been solved on an applied plane, that is, in different types of studies in the relevant types of forensic examinations, special research methods have been developed based on certain developments that, in one or another degrees apply the modeling method.

The purpose of the article is to systematize the theoretical foundations of applying the method of scientific modeling in forensic research, determining the requirements for building models in forensic research and creating a modeling method in forensic examination by stages of research.

The article examines the historical formation of the modeling method, describes the content, terminology and essence of the modeling method as an effective general scientific tool for cognition. The main feature of modeling is fixed as a method of indirect cognition of objects of research through substitute objects, when the model serves as a cognitive tool that the researcher puts between himself and the object, and with the help of which he studies the object of interest to him. The classification of the types of models is presented. Cases have been outlined where modeling when carrying out research in forensic science is desirable, and cases are presented separately when applying scientific modeling when conducting research in forensic science is the only possible method for obtaining a definitive conclusion. The general scientific theoretical foundations of applying the similarity criteria and similarity theorems in modeling when carrying out research in forensic science are systematized, the requirements for building models are identified, and similarity signs are formulated in forensic expert research.

A method for applying modeling at different stages of conducting research in forensics has been developed.

Keywords: forensic science, object of study, model, similarity, similarity criteria, simplification, adequacy, uniqueness.

Formulation of Research Problem.

The tasks decided by forensic science are based on advanced scientific advances, and since the forensic expert is involved in the process of proving the case, he or she must have different scientific methods to provide an objective conclusion in forensic examination.

Modeling is one of the most common in the application of scientific methods.

The application of the simulation method in forensics requires the forensic expert to operate certain philosophical categories, conceptual

apparatus, appropriate terminology and scientific knowledge in constructing models of research objects.

Some peculiarities of forensic expert examination are that sometimes an expert examining the object given to him may not always be able to reach a conclusion, because the objects of the study may be damaged, certain properties and characteristics may be lost.

In addition, there are other cases where, for example, expert study may be performed in fragments, and expert conclusions must be given as a whole in the fragments under research.

Therefore, scientific modeling is often the only method that can be used by a forensic expert in object research.

The principles of simplification and preservation of similarity are crucial when creating a forensic model of the object under research.

Because the need for modeling is due to the complexity, and sometimes the inability to directly study a real object; it is much more accessible to create and explore prototypes of real objects (processes, phenomena) that means models.

But these models must reflect the essential properties of the real object (process, phenomenon).

Important is the factual information that determines a complete list of all the essential properties of a real object (process, phenomenon) when building a forensic model of the research object.

Finally, to conclude on the adequacy of the model of the research object is possible only if the data (content of information) about the characteristics (parameters, properties) of the object determined by the expert, which in turn allows to establish the suitability of the model for use in the implemented forensic methodology for a specific forensic specialty, or as it may be described, embodied (implemented) in a particular field of scientific knowledge.

Analysis of recent research and publications.

In the relevant types of forensics from different types of studies, special research methods (register of forensic techniques¹) have been created that is used in one way or another a modeling method that allows to carry out the study of the object indirectly in the light of some experience.

Usually, the problem of modeling is solved in forensic practice separately in each type of research in the applied plane, despite the fact that the scientific method of modeling is generally studied in detail.

The application of scientific knowledge on these issues of scientific modeling in the modeling of objects of research in forensic examination should ensure a clear determination of the fit of the model to the investigated object (process, phenomenon) that should fully determine the adequacy of the model used in the while research on the object.

¹ Ofitsiyni sait Ministerstva yustytzii [Officers of the Ministry of Justice website]. URL : <http://rmpse.minjust.gov.ua/> (data zvernennia 24.04.2019 [in Ukrainian]).

The adequacy of the model to the specific real phenomenon (object, process) for which it is created can only be achieved by applying certain requirements, the criteria of similarity. The theory of this question provides three similarity theorems. One of the developers and researchers of this issue is academician M. V. Kirpichov.

One of the developers and researchers of this issue is academician M. V. Kirpichov. Application of similarity theorems in forensic research allows to establish general requirements for the construction of models in forensic research and on their basis to determine methodological recommendations for the stages of research in the application of modeling in forensic research.

Article Purpose. Systematization of theoretical bases of application of the method of scientific modeling in forensic research, determination of requirements for construction of models in forensic research and development of a method of application of modeling in forensic examination by stages of research.

Main content presentation

While performing his activity, forensic expert is guided by normative legal acts, among which among others are, first of all, the Law of Ukraine: *On Judicial Examination, On Scientific and Scientific and Technical Activities, On Scientific and scientific and technical evaluation, Instruction on appointing and conducting forensic examinations and researches*” etc.

According to the tasks of forensic analysis, expert research relies on advanced scientific advances, and since the forensic expert is involved in the process of proving the case, he must have different scientific methods to provide an objective conclusion in forensic science.

Modeling is one of the most common in the application of scientific methods as an effective scientific tool of cognition.

Applying philosophical categories, the scientific method, which has a general scientific application, can be called epistemological.

Understanding the epistemological meaning of modeling can be achieved by applying definitions, that is, when the meaning of the concept of the model used in science is clearly defined.

In other words, understanding of all kinds of modeling should begin by figuring out the exact meaning or meaning of the term model.

Analysis of the scientific literature, which uses the term model, gives the structure of different scientific theories, their experimental verification, description and explanation of the phenomena being studied, shows that this term is used primarily in two completely different, directly opposite meanings.

Firstly: in the sense of something to which the theory applies, that is, that it describes or reflects.

The specified dualism of definition of the term model is also cited by AA Gritsanov in [6]: “MODEL (Latin *modulus*: measure, sample) is an object-substitute, which in certain conditions can replace the object-original, reproducing the interesting properties and characteristics of the original.

Reproduction is carried out both in the subject (layout, device, sample) and in sign forms (graph, diagram, program, theory).

There are two ways to build a model.

If the first goes from the empirically revealed properties and dependencies of an object to its model, the second already at the starting point involves the experimental reconstruction of the object into the model, and, since the model is known, the object is considered to be known”¹.

The dualism of the term definition of the model can be traced to the well-known from the school bench example of the construction of the universe by Ptolemy and N. Copernicus.

The model of the geocentric and heliocentric structure is a drawing (layout) and outlook (theory).

We can say that modeling in various scientific studies was used in ancient times.

Gradually, it captured completely new branches of scientific knowledge, namely: construction and architecture, engineering, astronomy, physics and chemistry, biology and others. The great successes of the modeling method, as well as the recognition in many fields of science, have brought about the 20th and 21st centuries.

The Great Interpretive Dictionary of Modern Ukrainian provides eight interpretations of the MODEL meaning from everyday used in everyday ordinary use to values that reflect worldview, scientific categories.

1. Example of some new product, a model example of something.

2. Type, brand of construction. *New car model*.

3. The reproducing sample emulates the structure and action of any object used to gain new knowledge about the object.

Item reproduced in a reduced, sometimes enlarged or in kind.

Scale model: a model of aircraft, car, rail, etc., made in one of the international standard scales.

4. What is material, nature for artistic image, reproduction. A person posing in front of a painter or sculptor; *sitter*.

5. Sample from which a mold for casting or reproducing in another material is removed.

6. An imaginary or conditional (image, description, diagram, etc.) image of any object, process, or phenomenon used as its *representative*.

7. Design, structure, pattern by which a certain unit of language is constructed from lower-level units.

8. A mathematical dependency system or program that displays the essential properties of the object, process, or phenomenon under research.²

¹ Gricanov A. A. Novejsij filosofskij slovar [The latest philosophical dictionary] Mn. : Izd. V. M. Skakun, 1999. 896 s. URL : <https://www.e-reading.club/book.php?book=149350> (data zvernennja 23.03.2019) [in Russian].

² Velykvi tlumachnyi slovnyk suchasnoi ukrainiskoi movy (z dod. i dopov.) [A great explanatory dictionary of modern Ukrainian (with additions and

In general, the following types of models are used by researchers in widespread use in science and technology.

Systematics of modeling is presented in this article in a comprehensive way.

1. Imaginary or perfect modeling includes different representations in the form of imaginary models.

This is where idealization is inextricably linked to modeling – imaginary construction of concepts, concepts of objects that do not really exist.

For them, there is only a close analogue in the real world. Examples of ideal objects are geometric concepts: points, lines, planes; perfect gas; absolutely black body; etc.

2. Information modeling is a collection of information that characterizes the essential properties and states of the object of study (process, phenomena), as well as the relationship with the outside world.

Essence of information modeling is to create a database of parameters, characteristics, properties of the object of study (process, phenomena).

Information that contains data about a research object is selected by certain criteria.

3. Physical (material) modeling characterized by the fact that studies are conducted on models that have a physical similarity and preserve in whole or in part the nature of the object of study (process, phenomena) under research.

4. Symbolic (character) modeling is associated with the symbolic representation of some of the properties of the original.

Symbolic (character) models are the various topological, graphic and symbolic images (in the form of maps, graphs, diagrams, chemical formulas, etc.) of the objects under research.

5. Kind of symbolic (sign) modeling is mathematical modeling is a way of studying phenomena that have different physical content but are described by the same mathematical expressions.

Mathematical models include algorithms and programs designed for computers that model certain procedures.

Numerical simulation on computer is based on the mathematical model of the object under study and is applied to the large amount of computations that are required to research on.

Measure of the completeness of the model is one of the main features in the classification of modeling types.

On this basis, all models can be divided into: full, incomplete, approximate.

Depending on the nature of the processes under study, all types of modeling are divided into: deterministic and stochastic. Classification over

time divides models into dynamic, static, continuous, discrete, discrete-continuous.

While performing certain types of expert studies, the definitions of the model can be applied to the preceding values of the term and the classification given, and for some expert studies (such as engineering), the given interpretations of the term model need to be specified, supplemented and specified.

Historically, in the mathematical sciences, after Descartes and Fermat's creation of analytic geometry, on the basis of which the idea of coherence between different parts of mathematics was strengthened, the concept of the model was used to develop an ideological idea.

This model becomes a theory that has a structural similarity to another theory. Two such theories are called isomorphic, and one of them acts as a model of the other, and vice versa.

V. A. Stoff says that "Such models represent a significant moment of any historically transient scientific picture of the world, and the question may be how scientifically valid these models are, what are their functions, purpose, goal.

However, the model always acts in this sense as some idealization, simplification of reality although the very nature and degree of simplification of reality introduced by the model may change over time.

The model, as an integral element of the scientific picture of the world, also contains an element of fantasy being a product of creative imagination and this element of fantasy in one way or another must always be limited by facts, observations, measurements. In this sense, the models were discussed by G. Hertz, M. Planck, N. A. Umov and other physicists

In this source, the author cites significant factors that, when using the same conceptual apparatus, link the model and the object of study — this is the simplicity and similarity of the model created in order to obtain the result of scientific modeling while performing research on the object.

The peculiarities of forensic research are that sometimes an expert examining an object given to him may not always be able to conclude that Article 5 of the Law requires the forensic expert to ensure the maximum conservation of research objects.

During forensics, research objects may be damaged or expended only to the extent necessary for research.

It is not always possible to achieve this even with a full-scale inspection because of the limitations, when the objects of study provided, for example, have damage with loss of form, properties and so on.

In such cases, carrying out research by a forensic expert applying the instrumental methods to the object does not always produce the expected result.

In addition, there may be some complications and limitations, since the objects of study provided in the damaged state may have an irreversible loss of some of their properties and characteristics, and the data on the

existence of these properties in the object of research in the damaged state do not contain.

In addition, expert research can be performed on fragments (the objects of study are parts or components of the whole), and conclusions on the expert need to be given as a whole on the fragments under research.

There are frequent cases of forensic practice where the conclusions regarding the material objects of the study require the investigation of the use of data from material sources of information, or the expert task has the opposite task.

Therefore, scientific modeling is often the only method that can be used by a forensic expert in object research.

During modeling, the forensic expert takes into account the peculiarities of the modeling method and determines its specific features.

In addition to that the expert resorts to the use of abstractions, analogies, hypotheses or versions, other categories and other methods of cognition, which in turn requires the forensic expert to professionally apply this and other scientific methods.

For the forensic expert it is essential to study the object that if the creation of a physical object model, for example (see the classification of species above) for further research is carried out using the principle of full reflection of the structure, structure, properties (and such other) of this object, that is, when the model and the object are isomorphic, the study of such a model requires a considerable amount of work.

When a forensic expert creates a model that displays only certain characteristics that are relevant to the object, obtaining the result, namely, the conclusion of the expert in the study, can be achieved because the model is a reflection of the object.

In addition, the study can be performed in a shorter time.

In this regard, it is advisable to cite the statement of A. I. Bochkin, quoted by P. Yu. Kononyuk:

“By model, we will mean a system indistinguishable from a modeled object in respect of some properties assumed to be essential and distinguishable by all other properties that are considered unimportant; at the same time, the absence of insignificant elements in the model is no less important than the presence of essential elements in”¹.

The same conclusion is reached by P. Yu. Kononyuk in the *Generalized Modeling Theory* monograph:

«1. Models are more convenient to study than the original objects. In addition, some objects can only be studied on models.

2. Modeling allows you to identify the most significant factors of the object or phenomenon being studied, so it is a tool for a deeper study of reality”².

¹ Kononjuk A. E. Obobshhennaja teorija modelirovanija [Generalized theory of modeling]. K. : Osvita Ukraïni, 2012. S. 16 [in Russian].

² Ibidem.

Consequently, The principles of simplification and preservation of similarity are crucial when creating a forensic model of the object under research.

Because the need for modeling is due to the complexity, and sometimes the inability to directly study a real object; it is much more accessible to create and explore prototypes of real objects (processes, phenomena) that means models.

But these models must reflect the essential properties of the real object (process, phenomenon).

Important is the factual information that determines a complete list of all the essential properties of a real object (process, phenomenon) when building a forensic model of the research object.

Only in this case can it be considered that adequacy, as a measure of conformity of the model to the specific real phenomenon (object, process) for which it is created (under construction) can be achieved.

Finally, to conclude on the adequacy of the model of the research object is possible only if the data (content of information) about the characteristics (parameters, properties) of the object determined by the expert, which in turn allows to establish the suitability of the model for use in the implemented forensic methodology for a specific forensic specialty, or as it may be described, embodied (implemented) in a particular field of scientific knowledge.

That is why it is important to define the adequacy criteria. In scientific sources, the definition of *similarity criteria* is more common.

One of the developers and researchers on this issue is Academician M. V. Kirpichov. Proof of these theorems is performed using sections of Further Mathematics.

Formulations of similarity theorems and explanations of their understanding are given in brief.

First theorem..*“Such phenomena are described by literally the same equations, which are conditionally or unconditionally invariant with respect to such transformations of their magnitudes”*¹.

This means that the data obtained in the study of a particular object (process, phenomenon) can be transferred only to objects (processes, phenomena) that are similar to it, that is, objects described by one and the same by the equations themselves.

Second theorem. *In order for the data obtained from experience to be directly applicable to such phenomena, they must be processed in the form of a relationship between the criteria of similarity.” In other words, it is necessary to try not to establish the dependence not between the individual quantities (parameters) that characterize the object of study (process, phenomenon), but between their complexes, which represent the criteria of similarity.*

¹ Kirpichev M. V. Teorija podobija [Similarity theory]. Moskva: Akademija nauk, 1953. S. 35 [in Russian].

When applying the method of relative units, the formulation of the second theorem is further reduced to the next formulation. In similar phenomena, the criteria are the same.

An exemplary example is the application of similarity criteria in the theory of heat-mass transfer, when the similarity criteria established by Nusselt, Reynolds, and Prandtl are used for different objects subjected to heating (cooling) when determining by the researcher the actual data on reaching a certain temperature as the number Nu , Re , Pr , in the mathematical expressions used in the calculations.

First two theorems proceed from the existence of similarity as a consciously known fact, which is predetermined, the third theorem, on the contrary, establishes signs by which it is possible to find out whether two objects (processes, phenomena) are similar to each other.

Third theorem.

“Similar phenomena occurring in geometrically similar systems are subject to the same coupling equations, in which the monovalents are in a numerically constant relation and the criteria made of them are equal.

Since the property of such phenomena is that in nature there are only those whose criteria of similarity are equal, then it is possible to understand both the constancy of relations between them and the equality of the criteria made up of these quantities by the similitude of monovalents.

Similarity of monovalents can also include the geometric similarity of systems. With such an expanded interpretation of the word “similarity” of quantities, the third theorem is formulated as follows: *Similar are phenomena whose monovalents are similar.*

Since the theorem is proved by mathematical techniques, mathematical formulation is more concise, namely: similar objects (processes, phenomena), which are described by the same system of differential equations, and in which the similarity of uniqueness conditions is observed.

Conditions of uniqueness are called boundary and initial conditions, which allow one to infinitely many solutions of the system of differential equations to distinguish a single one that meets the conditions of this problem.

Criteria containing at least one non-uniqueness value are called non-determinants.

After the formulation of the original source, it is possible to construct a non-mathematical formulation of the third similarity theorem, which is widely available.

For similarities of objects (processes, phenomena), the defining criteria of similarity and similar conditions of uniqueness should be the same.

In other words third similarity theorem determines the necessary and sufficient conditions for the similarity of objects (processes, phenomena).

As an example of the application of the third similarity theorem, it is possible to cite an expert study in which the influence of a magnetic field on

the indicator of a magnetic field installed on a metering device is investigated.

While solving a system of differential equations in the research problem of a magnetic field to determine the magnitude of the magnetic induction on a magnetic field indicator, which is solved by applying the finite element method, the area in which the solution of differential equations is sought is broken down into a finite number of sub-regions (elements).

Boundary conditions under which an unambiguous solution of the whole problem is possible, provided that the approximating function at the nodes of the grid of adjacent elements is the same¹.

Summarizing the similarity theorems provided for their practical application in forensic research, the following formulations are given in this paper as signs of similarity:

First sign of similarity.

Characteristic properties (parameters) of the model and the characteristic properties (parameters) of the study object are described by the same formulations, physical regularities, mathematical dependencies and expressions.

The same definitions and conclusions can be applied to.

Second sign of similarity.

Model is similar to a research object in case the general or determinative list of the characteristic properties (parameters) of the model and the research object coincides.

Third sign of similarity.

Model is identical (identical) to the object of study in the case of simultaneous coincidence of the general or definitive list of characteristic properties (parameters) of the model and object of study and coincidence of conditions and circumstances in which their characteristic properties (parameters) are clearly manifested.

Application of scientific knowledge on these issues of scientific modeling in the modeling of objects of research in forensic examination should ensure a clear determination of the fit of the model to the

¹ Rohalin S. V. Matematychno modeliuвання vykhrovoho polia ta vyznachennia yoho kharakterystyk metodom kintsevykh elementiv prohramnymy zasobamy obchyslennia u doslidzhenni indykatoriv mahnitnoho polia pry vyrishenni diahnostychnykh zavdan sudovoi ekspertyzy rozrakhunkovykh prykladiv obliku, shcho zaznaly vtruchannia vid vplyvu postiiinoho abo povilno zminnoho mahnitnoho polia [Mathematical modeling of a vortex field and determination of its characteristics by a finite element method by software calculators in the study of magnetic field indicators in solving diagnostic problems of forensic examination of accounting devices that have been interfered with by the influence of a constant or slowly varying magnetic field] // Aktualni pytannia sudovoi ekspertyzy i kryminalistyky : zbirnyk materialiv mizhnar. nauk.-prakt. konf., prysviach. 150-richchiu z dnia narodzhennia Zasl. prof. M. S. Bokariusia (Kharkiv, 18–19 kvitnia 2019 roku) Kharkiv : KhNDISE. 2019. S. 346–348 [in Ukrainian].

investigated object (process, phenomenon) that should fully determine the adequacy of the model used in the while research on the object.

Thus, models are classified according to their attribution to the first, second, and third signs of similarity and, as a consequence, their appropriate use in certain forensic researches, namely:

1) models that are identified by forensic expert as being similar to objects (processes, phenomena) by the first sign of similarity are models that can be classified as a generalized set of expert studies and belong to a particular type of forensic examinations;

2) models that are identified by forensic expert as similar to objects (processes, phenomena) by the second sign of similarity are models that can be classified as a subset of expert studies and determine their belonging to a particular group of forensic studies (directions) in determined by the first sign of similarity to the type of forensic examinations;

3) models that are identified by the forensic expert as similar to objects (processes, phenomena) by the third sign of similarity are models that can be classified as one that is specific to that object in the expert study, which establishes individual conformity in the conditions unambiguous circumstances.

Conclusions.

Summarizing, it can be stated that in modeling, the principle of simplification and similarity should be supplemented with completeness (sufficient completeness) and adequacy.

Observance of these limitations and specific requirements specified in the study allows the forensic expert to apply the forensic research methods and / or scientific developments in the relevant scientific directions, to build a model for further research.

Thus, it is possible to distinguish the following steps in the expert study, which the forensic expert must overcome when applying the method of scientific modeling in forensic examination:

1. Awareness of the problem of studying the research object (original) in the factual circumstances and circumstances recorded in the case materials;

2. Defining the task and fixing all characteristics (parameters, properties) of the research object;

3. Defining essential characteristics (parameters, properties) of the research object;

4. Defining insignificant characteristics (parameters, properties) of the research object;

5. Minimizing the list of essential characteristics (parameters, properties) of the study object and maximize the list of non-essential parameters, properties) of the study object by successive step-by-step reduction for significant and non-essential lists.

Reducing the list of significant characteristics and increasing the list of irrelevant characteristics of the study object can be done in groups or in pairs.

It is necessary to monitor the presence or absence of dependency in groups or in pairs;

6. Preliminary establishment of adequacy of the list of material and non-essential characteristics (parameters, properties) of the research object;

7. Optimization of the study by limiting the number of significant and insignificant characteristics (parameters, properties) of the research object.

If necessary, a limit (increase or decrease) in the number of significant characteristics (parameters, properties) of the original should be introduced in order to obtain quantitative results in the expert's opinion on the results of the study, including to determine the accuracy of calculations when obtaining numerical results for models that are planned for use;

8. Use of similarity features in the construction (model) of a model that adequately describes the specific characteristics (parameters, properties) of the object of study (original), conditions and circumstances in which the characteristic properties (parameters) of the original clearly manifest.

Final determination of the list of essential and insignificant characteristics (parameters, properties) of the original.

Model construction is performed with the use of forensic research methods and / or scientific developments in the relevant scientific fields;

9. Studying of the model according to the expert task;

10. Transferring the model study results to the research object (original);

11. Delivering a reasoned conclusion.

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С. В. Роголін

ЗАСТОСУВАННЯ МЕТОДУ МОДЕЛЮВАННЯ В ДОСЛІДНИЦЬКІЙ ПРАКТИЦІ СУДОВИХ ЕКСПЕРТИЗ

У статті досліджено історичне становлення методу моделювання, наведено термінологію, зміст і суть методу моделювання. Надано класифікацію видів моделей. Систематизовано загальнонаукові теоретичні засади застосування критеріїв подібності та теорем подібності у моделюванні при виконанні дослідження в судовій експертизі, визначено вимоги до побудови моделей та сформульовано ознаки подібності у судовому експертному дослідженні, розроблено метод застосування моделювання у судовій експертизі по етапах дослідження.

Ключові слова: *судова експертиза, об'єкт дослідження, модель, подібність, критерії подібності, спрощення, адекватність, однозначність.*

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D. I. Gaydamakina,

Senior researcher of KhRIFE

ORCID: <https://orcid.org/0000-0002-2823-2810>,

e-mail: dianagayd@yahoo.com

O. S. Drobysheva,

Senior Researcher of KhRIFE

ORCID: <https://orcid.org/0000-0003-0447-0408>,

e-mail: 13335789@ukr.net

ABOUT INFLUENCE OF UNUSUAL WAY OF HOLDING WRITING DEVICE ON HANDWRITING

In expert practice, one of the known ways of distorting handwriting is the artificial creation of a change in the usual conditions for the execution of the manuscript by changing the mechanism of writing - an unusual way of holding a writing device by clipping it in the first or holding a writing device (ballpoint pen) at a considerable distance from the writing tip, at the end, opposite to the wanderer. Lack of necessary handwriting experts of modern reference materials with exhaustive information on changes in general and individual characteristics in handwriting with an unusual method of holding a writing device determines the relevance of the subject of this article.

The purpose of this research paper is to substantiate and systematize theoretical knowledge about the study of handwriting performed in unusual conditions - an unusual way of holding a writing device - by analyzing expert practice on the study of this kind of objects.

Methods general (formal-logical methods of cognition: analysis, synthesis, generalization, analogy), general science (observation, measurement, description, comparison), special (technical-forensic, identification, microscopic, quantitative, simulation, probabilistic-statistical).

The case from the expert practice of studying a handwritten text performed in unusual conditions artificially created by the performer for significant distortion of his handwriting - by holding a writing device (ballpoint pen) at a considerable distance from the writing tip at the end, opposite to the point, or clamped in the first is considered.

The general and private handwriting features are given, which change when handwriting is executed by distorted movements by the unusual holding of a writing instrument. The described mechanism of writing in the case of increasing the distance from the fingers to the tip of the writing device. The necessity of taking into account by the expert the character of changes of signs, caused by unusual way of maintenance of the writing device, is proved.

Keywords: handwriting, unusual method of holding a writing instrument, diagnosis, handwriting distortion, writing device clamped in a fist, holding a writing

device (ballpoint pen) at a considerable distance from the writing tip, at the end, the opposite tip.

Formulation of Research Problem.

While research on handwriting, it is important to correctly diagnose the fact of natural or deliberate distortion of handwriting, as each type of distortion has its own specific features.

In expert practice, one of the well-known ways of twisting handwriting along with masking handwriting by using graphic print graphics, handwriting is unusual for an artificially created change in the usual conditions of writing a manuscript by changing the writing mechanism — an unusual way of holding a writing device by clamping it or clenching it the writing device (ballpoint pen) at a considerable distance from the writing edge, in the opposite direction to the edge.

Analysis of Current Researches.

Despite the presence of theoretical and practical work that implements approaches to the study of features of the study of handwriting in an unusual way of holding a writing device, a complete and systematic description of the problem is not yet available.

Issues regarding unusual conditions of execution and ways of distortion of handwritten texts and signatures were studied by L. E. Arotsker, E. P. Konovalov, V. P. Burchaninov, M. G. Bogatyrev, A. D. Topolsky, A. I. Mantsetova, E. B. Melnikov, V. F. Orlova, V. A. Efremov, L. V. Markov, L. P. Nebesna, and others. L. E. Arotsker and E. P. Konovalov studied the signs of autocorrecting signatures.

L. E. Arotsker and E. P. Konovalov¹ studied the signs of signature auto-forgery.

V. P. Burchaninov VP, Bogatyrev MG and Topolsky AD considered the problem of the stability of handwriting when intentionally changed, including in cases of change of slope, acceleration or coherence.

A. I. Mantsetova, E. B. Melnikova and V. F. Orlova studied the interdependence of features in high-quality handwriting, the study of a manuscript made with changed handwriting, as well as the dependence of general features of handwriting on the method of holding a writing device.

V. A. Efremov, L. V. Markova deal with questions on the investigation of signatures made under unusual conditions in solving diagnostic and identification tasks.

L. P. Nebesna studied the question of the influence on the signs of the handwriting of the unusual direction of movements of the writing hand at the unusual position of a sheet of paper.

Lack of the necessary for forensic graphology experts of modern reference materials with comprehensive information on changes in general

¹ Arock L. E., Konovalov E. P. *Priznaki avtopodloga podpisov [Signs of auto-forgery of signatures]. Kriminalistika i sudebnaja jekspertiza. Kiev : Rad. Ukraina, 1957. S. 79–86 [in Russian].*

and individual features in handwriting in the unusual way of holding a writing device by clamping it in a fist or holding a writing device (ballpoint pen) at a considerable distance from the writing edge, opposite, determines the relevance of the topic of this article.

The **Research Purpose** is to substantiate and systematize the theoretical knowledge of the study of handwriting performed in unusual conditions — an unusual way of holding a writing instrument — by analyzing expert practice in the study of such objects.

As a result of the analysis of expert practice conducted to find out the degree and nature of the influence on the handwriting characteristics of such confounding circumstances, as an unusual way of holding a writing device by clamping it in a fist or holding a writing device (ballpoint pen) at a considerable distance from the writing edge, the end opposite the edge, some regularities and general features of the general and individual features of the handwriting were substantiated and systematized.

Expert practice requires some specific criteria that can be used to judge the robustness of features in manuscripts made in the unusual way of holding a writing device.

That is why the establishment of such criteria has been the focus of attention on this topic.

Main content presentation.

Research object is the handwriting of identification and diagnostic information contained in handwritten entries made under unusual conditions — by holding the typewriter (ballpoint pen) at a considerable distance from the writing edge, the end opposite the edge or clenched in the fist.

There is a whole range of issues related to finding out the dependencies of handwriting on a variety of circumstances, which should include technical writing skills: coordination of movements, pace of writing, style to hold a writing device.

Unfavorable external conditions of the letter are the reasons that cause natural changes in handwriting.

When executing handwritten texts in artificially created unfavorable writing conditions (an unusual way of holding a typewriter), significant changes in handwriting occur, making it difficult to identify the artist.

A number of features of the graphic side of the letter, which relate to both general and individual handwriting features, testify to the handwriting execution in the conditions of unusual holding of the writing device.

The analysis of expert practice shows that there is a dependence of general and individual features of the handwriting on the influence of the writing mechanism such a mechanism of writing, as a way of holding a writing device by clamping it in a fist or holding a writing device (ballpoint pen) at a considerable distance from the writing edge, at the end opposite the edge.

So, at the Hon. Prof. M. S. Bokarius Kharkiv Research Institute of forensic examinations was held handwriting examination, the object of which was the handwriting of an anonymous letter that began by the words:

“I’ve heard on the train...”

The examination decision raised the question of the fulfillment of the manuscript under study by an anonymous letter from a citizen of G. under the influence of natural or artificial confounding factors. The studied handwriting was executed in simple motions and high-quality handwriting, which provides for the formation and stability of writing and motor skills of writing.

As a result of the study, the expert came to the conclusion that the manuscript of the above-mentioned anonymous letter was written by the writing node of the ballpoint pen by G. himself under the influence of artificial confounding factors.

In this case, the above handwritten text of an anonymous letter was made in unusual conditions, artificially created by the artist for the most significant distortion of his handwriting — by holding the writing device (ballpoint pen) at a considerable distance from the writing edge, the end opposite the edge, or clamped in the fists.

There were no signs of an unusual hand letter in this text.

Analyzing the findings, the expert identified a number of features inherent in handwriting made in unusual conditions — an unusual way of holding a writing device by clamping it in a fist or holding a writing device (ballpoint pen) at a considerable distance from the writing edge, the end opposite the edge.

The choice of the writer as a way to distort the change of the mechanism of writing while holding the writing device clamped in the fist or holding the writing device (ballpoint pen) at a considerable distance from the writing edge, the end opposite the edge, provides a change in the appearance of the handwriting compared to normal.

As practice has shown, the biggest changes occur with common signs of handwriting.

In the process of writing with a writing device clamped in a fist, there is an increase in the activity of the brush in the writing process.

Fingers pinch, become almost stationary, and movements begin to be carried out, mainly by the brush and forearm. The mobility of the hand and forearm increases and allows the arm to move along the line.

The support of the hand increases, as the forearm and the outer edge of the brush are pressed tightly to the paper.

The writing device adopts a strictly vertical position perpendicular to the plane of the table.

Reduced coordination of movements affected, first and foremost, the slenderness of the handwriting, significantly reducing it, which was reflected in the fractures of straight lines, the irregularity of the line, uneven height, slope, acceleration, the cohesiveness of letters and their placement vertically.

The decrease in the coordination of movements was accompanied by a decrease in the clarity of the handwriting: the clear handwriting became

relatively clear and fuzzy, some letters looked deformed, others much simplified.

Comparison of indicators of height, inclination, acceleration and coherence of letters in the samples in the usual and considered unusual way of holding the writing instrument revealed an increase in the height and width of the letters as a whole; the slope of the letters became mixed, within one line there was a different position of the longitudinal axes of the letters with a clear predominance of the vertical; with a marked increase in the width of the letters there was a decrease in acceleration (the larger letters were more closely spaced); the cohesiveness of the letters increased in general, which is explained by the inconvenience of the letter, when it is difficult for the performer to tear the writing device from the paper because of the great stiffness of his fingers and hands.

Handwriting increased the pressure.

Considering the unusual mutual position of the hand and the writing device of all the common features, the greatest stability was observed with respect to the degree of elaboration.

Some performance indicators, such as coordination and tempo, have undergone significant changes due to a slowdown in performance.

The general character of the letter came closer to the character of the letter of the persons possessing technically low handwriting.

However, the difference from the poorly crafted handwriting is that along with the unstable coordination of movements there are signs of the produced letter and, in particular, variants of letters that go far beyond the graphical construction of the typical spelling of these letters, which allows to judge the degree of elaboration of the artist's handwriting.

Without significant changes in the conducted research the topographic features remained; peculiarities of the layout of the text in the line, paragraphs, on the page were stable.

Holding the typewriter by the end opposite to the edge, there is a decrease in coordination of movements, a decrease in pressure, there are simplifications in the structure of letters; motion automation is not saved.

Reduced coordination of movements and simplification of the structure of letters is associated with unusual letter conditions.

Signs of low coordination of movements are expressed in fractures of straight strokes and angularity of ovals, in uneven height, inclination, acceleration of letters, their placement vertically and unevenness of pressure, decrease in slenderness and clarity of handwriting.

The decrease in pressure is due to the weakening of the efforts of the writer, aimed at the working part of the writing device, due to the removal of her fingers and the reduction of the support area of the hand or lack of support, which leads to tension and stiffness of the brush.

The mechanism of the letter changes somewhat as the distance from the fingers to the tip of the writing device increases.

The writing device adopts an even more inclined position relative to the plane of the table.

The support decreases, the fingers are less pressed to the paper, the writing rests on the bent little finger, the lateral surface of the hand and forearm.

Mobility of the thumb, index and middle fingers (bending, stretching) increases.

As a consequence, the amplitude of the oscillatory movements in the vertical or inclined surface increases, which determines the height of the letters.

To align the writing device slightly, to bring it closer to normal, the writing person raises part of his hand, leaving support only on the little finger or on his last phalanx and on the forearm or part of his elbow.

The other part of the arm remains without support.

The little finger is straightened.

Sometimes only part of the wrist or all brush or fingers can be left unsupported, and only the forearm or elbow rests.

It can remain without the forearm support, and the support in the hand and little finger will remain.

In this example, the height of the letters increased with the distance between the fingers and the tip of the writing device increased.

This is due to the fact that increasing the distance from the fingers to the tip of the writing device allows you to perform through the bending and extension of the fingers together with other links of the writing hand strokes of great magnitude.

While maintaining the former coordination of movements and increasing the specified distance strokes of handwriting should be greater.

It is more difficult to keep the letter mechanism clear to the performer when locating the fingers at a great distance from the working part of the writing device.

Here also decreases the usual resistance.

Hence, more effort is needed to hold the writing device in a specific position, which causes some tension in the hands and fingers. Maintaining the uniqueness of the mechanism of writing is easier for a person writing when performing larger movements.

By controlling the edges of the writing device at a considerable distance from it to the fingers, it is easier for the performer to use the only necessary movements for playing the letter out of all possible hand movements.

The movements of individual elements and letters as a whole become simpler and more convenient.

This explains the appearance of cursive simplifications in the structure of letters.

The biggest changes in our example were observed in the general features of the handwriting, especially the height of the letters.

The letters as a whole or their elements have become more structurally simpler.

Simplification of movements occurred in the following letters or their elements:

«B», «В», «Д», «Ж», «З», «И», «К», «К», «Н», «Н», «П», «Р», «Т», numerals «1», «2», «9»,

rarely found when writing in the usual position simplified version of letters or elements of letters became more prevalent when writing with increasing distance from the fingers to the tip of the writing device.



In addition, there are new simplified variants of letters (most often the letter “d” with an extra-left element).

In performed research instead of cursive variants of lowercase letters:

“б”, “в”, “г”, “д”, “е”, “х”, “ч”, «я»

typographic letters were executed:



The greatest simplification of the structure of letters was noted by the end of the word. Attention is drawn to the degree of storage of the elements in the letter.

In most cases, the elements in the letter that are relevant to its reading are retained.

So, in letters:

“б”, “в”, “д”, “з”, “г”, “й”, “р”, “у”, “ф”, “ш”, “ц”

in the first the queue was stored above and below the line items:



Some letters were stored completely, in particular, the letters “ч”, “з”, “ю”, which may be due to the rare occurrence of these letters.

In this example, the inclination of the letters while holding the writing device clenched in a fist or holding the writing device (ballpoint pen) at a considerable distance from the writing edge, by the end opposite to the edge, increased.

This increase can be explained by the fact that in the ordinary letter the longitudinal axis of each letter is determined by the nature of the movements of the hand and fingers with a specific position of the hand and specific coordination of movements.

The movements of the hand in this case occur on a very small segment of the circle, part of which can describe the hand with the writing device with a fixed forearm.

The longitudinal axis of the letters must correspond to a small segment of this circle, corrected for finger movements and other factors.

The specified section is where the tip of the writing device is located.

With considerable removal of the fingers from the tip of the writing device, the radius of the circle increases, only the upper right segment of the circle is described (the arc becomes hollow).

Due to the unusual conditions of the letter and increased efforts to maintain the uniqueness of the mechanism of writing, it becomes more difficult to adjust the movements of the fingers of the movement of the brush (in an arc).

In this case, the most convenient are inclined movements that run along the sloping part of the circle, located at the top right (considering the center of the circle of the wrist).

Connectivity has remained largely unchanged.

In some words, it increased that was caused by the known inconvenience of the letter under the conditions under consideration.

It is difficult for the writer to tear the writing device away from the paper, as it requires the implementation of individual movements and their great accuracy (turning the tip of the writing device after the separation to a strictly defined point).

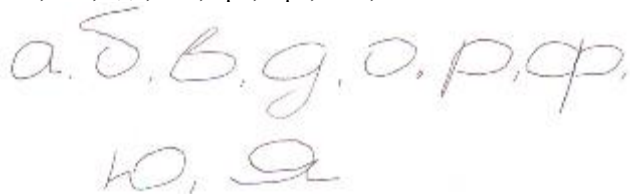
Easier to write without a break.

Even if in some words the gap and there was, in this case, there was a slowdown in movement when writing.

The main variant of writing the letters: "K", "к" in an unusual way of holding the writing device were those in which the first and second elements are not connected, and the second and third elements are performed by a single drive movement; in the second element of the letters: "K", "к" the arc shape of the movements was replaced by a straight-angular, directed from top to bottom.

There was a change (horizontal extension) of the areas formed by the strokes of the oval letters:

«а», «б», «в», «д», «о», «р», «ф», «ю», «я»:



Of the individual features that make up the structural characteristics of the movements, the most stable were the shape and direction of the movements when performing the letters as a whole.

The preservation of the general direction of movements in the execution of letters caused the stability of the form of movements.

However, the decrease in the coordination of movements has affected the stability of the form of movements in a number of manifestations.

The shape of the movements when performing elements of letters from straight (for straight strokes) and arc (for oval elements) became angular or close to angular.

There were numerous fractures of straight lines and the angularity of the ovals in the text.

The first element of the letters "3", "з", the second element of the letters "P", "p", the second and third elements of the letter "B" have acquired the likeness of *cuneiform*:

3, з, А, Р, В

Multiple angularity of movements was observed when performing closed ovals in letters:

“б”, “в”, “д”, “о”, “р”, “ф”, “ю”,

dominated by the angular shape of the movements and when performing the seminal elements of the letters:

«б», «г», «к», «с», «т»:

б, з, к, с, м

А, а, Н, н, Е, е, Л, л, И, и, П, р, С, с, Ч, ч, Э

While maintaining the usual arc shape of the movements when performing the humming elements was characteristic of the following: the arc shape of the movements combined with the left circular driving direction of motion.

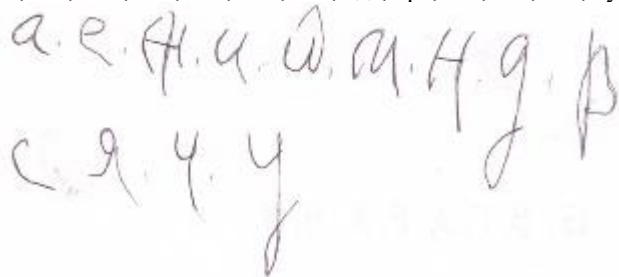
Yes, the letters: “А”, “а”, “ж”, “и”, “й”, “л”, “м”, “н”, “П”, “у”, “ц”, “ч”, “ш”, “я”; the elements of the number “4” were performed in pronounced arcuate, left-circular drive motions:

There was a replacement of the rectilinear shape of the movements in the execution of the second element of the letter "y" on the winding and arc shape of the movements on the bush when performing the superscript element of the letter “б”.

The area of the square narrowed considerably outlined by the strokes of the lowercase elements of the letters “д”, “з”, “у”, “ц” and the length of movements increased.

There was a low position relative to the line of the line of points of termination of movements when executing the final elements of the letters:

“а”, “е”, “ж”, “и”, “й”, “м”, “н”, “д”, “р”, “с”, “я”, “ч”, “у”:



There was a sharp deformation of individual letters, “bouncing” and “sagging” of letters in words, horizontal (“lying”) position of individual letters, “falling” letters, different position of longitudinal axes of letters (from right-handed to left-handed) within one word, offset by horizontal, “splicing” letters on each other, mutual cross-over of elements in the letters “ж”, “ч”.

There were no signs of *mirror* movements.

The most convenient were the oblique left-circular motions, there was also a large length of the final parts of the elements of letters, which, in turn, caused differences in the location of the point of end of the movements in the corresponding letters relative to the line of the line and other parts of these letters.

There have been inaccurate connections, cross-overlapping of elements, shifted horizontal movement as elements of letters with the previous or next ones are shifted.

A significant number of letters in the manuscript text under study looked warped.

When selecting experimental samples of handwriting, the expert was recommended to the judge to select a text similar to the one studied while holding the writing device clenched in a fist, as well as at different distances from the tip.

Later in the analysis of the obtained samples it was found that when holding the writing device at a short distance from the edge (1-2 cm), the height of the letters appeared to be small, while finding the fingers from the edge at a great distance (4-5 cm), the height was large, with an average the position of the fingers (more than 2-3 cm) height was often within the average.

The greater this distance, the greater the amplitude of the oscillatory movements of the hand vertically or inclined surface, which determines the

height of the letters, and vice versa, the smaller the specified distance, the lower the height.

Apparently, this distance should be correlated with the type of coordination of the movements of the writing hand, with its degree of perfection and other reasons.

It is easier for the contractor to maintain the uniqueness of the mechanism of writing, controlling the edges of the writing device at a short distance from him to his fingers than at a considerable distance.

In order to perform fine movements at a small height of letters and a relatively large distance between the fingers and the tip of the writing device, better coordination of movements is required than at a shorter distance. Hence, it is possible to maintain a small height of letters with better coordination of movements and finding the fingers at a relatively large distance from the writing edge.

With less perfect coordination of movements, the height of the letters may be greater with the close location of the fingers and the tip of the writing device.

At a short distance, the performer can perform letters of great height, connecting more actively to the movements of the fingers movements of the hand and forearm, which provide a greater amplitude of movements when writing.

Conclusions.

Thus, the choice of the writer, as a method of distortion unusual way of holding a writing device by clamping it in a fist or holding a writing device (ballpoint pen) at a considerable distance from the writing edge, the end opposite to the edge, provides a significant change in the appearance of handwriting in compared to normal.

Such an unfavorable condition of the letter entails a change in the pace and level of coordination of movements in the direction of their decrease. The general character of the letter approaches the character of the letter of persons possessing technically low handwriting.

The general features of the handwriting are subject to considerable changes, some of the features change to a lesser extent, the handwriting becomes similar to the poorly produced or to the handwriting of a younger student.

Therefore, in all cases of detection in handwriting (writing) signs of "poorly made" handwriting should establish their origin.

The expert in handwriting should be aware that the presence in the handwriting or writing of signs of low degree of coordination of movements and slow pace as a result of excessive tension of the muscles of the hand in writing, by itself does not yet indicate the execution of the manuscript by a person with a low degree of mastery of writing skills.

It should be borne in mind that such signs may indicate the execution of handwriting (records) under artificially created unusual conditions — when holding the writing device (ballpoint pen) at a considerable distance

from the writing edge, the end opposite the edge, or clamped in the fist — with the purpose of the most effective distortion of handwriting.

Changes in the general and individual features of the handwriting, depending on a particular violation of the usual conditions of the letter, should be considered by the expert both when checking the handwritten text (records) for unusual performance and in the process of comparative research.

This kind of change in the handwriting of an expert should be borne in mind, as in practice there may often be cases of intentional change in the distance from the fingers to the tip of the writing device or to the writing device clamped in a fist.

In assessing the converging and divergent features of the handwriting, the expert is obliged to take into account, if there are grounds for this, that the presence of a number of features may be a consequence of the execution of handwriting (records) in the unusual mutual position of the hand and the writing device.

He also needs to know the nature of the change in features caused by the unusual position of the hand and the writing device.

Information about those specific features that appear in handwritten text (entries) in unusual conditions — in the unusual way of holding the writing device by clamping it in a fist or holding the writing device (ballpoint pen) at a considerable distance from the writing edge, the end opposite to the edge needed by an expert to diagnose a method of intentionally distorting handwriting.

At the same time, it is essential for expert that greater variability is revealed by the general signs of the handwriting, while the individual signs in the majority retain stability allowing to identify the performer in in case of forensic examinations.

Therefore, the study of handwriting in an unusual way of holding a writing device by clamping it in a fist or holding a writing device (ballpoint pen) at a considerable distance from the writing edge is relevant today and requires further careful study.

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Д. І. Гайдамакіна, О. С. Дробішєва

**ПРО ВПЛИВ НА ОЗНАКИ ПОЧЕРКУ НЕЗВИЧНОГО СПОСОБУ
ТРИМАННЯ ПИШУЧОГО ПРИЛАДУ**

Мета роботи полягає в обґрунтуванні і систематизуванні теоретичних знань щодо дослідження почерку, виконаного в незвичних умовах — незвичним способом тримання пишучого приладу — шляхом аналізу експертної практики щодо дослідження подібного виду об'єктів. Розглянуто випадок із експертної практики дослідження рукописного тексту, який виконано у незвичних умовах, штучно створених виконавцем для найбільш значного перекручення свого почерку, — шляхом тримання пишучого приладу (кулькової ручки) на значній відстані від пишучого вістря, за кінець, протилежний вістря, або затиснутим у кулаці. Описано механізм письма і доведено необхідність врахування експертом характеру змін ознак, обумовлених незвичним способом тримання пишучого приладу.

Ключові слова: почерк; незвичний спосіб тримання пишучого приладу; діагностування; перекручення почерку; затиснення пишучого приладу в кулаці.

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Kh. V. Lutsenko,
Researcher of KhRIFE
Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0001-7883-3764>
e-mail: about-work@ukr.net

K. V. Nikulin,
Researcher of KhRIFEKharkiv, Ukraine,
ORCID:<https://orcid.org/0000-0002-0665-6313>
e-mail: knikulin87@gmail.com

VOICE IDENTIFICATION OF ANNOUNCER AS ONE OF THE MODERN PERSONAL BIOMETRIC IDENTIFICATION METHODS

The article deals with the most widespread biometric identification systems of individuals, including voice recognition of the speaker on video and sound recordings. The urgency of the topic of identification of a person is due to the active informatization of modern society and the increase of flows of confidential information.

The branches of the use of biometric technologies and their general characteristics are given. Here is an overview of the use of identification groups that characterize the voice. Also in the article the division of voice identification systems into the corresponding classes is given.

The main advantages of voice biometrics such as simplicity of system realization are considered; low cost (the lowest among all biometric methods); No need for contact, the voice biometry allows for long-range verification, unlike other biometric technologies.

The analysis of existing methods of speech recognition recognizing a person by a combination of unique voice characteristics, determining their weak and strong points, on the basis of which the choice of the most appropriate method for solving the problem of text-independent recognition, namely the model of Gaussian mixtures, was carried out.

The prerequisite for the development of speech technologies is a significant increase in computing capabilities, memory capacity with a significant reduction in the size of computer systems. It should also be noted the development of mathematical methods that make it possible to perform the necessary processing of an audio signal by isolating informative features from it.

It has been established that the development of information technologies, and the set of practical applications, which use voice recognition technologies, make this area relevant for further theoretical and practical research.

Key words: biometric identification technologies, Voice Identification Speaker, person verification, automatic speech recognition methods, examination of video, audio recordings.

Formulation of Research Problem.

Biometric technologies are technologies based on measuring the unique characteristics of a person.

These can be both unique birth characteristics (DNA, fingerprints, iris, etc.) as well as characteristics acquired over time or may change with age or external influence (handwriting, voice, gait, etc.).

Biometric technologies are widely used in many industries that are related to the security of access to information and material objects, as well as the unique identification of a person.

These can be access to jobs and network resources, law enforcement, social services to information protection, banking and other financial security.

Analysis of recent researches and publications.

The first international patent for the voice identification system was filed in 1983 by the CSELT Research Telecommunications Center (Italian Republic), by Michele Cavazza and Alberto Ciaramella. In May 2013, Barclays banking units began using the customer identification system over the first 30 seconds of a normal call. The system was developed by Nuance.

Currently known are the following developers of voice identification systems: Nuance, USA; Nok Nok Labs; VoiceVault, a US based research and development center in the United Kingdom of Great Britain and Northern Ireland; Sensory, Inc., United States; CMT companies, Russian Federation; Sistema-Sarov Innovation Technology Center, Russian Federation; BioLink, Russian Federation; AFM Solutions, Russian Federation; ValidSoft; Auraya Systems; Authentify; KeyLemon; Verint Systems; VoiceTrust.

A widely recognized market leader is Nuance, their solution is powered by Aeroflot, Speech Interpretation and Recognition Interface (Siri) is a personal assistant and answer and answer system developed for iOS.

This application uses natural language processing to answer questions and make recommendations. Siri adapts to each user individually exploring its benefits over time.

However, since a person's voice may vary depending on a number of factors, this method is not completely accurate¹.

The Article Purpose is to provide an overview and analysis of existing methods for biometric identification of a person, in particular, voice identification of a speaker.

Main Research Content Presentation.

The basis of the science of personality identification is the idea of measuring the body of a person and its parts.

These ideas were first formulated by Alphonse Bertillon (1853–1914), French forensic scientist, an employee of the Paris prefecture, who was engaged in the registration of criminals.

¹ Биомет Biometrija ot «A» do «Ja» [Biometrics from "A" to "I"]: polnoe rukovodstvo biometricheskoj identifikacii i autentifikacii. URL : <https://securityrussia.com/blog/biometriya.html> (data zvernennja 04.06.2019) [in Russian].рия от «А» до «Я»: полное руководство биометрической идентификации и аутентификации. URL : <https://securityrussia.com/blog/biometriya.html> (data zvernennia 04.06.2019).

In 1879, he introduced a system for identifying criminals, called anthropometry, and included: measurements of height, length and volume of the head, length of arms, fingers, feet, etc., as well as a verbal portrait of the criminal, a photo portrait in full face and profile, as well as description of special features.

Modern criminalistics still uses such a system, supplementing it with anthropometry, fingerprinting, photographic work, new methods for describing special features on a person's face or body and technologies for their implementation.

However, the concept of biometrics was formed a decade later.

In the origins of early biometrics was Francis Galton, English researcher.

The term *biometrics* first appeared around 1980.

In the encyclopedia of modern Ukraine, there is such an interpretation of the term biometrics (from *bio* and *metrics*): the science of applying the methods of mathematical statistics to study the phenomena of life. Another title is variation statistics.

The **ISO / IEC 2382-37: 2012** international standard: Information technology — Vocabulary — Part 37: Biometrics provides the definition of biometric systems.

Biometric system is a system designed to automatically recognize an individual (human person) based on his or her behavioral and biological characteristics³.

In the field of information technology, the following interpretation applies: *biometrics* is a set of automated methods and means of identifying a person based on his physiological or behavioral characteristics.

In the field of information technology, the following interpretation applies:

In recent biometrics based systems and technologies, biometric verification, identification and authentication should be distinguished.

In accordance with **ISO / IEC 2382-37–2016 37.08.03 biometric verification**: the process of conforming a biometric statement by comparison. The use of the term **"authentication"** instead of the term **biometric verification** is unacceptable⁴.

In accordance with the same **ISO / IEC 2382-37–2016 37.08.02** biometric identification: a process of searching a biometric retrieval database aimed at finding and returning an identifier (s) of a biometric control pattern associated with a single individual.

The use of the **authentication** term instead of **biometric identification** is unacceptable.

³ ISO/IEC 2382–37:2012. («Information technology – Vocabulary – Part 37:Biometrics», IDT). URL : <https://www.iso.org/standard/55194.html> (data zvernennia 13.05.2019).

⁴ ISO/IEC 2382–37–2016. [ISO/IEC 2382–37:2012] («Information technology – Vocabulary – Part 37:Biometrics», IDT). URL : <https://meganorm.ru/Data2/1/4293747/4293747566.pdf> (data zvernennia 13.05.2019).

In the same international standard **ISO / IEC 2382-37-2016 37.08.01** authentication– action that proves or demonstrates undeniable origin or authenticity.

The term is used in biometrics as a synonym for biometric verification application, **biometric verification** function used as a synonym for biometric identification supplements and biometric identification function.

Thus, *biometric identification* is a way of identifying a person by specific specific biometric features (identifiers) that are inherent in a particular person.

Biometric authentication is the recognition of an individual based on physiological characteristics and behavior. Authentication is carried out by checking the identity of the person presented with the identification mark.

Table 1 provides examples of the use of biometric technologies in various applications⁵.

Table 1

Areas of use of biometric technologies and their general characteristics.

№	Field of use	Key features
1	Computer Security	In this field, biometrics are used to replace (sometimes intensify) the standard logon procedure for a variety of passwords, startup cards, touch-memory tablets, and the like. The most common solution based on biometric technology is the identification (or verification) of biometric characteristics on a corporate network or when entering a workstation (personal computer, laptop, etc.).
2	Trade	Main Destinations: – in stores, restaurants, coffee bars, biometric identifiers are used either directly as a means of identifying the buyer to withdraw money from the account, or to confirm the buyer's right to any discounts or other benefits; – in vending machines and ATMs as a means of identifying a person instead of magnetic cards or supplementing them; – In e-commerce, biometric identifiers are used as a means of remote identification via the Internet, which is much more secure than

⁵ Биометрические системы идентификации и аутентификации [Biometric Identification and Authentication Systems]. URL : <http://mirznanii.com/a/309729/biometricheskie-sistemy-identifikatsii-i-autentifikatsii> (data zvernennja 04.06.2019) [in Russian].

		passwords, and in combination with cryptography, gives electronic transactions a very high level of protection.
3	Access Control and Management Systems	In a network architecture, where multiple entrances are equipped with biometric locks in the building, all staff members' biometric characteristics templates are stored centrally, with information about who and where (and possibly when) the entry is allowed. The following recognition technologies are implemented in such systems: fingerprint, face, arm shape, iris, voice, etc.
4	Automated fingerprint information systems	The main purpose of such a system is to manage the rights granted by the state to citizens and foreigners. Citizens' rights, voting, places of residence, work of foreigners, the right to receive social security, etc. are recognized and confirmed through documents and various cards. Nowadays, such systems have become widespread because some countries have begun to use them to verify the identity of those who drive.
5	Complex systems Systems	Systems of this type include solutions that combine the systems of the first three classes. The company employee registers with the system administrator only once, in the future he is automatically assigned all the necessary privileges both to enter the premises and to work in the corporate network with its resources.

In addition to these major sectors of biometric technology, biometrics is now being actively used in other areas, such as:

- Gaming.

Biometrics are used in two ways: checking all of the "black lists" (analogue of mass identification by persons used in airports), as well as the identification system and payment of regular customers;

- identification on mobile devices such as mobile phones, tablets, laptops, etc;

- in the transport industry as a means of payment;
- electronic voting systems (used instead of cards);
- medicine.

Biometrics are used to identify health care providers upon access to classified information and to receive electronic signatures in medical records.

Modern biometric authentication is based on two main methods:

- static method of authentication — recognizes the physical parameters of the person, which he possesses throughout life: from his birth to his death (fingerprints, characteristics of the iris, thermogram, face geometry, hand geometry, fragment of genetic code, fragment of genetic code);
- dynamic method of authentication — analyzes the characteristics, features of user behavior, which are displayed at the time of performing any ordinary daily activity (signature, keyboard handwriting, voice, etc.).

Static method has always been a major player in the global biometric protection market.

Dynamic authentication and combined information security systems accounted for only 20% of the market.

However, in recent years there has been an active development of dynamic protection methods⁶.

Voice identification has been known for a long time, and in the absence of any technical means, the person identified the other person by three possible features — voice, signature and appearance.

Therefore, voice identification is one of the oldest methods of biometric identification.

Each person has a unique voice that is different from any other specific trait.

Voice identification is one of the most attractive systems for identification, but current problems in this type of biometric system should be taken into account at least in working systems.

For example, voice recognition can be effectively used as an additional method, for example, to face recognition, since the probability of self-recognition error in voice is 2-5 %.

Currently, the areas of identification by voice are actively developing.

The advantage of voice biometrics is the ease of implementation of the system, which usually consists of a voice receiver, voice recorder, voice modulator, biometric software and a voice database.

Unlike other biometric technologies, voice biometrics allows for long-range verification.

One of the promising ways to increase the reliability of voice identification is to integrate the characteristics of the dynamics of subliminal movements, which is actively used in signature identification.

On the other hand, there are applications where voice identification is most convenient, such as remote access to telecommunication channels for voice data analysis⁷.

⁶ Biometrija ot «A» do «Ja»...[Biometrics from "A" to "I"] [in Russian].

⁷ Tsarov R. Yu., Lemekha T. M. Biometrychni tekhnolohii. [Biometric Technologies] Navch. posib. Odesa, 2016. S. 140 [in Ukrainian].

The voice recognition method identifies a person by a set of unique voice characteristics.

The algorithms analyze the main features that make a decision about the speaker's identity: voice source, resonant frequencies of the speech tract, their attenuation, and the dynamics of articulation management.

Based on age experience, modern scientists use two groups of features to characterize the voice when identifying by voice.

The first group is the physiological (anatomical) features that are related to the features of the mechanism of human speech formation.

The second group is the so-called articulatory features, which are based on the peculiarities of the human nervous system, which determines the nature of the use of physiological features.

Physiological features.

Physiological traits are based on the model of the speech tract. In this case, the main characteristics are several parameters that characterize the voice:

- energy of the speech signal;
- frequency range of the speech signal;
- fundamental frequency determines the length of the speech tract;
- formants determine the concentration of the speech signal by frequency and characterize the loud sounds.

Articulation features.

If the physiological features reflect the statistical properties of the language apparatus, then the articulatory features make it possible to describe the behavior of the language apparatus over time, that is, to reflect the articulatory dynamics of the language.

The main factor influencing this group of attributes are the socially conditioned speech skills of a person, his / her individual experience, temperament and personality traits.

Articulatory signs take into account the intonation of speech, rhythm, stress, volume. To obtain these characteristics, the concept of syntagm is used.

Syntagm is a rhythmic-melodic unit of language, grammatically worded and defined within a more complex whole structure (such as a sentence) with a finite thought.

Within the syntagm, the segments distinguish between language characteristics and intonation characteristics of speech, namely: voice intensity; melody of voice; stress system; temporal characteristics: length of segments and pauses; rate of speech; tone of speech.

It should be noted that modern voice identification systems can use both physiological and articulatory features at the same time.

Voice identification systems can be divided into the following classes: text-dependent, text-independent, voice-dependent, voice-independent.

Voice-dependent systems are systems that focus on the characteristics of a particular person or group of people, so they can be used to identify only that person (group of persons).

If you change the speaker (the person who is identified by the system), you need to adjust the system again using the voice features of the new speaker.

Dictator systems are systems that are not tied to a person's voice tags and can be used to identify any person.

Such systems themselves identify the necessary voice features and compare them with the standard from the base.

Text-dependent systems are voice identification systems that identify a person by a particular keyword or key phrase that an identifying person, for example, announce a password that is randomly generated.

The use of individual features and the coherence of phrases generated and recognized increases reliability.

Non-text-based systems are systems that identify a person by voice without being tied to any keywords.

In this case, the articulatory features of the human voice are important, they are used as the main features, and the physiological features act as secondary ones.

Non-textual identification implies the use of only individual features.

An important characteristic of the voice identification system is the speed (speed) of identification.

Improved performance can be achieved through the use of new fast processing algorithms.

Adweek estimates that in 2019, the voice recognition platform market will grow to \$ 601 million, and by the end of 2011 to \$ 40 billion.

All because it is easier for people to talk than to type, they need voice assistants that support habitual communication.

There are already a lot of helpers on the market: Amazon Alexa, Google Assistant, Cortana, Bixby, Alice, SoundHound, Apple Siri, X.ai and others.

The introduction of voice control devices in the car is one of the trends that will lead to global changes in the automotive sector.

Such devices will be able to centrally control most of the car's functions through human speech, eliminating the need to use buttons, dials, switches and more. Using voice recognition devices, users will be able to easily control a range of car features, making it more comfortable for the person and avoiding direct driving while focusing on driving.

The introduction of such technologies will increase in the near and medium term⁸.

Improving the reliability of voice identification is important not only in the areas such as the separation of access to physical and information

⁸ Биометрија от «А» до «Я»...[Biometrics from "A" to "I"] [in Russian].

objects, such as access to the operating system of a personal computer or remote access to telecommunication channels for voice data analysis.

There is some interest in related areas of language technology: speech recognition, voice command management, and more. Electronic digital signature for the protection of confidential documents in the form of a secure electronic device (token) has become widespread today and in this regard the development of the protection of confidential documents based on a language signature is in view.

In addition, the practical applications of such research are useful for law enforcement agencies, such as the identification of a person by the physical parameters of the voice.

However, the development of technology and technological advances not only bring about positive points but also empower criminals.

One of the major offenses in the telecommunications environment is telephone fraud, which is rapidly gaining in popularity and is becoming a real epidemic.

Victims of criminals are all without exception — these are businessmen, officials, stars of show business, and ordinary citizens.

Here are some basic types of phone fraud and how to combat them.

The most common type of telephone fraud is the so-called "Roddy in Need".

How is it organized?

A person is calling from an unknown number.

The offender is introduced by a relative or acquaintance and in an agitated voice informs him that he has been detained by police officers and is accused of committing a crime.

It can be a road accident, or storage of weapons, drugs, bodily harm, or even murder.

Next, the so-called police officer comes into the conversation, who tells in a confident tone that he has repeatedly assisted such people. To resolve the issue requires a certain amount of money, which should be brought to the designated place and handed to some man.

The asking price is usually between one and several thousand dollars.

Similar voices, one group voices that do not differ can be encoded in the cellular communication systems approximately the same, so they will appear similar to the degree of mixing in auditory perception and comparison of integral acoustic parameters.

It is in this particular feature of cell broadcasting that the prerequisites for the implementation of telephone fraud lie when the likelihood of mistakenly recognizing someone else's voice as an acquaintance is high when accessing a cellular phone.

As it is known, emotional state of a person significantly affects the characteristics of voice, conversation style, etc.

There are times when, upon receiving such a message, a person is deceived, even if the person referred to in the message is nearby.

This is how parents are arranged: they always worry about their children, and the reaction to a possible threat to them is very strong.

Simple, effective and brazen scheme that uses strong feelings and basic instincts.

The same principle is based on a type of telephone fraud — "Mom, I have problems, do not ring, transfer money to this account."

Like fingerprints in forensic science, criminalistics (fingerprinting), forensic examination uses video and audio objects, namely video, recordings recorded on storage media.

In this regard, forensic forensics use their specific methods and techniques.

The physical basis of voice verification is the anatomy of the speech tract, the properties of the articulation management system, and features of the voice source.

The anatomy of the tract determines the spectral characteristics of the speech sounds, the articulation control system influences the speech rate, the speed of transients, and the duration of the speech segments, and the voice source determines the pitch frequency and the timbral characteristics of the speech signal.

Only those features that can be directly measured in a speech signal are investigated.

However, as the results of the research show, speaker verification in the acoustic parameter space provides characteristics that are most satisfying and best suited to the real world environment.

Diagnosis uses known features of a class or group of objects and compares them with features of a particular object, which determines its belonging to that class or group.

To achieve this goal, experts solve different types of tasks.

An important characteristic of the voice identification system is stability.

Obstacles are distortions, noises, impulses, etc.

Current classification methods used in voice identification systems are very sensitive to noise, resulting in reduced reliability when exposed to noise.

An example of channel distortion is the reverberation of sound, ie, the sound is repeatedly reflected from objects in the room.

The background, in some cases being an obstacle, can have a significant impact on voice identification.

They may have a *significant* signal level (for example, vehicle sounds; sounds produced by devices and household appliances; sounds inherent in the mechanisms, devices, apparatus, devices and means that accompany the operation of these sources; sounds of wildlife; sounds of phenomena of nature ; mechanism sounds; sounds of devices, apparatus and devices specially designed to create, amplify and radiate sound, etc.) and *overlap* the range of the speech signal.

In a telephone channel, there may be obstacles such as clicks, overloads, music, beeps (tones), etc.

Since modern digital mobile devices typically have a built-in microphone and productive hardware, creating a voice authentication system with more cost-effective computing methods is quite a challenge for mobile platforms.

However, it is still necessary to provide minimal computational costs while maintaining accuracy, noise immunity to various types of interference, and sufficient reliability with common hardware.

Speaker identification is the process by which the system can determine who is the speaker based on the information from the speech signal.

Recently, sound recording has also been widely used in integrated security systems, video surveillance systems (CCTV) and security systems.

The information we receive is used to identify violators and to analyze the state of the audio environment in order to monitor personnel actions and security.

Audio information is also used in telephone call transfer information systems (TIS), alert systems, alarm calls, and the like.

In this regard, it becomes urgent to solve problems related to the analysis of audio information obtained during recording in security systems and which can be used for further analysis in specialized laboratories of law enforcement agencies, laboratories and centers of forensics, research and training centers to:

- identification of the person by means of the recorded phonogram;
- analysis of the noise background, diagnostics of the acoustic environment and the conditions of recording;
- identification of sound recording equipment;
- improving the quality and legibility of existing records;
- protection of the speech signal from unauthorized access;
- compression of speech messages;
- establish the literal content of low quality records.

When solving the problems of protecting physical objects and information resources from criminal and terrorist threats, it is very interesting to use audio information (audio voice recordings) in access control (AC) and management systems (ACS).

The peculiarity of such systems is that they allow remote (by telephone) and hidden authentication, which is sometimes the only possible means of establishing the interlocutor's identity.

Consider the most common modern automatic speaker recognition techniques that underlie voice biometric systems.

A method for comparing fundamental statistics⁹.

⁹ Matveev Ju. N., Simonchik K. K. Sistema identifikacii diktorov po golosu dlja konkursa NIST SRE 2010 [Sistema identifikacii diktorov po golosu dlja

The fundamental tone is one of the basic parameters of the speech signal, and does not depend very much on the recording conditions and the type of channel.

У зв'язку з цим, метод розпізнавання дикторів, заснований на параметричній статистиці основного тону (ОТ) є одним з базових серед автоматичних методів розпізнавання диктора.

The advantage of the spectral method used to calculate the pitch frequency is that it allows the pitch frequency to be estimated using all the available signal bandwidth.

Frequency response (AFC) of a sound recording channel always significantly affects the shape of the spectrum.

This effect should be taken into account, because otherwise the frequency response of the channel, on the one hand, may mask the individual parameters of the voice of the speaker, and on the other hand, mask some of the spectrum of the speech signal and make it inaccessible for further biometric recognition.

The key factors that affect the effectiveness of authentication by a method based on analysis of pitch statistics are the following:

- speech volume of the material under research and the volume of speech material in the voice and speaker samples (system performance is noticeably higher if a voice duration recording is sufficient to obtain reliable pitch statistics);

- the presence (both for the subjects and for video, phonograms with samples of oral speech) obtained with the same emotional state of the speaker);

- the presence (both for the investigated and for video, phonograms with samples of oral speech) obtained with the same background environment (when the influence of the environment is so large that the speaker's speaking style changes);

- signal-to-noise ratio;

- no reverb on the records.

Method of spectral-formant analysis The method of identification of speakers based on spectral-formant features compares the studied natural speech recordings with similar samples from the speech database of standards by analyzing the position of formants.

Main stages of work:

- reprocessing of an incoming audio file, including: deleting pauses; normalization per channel; constructing speaker models using formant vectors as input features; construction of SVM (Support Vector Machine) model of speakers;

- Comparison of speaker models.

The algorithm of the speaker identification method based on the comparison of spectral-formant representations consists of the following blocks:

- normalization per channel;
- calculation of speaker identification models;
- calculation of individual decision thresholds “own / alien” by comparing the obtained identification model with a standard set of reference models of consciously “alien” speakers;
- direct comparison of the obtained identification model with the model from the database and decision *friend or foe* according to individual thresholds and given probabilities of false alarm and omission of the target.

The method of analysis of a mixture of Gaussian distributions.

Currently mixtures of Gaussian distributions (MGD) are one of the main approaches in solving the problem of voice biometric authentication.

The speaker's Gaussian blend model provides a plausible model of the main sounds contained in the speaker's speech.

Linear combination of Gaussian functions is used to represent the large volume of experimental distributions as a basis. The main advantage of this method is the possibility of forming smooth approximations of the experimental distributions of the acoustic space components, the shape of which can be arbitrary.

The main difficulty in solving the problem of biometric authentication for systems based on the SGR method is to offset the impact of the mismatch introduced by the interference contained in the channel used during recording.

The reasons for this discrepancy may be: environmental noise during recording, distortion of the recording and transmission channels of speech signal, variability of voice of the speaker over time.

The channel, in this case, means the following set of effects: distortions made by the recording equipment; the influence of the microphone of the device used to obtain the individual voice biometric characteristics of the speaker; the influence of the frequency response of the connection channel.

The speaker's Gaussian blend model is convenient for modeling the speaker's voice characteristics, sound recording channel, and environment.

Each of the components of the model reflects some common, but unique for each speaker features of voice. That is why this approach can be successfully used to address the problem of speaker identification.

In order to build a model of the speaker, it is necessary to accurately estimate its parameters, which most closely correspond to the distribution of the vectors of features of the educational expression.

There are a number of methods for estimating model parameters. One of the most popular and well-established is the maximum likelihood estimation method.

The purpose of estimation by this method is to determine the model parameters that will maximize the likelihood of the model when given data for training.

The model is an efficient algorithm that enables identification with high accuracy of recognition. However, there are a number of problems associated with selecting the number of components of the model and initializing its initial parameters.

Joint factor analysis method¹².

This solution is to use Joint Factor Analysis (JFA), which allows a separate announcement of the speaker to effectively separate the channel information from the speaker information.

This allows you to build a channel-independent GMM model of the speaker's speech and suppress the effects of the channel in the audio data, which builds the speaker model.

Full Variability Matrix Method.

One solution to the large size of speaker models is to use low-dimensional feature vectors.

Thus, in the modified version of JFA, the Total Variability (TV) matrix is used to generate feature vectors.

This modified version of JFA is often referred to as the TV's auto speaker recognition method.

This method is widely accepted as the most promising method of speaker recognition, which allows the large-scale input data to be reduced to a low-dimensional feature vector, while preserving most of the useful information.

This reduces the size of the speaker model to 2-3 kbytes, which is often acceptable when solving the problem of speaker identification for a large collection or construction of a system that requires the transmission of speaker models via slow communication channels.

Probabilistic linear discriminant analysis method¹⁴.

The second solution to the mismatch problem is to modify the JFA method, which contains an additional operation based on probabilistic linear discriminative analysis (PLDA).

This allows you to more effectively offset the effect of channel distortions when solving the problem of voice recognition of the speaker.

¹² Shhemelinin V. L. Metodika i kompleks sredstv ocenki jeffektivnosti autentifikacii golosovymi biometricheskimi sistemami [Methods and a set of means for assessing the effectiveness of authentication with voice biometric systems] : dis. ... kand. tehn. nauk. Sankt-Peterburg, 2015. S. 22 [in Russian]. ации голосовыми биометрическими системами : дис. ... канд. техн. наук. Санкт-Петербург, 2015. С. 22.

¹⁴ Zakharov V. P., Rudeshko V. I. Biometrychni tekhnolohii v KhKhI stolitti ta yikh vykorystannia pravookhoronnymy orhanamy [Biometric technologies in the 21st century and their use by law enforcement agencies] : posib. Lviv, 2015. S. 492 [in Ukrainian].

Dynamic Time Warping (DTW) Timeline Transformation Method¹⁵.

This method allows you to find the closeness between two measurement sequences over a period of time.

This method was first used in speech recognition to determine how two language signals represent the same original spoken phrase.

In the general case, these sequences can be of different lengths, and measurements can be made at different speeds. The main advantage of the DTW algorithm is its ease of implementation.

However, this algorithm is not suitable for solving the problem of text-independent speaker identification.

A special place of identification of a person by voice occupies at investigation of crimes.

Defining such characteristics by speaker's voice as gender, age, nationality, dialect, emotional coloring of speech are also important in the field of forensic and anti-terrorist activities.

Identification results are important when conducting video, audio recording, expert forensic research based on the theory of forensic identification.

Much research has been done in the area of speech recognition, but so far, speech recognition systems are not one hundred percent accurate.

In the future, speech recognition systems should be free from these restrictions.

The growth of the global voice recognition market depends on many factors.

One of the main factors is the increasing demand for voice biometrics services.

The high demand for voice biometrics, which is unique to any person, is crucial in establishing a person's identity.

Biometrics will continue to be increasingly used in access control systems, in particular in various educational and medical institutions, and biometrics will increasingly become identification cards, various documents and voting systems.

Biometrics will make you feel safer because its main task is to fight crime, terrorism, a way of preserving personal information, and improving the comfort of citizens.

User-friendliness, simplicity, ability to integrate with other methods of identifying individuals are also significant factors that confirm the feasibility of using voice technologies in biometric systems, as separate

¹⁵ Zb. nauk.prats Tsentrui voienno-stratehichnykh doslidzhen Natsionalnoho universytetu oborony Ukrainy imeni Ivana Cherniakhovskoho [Coll. Scientific Work of the Center for Military-Strategic Studies of Ivan Cherniakhovsky National University of Defense of Ukraine]. 2018. № 3(64). S. 146. URL : https://nuou.org.ua/assets/journals/zbirnyk_cvsd/zb-3-64-2018.pdf (data zvernennia 08.05.2019 [in Ukrainian]).

from other methods of verification and identification, and in combination with them.

Conclusions.

This article provides an overview and analysis of existing methods for biometric identification of a person, in particular, voice identification of a speaker.

Based on the above, we can conclude that the development of biometric systems is another way to keep up with the times.

There are currently a number of methods available to solve the speaker's voice identification task, each with its own advantages and disadvantages.

However, the most common method is the Gaussian mixture model. Gaussian mixture models have proven themselves to be a stochastic model for building recognition systems. They are convenient not only for modeling the characteristics of the voice of the speaker, but also for the recording channel, the environment.

The individual components of the model can model a single set of acoustic features.

Each of the components of the model reflects both the general and the voice-specific features of each speaker.

That is why this approach can be successfully applied to solve the problem of text independent speaker identification.

Thus, voice identification of a person in certain circumstances has significant advantages that need to be developed, especially in Ukraine.

Biometrics will make you feel safer because its main task is to fight crime, terrorism, a way of preserving personal information, and improving the comfort of citizens.

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Х. В. Луценко, К. В. Нікулін

ГОЛОСОВА ІДЕНТИФІКАЦІЯ ДИКТОРА ЯК ОДИН ІЗ СУЧАСНИХ БІОМЕТРИЧНИХ МЕТОДІВ ІДЕНТИФІКАЦІЇ ОСОБИ

У статті розглянуто найбільш розповсюджені біометричні системи ідентифікації осіб, у тому числі голосової ідентифікації диктора на відео-, звукозаписах.

Приведені галузі використання біометричних технологій та їх загальні характеристики. Наведений огляд використання груп ознак при ідентифікації, які характеризують голос.

Розглянуто основні переваги голосової біометрії, такі як простота реалізації системи; низька вартість (найнижча серед усіх біометричних методів); вона не потребує контакту і дозволяє здійснювати верифікацію на великій відстані на відміну від інших біометричних технологій.

Проведено аналіз існуючих методів розпізнавання мовної інформації, які ідентифікують особу за сукупністю унікальних характеристик голосу.

Ключові слова: біометричні технології ідентифікації, голосова ідентифікація диктора, верифікація особи, автоматичні методи розпізнавання диктора, експертиза відео-, звукозапису.

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V. A. Rudniev,

Leading Researcher of KhRIFE, PhD in Chemistry Kharkiv, Ukraine
ORCID: <http://orcid.org/0000-0002-2550-3515>
e-mail: vasiliy.rudniev@gmail.com

O. D. Bui,

Leading Researcher of KhRIFE, PhD in Chemistry
Kharkiv, Ukraine
ORCID: <https://orcid.org/0000-0003-2053-3122>
e-mail: b.olga.d.75@gmail.com

A. F. Klimchuk,

Senior Researcher of KhRIFE
Kharkiv, Ukraine
e-mail: klimchuk.alla1965@gmail.com

ROLE OF THE THIN-LAYER CHROMATOGRAPHY METHOD IN THE CRIMINALISTICS RESEARCH ON IGNITION MIXTURES ON THE BASIS OF PETROLEUM PRODUCTS

The appearance and quality of the material evidence that comes to the study, often also not conducive to the use of complex methods of analysis. There are no separate techniques for forensic investigation of incendiary mixtures, and existing approaches to the study of petroleum products and fuels and lubricants do not allow the tasks set before the experts to be fully addressed.

To determine the applicability of the thin layer chromatography method and to interpret its results for the examination of incendiary mixtures, forensic modeling of incendiary incendiary incendiary mixtures was conducted. The study revealed the possibilities and limitations of thin layer chromatography in the analysis of complex compositions, including those containing polymeric thickeners. The results were interpreted for use in forensic practice. The study was performed by TLC in an octane solvent system: benzene with the detection of colored zones in UV rays, with the manifestation of iodine vapors and the processing of chromatograms of 2% formaldehyde in sulfuric acid. The results of thin-layer chromatography characterize the main constituent components and can be used in the primary study of petroleum-based ignition mixtures in expert practice. The use of UV detection of colored zones on a chromatographic plate allows to assess in more detail the nature and composition of the mixture under study, including to identify distillate and residual oil products.

Thin-layer chromatography can be recommended as a mandatory method of investigation for the ignition mixtures, which precedes the use of more complex Physics and Chemistry spectral and chromatographic approaches.

Keywords: oil products, combustion mixtures, multicomponent systems, component composition, thin-layer chromatography, forensic researches.

Formulation of Research Problem.

Results of forensic investigations are important in establishing the evidence base in judicial investigations.

Nowadays, there is no doubt that crime can be tackled on a scientific basis using a rich arsenal of scientific methods and technical means.

Also, to ensure the effectiveness of this process, the areas of research need to be continually expanded and transformed, given the challenges of today.

Given that there is a continuing threat to personal safety, the number of terrorist attacks using explosive devices containing ignition mixtures is increasing, and the number of expert researches focusing on various based on Petroleum products ignition mixtures has increased.

At the same time, available information on the use and preparation of which has not lost its relevance for decades¹.

The incoming combustion mixtures can be divided into three main groups:

- inflammatory mixtures based on Petroleum products;
- metal-containing ignition mixtures based on Petroleum products;
- termite ignition mixtures based on aluminum powder and iron

scale.

Petroleum-based ignition mixtures are divided into liquid (non-thickened) and binder (thickened).

The former are gasoline blends with heavy motor fuels of all types, diesel fuels and lubricants.

In their preparation, the starting compounds may be in different ratios.

The preparation of these mixtures does not require special qualification from the performer and the user.

Thickened mixtures are gelatinous compounds that contain liquid fuels and thickeners.

The light components of the mixtures improve its combustibility, the heavy ones increase the jet emission range and the duration of combustion.

Special thickeners, such as polystyrene or polybutadiene are used to make viscous ignition mixtures.

The use of a large amount of polystyrene in the mixture significantly improves the retention of the combustible liquid on a variety of surfaces, even wet.

¹ Nastavlenie po strelkovomu delu [Instruction on the shooting case]. Ruchnye oskolochnye i protivotankovye granaty i zazhigatel'nye butylki. Avtory neizv. Moskva : 1946, 94 s. URL: <https://armyman.info/books/id-10775.html> (data zvernennja 01.05.2019) [in Russian].

Current techniques for the study of petroleum products and fuels and lubricants do not provide a separate scheme for the study of ignition mixtures.

This leads to the urgency of establishing the design scheme for the study of such mixtures using existing methods.

Analysis of recent research and publications.

In foreign literature, the bulk of research on source, unmodified objects is devoted not to individual combustible mixtures, but to commercial fuels with impurities of other types of oil, such as in papers¹² and a review article³.

This can be explained by the fact that the list of methods of investigation of such ignition mixtures is diverse and relates to the conventional methods for forensic research of petroleum products and fuels and lubricants, although the approaches mentioned in these works can also be used in the study of ignition mixtures.

However, there are separate, more detailed studies of the latter.

Thus, the paper⁴ proposes to use the method of capillary electrophoresis to determine the composition of the inorganic component of ignition mixtures and the paper⁵ shows the possibility of using non-destructive Raman spectroscopy to control the composition of probable ignition mixtures.

¹ Ferreiro-González M. at al. Characterization of petroleum-based products in water samples by HS-MS. *Fuel*. Vol. 222, 2018. P. 506–512; Babua V., Krishnaa R., Mani N. Review on the Detection of Adulteration in Fuels through Computational Techniques. *Materials Today: Proceedings*. Vol. 4, 2017. P. 1723–1729; Rajneesh K. Verma, Payal Suwalka, Jatin Yadav. Detection of adulteration in diesel and petrol by kerosene using SPR based fiber optic technique. *Optical Fiber Technology*. Vol. 43, 2018. P. 95–100; Pontes M.J. at al. Screening analysis to detect adulteration in diesel/biodiesel blends using Near infrared spectrometry and multivariate classification. *Talanta*. Vol. 85(4), 2011. P. 2159–2165. Nespeca M. G. Rapid and sensitive method for detecting adulterants in gasoline using ultra-fast gas chromatography and Partial Least Square Discriminant Analysis. *Fuel*. Vol. 215, 2018. P. 204–211; Speller N.C. QCM virtual multisensor array for fuel discrimination and detection of gasoline adulteration. *Fuel*. Vol. 199, 2017. P. 38–46.

² Mendes, G., Barbeira, P.J.S. (2013) Detection and quantification of adulterants in gasoline using distillation curves and multivariate methods. *Fuel*. Vol. 112, 2013. P. 163–171.

³ Vempatapu B. P., Kanaujia P. K. (2017) Monitoring petroleum fuel adulteration: A review of analytical methods. *Trends in Analytical Chemistry*. Vol. 92, 2017. P. 1–11.

⁴ Martín-Alberca, C., Ferrando, J. L., García-Ruiz, C. (2013) Anionic markers for the forensic identification of Chemical Ignition Molotov Cocktail composition. *Science and Justice*. Vol. 53, No. 1, 2013. P. 49–54.

⁵ Martín-Alberca, C., López-López, M., García-Ruiz, C. (2015) Analysis of pre-ignited improvised incendiary devices using portable Raman. *Talanta*. Vol. 144, 2015. P. 612–618.

The use of instrumental methods, such as gas-liquid chromatography with different types of detection, in most cases require the preliminary analysis of relatively pure mixed samples or individual *light* oil products, which causes some difficulties in determining the component composition of real objects.

The appearance (Fig. 1) and the quality of packaging of physical evidence that comes to research, often do not contribute to the use of the above methods.

On the other hand, some forensic techniques for the study of inflammatory mixtures in the arsenal of forensic chemists are absent or do not allow to solve the tasks set before the experts.

In this regard, the authors of the article have applied the method of thin-layer chromatography to the study of the chemical composition of some components of *inflammatory mixtures*.

At the same time, the known possibilities of this method for the study of petroleum products and fuel and lubricants were taken into account¹².



Fig 1. Example of the appearance of combustible mixtures provided for research

Article Purpose.

The purpose of this work is to determine the suitability of thin layer chromatography for the study of combustion mixtures based on petroleum products and fuel and lubricants.

Research tasks include:

- Fixing chromatographic characteristics of the content of the components of the ignition mixture;
- detection of composition features by thin layer chromatography, which give reason to use other methods of investigation (in particular, IR spectroscopy).

Experimental part.

Objects and research methods. For the experiment, the following flammable mixtures models were made based on petroleum products:

1. Gasoline + diesel + fuel oil (10ml / 10ml / 2g).
2. Gasoline + diesel + synthetic oil (10ml / 10ml / 5ml).
3. Gasoline + Diesel + Spent Oil (10ml / 10ml / 5ml).
4. Petrol + fuel oil (10ml / 2g).

¹ Золотаревская И. А. Вказана праця.

² Dhole V. R., Ghosal G. K. J. (1994) Rapid detection and characterization of petroleum products and residues by TLC: Part 1 / V. R. Dhole, G. K. J. Ghosal // Planar Chromatogr. Mod. TLC. 1994. 7 (6). 469–471 p.

5. Petrol + spent oil (10ml / 5ml).
6. Gasoline + synthetic oil (10ml / 5ml).
7. Gasoline + diesel + mineral oil + fuel oil (10ml / 10ml / 5ml / 2g).
8. Gasoline + diesel + synthetic oil + fuel oil (10ml / 10ml / 5ml).
9. Gasoline + kerosene + spent oil (10ml / 10ml / 5ml).
10. Gasoline + diesel + paraffin (10ml / 10ml / 1.5g).
11. Petrol + polystyrene (10 ml / 2g).
12. Gasoline + diesel + polystyrene (10ml / 10ml / 2g).

Methodology and obtained results The research was performed by thin layer chromatography using Sorbfil chromatographic plates.

Samples of mixtures in the amount of ~ 2-0 μ l without additional dissolution were applied to the starting line of two chromatographic plates.

As the mobile phase used a mixture of solvents octane: benzene (5: 1).

After raising the eluent front by 10 cm, the plates were removed from the chromatographic chamber and dried in the open air, examined in UV rays of mercury-quartz lamp at two wavelengths, showed iodine vapors and 2% formalin solution in concentrated sulfuric acid (CSA).

The results are shown in Tables 1-4 and are presented in Figure 2-9.

Table # 1.

The nature of the chromatographic separation of samples of mixtures of NP in the case of vapor iodine

Mixture No	Chromatographic picture	Value: R_f
1	The strip is yellow	$R_f = 0, 90$
2	Elongated saturated yellow strip. Spot is brown-green in color, the top is bifurcated.	$R_f = 0, 60-0, 90$ $R_f = 0, 10-0, 15$
3	The spot is yellow-brown.	$R_f = 0, 65-0, 80$
4	Elongated strip with alternating colors: yellow, light brown	$R_f = 0, 15-0, 90$
5	Spot light brown	$R_f = 0, 80-0, 90$
6	The strip is yellow-brown in color. Spot is brown-green in color, the top is bifurcated.	$R_f = 0, 75-0, 80$ $R_f = 0, 11$
7	Elongated strip with alternating colors: yellow, light brown	to $R_f = 0, 90$
8	Spot light brown. Spot is brown-green in color, the top is bifurcated.	$R_f = 0, 70-0, 90$ $R_f = 0, 11$

9	The spot is light brown in color	$R_f = 0, 50-0, 85$
10	Spot light brown	$R_f = 0, 70 -0, 90$
11	Spot light brown	$R_f = 0, 50-0, 85$
12	Spot light brown	$R_f = 0, 80-0, 90$

Table # 2.

The nature of the chromatographic separation of samples of mixtures of NP in UV rays at $\lambda = 265 \text{ nm}$

Mixture No	Chromatographic picture	Value: R_f
1	The luminescent strip is purple, the top is bifurcated. Stained dark purple.	$R_f = 0, 10-0, 70$ From start to $R_f = 15$
2	The luminescent strip is purple, the top is bifurcated. Spot purple color $R_f = 0,55-0,85$	$R_f = 0, 12-0, 60$ $R_f = 0, 12$
3	The luminescent strip is purple, the top is bifurcated	$R_f = 0, 10-0, 60$
4	Luminescent strip of lilac color. The strip is dark purple in color.	From start to $R_f = 0, 80$ From start to $R_f = 0, 15$
5	Fuzzy (blurred) spot of lilac color	$R_f = 0, 55-0, 85$
6	The luminescent strip is purple, the top is bifurcated. Spot purple color $R_f = 0,55-0,85$	$R_f = 0, 55-0, 85$ $R_f = 0, 11$
7	Luminescent strip of lilac color. Dark purple spot	$R_f = 0, 12-0, 85$ $R_f = 0, 12$
8	The luminescent strip is purple, the top is bifurcated. Spot purple color $R_f = 0,55-0,85$	$R_f = 0, 55-0, 85$ $R_f = 0, 11$
9	Luminescent fuzzy lilac strip	$R_f = 0, 50-0, 75$
10	Luminescent fuzzy lilac strip. The top is forked.	$R_f = 0, 70-0, 75$
11	Any stains are missing	—
12	Llac spot. The top is forked.	$R_f = 0, 65-0, 67$

Table 3.

The nature of the chromatographic separation of mixtures of NPs when UV rays at $\lambda = 365 \text{ nm}$

No	The color of the	Color	R_f	Color, features of spots

Mixtures	spots on the starting line	features of spots with $R_f=0, 1-0, 2$		and zones
1	Dark	Up to 0, 90 Fluorescent strip with alternating colors: yellow-green, blue, top bifurcated		
2	Luminescent, blue	Dark	0, 45-0, 75	Luminescent stain of blue color, yard shape
3	Luminescent, light yellow	–	0, 45-0, 75	Luminescent stain of blue color, yard shape
4	Dark	Up to 0, 85 Fluorescent strip with alternating colors: yellow-green, blue		
5	Luminescent, light yellow	–	0, 55-0, 85	Slightly luminescent stain blue-violet colors
6	Luminescent, blue	Dark	0, 55-0, 85	Slightly luminescent stain blue-violet colors
7	Dark	Up to 0, 80 Fluorescent strip with alternating colors: yellow-green, blue, top bifurcated		
8	Luminescent, yellow	Dark	0, 10-0, 80	Up to Fluorescent strip with alternating colors: yellow-green, blue, top bifurcated
9	Luminescent, light yellow	–	0, 80-0, 90	Not clear slightly luminescent stain blue-violet colors, forked
10	Luminescent, light yellow	–	0, 50-0, 60-0, 75-0, 85	Not clear, slightly luminescent, yellowish, arcuate spot Not clear, slightly luminescent, yellowish, arcuate spot
11	Luminescent, light yellow	–	0, 50-0, 60-0, 75-0, 85	Not clear, slightly luminescent, yellowish, arcuate spot Not clear, slightly luminescent, yellowish, arcuate spot
12	Luminescent, light yellow	–	0, 50-0, 60-0, 75-0, 85	Not clear, slightly luminescent, yellowish, arcuate spot Not clear, slightly luminescent, yellowish, arcuate spot

Note: Luminesc. means luminescent.

As a result of the study of samples of mixtures of NP based on it is established that the obtained chromatograms show clear spots of the corresponding substances contained in the composition of the mixtures, namely:

– diesel fuel — the presence of bifurcated limb spots or elongated spots in the form of "torches" in the UV rays at $\lambda = 254 \text{ nm}$ and 365 nm in mixtures containing it (№№. 1-3, 7, 8, 10);

— black oil — spots of dark purple color with corresponding $R_f=0, 1-0, 15$ at $\lambda = 254 \text{ nm}$ and elongated spot in the form of *torch* almost from the start to the region with $R_f = 0,80$ in the UV rays at $\lambda = 254 \text{ nm}$ and 365 nm in mixtures containing it (№№. 1, 4, 7, 8);

– synthetic oil (synthetic component); spots of brown color when iodine vapors with corresponding $R_f=0, 1-0, 2$, containing (№. 2, 6, 8);

– polystyrene; the absence of any spots in the UV rays at $\lambda = 254 \text{ nm}$ on the chromatogram of the mixture containing it (№. 11).

It should be noted that the values of R_f for certain types of petroleum products may depend on the number and variety of components of the mixtures. The brightness of the color and the clarity of the separation of the zones depend on the concentration of the petroleum product in the mixture and the amount of sample mixture applied to the chromatographic plate.

Table №4.

The nature of the chromatographic separation of samples of mixtures of NPs in the manifestation of stains 2% solution of FGC

Sample number	R_f	Color	R_f	Color	R_f	Color
1	0, 10–0, 20 0, 35–0, 45	Light brown Brown	0, 55	Brown-green	0, 90	Brown-pink
2	0, 10–0, 20 0, 35–0, 45	Light brown Brown	0, 40– 0, 60	Brown-green	0, 60– 0, 80	Brown-pink
3	0, 10–0, 20 0, 35–0, 45	Light brown Brown	0, 45– 0, 55	Brown-green	0, 55– 0, 75	Brown-pink
4	0, 10–0, 40	Brown strip	0, 60– 0, 75	Brown-green	0, 80– 0, 90	Brown-pink
5	0, 10–0, 40	Brown strip	0, 50– 0, 75	Brown-green	0, 75– 0, 85	Brown-pink
6	0, 10–0, 20	Brown	0, 6– 0, 7	Blue-green	0, 8– 0, 9	Dark red
7	0, 10 0, 35–0, 40	Brown Brown	0, 40– 0, 50 0, 50– 0, 65	Blue-green Blue	0, 80– 0, 90	Brown-pink
8	0, 10	Brown	0, 40–0,	Blue-green	0, 80–	Brown-

	0, 25–0, 35	Brown	50 0, 50– 0, 65	Blue	0, 90	pink
9	0, 10–0, 30 0, 30–0, 40	– Brown	0, 40– 0, 60	Blue and black	0, 65– 0, 90	Brown- pink
10	0, 10–0, 30 0, 30–0, 40	– Brown	0, 50– 0, 60 0, 60– 0, 75	Brown- blue Blue	0, 80– 0, 90	Brown- pink
11	0, 10–0, 30 0, 35–0, 50	– Brown	0, 50– 0, 60	Brown- blue	0, 70– 0, 80	Brown- pink
12	0, 10–0, 30 0, 35–0, 45	– Brown	0, 50– 0, 70	Blue-green	0, 80– 0, 90	Brown- pink

Comparing the obtained pictures of the chromatographic separation of mixtures when considered in UV rays at different wavelengths $\lambda = 254 \text{ nm}$ and 365 nm , it should be noted that the picture that is obtained at $\lambda = 254 \text{ nm}$ is more informative and preferable. The appearance of the chromatographic picture in UV rays at $\lambda = 254 \text{ nm}$ is shown in Fig. 2, 3.

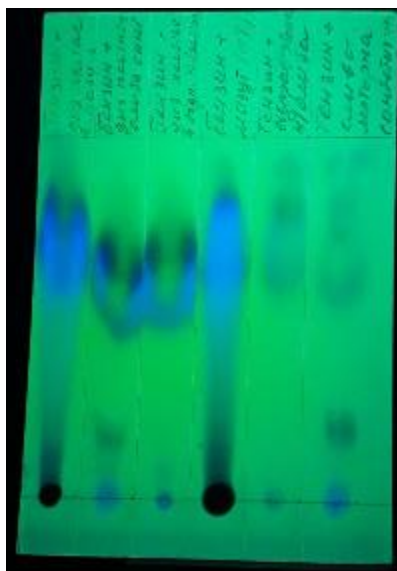


Fig. 2 Chromatogram of mixtures No. 1-6 (from left to right) in UV rays at $\lambda = 254 \text{ nm}$.

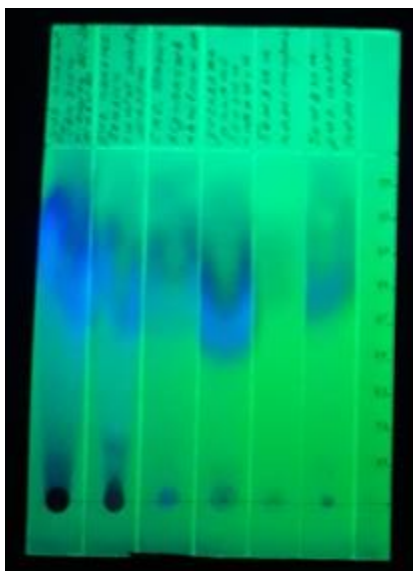


Fig. 3 Chromatogram of mixtures No. 1-7 (from left to right) in UV rays at $\lambda = 254 \text{ nm}$

The nature of the chromatographic separation of mixtures when UV is used ($\lambda = 365 \text{ nm}$) is shown in Fig. 4, 5.



Fig. 4 Chromatogram of mixtures No. 1-6 (from left to right) in UV rays at $\lambda = 365$ nm.



Fig. 5 Chromatogram of mixtures No. 1-7 (from left to right) in UV rays at $\lambda = 365$ nm

At the manifestation of the plates with a 2 % solution of FGC, there was an alternation of colored spots: light brown, brown, blue-green and brown-pink, which corresponds to the presence of a complex of hydrocarbons of paraffin, naphthenic, aromatic series and hybrid hydrocarbons of different structure (Fig. 8-9) .

The nature of the chromatographic separation of mixtures with the manifestation of iodine vapors and 2 % FGC solution is shown in Fig. 6, 7 and 8, 9, respectively.



Fig. 6 Pattern of iodine vapor manifestation of chromatogram of mixtures №1-6 (from left to right)



Fig. 7 Pattern of iodine vapor manifestation of chromatogram of mixtures №1-12 (from left to right)



Fig. 8 Picture of 2 % solution of FSK chromatogram of mixtures №1-6 (from left to right)



Fig. 9 Picture of the manifestation of 2 % solution of FSK chromatogram of mixtures No. 7-12 (from left to right)

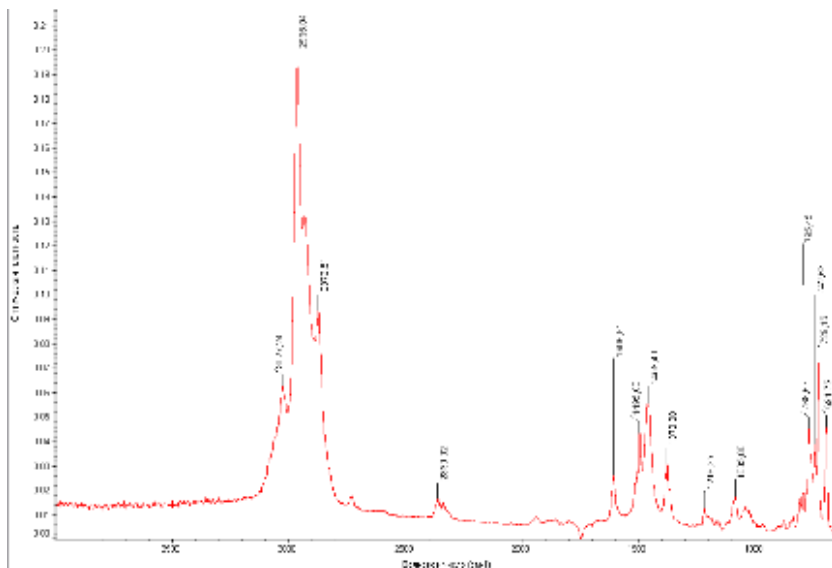
Analyzed the nature of the chromatographic separation of the studied mixtures, it is possible to pre-determine the probable groups of inflammatory mixtures, such as:

- with residual petroleum product;
- with synthetic oil (component);
- with probably a polymer component (polystyrene).

The IR spectroscopy method was used to confirm the presence of polystyrene in mixture № 11. The absorption spectra were recorded using a *NICOLET — 380* spectrometer manufactured by *Thermo Electron Corporation*, USA, at room temperature, and the full reflection method was excited. Software — *EZOmnics v. 7.4*. IR spectra were recorded in the wavenumber range from 650 to 4000 cm^{-1} .

The parameters of the analysis:

- measurement area: 650–4000 cm^{-1} ;
- resolution — 4;
- recording speed: 0, 6329;
- strengthening: 4;
- number of scans: 32.



10. IR spectrum of mixture No. 11 containing polystyrene in its composition

The IR spectra of mixture No. 11 (with polystyrene) contain the characteristic vibrational bands in the wavenumber range $\nu = 3000\text{--}2800\text{ cm}^{-1}$, which are characterized by the valence vibrations of the metal and methylene groups, and the characteristic vibrational bands with the wavenumber values 500, 1460, 750- 700 cm^{-1} , which coincide with the spectrum of polystyrene from the database of applied software in terms of location, quantity and relative intensity (Fig. 10).

It should be noted that use of the band at about 1460 cm^{-1} when installing polystyrene should only be in combination with other bands, since in the spectrum of most petroleum products in the range 1470-1440 cm^{-1} there is also a double absorption band (*with arm*), characteristic of asymmetric absorption bands of methyl absorption and symmetric absorption bands of methylene groups.

Conclusions.

Studies have shown that thin-layer chromatography can be useful in the initial investigation of NP mixtures in expert practice and provides general information on the main constituents of combustion mixtures if they relate to different types of petroleum products.

Further research should be carried out using methods that include more detailed information on individual components, such as IR spectroscopy.

In the study, it is recommended to use the conventional scheme of thin-layer chromatography in the octane: benzene system with a volume ratio of 5: 1.

Processing of chromatographic plates includes:

- UV scan that is desirable to be carried out consistently at two wavelengths of 365 and 254 nm.

This review allows to differentiate the distillate and residual nature oil in the composition of the mixture, as well as to conclude on their possible compatible presence;

In the presence of a high proportion of unsaturated compounds, the products of thermal refining processes in the object on the chromatographic plate, iodine absorption is observed at their locations with the appearance of white spots at the locations of saturated hydrocarbon structures.

In addition, steam treatment of iodine makes it possible to determine the presence of oils with a synthetic component (synthetic and semi-synthetic motor oils), which may be contained in combustible mixtures, for example, in the form of waste oil;

- treatment with a 2 % solution of FGC, which provides an additional possibility of differentiation of petroleum products in the composition of the ignition mixtures due to the transition of the colors observed in this case, and their localization (R_f).

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В. А. Руднєв, О. Д. Буй, А. Ф. Клімчук
РОЛЬ МЕТОДУ ТОНКОШАРОВОЇ ХРОМАТОГРАФІЇ ПРИ
КРИМІНАЛІСТИЧНОМУ ДОСЛІДЖЕННІ ЗАПАЛЮВАЛЬНИХ
СУМІШЕЙ НА ОСНОВІ НАФТОПРОДУКТІВ

У статті наведені можливості методу тонкошарової хроматографії при дослідженні запалювальних сумішей на основі нафтопродуктів, у тому числі із вмістом полімерних згушувачів, та інтерпретація отриманих результатів для використання в криміналістичній практиці. Дослідження проводилося методом ТІХХ в системі розчинників октан: бензол з детектуванням забарвлених зон в УФ-променях, при проявленні парами йоду та оброблення 2% розчином формальдегіду в сірчаній кислоті. Отримані результати дають інформацію щодо основних компонентів та можуть застосовуватися при первинному дослідженні запалювальних сумішей.

Ключові слова: нафтопродукти, запалювальні суміші, багатокомпонентні системи, компонентний склад, тонкошарова хроматографія, експертні дослідження.

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N. N. Kosmyna,

PhD in Law, Senior Researcher, Head of the department of research
of materials, substances and products of Kharkiv SSRFC of MIA
e-mail: N.n.kosmina@com.ua

O. V. Sydorenko,

Forensic expert at the Kharkiv SRFC of the Ministry MIA
ORCID: <http://orcid.org/0000-0002-7377-6809>
e-mail: Novitskaya/elena88@gmail.com

RESEARCH ON STEROIDS

This article examines the research methods on nandrolone and methandienone. The most sensitive reagents were selected to differentiate and identify these drugs. Medicinal products were identified by gas chromatography methods with mass-selective detector and gas chromatography method with PID detector. In addition to determining the qualitative characteristics of medicinal products by means of gas chromatography with PID detector, a quantitative analysis of the test substances was carried out. The main absorption bands characteristic of the investigated medicinal products was determined by IR spectroscopy.

In this regard, the development of effective approaches to forensic research and methods of determination on potent anabolic steroids in various objects of forensic chemical examination with the use of thin-layer chromatography, gas chromatography with mass-selective and flame-ionization detectors is relevant as the risks of their abuse in the illegal market and the availability of counterfeit products (with unknown active substance content) on the legal market are not excluded.

A number of methods that are most effective for use while examining materials, substances and products include various types of chromatography (TLC, GC, GC-MS) in combination with the method of IR-spectroscopy, provide an opportunity to establish the structure of the analyte and identify it, and also determine the concentration. The predominance of these methods is in simplicity and expressiveness. They do not require special reagents and solvents, there is no complex sample preparation for them, and their definition is not affected by fillers, such as sugar, starch, stearates and sodium carbonate.

Thus, as a result of a number of studies of anabolic steroids of nandrolone and methandienone by different physical and chemical methods, we can conclude that the complex application of these methods allows to conduct expert research, to determine the qualitative and quantitative composition of substances and mixtures, as well as to solve diagnostic and identification issues.

Keywords: nandrolone, methandienone, thin-layer chromatography, IR-spectrometer, gas chromatography.

Formulation of Research Problem.

The definition of controlled substances and drugs in the objects of the forensic chemical (forensic) examination is one of the main tasks solved by the forensic centers of the Ministry of Internal Affairs.

Anabolic steroids are referred to as a class of pharmacological drugs that, in chemical structure and pharmacological action, are close to testosterone and are its derivatives with a weakened androgenic and enhanced anabolic effect.

Almost all of them have a common mechanism of pharmacological action.

Anabolic steroids increase the plastic and energy processes in the human body, thus increasing the function of cellular respiration and oxygen transport function of the blood, as the total amount of blood and erythrocytes increases.

Unlike corticosteroids, anabolic steroids reduce platelet aggregation and adhesion, as well as blood clotting, which improves microcirculation during intense exercise.

The widespread use of testosterone in drug therapy was hampered by its pronounced androgenic action.

In this regard, steroid compounds, similar in structure to testosterone, or having selective anabolic activity with less pronounced androgenic action were synthesized.

Analysis of Current Researches.

In Ukraine, some of the anabolic steroids are under national control and are classified as potent. Effective approaches to forensic research and methods for identifying potent anabolic steroids have been virtually not considered.

Partial research on steroid hormones are given in the works of S. M. Biryukov, N. A. Fitseva¹, and I. N. Fitseva.²

In this regard, the development of effective approaches to the forensic investigation of methods for determining potent drugs using thin layer (TLC), gas chromatography with mass selective (GC-MS), flame ionization (GC-FID) detectors, infrared (IR) spectroscopy is relevant, since both the threat of abuse in the illegal market of controlled substances and the appearance of falsified products (with an unknown content of the current principle) in the legal headlight market are not excluded medications.

¹ Biryukov S. M., Vartuzov V. V., Minin O. V. Doslidzhennia synnodiichykh likarskykh zasobiv, shcho mistiat metandienon i nandrol on dekanat v ob'ektakh kryminalistychnoi ekspertyzy [Investigations of potent drugs containing methandienone and nandrol decanate in objects of forensic examination]. URL : <http://elar.naiu.kiev.ua/jspui/handle/123456789/2070> [in Ukrainian].

² Ficev I. M., Blohin V. K., Budnikov G. K. Hromatografichskie metody v kriminalisticheskoi jekspertize [Chromatographic methods in forensic examination]. Zhurn. analit. himii. 2004. T. 59, № 12. S. 1289–1299 [in Russian].

Research Purpose.

The use in medicine, the available cases of poisoning, as well as attempts to partially study steroids, the lack of guidelines for the study of qualitative and quantitative determination in expert organizations is one of the pressing problems of modern chemical analysis.

The purpose of this article is to select the most sensitive reagents and systems for thin-layer chromatography, as well as the conditions for conducting gas chromatography with mass-selective detection for qualitative determination and quantitative analysis by gas chromatography, as well as IR spectroscopes.

Main content presentation.

Methods that are most effective for use in the examination of materials, substances and products include various types of chromatography (TLC, GC, GC – MS), in combination with IR spectroscopy, make it possible to establish the structure of the test substance and identify it, as well as determine the concentration.

Priority of these methods is simplicity and expressiveness.

They do not require special reagents and solvents, they do not have a stage of complex sample preparation, excipients (sugar, starch, stearate and soda) do not affect their determination.

Therefore, there is a need to create sensitive and low-cost research methods for the drugs in this group to reduce the timing and rapid response to chemical research.

As for the representatives of this group, they are increasingly becoming the objects of study of chemical toxicological and chemical laboratories, since their sale is controlled in the territory of Ukraine and is subject to substantive quantitative accounting in the pharmacy network.

Relatively inexpensive but fairly accurate method of investigation is thin layer chromatography (TLC). The chromatographic characteristics were determined in a variety of organic solvents.

Sorbfil plates were used for TLC.

As reagents, developers used Marki's reagent and iodine vapors.

In the study of objects for belonging to high-potency anabolic steroids by TLC, chromatographic systems known in the art were used, with mobile phases characterized by efficiency and selectivity of separation, relative accessibility and not high toxicity.

Composition of the mobile phases was selected in such a way that the results obtained were as effective as possible and well reproduced.

Thus, TLC systems were selected, the composition of which is shown in Table 1.

*Table 1***The composition of the mobile phases for research by TLC method**

System No.	Composition of the mobile phases
1	toluene – ethanol – diethylamine (9: 1: 1)
2	chloroform – acetone – ethanol – 25% aqueous ammonia solution (20: 30: 3: 1)
3	Methanol — 25% aqueous ammonia solution (100: 1, 5)
4	toluene – acetone – ethanol – 25% aqueous ammonia solution (45: 45: 7: 3)
5	ethyl acetate – isopropanol – 25% aqueous ammonia solution (40: 30: 2)
6	methylene chloride – ether – methanol – water (77: 15: 8: 1, 2)

Given that the objects under study are well soluble in various solutions, solvents such as chloroform, ethanol, and methanol were used to prepare the samples.

Under TLC conditions, 10 µl of ethanol extracts of the objects under study were microscopically applied to a Sorbfil PTH-AF-A-UV thin-layer chromatography plate. On the same plate in an amount of 10 µl were applied standard samples — 0, 1% ethanol solution of methandienone and nandrolone, as well as control samples of the solvent.

The plate was placed in a chromatographic chamber saturated with one of the solvent systems and chromatographed in an ascending manner until the eluent front was lifted 100 mm.

After the end of the chromatography, the plate was dried at 50°C for 10 min, and then chromatographic zones were detected by fluorescence quenching at 254 nm, while fixing their position. Subsequently, the identified chromatographic zones were shown by visualizing reagents.

Visualization of the chromatographic zones was performed with a Marki reagent (1 part 40% formalin solution 9 parts concentrated sulfuric acid) and in an iodine chamber, with saturated iodine vapors.

The results of the study by chromatography in a thin layer of sorbent using various mobile phases and methods of visualization of the chromatographic zones by reagents – developers are presented in Fig. 1 and Table 2.



(a)



(б)

Fig. Fig. 1 (a) is a general view of the chromatograms of TLC of methandienone in systems 1, 2, 3 after the manifestation of 254 nm in UV; (b) is a general view of the chromatograms of TLC of methandienone in systems 1, 2, 3 after the manifestation of 254 nm in UV; (b) is a general view of the chromatograms of TLC of methandienone in systems 1, 2, 3 after the manifestation of 254 nm in UV

Table 2
Chromatographic mobility (R_f) values of some potent anabolic steroids in chromatographic systems

№	Test substances	Chromatographic mobility (R_f) values of some potent anabolic steroids in chromatographic systems						Chromatographic zone staining	
		№1	№2	№3	№4	№5	№6	Mark reagent	iodine pairs
1	Metandienone	0, 56	0, 63	0, 71	0, 70	0, 65	0, 65	dark brown	yellowy-brown

2	Nandrolone	0,44	0,71	0,71	0,75	0,67	0,88	-	yellowy-brown

Analyzing the results of chromatographic mobility shown in the table, we can conclude that the most positive separation characteristics were obtained using systems 1, 2, 6.

In this case, the values of R_f in all organic solvent systems used are close to each other, therefore, to increase the selectivity of this method, it is necessary to have samples for the comparative study of these substances.

In addition to thin layer chromatography, it is advisable to use the molecular Fourier method of molecular spectral analysis among instrumental methods.

However, as the practice shows, for the study of these substances come in the form of tablets and oily solutions, and along with the active substances may have fillers: sugar, starch, baking soda, etc., added to tablets and solutions in their manufacture.

For isolating anabolic steroids for the purpose of their further investigation by IR spectroscopy, they were extracted with organic solvents, then concentrated.

To isolate anabolic steroids for the purpose of their further investigation by IR spectroscopy, they were extracted with organic solvents, then concentrated.

spectrum registration range: 4000–550 cm^{-1} ;

Resolution: 4 cm^{-1} ;

number of scans– 32.

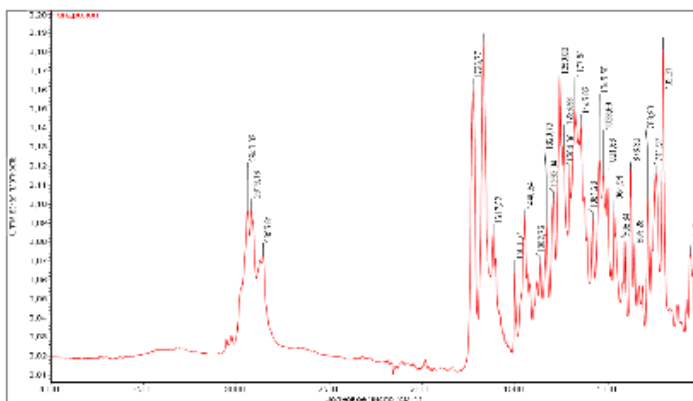


Fig. 2 IR spectrum of methanol extract of nandrolone

Decryption was performed on the library of IR spectra from the *Omnic 9.1* software package.

For research clarity, to establish the molecular composition in Fig. 2 demonstrates steroid spectra.

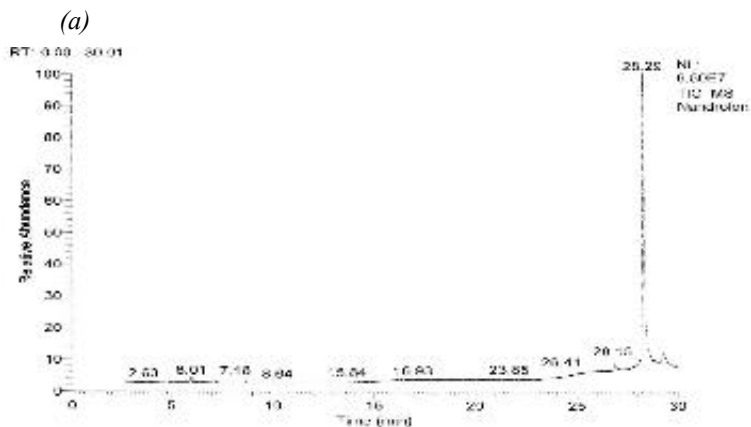
GC-MS object studies were performed to confirm the results of TLC analysis.

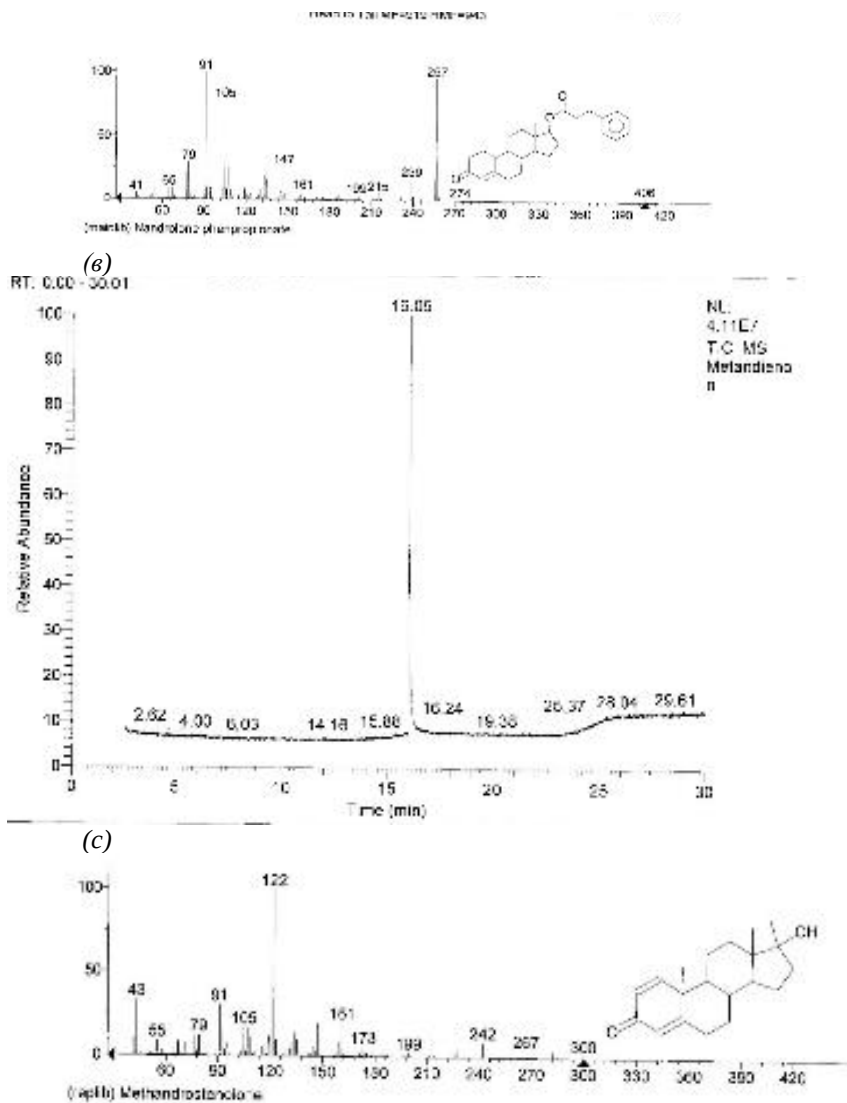
The research was performed with the aim of qualitatively determining the organic components in the research object.

For this purpose, weighed portions of nandrolone and metandienone in weights of 5 mg each (ground medium sample) were dissolved in 1 ml of methanol.

The obtained methanol extracts were filtered, transferred to glass vials and analyzed on a gas chromatograph with a selective detector with the conditions: TRASE ULTRA GC / ISQ / AS 3000 II; capillary column — TG — 5MS, length — 30 m, diameter — 0.25 mm, phase — 0.25 μ m; carrier gas — helium, constant flow — 1, 2 ml / min; injector — auto-injector 7683, Split 1:50, evaporator temperature $T = 280^{\circ}\text{C}$; column temperature: Tach. = 100°C , hold for 2 minutes, heating — $25^{\circ}\text{C} / \text{min}$, $T_{\text{KHD}} = 200^{\circ}\text{C}$, trimi 2 xv; heating — $10^{\circ}\text{C} / \text{hv}$, $T_{\text{konech.}} = 280^{\circ}\text{C}$, hold — 7 min, heating — $10^{\circ}\text{C} / \text{min}$, $T_{\text{kon}} = 300^{\circ}\text{C}$, hold 5 min, detector — mass-selective, interface temperature $T = 220^{\circ}\text{C}$, ionization — by electron impact, ionization energy — 70 eV, temperature of the ion source $T = 200^{\circ}\text{C}$; quadrupole temperature $T = 150^{\circ}\text{C}$; sample — 1 μ l.

Chromatograms and mass spectra of nandrolone are presented in Figs. 3 a, b, methanedienone — in Fig. 3 in, g.





(d) Fig. 3 (a) chromatogram of a solution of nandrolone in methanol; (b) the mass spectrum of nandrolone; (c) a chromatogram of a solution of methandienone in methanol; (g) a mass spectrum of methandienone.

To separate the components of anabolic steroids, retention time was determined under conditions of GC – FID.

Quantitative determination of potent anabolic steroids under conditions of GC – FID was carried out according to the calibration dependence, using absolute calibration. As an external standard, a sample provided by SSRFC of the Ministry of Internal Affairs of Ukraine was used.

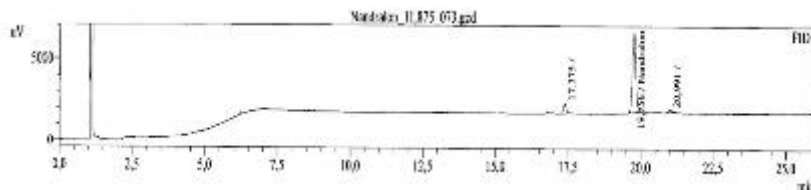
The basic requirements for reproducibility of GC – FID, as well as for GC – MS, are the accuracy of preparation of calibration solutions and the dosage of the sample, sample, as well as strict adherence to chromatographic conditions both during calibration of the device and in further quantitative determinations.

The retention time of the studied potent anabolic steroids during their gas chromatographic study are shown in table 3.

Table 3

The retention time of the studied potent anabolic steroids during their gas chromatographic study are demonstrated in table 3.

№	Test substance	Retention time
1	Nandrolone	19, 756
2	Metandienone	6, 938



Chromatograms of nandrolone and methanedienone obtained by chromatographic examination under GC – FID conditions are presented in Fig. 4 a, b.

(a)

(b)

Fig. 4 (a) a chromatogram of a solution of nandrolone in methanol, (b) a chromatogram of a solution of methandienone in methanol

Conclusions.

Thus, in the course of research on the anabolic steroids of nandrolone and methandienone by various physicochemical methods, it can be concluded that the combined use of these methods makes it possible to carry out their expert research, the qualitative and quantitative composition of the substances present in the mixture, and to solve diagnostic and identification problems.

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Н. М. Косміна, О. В. Сидоренко **ДОСЛІДЖЕННЯ СТЕРОЇДІВ**

У статті розглянуто методи дослідження нандролону і метандієнону. Підібрано найбільш чутливі реактиви, які дозволяють диференціювати і ідентифікувати дані лікарські препарати. Проведено ідентифікацію лікарських засобів методами газової хроматографії з мас-селективним детектором та методом газової хроматографії з ПІД — детектором. Крім визначення якісних характеристик лікарських засобів методом газової хроматографії з ПІД детектором проводився кількісний аналіз досліджуваних речовин. Методом ІЧ-спектроскопії визначено основні смуги поглинання, характерні для досліджуваних лікарських засобів.

У зв'язку з цим розробка ефективних підходів до криміналістичного дослідження і методів визначення сильнодіючих анаболічних стероїдів у різноманітних об'єктах судово-хімічної експертизи із застосуванням тонкошарової хроматографії, газової хроматографії з мас-селективним та полуменево-іонізаційним детекторами, інфрачервоної спектроскопії є актуальною, оскільки не виключені як загрози зловживання ними на нелегальному ринку, так і поява фальсифікованої продукції (з невідомим вмістом діючої речовини) на легальному ринку фармпрепаратів.

До ряду методів, найбільш ефективних при застосуванні в криміналістичній експертизі, належать різні види хроматографії (ТШХ, ГХ, ГХ-МС), їх поєднання з методами ІЧ-спектроскопії дають можливість встановити структуру досліджуваної речовини та ідентифікувати її, а також визначити концентрацію. Перевагою цих методів являється простота і експресність. Вони не потребують наявності спеціальних реактивів та розчинників, для них може бути відсутня стадія складної пробопідготовки, а визначенню можуть не заважати наповнювачі, такі як цукор, крахмал, стеарати та сода.

Таким чином, у результаті проведення ряду досліджень анаболічних стероїдів нандролону та метандієнону різними фізико-хімічними методами, можна зробити висновок, що комплексне застосування цих методів дає можливість проводити експертне дослідження, визначати якісний та кількісний склад наданих речовин та сумішей, а також вирішувати діагностичні та ідентифікаційні завдання.

Ключові слова: нандролон, метандієнон, тонкошарова хроматографія, ІЧ-спектроскопія, газова хроматографія.

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K. E. Rudnieva,

Forensic Expert of the Department of Forensic Chemistry and
Physics of Criminalistics Laboratory at the KhRIFE Kharkiv,
Ukraine

ORCID:<https://orcid.org/0000-0002-7676-749X>

e-mail: rudneva770@ukr.net

M. V. Zarubina,

Head of the Department of Forensic Chemistry and Physics at
KhRIFE Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0002-5855-3295>

e-mail: 17171785@ukr.net

L. V. Nardid,

Senior Researcher of the Department of Forensic Chemistry and
Physics of Criminalistics Laboratory at KhRIFE
Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0002-5855-3295>

e-mail: nardidlily@gmail.com

P.V. Karnozhitsky,

PhD in Law, Senior Researcher, Associate Professor at the
Department of National Technical University Kharkiv Polytechnic
Institute Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0002-5855-3295>

e-mail: lab.vtii@gmail.com

O. M. Pashkova,

Forensic Expert of the Department of Forensic Chemistry and
Physics of Criminalistics Laboratory at the KhRIFE Kharkiv,
Ukraine

ORCID:<https://orcid.org/0000-0002-5855-3295>

e-mail: lab.vtii@gmail.com

INFLUENCE OF POLYMER CONTAINER MATERIAL ON THE RESULTS OF EXPERT RESEARCH ON PHTHALATE DETECTION

The article deals with the problem of determining the influence of capacity on the presence of phthalates — esters of phthalic acid (EFC) and its isomeric compounds in the studied objects. The work is relevant in connection with the lack of clear rules for the transportation of objects that are provided for forensic research on the content of phthalates, because the packaging of objects in improperly selected packaging may lead to the EFC falling into the object under study and false as a whole research results.

The purpose of the work was to establish the presence of phthalates in the bottled drinking water, which is being sold in the territory of Ukraine in a polymeric container made of polyethylene terephthalate (PETF, PET), as well as tap water and distilled water and ethyl alcohol, placed in the same bottles during research.

Establishing an EFC in facilities placed in PET packaging is a direct confirmation of existing experience with similar topics.

The determination of the content of the EFC was carried out by gas chromatography-mass spectrometry. It is shown that in the composition of any drinking water from those sold on the domestic market in PET packaging, there is an EFC. In this case, the sample of mineral water in glass containers, as well as distilled, tap water, ethyl alcohol used in this work, the EFC did not contain within the limits of quantitative definition. After the expiry of these samples of distilled water and ethyl alcohol in the PET packaging, the presence of phthalates was detected.

The results of this work are supported by well-known global studies to determine the possibility of migration of the EFC from the packaging material to its liquid content. Taking into account the results obtained, we have provided recommendations for the packaging of liquid research objects when they are sent to a study to determine the content of the EFC.

Key words: esters of phthalic acid; gas chromatography; mass spectrometry; mineral water; polyethylene terephthalate.

Formulation of Research Problem.

Forensic research on diethyl phthalate (DEP)) and its isomers is linked to several areas of expertise that include the examination of foodstuffs and the study of chemicals and specialty chemicals.

In the study of EFCs as objects of industrial raw materials, the expert is asked whether these compounds are present in the test objects in relatively pure form or as impurities.

Other common tasks include determining the presence and quantitative content of DEPs in industrial, industrial or drinking water.

Given the wide range of constituent polymeric materials used in the manufacture of containers for the transportation of liquids, the possibility of the effect of packaging on the results of chemical analysis of the contents should be considered by the expert in the overall assessment of the research results.

Analysis of recent research and publications.

Polymeric materials include a number of polymers that differ in their composition and structure, which results in differences in their performance and applications.

One of these polymers includes, in particular, polyethylene terephthalate (PET, PETE), which is used in the packaging of food, beverages, technical liquids and the like.

DEP have become widespread as plasticizers for various types of polymeric materials, mainly polyvinyl chloride (PVC), and polymers used for food packaging.

It should be noted that some of the phthalates contained in the polymers are not chemically bound to the molecules of the material itself, that is, they are prone to migration to another contact medium.

In the production and bottling of drinking water, phthalates can pass through the process of contact with polymer parts, containers, etc., directly into the water itself.

Thus, the paper shows that phthalates are capable of migration from the PET material to its contents, with the rate of saturation of the EFC content being significantly dependent on temperature, and the concentration itself is gradually set at a constant maximum equilibrium level, after slightly more than 2 months of exposure¹.

The Research was performed on di-2-ethylhexylphthalate. You can also see an increase in phthalate content throughout the study period (up to 4 months).²

Some differences between the results can be explained by the conditions of the study and the raw material base.

When ingested with food, water, cosmetics, etc., phthalates have a special accumulation potential and pose a potential threat and danger to human health, causing various diseases, such as the endocrine system, allergies, etc.³

The paper states that the use of secondary PET polymers is one of the most important sources of phthalates entering drinking water.

It should be noted that the basic requirements of the allowable amount of migration (SCM) of chemicals released from polymeric materials in contact with foodstuffs and methods of their determination are set by sanitary norms in accordance with the legislation of Ukraine.

Previous studies have shown a correlation between the consumption of beverages and food stored in polymer containers and the appearance of phthalates in humans.⁴

The main DEPs, metabolites of which are found in vital products, include the following: dimethyl phthalate (DMP), diethyl phthalate (DEP), di-n-butyl phthalate (DnBP), diisobutyl phthalate (DiBP), butylbenzyl phthalate (BBP), ethyl dibutyl (BBP) (DEHP).

Concentration of phthalates in the contact medium increases under the influence of solar radiation and temperature rise¹ The transition of

¹ Farhoodi M. at al. Effect of environmental conditions on the migration of di(2-ethylhexyl) phthalate from pet bottles into yogurt drinks: influence of time, temperature, and food simulant. The Arabian Journal for Science and Engineering. 2008. Vol 33. P 281–287.

² Zaki G. at al. Concentrations of several phthalates contaminants in Egyptian bottled water: Effects of storage conditions and estimate of human exposure. Science of the Total Environment. 2018. Vol 618. P. 142–150.

³ Sax L. Polyethylene Terephthalate May Yield Endocrine Disruptors. Environmental Health Perspectives. 2010. Vol 118. P. 445–448.

⁴ Dong R.H. at.al. Association between Phthalate Exposure and the Use of Plastic Containers in Shanghai Adults. Biomedical Environmental Sciences. 2017. Vol 30. P. 727–736.

several basic phthalates from polymeric containers to water ² was also confirmed. It should be noted that the speed of this transition also depends on the temperature and time of storage of water.

The article emphasizes that the content of phthalates in mineral water stored in polymer (PET) containers is almost 20 times higher than for the water stored in glass bottles.³

The authors state that gas chromatography with mass-selective detection (GC-MS) is one of the most acceptable methods for detecting DEPs in water.

The article also demonstrates the use of the GC-MS method for detecting DEPs in wine, using deuterated DEPs as internal standards.⁴

The GC-MS method was found to be suitable for the detection of phthalates in vegetable oil.⁵ The GC-MS method has been determined to be the most common in the study of phthalates in consumer products.⁶

It should be noted that not only were the chromatographic methods suitable for the analysis of phthalates in drinking water and beverages, a rapid method for the detection of phthalates using electrochemical sensors was also proposed.⁷

The paper shows the possibility of investigating several DEPs using liquid chromatography with a UV detector.⁸

In this case, instead of conventional methods of extraction with organic solvents can be used methods of solid-phase microextraction⁹.

¹ Schmida P. et al. Does the reuse of PET bottles during solar water disinfection pose a health risk due to the migration of plasticisers and other chemicals into the water? *Water research*. 2008. Vol 42. P. 5054–5060.

² Luo Q. et al. Migration and potential risk of trace phthalates in bottled water: A global situation. *Water research*. 2018. Vol 147. P. 362–367.

³ Montuori P. et al. Assessing human exposure to phthalic acid and phthalate esters from mineral water stored in polyethylene terephthalate and glass bottles. *Food Additives and Contaminants*. 2008. Vol 25. P. 511–518.

⁴ Carrillo J.D. et al. Determination of phthalates in wine by headspace solid-phase microextraction followed by gas chromatography–mass spectrometry Use of deuterated phthalates as internal standards. *Journal of Chromatography*. 2008. Vol 1181. P. 125–130.

⁵ Pereira J. et al. Determination of phthalates in olive oil from European market. *Food control*. 2019 Vol. 98 P. 54–60.

⁶ González-Sálamo J. et al. Analytical methods for the determination of phthalates in food. *Current Opinion in Food Science*. Vol 22 P. 122–136.

⁷ Zia A.I. et al. Rapid and molecular selective electrochemical sensing of phthalates in aqueous solution. *Biosensors and Bioelectronics*. 2015. Vol 67. P. 342–349; Zia A.I. et al. Technique for rapid detection of phthalates in water and beverages. *Journal of Food Engineering*. 2013. Vol 2016. P. 515–523

⁸ Salazar-Beltrán D. et al. Determination of phthalate acid esters plasticizers in polyethylene terephthalate bottles and its correlation with some physicochemical properties. *Polymer Testing*. 2018. Vol. 68, P. 87–94.

⁹ He J. et al. Preparation and evaluation of molecularly imprinted solid-phase micro-extraction fibers for selective extraction of phthalates in an aqueous sample. *Analytica Chimica Acta*. 2010. Vol. 674. P. 53–58.

Given the presence of a wide range of existing literary sources devoted to meticulous research into the ways of getting DEP to water, the possibility of migration from the composition of polymeric containers, and the lack of appropriate recommendations for the expert treatment of objects of study in this direction, Ye advisable to conduct their own experimental experiments tasks:

- establishing the possibility of using relatively simple sampling technique for research objects, including the extraction and concentration stage;
- accelerated research using a chromatographic column;
- confirmation of the fact of migration of DEPs to the composition of water and organic solvents during their storage in PET containers;
- making recommendations on the packaging of objects in order to eliminate their contamination with DEPs.

Article Purpose.

The purpose of this work is to determine the presence of phthalates in the composition of bottled drinking water, which is sold in the territory of Ukraine, namely in polymeric containers made of polyethylene terephthalate (PET, PETE), as well as tap, distilled water and ethyl alcohol, placed in similar bottles for carrying experimental research.

Main content presentation.

Analysis of the literature sources of existing DEP research methods and their removal from objects, in particular water, provided the following approach to sample preparation for their further chromatographic research.

100 ml of the test sample of water were extracted three times with chloroform the *puriss. p.a.* brand in portions of 10 ml.

The resulting extract was transferred to a porcelain cup and evaporated to dryness, then re-dissolved in chloroform and quantitatively transferred to a 2 ml glass chromatographic vial.

The resulting solution was stored at 4 ° C. Immediately before gas chromatographic analysis, the sample vial was kept at room temperature for 1 hour.

Gas chromatographic studies were performed using a Shimadzu GCMS-QP2020 gas chromatograph-mass spectrometer under the following conditions:

- column manufactured by Shimadzu (length — 30 m, inner diameter — 0.25 mm, film thickness of the stationary phase — 0.25 microns, type of stationary phase — HP-5);
- initial column temperature: 60°C;
- isotherm — 1 min .;
- heating rate — 20 ° C / min .;
- final temperature of the column is 260 ° C;
- duration of analysis — 40 minutes;
- sample volume — 1 µl;
- flow separation — 1: 2;
- scan mode — full ion current (Scan) and individual ions (SIM);
- Mass Spectrum Database — NIST 17 and Wiley (11th Edition).

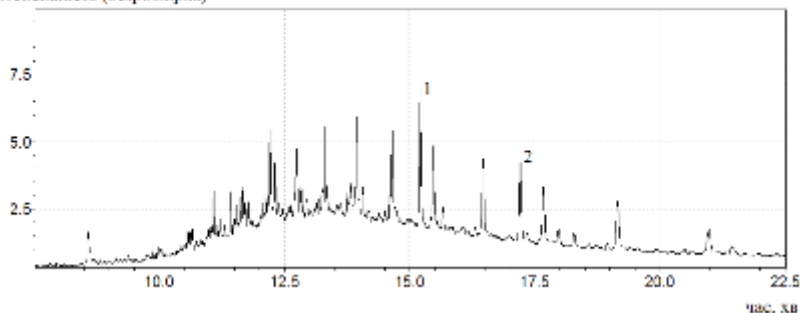
Qualitative and quantitative chromatogram processing was performed using software and databases, as well as EFC samples prepared as chloroform solutions.

The following samples were subject to the whole research:

- 1 sample of mineral water in a glass bottle (object # 1);
- 5 samples of mineral water in PET container (objects №2-6, object №2 — the same mark as sample №1);
- 1 sample of tap water selected from the general water supply network (cold water) in 1-2 minutes. after opening the water tap;
- 1 sample of distilled water;
- 1 sample of ethyl alcohol aged for 1 week in PET containers;
- 1 sample of distilled water, aged for 1 week in PET container.

For the original samples of ethyl alcohol and chloroform, blank experiments were conducted which consisted of evaporating 30 ml of the sample. Subsequently, the evaporated samples were brought to 1 ml with a suitable solvent and quantitatively transferred into a 2 ml vial. Subsequently, these ethanol and chloroform samples were stored and investigated in the same manner as other samples.

Интенсивность (безразмерная)



At the same time, 30 ml of chloroform was evaporated in an evaporation cup and quantitatively transferred to a 2 ml vial, and then examined as well as extraction. At the same time, 30 ml of chloroform was evaporated in an evaporation cup and quantitatively transferred to a 2 ml vial, after which the same was investigated as the extraction.

Composition of chloroform from one batch showed peaks of phthalic and isophthalic acid esters (Fig. 1).

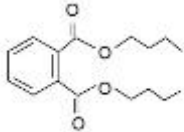
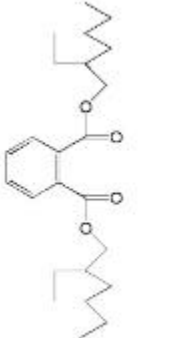
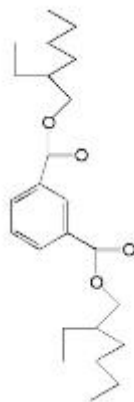
It should be noted that a number of peaks of a number of components, including hydrocarbons, were observed in the composition of all chloroform samples, but their presence did not interfere with the establishment of phthalates.

Fig. 1. Full-ion chromatogram, where 1 is the peak of 2-ethylhexylphthalate, 2 – the peak of 2-ethylisoxylphthalate.

After chromatography on the respective extracts, the presence of a significant portion of the extracts of dibutyl phthalate, 2-diethylhexylphthalate, 2-diethylhexylisophthalate which formulas are shown in table 1.

Table 1.

Compounds of phthalic and isophthalic acids as part of the studied

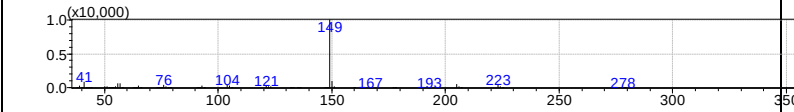
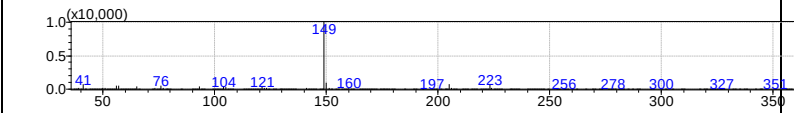
Title	dibutyl phthalate	2-diethylhexylphthalate	2-diethylhexylisophthalate
Formula			

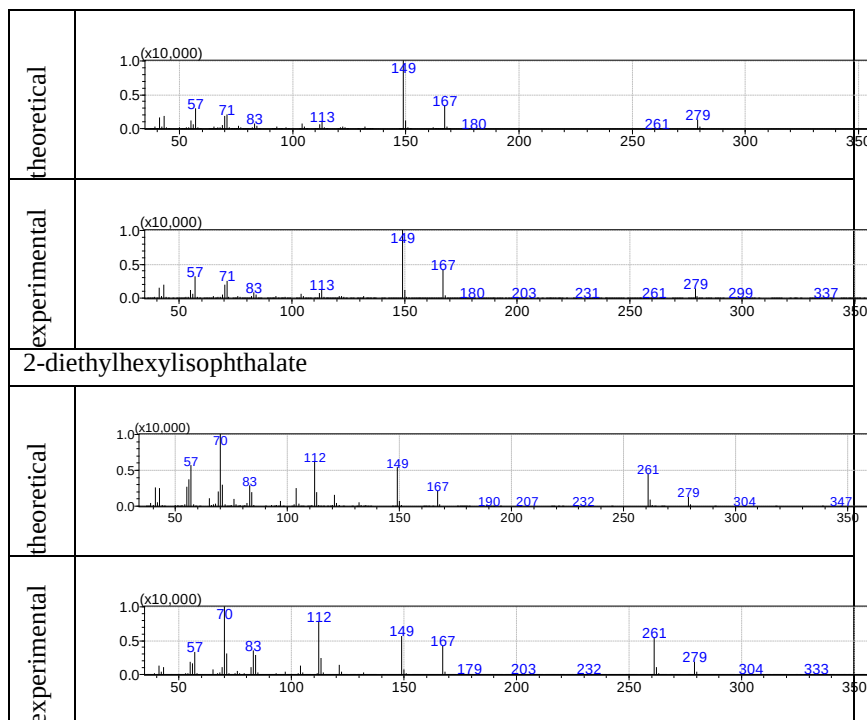
It should be noted that the mass spectra of the isomeric phthalates are similar to each other, therefore, to determine their specific accessory, samples of the corresponding compounds from the collection of the KhRIFE laboratory were additionally used.

The mass spectra of the corresponding phthalates are shown in table 2.

Table 2

Mass spectra of the corresponding phthalates (library spectra and obtained in this paper experimentally).

Component Name / Mass Spectrum (NIST Library 17)	
dibutyl phthalate	
theoretical	
experimental	
2-diethylhexylphthalate	



It should be noted that the peaks of the mass spectra of these phthalates are not characterized by a pronounced peak of the molecular ion, but have a sufficiently characteristic value of m/z equal to 149.

Availability of an intense peak of the corresponding m/z can be considered as an indirect sign of the presence of phthalates in the sample. The quantitative and qualitative results of the phthalate content study are shown in Table 3.

Table 3

The results of the study of the content of phthalates in different samples.

sample	dibutyl phthalate	2-ethylhexyl phthalate	2-ethylhexyl isophthalate
Chloroform (blank sample)	—	—	—
Ethanol	3, 2	11, 4	21, 8
Distilled water	—	—	—

Tap water	0, 074	0, 012	0, 002
Sam. No. 1 (glass)	0, 06	0, 08	0, 003
About. No. 2 (polymer)	1, 6	3, 41	17, 1
About. No. 3 (polymer)	1, 1	7, 3	8, 1
About. No. 4 (polymer)	0, 095	6, 6	18, 3
About. No. 5 (polymer)	0, 92	0, 075	0, 86

Quantitative calculation was performed on separate characteristic ions (m/z), with an additional two ions as confirmatory. In case of violation of the ratio of these ions to the characteristic calculation is not done because of the overlap of the same ions from the spectrum of other components. Examples of full-ion current chromatograms for each of the installed phthalates are shown in Figs. 2, 3, 4.

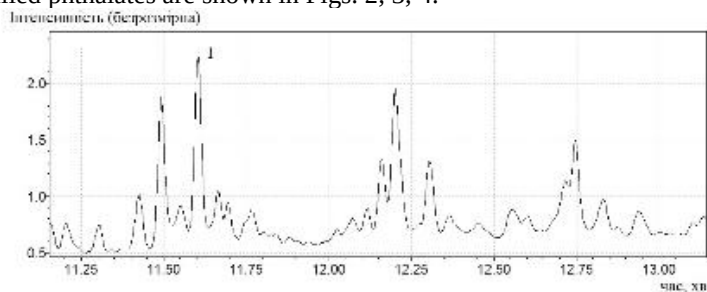


Fig. 2. Example of a water sample chromatogram (object № 2) where 1-dibutyl phthalate.

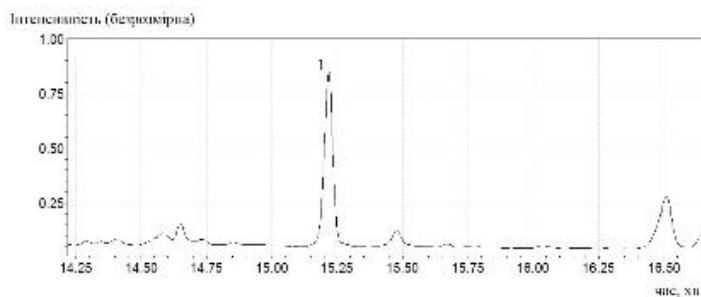


Fig. 3. Example of a water sample chromatogram (object № 3) wherein 1 is 2-diethylhexylphthalate.

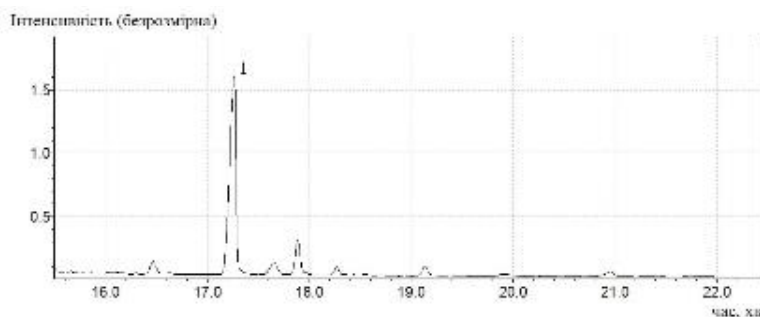


Fig. 4. An example of a chromatogram of a water sample of object № 2 is polymer (determination of 2-diethylhexylisophthalate).

Material composition of the container (bottles) was determined by IR spectrometry^{1, 2}, in the middle region of the spectrum, using disturbed full internal reflection on a ZnSe crystal. The absorption spectra were recorded on a NICOLET 380 spectrometer with the SMART PERFORMER prefix manufactured by ThermoElectron Corporation, USA, under standard IR conditions — the spectra were recorded in the wavenumber range from 650 to 4000 cm^{-1} .

The parameters of the analysis:

- measurement area: 650–4000 cm^{-1} ;
- resolution: 4;
- recording speed: 0, 6329;
- strengthening: 8;
- number of scans: 32.

According to the results of the study, it was found that all samples of the container are made of polyethylene terephthalate. Absorption bands were observed in the spectra of the container material in the main ranges: 723 cm^{-1} , 873 cm^{-1} , 1016 cm^{-1} , 1100 – 1110 cm^{-1} , 1240 cm^{-1} , 1340 cm^{-1} , 1410 cm^{-1} , 1720 cm^{-1} . This set of absorption bands is characteristic of polyethylene terephthalate (PET, PETE).

An example of the IR spectrum of the container material of object # 2 is shown in Fig. 5.

¹ Kalinina L. S. Kachestvennyj analiz polimerov [Qualitative analysis of polymers]. Moskva : Himija, 1975. S. 193–195; Kupcov A. H., Zhizhin G. N. Fur'e-spektry kombinacionnogo rasseivaniya infrakrasnogo pogloshhenija polimerov [Fourier spectra of Raman scattering of infrared polymer absorption]: spravocnik. Moskva : Fizmat lit, 2001. S. 167–169 [in Russian].

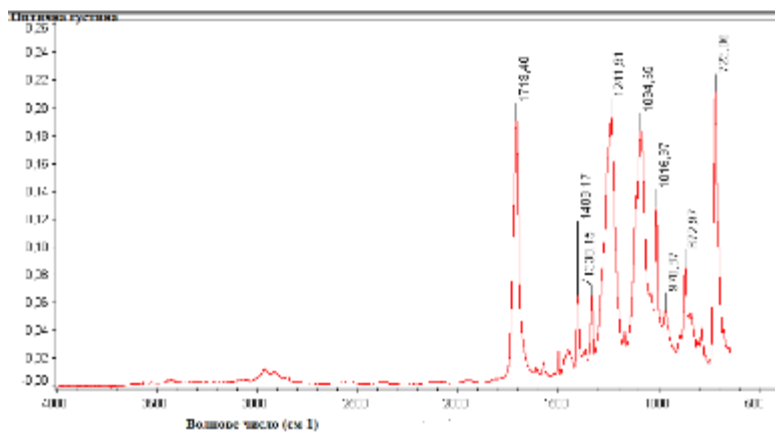


Fig. 5. Example of the IR spectrum of PET container material

The results of the analysis in Table 3 indicate the presence of DEPs in all water samples that were packed in PET containers.

In addition, in the samples of water and organic solvent (ethyl alcohol), which did not initially contain DEP (within the definition), after exposure in PET containers, which previously contained objects №2 – 6, the content of DEP, high quality composition which were somewhat similar to the water content (objects № 2-6).

Conclusions.

As a result of the conducted researches the cumulative correspondence of the obtained experimental data on determination of DEP content in the composition of water contained in PET container was established, world experience on such problem, which indicates the fact of DEP transition from the packaging material to its content.

In addition to water, phthalates can be saturated with organic solvents, in particular ethyl alcohol.

This demonstrates the acceptability of the results of research on DEP in water and the general methodology for phthalates in domestic, including forensic, practice.

The following guidelines should be noted as recommendations for the packing of research sites for the expert study of chemical products and specialty chemicals for phthalates establishment at any level (qualitative and quantitative), the following should be noted:

- container material may be made of any polymer that does not contain phthalates.

One indication of the composition of the container material is the marking on its outer surface;

- packaging that is most suitable for the packaging of objects is metal or glass containers (metal canisters or glass containers, bottles, etc.).

Note that the lids and gaskets that can be used are usually polymeric, so they must also be made of any non-PET material;

– provided that there is enough object, it is advisable to rinse the inner surface of the study object (2-3 times) before packing, in order to avoid the possible presence of EFC residues in the object.

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**К. Є. Рудисва, М. В. Зарубіна, Л. В. Нардід,
П. В. Карножицький, О. М. Пащикова**

**ВПЛИВ МАТЕРІАЛУ ПОЛІМЕРНОЇ ТАРИ НА РЕЗУЛЬТАТИ
ЕКСПЕРТНОГО ДОСЛІДЖЕННЯ З ВИЯВЛЕННЯ ФТАЛАТІВ**

У статті розглянуто проблему визначення впливу матеріалу ємності на наявність фталатів — складних ефірів фталевої кислоти (ЕФК) та ізомерних її сполук у складі досліджуваних об'єктів.

Мета роботи — встановлення наявності фталатів у складі експериментальних зразків та у складі бутильованої питної води, яка реалізується на території України у полімерній тарі.

Визначення вмісту ЕФК проводилося методом газової хроматографії-мас-спектрометрії.

Враховуючи отримані результати, надано рекомендації з пакування рідких об'єктів дослідження при направленні їх на дослідження з метою встановлення вмісту ЕФК.

Ключові слова: складні ефіри фталевої кислоти; газова хроматографія-мас-спектрометрія; мінеральна вода; поліетилентерефталат.

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V. K. Slovinskyi,

PhD in Technology, EOD Forensic scientist at the Cherkasy SRFC
of the MIA of Ukraine

ORCID: <https://orcid.org/0000-0002-6194-3171>

e-mail: vk Slovinskyi@ukr.net

G. I. Yelagin,

PhD in Chemistry, Senior Researcher, Engineer of Scientific and
Research Laboratory for Innovations in the Field of Civil Security of
Cherkasy Institute of Fire Safety named after Chornobyl Heroes of
National University of Civil Defense of Ukraine

ORCID: <https://orcid.org/0000-0003-2577-6430>

e-mail: gyelagin@ukr.net

O. S. Alexeieva,

PhD in Law, Docent, Leading Researcher of Scientific and Research
Laboratory for Innovations in the Field of Civil Security of Cherkasy
Institute of Fire Safety named after Chornobyl Heroes of National
University of Civil Defense of Ukraine

ORCID: <https://orcid.org/0000-0003-1119-4081>

e-mail: Alekseeva@ukr.net

V. V. Nakonetcnyi,

PhD in Law, Docent, Engineer of Labor safety at the Cherkasy
Institute of Fire Safety named after Chornobyl Heroes of National
University of Civil Defense of Ukraine

ORCID: <https://orcid.org/0000-0002-1081-6383>

e-mail: valnakon@gmail.com

COMPARISON OF POTENTIALALLY DANGEROUS FACTORS WHILE USING OF RARE MOTOR FUEL GAS

A detailed analysis of the potentially dangerous factors in the use of diesel, gasoline, methane and propane-butane fuels was carried out in cars. A detailed analysis of potentially dangerous factors when using diesel, gasoline, methane and propane-butane fuels in automobiles has been carried out. 6 options of fuel usage are considered: a tank with gasoline and a system supplying it to the carburetor and further to the engine cylinders, a tank with diesel fuel and the system feeding it to the engine cylinders, gas cylinder installation when installing cylinders with methane on the roof of the car, gas cylinder installation when mounting cylinders with methane in the luggage compartment of the car, gas installation when installing cylinders with propane-butane mixture on the roof of the car, gas installation when installing cylinders with propane-butane mixture in the cargo compartment of the car. Meanwhile, the potential danger while the vehicle is in motion is analyzed, as well as while it is in the open parking lot and in the garage. As the initial data, the common operation period was taken – in summer with the temperature of 30°C and possible fuel leakage with the probability of formation of an explosive mixture. Nonane is taken as a model when considering gasoline, and Pentadecane is used for diesel fuel.

It was noted that the gasoline self-ignition temperature ranges from 255°C to 435°C, the lower concentration limit of petrol explosiveness can be considered as 0.76% vol., while under selected conditions indoors, gasoline vapor can reach the concentration of up to 0.8 vol. %. The relative vapor density of diesel fuel betting the same conditions is 8.52 kg/m³. With the explosion, the pressure in the closed volume will reach 5.2 atm.

It was noted that the gasoline self-ignition temperature ranges from 210°C to 370°C, the lower concentration limit of petrol explosiveness can be considered as in 0.5 % vol., while under selected conditions indoors, gasoline vapor can reach the concentration of up to 0.13 vol. %. With the explosion, the pressure in the closed volume will reach 5.0 atm.

The self-ignition temperature of methane is 537°C, the lower concentration limit of explosiveness of this gas is 5.28% (vol). The vapor density of methane at the temperature of 300°C (303K) is 0.64 kg/m³, which is significantly less than the density of air. The explosion pressure in the closed volume will reach 7.7 atm.

The propane-butane mixture used in summer contains about 40% of propane and 60% of butane. Spontaneous ignition temperature of propane is 4700C, butane is 4050C. The calculated lower explosion limit of this mixture is 1.5% (vol), and the vapor density of mixture at the temperature of 300°C is 2.1 kg/m³, which is almost twice the density of air under the same conditions. The calculated explosion pressure in the closed volume will reach 8.3 atm.

It was concluded that when using certified equipment which is professionally installed, methane, which cannot accumulate in the lower part of the room or any compartment, is much safer than propane-butane and, especially, than gasoline or diesel fuel, as vapor densities of both are more than air density.

Keywords: automobile fuel, gasoline, diesel fuel, methane, propane, butane, explosion, relative density, explosion limits, self-ignition temperature, explosion temperature of explosion, pressure of explosion.

Formulation of Research Problem.

Constant health of oil and its refining products, including all types of liquid motor fuels, provokes the use of cheaper fuels, including combustible gases: natural gas (methane) and propane and butane extracted from petroleum.

One of the main issues is the potential danger of using such fuel.

As a matter of fact, both gasoline and diesel fuel and methane and propane mixtures are considered to be flammable substances.

Both fires and explosions, unfortunately, occur when using any of them.

There are many examples of fires in recent years with the burning and explosion of fuel and while driving a car¹ and during parking² at gas

¹ V Dnepre vo vremja dvizhenija zagorelsja avtomobil' s dvumja det'mi [In Dnipro, a car with two children caught fire while driving]. URL: <https://ru.tsn.ua/.../v-dnepre-vo-vremya-dvizheniya-zagorelsya-avtomobil-s-dvumya-detmi-1195215.html> (data zvernennia 10.04.2017) [in Russian].

² Na avtotrasse pod Zhitomirom sgorel avtomobil' s GBO [A car with HBO burned down on the highway near Zhytomyr]. VIDEO URL:

stations¹ and in garages². In this case, both liquid and gaseous fuel burns and explodes.

In this paper, a comparison of the potential hazards of operating vehicles with liquid fuel and vehicles with gas balloons.

Analysis of recent research and publications.

Given that more and more users are switching from liquid fuel to gaseous, the problem of choosing fuel is widely discussed.

Economic³ and environmental⁴ aspects of this problem, as well as the complexity of installing and maintaining gas-balloon systems are discussed.

Much attention is paid to comparing the advantages and disadvantages of using methane and propane-butane mixtures.

In detail, with statistics on Russia, the fire safety of gas cylinders and the causes in each case of the explosion are analyzed in⁵.

Research Purpose.

This paper discusses 6 options for using a car engine fuel.

Tank with gasoline and the system of supplying it to the carburetor and further into the engine cylinders, the tank with diesel fuel and the system of supplying it into the cylinders of the engine, gas-balloon installation when installing cylinders with methane on the roof of the car, gas-balloon installation when installing balloons with methane in the luggage compartment, gas-cylinder installation at installation of cylinders with a mixture of propane and butane on the roof of the car, gas-cylinder installation at installation of cylinders with a mixture of propane and butane in the luggage compartment of the car.

<http://zhzh.info/news/2018-11-01-37693> (data zvernennia 10.04.2017) [in Russian].

¹ U Vinnytsi 4 osoby zghorily v avtomobili zazhyvo [In Vinnitsa, 4 people were burned alive in a car]. URL: <https://znaj.ua/content/u-vinnyci-chotyryosoby-orily-v-avtomobili-zazhyvo> (data zvernennia 10.04.2017) [in Ukrainian].

² Na Dnepre v rezul'tate pozhara v garazhe sgorel muzhchina [On the Dnieper a man was burned in a garage fire]. URL: https://24tv.ua/ru/na_dnepre_v_rezultate_pozhara_v_garazhe_sgorel_muzhchina_n981223 (data zvernennia 10.04.2017) [in Russian].

³ Gaz VS benzin. Vygodno li v Ukraine ustanavlivat' GBO na avtomobil [Gas vs gasoline. Is it profitable in Ukraine to install HBO on a car]. URL: <https://www.segodnya.ua/.gaz-vs-benzin-vygodno-li-v-ukraine-ustanavlivat-gbo-na-avtomobil-668480.html> (data zvernennia 10.04.2017) [in Russian].

⁴ Jeksperty rasskazali, stoit li menjat' benzinovyj dvigatel [Experts have said whether it is worth changing a gasoline engine]. URL: <https://ru.tsn.ua/.../eksperty-rasskazali-stoit-li-menyat-benzinovyj-dvigatel-avto-na-gazovyj-416222.html> (data zvernennia 10.04.2017) [in Russian].

⁵ Vasjukov G. V., Korol'chenko A. Ja., Rubcov V. V. Pozharnaja bezopasnost' gazoballonnyh avtomobilej [Fire safety of gas vehicles.]. *Avtomobil'naja promyshlennost'*, 2006 g., № 2 [in Russian].

This analyzes the potential danger during the movement of the car, as well as when stored in an open parking lot and in a closed garage.

In each case, the extended operating period — summer with ambient air temperature of 30°C and possible fuel leakage and the likelihood of formation of an explosive mixture were taken as baseline data.

During 2018, 4,346 fires occurred in vehicles in Ukraine (4,212 fires in 2017; 3, 2%), which is 5, 5% of the total number of fires in Ukraine.

As a result of these fires, 22 people were killed (18 in 2017; 22.2%), which is 1,1% of the total number of deaths in Ukraine.

No deaths were reported (in 2017 — 1 child). The mentioned fires injured 55 people (in 2017 — 80 people; -31, 3%), including 3 children (in 2017 — 1 child).

Fires destroyed and damaged 3,924 vehicles. Material losses from the fires amounted to 972 million 446 thousand UAH, which is 11, 7% of the total losses.

Among the vehicles most often burned:

- passenger cars (3 209 against 3 158 fires; 1, 6% or 73, 8% of the total number of vehicle fires);
- trucks (462 against 448 fires; 3, 1% or 10, 6%);
- buses (285 vs. 248 fires; 14.9% or 6.6%).

The causes of fires in some vehicles are given in Table. 1.

Table 1

Causes of fire in some vehicles

Causes of Fires	Passenger Cars		Trucks Buses		Buses	
	2018	2017	2018	2017	2018	2017
Arson	734	802	43	47	47	48
PPB when conducting el., gas welding works	41	30	7	2	7	4
Careless behavior with fire while smoking	47	31	23	13	5	0
Careless behavior with fire	64	127	22	28	9	7
The disadvantage of production technology	41	15	10	0	2	0
Overheating (destruction moving parts) due to friction	22	10	30	16	3	1
Depressurization of fuel (gas) system	234	39	27	4	8	0
Malfunction of electrical systems	1861	1872	244	273	193	169
Other reasons	165	232	56	65	11	19
Total fires:	3209	3158	462	448	285	248

The most common fires in some vehicles are listed in Table. 2.

Table 2

Occurrence of fires in some vehicles

Fire place Trucks Buses	Passenger Cars		Trucks Buses		Buses	
	2018	2017	2018	2017	2018	2017
Driver's cab, interior	510	577	117	99	53	53
Engine compartment	2011	357	197	38	179	12
Body	467	494	90	106	35	33
Other	221	1730	58	205	18	150
Total fires:	3209	3158	462	448	285	248

The most common option is when the fuel tank is located behind the vehicle — in or under the luggage compartment. The most common option is when the fuel tank is located behind the vehicle in or under the luggage compartment.

Installing the fuel tank in close proximity to the engine, which reduces the length of the fuel line and increases the overall reliability of the fuel supply increases the fire hazard and overload of the front or rear axle wheels, respectively, at the front or rear engine layout.

Therefore, in cars with a front engine location, the fuel tank is located behind.

For low-capacity vehicles, the fuel tank is located on the side, bottom or rear.

In vehicles with a rear engine location, the fuel tank is in the front.

In *safe* cars the fuel tanks are located within the base of the car:

For a front-wheel drive car with an engine location in the front, the most rational is the location of the fuel tank in the rear seat.

In this case, the likelihood of fuel burning in the side and frontal impacts is reduced.

At the same time, this probability increases somewhat when struck from behind.

The most important internal sources of fire in a car include heated surfaces in violation of the tightness of the fuel system or lubrication system.

In the working car there are two zones of maximum temperatures:

- engine compartment;
- zone of the exhaust path from the manifold to the muffler exhaust pipe.

In the internal combustion engine, the exhaust gas temperature along the exhaust path is 800–830 °C, and the surface temperature is 710–770 °C.

Of course, this is a very high temperature, it is higher than the auto-ignition temperature of most fuel and lubricants used in vehicles.

In a car, fuel can only accumulate in the engine niches and in some engine compartments.

Because the engine compartments are not sealed, there is intense air exchange with the environment.

In this case, the vapor concentration in the fuel evaporation zone is limited by the upper limit, depending on the air velocity in the zone.

At an air speed equal to 0,15–0, 18 m/s the concentration of vapors may not exceed 0, 01 mg/l.

At a speed equal to 0, 25–0, 3 m/s — 0, 001 mg/l.

Taking in account that air velocities in the engine compartments of cars exceed the above values by an order of magnitude (1, 5 — 5 m / s), the concentration of the vapor or fuel accumulated cannot reach dangerous values and the ignition is excluded¹.

Nevertheless the fuel tank leakage or the spill from the spare canister in the luggage compartment, given that the vapor density of gasoline or diesel is much higher than the density of the air, leads to the rapid appearance of the mixture with a dangerous concentration.

Gasoline.

The most likely gasoline leakage points are leakage from a spare canister in the trunk, garage or other storage location; leakage from the tank (due to damage to the tank or due to the tightly closed lid); leaks in the fuel system or under the bonnet (due to leaks or malfunctions of the fuel pump or fuel line).

The characteristic odor of gasoline and the clearly visible spots of this substance, in most cases, cause immediate troubleshooting.

And what if the malfunction went unnoticed?

The lower concentration limit of the most hazardous A-66 flame spread is determined to be 76 % (vol)², corresponding to this value for nonane C_9H_{20} ³.

Тиск насиченої пари нонану при 30⁰C складає 6 мм рт. ст. Отже⁴, при даній температурі в закритому приміщенні пари бензину можуть знаходитися з концентрацією $6 \times 100 / 760 = 0, 8$ об. %.

Molecular weight of nonane is 182 atomic mass units. The density of nonane vapor at a temperature of 30⁰C (303K) is $182 \times 273 / (22, 4 \times 303) = 7, 32$ kg / m³.

¹ Rassledovanie pozharov [Fire investigation]: uchebnik / pod red. G. N. Kirillova, M. A. Galisheva, S. A. Kondrat'eva. Sankt-Peterburg : Sankt-Peterburgskij universitet Gosudarstvennoj protivopozharnoj sluzhby MChS Rossii, 2007. S. 134–136 [in Russian].

² Pozharo-vzryvoopasnost' veshhestv i materialov i sredstva ih tusheniya [Fire and explosion hazard of substances and materials and means of extinguishing them]. Spravochnik / pod red. A. N. Baratova i A. Ja. Korol'chenko. Kniga pervaja. Moskva : Himija, 1990. S. 163 [in Russian].

³ Pozharo-vzryvoopasnost' veshhestv i materialov i sredstva ih tusheniya [Fire and explosion hazard of substances and materials and means of extinguishing them]. Spravochnik / pod red. A. N. Baratova i A. Ja. Korol'chenko. Kniga vtoraia. Moskva : Himija, 1990. S. 54 [in Russian].

⁴ Yelahn H. I., Shkarabura M. H., Kryshthal M. A., Tyshchenko O. M. Osnovy teorii rozvytku ta prypynennia horinnia [Fundamentals of the theory of development and termination of combustion]. Chastyna 1. Cherkasy, 2004. S. 145 [in Ukrainian].

Air density under the same conditions – 1, 14 kg / m³. At this ratio, gasoline vapors will generally mix with the air in the lower trunk, garage or underbody.

Getting into such a mixture of open flames is likely to cause an explosion.

It is clear that the direct ignition of the ignition source to the surface of the fire fluid is most likely.

In this case, the heat from the ignition source will cause an increase in the surface temperature of the liquid layer, evaporation of additional portions of combustible vapors, increase the concentration of these vapors above the surface to the lower concentration limit of the flame propagation, ignition of these additional portions of vapor with more heat, increasing the amount of vapor. and, as a consequence, the spread of flames across the entire surface or explosion.

Thus, at this temperature, the leakage of gasoline in the trunk of the car or in a closed garage will quickly lead to the formation of explosive concentrations.

In a tightly closed luggage compartment, an explosive concentration due to leakage from the spare canister can be generated even when the vehicle is moving.

In the engine room at this temperature while moving the vapor in a concentration greater than 8 vol. %, unlikely, as this space is ventilated and the evaporating vapors are immediately mixed with excess air.

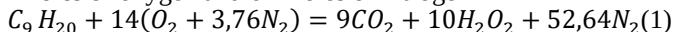
But, when the car is standing still and the engine is idling, malfunctions of the fuel system or gas pump can cause the formation of vapors that will not be eliminated by the radiator bleeding system.

The self-ignition temperature of gasoline ranges from 255°C (for the most dangerous A-66) to 435°C (for aviation 91/115).

This means that at such a temperature the ignition is possible even without an open fire, for example, when gasoline enters the hot surface of a muffler.

Due to the fact that during the explosion the combustion products do not work at first and all the oxidation reaction energy goes into thermal, the explosion temperature will be 15–20°C higher, i.e. about 1500K, that in this case is not significant.

With the complete conversion of the mixture of nonane with air into the products of combustion (explosion) one mole of nonane when reacted with 14 moles of oxygen and 64 moles of nitrogen¹



forms 64 moles of combustion products. That is, the volume of the mixture under hypothetical normal conditions would increase by 1, 06 times.

¹ Ibidem p. 33

Given the increase in temperature from 303K to 1500K, it can be predicted that the pressure of the explosion in a closed volume will be equal $(760 \times 1,06 \times 1500) / 303 = 3980$ mm Hg, ie, about 5, 2 atm.

Diesel.

As with gasoline, the most likely leakage points are leakage from a spare canister in the boot, garage or other storage location; leakage from the tank (due to the formation of holes in it or due to the tightly closed lid); leaks in the fuel system or under the hood (due to leakage or malfunction of the fuel pump).

Like gasoline, diesel fuel has a noticeable odor and forms well-visible spots, causing immediate troubleshooting.

The probability of not seeing the fault is very small in this case, but it still exists.

The lightest fraction of the most volatile diesel fuel grade "A" (according to GOST 305-82) begins to boil at a temperature of 150°C, which corresponds again to nonane, the saturated vapor pressure of which at 303°C is 6 mmHg.

Nevertheless the fractional composition of this hydrocarbon in diesel is very small.

The vast majority are fractions having a boiling point of 255–322°C

So the model can be taken pentadecane with a boiling point of 270°C.

The lower concentration limit of the flame spread of the most dangerous diesel fuels of grades "J" and "C" according to GOST 305-82 is determined as 5 % (vol.)¹.

The saturated vapor pressure of pentadecane at 300°C is less than 1 mmHg. Art. Therefore, at this temperature indoors, the vapor of diesel fuel can be at a concentration of not more than $1 \times 100 / 760 = 0,13$ vol. %.

This means that even getting into the open fire will not cause an explosion or fire.

Of course, this does not mean that you can light a fire or smoke in such a room.

Nevertheless accidentally getting into an open fire room is not likely to cause an explosion.

Ignition is only possible here by directly raising the ignition source to the liquid surface.

Molecular weight of nonane is 128 atomic mass units. The density of nonane vapor at a temperature of 30°C (303K) is $128 \times 273 / (22,4 \times 303) = 8,52$ kg / m³.

Air density under the same conditions – 1,24 kg / m³. Therefore, diesel vapors, like gasoline vapors, will mix with the air in the lower trunk, garage or underbody. But, unlike gasoline vapor, the dangerous concentration at 30°C will not work.

¹ Pozharno-vzryvoopasnost' veshchestv i materialov i sredstva ih tusheniya [Fire and explosion hazard of substances and materials and means of extinguishing them]. Kniga vtoraja. S. 266 [in Russian].

The temperature of self-ignition of diesel fuels is even lower than the temperature of self-ignition of gasoline, and ranges from 210°C (for fuel grade “Л” according to GOST 305-82 to 370°C (for aviation 91/115).

This means that at such a ignition temperature possible even without open flames, for example, when the fuel gets on the hot surface of the muffler.

When directly raising the source of ignition to the surface of the liquid or the ingress of liquid on the hot surface of the combustion is quite likely.

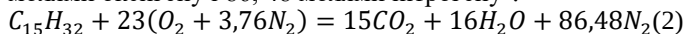
The temperature of the surface layer of the liquid will increase at a temperature of 60-700C.

At a temperature of 60-70°C, the evaporation of additional portions of combustible vapors will cause the concentration of these vapors above the surface to increase to 0.5% (about), i.e. to the lower concentration limit of the flame spread.

Flashing these extra portions of steam will cause an extra amount of heat, an extra amount of vapor and, as a result, the spread of flames across the surface or an explosion.

The temperature of the explosion will be 15–20°C higher, ie about 1400K, which in this case is also not significant.

При повному перетворенні суміші пентадекану з повітрям у продукти згорання (вибуху) один моль пентадекану при реакції з 23 молями кисню і 86, 48 молями нітрогену¹.



forms 117, 48 mole of combustion products. That is, the volume of the mixture under hypothetical normal conditions would increase by 1, 07 times.

Given the increase in temperature from 303K to 1400K, it can be predicted that the burst pressure in a closed volume will be equal to $(760 \times 1, 07 \times 1400) / 303 = 3760$ mmHg. ie, about 5, 0 atm.

Methane.

Methane, used as an automobile fuel, is usually contained in cylinders of high strength at a pressure of 200-250 atm.

As with methane, cylinders can be placed either in the luggage compartment or on the outside of the vehicle.

Possible causes of methane leakage are malfunction of gas equipment and leaks in the pipeline system.

To enable the detection of methane leaks, it is gifted with the addition of small amounts of substances with a very specific odor (ethyl mercaptan, etc.).

The odor of odorant, which is usually perceived as a smell of methane, is not very difficult to notice.

However, the potential risk of leakage cannot be underestimated.

¹ Ibidem S. 33.

The lower concentration limit of flame spread for methane is 5,28% (vol)¹. At 30°C this substance is in a gaseous state.

Molecular weight of nonane is 16 atomic mass units. The density of nonane vapor at a temperature of 30°C (303K) is $16 \times 273 / (22,4 \times 303) = 0,52 \text{ kg/m}^3$.

This means that in a closed room, the achievement of dangerous concentration is virtually eliminated.

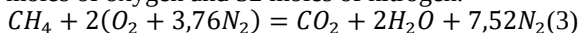
Therefore, with the location of the cylinders on the outer surface, the explosion is excluded even if the gas equipment malfunctions.

But the possibility of creating an explosive mixture in a very tightly closed luggage compartment or in the garage exists.

The self-ignition temperature of methane is 537°C which is much higher than the corresponding figure for gasoline or diesel.

Data on the combustion temperature of methane in the air range from 1900°C to 1600°C, an average of 2030°C (2303K), the explosion temperature will be approximately 2320K.

When the mixture of methane with air is completely converted into the products of combustion (explosion), one mole of methane is reacted with 2 moles of oxygen and 52 moles of nitrogen.



утворює 10, 52 молі продуктів згорання.

Thus, the volume of the mixture would not change at all under hypothetical normal conditions.

Taking in account the temperature increase from 303K to 2320K, it can be predicted that the burst pressure in a closed volume will be equal to $(760 \times 2320) / 303 = 5820 \text{ mmHg}$ that is, about 7 atm.

This is more than the explosion pressure for gasoline or diesel.

Propane-butane

Mixture of propane and butane used in automobiles contains about 40% C₃H₈ propane and 60% C₄H₁₀ butane in the summer.

This mixture is in liquid form in cylinders under pressure up to 16 atmospheres.

As with methane, cylinders can be placed either in the luggage compartment or on the outside of the vehicle.

The same and probable causes of a gas leak are gas equipment malfunctions and leaks in the pipeline system.

To ensure leakage detection, this mixture is also gifted with the addition of odorless substances.

The lower concentration limit of the spread of flame for propane is 2, 3% (vol)¹, for butane – 1, 2% (vol). For the mixture under consideration by the well-known formula²: $\text{KMIII} = 100 / (40/2,3 + 60/1,2) = 1,5\% \text{ (vol)}$.

¹ Pozharno-vzryvoopasnost' veshchestv i materialov i sredstva ih tusheniya [Fire and explosion hazard of substances and materials and means of extinguishing them]. Kniga vtoraja. S 466 [in Russian].

At 30°C this mixture is in a gaseous state. The molecular weight of propane is 44 atomic mass units. The density of its vapor at a temperature of 30°C (303K) is $44 \times 273 / (22,4 \times 303) = 1,77 \text{ kg / m}^3$

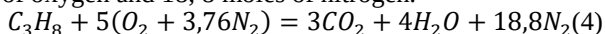
For Bhutan, the corresponding figures are 58 atomic units of mass and $58 \times 273 / (22,4 \times 303) = 2,33 \text{ kg / m}^3$. The vapor density of the mixture at this temperature is $1,77 \times 0,4 + 2,33 \times 0,6 = 2,1 \text{ kg/m}^3$, which is almost twice the density of air under the same conditions ($1,14 \text{ kg / m}^3$).

Therefore, propane-butane vapors will be miscible with the air preferably in the lower part of even an open space, including the lower part of the luggage compartment of the vehicle. Concentration of combustible gases in this mixture quickly reaches a mark of 5% (vol.).

The temperature of propane self-ignition is 470°C³, butane — 405°C. This is higher than the corresponding figure for gasoline or diesel, but lower than for methane.

According to the standard procedure, for example, the theoretical temperature of the explosion of propane and butane is almost the same and is 2130°C (2400K).

When the mixture of propane with air is completely converted to combustion products (explosion), one mole of propane is reacted with 5 moles of oxygen and 18,8 moles of nitrogen.

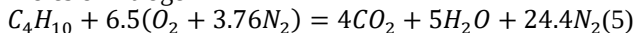


forms 25,8 moles of combustion products. That is, the volume of propane-air mixture under hypothetical normal conditions would in general increase by $25,8/24,8 = 1,04$ times.

Given the increase in temperature from 303K to 2400K, it can be predicted that the burst pressure in a closed volume will be equal to

$$(760 \times 2400,1 \times 04) / 303 = 6260 \text{ mmHg. ie, about } 8,3 \text{ atm.}$$

Accordingly, one mole of butane is reacted with 5 moles of oxygen and 24 moles of nitrogen



forms 33,5 moles of combustion products. That is, the volume of the mixture under the hypothetical normal conditions would increase by $33,5/31,9 = 1,05$ times. Given the increase in temperature from 303K to 2400K, it can be predicted that the burst pressure in a closed volume will be equal to

$$(760 \times 2400 \times 1,05) / 303 = 6320 \text{ mmHg. ie, about } 8,3 \text{ atm.}$$

Conclusions.

¹ Pozharno-vzryvoopasnost' veshchestv i materialov i sredstva ih tusheniya [Fire and explosion hazard of substances and materials and means of extinguishing them]. Kniga vtoraja. S 143[in Russian].

² Yelahn H. I., Shkarabura M. H., Kryshhtal M. A., Tyshchenko O. M. S. 130 [in Ukrainian].

³ Pozharno-vzryvoopasnost' veshchestv i materialov i sredstva ih tusheniya [Fire and explosion hazard of substances and materials and means of extinguishing them]. Kniga vtoraja. S 143[in Russian].

As the above calculations suggest, the least potential risk of fire and explosion when using modern automotive fuels is to acknowledge the danger of using methane.

The explosion pressure of this substance is slightly higher than the explosion pressure of liquid fuels, but methane is not able to accumulate not only in open spaces, but even in closed spaces, if the smallest slits are available.

In addition, methane has the highest self-ignition temperature of all types considered.

Gas cylinders, which are usually mounted in the trunk or on the roof of the car, are the most durable of all fuel storage tanks and can withstand considerable damage, even in severe accidents.

Available statistics state that no fires and explosions due to methane equipment have been recorded at all during the average year.

Instead, propane-butane plant equipment caused about 10% of fires and explosions, with the remaining 90% occurring in rare fuels.

Provided that certified equipment is used and professionally installed, methane cylinders and their “strapping” are much safer than LPG cylinders and, more so, than liquid fuel tanks and canisters.

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В. К. Словінський, Г. І. Єлагін,

О. С. Алексеева, В. В. Наконечний,

**ПОРІВНЯННЯ ПОТЕНЦІЙНО НЕБЕЗПЕЧНИХ ФАКТОРІВ
ПРИ ВИКОРИСТАННІ РІДКОГО ТА ГАЗОПОДІБНОГО
АВТОМОБІЛЬНОГО ПАЛЬНОГО**

Проведено аналіз потенційно небезпечних факторів при використанні в автомобілях дизельного, бензинового, метанового та пропан-бутанового пального. Доведено, що метан при використанні сертифікованого обладнання і професійному його монтажі значно безпечніше, ніж пропан-бутан і, тим більше, ніж бензин або дизельне пальне.

Ключові слова: автомобільне пальне, бензин, дизельне пальне, метан, пропан, бутан, вибух, питома густина, концентраційні межі поширення полум'я, температура самоспалахування, температура вибуху, тиск вибуху.

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V. O. Varlakhov,
Department Head of KhRIFE
Kharkiv, Ukraine,
ORCID: <https://orcid.org/0000-0001-6446-4400>,
e-mail: 19varlahov84@gmail.com

A. V. Lubentsov,
PhD in Law, Head of the Laboratory of KhRIFE
Kharkiv, Ukraine,
ORCID: <https://orcid.org/0000-0002-1419-6433>, e-mail:
Lubencov_av@ukr.net

PECULIARITIES OF PERFORMING EXPERT RESEARCH OF SRS CAR PASSIVE SECURITY SYSTEM FOR ESTABLISHING THE REASON NOT CAUSE THE FRONT BRAKE LOCK

Issues that arise from experts during the performance of court automotive expert assessments (expert researches) of technical condition of automobiles are considered, namely: SRS passive safety systems. The sequence of carrying out elemental research of the passive safety system of the SRS of cars on establishing the reasons for failure of the front (front) airbag of the passenger during a traffic accident is presented. The urgency of this paper is due, on the one hand, to the mass installation of airbags on cars of different brands, which are intended to protect the driver and passengers of vehicles from injuries during a collision, and on the other hand, frequent cases of not triggering airbags in the collision, associated as both for technical and operational reasons, resulting in serious injuries to the driver and passengers in the event of a collision. The increase in the level of constructive safety of the car, above all, is ensured by strengthening the requirements for the development, installation of structural elements and systems that provide protection of life and health of road users. Given the diversity of sources of risk factors for road accidents, constructive safety is divided into active, passive and after emergency. The examination of the technical condition of the SRS passive safety system is essentially a study of the vehicle electrical system requiring safety measures, since damage to the insulation of wires, shorting of individual circuits of electrical wires, and the introduction of extraneous current to the connectors can lead to the deployment of airbags during research.

Keywords: traffic collision, vehicle, passive safety system SRS, tensile safety belts, airbags, diagnostics of the SRS passive safety system, Road Accident Analysis, elemental research of the SRS passive safety system.

Formulation of Research Problem.

The constant increase in the capacities and speeds of cars, the density

of traffic of automobile flows, significantly increase the probability of occurrence of motor vehicle collisions (MVC).

Therefore, there is a constant problem of improving cars in the direction of reducing the consequences of an accident.

According to the reports of the patrol police of Ukraine, it follows that in 2018 there were 150120 accidents in the territory of Ukraine, including 24294 road accidents with the victims — in which 3350 people were killed and 30884 people were injured.

Reducing consequences of road accidents is ensured by the structural safety of the vehicle, the requirements of which are stipulated by regulatory documents, namely: ECE rules (they are the guest base); ISO (International Organization for Standardization) standards; EU (European Community) Directives; MVC; GOSTs etc.

Increasing the level of structural safety of the car is primarily due to the increased requirements for the development, installation of structural elements and systems that protect the life and health of road users.

Considering the variety of sources of accident risk factors, it is customary to divide structural safety into active, passive and after emergency.

Active, passive and after-accident safety are complex features that determine a car's ability to meet the accepted road safety standards.

If we take the whole set of measures to ensure road safety 100%, then about 50-60 % of road safety is determined by the functioning of the active safety system, about 30% — the system of passive safety, less than 10-20 % — the system after emergency safety.

The complex of the system "man-car-road-environment" when operating in road conditions can be represented by the open circuit of automatic control (see Fig. 1¹).

The initial input characteristic of the system "man-car-road-environment" is taken to be the speed of movement of the car V_a , the secondary is the action of force F_1 characterizing the emergency situation and the action F_2 of the collision object while MVC.

In an accident, there are three phases: initial (approximation), climax (vehicle contact with the object of collision and moving the vehicle to a final stop), and the final one, the end of which is determined by the cessation of dynamic and any other impact on the car.

¹ Gudkov V. A. Bezopasnost' transportnyh sredstv (avtomobili) [Safety of vehicles (cars)] / Ju. Ja. Komarov, A. I. Rjabchinskij, V. N. Fedotov : ucheb. posob. dlja VUZov. Moskva : Gorjachaja linija-Telekom, 2010. 431 s [in Russian].

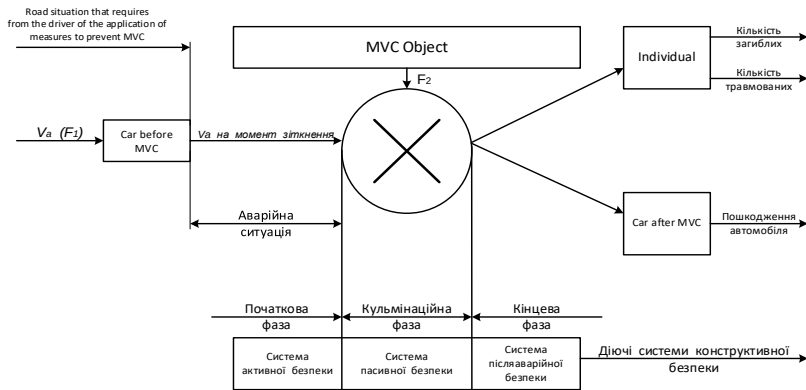


Fig. 1. Ensuring the security of the complex of the system "man-car-road-environment"

Thus, the passive safety system of the car is aimed at reducing the consequences of an accident at the moment of collision of vehicles, and the solution of the question of the reasons for the failure of the airbags is relevant in the investigation of cases related to an accident and their consideration in court.

Testing the technical condition of the passive safety system SRS is essentially a study of the electrical system of the car, which requires compliance with safety measures, as damage to the insulation of the wires, short circuits of separate electrical wires, introduction of third-party current to the contact sockets can lead to the operation of airbags when conducting research.

Electrical wiring of the SRS passive safety system can be detected by the characteristic yellow insulation¹.

Analysis of recent main research.

O. I. Stabrovskiy, A. B. Razumov, V. Zhilinsky, V. I. Orphan, V. K. Vakhlamov, M. G. Shatrov, A. A. Yurchevsky and others. were engaged in the study of the passive safety system of SRS.

The **Article Purpose** is to conduct an in-element study of the passive safety system SRS of a modern vehicle.

Consider the sequence of studies of the passive safety system SRS car on the example of expert practice.

Main content presentation.

¹ Ekspertne doslidzhennia systemy pasyvnoi bezpeky avtomobilia «SRS» [Expert study of the passive safety system of the car «SRS»] : zvit NDR (zakliuch.) / MİU, LNDİSE ; ker. O. I. Stabrovskiy; vykon. : A. B. Razumov, H. V. Zhylynskiy. 011U002597. Lviv, 2011. 80 s [in Ukrainian].

Hon. Prof. M. S. Bokarius Kharkiv Research Institute of forensic examinations received a court order appointing a forensic auto-technical examination of the technical condition of the KIA-Carens car to resolve questions about the technical condition of its passive safety system and to determine the reasons for its failure.

The examination is assigned in a civil case on a lawsuit brought by a driver of a KIA-Carens P. car to an official representative in Ukraine for the sale of KIA cars.

The driver of the KIA-Carens P., driving along the Kiev-Kharkiv-Dovzhansky highway, while choosing within the safe speed limits, did not take into account the traffic situation and the condition of the vehicle, thereby losing control of the car's movement, not coping with his driving and made an exit on the distribution lane, then left on the opposite side of the highway, where he collided with a car VAZ-2103, which was moving in the opposite direction.

As a result of an accident, a passenger in the front seat of a KIA-Carens car was fatal and died on the scene of a road accident.

In the statement of claim, the plaintiff stated that the passive safety system of the KIA-Carens car was technically malfunctioning at the time of the traffic accident, since the front (front) passenger airbag did not work when the vehicle collided, which in turn led to the death of the passenger, which was in the front passenger seat.

Expert inspection of the KIA-Carens car was carried out at an official service station to resolve the issues. The inspection was carried out in the presence of representatives of the owner of the car and the car dealership where the KIA-Carens car was purchased.

[illegible]

Fig. 2. Information from the site www.kia-hotline.com regarding the complete set of passive safety system SRS of the test car KIA-Carens with airbags (AirBag).

External review of the KIA-Carens study showed that mechanical damage was concentrated in its front, namely, a deformed front, a power unit displaced from its structural installation and deformed power elements of the car frame from impact loading directed load back.

According to the manufacturer, the passive safety system of the KIA-Carens SRS car according to its VIN code, it was found that the car under study is equipped with: front (front) driver's airbag and front (front) passenger airbag, as well as devices for pre-tensioning the seat belts. driver and front passenger (see Fig. 2 below), which was also installed during visual inspection in the passenger compartment, namely on the steering

wheel cover and on the right side of the front passenger compartment on vni inscription «SRS AIRBAG», testifying to install front airbags driver and passenger.

Expert examination of the KIA-Carens found that the front (front) driver's airbag is in the activated state — the airbag is in the activated state; the front (front) passenger airbag is in the inactive state — the airbag is in the idle state. When opening the upper part of the front panel of the car interior along the lines of its rupture when activating the front (front) airbag, it is established that the airbag is in the folded state (see Fig. 3-4 below).



Fig. 3. General view of the KIA-Carens driver's front airbag activated.



Fig. 4. General view of the KIA-Carens passenger front airbag not activated.

The investigation of civil case materials revealed that in the investigation of the circumstances of an accident in the framework of criminal proceedings conducted a forensic transport and trace examination, according to the conclusions of which, in the collision of the KIA-Carens and VAZ-2103 cars interacted with the front parts and the angle between their longitudinal 180 axes, the conditions for the operation of both front airbags are fulfilled, as evidenced by the activation of the front (front) airbags of the driver of the KIA-Carens vehicle being tested.

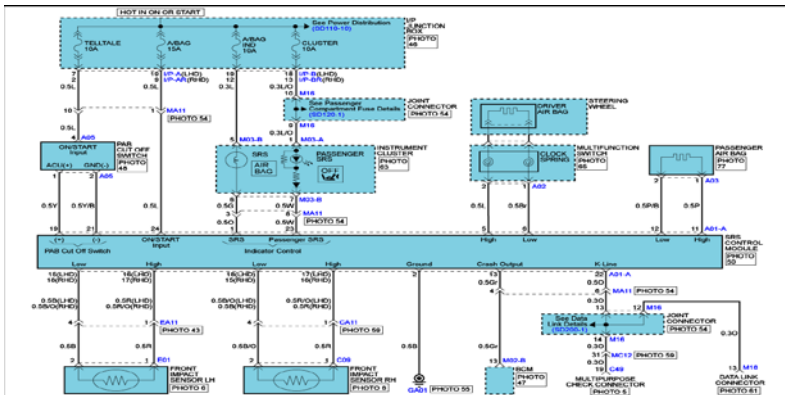


Fig. 5. Schematic diagram of the passive safety system of the vehicle SRS KIA-Carens.

Significant damage to the KIA-Carens car, such as circuit breakage, failure of the fuse box in the engine compartment and battery, made it impossible to diagnose the passive safety system of the vehicle's SRS using diagnostic equipment.

In connection with the above, an elemental study of the components of the passive safety system of the SRS of the KIA-Carens was carried out.

The electrical diagram of the KIA-Carens passive SRS system is shown below (see Figure 5 below).

From the wiring diagram of the passive safety system SRS of the test car KIA-Carens, it follows that control of the passive safety system SRS of the specified car consists of the following main components:

- electronic control unit of passive safety system SRS — SRS CONTROL MODULE.

The SRS passive control unit is structurally mounted in the vehicle's center console;

- front impact Sensors (Right and Left) — FRONT IMPACT SENSOR RH / FRONT IMPACT SENSOR LH.

The right (RH) and left (LH) impact sensors are fixed in the front of the right and left spars of the vehicle, respectively;

- driver's front (front) airbag unit — DRIVER AIRBAG, which is structurally mounted on the steering wheel of the car;

- passenger front airbag unit: PASSENGER AIRBAG, which is structurally mounted in the front panel above the storage box;

- fuse box: JUNCTION BOX, which is located on the left side of the front panel of the car;

- switch of the front (front) passenger airbag, which is located on the right side of the front panel of the car;

- electrical wires that have a bright yellow insulation color in the SRS passive system.

During an expert inspection of the KIA-Carens passive SRS control unit, it found that the housing of the SRS control unit, as a result of the destruction of its mounting brackets, is not fixed at its installation location, and the back left part of the casing of the electronic unit is damaged in the form of deformation.

One of the connectors of the SRS electronic control unit is separated from the unit, the second connector is located at the connection to the SRS electronic control unit.

When disassembling the SRS electronic block, it was visually found that there was no damage in the form of chip destruction.

When examining the SRS fuses, it found that the characteristics of the AIRBAG fuses meet the requirements of the manufacturer.

The multimeter was used to test the integrity of the passive safety locks of the SRS of the KIA-Carens test vehicle.

When checking the connection and the integrity of the electrical circuits of the components of the passive safety system of the SRS of KIA-Carens, it found that all the connectors of the electrical circuits are securely

connected, with the electrical circuit connecting the module of the front (front) airbag to the electronic control unit SRS has no damage in the form of breaking and breaking the circuit.

The integrity of the electrical circuit of the front airbag module to the SRS electronic control unit was checked using a multimeter.

Later, when inspecting the KIA-Carens driver's seat belt and front passenger's seat belt retainers, it found that the plastic parts of the retainers had traces of the plastic part of the retainers, which are signs of pre-tensioning of the driver's and front passenger's seat belts.

According to the algorithm of operation of the passive safety system of the vehicle SRS it follows that when determining the condition of activation, the electronic control unit SRS supplies the starting current to the flares of the devices of pre-tensioning of the seat belts, airbags of the driver and the front passenger.

If the vehicle is equipped with a front passenger airbag switch and is in the "OFF" position, the front passenger front airbag does not work and the front passenger pre-tensioner will operate in any case .

This leads to the conclusion that, as a result of the collision of vehicles, the KIA-Carens Passive Electronic Control System for Passive Safety System of the KIA-Carens applied the starting current to the driver and front passenger seat pretensioners, as well as to the front (front) seat trolley — as a result of which the devices of pre-tensioning of the seat belts of the driver and the front passenger, as well as the front (front) airbag of the driver were activated on the specified car.

During an expert examination of the KIA-Carens front passenger airbag switch, it was found that the decorative panel of the switch, which is fixed on the right side of the front panel of the car interior, is not due to the destruction of the right side of the front panel of the car.



Fig. 6. View of the front passenger airbag switch KIA-Carens.

The front (front) airbag switch housing of the KIA-Carens passenger

car has no damage in the form of destruction, and the electrical wiring connector to the switch is securely fastened.

While inspecting the front (front) passenger airbag switch, it is found that the switch is rotated counter-clockwise to the stop (see Fig. 6 below). The front (front) passenger airbag switch allows the driver to decide whether or not the front passenger airbag should operate.

Subsequently, the design and position of the front passenger airbag switch of the passenger car of the KIA-Carens vehicle under study was investigated to determine what condition it was (OFF or ON).

An anisotropic magnetoresistive (AMP) element is used in the front passenger airbag switch, which changes its resistance depending on the strength of the magnetic field. When the front passenger airbag switch is in the ON position, the magnet moves away from the AMP element and the output current generated by the SRS electronic unit is weak.

When the front passenger airbag switch is in the OFF position, the magnet approaches the AMP element and the SRS electronic unit captures strong current.

After disassembling the KIA-Carens passenger front airbag switch housing, it was found that in the position when the switch is rotated counter-clockwise to the stop, the magnet is at the level of the AMP switch indicating that the front switch (f) is off.) of the passenger airbag of the specified KIA-Carens car at the time of its expert inspection — "OFF" (see Fig. 7 below).



Fig. 7. KIA-Carens passenger front airbag switch (disassembled)

According to the KIA-Carens vehicle operating instructions, it is necessary to insert the main ignition key of the vehicle into the switch located on the right side of the front panel of the vehicle to switch off the front (front) passenger airbag of the specified vehicle. to the "OFF" position. In this case, a corresponding lamp will be illuminated in the vehicle dashboard, informing the driver that the front (front) passenger airbag has been deactivated and will remain on for as long as the airbag is switched off.

Turning the key counterclockwise corresponds to the OFF position, turning the key counterclockwise corresponds to the ON position. (see Figure 8 below).



Fig. 8. KIA-Carens passenger front airbag switch and exterior trim

Thus, on the basis of the above study, it should be concluded that at the time of the expert inspection of the KIA-Carens, the front passenger airbag switch was in the OFF position, under such conditions the front airbag the passenger should not work. The results of the above elemental study of

the components of the passive safety system of the KIA-Carens car SRS gave the expert reason to conclude that at the time of the expert examination the KIA-Carens car did not have technical failures of the passive safety system SRS, which resulted in the front (front) pillow passenger safety was not activated.

It should be noted that the following requirements must be observed when conducting a vehicle SRS passive safety study:

- it is forbidden to measure the resistance of the airbag module with devices with an internal power source, since the energy of the power source of portable electrical devices is sufficient for firing airbags;
- It is forbidden to disassemble the airbag modules which have not worked and the contact ring for visual inspection or in-depth diagnosis.

In view of the above, as it is forbidden to carry out measurements of the resistance of the airbag module with internal power supply devices, disassemble the airbag modules which have not worked, for the purpose of their visual inspection and in-depth diagnosis, then an in-depth study of the front airbag module (frontal) KIA-Carens car was not produced.

Conclusions.

Thus, the example of an in-element study of the passive safety system of the vehicle SRS in the article allows experts (specialists) to carry out forensic auto-expert examinations (expert researches) on a sufficient technical level to investigate the technical state of the passive safety system of the SRS and to determine the causes of failure of the front (front). passenger airbags.

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В. О. Варлахов, А. В. Лубенцов

ОСОБЛИВОСТІ ПРОВЕДЕННЯ ЕКСПЕРТНИХ ДОСЛІДЖЕНЬ СИСТЕМИ ПАСИВНОЇ БЕЗПЕКИ SRS АВТОМОБІЛЯ ЩОДО ВСТАНОВЛЕННЯ ПРИЧИН НЕ СПРАЦЮВАННЯ ФРОНТАЛЬНОЇ ПОДУШКИ БЕЗПЕКИ ПАСАЖИРА

Розглянуто питання, які виникають у експертів під час проведення судових автотехнічних експертиз (експертних досліджень) технічного стану транспортних засобів, а саме: системи пасивної безпеки SRS. Наведено послідовність проведення поелементного дослідження системи пасивної безпеки SRS транспортних засобів з встановлення причин не спрацювання передньої (фронтальної) подушки безпеки пасажирів під час дорожньо-транспортної пригоди. Актуальність вказаної роботи обумовлена, з одного боку, масовим встановленням подушок безпеки на транспортних засобах, а з другого, – частими випадками не спрацювання подушок безпеки при зіткненні.

Ключові слова: дорожньо-транспортна пригода, транспортний засіб, система пасивної безпеки SRS, паси безпеки з натягувачами, подушки безпеки, діагностування системи пасивної безпеки SRS, судова автотехнічна експертиза, поелементне дослідження системи пасивної безпеки SRS.

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A. V. Batig,

Senior Researcher of Railway Research Laboratory, at Lviv RIFE,
Master

ORCID: <https://orcid.org/0000-0003-1205-6004>

e-mail: batigasha1992@gmail.com

A Ya. Kuzyshyn,

Researcher of Railway Research Laboratory at Lviv RIFE,
Postgraduate Student

ORCID: <https://orcid.org/0000-0002-3012-5395>

e-mail: kuzyshyn1993@gmail.com

HUMAN RELIABILITY AS MAIN REASON FOR RAILWAY ACCIDENTS

The modern development of science and technology has practically resolved the issue of ensuring the reliability of technical means, but the influence of man as an integral part of the man-machine man-technology system, remains not fully investigated.

The problem of the influence of the human factor is versatile, complex structurally and is currently far from being resolved.

Rail transport is a complex system in which the individual is the main element. Therefore, the nature and degree of influence of a person, as an element of such a system, on traffic safety is determined by the nature and degree of his participation in the processes of functioning of an automated railway transport system.

The "human factor" is considered in almost all processes of the railway transport system. It depends on a person the level of labor and technological discipline, timely control and proper hazard assessment, reasonableness and correctness of actions in the field of their professional activities to prevent and prevent railway accidents.

The variety of railway accidents that investigated in Lviv NDISE indicate that it is impossible to use standard mechanisms for cases where the "human factor" is considered, but requires a thoughtful individual approach to developing a mechanism for each case separately.

The task of the expert in the study of railway accidents, in which the influence of the "human factor" is considered, is to establish the degree of its influence on the implementation (realization) of the refusal of the mechanism of a railway accident at the moments when some railway situations turn into others.

Keywords: railroad accident, human factor, rolling stock, transport situation.

Formulation of Research Problem.

There are about 500 railway accidents and events every year on the Ukrainian railways, each with a *human reliability*.

Human reliability refers to the actions or omissions of a person in the course of his/her duties having a major impact on the safety of rolling stock on railway transport.

At the same time, the problem of the study of the influence of this factor on the occurrence of rail accidents is versatile, complex structurally and is far from being resolved.

The variety of rail accidents analyzed on Ukrainian railways and investigated in Lviv RIFE indicates not the impossibility of applying typical mechanisms for cases where *human reliability* is considered, but requires a thoughtful individual approach to designing the mechanism on a case-by-case basis.

Analysis of recent research and publications.

A considerable amount of work is devoted to the study of the impact of the *human reliability* on the occurrence of rail accidents.

Among them is the work of V. M. Samsonkin *Development of a method for effective monitoring of the main activity of the train driver*¹, which invented a mechanism for determining the conditions of work of the driver when performing train and shunting work.

The author of the mentioned research paper developed an algorithm for monitoring the condition of the driver with the help of an individual norm and a mathematical model of the control system of operational activity, as well as presents a perspective direction of increasing the reliability of *human reliability* in the management of traction rolling stock without additional technical means.

In the research paper of O. M. Troynikov *Approaches to the management of safety of transport processes on the railways*² by the author identified the main causes of railroad accidents, among which the impact of *human reliability*.

In addition, in this work, railway safety is divided into four components: technological, industrial, environmental and railway safety.

In the work of V. A. Olentsevich and V. E. Gozbenko *The analysis of the reasons for the violation of the safety of the railway transport system* the authors investigated the state of safety on the railways of Russia over the past three years.

The authors also identified the main factors that affect the safety of the Russian rail transport system, and noted human activity as the root cause of almost all rail accidents.

Modern approaches in the field of railway safety improvement have been proposed by I. E. Skogarev in *Modern approaches to improving the safety of railway traffic*³ which proposed to reduce rail accidents associated

¹ Samsonkin V. N., Petinov Ja. P. *Razrabotka metoda jeffektivnogo monitoringa osnovnoj dejatel'nosti mashinista poezda* [Development of a method for effective monitoring of the main activity of a train driver]. *Vostochno-Evropejskij zhurnal peredovykh tehnologij*. Harkiv, 2016. Vip. 81. S. 52–58 [in Russian].

² Troinikova O. M. *Podkhody do upravlinnia bezpekoiu transportnykh protsesiv na zaliznytsi* [Approaches to the safety management of transport processes on the railway]. *NTP y efektyvnost proyzvodstva*. 2015. Vyp. 132. S. 54 — 60 [in Ukrainian].

³ Skogarev I. E., Kobozev A. Ja., Zhizhko V. V., Bogomazova E. A. *Sovremennye podhody v oblasti povysheniya bezopasnosti dvizheniya*

with low training of railway workers, to use a modern software complex to test and test their knowledge.

A great contribution to the study of the impact of the human factor on the onset of railroad accidents made E. M. Sokol.

The monograph: *Steps from the rails and collisions of rolling stock*¹ established the influence on the reaction of the driver in case of sudden obstruction to the movement of rolling stock of a number of physiological and psychological factors.

One of the results of the study is the derivation of a calculation formula for setting the response time of a driver to an obstacle to movement and the corresponding brake path of the train.

Thus, as the analysis of the above sources shows, the question of the influence of the *human reliability* in the onset of rail accidents is rather urgent and requires ongoing theoretical and practical research.

Article Purpose.

Performing an analytical review of the "human factor" as a basis for railway safety, establishing the expert's main tasks in the study of rail accidents, which analyze the impact of *human reliability*.

Main content presentation.

In practice, the human factor is considered when a person makes any decision in a particular situation or as a set of certain personality traits.

According to Ukrainian Railways statistics, the human factor has a leading role in the safety issue, and the causes of many railway accidents (RA) are:

- miscalculations in the organization of movement;
- car control errors;
- insufficient level of professional training of employees;
- disturbance of the processes of interaction between the participants of the movement;
- insufficient control over the implementation of existing rules and regulations, as well as the prevention and elimination of various technical failures by officials, etc.

Person on the rail remains a weak link in this system. Its capabilities are limited by the physiology of the body and psychological features.

In the conditions of objective complexity of transport situations (high speed of their changes in time, shortage of time for decision-making, failure of safety systems) the level of reliability of employees is determined (Fig. 1):

- physiological capabilities of the human body, depending on its nature;

zheleznodorozhnogo transporta [Modern approaches to improving the safety of railway traffic]. Visnik DNUZT. D., 2007. Vip. 17. S. 188–190 [in Russian].

¹ Sokol Je. N. Shody s rel'sov i stolknoveniya podvizhnogo sostava (Sudebnaja jekspertiza. Jelementy teorii i praktiki) [Descent from rails and collisions of rolling stock (Forensic examination. Elements of theory and practice)]. Kiev, Transport Ukraini, 2004. 368 s [in Russian].

- psychological capabilities of the individual;
- physiological and psychological state of the employee;
- professional training;
- consistency of actions of the members of the teams, their psychological compatibility.



Fig. 1. Model of human motivational behavior

The problem of influence of employees on the work process on the railway is becoming more urgent, because recently the number of control systems in which the leading function is performed by the person has increased significantly, and therefore the price of his mistakes has increased immensely.

Since the reliability of the system of management of technical means is largely determined by the correctness of the employee's actions, the more complex the system, the more pronounced this dependence.

In the face of increasing complexity and stress of work, the correctness of human actions can diminish and over time, even very significantly.

This leads to the fact that increasing the reliability of the technical part of the control system most often makes no sense, since the reliability of the whole system is limited by the characteristics of this property in humans, which in turn creates objective conditions to increase the risk of accidents.

The reasons for the occurrence of railway accidents are most often the psychological characteristics of a person. Sometimes in dangerous transport situations (NTS) a person is unable to act properly.

In life-threatening conditions, not everyone is able to adequately respond to an evolving situation, to work in it steadily, productively, without taking erroneous actions.

Among the psychological causes of conscious violations of safe work rules are the following: saving energy, saving time, habit of danger or its underestimation, orientation to ideals, tendency to copy norms of group behavior, habit of working with violations, reassessment of one's own experience and skill, desire to assert oneself stressful states, risk aversion, unmotivated risk.

Human behavior, its actions in any situation, even in the most dangerous, indirectly through a complex psychological process of

motivation, determine its needs according to the model of motivational behavior, which is based on the principles of Maslow and Herzberg theories.

Currently there are several theories of meeting human needs: the most common of these is Maslow's hierarchy of needs which determining the priority of meeting the five major human needs: physiological (material)→ needs for security→, social needs→ for recognizing the need for →self-realization (Fig. 2).

To justify the proper motivation of workers to work effectively and safely, they often use the provisions of Hertzberg's theory, according to which all the needs of an employee are grouped into two groups: motivational factors and factors of working conditions.

The Herzberg model adapts Maslow model to the study of the motivation of workers in the manufacturing sphere, since the factors of working conditions in the theory of Hertzberg cover the physiological (material) needs and security needs of the Maslow theory, and the motivating factors in the theory of Hertzberg; all other Maslow theory.

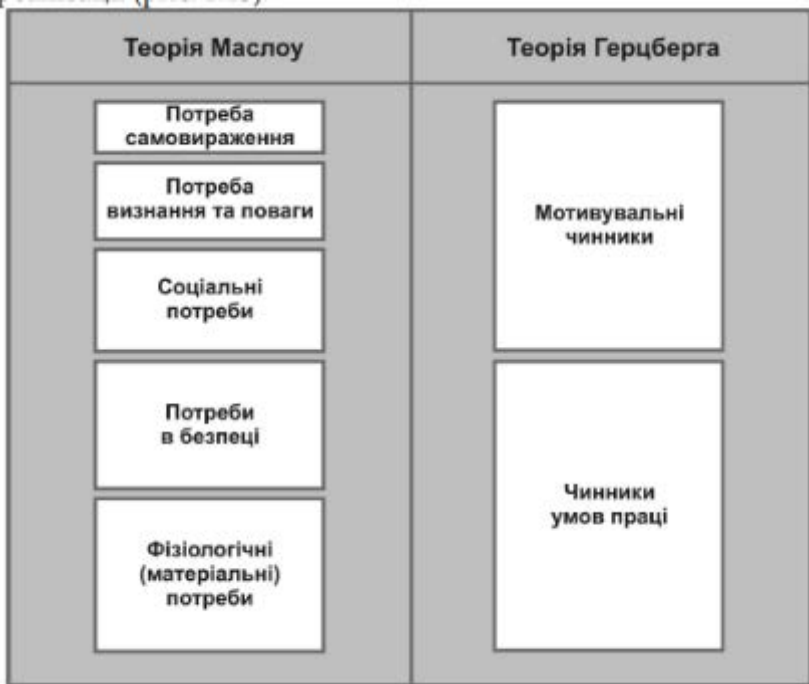


Fig. 2. The relationship between human needs in Maslow and Herzberg models

Working conditions alone cannot motivate a person to take any action, but if they are improper, the employee has a feeling of dissatisfaction that causes a disincentive effect and degrades the role of motivating factors.

Mismatch of mental and psychophysiological characteristics to working conditions, lack of proper level of safety at work and poor psychological relations in the team, stress, fatigue, illness, lack of education and lack of professional skills, financial and financial problems, decrease of professional ability in extreme conditions after extreme conditions psychophysiological factors that most often lead to rail accidents.

For example, the work of the next station at the station on physical grounds does not seem difficult and intense.

Although in the absence of visualization of the course of events at the object of observation leads to emotional tension, which in turn reduces the time of decision.

However, it is understood that constant nervous tension causes a violation of the normal physiological and mental state of the employee, and this can turn into a risk of emergencies.

All the work of the station depends on the actions of the station, so the risk in the production environment arises in any stressful situation.

Every technological operation needs an immediate reaction, and the slightest mistake or inattention causes inevitable consequences. From this it follows that each action of the next one affects the safety of train traffic.

However, as practice shows, good psychophysiological qualities are not enough, as the cause of a railway accident may be the physiological capabilities of members of the locomotive crew.

It may not be the receiving of the necessary information by the sensory organs (through hearing, sight, touch) due to the weak warning, forbidding signal or its absence.

For example, the sharp changes in the light and brightness of objects encountered near the railway tracks take time to adapt the visual analyzers of the members of the locomotive crews to these conditions. During this time, the ability to distinguish objects deteriorates to a greater extent and the number of errors when managing the rolling stock increases sharply.

It should be noted that both light and night adaptations are dangerous.

At night, the perception of the colors of objects is almost completely disturbed, they differ not in color but in brightness. It also degrades the ability to estimate the distance to and between objects, the speed of their movement.

Accordingly, the distance at which the members of the locomotive crew can detect the vehicle, the person is halved compared to the distance of their detection in the daylight hours.

As a result, they create the illusion that the obstacle to movement is at a great distance, which poses a real risk of an accident.

The subjective reasons, which include a low level of training and knowledge, play an important role in the occurrence of rail accidents.

Lack of knowledge makes it impossible to track and evaluate a dangerous traffic situation, as well as identify the possible consequences of a mistake, quickly respond to the situation and find the right solutions.

Ineffective and unskilled actions of a person in a dangerous traffic situation contribute to the implementation of the mechanism of a railway accident — a set of ordered fragmented elements of a railway accident (actions, events, states) with links of interaction between them.

At the same time, effective and skilled human actions in rail accidents prevent them from occurring.

It should be noted that *human reliability* in a railway accident can be active and passive.

Such traffic events as vehicle collisions, rolling stock strikes on fixed obstacles and people are characterized by the fact that *human reliability* is active and the moments of transformation of some situations into others are within the limits of perception by officials and the measures for preventing (CTS).

In this case, the formation of a mechanism of a railway accident occurs in short time frames (hours, minutes, seconds).

The other group of rail accidents include those in which the formation of a traffic safety threat (TST), the development of NTS and KTS and the moments of transformation of ZBR into NTS, NTS in KTS (the first and second critical points, respectively) are beyond the perception of these processes by officials.

For example, in adventures with ladders, the role of *human reliability* is passive.

Rolling stock rails occur regardless of the actions of the participants of the CTA or these actions contribute immediately; in this case, the operation of the ZTP mechanism occurs in extended time frames, that is, its formation takes days, weeks, months.

The role of the *human reliability* is significant both in the triggering and in the failure of the train accident mechanism. The dominant role of *human reliability* is not to prevent a catastrophic transport situation, but to a dangerous transport situation, that is, to eliminate the threat of safe movement.

The task of the expert is to establish the time at which one transport situation is transformed into another, as well as to establish a transport situation (NTS or CTS) in which the *human reliability* is involved.

If it is found that *human reliability* was involved in the CTS, then consideration should be given to mitigating the effects of *human reliability*.

If *human reliability* was involved in the NTS conditions, then the problem should be solved about the reasons that did not lead to the prevention of the traffic accident, that is, to establish the degree of influence of *human reliability* on the implementation (implementation) of refusal to

actualize the mechanism of the railway accident at the time of occurrence dangerous transport situation.

Thus, the form of a PTS mechanism with stable cause and effect links allows to establish the immediate technical cause of the mechanism of the PTS mechanism, and the content, ie the dynamic transformation of one transport situation into another, allows to solve the problem of the possibility of preventing a railway accident.

Conclusions.

The problem of *human reliability* influence is urgent and requires strict control, since it is involved in almost all processes of operation of the rail system.

The level of labor and technological discipline, timely control and correct assessment of danger, thoughtfulness and correctness of actions in the field of the professional activity on prevention and prevention of railway accidents depend on the person.

The task of the expert in the study of railroad accidents having influence of *human reliability* is to study the extent of its impact on the circumstances and the development of the railway accident at the time of transformation of one transport situation in another.

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А. В. Батіг, А. Я. Кузишин

«ЛЮДСЬКИЙ ФАКТОР» ЯК ОСНОВНА ПРИЧИНА ЗАЛІЗНИЧНО-ТРАНСПОРТНИХ ПРИГОД

Проблема дослідження впливу «людського фактора» на виникнення залізнично-транспортних пригоди є різносторонньою, складною структурно та на сьогодні далекою від вирішення.

Різноманіття залізнично-транспортних пригод, які досліджуються у Львівському НДІСЕ, вказує на неможливість застосування типових механізмів для випадків, де присутній «людський фактор».

Завданням експерта при дослідженні таких залізнично-транспортних пригод полягає у встановленні ступеня впливу зазначеного фактора на здійснення (реалізацію) відмови в спрацюванні механізму залізнично-транспортної пригоди.

Ключові слова: залізнично-транспортна пригода, людський фактор, рухомий склад, транспортна ситуація.

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A. I. Ripenko,

PhD in Law, Director of Odessa Scientific Research Institute of
Judicial Expertise of the Ministry of Justice of Ukraine,
e-mail: art.ripenko@gmail.com

Yu. I. Yaremko,

Doctor of Economics, Docent, Professor at the Department of
Kherson State Agricultural University, Forensic Expert at the
Kherson Branch of Odessa Scientific Research Institute of Judicial
Expertise of the Ministry of Justice of Ukraine
e-mail: pivden-zemlja@ukr.net

I. V. Pieskov,

Head of Kherson Branch of Odessa Scientific Research Institute of
Judicial Expertise of the Ministry of Justice of Ukraine
e-mail: ipeskov64@gmail.com

PECULIARITIES OF FORENSIC EXAMINATION OF LAND REGISTRATION DOCUMENTS REGARDING ESTABLISHMENT OF ADMINISTRATIVE AREAS

The paper considers the administrative-territorial system of Ukraine. The procedure of boundary determination, in particular the development of the relevant land management project, the procedure for conducting the state land survey of the project, its approval and certification of the borders are analyzed.

The problematic aspects of the execution of the judicial examination of documentation on the establishment of boundaries of administrative-territorial units are characterized. The emphasis is placed on the importance of adhering to the procedure of analysis of normative-legal and regulatory-technical documents in force at the moment of making the relevant decisions and development of relevant documentation.

Ways to improve scientific and methodological support of forensic activities in Ukraine are proposed.

Keywords: administrative-territorial unit, forensic examination, settlement limit, establishment of boundaries in kind, forensic expert, local self-government.

Formulation of Research Problem.

In case of disputes concerning the boundaries of administrative areas (entities) (hereinafter referred to as AA), belonging to the respective land plots, determining the jurisdiction of state authorities and local self-government, there is a need to conduct judicial expertise (expert studies) in the specialty 10.20 "Research in the field of research », Which is performed by forensic experts of the judicial review institutes of the Ministry of Justice of Ukraine.

Administrative and Territorial Structure (hereinafter referred to as ATS) is defined by Article 133 of the Constitution of Ukraine:

“... The system of Administrative and Territorial Structure of Ukraine consists of: Autonomous Republic of Crimea, oblasts, regions,

cities, districts in cities, towns and villages”.

Elements of this system do not include village, township or city councils, as well as United Territorial Communities (UTCs) whose existence is defined at the state level.

It should also be noted that projects for the formation of territories of the village councils, city councils, etc. are among main documents.

Land management projects for establishing (changing) the boundaries of ATS, which are stipulated by modern legislation, are not discussed in this paper, since, in their presence, the issue of defining the boundaries of settlements does not arise: it is sufficient only information about the boundaries of the settlement using GIS software in the required format and analyze their progress.

As is well known, the boundaries are determined by the method of analysis of the source materials and decoding of the corresponding contours and territories on orthophotos or according to the coordinates of the coordinates contained in the documentation on land management.

Land reporting is required to compare the areas indicated therein and the area of territories calculated as a result of defining the boundaries of a UTCs or a settlement.

The boundaries of the aforementioned councils are today defined on the basis of: documentation, charts, maps, atlases that were developed and approved in the USSR, or in the early 1990s on special documentation that requires a court expert to be aware of the provisions of the relevant legal and regulatory framework. regulatory and technical acts, including not valid ones, as well as certain knowledge not only in land management, but in urban planning too.

The problem is that such documentation has been developed in different years, including in the times of the USSR, different in purpose, content, composition, bodies that approved and approved it and so on.

Therefore, the tasks of a forensic expert at the stage of preliminary work on the study of the submitted materials for research also include the analysis of normative-legal and regulatory-technical documents that were in force at the time of making the relevant decisions and developing the relevant documentation.

Analysis of recent research and publications.

During forensic examinations on land management, the decision on the issues of establishing the boundaries of the AA is currently accompanied by a lack of methodological support, in particular, in the State Register there are no methods that would help solve the expert tasks.

The existing methodological guidelines for determining the compliance of the land management documentation with the requirements of the legislation contain only general recommendations for certain types of land management documentation, which may testify to the boundaries of territorial communities.

The aforementioned indicates the need for further development of a scientific and methodological base for conducting research on land

management by the staff of the research institutions of judicial expertise of the Ministry of Justice of Ukraine with the involvement of leading experts and scientists of the field.

Article Purpose.

The purpose of the study is to determine the required list of developed land management documents that can be used in conducting judicial expertise on land management in order to establish its compliance with the requirements of land legislation and other regulatory documents on land management and land use.

Main content presentation.

What is the territory of a council or an ATS?

Let's look at the definition of the territory: "territory (lat. Territorium — area, territory; from terra — land) — region, a limited part of the earth's surface within natural, state, administrative or conditional boundaries: determined by the length, as a specific kind of *spatial* resource, area, geographical location, natural conditions, economic development.

Territory is the object of specific activity".

In other words, to call a plot of the earth's surface *territory* it must have some kind of homogeneity now, earlier or in the future. The same administrative and territorial structure is the uniformity of administration or authority within certain spatial boundaries.

From all this it follows that, although there is no such administrative-territorial unit as village, town and city councils or UTC, the concept of territory as areas of the earth's surface with specific boundaries is inherent to.

Until 1996, there was such an administrative-territorial unit as the Council of People's Deputies. On August 22, 2018, the Verkhovna Rada of Ukraine received the Draft Law of Ukraine (hereinafter referred to as the Law) No. 8051 "On the Principles of the Administrative-Territorial System of Ukraine", in which the community is an administrative-territorial unit of the basic level, comprising one or more settlements. That is, again, among the lawmakers there is a tendency for the recognition of land outside settlements with territorial community land, which it will manage directly or through representative bodies, which are local self-government bodies (hereinafter referred to as municipality).

Article 4 of the Law "On voluntary association of territorial communities" defines: "The territory of the united territorial community must be indissoluble, the boundaries of the united territorial community shall be determined at the external borders of the jurisdiction of the united territorial communities councils".

Formation of united territorial communities and transfer of agricultural land from state-owned land to municipal property in the territory of Ukraine for 2018, is presented in table 1

Table 1

Formation of integrated territorial communities and transfer of agricultural land from state-owned land to municipal property for 2018

№	Oblast	UTC number in terms of schedule of land transfer	Number of UTCs received communally owned land plots of agricultural purpose	The area of land transferred to the farms, thousand hectares	% off UTCs that received land plots from planned ones
1	Vinnitsia Oblast	34	34	37, 6	100
2	Volyn Oblast	40	30	49, 4	75, 0
3	Dnepropetrovsk Oblast	56	55	185	98, 2
4	Donetsk Oblast	9	9	41, 8	100
5	Zhytomyr Oblast	45	44	95	97, 8
6	Zakarpattia Oblast	6	6	1, 7	100
7	Zaporozhye Oblast	36	36	105, 6	100
8	Ivano-Frankivsk Oblast	20	20	13, 4	100
9	Kiev Oblast	9	8	7, 4	88, 9
10	Kirovohrad Oblast	13	13	25, 8	100
11	Lugansk Oblast	8	8	13, 5	100
12	Lviv Oblast	35	35	41, 5	100
13	Nikolaev Oblast	28	28	81, 2	100
14	Odessa Oblast	25	25	97, 5	92, 0
15	Poltava Oblast	39	39	91, 1	100
16	Rivne Oblast	25	25	27, 8	100
17	Sumy Oblast	28	28	71, 8	100
18	Ternopil'ska Oblast	40	40	36, 4	100
19	Kharkiv Oblast	12	12	28, 1	100
20	Kherson Oblast	26	26	89, 2	96, 2
21	Khmelnitsky Oblast	39	39	100, 5	100
22	Cherkasy Oblast	26	26	40, 4	100
23	Chernivtsi Oblast	26	26	7,3	100
24	Chernihiv Oblast	37	37	161, 8	100
	Total in Ukraine	662	646	1450, 8	97, 6

Compiled according to the data obtained from authors¹

Thus, in the framework of the reform of decentralization of power in management 646 united territorial communities transferred 8 thousand hectares or 6 % of the planned agricultural land in 2018.

Найбільша кількість об'єднаних територіальних громад створено у Дніпропетровській області – 55, Житомирській – 44 та Тернопільських – 40. На противагу, укрупнення територіальних громад триває значно повільнішими темпами у Закарпатській області – 6, Луганській – 8, Донецькій – 9, Київській – 8 та Харківській – 12. У 2019 році процес передачі земель продовжується для новостворених об'єднаних територіальних громад.

Prospective plans envisage the creation of 1285 united territorial communities (however, 18.0% of the country territory is not covered by the prospective plans).

The absence of well-defined perspective plans entails the risks of not meeting the timeframes of forming united territorial communities and the possibility of forming potentially disadvantaged communities.

Yes, as of January 1 10 In 2019, 876 united territorial communities were created in Ukraine as a result of the unification of 4010 territorial communities (6% of all territorial communities), whose territory covers 37.6% of the country's area².

It should be noted that the continuity of the territory can only be achieved by uniting the boundaries of village councils (at that time Councils of People's Deputies), formed in the early 1990s.

До того, як прийняли ЗУ «Про місцеве самоврядування в Україні» від 21.05.1997 року питання регулювання діяльності законодавчих органів на місцях регулював інший Закон: від 07.12.1990 № 533–XII «Про місцеві Ради народних депутатів та місцеве і регіональне самоврядування», у статті 1 якого зазначено:

«...Територіальну основу місцевого самоврядування становлять сільська рада, селище, місто. Органами місцевого самоврядування є сільські, селищні, міські Ради народних депутатів. Базовим рівнем місцевого самоврядування є сільська рада, селища міського типу, міста...».

In other words, the law clearly stated that the powers of the Soviets of People's Deputies extend beyond the settlements.

¹ Storonianska I. Z. Detsentralizatsiia v Ukraini ta yii vplyv na sotsialno-ekonomichnyi rozvytok terytorii [Decentralization in Ukraine and its Impact on the Socio-Economic Development of Territories]: metodvchni pidkhody ta rezultaty otsiniuvannia. Lviv : IRD NANU, 2018. 144 s [in Ukrainian].

² Monitorynh protsesu detsentralizatsii vladly ta reformuvannia mistsevoho samovriaduvanniakh [Monitoring the decentralization process and reforming local self-government]. Ministerstvo rehionalnoho rozvytku, budivnytstva ta zhytlovo-komunalnoho hospodarstva Ukrainy. 2019. URL : <https://storage.decentralization.gov.ua/uploads/library/file/396/10.04.2019.pdf> (data zvernennia 20.06.2019) [in Ukrainian].

Almost all the time of the Law's implementation there was no other document that would regulate the issue of the administrative and territorial structure of Ukraine, since there was no separate law regulating this issue, and the Constitution of Ukraine was adopted only in 1996.

Among the powers of the Councils of People's Deputies were the powers delegated by the state in the field of land resources management, according to which the executive committee of the village, settlement, city Council of People's Deputies, in accordance with part three of Article 32 of this Law, exercises the powers delegated to it by the state:

- 1) exercise control over the use and protection of the land, its subsoil, reservoirs, forests, atmospheric air, flora and fauna, other natural resources in the respective territory within the limits and in the order established by the legislation of Ukraine;

- 2) registers land ownership and land use rights and land lease agreements;

- 3) organizes control over the compliance with the legislation of the land use and nature protection by agricultural enterprises, organizations and peasant (farmer) farms located in the territory of the Council”.

The territories of the council were determined on the basis of projects of their formation, developed in the early 90-s by regional branches of the Institute of Land Management.

The territories of the Soviets were formed mainly on the basis of the lands of collective and state agricultural enterprises, as well as forestry.

The cartographic basis taken from the materials of the internal economic structure of the same enterprises, which were created in the 70's of the last century.

The cartographic basis has occasionally been updated.

The territory subordinated to the Soviets of People's Deputies for these projects was not limited to the lands of settlements, but extended beyond their borders.

Territories of village, settlement, city councils of People's Deputies could also be formed on the basis of technical documentation on land inventory of the territory. They were also developed in the early 1990s by regional branches of the Institute of Land Management.

Regardless of the name of the documentation (which may differ depending on the region), it was developed for the implementation of the Decree of the Verkhovna Rada of the Ukrainian SSR of December 18, 1990 №563-12 “On Land Reform”. The boundaries of village / town / city councils were approved by the district councils of people's deputies, which contained annexes with explications reflecting the total area of village / town / city council, as well as the area within settlements. If you open a project of formation of the territory and compare the areas indicated in it with the data of the state statistical reporting on quantitative land registration, the so-called 6-land form, then most likely the figures will not be the same.

The reason for this is that during the privatization of agricultural

enterprises and the issuance of state acts for the collective ownership of land, the contours of the contours were adjusted, so their total area, equal to the area of the council's territory, also changed.

Preferably, the minor adjustments are less than 1% of the area. From this it follows that in determining the boundaries of the UGF as the district boundary of the united councils territory, the projects of divestment of agricultural enterprises and land accounting in the form of 6-land should be taken into account. The territories of the Soviets before the entry into force of the current Land Code of Ukraine — January 1, 2002 — were formal for the territorial organization of power.

After January 1, 2002, the habit of resolving issues, including in the field of land management, remained with the heads of these councils, while making decisions, they continued to be guided by the concept of the territory of the village council when identifying the location of land.

In addition, state statistical reporting on quantitative land registration continued to be maintained within these territories.

The boundary of an ATG is determined by the district boundary of the united village / town councils. For this purpose, projects for the formation of the territories of these councils, developed in the early 1990s, are analyzed.

Since the landforming projects have been developed using large-scale surveys, and the contours along which the boundaries of the councils have undergone changes, these boundaries need clarification. In practice, this is done by deciphering the boundaries of the territories of the councils on orthophotos and adjusting them to take into account the formed land plots adjacent to those boundaries.

Deciphering orthophoto plans means identifying and marking on them the same with the projects of contours and conditional lines formation: the edge of the highway, the boundaries of the array of agricultural land, etc. Additional materials to consider: projects for the divestiture of agricultural enterprises, decisions of district councils regarding the change of territories of the Soviets of People's Deputies, form 6 – ground.

According to Article 173 of the Land Code of Ukraine, the boundary of an area, village, settlement, city, district in a city is a conditional closed line on the surface of the earth separating the territory of a district, village, settlement, city, district in a city from other territories. Such boundaries shall be established and modified by the land management projects for the establishment (change) of the ATO boundaries and shall be established in accordance with the Land Code.

The main legislative act that defines the requirements for documentation on establishing the boundaries of the ATO is the Law of Ukraine “On Land Management”¹. Territories of ATO are objects of land

¹ Pro zemleustrii [About land management] : Zakon Ukrainy vid 22.05.2003 №858–IV. Vidomosti Verkhovnoi Rady Ukrainy. 2003. № 36. St. 282. URL :

management. According to Article 46 of the Law of Ukraine “On Land Management”, the project of land management for establishing (changing) boundaries of administrative-territorial units includes:

- a) explanatory note;
- b) the task of performing the works;
- c) the decision to develop a land management project to establish or change the boundaries of the AAs;
- d) copies of the master plan of the settlement, certified in accordance with the established procedure, and the decision on its approval (in case of changing the boundaries of the settlement);

r) e) copying from the scheme of land management and feasibility study of the use and protection of the lands of the ATO, and in the absence of such - copying from the project of formation of territories of village, settlement councils;

D. copying from cadastral maps (plans) with display of existing (if any) and project boundaries of AAs;

According to results of explication of land within the existing (if any) and project boundaries of the AAs;

description of the boundaries of the AAs;

d) project approval materials;
with materials of border removal of AA ion terrain with the catalog of coordinates of their turning points.

The Law of Ukraine “On Land Management” stipulates general requirements for the development, approval and approval of such land management projects.

The decision to establish (change) the boundaries of the ATO is at the same time the decision to approve land management projects for their installation (change).

The main question that can be put to the judgment of a court expert is to determine the conformity of the developed documentation with land management (land management project) and its approval to the requirements of land legislation and other normative documents on land management and land use.

At the same time, there may be other challenges to the forensic expert who do not currently have a clear legal basis and methodological solution.

Thus, in the legal acts that determine the order of land management, the boundaries of regions are not defined.

However, disputes over the boundaries of regions arise in practice (at the disposal of state authorities or local self-government land plots "on the border of regions"), which requires a forensic expert to carefully study archival, planning, mapping and other information, modeling the relevant boundary on a specific date, remote from current, etc.

It should be borne in mind that the boundaries of settlements could be certified in different ways, depending on the legislation in force at the time of setting the boundaries for this category of settlement (city, town, village).

For villages:

In 1970–1991, the boundaries of rural settlements, classified as promising for further development, were separated from other lands by setting the boundaries of settlements in accordance with the projects of their planning and construction, which were approved by the executive committees of the Regional Soviets of Workers' Deputies.

The lands of rural settlements not classified as promising were distinguished from other lands in the order of land management (Article 105 of the Land Code of the Ukrainian SSR in 1970).

1991 - January 1, 2002 (date of entry into force of the Law on Land Use) boundaries were established according to the project of formation (or inventory) of the territories of village and settlement councils, which could then be changed by the decision of the district council when allocating lands to local self-government bodies for expansion of settlements. These changes were mainly reflected in agricultural divestment projects.

From January 1, 2002 to June 26, 2015, inclusive, the boundaries of all administrative-territorial entities were certified by a state act of Ukraine, which was made on the basis of documentation on land management (Article 176 of the LCU).

from June 27, 2015, the boundaries of all administrative-territorial entities certify an extract from the State Land Cadastre (hereinafter — SCC), which is issued to the local self-government body after entering the information about the boundaries in the cadastre on the basis of the approved documentation on land management for the establishment (change) of boundaries of administrative-territorial boundaries formations

Therefore, there has always been a graphical representation of the boundaries of villages and settlements, and the decision of the district council to approve them, and in the period from 1970 to 1991, the regional council, and then only for the category of promising villages.

For cities and towns:

until 1970, the boundaries of cities were certified by a state act on the right of permanent use of land.

1970-1981 The boundaries of cities and villages were established on the basis of the master plan or the technical and economic foundations of city development.

The boundaries of cities whose master plans are subject to approval by the Council of Ministers of the Ukrainian SSR are established and modified by the Presidium of the Verkhovna Rada of the Ukrainian SSR.

The boundaries of other cities are established and modified by the executive committees of the Regional Soviets of Workers' Deputies (Article 85 of the Land Code of the Ukrainian SSR in 1970).

1981-1991 the boundaries of cities and towns were established on

the basis of the master plan or the technical and economic foundations of city development. The boundaries were set and changed by the Presidium of the Verkhovna Rada of the Ukrainian SSR upon the submission of the Executive Committee of the Regional, City (City of Republican Subordination) Council of People's Deputies. 1991 — January 1, 2002 the boundaries of cities and towns were established according to the city planning and construction project or the feasibility study of the city's development.

The boundary of the city was established and changed in the order determined by the Verkhovna Rada of Ukraine (Article 63 of the Land Code of Ukraine in 1990).

From January 1, 2002 to June 26, 2015, inclusive, the boundaries of all administrative-territorial entities were certified by a state act of Ukraine, which was made on the basis of documentation on land management (Article 176 of the LCU).

From June 27, 2015, the boundaries of all administrative-territorial entities certify an extract from the State Land Cadastre (hereinafter — SCC), which is issued to the local self-government body after entering the information about the boundaries in the cadastre on the basis of approved documentation from the land management on the establishment (change) of administrative-territorial boundaries.

Thus, the boundaries of cities and towns were established and changed on the basis of town planning documentation until 2002, and only after 2002 for this purpose began to produce documentation of land management.

When defining a city boundary, the most recent available documentation should be guided and Verkhovna Rada decision to establish or change the city boundaries adopted in accordance with it.

Conclusions.

projects of forming the territories of the Soviets of People's Deputies;

- projects of divestiture of agricultural enterprises;
- State acts for the right of permanent use of cities;
- topographic maps and plans;
- data of the State Land Cadastre;
- documents certifying the right to land plots, which are, according to preliminary estimation, located along the boundary of the TFG, as well as files of exchange of information on the results of works on land management (so-called exchange files) or directories of coordinates of land boundaries contained in the relevant documentation on land management;
- general plans of settlements;
- decisions of the authorities regarding the boundaries of the village councils or settlements;
- state / administrative reporting on quantitative land accounting.

These materials, when used, can and should be an integral part of land management projects for establishing the boundaries of ATO and, as a

consequence, are subject to investigation for compliance with applicable law in the performance of judicial expertise on land management.

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A. I. Pinenko, Yu. I. Yaremko, I. V. Piskov

ОСОБЛИВОСТІ СУДОВОЇ ЕКСПЕРТИЗИ ДОКУМЕНТАЦІЇ ІЗ ЗЕМЛЕУСТРОЮ ЩОДО ВСТАНОВЛЕННЯ МЕЖ АДМІНІСТРАТИВНО-ТЕРИТОРІАЛЬНИХ ОДИНИЦЬ

Розглянуто систему адміністративно-територіального устрою України. Проаналізовано процедуру визначення меж, зокрема розробку відповідного проекту землеустрою, порядок проведення державної землепорядної експертизи проекту, його затвердження та посвідчення меж.

Охарактеризовано проблемні аспекти виконання судової експертизи документації щодо встановлення меж адміністративно-територіальних одиниць. Акцентовано увагу на важливості дотримання порядку проведення аналізу нормативно-правових та нормативно-технічних документів, що діяли на час прийняття відповідних рішень та розробки відповідної документації.

Запропоновано шляхи вдосконалення науково-методичного забезпечення судово-експертної діяльності в Україні.

Ключові слова: адміністративно-територіальна одиниця; судова експертиза; межа населеного пункту; встановлення меж в натурі; судовий експерт; місцеве самоврядування.

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E. I. Urets,

Head of the sector of land-technical research of Dnipropetrovsk
Research Institute of Forensic Expertise
E-mail: panikaxi@ukr.net

V. I. Fenenko,

PhD in Technology, Associate Professor at the Department of
Automotive Roads of the Geodesy and Land Management of
Pridniprovskoya Academies of the Budva and Architects, Forensic
Expert of Dnipropetrovsk RIFE
e-mail: dniprondise@ukr.net

review article

**PECULIARITIES OF FORENSIC EXAMINATION OF LAND
PROJECTS FOR ALLOCATING LAND PLOTS WITH THE
CHANGE OF THEIR PURPOSE**

The issues of conducting forensic examinations on land management issues in the study of land management projects regarding the allocation of land plots with changes in their intended use are considered. The following regulatory acts regulating the issue of land plots with the change of their intended purpose and at present indicates the lack of the reference literature, methodology, methodological recommendations that would regulate the issues of conducting forensic expertise on land management projects regarding the allocation of land with a change in their purpose appointment.

It specifies the main tasks and necessary materials related to the possibility of conducting surveys of land management projects in relation to the allocation of land with a change in their intended use.

The list of issues and their sequence are indicated, which are necessary for carrying out the full study of the relevant documentation on land management. The questions concerning composition, content and rules of registration of the corresponding normative and technical documentation on questions of implementation in land management are set. The main issues concerning the assignment (transfer) of land to one or another category of land, as an example, are disclosed in the classification (transfer) of the category of land - agricultural land to the category land of industry. The procedure for granting land plots with change of their intended purpose, coordination of documentation with the land management by the relevant services, competent for the approval of the land management project and land plots provision. The attention is drawn to the presence of a conclusion of the state examination of land management documentation on the produced documentation of land management and its obligation in accordance with the norms of legislation.

This method and approach will enable full conduct of forensic examinations on land management issues in the study of land management projects for allotment of land plots with a change in their intended purpose, which is the basis for the formation of conclusions of judicial examinations.

Keywords: intended use of land plot, land management, relevant documentation on land management, land management projects regarding the allocation of land, land category.

Formulation of Research Problem.

Carrying out a survey of land management expertise in connection with the change of purpose of land plots and development of land management projects is connected, including with the rational use and protection of land.

In this regard, the study of this type of land management documentation depends on many factors, including changes to the legislation and unresolved issues, etc.

Disclosure of issues related to land survey expertise in connection with changing the purpose of land plots is the basis for improving the quality of judicial expertise and the validity of the research conducted.

Analysis of recent researches and publications.

Actual absence of any reference literature, methodologies, methodological recommendations, etc. that would regulate the issue of forensic examination on land management projects for land allotment with the change of their intended purpose.

Research Purpose.

Analysis of the submitted documentation on land management (text and graphic materials) for conducting forensic examination on land management, with further comparison of the results of the analysis with the requirements of regulations in the field of land management.

As the provision of land with a change of purpose and development of land management projects is associated with an increase in the number of violations of the requirements of land legislation and other normative documents on land management and land use, today there is an urgent need to determine the range of issues that are addressed in the examination of expertise on issues land management in connection with the change of purpose of land.

Main content presentation.

Chapter 7 of Section II of the Scientific and Methodological Recommendations on the Preparation and Assignment of Forensic Expertise and Expert Research, on the main tasks of land management expertise, is to determine the appropriateness of changing the purpose of land plots and approving it with the requirements of land legislation and other normative documents on land management and land use.

In order to solve the issues of expertise in land management, the expert must be provided with original or certified high-quality copies of the relevant legal documents and documentation of land management on land.

Land management is a set of socio-economic and environmental measures aimed at regulating land relations and rational organization of the territory of administrative-territorial units, economic entities, which are carried out under the influence of social and industrial relations and the development of productive forces. Land management is carried out on the basis of:

a) decisions of the executive authorities and local self-government bodies on the implementation of land management;

b) concluded agreements between legal or natural persons (landowners and land users) and developers of land management documentation;

c) court decisions.

Land management documentation - text and graphic materials regulating the use and protection of state, communal and private lands, as well as survey and exploration materials, project supervision, etc. approved in the established order. Land management documentation is developed in the form of a scheme, a project, working project or technical documentation.

The authorities of the government, the Council of Ministers of the Autonomous Republic of Crimea, local self-government bodies, landowners and land users can be the owners of land management documentation.

Developers of land management documentation are:

- legal entities possessing the necessary technical and technological support and comprising at least two certified land surveyors who are responsible for the quality of land management;

- natural persons - entrepreneurs who possess the necessary technical and technological support and are certified engineers-land managers, responsible for the quality of land management works.

Land management documentation includes textual and graphic materials and contains the mandatory provisions established by the task of developing the appropriate type of documentation.

Land management documentation is developed on the basis of the task of developing the appropriate type of documentation approved by the customer¹.

It is known that land in Ukraine is divided into categories by main purpose (Article 19 of the Land Code of Ukraine).

Land plots of each category of land not owned or leased use by citizens or legal entities may be in stock ².

Each category has a specific legal regime.

It should be noted that the same plot can belong to several categories of land at the same time. In this case, the legal regime of the land of several categories should be observed, and in case of collisions, the legal regime that most provides environmental security.

However, each conflict should be resolved individually, taking into account all the circumstances of the particular situation.

Each category of land distinguishes the types of purpose of land (types of land use).

¹ Pro zemleustrii [About land management] : Zakon Ukrainy vid 22.05.2003 №858–IV. Vidomosti Verkhovnoi Rady Ukrainy. 2003. №36. St. 282 (zi zminamy ta dopov.). URL:<https://zakon.rada.gov.ua/Laws/show/858–15> (data zvernennia 24.06.2019) [in Ukrainian].

² Zemelnyi kodeks Ukrainy [Land Code of Ukraine]: Zakon Ukrainy vid 25.10.2001 №2768–III. Vidomosti Verkhovnoi Rady Ukrainy. 2002. №3–4. St. 27 (zi zminamy ta dopov.). URL:<https://zakon.rada.gov.ua/Laws/show/2768–14> (data zvernennia 24.06.2019) [in Ukrainian].

Purpose of the land plot is the use of the land plot for the purpose determined on the basis of documentation on land management in accordance with the procedure established by law.

Main normative legal acts currently defining the procedure for changing the purpose of land use are the Land Code of Ukraine, the Law of Ukraine: *On Land Management* and the Law of Ukraine: *On the State Land Cadaster*.

It should be noted that at present, there is virtually no reference literature, methods, methodological recommendations, etc. that would regulate the issue of judicial expertise on land management projects for land allotment with the change of their intended purpose.

These issues are related to the rational use and protection of land, their intended purpose, restrictions on use and restrictions (burdens) on the rights of others (land easements), preservation and increase of soil fertility.

A change of destination can happen with a change of category and without a change of category.

If there is a change of purpose with a change in the category of land, such change should occur with the development of a project of land management regarding the allotment of land.

Land management project - a set of economic, project and technical documents on the justification of land use and protection measures to be implemented under such a project. According to Art. 50 of the Law of Ukraine: *On Land Management* the project of land management concerning the allotment of the land plot is made in case of change of the purpose of land plots or formation of new land plots¹.

Development of the Land Management Project, including the change of purpose, can be conditionally divided into five stages: obtaining permission for the development of the Project; development, approval and implementation of state land survey (if necessary) of the Project; state registration of the land plot; approval of the Project; registration of the right to the land plot. Land management projects for land allotment include:

- the task of developing a land management project;
- explanatory note;
- a copy of the application (application) for granting permission for the development of a land development project for the allotment of the land plot (in case of formation and / or change of purpose of the land plot at the expense of state or communal property lands);
- the decision of the Verkhovna Rada of the Autonomous Republic of Crimea, the Council of Ministers of the Autonomous Republic of Crimea, the relevant executive authority or local self-government body to

¹ Pro zemleustrii [About land management] : Zakon Ukrainy vid 22.05.2003 №858-IV. Vidomosti Verkhovnoi Rady Ukrainy. 2003. №36. St. 282 (zi zminamy ta dopov.). URL:<https://zakon.rada.gov.ua/Laws/show/858-15> (data zvernennia 24.06.2019) [in Ukrainian].

grant permission for the development of a land development project for land allotment (in cases provided for by law);

- written consent of the landowner (land user), notarized (in case of redemption (withdrawal) of the land plot in accordance with the procedure established by law), or court decision;

- a certificate from the state statistical report on the availability of land and their distribution by land owners, land users, lands;

- materials of geodetic surveys and land planning (in the case of land plot formation);

- information on the calculation of the area of land (in case of formation of land);

- copies of the title deeds for real estate objects for construction objects, which by the class of consequences (responsibility) belong to objects with medium and significant consequences, which are located on the land plot;

- calculation of losses of agricultural and forestry production (in cases provided by law);

- calculation of the amount of losses of land owners and land users (in cases provided by law);

- act of acceptance-transfer of boundary marks for storage (in case of formation of a land plot);

- the act of transferring to nature (on the terrain) the boundaries of the protection zones, zones of sanitary protection, sanitary protection zones and zones of special mode of land use in their presence (in case of formation of a land plot);

- a list of restrictions on land use;

- copying from the cadastral map (plan) or other graphic materials, which indicate the desired location of the land plot (in case of land plot formation);

- cadastral plan of the land plot;

- materials for transferring the boundaries of the land plot to nature (to the terrain) (in case of land plot formation);

- матеріали погодження проекту землеустрою¹.

These materials must be contained in the land development project for the allotment of the land plot with the change of its purpose except with the written consent of the landowner (land user), certified by a notary in case there is no purchase (withdrawal) of the land plot, and the land plot is provided at the expense of the land;

copies of the title deeds for real estate objects for construction objects that belong to medium and significant consequences located on the land plot (due to absence) by class of consequences (liability); the act of transferring to nature (to the terrain) the boundaries of protection zones,

¹ Pro zemleustrii [About land management]: Zakon Ukrainy vid 22.05.2003 №858–IV [in Ukrainian].

zones of sanitary protection, sanitary protection zones and zones of special mode of land use (in connection with absence).

The calculation of the amount of losses of agricultural and forestry production and the calculation of the amount of losses of land owners and land users should be included only in cases provided by law.

According to Art. 29 of the Law of Ukraine: *On Land Management* compliance of the documentation with the land management requirements of the legislation is its composition, content and rules of registration of regulatory and technical documentation on the implementation of land management.

At the same time, in accordance with Article 23 of the said Law, normative acts on the issues of land management establish the order of organization, compliance with state standards, norms and rules of performance of works on land management, their composition and content¹.

Thus, when conducting studies of compliance of documentation with land management requirements of land legislation and other normative documents on land management and land use, the range of issues to be resolved and their priority are determined, namely:

1) determining the validity of the legislation in time to be applied in the research;

2) grounds and purpose of development of documentation on land management;

3) analysis of the legal framework of Ukraine in the area of land allocation and drafting of land management;

4) analysis of the regulatory framework in the field of change of purpose and the procedure for its implementation;

5) establishing the powers of state and local self-government bodies to change the purpose of land plots;

6) study and analysis of the state of use of the allotted land;

7) research on documentation on land management regarding its composition, content and design rules with change of purpose and compliance of the content of documentation with the requirements of the task for its development and the requirements of the pre-project documentation;

8) consideration of the issue of calculating the amount of losses (in cases stipulated by law) and calculating the amount of losses of land owners and land users (in cases provided by law);

9) determination of compliance of the documentation with the land management and its approval (in cases provided by the legislation) to the requirements of the legislation in force at the date of approval of this documentation.

In this regard, land management expertise (including change of purpose) is carried out by the method of analysis of the submitted documentation on land management (text and graphic materials) with

¹ Pro zemleustrii [About land management]: Zakon Ukrainy vid 22.05.2003 №858–IV [in Ukrainian].

further comparison of the results of the analysis with the requirements of regulations in the field of land management, effective at the date of approval of this documentation.

For example, when using agricultural land (pastures - reserve lands located outside the settlement), for the location and operation of the main, ancillary and auxiliary buildings and structures associated with the use of subsoil KVPSP code -11.01, (placement and maintenance tailings of the mining and processing plant) formed specific features and complexities in the registration of land use rights. Such conditions are caused by the different legal status of the subjects of land relations and the absence of special legislative acts that would regulate the legal regime and mechanisms of use of certain categories of land, namely industrial lands.

Therefore, during the development of the project of change of purpose (change of lands from land category - agricultural land to land category - industrial land) it is necessary to additionally be guided by the Code of Ukraine on subsoil; Mining Law of Ukraine;

The Law of Ukraine “On State Registration of Real Property Rights and their Encumbrances”;

Instruction on the establishment (restoration) of land boundaries in kind (on the ground) and their fixing with boundary signs; DBN B.2.4-5: 2012 Tailings and sludges¹;

DBN 360-92 Planning and development of urban and rural settlements² etc.

That is, depending on the classification of land in one or another category, the relevant normative legal acts are applied, which relate to the legal status of each particular land plot.

State standards, rules and regulations in the field of land management establish a set of qualitative and quantitative indicators, parameters that regulate the development and implementation of documentation on land management, taking into account environmental, economic, social, natural and climatic and other conditions.

The decision of the Verkhovna Rada of the Autonomous Republic of Crimea, the Council of Ministers of the Autonomous Republic of Crimea, executive authorities or local self-government bodies to grant permission for the development of documentation on land management is made only within the time limits and only in cases provided for by land legislation.

In the case of research on documentation on land management, it is necessary to establish the powers of local self-government and executive

¹ DBN V.2.4-5:2012 Khvostoshkovyshcha i shlamonakopychuvachi. URL: <https://dbn.co.ua/load/normativy/abn/1-1-0-1022> (data zvernennia 25.06.2019) [in Ukrainian].

² Mistobuduvannia. Planuvannia i zabudova miskyykh i silskyykh poselen DBN 360-92**, nakaz Derzhavnoho komitetu Ukrainy u spravakh mistobuduvannia i arkhitektury, zatverdzhnyi nakazom Derzhkommistobuduvannia vid 17 kvitnia 1992 r. №44 URL: <https://zakon.rada.gov.ua/rada/Show/v0044481-92> (data zvernennia 25.06.2019) [in Ukrainian].

authorities to grant permission for the development of documentation on land management, granting (transfer) of land plots, including with a change of their intended purpose taking into account Art. 20, 122, 151 of the Land Code of Ukraine.

It should be noted that the relevant executive body reviews the application within one month and gives permission for the development of a land development project with the purpose of redeveloping the land plot or giving a reasoned refusal to grant it.

The grounds for refusal to grant such a permit can be only a mismatch of the location of the land plot to the requirements of laws adopted in accordance with them regulatory acts, as well as general plans of settlements, other town planning documents, land management schemes and technical and economic justifications for the use and protection of land administratively, territorial units, land management projects for the settlement of the territory of settlements approved in the manner prescribed by law.

It is forbidden to refuse permission for development of a project of land management for the allocation of land plots, the location of objects on which was agreed by the relevant executive authority or local self-government body in accordance with Art. 151 of the Land Code of Ukraine.

When examining a land management project for the allocation of a land plot with a change of its intended purpose (for the placement and operation of the main, ancillary and auxiliary buildings and structures related to the use of subsoil), which, as an example, the expert should be aware of the existence of a zoning plan or a detailed plan of the territory approved by the respective district state administration. Requirements for the mandatory availability of a zoning plan or a detailed site plan are laid down in Art. 24 of the Law of Ukraine "On Regulation of Urban Planning Activity"¹.

Land development projects regarding land allotment, including with the change of their purpose, are approved and approved in accordance with the procedure established by the Land Code of Ukraine².

n Art. 186-1 summarizes the powers of the executive authorities in terms of approval of land development projects for land allotment.

Thus, the project of land management for the removal of land plots of all categories and forms of ownership (except for the land plots of the exclusion zone and the zone of unconditional (obligatory) resettlement of the territory that has been contaminated as a result of the Chornobyl

¹ Pro rehuliuвання mistobudivnoi diialnosti [On regulation of town-planning activity]: Zakon Ukrainy vid 17.02.2011r. №3038–VI Vidomosti Verkhovnoi Rady Ukrainy, 2011 r. №34. St. 343. URL: <https://zakon.rada.gov.ua/Laws/show/3038-17> (data zvernennia 26.06.2019) [in Ukrainian].

² Pro zemleustrii [About land management] : Zakon Ukrainy vid 22.05.2003 №858–IV [in Ukrainian].

disaster) is subject to mandatory agreement with the territorial executive body that implements state policy in the field of land relations.

Land development project for allotment of land within the settlement or land outside the settlement where the construction object is located or the location of such object is planned (except for the land development project for the allocation of the land plot of the exclusion zone or the unconditional (mandatory) zone resettlement of the territory that has been the subject of radioactive contamination as a result of the Chornobyl disaster) is also submitted for approval to the structural units of the rayon, Kyiv and Sevastopol city states, urban and architectural administrations, and if the city is not within the territory of a particular district, the executive body of the city council in the field of urban planning and architecture, and if such body is not formed, the executive authority of the Autonomous Republic of Crimea on issues town planning and architecture or structural subdivision of regional state administration on urban planning and architecture¹.

In addition, the land management project for land allotment, including change of purpose depending on the category of land, is subject to agreement with the executive authorities in the field of the environment, if the land plot is located on the territory or within the object of nature reserve fund or within the coastal protection strip; with bodies of executive power in the field of cultural heritage protection if the land plot is located on the territory of cultural heritage monuments of national importance, their protected zones and protected archeological territories, on the territories of lands of historical and cultural purpose, monuments of cultural heritage of local importance, their protected zones, in the historical habitats of settlements and other lands of historical and cultural purpose; with the executive bodies of forestry if the land plot belongs to the forestry purpose; with the executive bodies on water management if the land belongs to the land of the water fund.

It should be noted that if the location of the object, the size and boundaries of the land being offered for foreclosure (redemption) and the conditions for foreclosure (redemption) of the land are agreed in accordance with the requirements of Art. 151 of the Land Code of Ukraine, which did not change during the development of the land development plan, is not subject to approval.

The approval of the materials of the location of the object to be placed on the land plot, especially of valuable state or communal property lands with the change of its purpose, is carried out in agreement with the Verkhovna Rada of Ukraine.

The change of purpose of land plots of nature conservation and other nature preservation, historical, cultural, forestry purpose, which are in state

¹ Zemelnyi kodeks Ukrainy [Land Code of Ukraine]: Zakon Ukrainy vid 25.10.2001 №2768–III [in Ukrainian].

or communal ownership, is carried out in agreement with the Cabinet of Ministers of Ukraine¹.

In addition, it should be borne in mind that when designing a land management project for the allocation of land with a change of their intended purpose, there may be a question about compensation for losses caused by seizure (redemption) and temporary occupation of land, establishing restrictions on their use, deterioration of soil quality and other beneficial properties of land or making them unusable and not generating income due to temporary non-use of land.

This issue is regulated by the Resolution of the Cabinet of Ministers of Ukraine *On the Procedure for Determining and Compensating Damages to Landowners and Land Users* dated on April 28, 1993 No. 284².

When allocating agricultural and forestry land, and in particular when changing the purpose of land, it is necessary to take into account the compensation of losses of agricultural and forestry production.

This issue is regulated by Art. 207–208 of the Land Code of Ukraine and Resolution of the Cabinet of Ministers of Ukraine “On Amounts and Procedure for Determining the Losses of Agricultural and Forestry Production to be Compensated” dated November 17, 1997. № 1279³.

A very important issue in the study of land management documentation is the availability of the opinion of the state examination of land management documentation, if this type of land management documentation was subject to mandatory state expertise in accordance with Article 9 of the Law of Ukraine "On State Expertise of land management documentation" and 4.2.1 of points 4.1 and 4.2 of Chapter 4 of the Methodology of conducting state examination of land management documentation, approved by the Order of the State Land Committee № 391 of 03.12.2004, registered with the Ministry of Justice of Ukraine 21 December 2004 under No. 1618/10217 (as amended)⁴.

¹ Zemelnyi kodeks Ukrainy [Land Code of Ukraine]: Zakon Ukrainy vid 25.10.2001 №2768–III [in Ukrainian].

² Pro Poriadok vyznachennia ta vidshkoduvannia zbytkiv vlasnykam zemli ta zemlekorystuvacham [About the Order of determination and compensation of damages to land owners and land users]: postanova Kabinetu Ministriv Ukrainy vid 19 kvitnia 1993 r. №284. URL: https://zakon.rada.gov.ua/Laws/show_284-93-p. (data zvernennia 26.06.2019) [in Ukrainian].

³ Pro rozmyry ta poriadok vyznachennia vtrat silskohospodarskoho i lisohospodarskoho vyrobnytstva, yaki pidliahaiut vidshkoduvanniu [On the Amounts and Procedure of Determining Agricultural and Forest Production Losses that Are Subject to Compensation]: postanova Kabinetu Ministriv Ukrainy vid 17 lystopada 1997 r. №1279. Ofitsiinyi visnyk Ukrainy, 1997. №47. St. 40. URL: <https://zakon.rada.gov.ua/Laws/show/1279-97-p>. (data zvernennia 26.06.2019) [in Ukrainian].

⁴ Pro zatverdzhennia Metodyky provedennia derzhavnoi ekspertyzy zemlevporiadnoi dokumentatsii [On approval of the Methodology for conducting state examination of land management documentation]: nakaz Derzhkomzemu Ukrainy vid 03.12.2004 №391, zareiestrovanyi v Ministerstvi yustytzii Ukrainy

The necessity of conclusion of state examination of land management documentation is required if the documentation of land management is not subject to the obligatory state expertise of land management documentation, but this is set by the task of developing the appropriate type of documentation.

It should be noted that the project of land management for the allocation of land with a change of its intended purpose (for the placement and operation of the main, ancillary and auxiliary buildings and structures related to the use of subsoil) when transferring land from the category of land - agricultural land (pastures) into the category of land - land of industry) is not subject to the obligatory state examination of land management documentation in accordance with the current norms of the legislation. In accordance with part 4 of Article 122 of the Land Code of Ukraine, the central executive body for land resources in the field of land relations and its territorial bodies shall transfer land for agricultural purposes of state ownership, except in cases specified by the legislation.

Part 10 of Article 123 of the Land Code of Ukraine provides that the decision to grant a land plot for use under the land management project for its allotment shall be made by:

- approval of the project of land management regarding the allotment of the land plot;
- withdrawal of land plots from land users with approval of conditions for land withdrawal (if necessary);
- granting the land to the person for use with the definition of the conditions of its use and approval of the conditions of granting, including (if necessary) requirements for compensation of losses of agricultural and forestry production¹.

In this regard, when designing a land management project with a change of purpose of agricultural lands (pastures), which are assigned to the reserve lands for the intended purpose for the placement and operation of the main, auxiliary and auxiliary buildings (industrial lands), the competence to approve the land management project on the allotment of land with a change of purpose and provision of land belongs to the central body of executive power on land resources in the field of land their relations and its territorial bodies.

The united territorial community may dispose of these lands in case of transfer of land from state ownership to communal property by the act of acceptance-transfer of such land plot and state registration of ownership of territorial community in accordance with the decree of the Cabinet of Ministers of Ukraine of January 31, 2018. №60 – p “Issue of Transfer of

21.12.2004 r. za №1618/10217. Ofitsiyniy visnyk Ukrainy, 2004, № 51. St. 3406. URL: <https://zakon.rada.gov.ua/Laws/show/z1618-04> (data zvernennia 26.06.2019) [in Ukrainian].

¹ Zemelnyi kodeks Ukrainy [Land Code of Ukraine]: Zakon Ukrainy vid 25.10.2001 №2768–III [in Ukrainian].

Land Plots of Agricultural Purpose of State Property into Communal Property of United Territorial Communities” and Law of Ukraine of September 6, 2012 No. 5245 – VI “On Amendments to Some Legislative Acts of Ukraine on Delimitation of State and Communal Property Lands”¹.

Conclusions.

This article raises the main issues related to the study of land management expertise in connection with the change of purpose of land plots and development of land management projects.

Summarizing the above, when conducting the study, the specified type of documentation on land management, the expert must take into account all the rules of law related to determining the compliance of the developed documentation with land management with a change of purpose of land plots, since the ownership of the land plot, land category, type of land, values Soil competence depends on the approval, approval of documentation of land management and the provision (transfer) of land.

At the same time, generalization and evaluation of the research results, which are the basis for drawing conclusions of land management projects for the allocation of land plots with a change of their purpose, depend on all circumstances, violations, shortcomings, etc., which are established during the study and which affect the results of the measures provided by this land management documentation on land use and protection and the like.

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¹ Pro vnesennia zmin do deiakykh Zakonodavchykh aktiv Ukrainy shchodo rozmezhuvannia zemel derzhavnoi ta komunalnoi vlasnosti [On Amendments to Some Legislative Acts of Ukraine Concerning the Separation of State and Communal Property Lands] : Zakon Ukrainy vid 06.09.2012 r. №5245–VI. Vidomosti Verkhovnoi Rady Ukrainy, 2013r., №36, stor. 1958. St. 472. URL : <https://zakon.rada.gov.ua/Laws/show/5245-17> [in Ukrainian].

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О. І. Юрець, В. І. Фененко
Оглядова стаття

ОСОБЛИВОСТІ ПРОВЕДЕННЯ СУДОВИХ ЕКСПЕРТИЗ ПРОЕКТІВ ЗЕМЛЕУСТРОЮ ЩОДО ВІДВЕДЕННЯ ЗЕМЕЛЬНИХ ДІЛЯНОК ЗІ ЗМІНОЮ ЇХ ЦІЛЬОВОГО ПРИЗНАЧЕННЯ

Розглянуто питання проведення судових експертиз з питань землеустрою при дослідженні проектів землеустрою щодо відведення земельних ділянок зі зміною їх цільового призначення.

Визначено коло питань, які пов'язані з аналізом наданої на дослідження документації із землеустрою та зіставленням її вимогам земельного законодавства та іншим нормативним документам з питань землеустрою та землекористування.

Наведено нормативно-правові акти, які регулюють питання надання земельних ділянок зі зміною їх цільового призначення. Викладено порядок складу, змісту і правил оформлення відповідної нормативно-технічної документації з питань здійснення землеустрою.

Проведено узагальнення та оцінку результатів досліджень, які є підставою для формування висновків судових експертиз з питань землеустрою.

Ключові слова: цільове призначення земельної ділянки; землеустрій; документація із землеустрою; проект землеустрою щодо відведення земельної ділянки; категорія земель.

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A. A Krupka,

PhD in Technology, Leading Forensic Expert of Odessa Scientific
Research Institute of Judicial Expertise of the Ministry of Justice of
Ukraine

ORCID:<https://orcid.org/0000-0002-1897-065X>,
e-mail: krupka666@gmail.com

M. O. Kraliuk,

Department Head of Odessa Scientific Research Institute of Judicial
Expertise of the Ministry of Justice of Ukraine

ORCID:<https://orcid.org/0000-0002-0693-9508>,
e-mail: m-kraluk@ukr.net

V. K. Kostenko,

Doctor of Technology, Professor, Head of Department of
Environmental Protection at the Donetsk National Technical
University (Pokrovsk);

ORCID:<https://orcid.org/0000-0001-8439-6564>,
e-mail: vk.kostenko@gmail.com

RISK OF LOSS OF PEOPLE OR ANY OTHER SERIOUS CONSEQUENCES OF PRODUCTION: PRE-CASE INVESTIGATION, FORENSIC SCIENCE

The article is devoted to the development of forensic engineering in the field of labor protection while investigation of crimes against the industrial safety. Based on the analysis of specific forensic examinations and ordering of scientific literature proposes the creation of a unified methodological approach to problem solving forensic expertise with a real threat of death or the occurrence of other severe consequences in production to establish the causes and consequences of emergencies, cause-effect relationships in the system of “action / in action of a person – emergency”.

Under the “real threat of death or the occurrence of other severe consequences,” it is necessary to understand such changes in the state of production objects as a result of which there is a real danger to the life or health of people or hurting a variety of benefits.

Creation of the threat of death or other severe consequences must be real, indicative of the occurrence of a particular production process or as a result of such a dangerous state (threats), may occur when the consequences prescribed by law. Not occurrence of the consequences can be associated either with the timely suppression of the violation, or with a “stroke of luck”.

Other serious consequences are grievous bodily harm to one or more persons, moderately bodily harms two or more persons, significant material damage to citizens and companies.

While resolving examination issues, the following should be indicated: what is the real threat of death or the occurrence of other severe consequences; who and what deflections from the regulatory and legal acts on labor protection allowed in this production situation; who of the persons involved in the event had the technical ability to

prevent the creation of a real threat of death or other severe consequences, what actions to do so they had to carry out and what their actions (inaction) from a technical point of view is in direct causation connection with the emergence of these hazardous working conditions.

Keywords: production, threat of death, other severe consequences, emergency, forensic science.

Formulation of Research Problem.

Violations of the requirements of regulations on labor protection often lead to injuries and deaths.

In accordance with the requirements of Article 43 of the Constitution of Ukraine, every citizen has the right to adequate, safe and healthy working conditions. The Law of Ukraine "On Occupational Safety" specifies that the priority of the life and health of employees, the full responsibility of the employer for the creation of proper, safe and healthy working conditions is one of the basic principles of state policy in the field of occupational safety¹.

But at the same time, the state of occupational safety at Ukrainian enterprises is unsatisfactory, the level of occupational injuries is high and due to a complex of objective and subjective reasons.

In recent years, though, there has been a tendency in our country to reduce the level of technogenic accidents, accidents, occupational diseases (hereinafter referred to as NA), but most likely due to a decrease in labor intensity and output. In 2018, the Social Insurance Fund of Ukraine registered 4805 (350 of them fatally) victims of industrial accidents.

As we can see, there is no dramatic improvement in the situation in the field of occupational safety.

This necessitates further search for effective solutions to these problems. One of the most important areas in this regard is to improve the quality of investigations into crimes against production safety.

This article identifies one of the main problems of litigation in the investigation of crimes against industrial safety (Part 1 of Article 272... 275 of the Criminal Code of Ukraine (hereinafter - CCU) - creation of a unified methodological approach to solving problems of forensic engineering and technical expertise in the field of labor protection and safety of life with a real threat of death or other serious consequences on the production. From 1997 to the present time, the authors of the article have conducted more than 300 forensic engineering and technical on the safety and life of forensics to address the real threat of death or other serious consequences on the production.

Unfortunately, some forensic experts have recently shown a tendency to point out in their findings that a real threat of death or other grave consequences may not occur and is a likely category.

¹ Pro okhoronu pratsi [On Labor Protection]: Zakon Ukrainy vid 14.10.1992 № 2694-KhII. Vidomosti Verkhovnoi Rady Ukrainy. 1992. № 49. St. 668. URL : <https://zakon.rada.gov.ua/laws/show/2694-12> [in Ukrainian].

For this reason, the actions of those involved in the event are technically likely to be causally linked to the occurrence of hazardous working conditions. But this statement contradicts the instructions of the Plenum of the Supreme Court of Ukraine 12.06.09 № 7¹.

Analysis of recent research and publications.

The research of the existing shortcomings of the methods of judicial examination on the issues of regulatory regulation, organization of conducting and scientific and methodological provision of expert studies in the field of occupational safety and health is constantly given the attention of scientists and practitioners.

Research in the field of occupational safety and health since the 90's of the twentieth century were conducted by such judicial scientists as L. V. Afanasiev, A. T. Asherov, A. S. Belikov, Ye. Yu. Bielohurova, V. D. Bezvesilnyi, V. A. Gorbenko, O. F. Dyachenko, L. E. Duz, Yu. A. Kiryanov, V. V. Sabadash, E. B. Simakova-Yefremian, N. A. Reshetnikova, O. V. Taran and others.

However, further research needs to address the problem of creating a methodology for establishing cause and effect relationships in the system of "action / inactivity of a person - an event of emergency" in the face of death or other serious consequences in the production.

Article purpose.

The purpose of the study is to develop a unified methodological approach for solving court expert tasks for establishing the causes and consequences of emergencies, cause and effect relationships in the system "action / inactivity of the individual - event of emergencies" in the appointment and conduct of judicial expertise in the field of occupational safety in the real threat of death people or other serious effects on the production.

Main content presentation.

In case of violation of the requirements of the normative legal acts on labor protection, the offenders are criminally responsible for parts 1 of articles 272 – 275 of the Criminal Code.

They state that in case of violations of the requirements of normative legal acts on labor protection during: performance of works of high risk (Part 1 of Article 272 of the Criminal Code); at the enterprise (workshop) classified as explosive (Part 1 of Article 273 of the Criminal Code); work with radioactive materials (access to them, their storage, use, disposal, etc.) (Part 1 of Article 274 of the Criminal Code); the design, construction, manufacture or storage of industrial products, as well as during the design, construction, operation of buildings and structures (Part 1 of Article 275 of

¹ Pro praktyku zastosuvannya sudamy Ukrainy zakonodavstva u spravakh pro zlochyny proty bezpeky vyrobnnytstva [On the Practice of the Application by the Courts of Ukraine of Legislation on Crimes Against Production Security: Resolution of the Supreme Court of Ukraine] : postanova Verkhovnoho Sudu Ukrainy vid 12.06.09 № 7. URL : <https://zakon.rada.gov.ua/laws/show/va007700-09> [in Ukrainian].

the Criminal Code), shall be punishable by criminal prosecution if such violation creates a real risk of death or other grave consequences, or caused harm to the health of the victim.

The "real threat of death or other grave consequences" must be understood to mean changes in the condition of production facilities that cause a real threat to the life or health of people or to the detriment of various goods.

The severity of the probable consequences is determined by the value of the jeopardized goods, the number of persons likely to be harmed, the magnitude of the material damage and the like.

Creating a threat of death or other grave consequences must be real, testify to the occurrence of a particular production process or the result of such a dangerous state (threat), when the consequences of the law may occur.

Non-occurrence of consequences may be due either to the timely termination of the violation by the offender as well as by others, or by "accident."

Other grave consequences are the infliction of grievous bodily harm to one or more persons, the moderate severity of bodily harm to two or more persons, considerable material damage to a state, public organization or citizens, as well as prolonged downtime of enterprises, workshops or their manufacturing sites.

Merely establishing significant material and other such damage is not sufficient to recognize it as a consequence of the crime being analyzed.

It must be the result of a breach of the requirements of the occupational safety and health regulations and be accompanied by a threat to the life or health of the person, or to the injury of varying severity.

The negative impact of violations of occupational safety requirements on the production process is characterized by inertia and chance due to the objectively correlating dependence between the admitted workers of the industrial enterprise deviations from the requirements of normative legal acts on occupational safety (rules, norms, instructions, regulations, permits, technical approvals). and technological documentation and the consequences that followed¹.

¹ Krupka A. A. Inercionnost' i sluchajnost' negativnyh vozdeystvij na proizvodstvennyj process otstuplenij ot trebovanij normativno-pravovyh aktov ob ohrane truda [Inertia and randomness of negative impacts on the production process of deviations from the requirements of regulatory legal acts on labor protection]. Teorija ta praktika sudovoï ekspertizy i kriminalistiki. Vip. 8. H. : Pravo / HNDI sudovih ekspertiz im. M. S. Bokariusa, Nacional'na juridichna akademija Ukraïni im. Ja. Mudrogo, 2008. S. 404-407 [in Russian]; Krupka A. A. Sudova hirnyhotekhnichna ekspertyza [Sudova expert examination: tired form of appointment and performance]: ustaleni formy pryznachennia ta provedennia : monohrafiia. Donetsk, 2010. 80 s.; Krupka A. A., Kryvchenko Yu. O., Marchenko I. M. Ekspertna otsinka stvorennia zahrozy zahybeli liudei abo nastannia inshykh tiazhykhyh naslidkiv na vyrobnytstvi [Ekspertna otsinka osnorenny threaten the

In other words, due to non-compliance with the requirements of technical norms and rules of conduct, emergencies do not always immediately arise, negative impacts can accumulate indefinitely for a long time and only, in the end, cause an event with consequences, the severity of which is not foreseen, and in a more favorable case, many circumstances. in many respects depend on stochastic production and natural conditions which have developed during the period of conducting works, and they do not lead at all to emergencies.

Therefore, if the emergencies are conditioned by human factors, then the presence of a person who has allowed deviation from the requirements of the normative legal acts on labor protection at the place of occurrence of the event is optional.

In the period of inertial delay almost always creates a real threat of death or other grave consequences, if the result of tolerances from the requirements of regulatory legal acts on labor protection will be even without the event for enterprises and its employees.

In case of violation of the requirements of safety rules during the execution of works with high risk (Part 1 of Art. 272 of the Criminal Code), it is necessary to follow the "Procedure for granting permits for performing works of high risk and for the operation (use) of machines, mechanisms, equipment of high risk", which defines the list high-risk works, as well as the Law of Ukraine: *On Labor Protection*, other legislative or regulatory acts (sectoral or inter-sectoral), which set safety rules during the relevant works.

Affiliation of an enterprise (workshop) to explosive (Part 1 of Article 273 of the Criminal Code) is determined not by the nature of the consequences that followed, but by the category and class of production according to the explosion hazard set by the technological regulations,.

These categories, classes and similar characteristics are established by design organizations, ministries, industrial associations, state labor bodies and some other organizations, both for the enterprise as a whole, and for its individual part or start-up complex, as well as for various basic (workshop, plot), offices) and auxiliary (warehouse, laboratory) production units, external equipment, coal seams and other production facilities.

As the legislatively established special rules of nuclear and radiation safety in production actually reduce to the rules of work with radioactive materials, access to them, their storage, use, disposal, there is reason to believe that the subject of this crime are radioactive materials.

Rules relating to the safe use of industrial products and the safe operation of buildings and structures include standards (state, sectoral, enterprise standards), state building codes; separate decisions of the competent authorities to ban the use of certain materials, raw materials,

deaths of people, but rather the imposition of the most serious heavy violations of the law]. Visti Donetskoho hirnychoho instytutu. Vseukrainskyi naukovo-tekhnichnyi zhurnal hirnychoho profilu. 2011. № 1. S. 159–166 [in Ukrainian].

semi-finished products; acts which set maximum permissible concentrations of harmful substances in finished products; regulations of state inspectors, etc.

In investigating crimes against production safety, the objective side is characterized by: a) acting in the form of a violation of the requirements of the relevant normative legal acts on labor protection; b) the consequences in the form of a threat of death or other grave consequences, causing harm to the health of the victim (Part 1 of Article 274 of the Criminal Code), or in the form of death of a person or other grave consequences (Part 2 of Article 274 of the Criminal Code); c) the direct causal link between the act and the consequences, d) the place and the time of the crime. The control over compliance with the legislation on labor protection at production sites is carried out by the state labor bodies, departmental supervision and the labor protection service of the enterprise.

At the same time the compliance with the requirements of technical norms, rules, instructions, provisions governing safety at work at the production, technology of works, mode parameters, the technical condition of buildings, structures, machines, mechanisms, means of protection and control, etc. are checked.

As a result of these inspections, certificates, acts and orders are issued, orders for elimination of violations are made, the persons who have admitted them and are responsible for the elimination of the identified defects are indicated.

Among these violations, some, seemingly insignificant, may be those which result in a real risk of emergencies at the site and / or a threat to human life and health and other serious consequences and which are subject to Part 1. Art. 272 – 275 of the Criminal Code.

In this case, the person responsible for eliminating these violations, at the time of the emergence of the emergency may not be at all not only in the workplace or place of the accident, but also at the enterprise, including for good reasons (day off, business trip, illness, vacation, etc.).

However, the inertia of the negative impacts on the production process by these officials is in direct (direct) cause and effect with the possible consequences.

Pre-trial investigation, as a rule, is conducted on the submission of State Labor bodies to the prosecutor's office, the national police.

The criminal proceedings must contain the following documents:

- information set out in the cover letter or separate document regarding the violations identified, indicating: the value of the goods at risk; the number of persons who may be harmed by dangerous acts; the amount of possible material damage; what are the requirements of labor safety regulations? the names, surnames, patronymic of the offender; other circumstances (location, time of detection, duration of violation); the measures taken earlier by the body of the territorial body of the State Labor Office to prevent violations of the requirements of normative legal acts on labor protection;

- an explanatory note from a public servant (state inspector) of the State Labor Inspectorate who found a violation during the inspection, referring to the provisions of the regulations on labor protection, whose requirements were violated, and other documents regarding this violation, signs indicating the presence of a threat of death people or other serious consequences;

- copies of written explanations of violators or persons responsible for compliance with the requirements of normative legal acts on labor protection and employees involved in the event (if any);

- conclusions of the experts involved in the inspection of labor protection (as a rule, these specialists are the chief state inspectors of the State Labor).

In the course of the pre-trial investigation, the following are duly approved at the enterprise:

Charter of the enterprise;

permits of the State Labor body to carry out high-risk works and to operate machines, mechanisms, high-risk equipment; regulations of officials of the State Labor bodies and departmental supervision, the enterprise labor protection service;

Regulations on the Occupational Safety and Health Management System at the Enterprise; technological passport (project) of production works; orders concerning safety issues issued by the enterprise administration; job descriptions of engineering and technical workers: chief engineer of the enterprise, deputy director of production and labor protection, chief of shift, dispatcher, chief (deputy, assistant chief) of the site, mechanic, master, etc. ;

instructions for labor protection of workers; instructions for the safe conduct of certain types of work, operation of equipment, machines, mechanisms, devices, environmental protection and their technical characteristics; technical passports, conditions and list of equipment directly involved in the production process;

materials that contain data on the technical condition of the equipment, machines, mechanisms and are directly related to the process of carrying out production work (acts of tests, technical inspections, etc.); documents containing the qualifications of persons performing high-risk work or operating high-risk machinery involved in the production process; books of outfits, outfits, outfits, outfits of craftsmen, which would confirm the fact that there are workers in the place where there is a risk of death or other grave consequences and the adequacy of their work performed by the assigned variable task; logs of training and instruction on safety of workers, inspection of equipment, measurements of various parameters, inspection; outputs of employees to work.

Depending on the type of production, technological operations and the place where the risk of death or other grave consequences was created, this list can certainly be supplemented.

As a rule, for the purpose of a comprehensive, complete and impartial investigation of the circumstances of criminal proceedings, it is designated and conducted in accordance with the requirements of Articles 69, 242, 243 of the Criminal Procedure Code of Ukraine (hereinafter - CCP) and Article 7 of the Law of Ukraine "On Forensic Examination", judicial engineering and technical expertise on occupational safety. The logical and epistemological structure of forensic research on the real threat to human life and health and the occurrence of other grave consequences can be reduced to the following universal questions:

- requirements of which regulations on labor protection in this production situation regulate the actions of persons involved in creating a real threat of death or other grave consequences?

- whether work is performed in this production situation with high-risk work (or at an enterprise (workshop), classified as explosive or with radioactive materials, or in the design, construction, manufacture or storage of industrial products, as well as during the design, construction, operation buildings and structures)?

- what specifically, in this production situation, was there a real threat of death or other grave consequences?

- who and what deviations from the normative-legal acts on labor protection have allowed in this production situation?

- who of the persons involved in the event had the technical ability to prevent the real threat of death or other grave consequences, what actions they had to take and what their actions (inaction) are in direct causal connection with the emergence of these dangerous working conditions? Here are examples of the appointment and conduct of forensics on criminal proceedings with the emergence of a real threat of death or other serious consequences when performing high-risk work at work.

Example.

In January 2018, the Department of Industrial Safety of PJSC XXX XXX carried out a labor safety inspection and the head of the workshop # 2 K ordered to ban the operation of the crane # 8 in connection with the failure of his expert examination and extraordinary full technical inspection after the end of the border service life. However, on November 14, 2018, during the inspection of the State Labor Office in the XXX region, it was established that the crane No. 8 from February 20 to November 14, 2018, being in a faulty technical condition, was operated.

As a result, the forensic examination raised the following questions: was the operation of the bridge crane No. 8, when performing works of high risk at the production, the risk of death of people or the occurrence of other grave consequences? is there a direct cause and effect relationship between the actions (inactivity) of the officials of workshop # 2 of PJSC XXX XXX and the event of a probable accident?

The forensic expert made the following conclusions: in this production situation, the operation of the bridge crane No. 8, which did not pass expert examination and extraordinary full technical inspection after the

end of the service life, and was also in a fault condition (wear of the rolling surface (reduction of diameter more than 2%) two wheels of the auxiliary trolley; there is no one clamping strap for securing the main lift rope to the drive drum; not all clamping rails for securing the auxiliary rope to the drive drum are installed;

the glazing elements of the cabin do not provide the necessary visibility, partly made of non-shattered glass; loosening of the crane suspension bracket attachment; there is no fence of the main lift mechanism coupling; malfunctioning brake of the left-hand drive of the crane movement mechanism;

a faulty brake of the left drive of the mechanism of movement of the main trolley;

malfunctioning brake of the auxiliary trolley; there is no possibility to check the door locks on the crane bridge gallery (doors welded);

faulty maximum current protection), could have caused injury to workers in the event of a rope breakage, a crane hit, rotating mechanisms, glass, electric shock, and thus created a real risk of death or other serious consequences. In the considered production situation, the head of the workshop No. 2 of PJSC XXX XX "XXX" K. had the technical ability to prevent the possible occurrence of a real emergency, but for reasons that should be established by an investigative way, he did not use it, so his actions did not meet the requirements of regulations from the point of view of safety and, from a technical point of view, were in direct causal connection with the real threat of death or other grave consequences.

Conclusions.

In conducting pre-trial investigation of violations of the requirements of regulatory acts on occupational safety, the appointment and conduct of forensic engineering and technical expertise on occupational safety and health is mandatory.

In their conclusions, forensic experts should indicate: in what particular circumstances, in this production situation, was the real threat of death or other grave consequences; who and what deviations from the requirements of normative-legal acts on labor protection have allowed in this production situation; who of the persons involved in the event had the technical ability to prevent the real threat of death or other grave consequences, what actions they had to take and what their actions (inactivity) are technically causally related to the occurrence of these dangerous working conditions.

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**А. А. Крупка, М. О. Кралюк, В. К. Костенко,
ЗАГРОЗА ЗАГИБЕЛІ ЛЮДЕЙ ЧИ НАСТАННЯ ІНШИХ ТЯЖКИХ
НАСЛІДКІВ НА ВИРОБНИЦТВІ: ДОСУДОВЕ РОЗСЛІДУВАННЯ,
СУДОВА ЕКСПЕРТИЗА**

Статтю присвячено розвитку судової інженерно-технічної експертизи в галузі охорони праці та безпеки життєдіяльності при розслідуванні злочинів проти безпеки виробництва. На основі аналізу конкретних судових експертиз та систематизації наукових джерел звернуто увагу на важливість та необхідність розробки єдиного методологічного

підходу до вирішення проблем судової інженерно-технічної експертизи в галузі охорони праці та безпеки життєдіяльності при реальній загрозі загибелі людей чи настання інших тяжких наслідків на виробництві.

Ключові слова: виробництво; загроза загибелі людей; інші тяжкі наслідки; надзвичайна ситуація; охорона праці; судова експертиза.

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O. O Mieshkov,
Researcher of KhRIFE
ORCID:<https://orcid.org/0000-0002-3046-6018>
e-mail: meshkov@hniise.gov.ua

THE OBJECT, SUBJECT AND TASK OF LEGAL ENGINEERING EXAMINATION OF ACCIDENTS IN CASE

Ensuring the high quality, completeness and correctness of the expert's conclusions based on the results of the investigation of accidents involving electrical intrusion, in the diversity of the actual circumstances of the occurrence of the event, in the huge range of electrical appliances and a large number of technical regulations in their application is impossible without a clear definition and understanding by the expert of the fundamental Fundamentals of expert science, which primarily concern the object, subject and task of examination.

The need for their detailed consideration is conditioned by the complex nature of the knowledge used in this area: in the field of electrical engineering and in the field of labor protection and safety of life.

The analysis of the scientific literature and the developments of scientists in this field is associated with insufficient development of issues of a clear and comprehensive definition of the terms “subject” and “object” of judicial complex expert examinations, in particular, examination of cases of electrical injuries. The author summarizes the various results of theoretical research and, taking into account expert practice, conducting an examination, offers to determine the subject and object of forensic engineering examination related to electrical injury.

Considering the typical tasks of a forensic examination, attention is drawn to the growing tendency of setting a specific task regarding the prediction of the occurrence of a certain negative event to resolve. The necessity is grounded and it is proposed to supplement the classification of expert tasks in the engineering and technical investigations of cases of electrical intrusion with a new kind - prognostic problems.

Keywords: forensic engineering and technical examination, electrical examination, examination in the field of labor protection and safety of life, accidents involving electrical intrusion, subject, tasks, object of expertise.

Formulation of Research Problem.

Defining the relevance of the topic of the study is based on the fact that forensic engineering expertise of accidents related to electro-trauma in its essence is the use of the achievements of various branches of specialized knowledge (in the field of occupational safety and health, electrical engineering, forensic medicine) in the pre-trial investigation such cases and in judicial proceedings, which are integrally applied to resolve the issues raised before the examination.

Aforementioned knowledge is integrally applied to solve the questions posed to experts.

The purpose of any expert investigation of an accident involving electrocution, including a comprehensive one, is to conduct a complete,

objective and comprehensive study to provide a reasoned and correct conclusion.

To date, domestic and foreign scientists and researchers have scientifically substantiated and identified the object, subject and tasks of forensic examination in a general sense, based on epistemological analysis of knowledge nature.

However, specific issues and definitions of the subject, object and task of complex examination of accidents related to electro-traumatism, taking into account their specificity and multiplicity, practical application, have not been practically developed and investigated.

In order to ensure the high efficiency of the study, the preparation and the conclusion of the proper quality, completeness and correctness of the establishment of the real circumstances of the event related to electrocution, the person conducting such research (expert) should fully possess, understand and practically use the whole conceptual toolkit basic definitions and terms. In particular, the forensic expert should clearly operate and highlight the concepts in each case. Therefore, we will consider the object, subject and tasks of a comprehensive engineering and technical examination of electrocution accidents.

The consideration of these issues will be based on a comparative analysis of the definitions of the subject, object and task of various types of expertise (in particular, occupational safety and health, electrical) with the identification of characteristic common features and features, their adaptation and adaptation to a comprehensive examination of accidents, electrocution.

The results for this study are based on the personal experience and analysis of scientific and regulatory sources, the practice of conducting comprehensive forensic engineering and technical examinations of accidents related to electrical trauma in forensic institutions of Ukraine.

Analysis of recent research and publications.

General principles of forensic expertise, among which the basic ones undoubtedly include the definition of the object, subject and tasks of forensic examination, were thoroughly covered in the works of such scientists as T. V. Averyanov, L. Yu. Arotsker, R. S. Belkin, A. I. Vinberg, V. G. Goncharenko, O. R. Rossinskaya, M. Ya. Segai, E. B. Simakova-Efremyan, V. Yu. Shepitko, O. R. Shliakhov and others ¹.

¹ Div. napriklad: Aver'janova T. V. Soderzhanie i harakteristika metodov sudebno-jekspertnyh issledovanij [Contents and characteristics of forensic research methods]. Alma-Ata : Kaz. NISJe, 1991. 240 s.; Arocker L. E. Sushhnost' kriminalisticheskoy jekspertizy. Kriminalist. Jekspertiza [Essence of forensic examination. Forensic expert. Expertise]. Moskva : VSh MOOP RSFSR, 1966. Vyp. 1. S. 51–54; Belkin R. S., Vinberg A. I. Kriminalistika. Obshheteoreticheskie problem [General theoretical problems]. Moskva: Jurid. lit., 1973. 264 s. [in Russian]; Honcharenko V. H. Metodolohichni problemy vchennia pro predmet kryminalistyky [Methodological problems of teaching about the subject of criminology]. Aktualni problemy kryminalistyky: materialy mizhnar. nauk.- prakt. konf. (Kharkiv, 25–26

These researchers have made a significant contribution to the development of the theory and methodology of forensic expertise, developed and defined basic concepts such as subject, object, tasks and further development, laid the groundwork for improvement and evolutionary movement.

Applying them to the definition of the subject, object and task of examination is an effective tool in the process of scientific knowledge.

However, when considering these fundamental concepts, they should be correlated with specific areas of expertise (or complex of specialist knowledge) used in different types of forensic science.

In this respect, the subject matter, object and tasks of forensic examination should be regarded as a set of investigated laws in the field of scientific knowledge, which have their specific peculiarities.

All this necessitates theoretical consideration of the basic foundations of comprehensive forensic research, in particular, electrocution accidents.

Article Purpose.

Defining and defining the object, subject and task of a comprehensive forensic engineering examination in the investigation of electrocution accidents.

Main content presentation.

Identifying, establishing, collecting and recording the circumstances of an event, investigating the offenses and adjudicating the criminal proceedings against them is inherently a process of knowing the truth, a process of proving that with a view to the continued expansion of scientific and technical capabilities and, as a consequence, a deeper understanding of is constantly evolving and improving.

veres. 2003 r.). Kharkiv : Hryf, 2003. S. 11–13 [in Ukrainian]; Rossinskaja E. R. Sudebnaja jekspertologija: genezis, predmet, sistema, funkcii, tendencii razvitiia [Judicial expertise: genesis, subject, system, functions, tendencies of development]. Criminalistics and Forensic Expertology: science, studies, practice. Vilnius; Varšuva; 2016. R. 32–49.; Segaj M. Ja. Sudebnaja jekspertologija: obekt, predmet, priroda i sistema nauki [Forensic expertise: object, subject, nature and system of science]. Teorija ta praktika sudovoï ekspertizi i kriminalistiki. Harkiv : Pravo, 2003. Vip. 3. S. 25–32. [in Russian]; Simakova-Yefremian E. B. Teoretyko-pravovi ta metodolohichni zasady kompleksnykh sudovo-ekspertnykh doslidzhen [Theoretical and methodological foundations of complex forensic research] : dys. ... d-ra yuryd. nauk: 12.00.09. URL : http://nauka.nlu.edu.ua/download/diss/Simakova/d_Simakova.pdf; Shepitko V. Yu. Tendentsii i perspektyvy rozvytku kryminalistyky (kontseptualnist pidkhodiv i dyskusiinist pohliadiv) [Trends and Prospects for the Development of Forensics (Conceptualism of Approaches and Discussion of Views)]. Aktualni problemy kryminalistyky: materialy mizhnar. nauk.-prakt. konf. (Kharkiv, 25–26 veres. 2003 r.). Kharkiv : Hryf, 2003. S. 7–8[in Ukrainian]; Shljahov A. R. O predmete sudebnoj jekspertizy [On the subject of forensic examination]. Nekotorye voprosy teorii sudebnoj jekspertizy : tezisy nauch. soobshh. na 7 teor. seminare — kriminalisticheskikh chtenijah 26 ijunja 1975 goda. Moskva : VNIISJe, 1975 [in Russian].

In the judiciary, proving and establishing truth as a kind of cognition is retrospective, since the event (accident, crime or misdemeanor) has already taken place and is being known according to the data currently coming.

Obtaining complete and objective information about a past event is almost impossible without the use of specialized knowledge in various fields of science and technology, which is owned by a knowledgeable person - specialist, expert. The most common procedural form of the use of specialized knowledge in the judiciary is the involvement of a forensic expert, who implements the state of the art in science and technology, and is at the same time a source for establishing and explaining the facts and circumstances of the case through the use of specialized knowledge.

Forensic expertise increases the probative value of the evidence system and facilitates the proper resolution of proceedings.

The development of forensic examinations of certain types, a significant expansion of their capabilities, led to the need to study the laws and methodology of the formation and development of forensics, the regularity of the study of their objects on the basis of special knowledge of natural, technical or other sciences.

Both general theoretical knowledge of the subject, subject matter, forensic expertise, and applied knowledge of the peculiarities of particular types of forensics and the assessment of expert opinion are equally required.

The Glossary of Forensic Terms gives the following definition of the object of the examination - it is a materialized source of information defined by the procedural law¹.

Object of forensic examination — material (materialized) sources of information (objects, formations, etc.), which are researched (recognized) by the expert on the basis of application of specialized knowledge, within the subject of expert research by certain methods and means for the purpose of solving tasks (questions), assigned by the authorized person person (body)².

Due to the evolutionary development and refinement of the natural and technical sciences, forensic technology and expert tools, the scope of forensics is also being expanded.

Article 1 of the Law of Ukraine: *On Forensic Examination* and Part 1 of Article 69 of the Criminal Procedure Code of Ukraine stipulates that forensic examination is a research based on special knowledge in the field of science, technology, art, craft, etc. objects, phenomena and processes for the purpose giving an opinion on issues that are or will be the subject of a trial or contain information about the circumstances of the offense.

¹ Slovar' osnovnyh terminov sudebnyh jekspertiz [Dictionary of the main terms of forensics]. Moskva : VNIISJe, 1980. S. 53 [in Russian].

² Osnovy sudovoi ekspertyzy [Basics of forensic examination] : navchalnyi posibnyk dlia fakhivtsiv, yaki maiut namir otrymaty abo pidtverdyty kvalifikatsiiu sudovoho eksperta / avt.-uklad.: L. M. Holovchenko, A. I. Lozovyi, E. B. Simakova-Yefremian ta in. Kharkiv : Pravo, 2016. 928 s. S. 27 [in Ukrainian].

According to E. B. Simakova-Efremian, the legislator did not quite accurately distinguish the range of objects of expert study, which include phenomena and processes. Because the phenomenon or process related to the crime is not directly investigated by a forensic expert - they have already taken place in the past.

The forensic expert examines the material and materialized media (the latter means the media presented in certain documents, etc., which the forensic expert examines)¹.

Integration object of forensic is the systematic integral material formation, combined with the common object of study of its different parties (properties). E. B. Simakova-Efremyan proposes the following definition of the integration object of forensic examination, with which the author agrees - this is a systematic integral material (materialized) formation, combined by a common subject of study of its different parties (properties), in order to solve a problem that requires application of integration of specialized knowledge in various fields of science, technology, etc.

By summarizing the above, we can give the following definition of the object of forensic engineering examination of accidents related to electrocution - a trace-reflection in the form of material and materialized sources of information (physical evidence: electrical equipment, apparatus of protection and control; documents on phenomena and processes, etc.) contained in the case file regarding electrocution.

In the general sense, as a philosophical category of knowledge of reality, the object of study is a process or phenomenon that gives rise to a problematic situation and is chosen for study.

When this part of objective reality is the topic of research, it becomes the subject of research.

The subject is what is contained within the object.

The subject matter of the study is the theoretical reproduction of objective reality, those essential relationships and relationships that are subject to direct study are the main determinants of a particular study².

¹ Simakova-Yefremian E. B. Teoretyko-pravovi ta metodolohichni zasady kompleksnykh sudovo-ekspertnykh doslidzhen [Theoretical and methodological foundations of complex forensic research]: dys. ... d-ra yuryd. nauk: 12.00.09. URL : http://nauka.nlu.edu.ua/download/diss/Simakova/d_Simakova.pdf (data zvernennia 10.09.2019) S.157 [in Ukrainian].

² Dyv., napr.: Dovidnyk zdobuvacha naukovoho stupenia. Zbirnyk normatyvnykh dokumentiv ta informatsiinykh materialiv z pytan atestatsii naukovykh kadriv vyshchoi kvalifikatsii [Collection of Regulatory Documents and Information Materials on Certification of Higher Qualified Scientific Staff] / Uporiadnyk Yu. I. Tsekov; perednie slovo R. V. Boika. Kyiv : Redaktsiia «Biuletens Vyshchoi atestatsiinoi komisii Ukrainy», 2000. 64 s.; P. Yolon. Piznannia. Filosofskyi entsyklopedychnyi slovnyk [Knowledge. Encyclopedic Dictionary of Philosophy] / V. I. Shynkaruk (holova redkolehii) ta in. ; L. V.

As categories of the scientific process, the object and the subject of the study are related as general and partial.

The object of scientific study is the surrounding material world and the forms of its reflection in the human consciousness, which exist regardless of our consciousness, are selected according to the purpose of the study.

«A subject is a category that determines a certain integrity... that is distinguished from the world of objects in the process of human activity and cognition... The subject includes only the main, most essential features and properties (in terms of research)»¹.

Based on the philosophical interpretation of this concept, we can determine that the subject is a set, a set of main properties, the most essential aspects of the phenomenon under study, the event, the object to which the cognitive process of the researcher is directed.

In general, this interpretation also applies to the determination of the subject matter of the forensic examination.

The subject matter of the examination is determined by the research objective, the subject (s), the subject (s) and the methods of conducting the research².

However, to date there is no definitive solution in the scientific literature to the concept of the subject of examination, it is debatable since there is no common understanding of the content of the subject of forensic examination among scientists and practitioners.

The analysis of various theoretical developments in this regard shows that the following types of definitions of the subject of forensic examination took place: issues that are solved with the help of specialized knowledge in its conduct; a set of factual data to be established on the basis of specialist knowledge; factual data that is established through the use of specialized knowledge; the circumstances of the case, which are investigated with the help of specialist knowledge of the questions that are put to the decision of examination³.

Ozadovska, N. P. Polishchuk (naukovi redaktory) ; I. O. Pokarzhevskaya (khudozhnie oformlennia). Kyiv : Abrys, 2002. 742 s [in Ukrainian].

¹ Filosofskij jenciklopedicheskij slovar [Philosophical Encyclopedic Dictionary] / red. kol. S. S. Averinceva i dr. 2-e izd. Moskva : Sov. jencikl., 1989. S. 505 [in Russian].

² Osnovy sudovoi ekspertyzy [Basics of forensic examination]: navchalnyi posibnyk dlia fakhivtsiv, yaki maiut namir otrymaty abo pidtverdyty kvalifikatsiiu sudovoho eksperta / avt.-uklad.: L. M. Holovchenko, A. I. Lozovyi, E. B. Simakova-Yefremian ta in. Kharkiv : Pravo, 2016. S. 24 [in Ukrainian].

³ Div. napr.: Aliev I. A., Koruhov Ju. G. Predmet obshhej teorii sudebnoj jekspertyzy. Osnovy sudebnoj jekspertyzy [The subject of the general theory of forensic examination. Forensic fundamentals]. Ch. 1: Obshhaja teoriya. Moskva : RFCSJe pri MJu RF, 1997. S. 25; Belkin R. S. Kurs kriminalistiki: v 3 t. Moskva [Forensic science course: in 3 volumes]: Jurist, 1997. T. 2. S. 311–315; Mirskij D. Ja., Rostov M. N. Ponjatie obekta sudebnoj jekspertyzy [The concept of the object of

In the author's view, the most appropriate and revealing concept is the well-known scientist O. R. Shlyakhov's definition of the subject of examination as established on the basis of special knowledge of factual data (facts, circumstances of the case).

He emphasizes the relationship of the subject to the objects and methods of forensic examination¹.

Carrying out a comprehensive forensic engineering and technical examination of accidents related to electro-trauma (hereinafter - CITENVE) is conditioned by the need to apply in the study of various fields of scientific knowledge: in the field of occupational safety, life safety and electrical engineering; its nature is integrative.

Forensic expertise in the field of occupational safety and health (SEGOPBZD) is one of the types of engineering and technical expertise..

Designed to establish the mechanism of occurrence and impact of dangerous or harmful factors, causes of accidents, as well as to determine the requirements of regulatory documents, non-compliance with which is causally related to the accident.

The subject of SSGSBDE is the actual data and circumstances of an accident (accident), which are established on the basis of special scientific and technical knowledge in the fields of occupational safety, industrial safety and safe life.

Судова електротехнічна експертиза (CEE) – один з родів інженерно-технічної експертизи.

It is intended to establish the actual data on the structure, composition of the electrical installation or its components, the causes of occurrence and occurrence of emergency situations and emergency modes in the electrical equipment, as well as compliance with its technical condition and process of operation with regulatory requirements.

The subject of FEE is the circumstances of the occurrence, development of abnormal modes in electrical installations or their components, electrical receivers, actual data on the consequences of such modes, which are established on the basis of special scientific and technical knowledge.

In the author's view, the most comprehensive and comprehensive definition of the subject of comprehensive examination, which undoubtedly includes the study of accidents related to electro-trauma, is proposed by the scientist-researcher E. B. Simakova-Yefremian to determine the intersectoral subject of complex research in forensic science.

it is factual data (facts) and circumstances of the case concerning the establishment of the nature, properties, states of objects, generic (group)

forensic examination]. Aktual. problemy teorii sudeb. jekspertizy. Moskva : VNIISJe, 1984. Vyp. 44. S. 26 [in Russian].

¹ Shljahov A. R. O predmete sudebnoj jekspertizy [On the subject of forensic examination]. Nekotorye voprosy teorii sudebnoj jekspertizy : tezisy nauch. soobshh. na 7 teor. seminare — kriminalisticheskikh chtenijah 26 ijunja 1975 goda. Moskva : VNIISJe, 1975 [in Russian].

affiliation, source of origin or specific objects by their reflections, as well as, by appropriate means (methods) as a result of the study of material and materialized information carriers for the purpose of solving diagnostic, identification and situational tasks of forensic science¹.

Summarizing the above, given that this type of examination by its nature requires the use of various branches of specialized knowledge (is inherently a complex expertise), we propose the author's definition of the subject of complex forensic engineering and technical expertise of accidents related to electrocution - (facts) and the circumstances of the case regarding the conditions of occurrence of a dangerous factor, structure, condition, occurrence and development of abnormal or emergency modes in electrical equipment, causes, mechanism and conditions under which electrocution occurred, through the integrated use of a complex of specialized knowledge in the field of occupational safety, life safety and electrical engineering.

The author deliberately omits part of the definition proposed by EB Simakova-Efremian in the part of the research task, since in the following we will consider in more detail the task of complex examination of electrocution accidents. Since the substance of the subject is reflected in the tasks of the study, the close and inseparable link between the subject and the task of forensic examination is evident.

The purpose of forensic expertise is an expert activity aimed at transforming the initial information contained in the materials submitted for expert examination and physical evidence into evidence that can be used by the initiator of the examination to make the right decision in the case.

From this definition of the expert task it follows that it has an informational nature and a procedural role and can be interpreted as a problem, formally expressed and embodied in the questions submitted to the expert and which requires a decision on the basis of his specialized knowledge.

To date, forensic scientists have conducted the coverage and scientific substantiation of the criteria for the classification of examinations by the nature of the tasks to be solved.

Until the mid-1970s, the traditional division of tasks into two groups, identification and non-identification, prevailed among scientists. However, with the development of scientific knowledge and the emergence of new types of expertise, there was an opinion on the division of tasks into identification, diagnostic and situational.

As E. B. Simakova-Yefremian notes, mainly scientists now differentiate tasks into three types: identification, diagnostic and situational.

¹ Simakova-Yefremian E. B. Teoretyko-pravovi ta metodolohichni zasady kompleksnykh sudovo-ekspertnykh doslidzhen [Theoretical and methodological foundations of complex forensic research] : dys. ... d-ra yuryd. nauk: 12.00.09. URL : http://nauka.nlu.edu.ua/download/diss/Simakova/d_Simakova.pdf (data zvernennia 10.09.2019). S. 175 [in Ukrainian].

Identification - these are the expert tasks whose main purpose is to establish the fact, the individual-specific identity or the general group (generic) affiliation of specific material objects. The latter can be both material objects and their reflection, as well as events and phenomena.

Diagnostic tasks are aimed at establishing the nature of the object, its purpose, scope, properties and condition, conditions of operation, mechanism of interaction with other objects, causes of occurrence of certain consequences, results, etc.

The most characteristic of these problems is the identification of the link between the result being observed and the causes of its occurrence.

Situational tasks are associated with establishing the mechanism and conditions of occurrence of an event, they are usually accomplished by establishing the circumstances of the case.

This study is based on a logical assessment of the situation at certain stages of the formation and development of events, conditions of occurrence of a negative factor.

That is, when solving a situational problem, the processes of interaction and communication of objects (phenomena) as carriers of information about the circumstances of the investigated event are clarified.

These three types of tasks are also solved by a comprehensive forensic engineering examination of electrocution cases, since it is an integrative application of specialist knowledge in the field of life safety and electrical engineering.

For the most part, forensic engineering and technical examination of accidents related to electro-traumas, is characterized by solving diagnostic and situational problems.

Generalized analysis of expert practice shows that more and more recently, new specific tasks for the study of hazards in human life are being put before expert institutions.

Articles 273, 274 and 275 of the Criminal Code of Ukraine provide for criminal liability for violations of safety rules during the performance of work with high risk, at explosive enterprises (workshops), violation of rules for the safe operation of buildings or structures.

In this case, liability is established in cases where the above violations have only created a threat of death or other serious consequences.¹

During the pre-trial investigation of such violations, there is a need for expert research in order to establish specific discrepancies from a technical point of view to the rules, norms and requirements of normative-technical acts for occurrence as a result of such deviations of prerequisites of an accident, since without the use of special knowledge it is impossible to establish.

¹ Kryminalnyi kodeks Ukrainy [Criminal codex of Ukraine]. URL : <https://zakon.rada.gov.ua/laws/show/2341-14> (data zvernennia 19.05.2019) [in Ukrainian].

In such cases The expert should solve the problem of predicting the possibility (real, high probability) of the occurrence of negative consequences in the presence of the fact of failure to comply with the relevant requirements.

The solution to this problem, unlike situational, is predictive.

The expert, using his or her specific knowledge, should evaluate the existing factual circumstances in the context of the multiplicity of conditions and factors that will influence the dynamics of a possible development of the event, create such a prognostic model that in the aggregate and inseparable combination of conditions and factors will inevitably lead to an extraordinary event.

For example, using a hand-held power tool with damaged insulation of conductive parts and without a properly connected protective PE conductor will result in electric shock.

Thus, in this case, only the combination of the two factors (damaged insulation and the absence of a protective conductor) will inevitably lead to electrocution.

By its very nature, solving a prognostic problem has a lot to do with the process of solving a situational problem in order to study the mechanism and conditions of occurrence of a negative factor, logical assessment of the situation and factual circumstances.

However, in a situational task, the expert reproduces the events of the past on the basis of trace-display and recorded information.

When solving a prognostic task, it is necessary to create (imaginatively) and predict the process of development of a dangerous situation, to establish the degree of influence of each negative factor and its dependence and connection with non-compliance with specific requirements, to assess under what conditions and circumstances an objective threat will first of all be created in the first place. human life, the inevitable onset of other consequences (harm).

Often, solving a prognostic task is impossible without solving diagnostic and situational sub-tasks, in which case they act as auxiliaries aimed at creating a holistic, comprehensive research process.

Conclusions.

Forensic science is characterized by a set of basic features that distinguish one type of research from another: subject, object, expert techniques and character of special knowledge, which play a dominant role in solving tasks of this class, kind, type, subspecies of science.

When conducting a comprehensive engineering and technical study of accidents related to electro-trauma, a forensic expert should have a thorough knowledge of professional knowledge, as well as a clear and sufficient understanding of the basic theoretical provisions: the subject matter, object and tasks of such examination.

The discovery of the concepts of the object, object and division of the tasks of forensic engineering and technical examination of accidents related to electro-traumas, for identification, diagnostic, situational and

prognostic purposes has the ultimate goal, which is to create a universal toolkit that enables experts to effectively apply scientific basis, and comprehensive identification of the cause of the accident and establishing a full range of cause and effect relationships of actions / omissions of specific persons with negative consequences and the case.

At the same time, it should be noted that the issues discussed in this paper are subject to further research and scientific study.

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О. О. Мещков

ОБЪЕКТ, ПРЕДМЕТ І ЗАВДАННЯ СУДОВОЇ ІНЖЕНЕРНО-ТЕХНІЧНОЇ ЕКСПЕРТИЗИ НЕЩАСНИХ ВИПАДКІВ, ПОВ'ЯЗАНИХ З ЕЛЕКТРОТРАВМУВАННЯМ

Забезпечення високої якості, повноти та правильності висновків експерта за результатами проведених досліджень нещасних випадків, пов'язаних з електротравмуванням, в умовах різноманітності фактичних обставин настання події і величезної номенклатури електротехнічних пристроїв та великої кількості норм технічної регламентації їх застосування унеможливорюється без чіткого визначення та розуміння експертом засад судової експертології, до яких першочергово належать поняття об'єкта, предмета і завдань судової експертизи.

Необхідність детального розгляду вказаних понять обумовлюється комплексною природою застосовуваних при цьому знань: у галузях електротехніки, охорони праці і безпеки життєдіяльності та інших.

Обґрунтовано необхідність та запропоновано доповнити класифікацію експертних завдань інженерно-технічного дослідження випадків електротравмування новим різновидом — прогностичні завдання.

Ключові слова: судова інженерно-технічна експертиза, електротехнічна експертиза, експертиза у галузі охорони праці та безпеки життєдіяльності, нещасні випадки пов'язані з електротравмуванням, предмет, завдання, об'єкт експертизи.

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I. V. Gubanova,
Department Head at KhRIFE
Kharkiv, Ukraine,
e-mail: irinarybalchenko1999@gmail.com

PERFORMING FORENSIC EXAMINATIONS RELATED TO BANK BANKRUPTCY

According to experience of the banking system existence of Ukraine it is obvious that every year an increasing number of banks are negatively affected by the financial crisis, which is the result of a wave of liquidation and bankruptcy of banking institutions.

Recently, a large number of requests have been sent to forensic institutions for conducting forensic economic examinations on the issues of a comprehensive analysis of the financial and economic activities of banks as well as on establishing features of concealing bankruptcy, fictitious bankruptcy or leading to bankruptcy. This is primarily due to the need to establish the possibility or impossibility of paying off monetary obligations including on deposits in the bank; analysis of the impact of certain management policies on the financial condition of banks; search for directions for optimizing costs and income of banks etc.

While performing a forensic examination on concealing bankruptcy, fictitious bankruptcy or bringing bankruptcy within the scope of his competence, a forensic expert shall give an opinion on the presence or absence at the enterprise of economic signs of fictitious bankruptcy, leading to bankruptcy or concealment of bankruptcy on the basis of the criteria defined in Guidelines No. 14. The calculation of these indicators for a bank is impossible due to the fact that there are differences in the determination of insolvency of the bank and the business entity due to the economic and legal nature of banks and the procedural steps for determining such insolvency.

Currently, there is no legislatively approved methodology for determining the economic signs of bankruptcy, fictitious bankruptcy, hidden bankruptcy specifically for banks, which makes it impossible to calculate such financial and economic indicators of the bank as bankruptcy, fictitious bankruptcy, hidden bankruptcy.

Keywords: bank, bankruptcy, insolvency, bringing the bank to insolvency, bringing to bankruptcy, hidden bankruptcy, fictitious bankruptcy.

Formulation of Research Problem.

Necessary condition for the proper functioning of any country's economy is the development of the banking sector.

Economy restructuring that Ukraine so needs can only be done through an efficient banking system.

Developed banking sector plays an extremely important role in stabilizing the country economy.

The experience of the existence of the banking system of Ukraine has shown that every year an increasing number of banks are adversely affected by the financial crisis, which is the result of a wave of liquidations and bankruptcies of banking institutions.

A large number of banks are declared bankrupt in Ukraine every year.

There are instances where bankruptcy is unlawfully used for useful purposes to prevent taxation, evasion and withdrawal of valuable assets.

Such actions entail risks of violating the rights of creditors of these organizations, and in cases of both criminal bankruptcies and market bankruptcies, which occur in the manner prescribed by law.

The problems of bankruptcy of commercial banks, insolvency, liquidation of banking institutions, the causes of bankruptcy and ways of prevention are studied by many domestic and foreign scientists.

State of exploring research issue. Scientific efforts of such national scientists as M. I. Savluk¹, V. M. Sutormina², V. I. Uspalenko³ and others are devoted to research on these problems. O. O. Tereshchenko, V. M. Kochetkov, V. V. Vitlinsky, O. I. Kopylyuk, A. V. Cherep, E. Shabalin and others⁴ devoted their work to the study of the features of bankruptcy of banks and ensuring financial stability.

However, the issue of conducting judicial economic expertise on bankruptcy issues by commercial banks has not received due attention so far, so research in this area is an important scientific and practical problem.

The subject of judicial economic expertise is the display of information on financial and economic performance of enterprises, including banks, the formation of their statutory funds, bankruptcy and liquidation of enterprises, lease relations, targeted use of budgetary funds and funds of enterprises for business transactions in cases in the conduct of a pre-trial investigation or court.

¹ Savluk M. I. Prychyny devalvatsii hryvni v lystopadi 2008 roku [Reasons for hryvnia devaluation in November 2008]. Materialy vseukrainskoi naukovo-praktychnoi konferentsii vid 27 zhovtnia 2010 roku [Kruhlyi stil: «Prychyny ta naslidky devalvatsii hryvni v 2008 r»]. Kyiv : AUB, 2010 [in Ukrainian].

² Sutormina V. M. Derzhava, podatky. biznes: iz svitovoho dosvidu fiskalnoho rehuliuвання rynkovoi ekonomiky [State, taxes. business: from the global experience of fiscal regulation of a market economy]. Kyiv : Lybid, 1992. 328 s [in Ukrainian].

³ Uspalenko V. I., Zotov I. V., Tokhtamysh T. O. Otsinka skhylnosti banku do bankrutstva [Assess bank's bankruptcy tendency]: monohrafiia. Kharkiv : KhDTUBA, 2008. 130 s [in Ukrainian].

⁴ Терещенко О. О. Фінансова санація та банкрутство підприємств [Financial rehabilitation and bankruptcy of enterprises] : навч. посіб. Київ : КНЕУ, 2000. 412с [in Ukrainian]. нко О. О. Фінансова санація та банкрутство підприємств : навч. посіб. К. : КНЕУ, 2000. 412 с.

Recently, a large number of requests has been received from expert institutions for conducting forensic and economic expertise on complex analysis of banks' financial and economic activity.

This is due, first of all, to the need to prove the unreasonableness of the loan; the possibility or inability of repayment of monetary obligations, including bank deposits; analysis of the impact of certain management policies on the financial position of banks; finding directions to optimize your bank costs and revenue, and more.

The issue of insolvency, bankruptcy, fraudulent bankruptcy, or bankruptcy are relevant.

Therefore, the purpose of the study is to compare the insolvency of the bank and the business entities, as well as to determine the possibility of settlement in the bank of such economic features as insolvency, actions for bankruptcy, fraudulent bankruptcy or bankruptcy.

Main content presentation.

Currently, according to the current legislation, the following actions are prosecuted: 1 (bringing the bank to insolvency) and Art. 219 (bankruptcy) of the Criminal Code of Ukraine¹.

Pursuant to Article 218¹ of the Criminal Code of Ukraine, bringing a bank to insolvency, that is intentional, for selfish reasons, other personal interest or in the interests of third parties to commit a related party with the bank of any actions that led to the classification of the bank in the category of insolvent caused extensive material damage to the state or the creditor.

The Law of Ukraine dated on 14.05.1992 No. 2343-XII *On Recovery of the Debtor's Solvency or Declaring Bankruptcy* (hereinafter referred to as Law of Ukraine No. 2343-XII) provides the following definitions of terms:

– insolvency is failure of the debtor to fulfill the obligations to creditors after maturity is due to the restoration of its solvency;

bankruptcy is the recognition by an economic court of the debtor's inability to recover its solvency through the procedures of resolution and amicable settlement and to repay the monetary claims of creditors, established in the manner stipulated by this Law, not by means of liquidation procedure.

Bank insolvency is defined by the Law of Ukraine: *On Banks and Banking* dated 07.12.2000 No. 2121-III² as the bank inability to timely and fully fulfill the legal requirements of creditors due to lack of funds or reduction of the bank's capital to an amount of less than one third of the minimum Bank regulatory capital.

¹ Kryminalnyi kodeks Ukrainy [Criminal code of Ukraine] vid 05.04.2001 № 2341–III. Vidomosti Verkhovnoi Rady Ukrainy. 2001. № 25–26. St. 131. URL: <https://zakon.rada.gov.ua/laws/show/2341–14> (data zvernennia 14.05.2019) [in Ukrainian].

² Pro banky i bankivsku diialnist [On Banks and Banking]: Zakon Ukrainy vid 07.12.2000 № 2121–III. URL : <https://zakon.rada.gov.ua/laws/show/2121–14> (data zvernennia 14.05.2019) [in Ukrainian].

Bankruptcy of a bank is the result of negative processes (crisis phenomena) that occur in it for a long time.

Crisis detection as early as possible, on the one hand, may allow the National Bank of Ukraine and the bank's management to remedy the situation by making appropriate decisions and, on the other, to reduce risks for other entities and avoid chain reactions¹.

The methodology for determining the insolvency of business entities involves the analysis and evaluation of its financial status on the basis of criteria defined by law.

However, there are differences in the definition of insolvency concepts of the bank and the insolvency of the business entity, which are based on the characteristics and insolvency criteria defined by law for each of them.

In addition, prior to deciding on the bank's liquidation, information about its financial position, including its insolvency, is protected by the Institute of Banking Secrecy.

In the course of their work, in determining the economic features of bankruptcy, fictitious bankruptcy or bankruptcy actions, forensic experts use methodical recommendations for identifying insolvency signs of the enterprise and signs of bankruptcy, fictitious bankruptcy or filing for bankruptcy. Ukraine dated on January 19, 2006 No. 14 (hereinafter referred to as Methodical Recommendations No. 14)².

The objects of forensic economic examination are documents which, in their totality, contain information that forms the subject of the research³. The objects of research of judicial economic expertise, in the course of which the analysis of the financial and economic state of the enterprise is carried out, for the presence of which he has signs of insolvency, in particular, the financial statements of the enterprise.

The financial statements are a system of generalized indicators that characterize the results of financial and economic activities of the enterprise.

¹ Kryklii O. A., Masliuk N. T. *Upravlinnia kredytnym ryzykom banku* [Management of bank credit risk]: monohrafiia. Sumy : DVNZ «UABS NBU», 2008. 86 s [in Ukrainian].

² Методичні рекомендації щодо виявлення ознак неплатоспроможності підприємства та ознак дії з приховування банкрутства, фiktivnoho bankrutstva chy dovedennia do bankrutstva [Guidelines for identifying signs of insolvency of the enterprise and signs of bankruptcy, fictitious bankruptcy, or bankruptcy] : nakaz Ministerstva ekonomiky Ukrainy vid 19 sichnia 2006 r. № 14. URL:http://search.ligazakon.ua/l_doc2.nsf/link1/ME06025.html (data zvernennia 14.05.2019) [in Ukrainian].

³ Khomutenko O. V., Kudriashova S. V. Pro predmet i ob'ekt sudovoi ekonomichnoi ekspertyzy [About the subject and object of judicial economic expertise]. *Zb. nauk.prats. Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky*. Kharkiv : Pravo, 2010. Vyp. 10. S. 553–561 [in Ukrainian].

In turn, the analysis of the financial condition allows us to identify the availability of financial resources; expediency and efficiency of their placement and use; solvency of the enterprise; its financial relations with partners that is an important point in conducting forensic studies on bankruptcy, bringing to bankruptcy, determining the real monetary valuation of the assets of enterprises.

Assessment of these indicators is necessary for effective management of the enterprise and shows a real financial picture that has developed at the enterprise under the influence of various factors.

Financial reporting and the assessment of financial position are a necessary tool in identifying various types of unlawful activities in the economic sphere and in analyzing the trends of further events. Banks submit their financial and statistical reports to the National Bank of Ukraine.

It reflects indicators of their work, operations, liquidity, solvency, profitability, as well as information of bank affiliates to assess the financial condition of the bank.

The forms of statistical reporting are defined by the “Rules of Organization of Statistical Reporting to be submitted to the National Bank of Ukraine”, approved by the Resolution of the Board of the National Bank of Ukraine dated March 19, 2003 No. 124.¹

These Rules define the list, sample forms of statistical reporting and the procedure for their completion, the periodicity of their preparation, the terms and methods of submission of data to the National Bank of Ukraine, as well as the persons entitled to sign the corresponding forms of reporting.

Another document *Instruction on the procedure for preparation and disclosure of financial statements of Ukrainian banks* approved by the Resolution of the Board of the National Bank of Ukraine on October 24, 2011 № 373 provides:

“1. 1. This Instruction has been prepared according to the Laws of Ukraine: *On Accounting and Financial Reporting in Ukraine, On the National Bank of Ukraine* and is based on the requirements of International Financial Reporting Standards (hereinafter referred to as IFRS) for disclosure of information in financial statements.

1. 3. This Instruction defines the order, frequency of preparation, submission and disclosure of financial statements, sample forms included in the financial statements, sets the minimum requirements for disclosure.

Financial statements are prepared in accordance with IFRS only if they comply with all the requirements of current IFRS that are required to be completed at the date of preparation of the financial statements.

¹ Pravyla orhanizatsii statystychnoi zvitnosti, shcho podaietsia do Natsionalnoho banku Ukrainy [Rules of Organization of Statistical Reporting to be submitted to the National Bank of Ukraine] : postanova Pravlinnia Natsionalnoho banku Ukrainy vid 19 bereznia 2003 r. № 124 (zi zminamy ta dopovnenniamy). URL : <https://zakon.rada.gov.ua/laws/show/z0353-03> (data zvernennia 14.05.2019) [in Ukrainian].

1.7. ... Bank draws up and submits financial statements to the National Bank of Ukraine (hereinafter referred to as the National Bank) in the currency of Ukraine — in thousands of UHA. ”

All types of balances are compiled according to the full nomenclature of accounts according to *Account Plan of Accounts of the National Bank of Ukraine* dated on September 11, 2017 №. 89¹.

The plan of bank accounts and the forms of statistical reporting differ from the forms of statistical reporting on the basis of which, in accordance with Methodical Recommendations No. 14, the calculation of signs of bankruptcy, fictitious bankruptcy and hidden bankruptcy is carried out.

It should also be noted that, in accordance with Section III of Methodological Recommendations No. 14, the report on the analysis of financial and economic activity of an insolvent enterprise is prepared in accordance with Law of Ukraine No. 2343-XII, Accounting Regulation (Standard) No. 1: *General Requirements for Financial Reporting* dated on 31.03.99 No. 87² and other legal acts.

At the same time, part 8 of Article 36 of the Law of Ukraine: *On the Deposit Guarantee Scheme* dated on February 23, 2012 No. 4452-VI (hereinafter — Law of Ukraine No. 4452-VI) establishes that the Law of Ukraine: *On Restoring a Debtor's Solvency or Recognizing It Bankrupt* does not apply to banks.

According to paragraph 3 of Art. 2 of section I of the Law of Ukraine No. 2343-XII the legislation on the resumption of the debtor's solvency or bankruptcy in the court's consideration of the bankruptcy bankruptcy bank application is applied taking into account the rules of the law on banks and banking activities.

In addition, Methodological Recommendation No. 14 provides that the main, in the a of the presence (absence) of signs of actions for concealment or bankruptcy or fictitious bankruptcy of the enterprise and determining the signs of loss or restoration of solvency, is the stay of the enterprise in one of the stages of bankruptcy and the presence of official statements by the owner or officer of the debtor to the economic court about the bankruptcy proceedings.

In accordance with the Law of Ukraine No. 4452-VI and the "Regulation on the withdrawal of an insolvent bank from the market",

¹ Plan rakhunkiv bukhhalterskoho obliku Natsionalnoho banku Ukrainy [National Bank of Ukraine Accounting Accounts Plan]: postanova Pravlinnia Natsionalnoho banku Ukrainy 11.09.2017 № 89 zi zminamy. URL : <https://zakon.rada.gov.ua/laws/show/v0089500-17> (data zvernennia 14.05.2019) [in Ukrainian].

² Polozhennia (standartu) bukhhalterskoho obliku 1 «Zahalni vymohy do finansovoi zvitnosti» [Accounting Standard 1 (General Requirements to the Financial Reporting)]: nakaz Ministerstva finansiv vid 31.03.99 № 87 (zi zminamy ta dopovnenniamy). URL : <https://zakon.rada.gov.ua/laws/show/z0391-99> (data zvernennia 14.05.2019) [in Ukrainian].

approved by the decision of the Deposit Guarantee Fund of 05.07.2012 No. 2, the bank is considered insolvent in the case of:

1) Failure to bring its activity in conformity with the requirements of the legislation, including normative-legal acts of the National Bank of Ukraine, after being classified as problematic, but not later than 180 days from the day of its recognition as such;

2) Reducing the amount of regulatory capital or bank capital ratios to one-third of the minimum level established by law and / or regulations of the National Bank of Ukraine;

3) Bank default on 10 or more percent of its obligations to depositors and other creditors within 10 working days.

The Law of Ukraine "On Banks and Banking" dated 07.12.2000 No. 2121 – III stipulates that the National Bank of Ukraine shall make a decision on revocation of a bank license and liquidation of a bank at the proposal of the Deposit Guarantee Fund within five days from the date of receipt such proposal of the Fund. The procedure for revocation of a bank license at a bank, which is liquidated at the initiative of the owners, is determined by the normative legal acts of the National Bank of Ukraine. No. 4452 – VI

The provisions of Law of Ukraine No. 4452–VI provide for a special procedure for removing an insolvent bank from the market, different from the procedure for liquidation of bankruptcy, which is carried out through the application of bankruptcy proceedings in accordance with Law of Ukraine No. 2343-XII, namely: withdrawal of an insolvent bank from the market resolution of the Board of the National Bank of Ukraine under the rules of the Law of Ukraine *On the system of guaranteeing deposits of natural persons* that does not provide for the initiation of bankruptcy proceedings in an economic court.

Forensic economist while performing an examination of bankruptcy concealment, fictitious bankruptcy or bringing to bankruptcy within its competence, concludes that the enterprise has or does not have economic signs of fictitious bankruptcy, bringing to bankruptcy or concealing bankruptcy on the basis of Methodological Recommendation № . 14.

It is determined that the calculation of these indicators in the bank is not possible due to the fact that there are differences in the definition of insolvent banks and business entity, which are due to the economic and legal nature of banks and the procedural actions of recognition of such insolvency.

At present, there is no legally approved method of determining the economic features of bankruptcy, fictitious bankruptcy, hidden bankruptcy for banks, which makes it impossible to calculate such financial and economic indicators of the bank as bringing to bankruptcy, fictitious bankruptcy, hidden bankruptcy.

Conclusions.

Thus, at the current stage of economic development in Ukraine, there is a need to develop methodological recommendations for identifying signs

of bankruptcy, fictitious bankruptcy or bankruptcy in the banking institutions, which will later be used in the forensic economic examinations.

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I. В. Губанова

**ПРОВЕДЕННЯ ФІНАНСОВО-ЕКОНОМІЧНИХ ЕКСПЕРТИЗ,
ПОВ'ЯЗАНИХ З БАНКРУТСТВОМ БАНКІВ**

Розглянуто особливості проведення та основні напрями дослідження судових економічних експертиз з питання визначення економічних показників дій з приховування банкрутства, фіктивного банкрутства чи доведення до банкрутства банків. Проаналізовано основні ознаки й критерії відмінності визначення неплатоспроможності банків від неплатоспроможності суб'єктів підприємницької діяльності, а також дій з приховування банкрутства, фіктивного банкрутства чи доведення до банкрутства підприємств. Визначено, що розрахунок цих показників у банку неможливий у зв'язку з тим, що існують відмінності у визначенні неплатоспроможними банку і суб'єкта підприємницької діяльності, які зумовлені економіко-правовою сутністю банків і процесуальними діями визнання такої неплатоспроможності.

Ключові слова: банк, банкрутство, неплатоспроможність, доведення банку до неплатоспроможності, доведення до банкрутства, приховуване банкрутство, фіктивне банкрутство.

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S. O. Kozub,
Department Head at KhRIFE
Kharkiv, Ukraine,
ORCID:<https://orcid.org/0000-0002-4692-7958>,
e-mail: skozub78@ukr.net

PERFORMING OF FORENSIC ECONOMIC EXAMINATIONS ON TAXATION OF OPERATIONS ASSET MANAGEMENT, WHICH MANAGES ASSETS OF MUTUAL FUNDS — MUTUAL VENTURE INVESTMENT FUND AND CORPORATE INVESTMENT FUNDS

The order of taxation of operations of company is considered from the management of asset-mi, that carries out a management the assets of institute of the general investing - a ration venture investment fund and corporate investment fund during realization of judicial economic examinations.

At determinations of accosts got from the sale of the real estate by property of institute of the joint investing upon termination of building of dwelling-house; warranty payments for the objects of the real estate, that is got on the basis of previous agreements of purchase-sale and after entering into the contracts of purchase-sale of apartments on the basis of preliminary agreements of payment of cost of such apartments.

For example, the operation of taxation is considered on the basis of preliminary agreements of purchase-sale in future after entering into the contracts of purchase-sale of apartments on the basis of preliminary agreements that is set off in payment to the cost of such apartments.

During realization of research on the indicated question an important value has, circumstances, that the facilities got by preliminary agreement of purchase-sale join in the assets of institute of the joint investing after their put in paying for the principal contract of purchase-sale of the real estate confess incomes from operations with the assets of fund in accordance with the international standards of record-keeping and fall under the action of privilege and indicated methodical approach it is appropriate to use for conducted corresponding economic researches after materials of tax verifications.

Keywords: mutual fund, previous contracts, general investment funds, assets of the common investment institute, common investment institute, venture fund assets, asset, liability, tax advice.

Formulation of Research Problem.

The study of the procedure for taxing the operations of an asset management company that manages the assets of a joint venture — a unitary venture investment fund and a corporate investment fund is important when conducting judicial economic examinations, because when conducting ex-post audits by authorized bodies of the State -In order to draw up acts of checks on the amount of taxes and expert institutions receive a large number of requests from law enforcement agencies and courts for conducting economic and economic examinations on the issues of documentary confirmation of the conclusions of acts of audits (inspections)

of bodies of the State Fiscal Service of Ukraine (hereinafter DFS) regarding the established violations in taxation of the said transactions.

Analysis of recent researches and publications.

The order of taxation of the operations of an asset management company that manages the assets of a joint venture — a unitary venture fund and a corporate investment fund when conducting judicial economic examinations is relevant, since in the aspect of changes in the current legislation of Ukraine on taxation, this issue is mentioned the provision of justice was not considered before.

The **article purpose** is to substantiate the procedure for conducting research on taxation of operations of an asset management company that manages the assets of a joint venture: a unitary venture investment fund and a corporate investment fund in the course of forensic economic examination.

Main Research Content Presentation.

The procedure for taxation of the above is governed by the provisions of the Tax Code of Ukraine (hereinafter referred to as the TCU¹) by tax authorities authorized by the State Tax Administration that sometimes do not meet the requirements of the said TCU and regulatory documents of the respective ministries and departments.

Control and performance of tax audits of the operations of the asset management company, joint venture — unit trust and corporate investment fund in accordance with the requirements of the CFC, are entrusted to authorized DFS bodies, which in the course of audits (audits) establish the facts of violations in spending these funds and determining the amount of losses.

Subsequently, inspection materials are forwarded to the relevant law enforcement agencies for registration of criminal proceedings. In the course of the pre-trial investigation, the materials of these inspections are assigned forensic expertise on the documentary confirmation of the conclusions of the inspection acts regarding the amounts of the assessed accrued taxes.

Provisions governing the taxation of assets of an asset management company (hereinafter referred to as AMC), a joint venture — a unit investment venture fund and a corporate investment fund, set out in the Permanent Standards of the TCU, which determines the complexity of conducting expert researches.

According to the Article: 41 of the Law of Ukraine: *On Mutual Funds (Share and Corporate Investment Funds)* dated on July 5, 2012 N 5080–VI (hereinafter referred to as the Law of Ukraine № 5080²); mutual fund is a set of assets belonging to the members of such a fund under the

¹ Podatkovyi kodeks Ukrainy [Tax Code of Ukraine] № 2755–VI vid 02.12.2010. Holos Ukrainy, 2010, 12, 04.12.2010 № 229–230 [in Ukrainian].

² Pro Instytuty spilnoho investuvannia [About Joint Investment Institutions] : Zakon Ukrainy vid 05 lypnia 2012 roku № 5080–VI. Holos Ukrainy, 2012, 08, 18.08.2012 № 153–154 [in Ukrainian].

right of joint private ownership managed by the asset management company and accounted for separately from the results of its business activities.

Peculiarity of taxation of assets management operations is that the entity manages the assets of the joint venture institute: unit trust and corporate investment fund and acts on its own behalf but in the interests and at the expense of the assets of the unit venture investment fund.

Mutual Venture Investment Fund or Corporate Investment Fund (hereinafter referred to as ICI), on behalf of and in the interest of which the Asset Management Company operates, is an investor in the construction of residential buildings through the conclusion of investment contracts with the developers of the facilities, and upon completion construction of an apartment building the first transfer of finished newly built housing (object of housing stock) is carried out in the ownership of ICI in interests of which AMC operates.

That is, during the period of construction of residential buildings, ICI concludes with other persons who are not participants of ICI, preliminary sale and purchase contracts, according to which ICI as seller and other persons as buyers are obliged upon completion of the construction of a dwelling house and state-owned registration of ownership of ICI for apartments to conclude contracts for the sale of such apartments on the basis of previous agreements.

Under preliminary agreements, ICI receives from the potential buyers security / guarantee payments to ensure fulfillment of obligations under the previous agreement, which after the conclusion of the sale and purchase contracts for apartments are credited to pay the cost of such apartments.

These transactions are carried out within the framework of contracts, namely:

- 1) Within the contract of organization of construction of real estate objects, concluded between the builder and the asset management company acting on its own behalf but in the interests and at the expense of the assets of the unit trust investment fund.

Thus, ICI on behalf of and in the interests of which the asset management company operates, is an investor in the construction of residential buildings and non-residential premises on the basis of concluded investment contracts with the developers of the construction sites.

Upon completion of the construction of a residential building, the first registration of the ownership of the finished newly constructed real estate (residential / non-residential buildings) is carried out by the ICI. Accordingly, the real estate ICIs obtained by the ICI are assets of the joint venture.

Within the framework of the previous contracts of purchase and sale of apartments, concluded by an asset management company acting in its own name but in the interest and at the expense of the assets of a unit venture investment fund, to fulfill the terms of the Agreement for the

organization of construction of real estate objects, with a number of Ukrainian citizens.

That is, during the term of real estate construction, ICI concludes preliminary sales contracts with third parties, according to which ICI as seller and third parties as purchasers, upon completion of real estate construction and state registration of ICI ownership, conclude sale contracts such housing / non-residential property on the basis of prior agreements.

It should be noted that according to the Preliminary Real Estate Purchase Agreements, the ICI and the counterparty to the Contract, subject to the terms of the respective Real Estate Organization, are bound to conclude a Non-Mobile Property Purchase Agreement in the future, not housing) under the terms and conditions specified in the Preliminary Contract.

Payments under the previous Purchase and Sale Agreements shall be made by means of (security / guarantee) payments, which are credited to the real estate payment account when signing the Purchase and Sale Agreement for the immovable property.

That is, when a preliminary agreement is concluded, the transfer of real estate is not yet carried out, but such an agreement is identified as a contract with a client in accordance with International Financial Reporting Standard 15 "Revenue from Contracts with Customers"¹, and such an agreement is also recorded as a contract with a client.

That is, the requirements of Article 635 of the Civil Code of Ukraine stipulate that the obligation of the parties to the preliminary contract is the obligation to conclude the main contract within a specified period (term) stipulated by such preliminary agreement, and the parties agree in advance that paid security payments will be credited as payment for the real estate transferred.

As the preliminary real estate purchase agreement establishes the seller's obligation to enter into the real estate sale contract and the sale of the real estate is a transaction with the assets of the fund, and the funds received under such preliminary contract are included in the assets of the fund.

According to paragraphs. 13 clause 1 of Article 1 of the Law of Ukraine №5080, Joint Venture Funds — funds contributed by the founders of a corporate fund, funds and in the cases stipulated by this Law, other assets, attracted from participants of the Joint Venture Institute, income from transactions with assets of the Joint Venture Institute investment, income accrued on the assets of the joint venture, and other income from the activities of the joint venture (interest on loans, rent (leasing) payments, royalties, etc.).

¹ Mizhnarodnyi standart, Rada z Mizhnarodnykh standartiv bukhhalterskoho obliku [International Standard, International Accounting Standards Board], vid 30.06.2017, «Mizhnarodnyi standart finansovoi zvitnosti 15. Dokhid vid dohovoriv z klientamy» [in Ukrainian].

Funds raised by the founders of a corporate fund are considered joint venture funds after such a fund is entered in the Register.

Assets of a joint venture formed at the expense of joint ventures, a set of property, corporate rights, property rights and claims and other assets stipulated by the laws and regulations of the National Securities and Stock Market Commission (SSMCS).

Under preliminary agreements, ICI receives from the potential buyers security / guarantee payments to ensure fulfillment of obligations under the previous agreement, which after the conclusion of the sale and purchase contracts for apartments are credited to pay the cost of such apartments.

Operations for obtaining a security / guarantee payment are recorded when forming the financial result before tax in accordance with accounting rules.

Such rules are established by national or international standards.

According to article 10, paragraph 10, of the Law of Ukraine №5080, a joint venture is a corporate investment or mutual fund (AMC and Mutual Fund) and, accordingly, assets (including cash) that are accounted on the balance sheet of a mutual fund are assets of the institute co-investment, which indicates the extension of the relevant benefits to transactions with the above assets.

Paragraph 1 of Article 43 of the Law of Ukraine №5080 establishes requirements for accounting of AMC and mutual fund operations.

Accounting and tax accounting of joint venture operations and results of operations carried out by an asset management company through a unit trust is carried out separately by the asset management company from accounting for its operations and results of operations and accounting for operations and results of activities of other institutions. joint ventures, the assets of which are under its management.

The assets structure of a non-diversified ICI (excluding venture ICI) must meet the following requirements:

the value of real estate and securities, which are not admitted to trading on the stock exchange, may not be more than 50 percent of the total value of assets of ICI non-diversified type;

promissory notes and savings (deposit) certificates may not be more than 30 percent of the value of assets of a ICI non-diversified type.

Venture fund assets may consist entirely of funds, non-mobility, corporate rights, claim rights, and securities not previously admitted to trading on the stock exchange.

Accordingly, the assets of the venture fund also include cash. In accordance with International Financial Reporting Standards (IFRS):

An asset is a resource controlled by an entity in the wake of past events that is expected to receive future economic benefits to the entity;

Liabilities are the present debt of an entity that arises from past events and the repayment of which is expected to result in the entity being deprived of resources embodying future economic benefits.

That is, the future economic gain embodied in an asset is the potential that may contribute (directly or indirectly) to cash and cash equivalents, and based on International Standards, financial indicators are recognized on an accrual basis that provides for the recognition of the effects of operations, other events and circumstances on the economic resources of the entity and the requirements therefor, in the periods in which such effects occurred, even if the corresponding cash and payment is received in and shomu period and, when assessing compliance with Article definition of an asset or liability, should consider the economic substance of the transaction.

The decision of the National Commission on Securities and Stock Market No. 2666 of November 26, 2013 approved the Regulations on the peculiarities of accounting of operations of joint investment institutions, according to paragraph 1

And what is the accounting of the activities of the joint venture institutions in accordance with the Law of Ukraine: *On Accounting and Financial Reporting in Ukraine*, International Financial Reporting Standards.

Decision of the National Securities and Stock Market Commission (SSMCS) of July 30, 2013 №1336¹ approved the Regulation on the procedure for determining the value of net assets of joint venture institutions, according to which the calculation of net assets also includes cash on current and/or current assets deposit accounts.

SSMSC decision approving the Regulations on the Composition and Structure of Assets of a Joint Venture Institute (Section V.

Requirements for the Composition and Structure of Non-Diversified ICI) assets) determined that the assets of a non-diversified ICI can be all the assets defined in Section II of this Regulation, subject to the statutory limits for non-diversified ICI).

According to subparagraph 141.6.1 of paragraph 141.6 of Article 141 of the TCU, joint venture funds are exempt from taxation, namely: funds contributed by the founders of a corporate fund, funds and other assets attracted by participants of a joint venture, income from transactions with assets of a joint venture institute, income accrued on assets of the joint venture, and other income from the activities of the joint venture (interest on loans, rent [leasing] payments, royalties, etc.).

It should be noted that the accounting and tax accounting of joint venture operations and results of an asset management company through a unit trust is carried out by the asset management company separately from the accounting for the transactions and the results of its business activities

¹ Polozhennia pro poriadok vyznachennia vartosti chystykh aktyviv instytutiv spilnoho investuvannia [Regulations on the Procedure for Determining the Value of Net Assets of Joint Venture Institutions]: zatv. rishenniam Natsionalnoi komisii z tsinnykh paperiv ta fondovoho rynku vid 30 lypnia 2013 roku №1336 Ofitsiyni visnyk Ukrainy, 2013, № 72 (27.09.2013). St. 2645 [in Ukrainian].

and accounting for operations and the results of the activities of other joint venture institutions whose assets are under its management (Part 1 of Article 43 of the Law of Ukraine: *On Collective Investment Institutions*).

According to subparagraph 14.1.172. Article 14 of the Tax Code, tax consultation — individual tax advice and general tax advice provided in the manner provided by this Code;

In the tax consultation dated 30.05.2018 N2375 / 6 / 99-99-15-02-02-15 / PKI determined that according to Nos. 134.1.1 n. 134.1 Art. 134 PKU, the object of taxation of corporate income tax is profit with source of origin from Ukraine and beyond, which is determined by the method of adjustment (increase or decrease) of the financial result before tax (profit or loss) specified in the financial statements of the enterprise in accordance with national accounting standards (standards) or International Financial Reporting Standards, the differences arising in accordance with the provisions of the Code.

It is also stated that the income of a venture investment fund derived from the sale of property that is an asset of a joint venture is an income of a joint venture which is exempt from income tax in accordance with paras. 141.6.1 § 141.6 Art. 141 PKU.

That is, according to paragraphs. 141.6.1 § 141.6 Art. 141 PKU is exempt from taxation on income that is recognized in accounting rules.

Thus, ICI revenues from transactions with the assets of a joint venture institute are exempt from corporate income tax, including: income derived from the sale of real estate that will become the property of ICI upon completion of the residential building; security/guarantee payments for real estate received on the basis of previous purchase and sale contracts and after the conclusion of purchase and sale contracts for apartments based on previous contracts are credited to the cost of such apartments.

In line with the consultations of the State Fiscal Service of Ukraine and in particular, it is specified in the State Fiscal Service of Ukraine Letter № 6557/6 / 99-99-15-03-02-15 dated on 30 March 2017¹.

The tax consultation, which is registered in the unified register of tax consultations under № 5210/6 / 99-99-15-03-02-15 / ITC dated 12.12.2018, states about the exemption from corporate income tax investment fund in the form of security payments for housing facilities received from the sale of apartments that will become the property of the corporate investment fund and the assets of ICI on the basis of the contract on the organization of construction.

In the letter of the DFS dated 30.03.2017 No. 6557/6 / 99-99-15-15-03-2002-15 also stated that tax-exempt co-investment funds are exempted, namely: funds contributed by the founders of the corporate fund, funds and other assets attracted from participants of the co-investment institute,

¹ DFS, Indyvidualna podatкова konsultatsiia [Individual tax consultation] vid 30.05.2018 № 2375/6/99-99-15-02-02-15/IPK. URL: <https://www.zakon-i-normativ.info> (data zvernennia 11.08.2019) [in Ukrainian].

income from the operations of the assets of the joint venture, the income accrued on the assets of the joint venture, and other income from the activities of the joint venture (interest on loans, lease payments, royalties, etc.) (par. 141.6.1 p. 141.6 of Art. 141 Tax Code of Ukraine).

Accordingly, any income of a joint venture institute is exempt from corporate income tax, including: income derived from the sale of apartments that will become the property of a corporate investment fund on the basis of an investment agreement with a developer upon completion of a residential building; advances for housing stock received on the basis of previous purchase and sale contracts and after the conclusion of purchase and sale agreements for apartments based on previous contracts are credited to the cost of such apartments.

Separately, it should be noted that the requirements of the TCU for the time of providing tax advice from 30.03.2017 N6557 / 6 / 99-99-15-03-02-15 and No. 5210/6 / 99-99-15-03-02-15 /ITC of 12.12.2018 regarding the definition of the provisions governing the issues above and mentioned the request for advice was unchanged.

Conclusions.

Accordingly to the foregoing, in the course of conducting transactions on sale of real estate by concluding a preliminary contract with the subsequent conclusion of the main contract of sale and purchase of real estate the income is recognized at the moment of transfer of ownership of such property to the buyer, and in case such sale makes CII, such income shall be exempt from taxation in accordance with Article 141, Section 141.6, subparagraph 141.6.1, of the TCU.

Funds received under a preliminary sale agreement are included in the ICI assets after they are credited to the main real estate purchase agreement and are recognized as income from operations on the assets of the fund in accordance with international accounting standards and are subject to benefits in accordance with subparagraph 141.6.1 of clause 141.6 of Article 141 of Section III of the Tax Code of Ukraine and the said methodological approach should be used when conducting relevant economic studies on the material of tax audits.

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С. О. Козуб

**ПРОВЕДЕННЯ СУДОВИХ ЕКОНОМІЧНИХ ЕКСПЕРТИЗ
З ПИТАНЬ ОПОДАТКУВАННЯ ОПЕРАЦІЙ КОМПАНІЇ
З КЕРУВАННЯ АКТИВАМИ, ЩО ЗДІЙСНЮЄ УПРАВЛІННЯ
АКТИВАМИ ІНСТИТУТУ СПІЛЬНОГО ІНВЕСТИВАННЯ —
ПАЙОВОГО ВЕНЧУРНОГО ІНВЕСТИЦІЙНОГО ФОНДУ
ТА КОРПОРАТИВНОГО ІНВЕСТИЦІЙНОГО ФОНДУ**

Розглянуто порядок оподаткування операцій компанії з керування активами, що здійснює управління активами інституту спільного інвестування — пайового венчурного інвестиційного фонду та корпоративного інвестиційного фонду при проведенні судових економічних експертиз. Проблематика даного питання є вузько- спеціалізованою та в попередніх публікаціях не розглядалась, що відповідно обґрунтовує новизну даної теми. За результатами розгляду визначено певні особливості оподаткування операцій компанії з керування активами, що здійснює управління активами інституту спільного інвестування — пайового венчурного інвестиційного фонду та корпоративного інвестиційного фонду.

Ключові слова: пайовий фонд, попередні договори, кошти спільного інвестування, активи інституту спільного інвестування, інститут спільного інвестування, активи венчурного фонду, актив, зобов'язання, податкова консультація.

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O. O. Mykhalskyi,

PhD in Law, Laboratory Head at KhRIFE Kharkiv, Ukraine

ORCID: <https://orcid.org/0000-0002-4551-4043>

e-mail: mix3103@ukr.net

D. I. Fokin,

Senior Forensic Expert at KhRIFE, Kharkiv, Ukraine

ORCID: <https://orcid.org/0000-0002-2058-6032>

e-mail: den4ikfox507@ukr.net

S. O. Kiriakov,

Department Head at KhRIFE, Kharkiv, Ukraine

ORCID: <https://orcid.org/0000-0003-1442-4798>

e-mail: sergey_kiryakov@ukr.net

ISSUES OF DETERMINING CHARACTERISTICS OF WHEELS WITH HYBRID ENGINES ACCORDING TO UKRAINIAN CLASSIFIER OF GOODS OF FOREIGN ECONOMIC ACTIVITY

This article discusses the problematic issues of the study of the characteristics of wheeled plug-in hybrid electric vehicles (PHEVs) in accordance with the requirements of the Ukrainian classification of goods of foreign economic activity. Existing types of hybrid power plants are considered. We consider the problems that are solved by experts in automotive industry in the study of wheeled vehicles with hybrid power plants. Problems of determining the type of hybrid power plant of a wheeled vehicle, the principle of its operation, and, consequently, the influence of this on the determination of the code according to the UKT ZED (Ukrainian Classification of Goods for Foreign Economic Activity) are considered. Currently, in expert practice, there is no single approach in carrying out research to determine which characteristics the wheeled vehicle meets according to the Ukrainian Classifier of Goods of Foreign Economic Activity. In this article the main types and types of hybrid power units, the principles of their operation and the effect on the definition of the code under the UKT ZED are given.

In relation to wheeled vehicles to one or another code under the UKT ZED it is necessary to determine the scheme of the operation of the hybrid power plant. In this case, hybrid power units operating on a parallel and serially parallel circuit should be classified in the code of code 8703 2 "Other vehicles with spark ignition internal combustion engine and crankshaft coupling" or 8703 3 "Other vehicles from an internal combustion engine with compression ignition (diesel or semi-diesel), and hybrid power plants that operate in a sequential scheme to the code number 8703 90 90 00 "other" as not falling under the requirements of the other the position of the booty on the principle of its work.

Keywords: Ukrainian classifier of goods of foreign economic activity, plug-in hybrid, wheeled vehicles, internal combustion engines (ICE) with spark-ignition engine (SI engine), slider-crank linkage.

Formulation of Research Problem.

Nowadays, customs clearance of wheeled vehicles with hybrid engines often causes disputes between the State Fiscal Service of Ukraine and the owners of cars regarding customs clearance.

Analysis of recent researches and publications.

To date, the problem of the relationship of wheeled vehicles with hybrid engines in accordance with the requirements of the Ukrainian Classifier of Foreign Economic Activity to one or another heading has not been considered.

Research Purpose.

This article discusses the problem of determining the type of hybrid power unit of a wheeled vehicle, the principle of its operation, and, accordingly, the influence of this on the definition of the code according to UKT ZED.

Main content presentation.

At present, there is no single approach in expert practice in conducting studies to determine what characteristics a wheeled vehicle meets according to the Ukrainian Classifier of Goods of Foreign Economic Activity.

This article describes the main types and types of hybrid power unit, how they work, and how this will affect the definition of the UKT ZED code.

Nowadays, quite often FSI (forensic science institutions) are approached by enterprises, organizations and natural persons with the request to determine what characteristics (including type) corresponds to vehicles according to the Ukrainian Classifier of Goods of Foreign Economic Activity, since there are disputes between declarants and customs authorities.

For example, cars with hybrid power units (motors) where the electric and internal combustion engines are located are classified by the customs authorities as ordinary vehicles equipped only with a spark ignition or pressure ignition product group 8703 21

– “other vehicles with spark ignition internal combustion engine and crank” or 8703 3 “other vehicles compression-ignition internal combustion engine (diesel or semi-diesel)”,

The difference between customs payments has a very significant difference, since the tax rates for vehicles equipped with spark ignition or compression-ignition internal combustion engines depend on the engine capacity and the life of the engine and is calculated by the following formula:

Rate = Base Rate x Kmotor x Quick¹,

where Base Rate is the EURO tax rate per vehicle unit:

with spark ignition internal combustion engine and crank mechanism– 50, 0;

with compression-ignition internal combustion engine (diesel or semi-diesel): 75, 0;

Kmotor is coefficient determined by the division of the volume of cylinders of the internal combustion engine of the respective vehicle into the cube. cm per 1000 cubic meters. cm;

Quick is the coefficient equal to the number of full calendar years from the year following the year of manufacture of the respective vehicle to the year of determining the tax rate (for new vehicles and vehicles used up to one full calendar year, the coefficient is 1)¹.

At the same time, the tax rate for vehicles specified in exclusively electric motors (one or more) is set at 1 euro per 1 kW of electric vehicle battery capacity of such vehicles.

The tax rate for other vehicles listed in heading 8703 90 10 90, 8703 90 90 00 in accordance with UKT ZED is set at EUR 100 per item.

That is, if you calculate a tax rate, such as a hybrid car equipped with an electric motor and an internal combustion engine with a displacement of 1500 cc. with a shelf life of 6 years we have the following results:

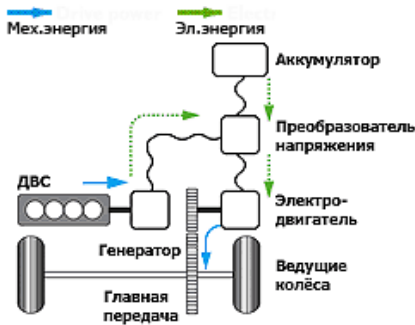
Classification of the car according to UKTZED 2	Tax amount, UAH.
8703229010: "8703 22 – equipped with a cylinder capacity exceeding 1 000 cm ³ but not exceeding 1500 cm ³ : 8703 22 10 00 – – – new 8703 22 90 – – – Used: 8703 22 90 10 – – – – not more than 5 years old"	Rate = Base Rate x Kmotor x Quick. Rate = =50x1, 5x6=450, 00 EURO.
8703 90 90 00: "8703 90 10 00 – – vehicles equipped with electric motors 8703 90 90 00 – – others"	100 EUROS.

As we can see the rate, the tax calculated for different product sub-categories differs 5 times.

¹ Pro vnesennia zmin do Podatkovoho kodeksu Ukrainy [On Amendments to the Tax Code of Ukraine]: Zakon Ukrainy vid 8 lystopada 2018 r. № 2611–VIII. Vidomosti Verkhovnoi Rady Ukrainy. 2018. № 48. St. 379. URL : <http://zakon.rada.gov.ua/laws/show/> (data zvernennia: 27.06.2019) [in Ukrainian].

To eliminate the differences in the approaches of classification of cars with hybrid powertrains it is necessary to dive into the specifics of the structure of the car and the principle of its operation.

According to the principle of the interaction of electric and fuel components of cars, hybrid drives are divided into three types: serial, parallel and serial-parallel.



1. Sequential scheme.

This is the simplest hybrid configuration. The internal combustion engine is used only for the drive of the generator, and the electricity produced by the latter charges the battery and feeds the motor, which rotates the drive wheels. e eliminates the need for a gearbox and clutch.

Regenerative braking is also used to

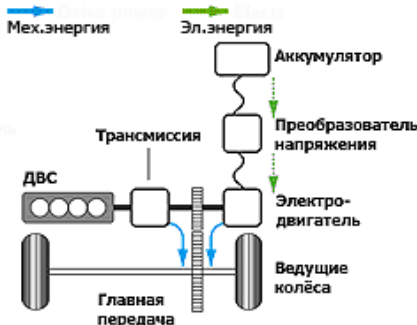
charge the battery.

The circuit got its name because the power flow enters the drive wheels, undergoing a series of successive transformations.

From the mechanical energy produced by the internal combustion engine to the electric energy produced by the generator, and again into the mechanical one.

The sequential hybrid allows the use of low-power ICE, and it is constantly operating in the range of maximum efficiency, or it can be completely turned off.

When the engine is switched off, the electric motor and the battery are able to provide the necessary power for movement.



2. Parallel scheme.

Here, the drive wheels are driven by both the engine and the motor (which must be reversible, that is, it can operate as a generator). For their coordinated parallel work computer control is used.

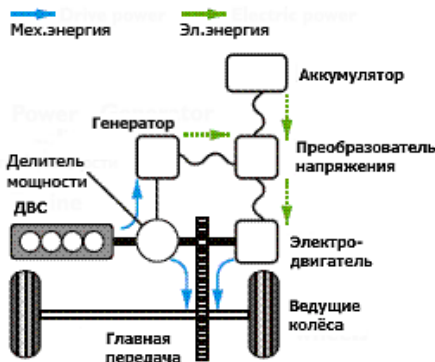
The torque from two sources is distributed

depending on the driving conditions: in transient modes (start, acceleration), an electric motor is connected to the help of an internal combustion engine, and in steady-state modes and when braking it acts as a generator, charging the battery.

Thus, in parallel hybrids most of the time the engine is running, and the motor is used to assist it.

Therefore, parallel hybrids can use a smaller battery compared to the serial ones.

Because the ICE is directly connected to the wheels, the power loss is also much smaller than in the serial hybrid.



3. Serial-parallel scheme.

A separate generator and power divider (planetary mechanism) is added to the parallel hybrid scheme.

As a result, the hybrid acquires the features of a consistent hybrid: the car moves and moves at low speeds only on the electric train.

At high speeds and when moving at a constant speed ICE is connected.

At high loads (acceleration, uphill movement, and the like), the motor is additionally fueled by the battery — that is, the hybrid works in parallel.

Due to the availability of a separate generator that charges the battery, the motor is only used for wheel drive and for regenerative braking.

The planetary mechanism transmits some of the power of the ICE to the wheels and the other to the generator, which either feeds the motor or charges the battery.

The computer system constantly adjusts the power supply from both power sources for optimum operation in all traffic conditions.

In this type of hybrid, the motor runs most of the time, and the engine is only used in the most efficient modes.

Therefore, its power may be lower than in a parallel hybrid.

Conclusions.

Thus, in the opinion of the authors, in relation to the CTE to a particular code according to the UKT ZED, it is necessary to determine the scheme of operation of the hybrid power plant.

In this case, the hybrid power units operating in parallel and sequentially-parallel scheme must be classified under heading 8703 2

- “other vehicles with spark ignition internal combustion engine and crank” or 8703 3
- “other vehicles compression-ignition internal combustion engine (diesel or semi-diesel)” and hybrid powerplants operating in series according to heading 8703 90 90 00
- “others”, as such that do not fall under the requirements of other heading under the principle of their work.

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О. О. Михальський, Д. І. Фокін, С. О. Кір'яков
ПИТАННЯ ВИЗНАЧЕННЯ ХАРАКТЕРИСТИК КОЛІСНИХ
ТРАНСПОРТНИХ ЗАСОБІВ З ГІБРИДНИМИ ДВИГУНАМИ У
ВІДПОВІДНОСТІ З УКРАЇНСЬКИМ КЛАСИФІКАТОРОМ ТОВАРІВ
ЗОВНІШНЬОЕКОНОМІЧНОЇ ДІЯЛЬНОСТІ

Розглянуто проблемні питання щодо дослідження характеристик колісних транспортних засобів з гібридними двигунами відповідно до вимог Українського класифікатора товарів зовнішньоекономічної діяльності. Розглянуто існуючі типи гібридних силових установок. Вивчено завдання, що вирішуються експертами автотоварознавцями при дослідженні колісних транспортних засобів з гібридними двигунами.

Ключові слова: Український класифікатор товарів зовнішньоекономічної діяльності, гібридна силова установка, транспортні засоби, двигуни внутрішнього згоряння з іскровим запалюванням, кривошипно-шатунний механізм

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O. S. Dontsova,

Senior Forensic Expert at KhRIFE

ORCID:<https://orcid.org/0000-0002-4828-5450>

e-mail: olgadoncovan@ukr.net

A. A. Sych,

Researcher at KhRIFE

ORCID:<https://orcid.org/0000-0002-7915-3506>

e-mail: anna82017@ukr.net

review article

ROLE OF FORENSIC MERCHANDISING IN CONSUMER PROTECTION CASES

This article content is aimed at characterization of urgent problematic issues, which are connected with determining the place of forensic expertise in cases related to the protection of consumer rights and the development of ways of solving emerging problems. The article emphasizes that in accordance with the current legislation, consumers have the right to protect their rights to the necessary quality, safety of goods and services, as well as the right to compensation for losses caused by goods of inadequate quality, dangerous to life and health, etc. It is determined that the main control in the sphere of trade is exercised by the State Service for Product Safety and Consumer Protection, and it is established that the problems are the inability of this service to carry out an instant check on a consumer complaint of a particular point of sale.

At the present stage, the problem of citizens' rights including rights in the sphere of consumption, is extremely urgent, because accession of Ukraine to the European Union requires the application of European standards of product quality. In developed country, the consumer is a major player in market relations, which is focused on the production and improvement of the quality of goods and services. The application of sanctions to sellers, manufacturers of poor-quality products does not always give the necessary effect, because usually an unscrupulous manufacturer (seller, executor) pays a fine and continues to provide poor quality services, to supply products that are dangerous to life and health.

Important factor in improving the quality of products and services provided is the legal knowledge of consumers themselves in protecting their rights. Consumer rights have a prerogative over the rights of sellers and producers, since human life and health under the Constitution of Ukraine is a fundamental value of the state.

The authors described the actions that the consumer should take to protect their violated rights, and emphasized that in cases where the consumer seeks to restore justice for this issue, he should ask an expert institution to perform a forensic trade research.

Keywords: consumer, goods, protection of rights, legislation, quality of goods, forensic science.

Formulation of Research Problem.

The regulation of relations between consumers of products and services and their manufacturers is carried out by the legislation of Ukraine and international enforcement acts.

The law itself, regardless of the ownership of the manufacturer, provides for consumer protection.

However, it is often left out of the question of those aspects that may not be taken into account by the consumer during the purchase of the goods or services, and in the future create the basis for possible compensation for damage caused by defects in the goods or services.

Such relations are governed by the laws of Ukraine including the Laws of Ukraine:

- *On Consumer Rights Protection*¹ regulating the relations between consumers of goods, works and services and producers and sellers of goods, contractors and service providers of various forms of ownership, establishes consumer rights, and defines the mechanism of their protection and the basis for the implementation of state policy in the field protection of consumer rights;

- *On Liability for Damages Caused by Product Defects* regulating the relations regarding liability for damage caused by a defect in a product put into circulation in Ukraine,

- *On Basic Principles and Requirements for Food Safety and Quality* regulating the relations between executive authorities, food market operators and food consumers, and defines the procedure for ensuring the safety and individual quality indicators of food produced, imported (shipped) to the customs territory of Ukraine and / or exported (shipped) from², etc.

Along with the current consumer protection legislation, forensic expertise helps to establish the truth in consumer protection cases.

At the present stage, expert practice does not fully meet the needs of judicial investigative bodies, legal entities and ordinary citizens in solving the problematic issue of consumer protection cases in assessing the actual quality and value of counterfeit, non-standard, substandard consumer goods.

The relevance of this topic is determined by the need to determine the place and develop common common approaches to the appointment of forensic expertise in consumer protection cases, as there are currently no methodological materials to address this problematic issue.

Analysis of recent research and publications.

¹ Pro zakhyst prav spozhyvachiv [On Consumer Protection]: Zakon Ukrainy vid 12.05.1991 № 1023–KhII (zi zminamy ta dopovnenniamy) Vidomosti Verkhovnoi Rady Ukrainy (VVR). 1991. № 30. St. 380 [in Ukrainian]..

² Pro osnovni pryntsypy ta vymohy do bezpechnosti ta yakosti kharchovykh produktiv [On basic principles and requirements for food safety and quality] : Zakon Ukrainy. № 771/97–vr. Vidomosti Verkhovnoi Rady Ukrainy (VVR), 1998, № 19. St. 98. URL: [https://zakon.help/law/771/97-%D0%92%D0%A0/edition04.04.2018/\(data zvernennia 21.06.2019\)](https://zakon.help/law/771/97-%D0%92%D0%A0/edition04.04.2018/(data%20zvernennia%2021.06.2019)) [in Ukrainian].

Researches in the field of consumer protection were conducted by: O. M. Galkin, O. V. Zverev, T. O. Kagal, M. M. Kuzmin, L. V. Krychkovskaya, I. A. Petrova, T. M. Kolomiets, N. V. Pritulskaya, O. L. Romanenko, A. V. Rabinovich, V. D. Pchelkin and others. In their textbook: *Forensic examination of goods*, T. M. Kolomiets, N. V. Prytulskaya, A. L. Romanenko pay considerable attention to the issues of technology of conducting examinations with differentiation into examination of quality, quantity and other specific features; document their results, identify requirements and characterize the status of the marking of goods in accordance with applicable standards.

Among other domestic scientists, O. M Galkin, on the basis of the analysis of the current legislation of Ukraine and the practice of its implementation, determined the administrative and legal principles of ensuring the safety and quality of food products and outlined the ways of their further development.

M. M. Kuzmina researched on legal nature and content of consumer protection in the Internet commerce network and analyzed the case law of considering cases in the field of consumer rights protection in Internet commerce.

IA Petrova noted that preventing offenses related to the supply of harmful products to the market allows the quality control of goods carried out in Ukraine at several levels of management: at the level of enterprises, sectoral and state.

This control prevents the formation of those properties of products that do not meet the requirements of regulatory documents, even at the stage of manufacture.

The author emphasizes that the most stable quality of manufactured products are the enterprises that have developed and implemented modern quality systems in accordance with the requirements of international standards ISO 9000 series, have mastered the principles of general quality management¹.

In the manual (authors: I. A. Petrova S. O. Petrov, L. V. Krychkovska, Dubonosov VL) methodological features of expert study of quality and safety of consumer goods are analyzed in detail, general approaches to characterization of features are given. identification and detection of fraud.

The detailed description of the general aspects of quality assessment of food and non-food products, determination of ecological safety of production of products and factors that affect the quality of goods in the process of turnover are given.

¹ Petrova I. A. Orhanizatsiia kontroliu yakosti tovariv yak sposib poperedzhennia pravoporushen] [Organization of quality control of goods as a way to prevent offenses] Visnyk Kharkivskoho natsionalnoho universytetu vnutrishnikh sprav. 2013. № 4 (63). S. 188–199 [in Ukrainian].

However, there is a need for further elaboration of this issue, taking into account the constant change of economic conditions and the development of legislation.

The purpose of the article is to outline topical issues related to determining the place of forensic expertise in consumer protection cases and developing ways of their solving.

Main content presentation.

Consumer protection in all developed and developing countries is at the forefront.

In 1961, President John Kennedy, for the first time in Congress, expressed his views on protecting consumer rights and outlined their fundamental rights: the right to quality goods and services; the right to have reliable information about them; the right to safety; the right to defend their consumer claims in court.

They later added to the right to consumer education, the right to damages, the right to meet basic needs and the right to a healthy environment.

Subsequently, March 15, 1962, the world began to celebrate as the World Consumer Protection Day¹.

Currently the problem of citizen rights, including consumer rights, is extremely urgent, since Ukraine approximation to the European Union requires the application of European standards of product quality and the creation of preconditions for the exercise of the right of every citizen to a decent level of services and products consumed.

In the developed country, the consumer is a major player in market relations, which is focused on the production and improvement of the quality of goods and services.

Applying sanctions to sellers, manufacturers of low-quality products does not always have the necessary effect, since usually the unscrupulous manufacturer (seller, contractor) pays a fine and continues to provide poor-quality services, supplying products that are dangerous to life and health.

An important factor in improving the quality of products and services provided is the legal awareness of consumers themselves in protecting their rights.

Consumer rights must prevail over the rights of sellers and producers, since human life and health are, according to the Constitution of Ukraine, a fundamental value of the state.

Consumers, in accordance with applicable law and in accordance with Art. 3 of the Consumer Protection Law, have the right to protect their rights in respect of quality, safety of goods and services, as well as the right

¹ Problemy zakhystu prav spozhyvachiv v Ukraini ta shliakhy yikh vyryshennia [Consumer protection issues in Ukraine and ways to solve them]. URL : <https://consumerhm.gov.ua/774-problemi-zakhystu-prav-spozhyvachiv-v-ukrajini-ta-shlyakhi-jikh-virishennya> (data zvernennia 17.06.2019) [in Ukrainian].

to compensation for damage caused by goods of poor quality, life-threatening and health hazards, etc¹.

Such a right is confirmed by the Law of Ukraine: *On Liability for Damages Caused by Product Defects*.

It should be noted that Ukraine was one of the first among the post-Soviet countries to adopt the Law: *On Consumer Rights Protection*.

However, this was not a push to take the issue of consumer protection to a high and high standard.

This is due to the fact that in addition to the laws passed, it necessary to create the preconditions for their effective implementation and implementation.

Quite often Ukrainians have to deal with the fact that the quality of the goods they buy at different outlets leaves much to be desired.

In shops, supermarkets, and even in markets that are trusted by many of our compatriots by ancient habits, you may encounter non-standard, defective and overdue goods every now and then.

According to the reports of the State Consumer Service, last year inspections were carried out in 4873 business entities, and violations were found in 1984 from them, ie in 40% of cases.

The most common violation was the lack of necessary, accessible, reliable and timely information on products (including non-standard ones): 74,8% of cases and sale of goods with an expired shelf life was only 17,2%.

At the moment, the main control in the sphere of trade is exercised by the State Service of Ukraine for Food Safety and Consumer Protection, which started operating only in 2016, after several services and inspections have been combined.

It is up to this service to file a complaint, after which the State Consumer Service must conduct a shop, market or market check.

The problem is that an instant check of a particular point of sale of the State Consumer Service cannot.

It is necessary to spend 14 days in coordination with the Ministry of Economic Development and Trade and 5 days in the State Regulatory Service. After this period, when the service comes to check, the stores, as a rule, have long hidden or disposed of all overdue, defective or non-certified goods.

As a result, the result of such inspections does not demonstrate the mass disclosure of the sale of such a product.

In order to ensure a high level of protection of the health of citizens and to satisfy their social and economic interests and to approximate the legislation of Ukraine with the legislation of the European Union in the field of safety and quality of products, on July 22, 2014, the Verkhovna Rada of Ukraine adopted the Law: *On Amendments to Certain Legislative Acts of Ukraine food products*.

¹ Pro zakhyst prav spozhyvachiv [Consumer Protection]: Zakon Ukrainy. Vidomosti Verkhovnoi Rady Ukrainy (VVR). 1991. № 30. St. 380 [in Ukrainian].

The main purpose of this Law is approximation of the legislation of Ukraine to the legislation of the European Union in the field of safety and quality of products, formation of a high level of consumer protection, creation of transparent conditions for business activity, increase of the level of competitiveness of Ukrainian foodstuffs and reduction of their prices, introduction of European principles of regulation of GMO. specific requirements for the state control procedures for food quality in the market of Ukraine and imported products according to European practice, the establishment of a mechanism of self-regulation by market operators on the general requirements of legislation on food hygiene.

In addition, this Law supplements the *Code of Ukraine on Administrative Offenses* by Article 166-22 *Violation of the requirements of the legislation on safety and certain indicators of food quality*", which provides for penalties for a number of offenses, namely:

- implementation of unregistered objects of sanitary measures, stipulated by the Law of Ukraine: *On Quality and Safety of Food Products and Food Raw Materials* entails imposing a fine on citizens from forty-five to sixty non-taxable minimum incomes of citizens;
- junk food circulation entails a fine for citizens of thirty to forty-five non-taxable minimum incomes;
- violation of the safety parameters of the sanitary measures objects, established by the legislation on safety and certain indicators of food quality entails the imposition of a fine on citizens from fifty to sixty non-taxable minimum incomes of citizens.

It is hoped that the provisions of the Act will be effective in practice and will lead to improved consumer protection.

Verkhovna Rada adopted the Law: *On Consumer Information on Foodstuffs* establishing the legal and organizational framework for providing consumers with information on foodstuffs in order to ensure a high level of protection of citizens' health and to satisfy their social and economic interests.

This Law sets out the general principles for the provision and requirements for food information provided to consumers, in particular on the labeling of food products, as well as the obligations of food market operators to communicate this information to other food market operators and to consumers.

In addition, the Law defines: the content of the main terms used in this field; general requirements for food information; what information is mandatory and voluntarily provided; responsibilities of food market operators; the procedure for the placement and presentation of food information; features of marking and state control, etc.

An important factor in reaching a new level of quality protection and protection of consumer rights is the legal and consumer awareness of a person who knows their rights and understands how they can be protected.

In developed countries, civil society organizations, which focus their activities on counteracting dishonest producers and sellers, as well as

helping ordinary citizens to defend their rights and interests in the judiciary and public authorities, take the leading role in protecting consumer interests.

Nor can it be neglected that the key to success in achieving high standards of quality of life is the cooperation of government agencies, NGOs and consumers.

Consumer culture should be used to educate children from a young age, because the right quality of goods and services is not only safety for life and health, but also respect for human dignity.

It is not enough for the consumer to know that the product can be returned within fourteen days, because the Law of Ukraine: *On Consumer Rights Protection* provides for other rights of the buyer and consumer of services. They need to understand that they have the ability to protect their rights when they receive services such as footwear repair, hairdresser services, vehicle inspection.

When receiving poor quality services, the consumer is entitled to compensation.

The main point that complicates the situation regarding the protection of consumers' rights and interests is the indifferent attitude of people to their rights.

Often, the consumer does not want to get involved in long-term litigation because of the low cost of poor quality purchased products or little harm to health.

Not all people understand that their passivity in this matter leads to a deterioration in the quality of food, electrical goods, drinking water, utilities, and lower living standards in general.

You should always remember that consumer rights are an integral part of human rights.

Consumer satisfaction in a developed European country should be a priority in the activities of public authorities.

In order to improve the quality of life, one should not rely on anyone and start defending their rights independently, demanding and encouraging manufacturers (sellers, contractors) to fulfill the requirements of the law and not violate consumers' rights to protection from goods and services of poor quality, to accessible, reliable, complete and timely information on goods and services, on the free conscious choice of quality products.

It is necessary to establish a civilized dialogue between public authorities, business and consumers in order to get the best result in the field of consumer safety, since Ukraine's approaching to the European community presents new challenges for our country, in particular in the field of protection of consumers' rights and interests.

Every conscious citizen should feel responsible because changes for the better depend on the efforts of one and all, on the awareness of their personal role in improving consumer culture and safety.

It should be emphasized that the legal awareness of consumers in Ukraine is very low.

All shoppers in the stores see the Consumer Protection Law of Ukraine in the corner of the consumer, but most often they are not interested in familiarizing themselves with the rights stated therein in order to be able to exercise them and defend their interests. Actions that the consumer must take to protect his or her violated rights:

- while purchasing a product or receiving a service, you must keep a check that confirms the purchase or receipt of the service.

- In case of discrepancy of a product or service, an appropriate statement (appeal, complaint, claim) should be addressed to the seller (manufacturer, contractor) for damages.

The application (complaint, request, request) is sent to the legal address of the seller, the manufacturer with a letter with a description and notification of delivery.

If the seller (manufacturer) does not respond in any way to the claim for reimbursement, you should file a complaint (complaint) with the public authorities, which are obliged to protect the consumer's rights. Today, these functions are performed by the State Consumer Protection Inspectorate of Ukraine and its territorial bodies.

- Another option to protect the rights and interests of the consumer is to sue for damages for poor quality goods and services.

- In parallel, the consumer can seek help from a non-governmental organization that specializes in upholding citizens' rights to quality goods and services.

Non-governmental organizations of this type will help to carry out all necessary examinations and inform what evidence should be provided to the court in order to successfully settle the case in favor of the consumer.

In addition, it will be advisable to seek the services of a qualified lawyer who will help prepare all the necessary documents to file a lawsuit, as well as protect the consumer's rights in court and in relations with the seller, manufacturer or service provider.

In cases where the consumer tries to restore justice in this problematic issue, he asks the expert institutions to conduct commodity research of the goods.

For example, if during the warranty period it is necessary to determine the reasons for the loss of product quality, the seller is obliged to arrange for the expert examination of the product within three days from the receipt of the written consent from the consumer.

If the expert's findings prove that the defects arose after the product was delivered to the consumer due to violation of the established rules of use, storage or transportation or the actions of third parties, the consumer's requirements shall not be satisfied and the consumer shall be obliged to reimburse the seller for the cost of forensic examination.

In addition, the consumer, the seller (contractor, manufacturer) have the right to appeal the expert's findings in court.

If the expert concludes that the defect is to be remedied, then the consumer of his choice has the right to demand from the seller a reduction

in the price of the product, free repair or compensation for the cost of eliminating the defects of the goods.

If the examination establishes that the defect in the goods can not be eliminated, the elimination of this defect takes more than 14 days, or after elimination of the defect the goods will be substantially other than provided for the supporting documents, then the consumer has the right to demand termination of the contract of sale and return of the paid for goods of a monetary amount, to demand replacement of the goods for the same goods or for a similar one, from the number available from the seller.

Conclusions.

Given the pressing problems of today, one of which is the protection of consumers' rights against counterfeiting and the decline in the quality of goods, one can trace in line with this increasing importance of forensic expertise.

In addition, it should be emphasized that trade specialists of the new formation should: be able to assess the quality, consumer preferences of goods, their compliance with standards, norms, requirements of laws, distinguish counterfeit goods, surrogate goods, non-standard, unsorted goods; to advise buyers, to influence the creation of public opinion on certain goods in the market, based on the knowledge of their high quality; to provide real assistance to the consumer in the choice of the goods, to formulate and provide the creation of modern consumer properties of goods in a positive way.

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О. С. Донцова, Г. А. Сич
Оглядова стаття

МІСЦЕ СУДОВО-ТОВАРОЗНАВЧИХ ЕКСПЕРТИЗ У СПРАВАХ ПРО ЗАХИСТ ПРАВ СПОЖИВАЧІВ

Окреслено актуальні проблемні питання, пов'язані з визначенням місця судово-товарознавчих експертиз у справах про захист прав споживачів і розробкою шляхів вирішення проблем, що виникають. Споживачі згідно з чинним законодавством мають право на захист своїх прав щодо належної якості, безпеки товарів та послуг, а також право на відшкодування збитків, завданих товарами неналежної якості, небезпечними для життя та здоров'я тощо. Визначено дії, які споживач повинен вчинити для захисту своїх порушених прав, та підкреслено, що у випадках коли споживач намагається відновити справедливість у цьому проблемному питанні, він має звернутися до експертних установ з проханням провести товарознавчі дослідження товарів.

Ключові слова: споживач, товари, захист прав, законодавство, якість товарів, судова експертиза.

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I. V. Sabadash,

PhD in Law, Senior Researcher at KhRIFE, Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0003-1967-9271>

e-mail: saba-inna@ukr.net

V. N. Hubareva,

Senior Researcher at KhRIFE

Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0003-1425-4469>

e-mail: victory2006@ukr.net

PROBLEMS REGARDING COST ESTIMATE FOR FORENSIC COMMODITY RESEARCH

The development of new directions while performing of various types of examinations and forensic researches is one of the priority areas of scientific activity of experts of forensic science institutions of the Ministry of Justice of Ukraine. One of problematic issues arising at the present stage of the development of forensic trade analysis is determining the cost of services, choosing a methodological approach and method for performing aforesaid researches, the limits of competence of forensic trade experts while determining the cost of certain services. Creating methodological recommendations “Determining the Cost of Services while performing forensic trade analysis «will contribute to the improvement of the quality of expert practice in carrying out the forensic examinations in this field.

Whole performing forensic trade researches to determine the cost of services in the framework of the expert subject field 12.1. «Determining the cost of machinery, equipment, raw materials and consumer goods» raises a lot of disputes and doubts, both among forensic experts working in state expert institutions and among appraisers. This is due to the fact that the service is considered to be a product that is endless that means intangible. Also, one of the arguments is that the word service is not listed in the title of specialty 12.1 and does not apply to objects of valuation in intangible form, according to the definitions of national standard No. 1 «General principles for property and property rights assessment».

At the 39th meeting of the section of forensic trade analysis at the Ministry of Justice of Ukraine which was held in May 2018, it was proposed to consider a research work on the topic: “Determining the cost of services while performing forensic trade examinations” will contribute to ensure objectivity and completeness of research on determining the cost of services, the formation of uniform methodological principles for performing examinations and forensic researches in this area filling in the gaps in determining the cost of services, using them for preparing and confirmation of the qualifications of forensic experts in relevant subject field.

Keywords: service, products, realization, intangible object, classification of services, assortment of services, tariff.

Formulation of Research Problem.

Development of new directions in the performance of different types of expertise and expert studies is one of the priority areas of scientific

activity of specialists of judicial expert institutions of the Ministry of Science of Ukraine.

One of the problematic issues that arises at the present stage of the development of forensic expertise is the determination of the cost of services.

While performing commodity research to determine the cost of services, within the expert specialty 12.1. *Determining the Cost of Machines, Equipment, Raw Materials and Consumer Goods* raises a great deal of controversy and doubt both among the forensic experts working at the State Expert Institutions and among the appraisers.

This is due to the fact that the service is considered a product that is immaterial, ie intangible.

One of the arguments is that word *service* is not included in the specialty 12.1 name and does not refer to valuation objects in intangible form according to the definitions of national standard №1: *General principles of property and property valuation* defining intangible valuation objects are valuation objects that do not exist in a tangible form but which provide some economic benefit.

Intangible assets include financial interests (shares (units, shares), options, other securities and their derivatives, promissory notes, accounts receivable and payables, etc.), as well as other property rights¹

It should be noted that the end result of the work for the provision of any service is evaluated in monetary terms, that is, the service is a kind of goods, proposals for which are available on the Ukrainian market and can accordingly be the object of evaluation.

In our opinion, this point of view is relevant, therefore, at the meetings scientific advisory and methodological council at the Ministry of Justice of Ukraine, it was noted that the problem of methodological regulation of solving the cost of services has not been solved so far.

Analysis of Current Researches.

We do not currently have any methodologies and guidelines for the preparation of forensic materials to evaluate the cost of services, and therefore we consider it necessary to carry out scientific development that will contribute to the formation of uniform methodological foundations, as well as the correct formulation of questions for the examination and expert research in this area.

At the 39th meeting of scientific advisory and methodological council at the Ministry of Justice of Ukraine which was held in May 2018, it was proposed to consider R&D on the topic: *Determining the cost of services in for performing forensic commodity researches.*

At the autumn 40th section of forensic expertise at the Ministry of Justice of Ukraine, Volyn Branch of Lviv Research Institute of Forensic

¹ Дyv.: Ofitsiynyi visnyk №37 2003 r. Natsionalnyi standart №1 «Zahalni zasady otsinky maina y mainovykh prav». Zatverdzheno Postanovoiu Kabinetu Ministriv Ukrainy vid 10 veresnia 2003 r. №1440 [in Ukrainian].

Examinations provided a package of documents on the topic *Determining the Cost of Services while Forensic Examination*. The work is planned to be completed within a period of 3 years, namely: from January 2019 to December 2021, the co-executor of the topic is the Hon. Prof. M. S. Bokarius Kharkiv research Institute of forensic examinations.

Research Purpose.

We substantiate the relevance of this development:

- this is the first time the topic has been addressed and the theoretical and practical aspects of service evaluation have not been covered;
- development of methodological recommendations based on this will ensure the objectivity and completeness of the research;
- classification and assortment of services will be carried out in the work;
- work will define the limits of competence of experts of commodity experts (what kinds of services may be objects of commodity expertise and expert research);
- list of output data needed to determine the cost of services will also be generated.

Main content presentation.

Here are the definitions under the Law of Ukraine: *On Consumer Rights Protection*:

“Service is contractor activity to provide (transfer) to the consumer a certain tangible or intangible good defined by the contract, which is carried out at the individual order of the consumer to meet his personal needs;

products – any product (product), work, or service that is manufactured, performed, or provided to meet public needs;

realization – activity of economic entities on sale of goods (works, services)”.

This R&D performers will analyze the objects of commodity research that will fully relate to services (its concept).

The work will be done to identify the range of services provided by enterprises of different ownership types, which are the most common and have a wide range of offers in the market of similar services, which will allow for comparative analysis of the cost of services.

Carrying out a costing study involves three steps:

- collection of raw data;
- search and collection of data regarding the cost of services provided by enterprises of different ownership;
- determining the cost of services.

In the first stage, the expert collects raw data on the list of materials, raw materials used and the types of work (services) that are performed to deliver the end result — the provision of the service.

The second stage is the search and collection of data on the cost of services provided by enterprises of different ownership, represented in the market of similar services, which have a wide range of offers for the

possibility of conducting and comparing types of services and goods, materials used, etc.

The third stage involves a comparative analysis of the proposals and averaging of the evaluation results regarding the cost of the service being investigated.

Since KhRIFE experts are developmental co-executors of topic: *Determining the cost of services for performing forensic commodity researches*”, we are offered an example of determining the cost of services, indicating the technology of service evaluation, the choice of methodological approaches and determining the cost of the service.

Objective of the assessment: to conduct a study of the estimated cost of placing promotional media on rolling stock A and B, in accordance with the attached tender documentation.

The study presents the tender documentation, according to which the *name of the competition subject* (for the right to use commercial experience and business reputation for the purpose of providing full-cycle advertising services under a commercial concession agreement):

Service # 1 — Provision of a service for distribution of a video log made by the manufacturer and at the manufacturer's own expense, taking into account the requirements of the Law of Ukraine “On Advertising” and the requirements of the Customer.

Service №2: providing a service for production and distribution of circulation of the logbook in accordance with the requirements of the Customer.

Service №3: Provision of indoor advertising service on Branch C trains according to customer requirements.

Service №4: additional types of advertising (subject to availability of advertising counterparty):

- distribution of disposable head restraints with advertising image of the winner of the competition;
- placement of additional promotional stickers in the cars;
- placement of advertising stickers on the outer surfaces of the rolling stock.

The technology of service evaluation is determined by the actual circumstances of a particular assessment situation. In the example above, the commodity research process is based on both the consideration of the input data presented for the commodity research entities and the available market information from different sources at the valuation date.

Evaluation technology (commodity research) of different categories of objects implies the division of the evaluation process into several stages:

- study and preliminary collection of the initial data on the object of evaluation (a service in the form of advertising media), on the basis of the raw data presented for conducting this commodity research;
- identification of the object during which its product characteristics are realized;

- substantiation and choice of methodological approaches to property valuation;
- estimation of the cost of the research object (cost) based on the chosen approach;
- conducting a detailed comparative analysis of the commercial offers of different price sources of the research object at the date of valuation. At this stage, the expert will finally weigh the acceptability of the chosen level of market value of services, determine the relevance of the situation of the market of commercial offers (price dynamics) for the considered evaluation period;
- in accordance with the tasks of the commodity research, this research on the question raised in the statement was conducted within the competence of the expert of the commodity expert, taking into account the provided initial data regarding the object of the research;
- Reconciliation of the obtained results and final conclusions about the cost of the service.

Based on the submitted identification documents are subject to the services, namely: providing video distribution service; provision of services for production and distribution of circulation of the logbook; provision of indoor advertising services on Branch C trains as required by the Customer; additional types of advertising (subject to availability of advertising counterparty).

Technical specification:

Service №1: Placement of a magazine (Video magazine – audiovisual work with materials of informational and entertaining nature: videos, videos, clips, audio-visual effects, other informative visual materials and advertising videos).

Requirements for the video log: timing of the video log: duration not less than 8 hours. 20 minutes broadcast.

Frequency of replacing the content of the video log: weekly 100% update of the video log, content titration. Must contain a variety of programs by genre (subject to copyright used in the video magazine), but without loudspeaker support.

Video magazine content should contain no more than 20% of the advertisement of the total volume of the broadcast.

Obligatory filling of the video magazine by the Customer.

Technical requirements for the video format of video magazines for uploading to video systems contained in D trains:

- file size to be uploaded to the video system: 3 files up to 3 gigabytes (GB).
- number of rolling stock: 10 units.
- video format: AVI, mpeg-TS
- video codec — mpeg-2, mpeg-4, H.264

Technical requirements for the video file format for uploading to video systems contained in production E trains:

- number of rolling stock: 2 units; AVI format without additional processing and conversion;
- 1024x768 pixel image format, 16x9 aspect ratio;
- video clips of one issue are reduced in length by video blocks up to 3 Gigabytes,

- maximum number of end blocks of up to 5 files.

Service №2: logbook. The contractor fully provides the process of making the journal at his own expense. Required official information provided by the affiliate of the *Ukrainian Railways* SOE for journaling:

- opening statement of the Head of the branch of the *Ukrainian Railways* SOE in Ukrainian and English;
- safety instructions;
- train schedule;
- general information and technical characteristics of trains;
- train wagon schemes;
- scheme of network of trains A and B;
- information for persons with disabilities;
- loyalty programs for high-speed trains of the branch of *Ukrainian Railways* SOE;

– *Ukrainian Railways* SOE branch news and useful information on introduction of new services on trains A and B.

- Technical requirements for the logbook:
- paper porosity, cm^3/g , not less than: 0, 97;
- paper density, internal block $110 \text{ gr}/\text{m}^2$;
- paper density, outer block $350 \text{ gr}/\text{m}^2$;
- periodicals: monthly, 12 times a year;
- placement: 100% availability in the pockets of chairs of cars of I and II classes; minimum circulation: 15 thousand copies.

Service №3: placement of all types of indoor advertising on trains of branch formation of the *Ukrainian Railways* SOE according to the schemes:

Technical requirements for advertising materials used for indoor advertising materials used for indoor advertising in the rolling stock of the branch of the *Ukrainian Railways* SOE and conditions of placement:

- poster (poster) in wagons — Size (format): A2; A3; A4; A5;
- paper density: not less than $150 \text{ gr}/\text{m}^2$;
- lamination: posters should be laminated with transparent film Oracal S640/641, which is easy to remove and does not damage the surface;
- installation/dismantling: treatment of the rolling stock surface after dismantling of advertising materials and bringing it to the proper aesthetic and sanitary condition;

- stickers on the elements of passenger seats: size (format) 50x300mm., Material Oracal S640/641, installation / dismantling: surface cleaning after dismantling.

Service # 4: subject to availability of additional advertising scenes of the counterparty, the placement of the advertisers is coordinated by the branch of the *Ukrainian Railways* SOE and is formalized by additional

agreements to the contract in accordance with the procedure for determining the amount of payment for the provision of advertising services at that time.

While research we have identified the services, namely: the name of the objects of study (tariffs), their purpose, main characteristics, pricing characteristics, location of the object of valuation and so on. A tariff is a system of rates for payment for production and non-production services provided to the public, companies, organizations, firms and institutions¹.

Methods used in the execution of the above examination, both general and separate method of commodity.

Separate method of commodity research is the system of procedures for the knowledge of consumer value of goods and the determination of the laws of its manifestation and preservation².

Appraisal of property can be carried out using well-known methodological approaches in the world, in particular: income, comparative and cost.

Performed forensic examination used a comparative methodological approach of assessment.

The comparative approach is based on the principles of substitution and supply and demand.

The comparative approach involves the analysis of selling prices and the offering of similar property, with the corresponding adjustment of differences between the objects of comparison and the object of valuation.

To determine the market value of a valuation item in tangible form using a comparative approach, information on similar property should meet the following criteria:

- terms & conditions of the purchase or sale agreement or the terms of the offer for the conclusion of such transactions do not differ from the conditions that meet the requirements for determining the market value;

- the sale of such property is subject to the standard terms of payment;

- conditions on the market for similar property that determined the pricing of the sale or offer, have not changed substantially at the valuation date, or changes that may have occurred can be taken into account.

In the examination, the comparison of the objects was made with approximate analogues, as the baseline information was used metro and public transportation tariffs of communal property of one of the cities of Ukraine.

In the course of commodity research we conducted a detailed analysis of prices (basic tariffs that correspond to the types of advertising means / advertisements that are placed on the territory of the subway and

¹ URL : <https://uk.wikipedia.org/wiki/Тариф> (data zvernennia 14.05.2019).

² Osnovy sudovoi ekspertyzy [Basics of forensic examination]: navchalnyi posibnyk dlia fakhivtsiv, yaki maiut namir otrymaty abo pidtverdyty kvalifikatsiiu sudovoho eksperta / avt.-uklad.: L. M. Holovchenko, A. I. Lozovy, E.B. Simakova-Yefremian ta in. Kharkiv : Pravo, 2016. S. 256 [in Ukrainian].

tariffs of public transport utilities of one of the cities of Ukraine), taking into account information provided by the executive body of the city council: *On the issue of determining the amount of advertising fees in the M city.*

Comparative approach in this paper involves a direct comparison of the evaluated service with similar services.

Conclusions.

Performed research established the estimated cost of services for placement of advertising carriers in rolling stock of trains A and B, in accordance with the submitted Competition Documentation.

Summing up, we conclude that the creation of methodological recommendations: *Determining the cost of services for performing forensic commodity researches* will contribute to:

- ensuring objectivity and completeness of cost-benefit research;
- formation of common methodological bases for conducting expertise and expert studies in this area;
- use, if necessary, in the future, by law enforcement authorities and judges of the results obtained for the preparation and appointment of judicial expertise, as well as the correct formulation of issues assigned to cases in determining the value of services;
- elimination of gaps in determining the cost of services, which will be based, as on the study of regulatory documents, special literature of the specified direction and practical experience of experts;
- use of forensic experts in the relevant specialty for the preparation and certification of qualifications.

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I. В. Сабадаш, В. М. Губарева

ПРОБЛЕМНІ ПИТАННЯ З ОЦІНКИ ВАРТОСТІ ПОСЛУГ ПРИ ПРОВЕДЕННІ ТОВАРОЗНАВЧИХ ЕКСПЕРТИЗ

Розробка нових напрямків при виконанні різного виду експертиз та експертних досліджень є одним з пріоритетних напрямків наукової діяльності фахівців судових експертних установ МЮ України. Одним з проблемних питань, яке виникає на сучасному етапі розвитку судової товарознавчої

експертизи та нових напрямків експертних досліджень, є визначення вартості послуг, вибору методичного підходу та методу при проведенні вищезазначених досліджень, межі компетенції експертів-товарознавців при визначенні вартості певних послуг. Створення методичних рекомендацій «Визначення вартості послуг при проведенні судово-товарознавчих експертиз» сприятиме: забезпеченню об'єктивності та повноти досліджень щодо визначення вартості послуг, формуванню єдиних методологічних засад при проведенні експертиз та експертних досліджень даного напрямку, використанню, у разі необхідності в подальшому, правоохоронними органами і суддями отриманих результатів для підготовки і призначення судових експертиз.

Ключові слова: послуга, продукція, реалізація, нематеріальний об'єкт, класифікація послуг, асортимент послуг, тариф.

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V. V. Yehorov,

PhD in Medicine, Psychiatrist at the Poltava Regional Clinical
Psychiatric Hospital named after A. F. Maltsev,
Poltava, Ukraine

ORCID: <https://orcid.org/0000-0002-0661-9985>

e-mail: tet-egorova@meta.ua

T. M. Yehorova,

Department Head of Poltava branch of KhRIFE, Poltava, Ukraine

ORCID: <https://orcid.org/0000-0002-3588-2475>

e-mail: tet-egorova@meta.ua

ISSUES OF CURRENT STATE OF FORENSIC PSYCHIATRY AND FORENSIC PSYCHOLOGY

The problem of determining the limits of competence of a forensic psychiatrist expert and a psychologist expert, the principles of interaction of law, forensic psychiatry and psychology in modern domestic expert practice remain relevant to the present day. The current legislation of Ukraine regulates expert compliance with the limits of competence. In jurisprudence and psychiatry, the issue of the definition of the concept of “insanity” is currently debatable, since the so-called “formula of insanity” contains medical (biological) and psychological (legal) criteria.

This article purpose The purpose of this paper: presenting of the author's systemic model of ascertaining insanity, which delimits the competences of lawyers and an expert psychiatrist; A written description of the psychiatric criteria (diagnostic, criticality and anamnestic) of determining the mental state of a person in a legally relevant period of time is given; The definition of the concept of “insanity” is formulated.

No less urgent is the problem of further improvement and bringing into compliance of certain paragraphs the Procedure for conducting a forensic psychiatric examination of the current legislation of Ukraine and departmental regulatory acts governing the organization of forensic expert activity in state specialized expert institutions. Separate provisions of the Procedure for conducting a forensic psychiatric examination, which can create significant difficulties in the work of a forensic psychiatrist, are analyzed, and appropriate proposals are made to change the content of problematic provisions in the specified regulatory document.

Keywords: insanity; “Formula of insanity”; mental condition; severe mental illness; psychiatric criteria; legal criteria; criminal law circumstance; expert competence; forensic psychiatric examination; forensic psychological examination.

Formulation of Research Problem.

The problem of defining the boundaries of competence of forensic psychiatrist and expert psychologist, the principles of interaction between

law, forensic psychiatry and psychology in modern domestic expert practice are still relevant.

In the criminal and criminal procedure legislation of Ukraine the activity of a court expert is normalized.

Effective safeguards that ensure the expert's compliance with the limits of competence are the norms of Part 1 of Article 69, Parts 4, 6 of Article 101, Part 1 of Article 242 of the Criminal Procedural Code of Ukraine stipulating that expert in criminal proceedings conducts research and gives a conclusion on issues, concerning the sphere of his knowledge; the questions posed to the expert and his conclusion cannot go beyond the expert's specific expertise; expert in the opinion on the mental state of the suspect, accused has no right to state whether the suspect, the accused had such a mental condition, which is an element of a criminal offense or an element that excludes liability for a criminal offense; the expert is forbidden during the examination to decide the issue of law¹.

From an epistemological point of view, the procedural provisions on an expert's obligation to conduct research and to provide an opinion on matters within his field of knowledge mean that he, as a specialist in the relevant field of knowledge, should only use his specialty criteria to establish the truth.

The criterion of truth (Greek: *κριτήριο* — the measure, the way of judgment) in epistemology means the way by which truth of knowledge is established and truth is distinguished from error. Each science has its own ways (criteria) of establishing the truth, and the use of criteria of other sciences ("alien ways") means going beyond specialized expertise.

But, despite the rules of the current legislation, the document on the appointment of forensic psychiatric and forensic psychological expertise raises questions of a legal nature.

In particular, the following legal questions are often raised to address a forensic forensic psychiatry: whether a suspect (accused) should be considered convicted / not convicted; whether a person is subject to Articles 19 and 20 of the Criminal Code of Ukraine.

When appointing a forensic psychological examination, questions of a legal nature are also formulated, for example: about the presence of a strong emotional disturbance in the suspect (accused), about causing moral harm to the victim, etc.

Analysis of recent research and publications.

According to Ella Simakova-Yefremian² the statement by legal investigative bodies of legal issues is explained by a complex and

¹ Kryminalnyi protsesualnyi kodeks Ukrainy [Criminal Procedure Code of Ukraine]: Zakon Ukrainy vid 13.04.2012 № 4651–VI. Vidomosti Verkhovnoi Rady Ukrainy, 2013. № 9–10, № 11–12, №13. St. 88. URL : <https://zakon.rada.gov.ua/laws/show/4651–17> (data zvernennia 30.06.2019) [in Ukrainian].

² Simakova-Yefremian E. B. Kompleksni sudovo-ekspertni doslidzhennia: teoriia ta praktyka [Complex forensic research: theory and practice]: dys. ... d-ra yurydych. nauk: 12.00.09. Kharkiv, 2017. S. 46–47 [in Ukrainian].

voluminous regulatory regulatory framework in which the regulations do not correspond with each other, contain opposite interpretations.

Why the legislator in Part 6 of Art. 101 does the Criminal Procedural Code of Ukraine of Ukraine specifically point to the expert's restriction on the mental state of the suspect, accused, who is an element of a criminal offense or an element that excludes liability for a criminal offense?

The stated provision of the law reflects the uniqueness of the functions of forensic psychiatric and forensic psychological examinations, and places a semantic emphasis on the fact that there is a rather fine line between the sphere of competence of the expert who determines the mental state of the suspect (accused) and the sphere of competence of the lawyer.

The subjective side of the crime includes such elements as the form of guilt (intent or negligence), motive and purpose of the crime.

Therefore, the question of the function of the subjective side of the crime must be considered in the plane of its significance for criminal liability¹, which is the competence of legal professionals.

Since the subject of the crime is a natural convicted person who has committed a crime at an age from which, according to the Criminal Code of Ukraine, comes criminal responsibility, this person, in the aspect of investigation of the subjective side of the crime, is a common object of knowledge as a specialist in the field of jurisprudence, as well as specialists in the field of mental activity: psychologist and psychiatrist.

At the level of the subject of maternal sciences — jurisprudence, psychology and psychiatry — the difference between the purpose of activity of the respective specialists and their tasks is determined.

Investigation by a lawyer of the activity of the suspect (accused) is aimed at establishing the subjective side of the crime (motive, intent to act, predicting the consequences of their own actions, etc.).

The psychologist and psychiatrist's research focuses on the same aspects of mental activity in order to determine their individual specificity, the presence of painful disorders, which may be the basis for the court's determination of limited conviction, conviction and guilt.

According to the results of forensic psychiatric examination, conclusions are drawn regarding the presence of mental disorders, their nature and severity — which may serve as a basis for a court to recognize a person's indecency in accordance with Part 2 of Art. 19 of the Criminal Code of Ukraine; according to the results of the complex psychological and psychiatric examination, it is established whether the disorder of the mental state is a borderline mental disorder, which significantly influenced the mental activity in the legally relevant period of time — which may serve as

¹ Panov N. I. Problemy sostava prestupleniya i ego funkciy v doktrine ugovnogo prava [Problems of the composition of crime and its functions in the doctrine of criminal law]. Visnik Asociaĭ kriminal'nogo prava Ukraĭni. Harkiv, 2013. № 1(1). S. 103–125. URL : http://nauka.nlu.edu.ua/wp-content/uploads/2015/07/1_7.pdf [in Russian].

a basis for the court's recognition of the limited conviction of the individual according to Art. 20 of the Criminal Code of Ukraine; on the basis of the results of psychological examination, the peculiarities of the mental activity of a person are established, which can be recognized by the court as mitigating or aggravating circumstances in accordance with Art. Art. 66, 67 of the Criminal code of Ukraine¹.

In the science of criminal law, the set of signs of insanity provided for Part 2 of Art. 19 of the Criminal Code of Ukraine (2001), traditionally regarded as *insanity defense formula*², which in Art. 39 of the Criminal Code of 1903 is enshrined as a *mixed type* formula because it contains medical and psychological (legal) criteria³.

Subsequently, *insanity defense* formula has been repeatedly reviewed by jurists and psychiatrists⁴, but its structure has been unbroken for the past 50 years.

The classical literature on forensic psychiatry identifies the main tasks to be solved by a psychiatrist using a method of clinical psychiatric analysis based on the evaluation of clinical symptoms of the disease: establishing a diagnosis of the disease, the obligatory determination of the nature of painful disorders of the psyche and the severity of their severity in time⁵.

This means that the psychiatrist expert, when completing these tasks, should conduct research and provide conclusions based on his or her specialist knowledge of psychiatry, using only psychiatric criteria.

Commonly acknowledged and undeniable are the views of V. Kh. Kandinsky⁶, who believed that in the course of expert research a forensic psychiatrist should use two interdependent psychiatric criteria:

¹Ibidem

² Trahterov V. S. Formula nevmenjaemosti v sovetskom ugodovnom prave (istoricheskij ocherk) [The formula of insanity in Soviet criminal law (historical outline)]: ucheb. posobie. Harkiv : Ukrainskaja juridicheskaja akademija, 1992. S. 37–38. URL : <https://lawdiss.org.ua/books/a1893.doc.html> [in Russian].

³ Ugodovnoe ulozhenie: Sobranie uzakonenij i rasporjazhenij pravitelstva [Criminal Code: Collection of statutory and government orders]. 16 aprlja 1903 g. №88. S. 8. URL : http://pravo.by/upload/pdf/krim-pravo/ugolovnoe_ulogenie_1903_goda.pdf [in Russian].

⁴ Pervomajskij V. B. Novyj Ugodovnyj kodeks: starje i novye problemy sudebno-psihiatricheskoj jekspertizy [The new Criminal Code: old and new problems of forensic psychiatric examination]. Arhiv psihii. Kiev, 2001. № 4. S. 49–52 [in Russian].

⁵ Lunc D. R. Problema nevmenjaemosti pri sudebno-psihiatricheskoj jekspertize. Sudebnaja psihiatrija [The problem of insanity in forensic psychiatric examination. Forensic Psychiatry]: uchebnik dlja juridicheskikh vysshih uchebnyh zavedenij / red. A. N. Buneev i dr. Moskva : Gos. izd-vo jurid. literatury, 1954. Gl. I. S. 15–36 [in Russian].

⁶ Kandinskij V. H. K voprosu o nevmenjaemosti [On the issue of insanity]/ Sankt-Peterburgskaja psihiatricheskaja bol'nica sv. Nikolaja Chudotvorca. K 140-

First one being *separate* or *specific*, which consists in diagnosis of a specific mental disorder and is considered in the section of psychiatry called *separate psychiatry*;

Second is *general*¹ that is a common, common to many different psychiatric disorders, a profound disorder of the psyche, and is considered in a section of psychiatry called *general psychiatry*.

V. P. Serbsky² called the second criterion psychopathological, since the general patterns of mental disorders and, in particular, the degree of depth of disorders in different mental disorders, refer to the subject of psychopathology (synonymous with general psychiatry).

Forensic psychiatrist statement of a person's mental state according to the two above criteria enables the court to apply the rule of law correctly when deciding the issue of insanity.

At the same time, during Soviet era and later Ukrainian forensic psychiatry, the first criterion of *of insanity defense* formula followed by jurists, was also called *medical* or *biological* that is surprising because specialists in general medicine and biology do not have competence in establishing a psychiatric diagnosis.

The second criterion of traditional *insanity defense formula* is *psychological (legal)*. In our opinion, in its essence, also refers to the competence of a psychiatrist who has special knowledge to determine the main task: establishing the degree of depth of mental disorder that deprives a person of ability Adequate awareness of the surrounding reality, their mental state and behavior (that is, determine whether a mental disorder is serious, according to the terminology provided by Article 1 of the Law of Ukraine: *On Psychiatric Aid*)³.

At the end of the twentieth century, the community of psychiatrists was de facto insensitively classified as psychiatry. Thus, in the Encyclopedic Dictionary of Medical Terms (1983), the concept of *insanity defense* is defined as the inability of a person as a result of a mental illness or temporary disorder of mental activity to realize or manage their actions; a person whose conviction was established by forensic psychiatric examination was exempted from criminal liability⁴.

letiju. Tom III. Sankt-Peterburg : Izdatel'sko-poligraficheskaja kompanija «KOSTA», 2012. S. 321–343 [in Russian].

¹Ibidem p. 330

² Serbskij V. P. O sudebno-psihiatricheskoj jekspertize [On forensic psychiatric examination: Proceedings of the second congress of domestic psychiatrists]: Trudy vtorogo sezda otechestvennyh psihiatrov. Kiev, 1997. S. 122–124 [in Russian].

³ Pro psykhiatrychnu dopomohu [On Psychiatric Care]: Zakon Ukrainy vid 22.02.2000. № 1489–III. Vidomosti Verkhovnoi Rady Ukrainy. URL : <https://zakon.rada.gov.ua/laws/show/1489-14> [in Ukrainian].

⁴ Jenciklopedicheskij slovar' medicinskih terminov [Encyclopedic dictionary of medical terms]. Izd. pervoe / Gl. red: B. V. Petrovskij. Moskva : Sovetskaja jenciklopedija, 1983. T. 2. S. 218 b[in Russian].

Based on the content of the first part of this definition, insanity is established on the basis of *inability* determining the mental state (categories of psychology, psychiatry) that is the competence of a psychiatrist expert; but in the second part of this definition, forensic psychiatric expertise is given the function of establishing non-judgment, thereby invalidating the role of the court.

With respect to the current state of development of forensic psychiatric examination, it can be stated that it is lagging behind the evolution of Ukrainian judicial proceedings and in fact contradicts the above-mentioned norms of the current legislation of Ukraine, which regulate the activity of the psychiatrist expert in respecting the limits of his competence and prohibition to resolve the issues of law.

This is due to the longstanding controversy in the field of forensic psychiatry and jurisprudence regarding the concept of *insanity defense*¹, but to date, some scholars and psychiatrists consider *immunity from prosecution* a category of forensic psychiatry forcing a psychiatrist expert to move beyond his or her competence and to resolve legal issues.

In particular, S. V. Losich and K. A. Rutvian² note that the content of the legal *form* of insanity defense is filled by psychiatry; the authors, adhering to the traditional name of the first criterion of *insanity defense* is *medical* having come to the conclusion that it is possible to influence not only mental but also somatic disorders on the intellectual and volitional activity of the person, which, in their opinion, should also belong to medical grounds for insanity defense.

In our opinion, the fallacy of this conclusion lies in the fact that under the conditions of influence of somatic disorders on intellectual and volitional activity it is a question of the presence of somatogenic (or symptomatic) mental disorders, which are the competence of the psychiatrist.

The inclusion of somatic disorders in the *medical* criterion as a basis for determining the court's insanity would lead to the inclusion of a specialist therapist (somatic diseases specialist) in the commission of experts.

Controversial is the content of Article 19 of the Criminal Code of Ukraine which states: "... A person who, while committing a socially

¹ Pervomajskij V. B., Ilejko V. R. Sudebno-psihiatricheskaja jekspertiza: ot teorii k praktike [Forensic psychiatric examination: from theory to practice.]. Kiev : KIT, 2006. 394 s [in Russian].

² Losich S. V., Rutvjan K. O. Problemi viznachennja medicznogo kriteriju neosudnosti v kriminal'nomu pravi Ukraïni [Problems of determining the medical criterion of insanity in the criminal law of Ukraine]. Pravovij chasopis Donbasu. Krivij Rig, 2018. № 4 (65). S. 185–192. URL : file:///C:/Documents%20and%20Settings/1/%D0%9C%D0%BE%D0%B8%20%D0%B4%D0%BE%D0%BA%D1%83%D0%BC%D0%B5%D0%BD%D1%82%D1%8B/Downloads/pppd_2018_4_33.pdf. (data zvernennja: 02.06.2019) [in Ukrainian].

dangerous act under this Code, was in a state of negligence shall not be criminally liable...”.

The meaning of the foregoing, upon careful reading, may mean that the criminal lawyer has established the fact of the criminal act and, having obtained the opinion of the psychiatrist expert on the state of the defendant's insanity, excludes his criminal liability.

Such wording in the current criminal legislation brings back a modern forensic psychiatric examination to the practice of the 1950s, when in Soviet times the main task of forensic psychiatric examination was to give a conclusion on the conviction or insanity of a person¹.

In addition, in our opinion, the use of the term *state of insanity* in Article 19 of the Criminal Code of Ukraine is contrary to the provisions of the Law of Ukraine: *On Psychiatric Aid* and scientific psychiatry. First, the mental state itself, which causes the emergence of a person's ability or inability to become aware of and act on their actions, is a psychiatric phenomenon, and therefore a priori cannot be a state of insanity.

Second, the condition of a person who, due to a severe mental disorder at the stage of exacerbation, is unable to realize and manage their actions is a state of severe mental disorder, the establishment of which, according to Article 1 of the Law of Ukraine: *On Psychiatric Aid*, falls within the competence of a psychiatrist.

Third, the legal significance of a state of serious mental disorder is actualized only in the presence of the fact of a criminal offense, which in time coincides with the state of serious mental disorder — on the basis of which the court finds the recklessness of the person who committed a socially dangerous act.

The author cites the legal criteria of insanity and notes that the phenomenon of *insanity defense* does not apply to the subject of forensic psychiatry; psychiatrists do not have to state insanity because they are beyond their competence; only the court, having evaluated all the evidence (including the conclusion of the forensic psychiatric examination concerning the mental state of the person) having established all legally relevant circumstances, has the legal right to conclude that the suspect has no jurisdiction.

Article Purpose.

The purpose of this work is to create a systemic model of insanity, which defines the psychiatric criteria of ascertainment in the opinion of the expert of the state of severe mental disorder of the person in the criminal-relevant period of time, as a psychiatric basis for the court's recognition of that person as not guilty.

Main content presentation.

¹ Sudebnaja psihiatrija: Rukovodstvo dlja vrachej [Forensic Psychiatry: A Guide for Physicians] / pod. red. C. M. Fejnberg i dr. Moskva : Medgiz, 1950. S. 41 [in Russian].

This article provides clarification on the basic provisions on issues of insanity, which are clearly illustrated in the system model of finding insanity (Fig. 1). Yu. approach of Yu. S. Bogomyagkov was taken as the basis of legal criteria for insanity defense



Рисунок 1. Системна модель констатації персудності

As follows from the scheme above (Fig. 1), the finding of nonsense is the prerogative of a court that must apply two legal criteria. An expert psychiatrist applies three interdependent psychiatric criteria that allow one to conclude that there are (or lack of) psychiatric grounds for a court's admission of insanity.

The first psychiatric criterion should be called diagnostic, which is that the psychiatrist expert in the diagnosis of mental disorders should be guided by modern diagnostic features¹; the Law of Ukraine: *On Psychiatric Aid*² and data from scientific psychiatry.

The second psychiatric criterion is to determine the degree of depth of mental disorders as having deprived an individual of the ability to become aware of his or her actions and to manage them over a legally relevant period of time.

This criterion is suggested to be called the criterion of criticality, since, in agreement with the opinion of I. A. Kudryavtsev³; it is the level of criticality that most fully characterizes a person's ability to realize their own actions and to manage them.

The third psychiatric criterion determines the peculiarities of the dynamics of mental disorder.

Even when identifying a person with a particular severe mental disorder, it is necessary to determine what stage of the painful process took place during the criminally relevant period (exacerbation or remission of the painful process; compensation or decompensation of the pathological mental state).

A. V. Melnik⁴ points to the urgency of clarifying the psychopathological dynamics in time, the sequence of the development of

¹ Mizhnarodna statystychna klasyfikatsiia khvorob ta sporidnennykh problem okhorony zdorovia 10-ho perehliadu [10th International Statistical Classification of Diseases and Related Health Issues]. URL : <http://www.surgery.org.ua/Documents/Details> (data zvernennia 06.06.2019 [in Ukrainian]).

² Pro psykhiatrychnu dopomohu [On Psychiatric Care]: Zakon Ukrainy vid 22.02.2000. № 1489–III. Vidomosti Verkhovnoi Rady Ukrainy. 2000. № 19. St.143. URL : <https://zakon.rada.gov.ua/laws/show/1489-14> (data zvernennia 06.06.2019) [in Ukrainian].

³ Kudryavtsev I. A. Aktual'nye problemy medicinskoj psihologii v sudebno-psihiatricheskoj praktike [Actual problems of medical psychology in forensic psychiatric practice.]. Psihologicheskaja diagnostika pri nervno-psihicheskikh i psihosomaticeskikh zabolovanijah: sb. nauchnykh trudov. Leningrad : Izd. Leningradskogo nauchno-issledovatel'skogo psihonevrologicheskogo instituta im. V. M. Behtereva, 1985. Tom 112. S. 11–16 [in Russian].

⁴ Melnyk A. V. Shchodo tymchasovykh rozladiv psykhichnoi diialnosti [Concerning temporary disorders of mental activity]// Aktualni pytannia suchasnoi psykhii: materialy nauk.-prak. konferentsii, prysviachenoi 30-richchiu kafedry psykhii, narkolohii ta medychnoi psykhologii Ukrainkoj medychnoi stomatolohichnoi akademii (m. Poltava). Poltava : «Vydavnytstvo «Poltava», 2005. S. 86–89 [in Ukrainian].

the symptoms of the disease, especially in forensic psychiatric examination of temporary disorders of mental activity.

If the offense consists of a series of consecutive episodes, the expert provides for each episode separate expert assessments of the mental state of the person¹.

We have refined the content of this criterion and we propose to call it anamnestic, since this criterion concerns the history (history) of the development of mental disorder.

Thus, the systemic model of insanity defense (Fig. 1) has clear criteria for its ascertainment, distinguishing between the areas of competence of a lawyer and an expert psychiatrist.

This systematic approach makes it possible to clarify the definition of "insanity" in accordance with the current legislation of Ukraine and the achievements of judicial psychiatry, which the authors of this publication propose in the following formulation:

insanity defense is a criminal circumstance that establishes committing a socially dangerous act by a person who, at the time of the tort, showed signs of a specific form of severe mental disorder in such a phase, when the mental disorders deprived her of the ability to realize and manage the public danger of their actions, and excludes the subject of the crime.

Equally relevant is the problem of regulatory regulation of expert activity in conducting forensic psychiatric examination.

The order of the Ministry of Healthcare of Ukraine dated on 8.05.2018 № 865 approved a new Procedure for conducting forensic psychiatric examination² (hereinafter referred to as Procedure).

The novelties of the Order are the content of paragraphs 6, 7 defining the form of forensic psychiatric examination (hereinafter referred to as FPE) — outpatient, inpatient and posthumous, as well as the conditions for conducting the FPE at the location of the individual.

Clause 9 of the Procedure states that, on organizational grounds, an FPE may be a single entity and a commission. Complex examinations, which in modern expertise are determined by forensic branches of expertise (expert specialties), are not mentioned at all in clause 9³. However, clause

¹ Morozov G. V. Problema nevmenjaemosti. Sudebnaja psihiatrija [The problem of insanity. Forensic Psychiatry]: rukovodstvo dlja vrachej. 2-e izdanie, pererabotannoe i dopolnenoe / pod. red. G. V. Morozova. Moskva : Medicina, 1988. S. 31 [in Russian].

² Poriadok provedennia sudovo-psykhiatrychnoi ekspertyzy [Procedure for conducting forensic psychiatric examination]: nakaz, poriadok, Forma typovoho dokumenta vid 08.05.2018. № 865. Ministerstvo okhorony zdorovia Ukrainy. URL: <https://zakon.rada.gov.ua/laws/show/z0719-18> (data zvernennia 06.06.2019) [in Ukrainian].

³ Simakova-Yefremian E. B. Kompleksni sudovo-ekspertni doslidzhennia: teoriia ta praktyka [Complex forensic research: theory and practice]: dys. ... d-ra yurydych. nauk: 12.00.09. Kharkiv, 2017. S. 114–119. [in Ukrainian].

15 of the same Procedure provides for carrying out complex examinations in an expert institution.

These contradictions, in our opinion, can disorganize expert activity in cases of admission to the institution of complex research.

In addition, the lack of a position regarding comprehensive examination is contrary to the procedural legislation of Ukraine (in particular, Article 112 of the Code of Administrative Proceedings of Ukraine).

The clarification in Item 10 of the Procedure regarding the purpose and subject of forensic psychiatric examination is positive: the mental state of a person at certain legally significant intervals¹. The previous version of the Order in item 7, concerning the subject of FPE, does not contain a reference to a legally significant period of time².

The content of clause 16 of the new Procedure is ambiguous, stating that in the case of documents containing information on the health status of the person to whom the MSE is assigned, the facts of his request for medical assistance, his diagnosis and family side of life, as well as other information obtained during her medical examination, the expert is obliged to request from the body (s) that appointed the examination (s) (expert), the consent of that person to the use of the said information³.

The Order has been added to the standard form of a document entitled: *Conscious consent of the accused, accused or convicted person*⁴ where the individual must certify that she has received information that during the course of her forensic psychiatric examination, forensic experts found psychiatric disorders that could result in mental disorders the use of torture and other cruel, inhuman or degrading treatment or punishment; the person is informed about the potential benefits, risks and possible

¹ Poriadok provedennia sudovo-psykhiatrychnoi ekspertyzy [Procedure for conducting forensic psychiatric examination]: nakaz, poriadok, Forma typovoho dokumenta vid 08.05.2018. № 865. Ministerstvo okhorony zdorovia Ukrainy. URL: <https://zakon.rada.gov.ua/laws/show/z0719-18> (data zvernennia 06.06.2019) [in Ukrainian].

² Poriadok provedennia sudovo-psykhiatrychnoi ekspertyzy [Procedure for conducting forensic psychiatric examination]: poriadok vid 08.10.2001. № 397. Ministerstvo okhorony zdorovia Ukrainy. URL : <https://zakon.rada.gov.ua/laws/card/z0219-02> (data zvernennia 06.06.2019) [in Ukrainian].

³ Poriadok provedennia sudovo-psykhiatrychnoi ekspertyzy [Procedure for conducting forensic psychiatric examination]: nakaz, poriadok, Forma typovoho dokumenta vid 08.05.2018. № 865. Ministerstvo okhorony zdorovia Ukrainy. URL: <https://zakon.rada.gov.ua/laws/show/z0719-18> (data zvernennia 06.06.2019) [in Ukrainian].

⁴ Usvidomlena zghoda pidslidnoho, obvynuvachenoho abo zasudzhenoho [Conscious consent of the defendant, accused or convicted person]. Dodatok do Poriadku provedennia sudovo-psykhiatrychnoi ekspertyzy (punkt 19): Forma typovoho dokumentu. URL : <https://zakon.rada.gov.ua/laws/card/z0719-18> (data zvernennia 06.06.2019) [in Ukrainian].

limitations in case of forensic reports of this information to the body (person) who appointed the expert (attracted expert) and at whose request it was conducted; as well as agreeing to provide information in the form of primary records of the presence of mental disorders that may have arisen as a result of torture and other cruel, inhuman or degrading treatment, treatment or punishment.

Undoubtedly, paragraph 16 of the new Order is aimed at the protection of fundamental rights and freedoms of the individual and the citizen, the right to non-interference with privacy, but contradicts the paragraph 3, 6 h. 2 Article. 7 of the Law of Ukraine: *On Protection of Personal Data* providing special requirements for the processing of personal data, namely: no ban on the processing of personal data necessary to protect the vital interests of the personal data subject or another person in the event of incapacity or restriction of civil the capacity of the data subject; no ban on the processing of personal data required for health care, medical diagnosis, care or treatment or medical services, etc¹.

Paragraphs 17, 18 of the Procedure set out in detail the requirements for outpatient and inpatient examinations, but there is no reference at all to the neurological examination of a pediatrician, which is compulsory in accordance with current methods of clinical and psychiatric examination.

Section 19 of the Procedure states that during the FPE of different types; *expert shall involve a psychologist when necessary*.

It should be noted that independent involvement of an expert by other specialists in performing the examination is not provided by the current legislation of Ukraine.

In addition, current methods of clinical psychiatric examination, especially expert (both homogeneous and complex), include experimental and psychological research as a compulsory algorithm.

In the case of the appointment of a complex forensic psycho-psychiatric examination, the court itself attracts a psychologist.

Particular comment in paragraph 19 of the New Order is raised by the position on the examination by the expert of *psychiatric disorders that may arise as a result of torture and other cruel, inhuman or degrading treatment, treatment or punishment*.

The said expert point is obliged to inform the investigator (accused or convicted person or his legal representative), and, subject to his or her informed consent in a typical form², to pass this information on to the body

¹ Pro zakhyst personalnykh danykh [On protection of personal data]: Zakon Ukrainy vid 01.06.2010. № 2297–VI. St. 481. Data onovlennia: 30.01.2018. URL : <https://zakon.rada.gov.ua/laws/show/2297–17> (data zvernennia 05.06.2019) [in Ukrainian].

² Usvidomlena zghoda pidslidnoho, obvynuvachenoho abo zasudzhenoho [Conscious consent of the defendant, accused or convicted person]. Dodatok do Poriadku provedennia sudovo-psykhiatrychnoi ekspertyzy (punkt 19): Forma typovoho dokumentu. URL : <https://zakon.rada.gov.ua/laws/card/z0719–18> (data zvernennia 06.06.2019) [in Ukrainian].

(person) who appointed the expert (involved expert), regardless whether the question was asked.

In our opinion, the application of this provision is impossible for the following reasons:

Article 7 of the Law of Ukraine: *On Psychiatric Aid* stipulates¹ that diagnosis of mental disorder is established in accordance with generally recognized international standards for diagnosis and International Statistical Classification of Diseases and Related Health Problems (at the moment: ICD-10²).

However, ICD 10 does not contain a taxon on mental disorders *specific* to the use of torture, cruel and degrading treatment.

Therefore, even a probable conclusion that the use of torture and other cruel, inhuman or degrading treatment, treatment or punishment may be the cause of mental disorder will be in violation of international standards of diagnosis and the Law of Ukraine: *On Psychiatric Aid*.

In modern psychiatry, principles of ambiguity of causality and polyetiology of mental disorders³: are generally accepted: different pathogenic factors can cause similar mental disorders in different persons; the same negative effects on the psyche cause different mental disorders in different persons (or may not cause them);

It is common knowledge that the mere fact of presenting a person with a suspicion or charge of a criminal offense, or its punishment, are psycho-traumatic factors that in most cases adversely affect mental activity even in the absence of unlawful pressure (in particular, so-called "prison" psychoses). Researches of prisoners in English places of detention show that being in detention centers is detrimental to mental health⁴;

determining etiology of mental disorder requires a detailed collection and objectification of anamnesis of the presence of various types of psycho-traumatic events and destructive factors in the person, and their subsequent

¹ Pro psykhiatrychnu dopomohu [On Psychiatric Care]: Zakon Ukrainy vid 22.02.2000. № 1489–III. Vidomosti Verkhovnoi Rady Ukrainy. 2000. № 19. St.143. URL : <https://zakon.rada.gov.ua/laws/show/1489-14> (data zvernennia 05.06.2019) [in Ukrainian].

² Mizhnarodnyi klasyfikator khvorob MKKh 10 [International Classification of Diseases of ICD 10.] URL : <http://www.surgery.org.ua/Documents/Details/aa535505-419d-4d67-a9e7-5c6d4b8f1ced?title=MizhnarodniiKodifikatorKhvorobMkkh10> (data zvernennia 09.06.2019) [in Ukrainian].

³ Snezhnevskij A. V. Obshhaja psihopatologija: kurs lekcij [General psychopathology: a course of lectures]. 5-e izd. Moskva : «MEDpress-inform», 2008. S. 7–36; Nuller Ju. L. Smena paradigmy v psihiatrui [A paradigm shift in psychiatry]. Obozrenie psihiatrui i medicinskoj psihologii im. V. M. Behtereva. Sankt-Peterburg : Psihonevrologicheskij institut im. V. M. Behtereva, 1992. № 1. S. 13–18 [in Russian].

⁴ Birmingem L. Psicheskoe zdorov'e zakljuchennyh [Mental health of prisoners]. Vestnik Asociacii psihiatrov Ukraïni. Kiev, 2007. №1–2 (36–37). S. 137–159 [in Russian].

comparison with the history of development and manifestations of the disease. Based on the evaluation of the whole set of medical records and clinical diagnostic features, conclusions about the cause of the disease and the conditions that contributed to its occurrence are provided.

In the cases referred to in paragraph 19 of the New Order, the expert must first obtain objective information about the facts of torture and other cruel, inhuman or degrading treatment, behavior or punishment against the person and only then determine the presence or absence of causation between mental disorder and the use of illicit measures against a person; under these conditions, the psychiatrist may provide a categorical or probable conclusion.

In the absence of objective information about the facts of torture, etc. with respect to a person, the obligation of the expert provided for in paragraph 19 of the Procedure may induce him to go beyond the competence and to give an objective conclusion.

In view of the above, the application of this item under item 19 of the Procedure is inappropriate.

Paragraph 20 of the Procedure specifies the term of the outpatient FPE, as well as the possibility of extending the term of the examination, depending on the degree of its complexity and the volume of the investigated objects. At the same time, the Procedure does not define the criteria by which the degree of complexity of the FPE is determined — which can cause unreasonable delay of its implementation.

Comparative analysis of the above provisions of the Procedure of conducting forensic psychiatric examination allows to establish the presence of separate positive changes.

In addition, in the Procedure there are significant contradictions to the legal norms governing forensic activities. The foregoing may lead to errors in the organization of forensic psychiatric examination and the exit of the psychiatrist expert beyond his/her competence.

Separate provisions in the Procedure of forensic psychiatric examination concerning the category of complexity, terms of execution of expert examination, terms of execution of expert's requests, grounds for drawing up the report on impossibility of conducting the research, structure of expert's opinion, description of the research process, etc., do not correspond with the provisions of the Instruction on appointment and conducting of judicial examinations and expert researches (hereinafter referred to as Instruction), approved by the order of the Ministry of Justice of Ukraine of 08.10.1998 under №53/5 (as amended and supplemented) by introductions)¹.

¹ Pro pryznachennia ta provedennia sudovykh ekspertyz ta ekspertnykh doslidzhen [On the appointment and conduct of forensic and expert investigations]: instruktsiia vid 08.10.1998. № 53/5. Ministerstvo yustytzii Ukrainy. URL : <https://zakon.rada.gov.ua/laws/show/z0705-98>. (data zvernennia 05.06.2019) [in Ukrainian].

This significantly complicates the joint work of an expert psychiatrist and expert psychologist in the course of carrying out a comprehensive examination assigned to the forensic institutions of the Ministry of Health and the Ministry of Justice of Ukraine.

Thus, it can be stated that the Procedure for conducting forensic psychiatric examination requires further improvement and alignment with the current legislation of Ukraine, the basic principles, methods and practice of modern psychiatry and forensic psychiatric examination.

Conclusions.

The category of *insanity defense* is the prerogative of jurisprudence, since it means a criminal circumstance that establishes the commission of a socially dangerous act by a person who at the time of torture showed signs of a specific form of severe mental disorder in such a phase, when mental disorders deprived the person of the ability of the community and to rule them and exclude the subject of the crime.

Developed by the authors, the system model of ascertaining the most in line with Art. 19 of the Criminal Code of Ukraine, the provisions of classical scientific psychiatry and its modern achievements, allowing a clear distinction between the areas of competence of a lawyer and an expert psychiatrist.

Legal and regulatory support for the organization of forensic psychiatric examination requires further improvement and compliance with the current legislation of Ukraine and the departmental normative legal acts that regulate the organization of forensic activities in other specialized state expert institutions.

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В. В. Єгоров, Т. М. Єгорова

ПРОБЛЕМНІ ПИТАННЯ СУЧАСНОГО СТАНУ СУДОВО-ПСИХІАТРИЧНОЇ ТА СУДОВО-ПСИХОЛОГІЧНОЇ ЕКСПЕРТИЗИ

Проаналізовано чинне законодавство України, що регулює судово-експертну діяльність, зокрема, у галузях судової психіатричної та судової психологічної експертизи. В юриспруденції і психіатрії поняття «неосудність» трактується неоднозначно, оскільки критерії так званої «формули неосудності» до даного часу чітко не визначені. Надано авторську системну модель констатації неосудності, уточнено психіатричні критерії щодо визначення стану тяжкого психічного розладу як підстави для встановлення судом неосудності особи; сформульовано сучасне визначення поняття «неосудність». Проаналізовано чинний Порядок проведення судово-психіатричної експертизи; надано відповідні пропозиції щодо внесення змін до змісту проблемних положень зазначеного нормативного документа.

Ключові слова: неосудність; «формула неосудності»; психічний стан; тяжкий психічний розлад; психіатричні критерії; юридичні критерії;

кримінально-правова обставина; компетенція експерта; прерогатива; судова психіатрична експертиза; судова психологічна експертиза.

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O. A. Herasimenko,

Senior Researcher at KhRIFE,

ORCID:<https://orcid.org/0000-0002-1447-6101>

e-mail: olga_gerasi993@ukr.net

T. H., Kharina,

Researcher at the KhRIFE

Kharkiv, Ukraine

ORCID: <https://orcid.org/0000-0002-8482-2639>

e-mail: larinatatiana111@gmail.com

T. V. Savkina,

Department head at KhRIFE

Kharkiv, Ukraine

ORCID:<https://orcid.org/0000-0002-9903-7393>

e-mail: tsavkina55@gmail.com

FORENSIC FORENSIC PSYCHOLOGICAL EVALUATION REGARDING CRIMES COMMITTED BY A GROUP OF PERSONS

Analyzed the achievements of scientists and practitioners on the conducting of forensic psychological examinations of crimes committed, by a group of persons. In cases where a crime is committed by a group of persons (from two or more persons) and the defendants give conflicting information about the role of each of them in the commission of the act incriminated to them (in particular leader of the group), a forensic psychological examination of social and psychological characteristics can be appointed on crimes committed by a group of individuals. The object, tasks and subject of the forensic psychological examination of the crimes committed by a group of persons are defined. The features of the study of the socio-psychological characteristics of the suspects (accused) during the forensic psychological examination of criminal cases of crimes committed by a group of persons.

The purpose of the article is to analyze the developments of scientists and practitioners for further use in the development of scientific and methodological recommendations for conducting forensic psychological examinations of crimes committed, by a group of individuals.

The concept of leadership in the group of persons who committed a crime is disclosed and the types of leaders in the group are indicated. The issues that are put to the resolution of the examination during this type of research and the limits of the competence of the forensic psychologist when performing this subject type of forensic psychological examination are identified. The list of materials of the case (initial data), necessary for carrying out psychological research is indicated.

Keywords: crimes, forensic psychology, crimes committed by a group of individuals, group members, socio-psychological qualities, leadership in a group, individual psychological characteristics, defendants, personality, personality characteristics, individualization of responsibility, imprint, psychological research.

Formulation of Research Problem. The objective need for the use of professional psychological knowledge in criminal law and criminal

procedure regulation, as well as in the investigation of crimes, initiates the interaction of pre-trial and judicial investigation and psychologists.

First of all, it concerns the appointment and conduct of forensic psychological examination.

Especially in cases where the crime is committed by a group of persons and the accused give conflicting information about the role of each of them in committing the act they are charged with.

Crimes committed by a group of individuals always represent a greater public danger than similar acts committed by individuals.

Statistical reporting shows that among all crimes registered in Ukraine annually, 14.2% are committed by a group of persons¹. In fact, every sixth crime in Ukraine is committed by a group and is characterized by the group behavior of its participants.

The joint criminal activity of several persons has certain socio-psychological characteristics.

Therefore, in order to effectively investigate and solve crimes committed by a group of persons, it is necessary to apply special knowledge in the field of psychology (assigning and conducting forensic psychological examinations on crimes committed by a group of persons, regarding the socio-psychological characteristics of members of this group).

In recent years, there has been an increasing need for the use of professional psychological knowledge in criminal law and criminal procedure regulation, as well as in the investigation of crimes, initiating the interaction of pre-trial and judicial investigations and psychologists.

First of all, it concerns the appointment and conduct of forensic psychological examination, which according to Art. 84 of the Criminal Procedural Code of Ukraine of Ukraine² is the main procedural form of the use of special psychological knowledge in legal proceedings.

Taking in account the above, in the period of pre-trial and judicial investigation, it is advisable to carry out examinations of the social and psychological characteristics of the members of such a group.

This type of forensic psychological examination, in accordance with Art. 27, 28, 29 of the Criminal Code of Ukraine, is appointed for the purpose of determining the leader of a group of perpetrators of a crime, the specific role of each participant in criminal episodes; the degree of influence of the group on the individual participant; typical forms of interaction between members of the group, both in the commission of

¹ Beschastnyi V. Kryminolohichnyi analiz stanu zlochynnosti v Ukraini [Criminological analysis of crime in Ukraine]. URL : <http://pgp-journal.kiev.ua/archive/2017/1/40.pdf> [in Ukrainian].

² Kryminalnyi kodeks Ukrainy [Criminal Code of Ukraine]: vid 2001 r. (zi zminamy vid 27.06.2019 roku, № 2747–VIII). Vidomosti Verkhovnoi Rady Ukrainy, 2019. № 25–26 URL : <https://zakon.rada.gov.ua/laws/show/2341-14> [in Ukrainian].

crimes and in the process of investigation to individualize responsibility in accordance with Art. 29, 30 of the Criminal Code of Ukraine¹.

An expert psychologist can conclude what the impact of the group is on the individual participant, establish the informal leaders of the group of perpetrators of the crime, reveal the most common forms of interaction between the members of the group in the preparation of the crime, during its commission and in the process of disclosure.

Analysis of recent research and publications.

In literature, attempts have been made to investigate the problem of criminal groups by such authors as B. I. Baranenko, V. M. Bykov, G. M. Biryukov, V. G. Glukashovich, I. Grishaev, N. Y. Guturov, O. M. Dzhuzha, A. I. Dolgov, V. Kartavtsev, V. T. Kontemirov, V. M. Kornienko, G. A. Krieger, V. I. Litvinenko, V. G. Lukashevich, Ye. Makarenko, I. V. Maximchenko, M. I. Melnyk, E. M. Moiseev, A. A. Music, V. D. Pakhomov, B. V. Romanyuk, D. Savchenko, I. V. Servetsky, I. V. Tarasyuk, T. A. Tretyakova, V. P. Filonov, A. G. Tsvetkov, V. M. Tsybalyuk, K. A. Chaplinsky.

The issues of the use of forensic psychological examination in the process of investigation of criminal offenses were reflected in the works of M. O. Osmansky, V. L. Vasilyeva, E. P. Volkova, O. M. Guseva, S. M. Knyazev, O. R. Onishchenko, F. S. Safuanova, T. M. Sekerazh, T. O. Smirnova, O. O. Tkachenko, T. Yu. Filate, etc.

The purpose of the article is to analyze the achievements of scientists and practitioners for further use in the development of scientific and methodological recommendations for conducting forensic psychological examinations of crimes committed by a group of persons.

Main content presentation.

In the legal literature, the terms *collective crime* are used as a crime committed by a group of persons (two or more participants), *committing a crime by a group of persons*, *collective crime*.

In criminal law, a criminal group refers to the intentional involvement of two or more persons in committing a crime in the form of simple or complex complicity, which results in the responsibility for committing crimes of some kinds by a simple conspiracy group or group, a group of persons in the prior conspiracy, and organized group as well as criminal gang (gang).

Certain division of criminal groups contains criminal law. Thus, Art. 28 of the Criminal Code of Ukraine gives the definition of types of criminal groups depending on the nature of complicity and degree of organization:

1) committing a crime by a group of persons, if several (two or more) perpetrators participated in it without prior collusion;

2) committing a crime by a group of persons by prior conspiracy, if it was jointly committed by several persons (two or more) who, in advance, i.e. before the commencement of the crime, agreed to jointly commit it;

¹ Ibidem.

3) committing crime by an organized group, if several persons (three or more) who have previously organized themselves into a stable association for committing this or other (other) crimes, united by a single plan with the distribution of functions of participants, participated in its preparation or commission a group aimed at achieving this plan, known to all members of the group;

4) committing crime by a criminal organization, if it is committed by a stable hierarchical association of several persons (three or more), whose members or structural parts of which, by prior conspiracy, have organized themselves for joint activities for the purpose of directly committing serious or particularly serious crimes by members of that organization, or directing or coordinating the criminal activities of others, or ensuring the functioning of both the criminal organization itself and other criminal groups¹.

V. L. Vasilyev and V. M. Bykov distinguish between these types of criminal groups²:

– Random group, originally created for a non-social purpose, but in the process of communication, sharing alcohol, etc., which carried out dangerously social action through situational-random mechanisms.

Such a group lacks an internal socio-psychological structure, an antisocial purpose, and a precise role distribution. They are connected by friendly, not business relations.

However, such a group has the opportunity to analyze the distribution of roles in the specific situation of the incriminating act. A company into which a random group can turn into a systematic meeting.

There is a constant theme for these meetings in an asocial orientation.

Usually, there is a strong leader in such a group, and the roles of others are not clearly defined.

– Criminal group characterized by the stability of its personnel, the presence of its members criminal experience (criminal experience is not only the presence of criminal records and stay in a correctional institution), the distribution of roles.

The boundary of permissible behavior is systematically deliberately sharply expanded, that is, a stable anti-social orientation of the group and criminal professionalism of its members.

– The further development of the group leads to a criminal organization where relationships become rigidly formalized in nature, the role distribution is well aware, there are strict standards of behavior, rigid discipline, a well-developed system of sanctions.

Forensic practice shows that most often there is a demand to study the individual-psychological characteristics of persons who have committed a crime in a group without prior collusion.

¹Ibidem

² Bykov V. M. Prestupnaja gruppa: kriminalisticheskie problem [Crime group: forensic problems]. Tashkent, 1991 [in Russian].

The general object of forensic psychological examination is the peculiarities of the psyche, its components and manifestations in the activity of a mentally healthy person as a carrier of procedural status in a legally significant situation, as well as the situation itself.

The main task of psychological examination is to determine the individual subject: individual psychological characteristics, personality traits, leading personality traits; motive factors of mental life and behavior; emotional reactions and states; regularities of the course of mental processes, the level of their development and its individual properties.

The subject of such expertise is a retrospective assessment of a person's condition for the period of his various actions in the legal field.

At the same time during the study period, the condition of the person may be influenced by factors of different nature: socio-psychological, psychogenic, homogeneous, psychiatric and others.

Therefore forensic psychological examination is considered one of the most difficult types of examination.

In turn, S. D. Maksimenko emphasizes that the scientific study of personality psychology as a subject of study of uniqueness, uniqueness and integral system poses a rather significant problem.

The scientist, in particular, determines the composition of the mechanisms of the human psyche, which is based on reflection as a regulator of human activity and meets the adequate environmental conditions that affect the function of personality behavior.

On the other hand, every mental act is the result of the action of the objective through the subjective reflection, through the human individuality, which imposes a peculiarity on the mental life.

Finally, in the course of criminal activity, the mental reflection is constantly deepened, improved and developed¹.

The competence of a forensic expert psychologist in performing this subject type of forensic psychological examination includes establishing the individual and role status of the members of the group (leader, subject, led, etc.)².

Research on the psychology of committing a crime within a group involves defining its concept.

¹ Maksymenko S. D. Henezys osobystosti [Genesis of personality]. Kyiv : KMM, 2006. S. 51–69 [in Ukrainian].

² Pro zatverdzhennia Instruktsii pro pryznachennia ta provedennia sudovykh ekspertyz ta ekspertnykh doslidzhen ta Naukovo-metodychnykh rekomendatsii z pytan pidhotovky ta pryznachennia sudovykh ekspertyz ta ekspertnykh doslidzhen : nakaz Ministerstva yustytisii Ukrainy [On approval of the Instruction on the appointment and conduct of judicial examinations and expert studies and Scientific and methodological recommendations on the preparation and appointment of judicial examinations and expert studies: Order of the Ministry of Justice of Ukraine] vid 08.10.1998 № 53/5. Ofitsiinyi visnyk Ukrainy. 1998. № 46. St.1715 [in Ukrainian].

In the etymological sense, *group* is “set of people united by a common interest, profession, activity, etc.” or “a set of persons united by a common purpose, idea, work, etc.”¹. In social psychology, a group is a limited community of people, which stands out from the social whole on the basis of certain characteristics (nature of the activity performed, social or class affiliation, structure, composition, level, etc.). A social group is a relatively stable group of people who share common interests, values and behaviors that are formed within a historically defined society.

In psychology, a small social group is also distinguished — a relatively small community of people who are in direct personal communication and interaction. In relation to a person, a small group is seen as a social environment that rigidly determines the behavior and characteristics of the person, and for the whole society, the small group acts as an analogue, a kind of model of social relations².

In the literature, there has long been a debate about the lower and upper small group numbers. In most studies, the number of small group members ranged between 2 and 7 with a modal number of 2 (mentioned in 71% of cases). This calculation is in line with the widespread notion that the smallest group in the psychological sense is the so-called *dyad* that is two interacting individuals. With regard to determining the upper index of the size of the group, the practice of known studies defines it as follows: 10, 15, 20 people. Some studies by Moreno, author of a sociometric technique designed specifically for use in small groups, mention groups of 30 to 40 people. Thus, if a small group under study actually exists, it is considered as a subject of activity. Therefore, it is logical not to set some rigid *upper* figure, but to accept it as existing³.

In cases where the crime is committed by a group of persons (from two or more persons) and the accused give conflicting information about the role of everyone in the commission of the crime they are charged with, the forensic and psychological examination of the socio-psychological characteristics of the crimes may be assigned to the leader of the group, committed by a group of persons.

The following issues are addressed in the research process:

What are the individual and psychological characteristics of an individual?

What is the individual-role status of the individual in the criminal group (leader, subject, led, etc.) and is it due to his / her individual-psychological properties and peculiarities of the social-psychological structure of the criminal group (criminal group)?

¹ Tolkovyj slovar [Explanatory Dictionary] S. I. Ozhegova / pod redakciej N. Ju. Shvedova (21-e izdanie). Moskva : Nauka, 2002 [in Russian].

² Bekh V. Teoriia hrup [Group theory]. Politychna entsyklopediia. Kyiv : Parlamentske vydavnytstvo, 2011 [in Ukrainian].

³ Andreeva G. M. Social'naja psihologija [Social Psychology]. Uchebnik dlja vuzov. Moskva : Aspekt Press, 2001 [in Russian].

In accordance with the particular circumstances of the case, the psychological issues that are resolved shall be agreed, as appropriate, by the body (s) who appointed the expert, in consultation with the expert for the purpose of arranging them into blocks that are appropriate for the case¹.

Nowadays, diagnostics of relationships within a group is becoming more urgent in order to identify the motives of individual members of the group, their social and psychological role in the overall criminal activity. This type of examination is assigned by a judge to individualize criminal liability, the degree and forms of punishment. In addition, the personal diagnosis of group members, the identification of those traits that give a *difficult prognosis*, a high likelihood of recurrence, also has legal significance.

Research on small groups has as its prerequisite the characteristics of some "static" group: determining its boundaries, composition, composition. But it is natural that the main task of social and psychological analysis is to study the processes that occur in the life of the group.

A. G. Kovalev notes that in the process of communication people interact with each other. During the interaction, the emotions of one decrease or increase under the influence of the thoughts or experiences of the other. Personality more influences other people and the group as a whole, the more authoritative it is in the eyes of others².

Group leadership is important. Leadership is a purely psychological characteristic of the behavior of certain members of the group, whereas leadership is more a social characteristic of group relations, primarily in terms of the distribution of leadership and subordination roles. Leadership is understood to mean one of the processes of organizing and managing a small social group, which contributes to the achievement of group goals in the optimum time and with the optimum effect determined in society by social relations. Leadership implies the existence of a figure (several figures) as a leader.

The leader is a member of the group, according to which she recognizes the right to make responsible decisions in significant situations, that is, the most authoritative person who really plays a central role in organizing joint activities and regulating relationships in the group. The

¹ Pro zatverdzhennia Instruktsii pro pryznachennia ta provedennia sudovykh ekspertyz ta ekspertnykh doslidzhen ta Naukovo-metodychnykh rekomendatsii z pytan pidhotovky ta pryznachennia sudovykh ekspertyz ta ekspertnykh doslidzhen : nakaz Ministerstva yustytii Ukrainy [On approval of the Instruction on the appointment and conduct of judicial examinations and expert studies and Scientific and methodological recommendations on the preparation and appointment of judicial examinations and expert studies: Order of the Ministry of Justice of Ukraine] vid 08.10.1998 № 53/5. Ofitsiyni visnyk Ukrainy. 1998. № 46. St.1715 [in Ukrainian].

² Kovalev A. G. Komandnye i social'no-psiologicheskie problemy liderstva [Command and socio-psychological problems of leadership]. Moskva : Politizdat, 1998. 58–59 [in Russian].

leader is a small group member who is nominated as a result of the interaction of the group members to organize the group when solving a specific task. He demonstrates a higher level of activity, participation, influence in solving this task than other members of the group. Thus, the leader moves in a specific situation, assuming certain functions. The rest of the group members take leadership, that is, build relationships with the leader that suggest that he will lead, and they will be known.

Leadership must be seen as a group phenomenon: the leader is unthinkable alone, he is always given as an element of group structure, and leadership is the system of relations in this structure. Therefore, the phenomenon of leadership refers to the dynamic processes of a small group. This process can be quite contradictory: the extent of the leader's demands and the willingness of other group members to accept his leadership role may not be the same. Finding out a leader's true capabilities means finding out how other members of the group perceive the leader¹.

The extent of the leader's influence on the group is also not constant, in some circumstances leadership opportunities may increase and, in others, decrease (Krichevsky, Ryzhak, 1985).

Sometimes the notion of leader is identified with the notion of *authority*, which is not entirely correct: of course, the leader acts as authority for the group, but not every authority necessarily means leadership capabilities of its carrier. The leader must arrange for the solution of a problem, the authority of such a function does not perform, he can simply act as an example, as an ideal, but not take the decision of the task at all.

Therefore, the phenomenon of leadership is a very specific phenomenon that is not described by any other concepts².

In order to be promoted to the role of group leader, a person must have a certain set of personal socio-psychological qualities, in particular a sufficiently high level of initiative and activity, experience and skills of organizational activity, interest in achieving group goals; be informed of the group's affairs, as well as sufficiently sociable, and have a personal appeal, with a high level of prestige and authority in the group that matches these qualities.

In the psychological literature, the following types of leaders are distinguished:

1) in terms of content of activity (leader-inspirer, leader-initiator, leader-organizer, leader-executor);

2) by nature of activity (universal leader and situational leader); 3) by activity orientation (emotional leader, erudite leader, business leader, artisan leader)

¹ Andreeva H. M. Vkazana pratsia [in Ukrainian].

² Krichevskij R. L., Ryzhak M. M. Psihologija rukovodstva i liderstva v sportivnom kollektive [Psychology of leadership and leadership in a sports team] [in Russian].

3) by activity orientation (emotional leader, erudite leader, business leader, artisan leader)¹.

Experimental psychological research indicates that in the group people tend to be more risky in solving problematic situations than alone. People are more likely to take risks together than individually².

Committing crimes by a group of individuals brings some specificity to the mechanism and other components of criminal activity, and usually entails more serious consequences³.

In carrying out psychological examinations, psychological methods and those that have passed the state certification, as well as their author's modifications, which are selected taking into account the specifics of expert researches and specific questions raised before psychological examination, are used in scientific practice⁴.

An essential element of the purpose of forensic psychological examination is the formulation of questions to the expert.

These questions must meet the basic requirements: 1) not to go beyond the specialist knowledge of an expert and not to be of a legal nature;

2) be defined, specific and concise;

3) have a logical sequence.

For the purpose of the study, the body (person) who appointed the examination (hired expert) provides the expert with the opportunity to psychologically examine the individual and the case file.

To conduct a psychological examination (in view of the age of the individual and on the basis of the questions posed to the expert), the expert must be provided with: medical documentation, personal case, school characteristics and characteristics from the place of work, testimonies of accomplices, teachers, colleagues, friends, acquaintances, relatives and other people with whom the individual has been in close contact.

In the testimonies of loved ones should reflect the peculiarities of its development and behavior, living conditions, environment, inherent tendencies, hobbies, interests.

If available, also diaries, letters, samples of creativity of the individual⁵.

¹ Andreeva H. M. Vkazana pratsia [in Ukrainian].

² Vasylev V. L. Vkazana pratsia [in Ukrainian].

³ Vasil'eva N. V., Gor'kaja I. A. Sudebno-medicinskaja jekspertiza i ee kliniko-psihologicheskie osnovy [Forensic medical examination and its clinical and psychological foundations]. Prakticheskoe rukovodstvo. SPb, 1997 [in Russian].

On approval of the Instruction on the appointment and conduct of judicial examinations and expert studies and Scientific and methodological recommendations on the preparation and appointment of forensic examinations and expert studies: Order of the Ministry of Justice of Ukraine dated 08.10.1998 No. 53/5. Official Bulletin of Ukraine. 1998. № 46. Art.1715.

⁵ Васильев В. Л. Юридическая психология. СПб : ПетерКом, (Серия «Мастера психологии»), 1998.

The body that appointed the expert should pay special attention to the testimony or information about the peculiarities of the behavior of the sub-expert in problem situations (conflicts, punishments, losses, etc.) and testimony of his / her peculiarities. emotional state in certain circumstances (immediately at the time of the event, at the time before the event, and after the event).

During the psychological examination, authentic indications are examined, that is, those that are not dependent on any third party influence or coercion.

The sources of information for forensic psychological examination may be criminal case materials, other documents describing both a person's life path and his actions and behavior in a criminal situation.

External manifestations of motor and speech acts, behaviors and actions of the investigated person during the examination may also be informative.

The expert's opinion is based on: the analysis of the case file, in particular, the data on the distribution of the roles of the accused in committing unlawful acts; the results of mandatory experimental and psychological research of all members of the group, including data on intellectual characteristics, personal characteristics, the system of relations to different social values, interpersonal relationships in the group; on the results of the comparative analysis of the obtained data.

Conclusions.

Thus, the results of the analysis of the researches of the scientists show that during the pre-trial and judicial investigation it is advisable to carry out the examinations of the socio-psychological characteristics of the members of the criminal group.

Especially in cases where the crime is committed by a group of persons and the accused give conflicting information about the role of everyone in committing the act they are charged with.

This kind of research is aimed at identifying the structure of a criminal group, determining the role of each of its participants and the peculiarities of the relationship between them.

An expert psychologist can conclude what the impact of the group is on the individual participant, identify informal leaders of the criminal group, reveal the most common forms of communication between members of the group at the time of the crime and in the process of disclosure.

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О. А. Герасименко, Т. Г. Харіна, Т. В. Савкіна

Оглядова стаття

СУДОВО–ПСИХОЛОГІЧНА ЕКСПЕРТИЗА ЗА ЗЛОЧИНАМИ, ВЧИНЕНИМИ ГРУПОЮ ОСІБ

Проаналізовано напрацювання науковців щодо проведення судово-психологічних експертиз соціально-психологічних особливостей за злочинами, вчиненими групою осіб. Визначено об'єкт, завдання та предмет даного виду експертизи. Розглянуто особливості дослідження соціально-психологічних особливостей підекспертних. Розкрито поняття лідерства у групі, зазначені типи лідерів. Визначено питання, які ставляться на вирішення, та межі компетенції експерта-психолога. Зазначено перелік вихідних даних, необхідних для проведення психологічного дослідження.

Ключові слова: психологічна експертиза, злочини вчинені групою осіб, члени групи, індивідуально-психологічні особливості, соціально-психологічні якості, лідерство, психологічне дослідження.

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O. I. Mikhieieva,

Laboratory Head of KVD Donetsk NDYSE
Sloviansk, Ukraine

ORCID:<https://orcid.org/0000-0001-9949-1118>

E-mail: mary.mikheeva@ukr.net

M. L. Mikheieva,

Laboratory Head of KVD Donetsk NDYSE, Sloviansk, Ukraine

ORCID:<https://orcid.org/0000-0002-9949-5810>

E-mail: mary.mikheeva@ukr.net

PROBLEM OF FORENSIC PSYCHOLOGICAL EXAMINATION OF DOMESTIC VIOLENCE IN MODERN SCIENTIFIC PSYCHOLOGICAL DISCOURSE

The article is devoted to the problem of forensic psychological evaluation of victims of domestic violence. Domestic violence has become one of the most urgent social problems of the modern Ukrainian family. It is emphasized that analysis of modern domestic expert practice testifies absence of the appropriate expert methodology developed and approved by the Ministry of Justice of Ukraine for performing psychological examination in the criminal implementations stipulated by article 126–1 of the Criminal Code of Ukraine.

The purpose of the article is to determine the outcomes of forensic expert activity in the context of the problem of forensic psychological evaluation of of domestic violence victims.

The necessity of optimization of methodical provision of expert activity concerning victims of domestic violence based on: determining domestic violence as a phenomenon with complex pluricausal nature; isolating the concepts of “quarrel”, “conflict”, “violence”; differentiating the types of domestic violence; understanding the immediate and remote consequences of domestic violence; analyzing individual-psychological characteristics of violence victims. The initial positions of the expert’s work on the forensic psychological examination of victims of domestic violence based on the principles that in general determine the construction of a psychodiagnostic research are substantiated: methodical restriction; mutual verification and comparison of the results; necessity-sufficiency; interconnection of the capabilities of the diagnostic toolkit and the depth of sensing of psychic reality. It is noted that the considered problem is at the initial stage of theoretical research and practical implementation in modern expert activity.

The identified starting positions of expert activity in the context of the problem of forensic psychological examination of victims of domestic violence can be the basis for substantiating and implementing the relevant expert technique.

Keywords: domestic violence; forensic psychological evaluation; victims; outcomes of forensic expert activity.

Formulation of Research Problem.

At the present stage of the country's development, the family institute has great difficulties due to the crisis in the economy, politics, culture, etc.

Unfortunately, these phenomena affect family relationships, living conditions of each family member, their psychological and emotional state.

As a result, domestic violence is becoming one of the most pressing social problems of the modern Ukrainian family.

The study of the legal aspects of the problem of domestic violence is conditioned by the legal necessity: identification of each specific situation, implementation of the principle of inevitability of punishment for the offender, orientation of justice to the needs of the victim.

On January 11, 2019, Law № 5294: *On Preventing and Combating Domestic Violence* entered into force in Ukraine. According to the law: "... domestic violence — acts (acts or omissions) of physical, sexual, psychological or economic violence perpetrated in the family or within the place of residence or between relatives or between former or current spouses or between other persons cohabiting (living) with one family but not (not) married or married, regardless of whether the abuser (s) lived in the same place as and the person as well as the threats committing such acts ..."¹.

In this context, the problem of improving the procedure of expert research, optimizing its content and form, validity of expert opinions on victims of domestic violence is becoming more urgent in light of the requirements of reliable ensuring the fairness of court decisions.

Analysis of recent research and publications.

Some aspects of the issue of domestic violence are covered in the publications:

- T. Honcharova, O. Kolomiiets, O. Kochemyrovska, T. Safonova, E. Tsymbal and others;
- M. Asanov, N. Zinoviev, I. Malkin-Pykh, N. Mikhailova and others. (issues of emotional, psychological, physical, sexual abuse in the family);
- H. Hindin, M. Dogadin, O. Dukhova, L. Perezhogin, E. Cherepanova and others. (forms and methods of working with children who have experienced violence);
- K. Ilikchiieva, A. Kolesova, T. Matiushkova, T. Shevchuk (Violence against women) I. Bahadenko and others;
- T. Protsenko, O. Logvinenko, I. Bagadenko and others. (preventing domestic violence);
- L. Gauhman, I. Davidovich, K. Zadoya, V. Ivanov, R. Levertova, V. Navrotsky, M. Panov, L. Serdyuk, V. Simonov, O. Khramtsov, S. Shapchenko, S. Yatsenko, R. Sharapov and others. (violence in the science of criminal law);

¹ Pro zapobihannia ta protydiiu domashnomu nasylstvu [On the Prevention and Countering of Domestic Violence]: Zakon Ukrainy «vid 07.12.2017 (zi zminamy vid 2018, № 5. St. 35). Vidomosti Verkhovnoi Rady Ukrainy, 2018. URL : <https://zakon.rada.gov.ua/laws/show/2229-19> [in Ukrainian].

– V. Bondarovskaya, O. Kochemyrovskaya, G. Laktionova, Yu. Onyshko, R. Haar, H. Hristov and others. (legal, social, psychological and medical aspects of domestic violence prevention);

– M. Khavroniuk, G. Khristov, H. Truchero Cuevas (correlation of Ukrainian legislation with the requirements of international standards on domestic violence), etc.

The unresolved issue in the legal space of Ukraine and the need for reliable provision of objective consideration of criminal proceedings provided for in Art. 126-1 of the Criminal Code of Ukraine (“... domestic violence, i.e. intentional systematic committing of physical, psychological or economic violence against a spouse or former spouse or other person with whom the perpetrator is (has) been in a family or close relationship, which leads to physical or psychological suffering, health disorders, disability, emotional dependency or deterioration in the quality of life of the victim — punishable by community service for a period of one hundred fifty to two hundred forty hours, or arrest for up to six months in, or imprisonment for up to five years, or imprisonment for up to two years”¹) confirms the relevance of our research.

Article Purpose.

The purpose of the article is to determine the initial positions of forensic activities in the context of the problem of forensic psychological analysis of victims of domestic violence.

Main content presentation.

The legal basis for conducting forensic psychological examination of victims of domestic violence is Art. 1.8, 3.3 Instructions on the appointment and conduct of forensics and expert studies No. 53/5 of October 8, 1998, as amended, Law of Ukraine *On Judicial Examination*”.

The Law of Ukraine *On Preventing and Combating Domestic Violence* defines the categories of persons who may be recognized as victims in this legal situation: spouses; former spouse; brides; mother (father) or children of one spouse (former spouse) and the other spouse (former spouse); persons who co-live with one family but are not married, their parents and children; parents (mother, father) and child (ren); grandfather (grandmother) and grandson (grandson); siblings; other relatives: uncle (aunt) and nephew (niece), cousins, cousin (grandmother) and cousin (grandson), etc. It should be noted that according to the Ministry

¹ Kryminalnyi kodeks Ukrainy [Criminal Code of Ukraine]: vid 2001 r. (zi zminamy vid 27.06.2019 roku, № 2747–VIII). Vidomosti Verkhovnoi Rady Ukrainy, 2019. № 25–26 URL : <https://zakon.rada.gov.ua/laws/show/2341-14> [in Ukrainian].

² Instruktsiia pro pryznachennia ta provedennia sudovykh ekspertyz ta ekspertnykh doslidzhen [Instruction on the appointment and conduct of forensic and expert investigations]: zatv. nakazom M-va yustytzii Ukrainy vid 08.10.1998 № 53/5 URL : <http://zakon2.rada.gov.ua/laws/show/z0705-98>; Pro sudovu ekspertyzu : Zakon Ukrainy vid 25.02.1994 № 4028–KhII. Vidomosti Verkhovnoi Rady Ukrainy. 1994. № 28. St. 232 [in Ukrainian].

of Social Policy of Ukraine, in 2013–2018, 90% were women, 8, 5–9% — men, and 1–1, 5% among those who approached state bodies for violence.

The legal concept of *victim* in the legislative field is defined by an individual whose offense is caused by moral, physical or property damage.

In order to establish (or reject) the presence of harm caused by mental activity, the bodies of pre-trial investigation appoint a forensic psychological examination, the task of which is to establish the psychological factors of the personal characteristics of the victim, the degree of dependence on another person or certain life circumstances, manipulation of volition.

Appointment of a forensic investigation / court forensic psychological examination on the basis of domestic violence is motivated by the fact that the victims of violence need to analyze such psychological characteristics as the individual-psychological characteristics of motivational, intellectual, emotional-volitional and behavioral personality.

The activity of an expert psychologist allows you to determine the mechanisms and nature of the degree of suffering of the victim, the presence of feelings of fear, anxiety, deformation of self-esteem, dependence on the offender.

The list of issues to be resolved by forensic examination involves an analysis of the psychological aspects of the situation of the case, the peculiarities of its perception and evaluation, the relation to the offender and to himself; adaptability and resilience to stress.

Methodology of expert research involves the use of scientifically sound methods and means of researching the object of forensic examination, the decision of expert task in the proposed expert situation¹. The need to optimize the methodological support of expert activities for victims of domestic violence is based on:

- defining domestic violence as a phenomenon of complex polyetiological nature;

- isolation of concepts *quarrel* (acute dispute, accompanied by mutual reproaches, insults; state, period of mutual enmity resulting from such dispute; breach of friendly relations), *conflict* (clash of conflicting interests and views, tension and extreme contention leads to active actions, complications, struggles, accompanied by complex conflicts, a special kind of interaction, which is based on opposite and incompatible goals, interests, types of behavior of people and social groups, which are accompanied by negatives psychological conflicts; this is a clash of oppositely directed, incompatible tendencies (needs, interests, values, social attitudes, plans, etc.) in the consciousness of a single individual, in interpersonal interactions and interpersonal relationships of people deliberate use of physical force or power, made or in the form of a threat directed against oneself, against

¹ Bondar' M. E. O ponjatii «jekspertnaja metodika» [On the concept of “expert methodology”]. Kriminalistika i sudebnaja jekspertiza : resp. mezhved. nauchn.-metod. sb. Kiev, 1990. Vyp. 40. S. 13–19 [in Russian].

another person, group of persons or community, which results in (or there is a high probability) bodily injury, death Psychological trauma, abnormalities in the development or various loss)¹;

– economic violence (a form of domestic violence involving deliberate deprivation of housing, food, clothing, other property, funds or documents, or the ability to use them, leaving without care or care, obstructing the provision of necessary treatment or rehabilitation services, prohibiting work, being forced to work, bans on studying, and other economic offenses); psychological violence (a form of domestic violence, including verbal abuse, threats, including against third parties, humiliation, harassment, intimidation, other acts aimed at limiting the will of the person, controlling in the reproductive sphere, if such acts or omissions caused the victim fears for their own safety or the safety of third parties, caused emotional insecurity, inability to protect themselves or harmed the mental health of the individual); sexual assault (a form of domestic violence involving any act of a sexual nature committed against an adult without his or her consent or with respect to the child regardless of his or her consent, or in the presence of a child, coercion to a sexual act with a third party, and other offenses against sexual freedom or sexual integrity of the person, including committed against or in the presence of the child); physical violence (a form of domestic violence involving slaps, kicks, pushing, pinching, tapping, biting, and unlawful imprisonment, beating, snorting, injuring persons of varying severity, leaving in danger, failing to assist a detained person life-threatening condition, causing death, committing other violent offenses)². We emphasize that these types of violence can occur in isolation or in combination;

understanding of the immediate and long-term effects of domestic violence: close (bruising, trauma, fractures, damage to internal organs - liver, kidney, spleen, etc.; impaired function of any organ; vomiting, headaches, loss of consciousness (concussion); apples; acute mental disorders of arousal, desire to go somewhere to hide, deep inhibition, outward indifference; fear, anxiety, anger; development of severe depression with feelings of self-infirmity, inferiority; death as a result of murder and / or attempt suicide); remote (disorders of the physical and mental state and / or development of the child; somatic diseases (respiratory system, nervous system, metabolic disorders);

- analysis of individual-psychological features of victims of violence: passive-contemplative position, feelings of fear, anxiety, patience, reaching

¹ Shuklina N. H., Stefaniv N. S., Levchenko K. B. Osoblyvosti rozghliadu sprav, poviazanykh iz domashnim nasylstvom: navchalnyi kurs dlia suddiv [Features of consideration of domestic violence cases: a training course for judges]. Kyiv, 2018. 300 s [in Ukrainian].

² Pro zapobihannia ta protydiu domashnomu nasylstvu [On the Prevention and Countering of Domestic Violence]: Zakon Ukrainy «vid 07.12.2017 (zi zminamy vid 2018, № 5. St. 35). Vidomosti Verkhovnoi Rady Ukrainy, 2018. URL : <https://zakon.rada.gov.ua/laws/show/2229-19> [in Ukrainian].

for sacrifice, rigidity of attitudes, low self-esteem, self-doubt, increased emotionality, vulnerability, aggressiveness, tendency to stereotypical behavior, expressiveness,), low level of self-awareness, pronounced masochistic component, low educational and cultural level, ambivalence, impaired sexual identification, etc.

The initial positions of the expert on forensic psychological examination of victims of domestic violence are based on the principles that generally determine the construction of psychodiagnostic research¹:

1. The principle of methodological restriction implies that a method developed within one theoretical concept cannot be fully used to objectify that side of an object illuminated by another theory.

2. The principle of mutual verification and comparison of the results obtained² implies that any technique has more probing capabilities beyond its direct targeting.

3. The principle of necessity-sufficiency is that the set and number of diagnostic procedures must be minimally necessary, and at the same time quite sufficient for an objective study of mental reality. Most psychological techniques allow for a wider range of data at the expense of additional techniques. The expert psychologist should build a diagnostic algorithm so that, using the main focus and additional possibilities of techniques, to make the necessary set of tools and techniques on the basis of the diagnostic algorithm, which allow to conduct economically and sufficiently reliable research.

4. The principle of interconnecting the capabilities of diagnostic tools and the depth of sensing of mental reality implies that each specific technique investigates what it is aimed at, only at a certain level.

The basis for expert opinions and the verification of the expert hypothesis are the criminal case materials, which reflect the external factual side of the legally significant event; retrospective reconstruction of the psychological circumstances that preceded and accompanied the act of domestic violence; experimental research of the victim using techniques that are adequate to the tasks of the psychologist-expert.

In psychodiagnosis practice, the most widespread typology of diagnostic techniques for the intended purpose, within which they can be conditionally differentiated into three main groups:

- descriptive - observations, conversations, questionnaires, surveys, interviews, analysis of results of activity, content analysis;
- evaluation and measurement, which allow to obtain relatively accurate quantitative and qualitative characteristics of the studied

¹ Bondar' M. E. O ponjatii «jekspertnaja metodika» [On the concept of "expert methodology"]. *Kriminalistika i sudebnaja jeksperimentacija* : resp. mezhved. nauchn.-metod. sb. Kiev, 1990. Vyp. 40. S. 13–19; Rubinshtejn S. Ja. *Jeksperimental'nye metodiki patopsihologii* [Experimental methods of pathopsychology]. Moskva : JeKSMO-Press, 1999. 448 s [in Russian].

psychological properties: design, procedural, criterion-oriented tests, tests of states and properties, etc. ;

- explanatory, which include the method of experimental research, qualitative and quantitative analysis of results and empirical data.

We believe that the implementation of a system-integrative approach to the selection of diagnostic tools will help to increase the objectivity and validity of expert opinions.

Conclusions from the research and prospects for further developments in this scientific area. To sum up, the problem of forensic psychological examination of victims of domestic violence is connected with a wide range of tasks for the development of the rule of law. This problem is at the initial stage of theoretical study and practical implementation in modern expert activity. The initial points of expertise in the study in the context of the problem of forensic psychological examination of victims of domestic violence may be the basis for substantiation and implementation of appropriate expert methodology.

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O. I. Mixeeva, M. L. Mixeeva

ПРОБЛЕМА СУДОВОЇ ПСИХОЛОГІЧНОЇ ЕКСПЕРТИЗИ ПОТЕРПІЛИХ ВІД ДОМАШНЬОГО НАСИЛЬСТВА У СУЧАСНОМУ НАУКОВОМУ ПСИХОЛОГІЧНОМУ ДИСКУРСІ

Статтю присвячено проблемі судової психологічної експертизи потерпілих від домашнього насильства. Обґрунтовано вихідні позиції

діяльності експерта щодо судовопсихологічної експертизи потерпілих від домашнього насильства на основі принципів, що взагалі визначають побудову психодіагностичного дослідження: методичного обмеження; взаємної перевірки та зіставлення отриманих результатів; необхідності – достатності; взаємозв'язку можливостей діагностичного інструментарію та глибини зондування психічної реальності. Зазначено, що розглянута проблема знаходиться на початковому етапі теоретичного вивчення та практичного впровадження в сучасну експертну діяльність.

Ключові слова: домашнє насильство; судова психологічна експертиза; потерпілі; вихідних позицій експертної діяльності.

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UDC340.65/66:343.985–052

V. O. Olkhovskiy,

Head of the Department of Forensic Medicine, Medical Law named
after prof. M. S. Bokarius at the Kharkiv National Medical

University Doctor of Medicine

ORCID: <https://orcid.org/0000-0003-2843-2692>

e-mail: prof_olkhovsky@ukr.net

P. A. Kaplunovskiy,

PhD in Medicine, Docent, Associate professor associate professor of
the Department of Forensic Medicine, medical law named after prof.

M.S. Bocarius

ORCID: <https://orcid.org/0000-0003-1828-1704>

e-mail: petrkaplunovskiy@gmail.com

M. V. Hubin,

PhD in Medicine, Docent, Associate professor associate professor of
the Department of Forensic Medicine, medical law named after prof.

M.S. Bocarius

ORCID: <https://orcid.org/0000-0002-2383-3211>

e-mail: n-gubin@ukr.net

V. V. Balanovskiy,

Head of the Department of Forensic Examination of victims, accused
and other persons at the Kharkiv Regional Bureau of Forensic
medical examination

ORCID: <https://orcid.org/0000-0002-3410-4073>

e-mail: sme_khnmua@email.ua

IMPORTANCE OF TRIAL-MEDICAL MECHANISM FOR DEVELOPMENT OF BODIAL DAMAGES IN THE EXAMINATION OF DETENTIONED PERSONS

Detainees often complain about the unlawful use of force when special means and methods of detention were used, which they take as beatings and torture. Victims with such injuries commonly become the object of forensic medical examination of alive persons which is carried out during the trial and pre-trial investigation. There is a need to systematize and classify many types of mechanical and other types of injury: specific, typical or atypical for the well-known classical methods of hand-to-hand combat that law enforcement officers use.

The purpose of this work was to characterize injuries in victims received during their detention by law enforcement agencies and provide their morphological and clinical analysis in order to identify ways to improve the effectiveness of these injuries' forensic assessment in the examination of alive persons.

Based on a retrospective morphological and clinical analysis of archival materials of the Kharkiv Regional Bureau of Forensic Medical Examination, the frequency and types of injuries, that were detected during the examination, of

suspects injured in the course of their arrest by law enforcement agencies were determined. The features of forensic medical expert assessment in determining the mechanism, the severity of injuries associated with the detention of suspects by law enforcement agencies were defined. In the forensic medical expert practice, in the examination of alive persons when determining severity of injuries to suspects detained by law enforcement agencies, slight injuries and, in certain cases, injuries of moderate severity prevailed.

The localization and the mechanism of bodily injuries formation in detained victims, in some cases, allows to qualify such injuries as specific for detention by law enforcement agencies. A further prospect of this study is the identification and justification of clear diagnostic indications for the forensic assessment of bodily injuries received by suspects when detained by law enforcement agencies that arise from the action of blunt solid, sharp objects, gunshot wounds.

Keywords: forensic medical examination, bodily injuries, injuries to detainees, the severity of bodily injuries.

Formulation of Research Problem.

In the current practice of forensic institutions of Ukraine, it is quite common that law enforcement agencies appoint forensic examinations to examine persons who have been detained by law enforcement officials and who have been subjected to violent acts.

In addition, detainees often complain about the misuse of force or the special means and methods of detention they consider to be beatings and torture. Case law also includes cases of unlawful, inadequate, and excessively high levels of use of physical force against suspected offenses.

Analysis of recent researches and publications.

As is well known, the detention and use of force and special means against suspects and offenders in Ukraine is regulated by a number of legislative acts, including the Criminal Procedural Code of Ukraine¹, the Law of Ukraine: *On National Police* and the relevant resolutions of the Cabinet of Ministers of Ukraine. In particular, Article 45 of the Law of Ukraine: *On National Police* states that "... a police officer is authorized to use special means only if he or she has received special training, in addition, the use of force and special means must be proportionate and cause the least to the detriment of the addressee of this event and other persons."

Articles 42, 43, 44 of the same Law provide for a list of special means and procedure for the use of physical force.

It is stated that "... a police officer is obliged to inform his supervisor in writing in case of personal injury to his detained person".

Thus, proceeding from the foregoing, the procedure for the appointment of forensics for the identification, assessment of severity and the establishment of the mechanism of injury is very logical and legally

¹ Kryminalnyi protsesualnyi kodeks Ukrainy [The Criminal Procedure Code of Ukraine], URL : [https:// zakon.rada.gov.ua/laws/show/4651-17](https://zakon.rada.gov.ua/laws/show/4651-17); Pro natsionalnu politsiyu : Zakon Ukrainy URL : <https:// zakon.rada.gov.ua/laws/show/580-19> [in Ukrainian].

correct, with the aim of preserving important information, which in turn will facilitate further investigation and hearing the merits of the case in court.

During the forensic examination of the detained persons, specialists find and establish the presence and location of bodily injuries¹. They also have the ability to determine the mechanism and duration of injury. Quite often, it is possible to match personal injury with information that comes legally from legal institutions that have appointed this forensic examination and from the person certifying him/her.

This information should be reflected in forensic expert conclusion². On the basis of the results of forensic examination, it is logical to systematize and classify many types of mechanical and other types of trauma — specific, typical or atypical for the well-known classic techniques of hand-to-hand combat, taught by law enforcement officers.

At the same time, it should be noted that the standard set of special means for ensuring public safety and order also leaves very characteristic bodily injuries on those parts of the body of a person to which they were applied according to the legislation of Ukraine.

In view of this, it can be argued that a scientific forensic study of the use of legal and adequate physical force in order to obtain objective information on a particular case is a great incentive to improve the national law enforcement system.

In addition, this research in the field of forensic science, in terms of practical importance, will greatly contribute to the development of humanism and protection of the rights of Ukrainian citizens.

The article purpose was to characterize and morpho-clinical analysis of bodily injuries in injured suspects obtained during their detention by law enforcement agencies to further identify ways to improve the effectiveness of forensic assessment of the said trauma in the examination of living persons.

Material and methods of research.

The findings of the forensic examination of living persons on the basis of injuries received during the detention of suspected law enforcement agencies, conducted directly with our participation on the basis of the Kharkiv Regional Bureau of Forensic Expertise (KhRFME), during 2016-2018, were the material for the analysis.

Experts of the examination department of victims, accused and other persons of KhRFME for 2005-2015. In total, 58 conclusions of forensic examination were processed.

During research, the following methods were used: registration: data obtained were recorded in specially designed registration cards, which

¹ Hohlov V. V. Sudebnaja medicina: Rukovodstvo [Forensic Medicine: A Guide]. Izd-e 3-e pererab. i dop. Smolensk, 2010. 992 s [in Russian].

² Tahaiev M. M. Sudova medytsyna [Forensic medicine]. Navchalno-praktychnyi posibnyk. 2-he vyd., pererob. i dop. Kharkiv : Fakt, 2012. 1296 s [in Russian].

included an appropriate list of morpho-clinical features; method of mathematical and statistical analysis; morphological method — determine the nature of injuries; clinical: analyzed disorders of the function of injured organs, duration of health disorders; forensic : analyzed the severity of injuries established by experts.

Main content presentation.

The performed analysis of the observations showed that the forensic medical examinations of the suspected victims with personal injuries received during the detention by law enforcement agencies make up on average 2% of the total expert studies of the expert examination department of the victims, accused and other persons of KhRFME.

The majority of our observations were made by male persons: 53 cases (4 % of observations), more than half of the victims were of working age 20-50 years.

While clarification the mechanism of bodily injury in 15 cases (25, 9% of observations) suspected victims complained about the use of handcuffs by law enforcement agencies, in 35 cases (60, 3% of observations): use of unarmed extremities of law enforcement officers as a means of physical influence (striking, squeezing, squeezing twisting the hands of the suspect victim).

In 8 cases (13.8% of observations), suspects indicated the absence of any physical influence on the part of law enforcement officials.

In no case did the suspects complain about the use by police officers of sticks or firearms.

At the same time, a forensic examination was appointed by law enforcement authorities even in cases where the suspects were absent of any bodily harm.

The purpose of such expertise in these cases was that the law enforcement agencies wanted to certify that the suspects had no physical injuries at the time of detention, and thus that there was no physical impact on the part of law enforcement officials.

When ordering a forensic examination, law enforcement authorities often raised the issue of the presence of bodily injuries, suspicion, character, localization, mechanism of formation and severity of the suspects.

The question was also raised about the possibility of causing bodily harm, discovered in the suspect victim by his own hand, in the struggle, self-defense, falling from the "height of his own height".

The nature of the bodily injuries found in the suspected victims was as follows.

In most of the suspected suspects, experts have found that the lesions of soft tissues of the skin — bruises, bruises, wounds of different limitation, have been established.

However, in 5 cases (8, 6% of observations) in the suspected affected experts were found clogged wounds, which were located on the legs (mainly in the shins) and in 1 case (1, 7% of observations) – on the scalp.

In most of the suspected victims — 24 cases (41, 4% of observations) injuries were located mainly on the hands, wrists and forearms of the hands.

At the same time, the location of such bodily injuries on the back surface of the hands and forearms of the hands may indicate self-defense, including during the detention of the suspected victim.

In 22 cases (37, 9% of observations) injuries were found on the head and neck, in 16 cases (27, 6% of observations) — on the chest, in 13 cases (22, 4% of observations) on the legs.

Thus the character and localization of these bodily injuries, did not exclude the possibility of their formation at the action of the hands or feet of an unarmed person, or special means, namely, cues.

In one observation, a suspected victim had a complex of injuries in the form of a fracture of the pterygoid process of the left radial bone, marginal fracture of the coronal process of the ulnar bone, a large hematoma in the area of the left forearm, traumas of the laryngeal gastric lengthening,, phonastenia (weakened vocal closure).

At the same time, it was the nature and localization of the above bodily injuries that indicated that they could be obtained by a specific mechanism, as indicated by the injured suspect.

In the course of his testimony, he noted that law enforcement officers choked him, clasped his hands, tried to bring them back.

The suspect stressed that one law enforcement officer was behind him and the forearm of his left hand was squeezing his neck.

Other law enforcement officials grabbed the suspect's hands and twisted them back.

It should be emphasized that saddles and bruises on suspects' hands and wrists were established in 11 cases (18.9% of observations) out of 15 cases where suspected victims indicated the use of special handcuffs.

Such bodily injuries, in our opinion, can be considered as a characteristic feature in the application of these special means.

However, it is noteworthy that their form, most often, was presented in the findings of forensic experts as "uncertain".

In our view, it is still necessary to clearly state the form of bodily injury when conducting such forensic examinations, which in this case in particular may be either an elongated oval or rectangular.

In forensic expert assessment of injuries, the conclusions indicate the severity of their injuries in the suspected victims.

In 1 case (7 % of observations), a suspected victim with a traumatic process of the left radial process, marginal laceration of the coronal process of the ulna, laryngeal injuries of moderate severity according to the criterion "Long-term disorder. 2.2. 1 of the "Rules of Forensic Determination of the Severity of Personal Injury" (hereinafter "Rules...") (approved by the order

of the Ministry of Health of Ukraine No. 6 of 17.01.1995).¹ In 39 cases (67, 2% of observations) in the suspected victims of the presence of bodily injury of the soft tissues of the skin of different parts of the body, slight bodily injuries were established (paragraph 2.3.2. "b" of the *Rules*).

In 12 cases (23.5% of observations), the severity of injuries was not established by experts due to the fact that no injuries were detected by the suspected experts.

The reasons for the appointment in some cases of forensic commissions in our observations were: the doubts of the investigator, the lawyers, the accused persons in the correctness of the established degree of severity of bodily injuries during the initial examinations; contradictions of the forensic expert's findings regarding the established mechanism of injuries during the primary and subsequent examinations; appearance of additional medical data on the trauma course; the need to ascertain the consequences of the trauma; the absence of a forensic expert's opinion in the foregoing and subsequent examinations of the answers to all questions of the investigator.

As a result of our work, we have developed an algorithm program for scientific research on the identification and substantiation of forensic diagnostic criteria for expert evaluation of the presence of specific, characteristic or uncharacteristic bodily injuries in suspected victims, received by them during detention of employees:

- analysis of the nature, localization, mechanism of formation of bodily injuries received by suspected victims during detention by law enforcement agencies, as well as establishing the frequency of occurrence of individual bodily injuries on the basis of their own expert studies and analysis of archival forensic material;

- in case of severe injuries, to analyze their clinical course and final results according to the "Rules ..." based on the study of clinical material. To determine the severity of these injuries on the basis of the conducted analysis and revealed forensic diagnostic criteria;

- to compare the obtained data in the analysis of forensic archival material with clinical data by interpreting the obtained forensic data;

- substantiate forensic diagnostic criteria for the expert establishment of specific, characteristic or uncharacteristic bodily injuries in suspected victims, obtained during their detention by law enforcement officials.

Conclusions:

1. In the expert practice of the department of forensic medical examination of victims, accused and other persons of KhRFME traumas

¹ Pravyla sudovo-medychnoho vyznachennia stupenia tiazhkosti tilesnykh ushkodzen [Rules of forensic determination of severity of injuries]: zatv. nakazom MOZ Ukrainy №6 vid 17.01.1995 r. URL : <https://zakon.rada.gov.ua/laws/show/z0255-95> (data zvernennia 10.06.2019) [in Ukrainian].

received by suspected victims during their detention by law enforcement agencies make 2 % of the total annual number of examinations;

2. Until recently, there are no clear forensic diagnostic criteria for establishing bodily injury during the examination of suspected persons (specific, characteristic or uncharacteristic) during their detention by law enforcement agencies.

This may lead to arbitrary interpretations of the mechanism, the means of causing such bodily harm to forensic experts in such cases, and ultimately to the wrongful qualification of the offense committed by law enforcement officials.

3. In forensic expert practice, in the examination of suspected persons to determine the severity of bodily injuries detained by law enforcement officers, light bodily injuries and, in some cases, moderate severity, prevail.

4. Localization and mechanism of bodily injury formation in suspected victims according to our observations, in some cases allows to qualify them as characteristic of law enforcement agencies receiving during detention.

5. A further perspective of this study is to identify and substantiate clear diagnostic features for forensic evaluation of injuries sustained by suspected law enforcement officers, resulting from blunt, sharp objects and gunshot wounds. The results obtained will provide a basis for forensic specialists to increase the objectivity and probative value of expert opinions, and thus improve the quality of forensic diagnostics of such injuries in the examination of living persons.

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**В. О. Ольховський, П. А. Каплуновський, М. В. Губін,
В. В. Балановський**

**ВАЖЛИВІСТЬ СУДОВО-МЕДИЧНОГО ВСТАНОВЛЕННЯ
МЕХАНІЗМУ УТВОРЕННЯ ТІЛЕСНИХ УШКОДЖЕНЬ ПРИ
ЕКСПЕРТИЗІ ЗАТРИМАНИХ ОСІБ**

Затримані особи нерідко скаржаться на неправомірне застосування до них сили або спеціальних засобів і методів затримання, які вони сприймають за побої та тортури. Постраждалі з такими ушкодженнями стають об'єктом судово-медичної експертизи живих осіб, яка проводиться в ході судового та досудового слідства. Виникає необхідність у систематизації та класифікації багатьох різновидів механічної та інших видів травми — специфічної, типової або нетипової для відомих класичних прийомів рукопашного бою, яким навчаються співробітники правоохоронних органів.

Метою даної роботи є характеристика та морфо-клінічний аналіз тілесних ушкоджень у потерпілих, отриманих під час їх затримання правоохоронними органами для подальшого виявлення шляхів підвищення ефективності судово-медичної оцінки вказаної травми при експертизі живих осіб.

На підставі ретроспективного морфо-клінічного аналізу архівних матеріалів Харківського обласного бюро судово-медичної експертизи визначено частоту та види травм при експертизі живих осіб у постраждалих, які травмовані при затриманні правоохоронними органами. Встановлено особливості судово-медичної експертної оцінки при визначенні механізму ступеня тяжкості тілесних ушкоджень, пов'язаних із затриманням правоохоронними органами підозрюваних. У судово-медичній експертній практиці при експертизі живих осіб із визначення ступеня тяжкості тілесних ушкоджень у постраждалих підозрюваних, затриманих правоохоронними органами, превалюють легкі тілесні ушкодження та в окремих випадках ушкодження середнього ступеня тяжкості.

Локалізація та механізм утворення тілесних ушкоджень у затриманих постраждалих, за нашими спостереженнями, в окремих випадках дозволяє кваліфікувати їх як характерні для отримання під час затримання правоохоронними органами. Подальшою перспективою даного дослідження є виявлення та обґрунтування чітких діагностичних ознак для судово-медичної оцінки тілесних ушкоджень, отриманих постраждалими при затриманні їх правоохоронними органами і які виникають від дії тупих твердих, гострих предметів, а також вогнепальних поранень.

Ключові слова: судово-медична експертиза, тілесні ушкодження, травми у затриманих осіб, ступінь тяжкості тілесних ушкоджень.

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A. N. Ovsepyan,

PhD in Medicine, Docent, Director of the National Bureau of
Expertise, National Academy of Sciences, Yerevan, Republic of
Armenia,
e-mail: argam.hovsepyan@gmail.com

R. A. Hovhannesian,

Doctor of Medicine, Professor, Head of the Department of
Biomedicine, Yerevan State University, Yerevan, Republic of
Armenia
ORCID:<http://orcid.org/0000-0003-1230-4215>
e-mail: hovrouben@googlemail.com

K. G. Mkhitarian,

Head of Forensic Medical Expertises Department, National Bureau
of Expertise, National Academy of Sciences, Yerevan, Republic of
Armenia
ORCID:<http://orcid.org/0000-0002-5776-7769>
e-mail: mkhitarian.k@inbox.ru

COMPARATIVE ASSESSMENT OF THE FREQUENCY OF MEDICAL DEFECTS DEFECTS WITH REGARD TO THE LIKELIHOOD OF DEVELOPMENT OF EMOTIONAL HEALING SYNDROME

The problem of proper / inadequate medical care (MC) in the forensic aspect is relevant for domestic healthcare. The reasons leading to the occurrence of defects in the MC vary from accidents and medical malpractice to careless actions and deliberate crimes of medical workers. However, during comprehensive forensic medical expertise (CFME), an important aspect of the problem remains out of sight of the researchers, particularly: the development of an emotional burnout syndrome (EBS) at doctor who has provided MC.

The subject of the study are 208 conclusions of CFME, according to the archival material of the National Bureau of Expertise of the National Academy of Sciences of the Republic of Armenia for the period from 2006 to 2012, as well as 141 questionnaires of the EBS, filled by doctors in the framework expertise of “medical cases”. Defects in MC were classified as follows: diagnostics defects; treatment defects; defects in the organization of medical care; defects in keeping medical records.

Research Purpose Assessment of the frequency of defects in the provision of medical care, taking into account the likelihood of the development of emotional burnout syndrome at doctors based on materials from comprehensive forensic medical expertise.

According to the findings of CFME 408 MP defects were recorded. Defects of diagnostics are the most common (30.1%), the least common defects are the medical documentation defects (17.6%). Defects of MC were detected at doctors of 23 specialties. The first 3 “leading” places are occupied by surgeons, obstetricians-gynecologists and resuscitators (14.5%, 14.0% and 12.4%, respectively). The presence (58; 41, 1%) or the formation EBS (59; 41, 8%) was detected by the

moment of providing CFME at the overwhelming number of doctors, which made MC defects. The absence of EBS was detected only at 24 respondents (17, 0%). EBS was present mostly at respondents, anesthesiologists, obstetricians-gynecologists, surgeons and pediatrician. An analysis of the relationship between the likelihood of EBS development and the frequency of allowed defects in providing MC has shown that as the EBS forms, the number of diagnostic defects, treatment defects and defects in keeping medical records increases.

Thus, there are several specialties for which the development of the EBS is a very likely event: resuscitation, anesthesiology, gynecology and surgery, with the most severe degree of the EBS being developed by resuscitation and anesthesiologists. Formation of the EBS at doctors of various specialties is accompanied by an increase in the probability of occurrence of defects in MC. In this case, the most likely is the occurrence of defects in the treatment and documentation of anesthetists, gynecologists, resuscitators and surgeons. Here we should highlight the specialty "resuscitator" with the highest risk of treatment defects and defects in keeping medical records.

Keywords: diagnostic defects, treatment defects, defects in organization of medical care, defects in keeping medical records, comprehensive forensic-medical expertise, proper medical care, emotional burnout syndrome.

Formulation of Research Problem.

The problem of adequate/inadequate medical care (MC) in the forensic aspect is relevant for domestic health care and requires large-scale research in various areas, which, of course, will help reduce the number of medical errors and various defects in the provision of MC.

The causes leading to the appearance of MP defects vary widely: from accidents and medical errors to careless actions and intentional crimes of medical workers. An accident in medical practice is understood as an unfavorable outcome of treatment, which was the result of an accidental combination of circumstances and which, in the most conscientious attitude of the doctor to his official duties, could not be foreseen¹. Medical error: accidental harm to the life or health of a patient caused by erroneous actions or inaction of a medical worker, characterized by his bona fide delusion with due regard to professional duties and the absence of signs of intent, negligence, negligence or negligence².

¹ Kiseleva, I. Kriterii sudebno-meditsinskoi otsenki professional'nykh oshibok i neblagopriyatnykh iskhodov pri okazanii dermatokosmetologicheskoi pomoshchi [Criteria for forensic assessment of professional errors and adverse outcomes in the provision of dermatological and cosmetological assistance] (Moscow, 2010) (in Russian). URL: <http://medical-diss.com/medicina/kriterii-sudebno-meditsinskoy-otsenki-professionalnyh-oshibok-i-neblagopriyatnyh-iskhodov-pri-okazanii-dermatokosmetologic> (access 13.07.2019).

² Sharabchiev, Yu. Vrachebnye oshibki i defekty okazaniya meditsinskoi pomoshchi: sotsial'no-ekonomicheskie aspekty i poteri obshchestvennogo zdorov'ya [Medical errors and defects in the provision of medical care: socio-economic aspects and loss of public health] (in Russian). URL: <https://cyberleninka.ru/article/n/vrachebnye-oshibki-i-defekty-okazaniya>

While conducting forensic panel examinations (FPE), an important aspect of the problem remains outside the field of view of the researcher, namely: the development of a physician who has had an MP and, as a result, a defendant in the claim of the patient, emotional burnout syndrome (EBS). In this case, the development of CMEA in these physicians is possible both at the stage of rendering MP and in the very process of conducting CSME.

Analysis of Current Researches.

Burnout syndrome is a reaction of the body that occurs as a result of prolonged exposure to moderate-intensity¹ occupational stresses. The terms: *burnout syndrome*, *professional burnout*, *chronic fatigue syndrome*^{2, 3, 4}, are also often used as a synonym. Common manifestations of CMEA are⁵: a sense of indifference, emotional exhaustion and exhaustion; dehumanization; negative self-perception in a professional way.

It should be noted that in the International Classification of Diseases and Behavioral Disorders (ICD-10), EBS is classified in the Z-73 diagnostic taxon – *Problems related to life-management difficulty* and is coded as Z-73.0: *Fatigue – The state of vital exhaustion* (in Russian) and *Burnout – State of vital exhaustion* (in English)⁶.

First of all, representatives of professions related to direct work with people and / or high responsibility for others (doctors, teachers, psychologists, social workers, rescuers, etc.) are exposed⁷. The doctors,

meditsinskoy-pomoschi-sotsialno-ekonomicheskije-aspekty-i-poteri-obschestvennogo-zdorovya (access 13.07.2019).

¹ Vodop'yanova, N., Starchenkova, E.S. Sindrom vygoraniya: diagnostika i profilaktika [Burnout syndrome: diagnosis and prevention] (Sankt-Peterburg, 2008) (in Russian).

² Orel, V. 'Fenomen «vygoraniya» v zarubezhnoi psikhologii: empiricheskie issledovaniya' ['The phenomenon of burnout in foreign psychology: empirical research'] (2001) Psikhologicheskii zhurnal 1:90–91 (in Russian).

³ Pigarova, E., Pleshcheva, A., Dzeranova, L., Rozhinskaya, L. Sindrom khronicheskoi ustalosti: sovremennye predstavleniya ob etiologii [Chronic Fatigue Syndrome: Modern Concepts of Etiology] (in Russian). <https://cyberleninka.ru/article/n/sindrom-hronicheskoy-ustalosti-sovremennye-predstavleniya-ob-etologii> (access 13.07.2019).

⁴ Sindrom emotsional'nogo vygoraniya [Burnout Syndrome] (in Russian). URL: <http://womanadvice.ru/sindrom-emotsionalnogo-vygoraniya> (access 13.07.2019).

⁵ Ronginskaya, T. Sindrom vygoraniya v sotsial'nykh professiyakh [Burnout syndrome in social professions] (2002) 3:85–95 (in Russian).

⁶ International classification of diseases 10th revision. URL: <http://apps.who.int/classifications/icd10/browse/2016/en#/Z73> (access 13.07.2019).

⁷ Alekseev, A. Vrachy – zalozhniki smerti (Pochemu vrachi umirayut Na 10–20 let ran'she svoikh patsientov) [Doctors are hostages of death (Why do doctors die 10–20 years earlier than their patients)] (Moscow, 2000) (in Russian); Karaseva, O. Sindrom vygoraniya v rabote vrachei [Burnout syndrome in the work of doctors] (in Russian). URL: <http://medstrana.com/articles/3040/> (access 13.07.2019).; Koroleva, E., Shuster, E. Sindrom emotsional'nogo vygoraniya [Burnout Syndrome] (in Russian). URL: <https://cyberleninka.ru/article/n/sindrom-emotsionalnogo-vygoraniya>

CMEA most often develops among anesthetists, resuscitators, neuropathologists, psychiatrists and pediatricians¹.

Most of the authors among the reasons for the development of CMEA among doctors of various specialties distinguish production and non-production premises. The leading place is given to excessive workload, irregular work and too high responsibility for the final result of labor². Among the non-productive factors in the development of CMEA, the authors note a deep dissatisfaction with the contradiction between the extremely high workload, its social significance and the extremely low economic equivalent¹⁹.

The work of the doctor has the following peculiarities³:

Work of a doctor requires considerable emotional investments, as it is connected with communication with people (negative emotions, experiences, conflicts);

the work of a doctor requires intellectual and temporary investment in education and continuous postgraduate education;

work of the doctor is connected with night watch, not working day;

there are many difficulties in the work of the doctor in connection with the reporting, which takes time and can be a source of conflict with the management;

The need for financial support for oneself and family often conflicts with the professional aspirations of a physician.

vygoraniya (access 13.07.2019).; Ognerubov, N. Sindrom emotsional'nogo vygoraniya u vrachei [Burnout syndrome at doctors] (in Russian). URL: <https://cyberleninka.ru/article/n/sindrom-emotsional'nogo-vygoraniya-u-vrachey> (access 13.07.2019).

¹ Andersen, I., Borritz, M., Christensen, K.B. et al. Changing job-related burnout after intervention-a quasi-experimental study in six human service organizations. *J Occup Environ Med.* 2010;52(3):318–23; Bragard I., Libert Y., Etienne AM, Merckaert I. et al. Insight on variables leading to burnout in cancer physicians. *Journal of Cancer Education.* 2010;25(1):109–15; Di Iorio B, Cillo N, Cucciniello E, Bellizzi V. Burn-out in the dialysis unit. *J Nephrol.* 2008;21(13):158–62; Ruotsalainen JH, Verbeek JH, Mariné A, Serra C. Preventing occupational stress in healthcare workers. *Cochrane Database of Systematic Reviews* 2015, Issue 4; Tanriverdi O. A medical oncologist's perspective on communication skills and burnout syndrome with psycho-oncological approach (to die with each patient one more time: the fate of the oncologists)// *Med Oncol.* 2013;30 (2):530; Ovsepyan A. Stepen' vyrazhennosti sindroma emotsional'nogo vygoraniya u vrachei, dopustivshikh defekty okazaniya meditsinskoi pomoshchi [The severity of burnout syndrome in doctors who have committed defects in the provision of medical care] (2014) *Meditsinskaya Nauka Armenii* 3:18–29. (in Russian).

² Galimov, A.R. Stress Na rabote u vrachei-khirurgov i ego profilaktika [Stress at work with surgeons and its prevention] (Moscow, 2006) (in Russian). URL: <http://www.dissercat.com/content/stress-na-rabote-u-vrachei-khirurgov-i-ego-profilaktika> (access 13.07.2019).

³ Karaseva, O. Sindrom vygoraniya v rabote vrachei [Burnout syndrome in the work of doctors] (in Russian). URL: <http://medstrana.com/articles/3040/> (access 13.07.2019).

Research Purpose.

Assessment of the frequency of defects in the provision of medical care, taking into account the likelihood of the development of emotional burnout syndrome in doctors on the basis of materials of forensic medical examinations.

Main content presentation.

The object of the study were 208 FPE findings, according to the archival material of the forensic examination department of the National Academy of Sciences of the National Academy of Sciences of the Republic of Armenia for the period from 2006 to 2012, as well as 141 questionnaires of the EBS questionnaire, completed by doctors involved in *medical cases*.

For the analysis of the structure of defects of rendering of MC we have classified them as follows: defects of diagnostics; treatment defects; defects in the organization of medical care; defects in keeping medical records.

To assess the frequency and severity of EBS; the method of individual interviewing of doctors passing on *medical cases* was used with the help of the questionnaire V. V. Boyko¹.

However, in this work, we used the questionnaire of V. V. Boyko, due to the fact that: firstly, in the questionnaire of V. V. Boyko, the number of questions asked to the subject was expanded to 84; secondly, V. V. Boyko, considering that EBS, is a stressful situation, and therefore, pathogenetically can be classified as a practical application of the provisions of the general adaptation syndrome G. Selye (1936), instead of the scales proposed by Maslach and C. Jackson introduced the three phases of EBS development: *stress, resistance, exhaustion (alarm reaction, stage of resistance and stage of exhaustion)*.

Completing the questionnaire according to V. V. Boyko methodology was conducted solely on a voluntary basis and with confidentiality, which was documented in the form of informed voluntary consent of the respondents.

The material of the questionnaire consists of 84 statements vis-a-vis the subject should express his/her attitude in the form of unambiguous yes or no answers.

Each answer (yes or no) is evaluated by one or another number of points, since the signs included in the symptom have different meanings in determining its severity.

A quantitative calculation of the severity of an individual symptom is made, the summation of symptom indicators for each of the EBS phases, the determination of the total EBS indicator.

Interpretation is based on qualitative and quantitative analysis, which is carried out by comparing the results within each phase.

¹ Boiko, V. Sindrom "emotsional'nogo vygoraniya" v professional'nom obshchenii [Burnout syndrome in professional communication] (Sankt-Peterburg, 1999) (in Russian).

The results of the studies were statistically processed using parametric and non-parametric criteria (depending on the distribution of the analyzed values) using the SPSS-25, 0 program.

One-way analysis of variance (ANOVA) was used to analyze the frequency and severity of EBS.

To determine the significance of differences between group averages in the analysis of variances for the compared samples: *stress, resistance, exhaustion*, the posterior Duncan multiple comparison criterion was used.

Spearman correlation analysis was used to identify the relationship between the severity of EBS and the type of medical specialty.

To identify the relationship between the severity of EBS and the frequency of physicians' admission of defects in the provision of MC; the analysis was performed using Pearson's consent criterion χ^2 , as well as the calculation of relative risk (RR).

Research results.

According to the conclusion of 208 FPE in 141 (67, 8%) cases, various defects in the delivery of MPs were detected, and in 67 (32, 2%) cases, such defects were not registered. Therefore, further analysis was carried out by us for a sample of data including defects in the delivery of MC: 141 cases.

Table 1

Structure and frequency of MC defects

Type of MC defect	absolute expression	%
defects in diagnosis	123	30, 1
treatment defects	106	26, 0
defects in the organization of MC	107	26, 2
defects in medical records	72	17, 6
Total	408	100, 0

As can be seen from Table. 1, according to the 141st opinion of the FPE, 408 defects of rendering of MC were recorded. Diagnosis defects (30, 1%) were most often admitted, and medical records defects (17, 6%) were the least common.

Table 2

Distribution of doctors who have admitted defects of rendering of MC to areas of specialization

N	Area of specialization	absolute expression	%
1	physician	15	7, 8
2	surgeon	28	14, 5
3	obstetrician-gynecologist	27	14, 0
4	pediatrician	23	11, 9
5	anesthesiologist	11	5, 7

6	resuscitator	24	12, 4
7	neurosurgeon	7	3, 6
8	vascular surgeon	1	0, 5
9	urologist	4	2, 1
10	orthopedic traumatologist	11	5, 7
11	Otolaryngologist	1	0,5
12	cardiologist	6	3, 1
13	neurologist	6	3,1
14	phthysiologist	3	1,6
15	oncologist	1	0,5
16	psychiatrist	2	1,0
17	neonatologist	3	1,6
18	toxicologist	2	1,0
19	radiologist	2	1,0
20	ultrasound doctor	1	0,5
21	dentist	1	0,5
22	ambulance doctor	6	3,1
23	military doctor	8	4,2
Total		193	100,0

As can be seen from Table. 2, defects of rendering of MP were revealed at doctors of 23 specialties. Of these, the first 3 "leading" places are occupied by surgeons, obstetricians and resuscitators (14, 5%, 14, 0% and 12, 4% respectively).

It should be noted that in most cases, defects in the provision of MC were the result of inappropriate actions of two, and often three, specialist doctors. The largest number of cases of joint defects in the provision of MC was allowed by resuscitators (20, 2%) and surgeons (16, 2%). Thus, in the conditions of the *transfer* of the patient from one specialist to another, there was a lack of continuity during the treatment and diagnostic process, and in the case of joint management of one patient by several specialists, there was a lack of coordination of certain diagnostic and therapeutic measures.

141 (73, 1%) doctors replied on the questions of the Boyko questionnaire. The remaining 52 questionnaires (26, 9%) were left blank or filled with defects for various reasons (non-appearance of the respondent, misinterpretation of questionnaires, non-return of questionnaires, refusal to fill in the questionnaire).

It should be noted that the results of our survey can be considered representative, since according to the accepted international standards the level of attainment of response for sociological research is more than 50% considered representative.

Table 3

The degree of EBS severity in physicians who have admitted defects in the provision of MC

N	Area of specialization	N	EBS					
			lack		formation		availability	
			absolute expression	%	absolute expression	%	absolute expression	%
1	physician	4	1	25, 0	3	75, 0	—	—
2	surgeon	27	5	18, 5	13	48, 1	9	33, 3
3	obstetrician-gynecologist	24	9	37, 5	6	25, 0	9	37, 5
4	pediatrician	21	5	23, 8	9	42, 9	7	33, 3
5	anesthesiologist	11	1	9, 1	4	36, 4	6	54, 5
6	resuscitator	19	—	—	8	42, 1	11	57, 9
7	neurosurgeon	5	—	—	3	60, 0	2	40, 0
8	urologist	3	—	—	2	66, 6	1	33, 3
9	traumatologist	9	1	11, 1	6	66, 6	2	22, 2
10	cardiologist	6	—	—	1	16, 6	5	83, 3
11	neurologist	6	—	—	2	33, 3	4	66, 6
12	phthisiologist	1	1	100, 0	—	—	—	—
13	neonatologist	1	—	—	1	100, 0	—	—
14	radiologist	2	1	50, 0	—	—	1	50, 0
15	ultrasound doctor	1	—	—	—	—	1	100, 0
16	dentist	1	—	—	1	100, 0	—	—
Total		141	24	17, 0	59	41, 8	58	41, 2

As can be seen from Table. 3, the overwhelming majority of respondents noted the availability (58 people; 41, 1%) or the formation of EBS (59 people; 41, 8%). Only 24 (17, 0%) respondents reported that there was no EBS.

The *resuscitation* area of specialization should be noted: for example, out of 19 resuscitators surveyed, 57.9% had a EBS and 42.1% had a EBS in the formation stage.

It is also possible to note area of specializations *cardiology* (presence — 83, 3%; formation: 16, 7%), *neuropathology* (availability: 66, 7%; formation — 33, 3%) and *neurosurgery* (availability: 40, 0%; formation— 60, 0%). In other cases, the comparative assessment was considered inappropriate because of the small number of samples (from 1 to 5 respondents).

Thus, at the time of the FPE, the overwhelming number of doctors of different specialties who admitted defects in MC provision was noted EBS "in progress" (41, 2%) or in the formation stage (41, 8%).

Most of the EBS was available from resuscitators (57, 9%), anesthetists (54, 5%), obstetricians-gynecologists (37, 5%), surgeons and pediatricians (33, 3%).

Representatives of the above specialties in a slightly different sequence also took the lead in the "CMEA formation" gradation: surgeons (48, 1%), pediatricians (42, 9%), resuscitators (42, 1%), anesthetists (36, 4%) and obstetrician-gynecologists (25, 0%). Resuscitators, who in 100% of cases have CMEA "in progress" or in the formation stage, should be considered the unconditional "leader".

I was interested in the question of which medical professions are most likely to be exposed to EBS.

To address this issue, we conducted an analysis of the correlation relationships between the probability of developing EBS and different types of medical area of specializations.

Table 4

Correlation between the probability of developing EBS and medical area of specializations

Indicators of correlation	Medical area of specialization									
	1	2	3	4	5	6	7	8	9	10
r_s	0,02	-0,21*	0,12	0,02	0,11	-0,10	0,26**	-0,02	0,07	0,25**
p	0,84	0,03	0,20	0,81	0,25	0,32	0,01	0,83	0,47	0,01

Note: 1 – anesthetists, 2 – gynecologists, 3 — cardiologists, 4 – neuropathologists, 5 – neurosurgeons, 6 – pediatricians, 7 – resuscitators, 8 – therapists, 9 – traumatologists, 10 – surgeons; * – marked significance level $p = 0,05$; ** – the significance level $p = 0,001$ is marked.

As can be seen from the table. 4, there is a positive weak correlation ($r_s = 0,26$ and $r_s = 0,25$) with high significance ($p = 0,01$) between the likelihood of developing CMEA and the specialties "resuscitator" and "surgeon". There is a negative weak significant correlation between the likelihood of CMEA and the specialty "gynecologist" ($r = -0,21$, $p = 0,03$). Between other specialties and the likelihood of developing CMEA, correlation relationships are much weaker and almost tend to zero.

To test this hypothesis, we conducted an analysis of the relationship between the probability of developing EBS on the one hand and the

frequency of physicians admission of defects in rendering MC – on the other.

Table 5

Relationship between the probability of developing EBS and the frequency of diagnostic defects

Criterion	Meaning	Degree of freedom	Significance
Pearson's chi-squared test	20, 260	1	0, 000
Yates's correction for continuity	17, 353	1	0, 000
Likelihood ratio	16, 593	1	0, 000
F-test			0, 000

The given value of the criterion χ^2 is greater than the critical one (3, 841; $\alpha = 0.05$ with one degree of freedom), therefore, there is a statistically significant relationship between the probability of developing EBS and the frequency of diagnostic defects.

The value of the χ^2 criterion with the Yates correction is 17, 353 ($p = 0, 000$), and the likelihood ratio is 16, 593 ($p = 0, 000$), which is also greater than the critical value (3, 841). Therefore, the presence of a connection is confirmed, namely: as the formation of CMEA the number of diagnostic defects increases.

Table 6

The relative risk of diagnosis defects depending on EBS development

Criterion	Meaning	95% confidence interval	
		Lower boundary	Upper border
OP	1, 704	1, 158	2, 506

As can be seen from the table. 6, $RR = 1, 704$ at 95% CI from 1, 158 to 2, 506, which indicates that as the CMEA is formed, the risk of diagnostic defects increases. However, the CI range includes 1, which means the result is not statistically significant. Despite this, the width of the CI gives a clear idea of what OR values can take in 95% of cases, and this allows us to attribute the results to clinically important (clinical importance).

Table 7

Relationship between likelihood of EBS development and the incidence of treatment defects

Criterion	Meaning	Degree of freedom	Significance
Pearson's chi-squared test	10, 556	1	0, 001
Yates's correction for continuity	8, 880	1	0, 003

Likelihood ratio	9, 651	1	0,002
F-test			0, 002

As can be seen from the table 7, Pearson's χ^2 criterion is: $\chi^2_{(1)} = 10, 556$ ($p=0, 001$).

This value of the χ^2 criterion is more than critical (3, 841; $\alpha = 0.05$ for one degree of freedom); therefore, there is a statistically significant relationship between the likelihood of CMEA and the frequency of treatment defects. The value of the χ^2 criterion with the Yates correction is equal to 8, 880 ($p = 0, 003$), and the likelihood ratio is 9, 651 ($p = 0, 002$), which is also more than the critical value (3, 841). Consequently, the presence of a relationship is confirmed, namely: as the CMEA forms, the number of treatment defects increases.

Table 8

Relative risk of diagnosis defects depending on EBS development

Criterion	Meaning	95% confidence interval	
		Lower boundary	Upper border
OP	1, 760	1, 100	2, 816

As can be seen from the table. 8, OP=1, 760 at 95% ДИ from 1, 100 to 2, 816, which indicates that with the formation of CMEA, the risk of treatment defects increases. The ДИ range includes 1 and, therefore, the result is not statistically significant, but the results can be attributed to clinically important.

Table 9

Relationship between developing probability of EBS and the frequency of defects in MC organization

Criterion	Meaning	Degree of freedom	Significance
Pearson's chi-squared test	0, 268	1	0, 604
Yates's correction for continuity	0, 062	1	0, 803
Likelihood ratio	0, 276	1	0, 599
F-test			0, 789

As can be seen from the table. 9, the Pearson criterion χ^2 is: $\chi^2 (1) = 0, 268$ ($p = 0, 604$). This value of the χ^2 criterion is less than critical (3, 841; $\alpha = 0.05$ for one degree of freedom); therefore, there is no statistically significant relationship between the probability of CMEA development and the frequency of defects in the organization of MCs. The value of the χ^2 criterion with the Yates correction is 0, 062 ($p = 0, 803$), and the likelihood ratio is 0, 276 ($p = 0, 599$), which is also less than the critical value (3, 841). Therefore, the lack of communication is confirmed.

Table 10

Relative risk of diagnosis defects depending on EBS development

Criterion	Meaning	95% confidence interval	
		Lower boundary	Upper border
OP	0, 929	0, 714	1, 208

As can be seen from the table 10, OP=1, 929 at 95% ДИ from 1, 714 to 1, 208, which indicates that with the formation of CMEA, the risk of treatment defects increases. The ДИ range includes 1 and, therefore, the result is not statistically significant, but the results can be attributed to clinically important.

Table 11

Relationship between the EMC developing probability and the frequency of documentation defects

Criterion	Meaning	Degree of freedom	Significance
Pearson's chi-squared test	13, 873	1	0, 000
Yates's correction for continuity	12, 101	1	0, 001
Likelihood ratio	13, 671	1	0, 000
F-test			0, 000

As can be seen from the table. 11, the Pearson criterion χ^2 is: χ^2 (1) = 0, 873 ($p = 0, 000$). This value of the χ^2 criterion is less than critical (3, 841; $\alpha = 0.05$ for one degree of freedom); therefore, there is no statistically significant relationship between the probability of CMEA development and the frequency of defects in the organization of MCs. The value of the χ^2 criterion with the Yates correction is 0, 101 ($p = 0, 001$), and the likelihood ratio is 0, 671 ($p = 0, 000$), which is also less than the critical value (3, 841). Therefore, the presence of a connection is confirmed, namely: as the formation of the CMEA, the number of defects in documentation is increased.

Table 12

Relative risk of diagnosis defects depending on EBS development

Criterion	Meaning	95% confidence interval	
		Lower boundary	Upper border
OP	2, 588	1, 290	5, 191

Therefore, the presence of a connection is confirmed, namely: as the formation of the EBS, the number of defects in documentation is increased.

The CI range includes 1 and therefore the result is not statistically significant, but the results can be considered clinically important.

It was of great interest to find out the correlation between the severity of EBS in doctors of different specialties and the likelihood of

occurrence of defects of MC, since the detection of such could be judged on the negative role of "burned out" specialists in the process of occurrence of MC defects, especially while *working in the team*.

Table 13

Correlational links between risk of EBS developing in doctors of various specialties and defects in MC

Area of specialization	Indicators of correlation	defects in the organization of MC			
		1	2	3	4
anesthesiologist	r	0, 15	0, 67*	–	0, 67*
	p	0, 662	0, 024	–	0, 024
gynecologist	r	0, 37	0, 64*	–	0, 60
	p	0, 079	0, 001	–	0, 071
cardiologist	r	–	–	–	–
	p	–	–	–	–
neurologist	r	–	–	–	–
	p	–	–	–	–
neurosurgeon	r	–	–	–	–
	p	–	–	–	–
pediatrician	r	–	0, 01	-0, 35	0, 19
	p	–	0, 953	0, 116	0, 400
resuscitator	r	0, 13	0, 84**	0, 17	0, 63**
	p	0, 595	0, 000	0, 493	0, 002
physician	r	-0, 58	0, 58	–	0, 58
	p	0, 423	0, 423	–	0, 423
traumatologist	r	-0, 13	0, 40	0, 66	-0, 25
	p	0, 749	0, 292	0, 052	0, 516
surgeon	r	-0, 03	0, 23	-0, 43*	0, 51**
	p	0, 900	0, 250	0, 027	0, 007

Note: 1 – diagnostic defects; 2 – treatment defects; 3 – defects in the organization of medical care; 4 – defects in keeping medical records.

* – marked significance level $p = 0, 05$; ** – significance level $p = 0, 001$ is marked.

As can be seen from the table 13, there is an average strength between the area of specialization *gynecologist*, "*therapist*" and defects in diagnostics, however, the insignificant correlation ($r_s = 0, 37$ and $r_s = -0, 58$).

There is no correlation between the other specialties and defects in diagnosis.

Between the areas of specializations *anesthesiologist*, *gynecologist* and treatment defects, a significant positive correlation between the mean strength was observed ($r = 0, 67$ and $r = 0, 64$, respectively).

There is a strong positive correlation ($r_s = 0,84$) with a high degree of significance ($p = 0,0001$) between the area of specialization *resuscitator* and treatment defects.

There is an average strength between the specialties *therapist*, *traumatologist* and treatment defects, however, there is a slight positive correlation ($r_s = 0,58$ and $r_s = 0,40$, respectively).

There is no correlation between the other specialties and defects in diagnosis.

Between the *surgeon* area of specialization and defects in the organization of MP, there is an average negative significant correlation relationship ($r_s = -0,43$; $p = 0,027$).

There is an average strength between the specialties *therapist*, *traumatologist* and treatment defects, however, there is a slight positive correlation ($r_s = 0,35$ and $r_s = 0,66$, respectively). There is no correlation between other medical specialties and defects in MC management.

Between areas of specialization: of *anesthesiologist*, *resuscitator*, *surgeon* and defects in keeping documentation there is a significant positive significant correlation relationship ($r_s = 0,67$; $r_s = 0,60$; $r_s = 0,63$ and $r_s = 0,51$ respectively).

There is an average strength between the areas of specialization *gynecologist*, *therapist* and defects in maintaining medical records, however, a negligible positive correlation ($r_s = 0,60$ and $r^s = 0,58$, respectively).

There is no correlation between the other specialties and defects in diagnosis.

Conclusion.

Thus, there are several specialties for which EBS development is a very probable event with a regular transition from one phase to another, a higher phase. Such specialties are in descending order: neuropathology, cardiology, resuscitation, anesthesiology and neurosurgery.

It can be stated that the most severe degree of EBS develops in resuscitators and anesthetists. The formation of EBS in physicians of different specialties is accompanied by an increase in the likelihood of MC defects.

In this case, the most likely is the occurrence of defects in treatment and defects in maintaining medical records in anesthetists, gynecologists, resuscitators and surgeons.

The *resuscitator* area of specialization with the highest risk of treatment defects and medical records defects should be emphasized here.

It can be assumed that the leading symptoms of EBS: reduction of professional responsibilities and the expansion of the field of economy of emotions lead these doctors to a frank reluctance to engage in *writing* with an emphasis on more productive aspects of professional activity (diagnostic and therapeutic issues) that eventually are flawed.

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А. Н. Овсепян, Р. А. Ованесян, К. Г. Мхитарян

ПОРІВНЯЛЬНА ОЦІНКА ЧАСТОТИ ДЕФЕКТІВ МЕДИЧНОЇ ДОПОМОГИ З УРАХУВАННЯМ ЙМОВІРНОСТІ РОЗВИТКУ СИНДРОМУ ЕМОЦІЙНОГО ВИГОРАННЯ У ЛІКАРІВ

Проблема належної/неналежної медичної допомоги (МП) у судово-медичному аспекті є актуальною для вітчизняної охорони здоров'я. Причини, що ведуть до виникнення дефектів МП, варіюють від нещасних випадків і лікарських помилок до необережних дій та умисних злочинів медичних працівників. Однак при проведенні комісійних судово-медичних експертиз (КСМЕ) поза увагою дослідників залишається важливий аспект проблеми, а саме: розвиток у лікаря, котрий надає МП, синдрому емоційного вигорання (СЕВ).

Об'єктом дослідження стали 208 висновків КСМЕ, за даними архівного матеріалу «Національного бюро експертиз» Національної академії наук Республіки Вірменія за період з 2006 по 2012 рік, а також 141 анкета опитувальника СЕВ, заповнена лікарями, що проходять за «лікарськими справами». Дефекти МП класифікували наступним чином: дефекти діагностики; дефекти лікування; дефекти організації медичної допомоги; дефекти ведення медичної документації.

Метою дослідження є оцінка частоти дефектів надання медичної допомоги з урахуванням ймовірності розвитку синдрому емоційного вигорання у лікарів за матеріалами комісійних судово-медичних експертиз.

За даними висновків КСМЕ, зафіксовано 408 дефектів МП. Найбільш часто допускалися дефекти діагностики (30, 1%), найменш часто — дефекти ведення медичної документації (17, 6%). Дефекти МП були виявлені у лікарів 23 спеціальностей. З них перші 3 «лідуючих» місця займають хірурги, акушери-гінекологи і реаніматологи (14, 5%, 14, 0% і 12, 4% відповідно). До моменту проведення КСМЕ у переважній кількості лікарів різних спеціальностей, які допустили дефекти надання МП, зазначалася наявність (58; 41, 1%) або ж формування СЕВ (59; 41, 8%). Відсутність СЕВ зазначалося всього у 24-х (17, 0%) респондентів. Здебільшого СЕВ наявний у реаніматологів, анестезіологів, акушерів-гінекологів, хірургів і педіатрів. Аналіз взаємозв'язку між ймовірністю розвитку СЕВ і частотою допущення лікарями дефектів надання МП показав, що у міру формування СЕВ збільшується число дефектів діагностики, лікування і ведення медичної документації.

Таким чином, можна виділити кілька спеціальностей, для яких розвиток СЕВ є досить ймовірною подією: реаніматологія, анестезіологія, гінекологія, хірургія. При цьому найбільш важка ступінь СЕВ розвивається у реаніматологів та анестезіологів. Формування СЕВ у лікарів різних спеціальностей супроводжується підвищенням ймовірності виникнення

дефектів МП. При цьому найбільш імовірним є виникнення дефектів лікування та ведення документації у анестезіологів, гінекологів, реаніматологів та хірургів. Тут особливо слід виділити спеціальність «реаніматолог» з найбільш високим ризиком виникнення дефектів лікування і дефектів ведення медичної документації.

Ключові слова: дефекти діагностики; дефекти лікування; дефекти організації медичної допомоги; дефекти ведення медичної документації; комісійна судово-медична експертиза; належна медична допомога; синдром емоційного вигорання.

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O. S. Ziubrii,

Senior forensic expert of Kharkov SSRFC of the Ministry of Internal
Affairs of Ukraine

e-mail: sonya.zuybrij@gmail.com

COMPARATIVE CHARACTERISTICS OF EFFECTIVENESS OF SOME DECONTAMINATION FACILITIES USED FOR CARRYING OUT FORENSIC MOLECULAR GENETIC EXAMINATION

The article is devoted to comparing the performance of disinfectants at different concentrations of a contaminating agent. Contamination of objects can occur at any stage of the study, so effective methods of decontamination should be used to prevent it, which at the same time should be safe for laboratory staff. The purpose of the work is to check the effectiveness of disinfectants while working in biological laboratories and to determine their effects on the genetic information of the cell, the effect on the inhibition of PCR reaction and DNA degradation. The mechanisms of influence on a cell and DNA of chemical solutions are analyzed: Винсент експресс, Бациллол АФ, Дезактин 0, 2 %, WIP'ANIOS Premium, DNAZap™ PCR DNA Degradation Solutions, 70 % и 96 % ethyl alcohols, and physical methods: ultraviolet radiation, alcohol treatment followed by calcination in the flame of the burner and treatment with bidistilled deionized water. While research the contaminating DNA is represented by the synthetic genomic DNA produced by the Promega company. As a result of the pilot study, DNAZap™ PCR DNA Degradation Solutions and bidistilled deionized water had the highest decontamination efficiency. Bidistilled deionized water can be used to the fullest in the laboratory if medical waste disposal standards are met. Other methods showed an efficiency of more than 99.98% which also allows them to be used when working in a biological laboratory, following the suggested recommendations. The presented methods of decontamination did not cause inhibition of the PCR reaction. Preserved, after decontamination treatment, DNA for most agents had a low level of degradation. After being treated with ultraviolet radiation, the level of DNA degradation was medium which means that ultraviolet radiation destroys long strands of DNA, leaving strands unbroken up to 200 bp. In addition, increasing the concentration of contaminating DNA did not affect the change in the efficiency of decontamination substances. All the decontaminated substances analyzed can be modified in molecular genetic laboratories.

Keywords: decontamination agents, DNA, inhibition, PCR, efficiency.

Formulation of Research Problem. Polymerase chain reaction (PCR) has been developed to detect pathogens in clinical specimens, which has revolutionized diagnostic approaches in many fields.

The PCR technique allows the detection of deoxyribonucleic acid (DNA) in an amount of less than 100 pg, for example, by low-copy DNA (LCN) amplification or mitochondrial DNA typing.

Sensitivity of this technique implies the perfect sterility of laboratory rooms, equipment, supplies and solutions¹, so methods to avoid contamination are especially important.

Typically, contamination of consumables occurs at low levels and will not be detected in a sample with enough DNA. In samples with a small amount of DNA, on the contrary, it can be difficult to distinguish between the profile of the sample and the profile of contaminants.

Laboratories utilize negative control for DNA isolation and amplification during screening of reagents for purity of reagents and monitoring of possible contamination.

Each sample, laboratory items, and equipment are potential sources of contaminating DNA, and in addition, a large number of DNA copies exist in the air and on the surfaces of objects in the laboratory during operation. Different sources of contamination require different methods of decontamination.

Contamination of samples and surfaces can occur at any of the stages of operation:

- pre-laboratory (infection of the object of own DNA of the employees who make the selection of objects at the crime scene). Experts working in a DNA laboratory cannot prevent this kind of contamination;
- laboratory (due to violations of the zoning of premises, the transfer of equipment and dispensers between rooms, neglect to use and change of protective clothing: disposable gloves, masks, medical caps and lab clothes).

Laboratory pollution has four main sources:

- contamination of human DNA from the environment: occurs when ignored by experts, biologists, observers or service personnel norms for the use of personal protective equipment in laboratory rooms or the transfer of objects and equipment between areas of the laboratory, without their preliminary cleaning;
- cross-contamination: unintentional contamination of one object with DNA material of another object due to the careless use of equipment, carrying out techniques;
- contamination of PCR reagents and kits for DNA extraction: occurs in the absence of sterility of the reagents, in the preparation of solutions, the use of non-sterile supplies or due to careless handling of research objects;
- contamination by amplification products: transfer of amplified DNA to an object that has not undergone amplification. Amplicons are one of the most common sources of contamination because they can be homologous to target molecules and amplify with higher efficiency than research object.

¹ Tamariz, J. and other. The Application of Ultraviolet Irradiation to Exogenous Sources of DNA in Plasticware and Water for the Amplification of Low Copy Number DNA. Journal of Forensic Sciences. 2006. Vol 51 , № 4. P. 790–794.

The sources of this kind of pollution are dispensers, lab tables and equipment and even the surface of an expert's hands.

Contamination of laboratory surfaces and devices can occur at any stage of the study, which can be avoided by ensuring the cleanliness of the premises and using DNA deactivation techniques.

Scientific problem is to find effective methods of DNA deactivation that could be used in health care settings that were safe for the staff using.

In recent years, various methods of DNA deactivation have been developed to solve this problem, including the use of ultraviolet or γ -radiation, hydroxylamine hydrochloride or ethidium monoazide, treatment with exonuclease III or endonucleases (for example, DNase I or restriction enzymes), as well as autoclaving and deactivation by a gas generator based on radicals. The most affordable and cheapest decontamination methods applicable in PCR laboratories are oxidative reagents and UV radiation¹.

Research on this topic by scientists such as Y. Wu, J. Wu, Z. Zhang, Cheng², Setlow, Parish, P. Zhang², focused on determining the effect of disinfection methods (UV, high temperature, 75% ethanol) and sodium hydrochloride) for certain types of pathogenic microorganisms (*Staphylococcus aureus*, *HBV*, *Entamoeba histolytica*) and their spores, which in medical laboratories can lead to false positive test results.

Researchers Gefrides, Powell, Donley, Kahn³, determined the effectiveness of autoclaving and ultraviolet irradiation as methods of cleaning supplies from contamination of human DNA. The presented works cover a limited number of disinfection methods that are used in medical and biological laboratories, and do not describe the effect of decontaminants on the contamination of laboratory surfaces of human DNA.

Based on this problem, and on the basis of data on the physicochemical and biological properties of disinfectants used in biological laboratories, the assumption was made to check the effectiveness of these agents when working in biological laboratories and their effect on the genetic information of the cell.

Research Purpose:

elucidation, according to the literature, of the mechanisms of action of decontamination means, verification of the effectiveness of disinfection of DNA contamination by selected physical and chemical methods, the

¹ Wu Y. and other. DNA decontamination methods for internal quality management in clinical PCR laboratories. Journal of clinical laboratory analysis. 2017. Vol 32. № 3.

² Setlow, B. and other. Mechanism of killing of spores of *Bacillus anthracis* in a high-temperature gas environment, and analysis of DNA damage generated by various decontamination treatments of spores of *Bacillus anthracis*, *Bacillus subtilis* and *Bacillus thuringiensis*. Journal of Applied Microbiology. 2014. Vol. 116. P. 805–814.

³ Gefrides, L. A. and other. UV irradiation and autoclave treatment for elimination of contaminating DNA from laboratory consumables. Forensic Science International: Genetics. 2010 . Vol 4. № 2. P. 89–94.

effect of disinfectants on the inhibition of PCR reaction and degradation of DNA.

Main content presentation.

The analysis of the literature revealed that the mechanisms of decontamination chosen for the study have state registration in Ukraine, methodological instructions for use, approved by the State Sanitary and Epidemiological Service, are used in other laboratories, including international ones.

The presented decontamination agents have different mechanisms of action on the cell and DNA.

We describe them by the mechanism of action and the main active substances:

1. Chemical methods:

A) alcohol-containing drugs:

– 70% and 96% ethyl alcohols have the same mechanism of action on the cell — when interacted with the cell surface, cause its dehydration and denaturation of proteins.

Antiseptic effect of an aqueous solution of alcohol has a concentration dependence, so preparations with an ethyl alcohol content of less than 50% do not have a pronounced antiseptic effect, but with an increase in the concentration of alcohol increases its ability to coagulate cell proteins.

Antiseptic ability of absolute alcohol drops sharply, as the rapid coagulation of the membrane proteins of the cell prevents the concentrated alcohol from penetrating the cell and destroying its inner contents.

– *Винсент експресс.*

Main active ingredient is 65-70% ethyl alcohol.

The mechanism of action of ethanol is denaturation and coagulation of proteins, dissolution of lipids.

The hydroxyl group, which is present in the structure of alcohols, binds to the proteins of the cell wall through a hydrogen bond, disrupts their structure and function, which leads to the deposition of proteins in the precipitate.

In addition, hydroxyl ions saponify lipids in the membrane, causing the cell surface structure to break down.

– *Бациллол АФ.* main active substances: 1-propanol 45% and 2-propanol 25%, cause cell dehydration and protein denaturation, which leads to the destruction of the cell wall structure and cell membrane, the release of intracellular components, which ultimately leads to a loss of cell functionality¹.

B) Chlorine-containing preparations:

¹ Sang Su Kim and other. Comparison of disinfective power according to application order of 70% isopropyl alcohol and 10% povidone-iodine. Korean J Anesthesiol. 2013. Vol 65. P. 519–524.

– Decactin 0, 2%. The main active substances are: sodium chloride, 1, 3-dichloro-5, 5-dimethylhydantoyl.

Chlorine compounds have multiple effects on the cell, among them: chlorination of amino acids; oxidation of peptide bonds in proteins and their subsequent denaturation¹; reduced absorption of nutrients and oxygen; inhibition of protein synthesis; reduced production of adenosine triphosphate due to K⁺ leakage and malfunctioning of the Na⁺ / K⁺ pump; single and double stranded DNA breaks and inhibition of DNA synthesis; violation of the SOS-DNA repair system².

– *WIP'ANIOS Premium*.

The main active substances are: didecyldimethylammonium chloride, polyhexamethylenebiguanide hydrochloride. WIP'ANIOS Premium combines the disinfectant properties of chlorides and ammonium compounds.

Chlorine compounds cause inactivation of energy-producing enzymes, denaturation of major cellular proteins, and destruction of the cell membrane.

Ammonium compounds, for their part, lead to disruption of intermolecular interactions and dissociation of lipid bilayers; reducing the electron transport intensity and reducing the efficiency of the phosphorylation system; protein denaturation; a rapid increase in the permeability of cell membranes and their destruction, followed by leakage of intracellular components. WIP'ANIOS Premium has a long-lasting effect, as it is deposited in the form of a microscopically thin film on objects and surfaces, with prolonged contact with cells, the biocide causes their autolysis³.

C) Drug with copper sulfate

– DNAZap™ PCR DNA Degradation Solutions.

Main active substances of this drug are trade secrets.

According to the protocol of use, sprays contain metal ions, among which there is copper (II) sulfate, capable of catalyzing the peroxidation of membrane lipids using active forms of oxygen to the cell; oxidize low density lipoproteins; subject the base to oxidation through free oxygen radicals; to induce breaks in DNA strands due to the association of metal ions with various regions of the double helix and binding to individual nucleotides⁴.

¹ Maris P. Modes of action of disinfectants. Rev. sci. tech. Off. int. Epiz. 1995. Vol. 14. № 1. P. 47–55.

² Guideline for Disinfection and Sterilization in Healthcare Facilities. Centers for Disease Control and Prevention. 2016. URL : <https://www.cdc.gov/infectioncontrol/guidelines/disinfection/disinfection-methods/chemical.html> (дата обращения: 19.06.2019).

³ Ioannou, C. J., Hanlon, G. W., Denyer, S. P. Action of Disinfectant Quaternary Ammonium Compounds against *Staphylococcus aureus*. Antimicrobial Agents and Chemotherapy. 2006. Vol. 51. № 1. P. 296–306.

⁴ DNAZap™ PCR DNA Degradation Solutions. Thermo Fisher Scientific. 2017. URL : https://assets.thermofisher.com/TFS-Assets/LSG/manuals/9890M_DNAZapSolutions_PL.pdf (дата обращения: 20.06.2019).

Copper ions also react with hydrogen peroxide to form free hydroxyl radicals, which initiate a chain reaction of peroxidation that damages the DNA molecule¹.

2. Физические методы:

Ultraviolet radiation inactivates the functional activity of proteins due to the destruction of nitrogenous bases in the active center of the protein; causes photo-oxidation of lipids, with the formation of free radicals and hydroperoxides; leads to the formation of dimers between pyrimidine bases in DNA and disrupts the reaction of transcription and replication of nucleic acids².

In addition, UV damage causes suppression of adenosine triphosphate synthesis, increased membrane permeability, loss of activity of biologically active substances.

B) Alcohol treatment followed by calcination in the burner flame.

It combines the benefits of alcohol decontamination, which causes cell dehydration and denaturation of its proteins, and complete cell dehydration by burning the alcohol solution.

Removal of an aqueous component of a cell, when calcined in a flame, leads to an increase in the concentration of salts and minerals, which disrupt the metabolic functions of the cell and cause its death.

In addition, heat denatures proteins, provokes oxidative damage to the cell due to the action of free radicals and leads to the "burning" of all surface biomaterials on objects.

Distilled water is a hypotonic solution, so there is a swelling of the cell and then cytolysis, during which the cell's own lysosomal enzymes dissolve the internal contents of the cell.

Research objects

Seven decontamination solutions used in the laboratory were tested during the study (Винсепт экспресс, Бациллол АФ, Дезактин 0, 2%, WIP'ANIOS Premium, DNAZap™ PCR DNA Degradation Solutions, 70% ethyl alcohol, 96% ethyl alcohol), physical decontamination methods (ultraviolet radiation, alcohol treatment followed by calcination in a burner flame) and bidistilled deionized water.

The contaminating solution is a synthetic genomic DNA company Promega, a concentration of 50 ng / µl. DNA, which for the study, was reduced to concentrations: 1 ng / µl, 3 ng / µl, and double-distilled deionized water was used to dilute.

Two controls were used in the study:

– negative: a slide on which control DNA was not applied, is an indicator of the purity of the glasses used while research;

¹ Georgieva S., Popov B., Petrov V. Genotoxic effects of copper sulfate in rabbits. Archives of Biological Sciences. 2013. Vol. 65. № 3. P. 963–967.

² Mark W LeChevallier, Kwok-Keung Au. Water Treatment and Pathogen Control: Process Efficiency in Achieving Safe Drinking Water. World Health Organization. 2004. P. 41 – 66

– positive: a glass on which the chosen concentration of DNA was applied, but which was not exposed to disinfectants, is an indicator of the efficiency of sampling¹.

In order to ensure the purity of the experiment and to avoid cross-contamination, a blind experiment method was conducted, deliberate glass contamination and sampling were separated over time.

During all the procedures, the research staff wore appropriate protective equipment (nitrile gloves, a mask, a dressing gown and a hat) and cotton swabs and 1, 5 ml tubes used for washing were previously disinfected in accordance with the technical recommendations for working in the laboratory². Nitrile gloves were systematically replaced between successive application and sampling sessions. A sample with control DNA diluted to the required concentration was systematically mixed during operation on a Biosan FV-2400 vortex centrifuge.

Experiment technology

For the research we used microscope slides (hereinafter referred to as glasses), which were pre-immersed for 24 hours in a disinfectant solution, cleaned with detergent and deionized bidistilled water, treated with 70% alcohol solution. After the purification step, the glasses were placed in a laminar box for natural drying.

At the next stage, the glass was contaminated by applying, using dispensers and disposable tips, 3 µl of the solution with the selected DNA concentration to the central region of each glass.

Material, mechanically, using a tip, was distributed in a thin layer over the surface of the slide. The contaminated glasses were then allowed to dry completely at room temperature without direct sunlight.

The finished contaminated glasses were divided into groups, namely, three glasses for each disinfectant solution and physical disinfection method.

Thus, all disinfectants were tested in three parallel replicates (to evaluate the reproducibility of the results).

The further steps for disinfecting the glass depended on the method of disinfection chosen. A group of glasses selected for research:

- ultraviolet radiation was placed in a laminar box (distance from lamps to objects was 45 cm) and irradiated for 30 minutes;
- chemical disinfecting solutions, 70% and 96% ethyl alcohol and double-distilled deionized water were treated with solutions using the wash method. Rinses were carried out in three “wiping” movements, for each glass, using cotton swabs soaked in disinfectant reagents;

¹ Adé A and other. Comparison of Decontamination Efficacy of Cleaning Solutions on a Biological Safety Cabinet Workbench Contaminated by Cyclophosphamide. The Canadian Journal of Hospital Pharmacy. 2017. Vol. 70. № 6. P. 407–414.

² Derzhavni sanitarni normy i pravyla [State sanitary rules and regulations]: nakaz Ministerstva okhorony zdorovia Ukrainy vid 24.01.2008 № 26. Ofitsiyniy visnyk Ukrainy. 2008. № 11. St. 274 [in Ukrainian].

– 70% of the alcohol with subsequent burning was investigated by the method of flushing and burning the entire surface of the glass with an alcohol burner.

Degree of cleaning efficiency of the glasses by decontamination agents was determined by the method of washing the samples, using a cotton swab, five times “wiping” movements for each glass tested.

To measure the residual amount of DNA, at the beginning, DNA was extracted from swabs using a Chelex ion exchange resin. 200 µl of 5% Chelex (Bio-Rad Laboratories, Hercules, CA) was added to the test tubes, incubated at 56 ° C for 30 minutes, then the tubes were shaken in a vortex centrifuge and incubated in a water bath for 8 minutes, the vortexing step was repeated, and then centrifuged at a maximum speed of 5 minutes¹. The supernatant with the extracted DNA from each sample was transferred to a new clean tube and the PCR reaction was performed in real time using the Promega PowerQuant TM System kit. The result of real-time PCR is the quantitative determination of total (autosomal) DNA, the degree of degradation and inhibition of DNA on the presented swabs.

Ct values (cycle threshold) and amplification efficiency values were calculated using Real Time PCR System 7500 v2.0 software (Applied Biosystems, Life Technology, ThermoFisher Scientific) provided by the manufacturer.

Statistical analysis and research results

To test the significance of the data obtained, two hypotheses were put forward:

H₀ — there are differences between the mean values of the concentration of the pollutant before and after the use of the decontamination agent.

H₁ — there are differences between the mean values of the concentration of the pollutant before and after the use of the decontamination agent. The decontamination agent works.

The results of the calculation of statistical indicators are shown in the table below. Since we have two related samples that correspond to the normal distribution, we will use paired Student t-test for statistical calculations of the study. The central characteristics of the presented series of results were also calculated: arithmetic mean ($\bar{x}$), confidence interval of arithmetic mean ($\Delta\bar{x}$), standard deviation (SD)². And a separate indicator — decontamination efficiency (DE), is calculated for each washing solution as the measured concentration of the contaminating agent after treatment to the initial concentration of the agent.

¹ Abbasov R. H., Povkh A. S., Romanchuk S. M. *Metodyka provedennia molekuliarno-henetychnykh doslidzhen* [Methodology of molecular genetic studies]: metod. rekomend. Kyiv : DNDEKTs MVS Ukrainy, 2018. 75 s [in Ukrainian].

² Atramentova L. A. *Dizajn i statistika biologicheskogo issledovaniia* [Design and statistics of biological research]. Har'kov : Izdatel'stvo «NTMT», 2015. 269 s [in Russian].

The absolute values (modules) of the Student criterion were compared with the table value of the indicator, with the number of degrees of freedom equal to $df = N - 1 = 5$ and the significance level equal to 0.05. Two-sided student criterion for a given value of the degree of freedom is 2. 57. Indicators of the criterion Student's study is from 4,422 to 4,473, which exceeds the critical tabular value of the indicator. Thus, for all the presented disinfectant solutions and methods, we can reject the stated null hypothesis and accept the alternative hypothesis, with the statement of a statistically significant difference in the concentration of the contaminant before and after the disinfecting measures.

Table 1

Statistical characteristics of the efficiency of decontamination agents

Methods/Indicators	$\bar{x} \pm ДИ$	SD	T	DE, %
Бациллюл АФ	0, 00380, 0033	0, 0031	- 4, 470	99, 998
Дезактин 0, 2 %.	0, 0020 $\pm$ 0, 0018	0, 0017	- 4, 472	99, 999
bidistilled water	0, 0003 $\pm$ 0, 0005	0, 0005	- 4, 473	100, 000
70% ethyl alcohol	0, 0025 $\pm$ 0, 0014	0, 0014	- 4, 470	99, 999
96 % ethyl alcohol	0, 0213 $\pm$ 0, 0234	0, 0223	- 4, 422	99, 986
70 % alcohol and calcination	0, 0035 $\pm$ 0, 0036	0, 0034	- 4, 472	99, 998
UV radiation	0, 0198 $\pm$ 0, 0063	0, 0060	- 4, 442	99, 988
Винсепт експресс	0, 0028 $\pm$ 0, 0019	0, 0018	- 4, 473	99, 998
WIP'ANIOS Premium.	0, 0015 $\pm$ 0, 0018	0, 0018	- 4, 473	99, 999
DNAZap	0, 0003 $\pm$ 0, 0009	0, 0008	- 4, 470	100, 000

Примечание: $\bar{x}$ – arithmetic mean, ДИ – 95 % confidence interval, SD – standard deviation, T – Student's t-test, DE – decontamination efficiency.

Results and discussion

This work, carried out on the basis of the Department of Biological Research and Accounting of Kharkov Research Institute of the Ministry of Internal Affairs of Ukraine, is a pilot study of the study of the effectiveness of decontamination at different concentrations of the contaminating agent.

Results of the quantitative analysis showed that the highest observed concentration after purification was 0, 061 ng (when treated with 96% alcohol), and the lowest observed concentration was the complete absence of DNA (when treated with decactin, bidistilled deionized water, WIP'ANIOS Premium, DNAZap™ PCR DNA Degradation Solutions).

Not detecting a contaminant does not necessarily mean that all the DNA molecules have been completely removed. A small amount could remain on the glass surface but was not measured because the concentration was below the detection limit.

Винсепт експресс, Бациллюл АФ, Дезактин 0, 2 %, WIP'ANIOS Premium, DNAZap™ PCR DNA Degradation Solutions, 70% ethanol, treatment with alcohol, followed by roasting in a burner flame and bidistilled deionized water removed the control DNA with a concentration

of 1 ng / μ l and 3 ng / μ l with equal efficiency, and the effectiveness of these disinfectants was 99.9% after the first surface cleaning session.

The highest 100, 0% decontamination efficiency was demonstrated by DNAZapTM PCR DNA Degradation Solutions and double-distilled deionized water. However, the main effect of bidistilled deionized water is based on the washing off of DNA from the glass, and not its complete destruction, as is typical when using DNAZap, therefore, after decontamination, the consumables (wipes, gauze) used to wash them must be disposed of as medical waste. As the study showed, bidistilled deionized water can also be fully used in a biological laboratory as a disinfectant solution, along with other chemical solutions by physical methods.

For 96% ethyl alcohol and ultraviolet radiation, the efficiency index was 99, 98%, these methods work less efficiently than the rest, and after treatment there is a residual concentration of DNA that can contaminate the samples and lead to unreliable genetic analysis results. The property of 96% alcohol to instantly coagulate the proteins of the cell reduces its ability to penetrate into the cell and disrupt its operation, which explains the results.

In practice, this can be adversely affected, for example, by contamination with a multilayer or multicellular contaminating agent.

Ultraviolet irradiation also has a number of usage features that, in real conditions, negatively affect its effectiveness: indoor humidity is above 70%, dust (dirt) accumulates on surfaces, long distances from surfaces to an incandescent lamp, the material of which the object is made (porous and opaque materials are not effectively disinfected by radiation)¹.

Taking into account these negative features, the experimental level of disinfection efficiency, the availability and prevalence of these processing methods, it can be said that these methods can be used as independent decontamination agents, but for the complete removal of contaminants it is recommended that, as a first step, treatment with 96% alcohol or ultraviolet radiation, and as a final stage – use one of the other means presented.

Quantitative analysis also evaluated the threshold positive internal control (IPC Ct) cycle and the level of DNA degradation. The performance of the IPC Ct threshold cycle for all samples corresponded to the necessary, according to the manufacturer's protocol, the exit cycle of the internal control, meaning the use of these decontamination substances does not cause inhibition of the PCR reaction.

However, the exception was the samples treated with ultraviolet radiation, the degradation level for them was from 3, 0 to 5,5, which corresponds to the average level of degradation of the sample and means that the irradiation better destroys long strands of DNA, and leaves undamaged DNA fragments less than 200 pn., which, according to literary data, is characteristic of this radiation².

¹ Burgener, J. Position paper on the use of ultraviolet lights in biological safety cabinets. Applied Biosafety. 2006. Vol 11. № 4. P. 228–230.

Thus, all disinfection methods significantly reduced the contamination of glass surfaces that were exposed to a certain amount of DNA. In addition, when the concentration of pollutants changed, there was no noticeable difference in the efficiency of the disinfectors, this means that the DNA concentration does not affect the performance of the decontaminants and all the presented processing methods can be fully used in biological laboratories.

Conclusions

1. Results of the quantitative analysis showed that the highest observed concentration after purification was 0,061 ng (when treated with 96% alcohol), and the lowest observed concentration was the complete absence of DNA (when treated with decactin, bidistilled deionized water, WIP'ANIOS Premium, DNAZapTM PCR DNA Degradation Solutions).

2. The highest 100.0% decontamination efficiency was demonstrated by DNAZapTM PCR DNA Degradation Solutions and bidistilled deionized water.

Decontamination efficiency using Vinsept Express, Bacillol AF, Dezactin 0, 2%, WIP'ANIOS Premium, 70% ethyl alcohol, alcohol treatment followed by calcination in the burner flame was 99,99%.

For 96% of ethyl alcohol and ultraviolet radiation, the decontamination efficiency was 99.98%.

3. The presented decontamination agents do not cause inhibition of the PCR reaction.

4. The DNA degradation index for most decontamination substances was <2, 0, but for the samples treated with ultraviolet radiation, the degradation level was from 3, 0 to 5, 5.

5. High concentration of DNA does not affect the performance of the presented decontamination substances. However, the effect of decontamination agents on trace concentrations and degraded DNA may differ. This problem is a goal for future research.

6. The comparative characteristics of the presented treatment methods showed the difference in the mechanisms of action of decontaminating agents on human DNA and the high efficiency of their work, which allows to apply the selected methods in biological laboratories.

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С. О. Зюбрий

**СРАВНИТЕЛЬНАЯ ХАРАКТЕРИСТИКА ЭФФЕКТИВНОСТИ
НЕКОТОРЫХ ДЕКОНТАМИНАЦИОННЫХ СРЕДСТВ,
ИСПОЛЪЗУЕМЫХ ПРИ ПРОВЕДЕНИИ СУДЕБНОЙ МОЛЕКУЛЯРНО-
ГЕНЕТИЧЕСКОЙ ЭКСПЕРТИЗЫ**

Статья посвящена сравнению эффективности работы дезинфицирующих средств при различной концентрации контаминирующего

агента. Контаминация объектов может происходить на любой стадии проведения исследования, поэтому для ее предотвращения необходимо использовать эффективные деконтаминирующие методы, которые в то же время должны быть безопасны для персонала лаборатории. Целью работы является проверка эффективности дезинфицирующих средств при работе в биологических лабораториях и определение их воздействия на генетическую информацию клетки, влияния на ингибцию реакции ПЦР и дегградацию ДНК.

Ключевые слова: деконтаминирующие средства; ДНК; ингибция; ПЦР; эффективность.

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K. M. Danshina,

Senior Researcher at KhRIFE, Kharkiv, Ukraine

T. A. Filonenko,

Forensic Expert at KhRIFE

Kharkiv, Ukraine

E-mail: limbo5@ukr.net

PECULIARITIES OF MULTIDISCIPLINARY FORENSIC RESEARCH ON HYDROLYSIS LIGNIN

The article deals with the peculiarities of complex expert research of lignin, since knowledge of the forensic and chemical and forensic examinations was required. It was noted that in the microscopic study, all of the samples submitted for research revealed small particles of brown wood with different shades and brown conglomerates. The maceration method investigated specially processed samples of the substances provided. A qualitative reaction to lignin revealed the presence of molecules provided for the study of substances, the conifer aldehyde group and the structural chain that is characteristic of lignin. Qualitative reactions revealed that iron, calcium, magnesium, aluminum and sulfate ions were identified in all lignin samples, which characterizing qualitative composition of vegetable raw materials. It has been determined that further studies of lignin should be carried out in a well-established manner, namely: determination of carbon content; quantitative determination of solids and hygroscopic moisture; determination of ash content; determination of the quantitative content of calcium; quantitative determination of magnesium; determination of quantitative content of iron.

Keywords: lignin, microscopic investigations, qualitative reactions, properties, content of substances.

Formulation of Research Problem.

The issue of environmental quality assurance in Ukraine is related to the reduction of environmental burden of waste of various origins.

The problem of industrial waste disposal is caused by the reduction of some types of resources and the possibility of manufacturing recyclable products with lower production costs and high quality of the final product.

The economic and technical nature of waste management is closely linked to a number of measures to protect the environment and use natural resources¹.

¹ Shmandyi V. M., Pliatsuk D. L. Peredumovy pobudovy modeli imovirnisnoho rozpodilu zabrudniuiuchykh rechovyn v atmosferi [Prerequisites for constructing a model of probable distribution of pollutants in the atmosphere]. Naukovyi zhurnal «Ekologichna bezpeka». Kremenichuk : KrNU. 2014. № 2 (18). S. 56–60. Povzun O. I., Podkopaiev S. V., Virych S. O., Horiacheva T. V., Dorokh S.

Hydrolysis plants can be considered as waste-producing enterprises.

The hydrolysis plants mainly process sawmill and woodworking waste: sawdust, crushed sawmill waste (slopes, rails) and wood for the purpose of obtaining, among other things, a commodity product such as hydrolysis lignin.

In the technologies of production of lignin on the basis of waste of vegetable raw materials use various methods that affect its properties.

Аналіз останніх досліджень і публікацій.

In the processing of vegetable raw materials by a complex method is complete hydrolysis of polysaccharides, and lignin remains in the form of insoluble residue, the humidity of which is 20%.

In the complex processing of coniferous wood for cellulose and other products, when only hydrolysis of hemicellulose polysaccharides is provided, water-soluble lignin is formed.

Technical or hydrolytic lignin after hydrolysis with dilute acids remains insoluble in water, but a small number of active groups are formed, which form methyl alcohol, formaldehyde, acetic acid and formic acid.

In the waste of this production, in addition to hydrolysis of lignin, there are residues of plant tissue¹.

Problems of the use of wood waste are also considered in the scientific works of other scientists, among them: M. S. Gabrel, G. G. Geletukha, T. A. Zhelezna, M. M. Zhovnir, A. M. Deineka, P. R. Puzentilo, M. B. Svintukh and others.

However, the papers of these authors did not pay attention to complex expert study of lignin.

The **article purpose** is to outline the features of a comprehensive expert study of lignin.

Main content presentation

Despite the development of processing technologies, the issue of the generation of waste that is harmful to the environment remains open.

Along with the problem of environmental pollution is the problem of illegal production of lignin hydrolysis brand L-4 in order to sell it at the consumer market at inflated prices. That is why environmentalists and law enforcement officials initiated criminal proceedings and prepared a motion to appoint a forensic examination of materials, substances and articles.

Knowledge in the fields of forensic-chemical and forensic-biological expertise was required to resolve the issues raised by the investigators in the forensic examination, therefore, a comprehensive forensic examination was

H. Utylizatsiia polimernoho ta lisokhimichnoho vyrobnytstva u dorozhnomu budivnytstvi [Utilization of polymer and forestry production in road construction]. Ekologichna bezpeka. № 2/2016(22). S. 102–111 [in Ukrainian].

¹ Basiuk B. I., Obodovych O. M., Lunina A. O. Analiz metodiv pererobky vidkhodiv roslynnoi syrovyny v tekhnolohiiakh vyrobnytstva hidroliznoho spyrtu, furfurolu ta lihninu [Analysis of methods of processing waste of vegetable raw materials in technologies of production of hydrolysis alcohol, furfural and lignin]. Prom. teplotekhnika. 2007. T. 29. № 6. S. 33–45 [in Ukrainian].

conducted to investigate the substances of chemical industries and specialty chemicals and objects of plant origin.

In the expert examination of the samples provided, namely microscopic examination, we used the technique of investigation of objects of plant origin using a stereo microscope MBS-9 (reflected light, magnification 48x) and microscope "Amplival" (transmitted light, magnification 210x, medium — glycerol).

When examined in the field of view of the stereo microscope IBS-2 as a part of all samples submitted for the study revealed insignificant particle sizes of brown wood with different shades and conglomerates of brown color.

Maceration in the field of view of the microscope "Ampival" investigated specially processed samples of the given substances.

The test specimens of the test substances were treated with concentrated nitric acid, washed twice with distilled water, and then the preparations were prepared in glycerol.

At microscopic examination of the prepared preparations it found that macerated particles of each of the substances presented for research contain:

- remains of plant objects in the form of fragments of vessels with numerous pores, which is characteristic of deciduous trees of trees;
- remnants of mechanical tissues, tracheids with large framed pores, arranged in a single row, which is characteristic of coniferous trees;
- other parts of plant origin.

After conducting the microscopic examination, taking into account the data given in the decision of the initiator of the examination and the results of the external examination, the experts assumed that the substances provided for the study were lignin.

To confirm this assumption, a qualitative reaction to lignin was performed.

Parts of the substances presented for study separately from each package (6 packages in total) were impregnated with 12% hydrochloric acid solution.

Excess acid was selected by filter paper. The residues prepared in this way were separately applied dropwise with a 5% ethanol solution of phloroglucine, after which the particles of the substance from each package were colored purple-red. Thus, a qualitative chemical reaction established the presence of molecules provided for the study of substances, coniferaldehyde group and the structural chain that is characteristic of lignin. Based on the information obtained, it is concluded that the substances provided for research are the product of synthesis of terrestrial parts of plants: lignin

Subsequently, the fractional composition of the presented lignin samples was determined using the sieving method using a laboratory sieve set. The results of the study made it possible to establish that the smallest

particle size from 0, 5 to 1, 0 mm (9, 3... 12, 5%) was given for the study, and the largest particle size from 1, 0 to 5, 0 mm.

To establish the qualitative elemental composition of the lignins provided for the study, their parts were separately placed in porcelain crucibles, 2 cm³ of concentrated sulfuric acid was added, heated in a water bath, and 2 cm³ of distilled water was added. The resulting mixtures were thoroughly mixed and separately filtered through paper filters into conical flasks. Each crucible and filter were washed 3 cm³, attaching the wash water to each of the filtrates, respectively. Each of the filtrates was divided into several parts, with which the characteristic qualitative chemical reactions were carried out:

- addition of ammonia solution and sulfosalicylic acid solution in all 6 mixtures obtained revealed ions of iron (appeared brown-red color) in the composition of the lignins provided for research;

- the addition of solutions of ammonia, ammonium chloride and ammonium oxalate in all 6 mixtures obtained revealed calcium ions, as after the addition of solutions initially appeared a white opacity, which gradually turned into a white fine crystalline precipitate, which did not dissolve when added concentrated acid, but readily soluble by the addition of nitric acid;

- addition of solutions of ammonium chloride, sodium phosphate, ammonia in all 6 mixtures obtained revealed magnesium ions, as evidenced by the appearance of a cloudy white color, which gradually turned into a white finely crystalline precipitate, which dissolves with the addition of acetic acid;

- successively added an excess of 20% sodium hydroxide solution and ammonium chloride powder; the resulting mixtures were heated to boiling, followed by the formation of a gelatinous precipitate of white color, which dissolves in excess of solutions of mineral acids; this qualitative chemical reaction proves the presence in the samples of lignin of aluminum ions;

- addition of a solution of hydrochloric acid and 5% solution of barium chloride in all 6 mixtures obtained revealed sulfate ions, because after the addition of solutions initially appeared a cloud of white, which gradually turned into a white precipitate, which is insoluble in mineral acids.

Thus, by qualitative chemical reactions, it was found that iron, calcium, magnesium, aluminum and sulfate ions, which are characteristic of the qualitative composition of the plant material, were detected in all lignin samples tested.

The following studies were conducted in a clearly defined order, namely:

- determination of carbon content;
- determination of the quantitative content of dry matter and hygroscopic moisture;
- determination of ash content;
- determination of the quantitative content of calcium;

- determination of the quantitative content of magnesium;
- determination of the quantitative content of iron.

The quantitative carbon content was determined in fractions less than 0, 25 mm (three samples per object) of all lignin samples submitted for study. At analytical scales, samples of 0,005 g of the indicated fractions of all lignin samples submitted for the study were taken and placed in conical flasks with a capacity of 100 cm³, 15,0 cm³ of 0, 1 N potassium hydroxide solution were poured. The extraction was carried out for 1 hour in an oven at +165°C. After cooling, 1 cm³ of 1% phenylanthranilic acid solution was added to each mixture and titrated with a 0, 2 N solution of Mor salt. The results of the study showed that the carbon content of the samples submitted for study ranges from 57, 0% to 60, 6%.

The amount of hygroscopic moisture and dry matter was determined after drying at 105 ° C to a constant weight of 1, 000 g of each of the given lignin samples. As a result of the study it was found that the content of hygroscopic moisture in the samples ranges from 45, 36% to 55, 45%, and the dry matter — from 44, 55% to 54, 64%.

Determination of ash was performed after drying lignin samples, when air-dry samples (1, 000 g) in ceramic crucibles were placed in a muffle furnace and kept at 750 ° C for 2 hours. The ash content of the samples submitted for study ranges from 6, 83% to 13, 78%.

Calcium, magnesium and iron were determined in lignin fractions less than 0, 25 mm (three samples from each object). After determining the ash content, the lignin contents were quantitatively transferred into conical flasks, filled with 10 cm³ with 10% hydrochloric acid, and brought to boiling point. After cooling, the mixture was filtered into 25 cm³ volumetric flasks, the filter and the precipitate were washed with distilled water and added to the resulting filtrates. After such preparation, the samples were used to determine the quantitative content of calcium, magnesium and iron.

To determine the quantitative calcium content of each volumetric flask, using a Mora pipette, 10 cm³ of hydrochloric acid solution was taken, which was transferred to a glass beaker, 1-2 drops of methyl-mouth indicator were added, and then 10% aqueous ammonia solution was added dropwise to change the color indicator. The cups were then heated on an electric tile until the first bubble appeared. The mixtures were filtered into conical flasks, the beaker and filter washed several times with distilled water to a volume of 150 cm³ of filtrate. To the resulting filtrate, 5 cm³ of 20% sodium hydroxide solution, 1 cm³ of 1% sodium sulfide solution and 5% hydroxyl amine hydrochloric acid solution were added to each flask, after which the indicator — dry chromogen dark blue was added. The resulting mixtures were titrated with a 0.02 M complex-III solution and the calcium content was calculated on a dry sample. The calculations showed that the calcium content of the lignin samples provided for the study is from 1, 53% to 1, 83%.

To determine the magnesium content of each of the flasks, which was determined by the quantitative calcium content, was placed a fragment of Congo paper, was added dropwise 10% hydrochloric acid solution to change the color of the paper from red to blue. After that, the mixture was heated until condensate vapor flasks appeared on the walls, a 10% ammonia solution was added dropwise until red Congo paper appeared, and then a chloride-ammonia buffer solution with $\text{pH} = 10$ to 20 cm^3 . The mixture is titrated with Complexon-III after the addition of the black chromogen indicator and the magnesium content is calculated. The calculations show that the magnesium content of the lignin samples provided for the study ranges from 0,21% to 0,28%.

To determine the quantitative content of iron from a volumetric flask using a pipette Mora was selected 10 cm^3 hydrochloric acid solution and placed in a glass beaker, added dropwise 10% ammonia solution to the appearance of precipitates of one and a half oxides and added 5 cm^3 of 1 N hydrochloric acid solution. The mixture was heated to a temperature of $+60 \dots 70^\circ \text{C}$, an indicator of 1 cm^3 solution of 1% sulfosalicylic acid was added, titrated in a hot state with a 0.02 M complex-III solution and the iron content was calculated. The calculations prove that the magnesium content of the lignin samples provided for the study is from 1, 2% to 1, 9%.

Conclusions. According to the results of the conducted researches it is established that the substances submitted for research coincide with each other in appearance, which is confirmed by microscopic examination. The samples also have the same content of iron, calcium, magnesium, aluminum and sulfate ions in their composition. The listed overlapping features are generic in forensic significance, and lignin specimens submitted for research have a common generic identity. However, at the same time, these samples differ in quantitative content of dry matter and hygroscopic moisture, ash content, quantitative content of carbon, iron, magnesium, calcium. Such differences can be explained by different sources of origin of lignins provided for research, as well as technological features of their production, storage conditions, etc. Considering the above, it is not possible to resolve the question of establishing common (different) group membership of the samples submitted for research and whether they were previously a single mass.

Based on the data obtained, it can also be concluded that the characteristics of lignin samples are in accordance with the specifications in the technical documentation for the product¹, namely: the quantitative content of carbon, calcium, magnesium, iron, ash, hygroscopic moisture, dry matter, but submitted for research the samples do not correspond to the quantitative content of the particles, the sizes: less than 0,25 mm; from 0, 25 to 0.50 mm; from 0, 5 to 1,0 mm.

¹ ГОСТ 26177–84. Корма. Комбикорма. Метод определения лигнина. Москва : Издательство стандартов. 1984. 3 с.

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К. М. Даньшина, Т. А. Філоненко

ОСОБЛИВОСТІ КОМПЛЕКСНОГО ЕКСПЕРТНОГО ДОСЛІДЖЕННЯ ГІДРОЛІЗНОГО ЛІГНІНУ

У статті розглянуто питання щодо особливостей комплексного експертного дослідження лігніну. При мікроскопічному вивченні у складі усіх наданих на дослідження зразках виявлено незначні за розмірами частки деревини коричневого кольору з різними відтінками та конгломератики коричневого кольору. Крім того, мацеровані частки кожної із наданих на дослідження речовин містять залишки рослинних об'єктів. Якісною реакцією на лігнін встановлено наявність у складі молекул, наданих на дослідження речовин, коніферилальдегідної групи та структурного ланцюга, що є характерним для лігніну. Проведеними якісними хімічними реакціями встановлено, що у всіх наданих на дослідження зразках лігніну виявлено іони

заліза, кальцію, магнію, алюмінію та сульфат-іони, що є характерним для якісного складу рослинної сировини. Доведено, що подальші дослідження лігніну мають проводитись у чітко визначеному порядку, а саме: визначення кількісного вмісту вуглецю; визначення кількісного вмісту сухої речовини та гігроскопічної вологи; визначення зольності; визначення кількісного вмісту кальцію; визначення кількісного вмісту магнію; визначення кількісного вмісту заліза.

Ключові слова: лігнін, мікроскопічні дослідження, якісні реакції, властивості, вміст речовин.

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N. V. Syrotenko,
Kharkiv, Ukraine
ORCID:<https://orcid.org/0000-0002-2023-6518>
e-mail: shunya1964@gmail.com

V. G. Abrosymova,
Department Head at the KhRIFE
Kharkiv, Ukraine
ORCID:<https://orcid.org/0000-0003-3767-5303>
e-mail: abrosymova@gmail.com

L. V. Svyrydova,
PhD in Law, Head of Department at KhRIFE, Kharkiv, Ukraine
ORCID:<https://orcid.org/0000-0001-6667-2852>
e-mail: ludmila.sviridova@hniise.gov.ua

PECULIARITIES OF RESOLVING ISSUES OF MULTIDISCIPLINARY RESEARCH ON SIGNATURES

In this article, some examples of case study research are considered in the examples from expert practice, namely: signatures and handwritten records of surnames and initials, serving as certificates of specific persons, in the locations of which there were no additional strokes that did not belong to.

Purpose. The purpose of the article is to determine the necessity of a comprehensive handwriting and technical study of documents for objective, comprehensive and complete research and to provide a sound and correct conclusion for the questions posed before the examination.

When considering the tasks, cognitive methods were used: description and observation; methods of analysis and synthesis.

The above examples from expert practice and the presented studies prove the importance of strict observance of expert handwriting of all stages and levels of the expert method of investigation of signatures (short manuscripts); the need for complex research: handwriting and technical study of documents, in the case of identifying unnecessary strokes at the location of the studied handwriting objects; compulsory mastery of the expert-handwriter basic knowledge of technical study of documents.

Keywords: signature, test sign, complex study, additional strokes, unnecessary strokes.

Formulation of Research Problem. Signatures, as certificates, are found in all spheres of human life. This makes them a common target for forensic research. The peculiarities of signature formation as objects of research, to a certain extent, determine the complexity of handwriting research.

Analysis of recent researches and publications. Many scholars of the second half of the twentieth century (L. Yu. Arotsker, V. V. Lipovsky, V. F. Orlova, A. V. Smirnov, L. G. Lekanov, etc.) were engaged in the research of signatures. They have determined the principles of the signature

research methodology, which is used today in carrying out handwriting research in expert institutions of the Ministry of Justice of Ukraine.

Usually, law enforcement agencies and persons who design forensic examinations / investigations are interested in the authenticity of the document in question.

With proper preparation of the comparative material submitted for research, the identification and diagnostic tasks are resolved successfully enough.

Article Purpose. The purpose of the article is to determine the need for a comprehensive handwriting and technical study of documents for an objective, comprehensive and complete study and to provide a reasoned and correct conclusion on the questions before the examination.

Main content presentation. The technique of signature research has several levels, including certain steps. The first level begins with the preliminary study and ends with the nomination of general and individual expert versions, planning for further study. Level 1 steps are:

1. Familiarity with the materials provided;
2. Review and preliminary examination of the investigated signature (s);
3. Review and preliminary study of comparative material;
4. Preliminary comparison;
5. Preliminary assessment and formation of general and individual expert versions;
6. Planning for the next study¹

In some cases, a specialist in handwriting already at the stage of review and preliminary study of the objects under study, there are certain separate versions, the examination and confirmation of which requires the use of knowledge of technical study of documents. This occurs when additional (extra) strokes are detected in the document under study, which cannot be attributed to the strokes of the investigated signature. Unnecessary strokes should be on the location of the test signature, must be either engraved or penciled, or painted with the same color as the test signature or another color. The following may also be observed: the irregularity of the pace of completion of the strokes included in the configuration of the test signature, the unconditioned stoppages of the writing device, the violation of the top layer of paper that may indicate cleaning, and so on. In these cases, there is a need to explain the origin of the existing unnecessary strokes, to establish a way to perform the studied handwriting implementations to conduct it is the study of handwriting.

It should be noted that in these cases, the examination changes its appearance in the process of research and objects and becomes complex. The Head of the Expert Institution, in accordance with Clause 4.2 of the

¹ Kompleksnaja metodika ustanovlenija podlinnosti (nepodlinnosti) kratkih i prostyh zapisej [A comprehensive methodology for establishing the authenticity (non-authenticity) of short and simple records] / otv. red. Orlova V. F., Dutova N. V. Moskva, 1987. S . 25 [in Russian].

Instruction on the appointment and conduct of judicial examinations and expert studies, approved by Order No. 53/5 of 08.10.1998 of the Ministry of Justice of Ukraine (as amended), hereinafter referred to as Instruction, organizes the carrying out of the relevant expert examination. An expert in document research is involved to determine whether technical background has been obtained while performing the test signature, or whether additional dyes and strokes of the test signature have been completed.

That is, a technical study from a methodological point of view should always precede handwriting. According to the complex methodology of the research, the expert on technical examination of documents should detect both secondary and primary strokes. From the results of his research depends directly on the content of the expert handwriting expert.

Please note that the presence of the above specifications does not always indicate that the signature at issue is invalid. In practice, both a person's signature stroke when a writing device is not written to improve its visibility and the destruction of an original signature that is incorrectly or to indicate a location may occur in practice. Imitation of the technical forgery of the signature by the person on whose behalf it is indicated cannot be ruled out, with the subsequent refusal of.

If the technical examination does not reveal certain strokes of the original signature, the handwriting expert gives a firm conclusion about the inability of this object to solve identification problems.

Thus, at the Kharkiv Scientific Research Institute of Forensic Science. The last prof. MS Bokarius conducted forensic examination by court order. The study provided payment information on receipt of cash with signatures on behalf of City C. To resolve the forensic examination, identification questions were posed, namely: whether signatures were made on behalf of S. in the payment information provided by S. or another person. When examining the objects under study, the expert noted that some of the investigated signatures in the placements were gray. There was a need to decide whether the researched signatures with prior technical training were fulfilled.

Expert on technical research of documents conducted relevant research, found that the investigated signatures were made with a paste of blue color with a purple tint, in some areas of signatures there were strokes made with a graphite pencil (a dye of gray color, had a glitter, was distributed in the form of a surface), as well as extruded unpainted strokes with graphite pencil particles that did not belong to the controversial signature strokes. In addition, the areas of the signatures revealed a cracking of the surface layer of paper, directly around the signatures — particles of graphite pencil, which indicated the cleaning, as well as particles, probably gum, used to clean the strokes of the pencil (see figures 1-6):

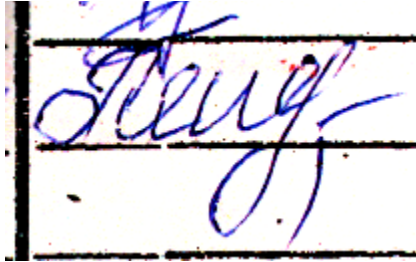


Fig. 1 General view of the investigated signature on behalf of citizen C.

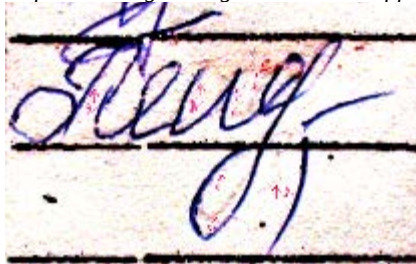


Fig. 2 Stroke of pre-technical signature preparation — copy the signature to the lumen using a graphite pencil (research photo).

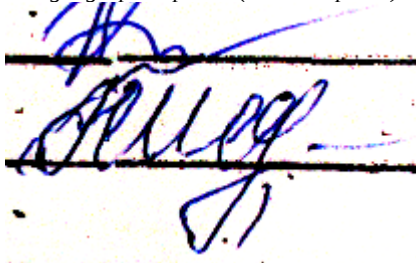


Fig. 3 General view of the investigated signature on behalf of citizen C.

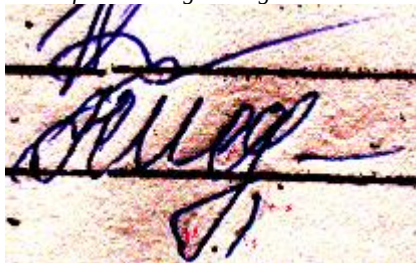


Fig. 4 Stroke of pre-technical signature preparation — copy the signature to the lumen using a graphite pencil (research photo).

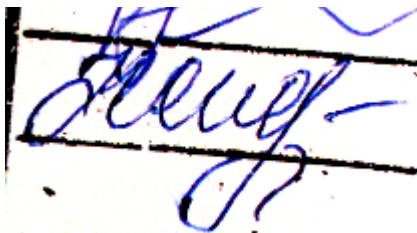


Fig. 5 General view of the investigated signature on behalf of citizen C.



Fig. 6 Stroke of pre-technical signature preparation — copy the signature to the lumen using a graphite pencil (research photo).

Experts concluded that the signs identified together indicate that the signatures on behalf of the town of S. were made with the prior technical preparation — copying the signatures on the lumen with a graphite pencil, followed by stroke strokes for ballpoint pens.

The technical study did not fully identify the graphite pencil signatures because the strokes made with saturated blue paste appeared to be opaque to infrared rays.

Considering that the signature strokes made with a graphite pencil were not fully revealed, the expert in handwriting concluded that they were unfit for solving identification handwriting problems. In the above example, the secondary signature strokes were not investigated for objective reasons.¹

It should be noted that in the case of stroke strokes made with pencil, another dye (writing device), as a rule, there is a cleaning. This is because the person is trying to destroy the traces of previous preparation. In this case, the expert on technical study of documents can detect changes in the physical and chemical properties of the paper, namely: luminescence, damage to the surface layer, squatting of fibers. In some cases, as in the example above, particles of rubber or other substance that has been used for erasing, particles of graphite can be found.

In case the expert on technical investigation of the documents of the original signature is completely revealed, the expert-handwriter should carry out his separate research. It should be borne in mind that when comparing

Архив Харківського науково-дослідного інституту судових експертиз ім. Засл. проф. М. С. Бокаріуса за 2013 рік [in Ukrainian].

such a signature with the specimens of the person, there is a certain external coincidence. First of all, transcription, size, acceleration and the most striking individual features coincide. But when performing such a handwriting object, there is usually a violation of the coordination of movements of group 1, which have a manifestation in the angularity, tortuosity of strokes, the execution of which require significant coordination of movements, slowing the pace of performance in comparison with samples, differences of individual features. The slowing of the tempo is evidenced by the unconditional stops of the writing device, the blunt beginnings and endings of strokes, the undifferentiated pressure, for the most part is strong.

Thus, the comparison of handwriting features in the studied signature and samples is a necessary component of a comprehensive study. The study establishes both convergent and divergent features, which are evaluated in conjunction with features identified by technical methods. Each identified trait is evaluated separately based on the prediction of its origin. Its stability and repeatability are evaluated. In doing so, the expert in handwriting must take into account the peculiarities of the drawing, that the change of general features may affect individual features, the dependence of the features of the secondary signature, especially such as pressure, length of movement, shape and movement of the connection, the method and the nature of the original signature.¹ A set of identified features — in terms of its sufficiency to form a specific conclusion.

It is the combination of signs that may indicate that different phenomena are due to different causes. For example, the slow motion that is inherent in the forgery of the signature may also be inherent to the executor, or conditioned by the performer's condition (natural internal confounding factors, such as morbid condition, etc.), or unusual writing conditions (external confounding factors).² That is, the detected set will contribute to the emergence of a specialist in handwriting beliefs about the invalidity or authenticity of the disputed signature.

The conclusion about the lack of technical forgery is made by the expert of technical research of documents by identifying the signs of free execution of the investigated signature, namely: uneven distribution of the dye substance in the strokes — alternation of intensely colored areas with weakly colored ones, which are characteristic of ball-points, ball-points, narrowing of strokes to the end of movements, presence of reflex strokes at the beginning of movements, uniform alternation of pressure (bending and extending) strokes, the correspondence of curved strokes on the back of the document with the strokes of pressure, the presence of strokes in the strokes

¹ Lipovskij V. V. Pocherkovedcheskoe issledovanie podpisov, ispolnennyh s pomoshh'ju tehnikeskikh priemov [Handwriting study of signatures executed using technical techniques] / Kievskij nauchno-issledovatel'skij institut sudebnyh jekspertiz, redakcionno-izdatel'skij otdel MVD USSR. Kiev, 1975. S. 20 [in Russian].

² Sudebno-tehnicheskaja jekspertiza dokumentov (Uchebno-metodicheskoe posobie) [Forensic technical examination of documents (textbook)] / Vypusk 5. MJU SSSR, VNIISJe. Moskva, 1973. S. 92–93, 95 [in Russian].

of the writing device, the coincidence of common and individual features in the studied signature and samples.

An example of the execution of a genuine signature on top of another, which was made with a graphite pencil and partially removed, is a comprehensive examination of the signature and a short handwritten record of the surname and initials, which is also bearable. The decision of the district court in a civil case was assigned forensic examination, the solution of which was raised questions on establishing the authenticity/invalidity of the signature and a short handwritten record of the name and initials in the contract of sale (retreat) of a share in the charter capital of one of the private equity. At the stage of the study of the study document, handwriting expert noted the presence of the location of the studied handwriting objects unnecessary depressed strokes, which were partially painted in gray. The said examination was conducted according to the rules of carrying out complex examinations.

The document expert, after examining the extra strokes mentioned above, concluded that, although they are (strokes) both made with graphite pencil and partially removed (cleaned), this does not mean that they are made with prior technical training. The reason for this conclusion was that the pencil strokes and pastes made by the paste were located with significant displacement, had significant differences in the configuration and arrangement of the elements; pencil strokes were cleaned before the ballpoint pen strokes of the studied signature and short handwriting were completed. That is, not only the signature, but also the short handwritten record made by the ballpoint pen without prior technical preparation and use of technical means in the contract submitted for study (see Figures 7, 8).



Fig. 7. Tested signature and handwriting. The marks indicate the strokes made with a graphite pencil.



Figure 8 Graphical pencil strokes and ballpoint pen (research photo).

Hereafter, the handwriting expert conducted the relevant identification studies and established the identity of the investigated signature on behalf of Mr. Sh. (see Figures 9-13).



Fig. 9



Fig. 10



Fig. 11

Figures 9-11: investigated signature on behalf of Mr. Sh. (research photos).

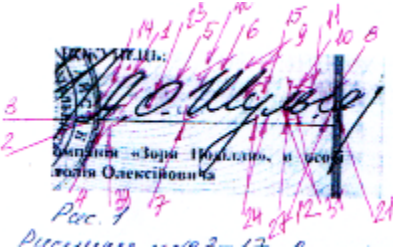


Fig. 12



Fig. 13

Figures 12, 13 studied a short handwritten record of surnames and initials with the designation of coincidental individual handwriting (research photos).¹

The second example shows that establishing the authenticity / invalidity of a signature (in this case, and a short handwritten record), in the presence of visual signs of execution with the help of techniques (extra unnecessary strokes) is possible only if the results of both types of studies (technical and handwriting are combined) : establishing the sequence of application of primary and secondary strokes, their correlation, materiality of convergent / divergent features).²

According to the authors, quite interesting, from the point of view of the conducted researches, is a comprehensive forensic examination and

¹ Arkhiv Kharkivskoho naukovo-doslidnoho instytutu sudovykh ekspertyz im. Zasl. prof. M. S. Bokariusa za 2013 rik [in Ukrainian].

² Lipovskij V. V. Poчерkovedcheskoe issledovanie podpisov, ispolnennyh s pomosh'ju tehnikeskikh priemov [Handwriting study of signatures executed using technical techniques] / Kievskij nauchno-issledovatel'skij institut sudebnyh jekspertiz, redakcionno-izdatel'skij otdel MVD USSR. Kiev, 1975. S. 25 [in Russian].

forensic examination of documents, which was assigned by a court order, the decision of which was assigned an identification task for execution of the signature on behalf of Mr. X. the handwritten record of the surname with the initials, which together with the signature bore the certifying character, in the contract of donation of the apartment by Mr. H. The materials were received repeatedly at the expert institution. However, the original of the document under study was not provided, but copies of the case file, as an annex to the statement of claim and in the samples, were provided. Following another request, the expert was provided with the original gift agreement, a large number of free and conditionally-free samples of signature and handwriting of Mr. X.

At the first stage of the study, namely when familiarizing with the materials received for forensic examination, examining the document under study, the expert noted that both the investigated signature and the investigated handwritten record of surnames without initials contain random, which differ in appearance with the main strokes of signature and handwriting. In addition, these additional touches were missing on copies of the contract under study. Already in the first stage of the study, this to some extent helped handwriting expert to come up with a separate preliminary expert version, which made unnecessary strokes after the disputed signature and handwriting, and did not apply to them (see Figures 14, 15).



Fig. 14 studied the signature on behalf of Mr. H. and a short handwritten record of the surname with the initials.

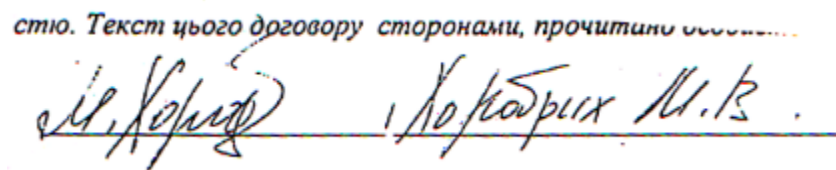


Fig. 15 images in a copy of the document under study.

In forensic practice, it is quite rare, but there are cases of even strokes of additional strokes to controversial signatures or entries, probably with the aim of masking a false object that complicates their research .

In order to carry out a full and comprehensive study and to provide a reasoned, objective conclusion and to resolve issues of identification character, which were submitted to the decision of forensic examination, in accordance with Clause 4.2 of the Instruction, the management of the expert

institution organized a comprehensive forensic examination and forensic examination. technical examination of documents.

The expert at the technical study of the documents was asked the following question: did the same writing instrument sign on behalf of Mr. X., a handwritten record of the surname with the initials and additional strokes that appear on the sites of their location.

Using the methods of technical examination of documents, the expert found that the signature and handwriting were made of violet color with a blue tint, and additional strokes not included in the configuration of the signature and handwritten record, a paste of blue with a purple tint. That is, the expert concluded that the investigated signature and handwriting were made with a different ballpoint pen paste than the additional strokes that were on the areas of their location (different writing nodes of the ballpoint pen) (see Figures 16, 17).



Fig. 16 Tested signature on behalf of Mr. X. (research photo)

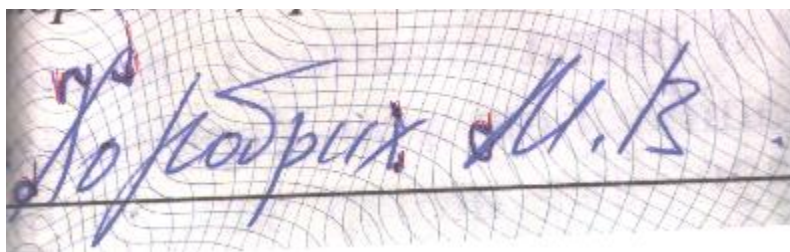


Fig. 17 Investigated short handwriting (research photo)¹

Subsequently, the expert handwriter conducted separate studies of the signature and handwriting, found both convergent and divergent general and individual features. Analyzing the results of the conducted research, he came to definite negative conclusions on both objects.

It should be noted that in this case, the key to successful research was the large volume of various specimens of the signature and handwriting of Mr. H. himself, provided by the district court for comparative handwriting research.

¹ Архив Харківського науково-дослідного інституту судових експертиз ім. Засл. проф. М. С. Бокаріуса за 2018 рік [in Ukrainian].

With regard to the handwriting study of additional unnecessary strokes that were located in the areas of the studied handwriting objects. As technical studies have established that they do not form any written characters and their elements, the handwriting expert has made firm conclusions about the inability of these strokes to identify the artist.

Conclusions. Quite different cases of complex handwriting and technical studies of documents prove the following:

1) in order to avoid expert error in the study of signatures or records that have additional unnecessary touches, the expert handwriter must strictly adhere to all stages of the expert method of investigation of signatures. To pay considerable attention to the stage of studying the materials received for the handwriting research, namely the careful study of the document under research;

2) When detecting unnecessary strokes at the location of the object under study, it is obligatory to involve a technical expert in the document research. In other words, to conduct a comprehensive study of controversial handwriting implementations;

While training handwriting expert take the place of mastering basic knowledge of the technical examination of documents and individual features, indicating the possibility of technical forgery, etc.

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Н. В. Сиротенко, В. Г. Абросимова, Л. В. Свиридова ОСОБЛИВОСТІ ВИРІШЕННЯ ПИТАНЬ КОМПЛЕКСНОГО ДОСЛІДЖЕННЯ ПІДПИСІВ

Розглянуто окремі випадки дослідження почеркових реалізацій на прикладі експертної практики.

Визначено необхідність комплексного почеркознавчого та технічного дослідження документів для об'єктивного, всебічного і повного дослідження та надання обґрунтованого і правильного висновку за поставленими перед експертизою питаннями.

При розгляді поставлених задач використано методи описування та спостереження; методи аналізу та синтезу.

Дослідженнями доведено важливість дотримання експертами-почеркознавцями всіх етапів експертної методики дослідження підписів; необхідність проведення комплексних досліджень при виявленні зайвих штрихів на місці розташування досліджуваних об'єктів; обов'язкове оволодіння експертом-почеркознавцем базовими знаннями з технічного дослідження документів.

Ключові слова: підпис, засвідчувальний знак, комплексне дослідження, додаткові штрихи, зайві штрихи.

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I. V. Bohdaniuk,

PhD in Law, Department Head at the KhRIFE
ORCID: <https://orcid.org/0000-0003-4782-9986>,
E-mail: bogdanyuk.hniise@gmail.com

O. V. Bublyk,

Researcher at the KhRIFE ORCID:<https://orcid.org/0000-0002-0215-6653>,
E-mail: olexbublyk@ukr.net

V. F. Chernyuk,

Researcher at the KhRIFE
ORCID:<https://orcid.org/0000-0003-0264-868X>,
E-mail: Vcernuk81@gmail.com

V. S. Suprun,

Researcher at the KhRIFE
ORCID:<https://orcid.org/0000-0001-8830-0267>,
E-mail: valeriy.suprun@hniise.gov.ua

SOME ISSUES OF CAUSE-CONSEQUENCY RESEARCH IN THE PERFORMANCE OF MULTIDISCIPLINARY RESEARCHES IN THE FIELD OF LABOR SAFETY, FORENSIC ENGINEERING AND ELECTRICAL EXAMINATIONS

It is impossible to establish the truth in criminal proceedings while considering cases related to non-compliance with the requirements of the Law of Ukraine with the requirements of the Law of Ukraine "On Labor Protection" without performing forensic examinations regarding the investigation of causal relations and establishing circumstances preceding the accident. As a rule, the research subject in this case is materialized carriers of information about a harmful event that had taken place. Therefore, from a technical point of view establishing the presence of circumstances that preceded and led to adverse effects and their direct connection with the occurrence of these consequences is one of the issues of Forensic Engineering.

The causation assessment is based on a theoretical research of circumstances of an accident event on the basis of materials provided for research. The use of philosophical and logic means is the basis of forensic research on the causation determination and the establishment of objective truth in legal practice.

The article reveals contemporary views on the problems of causal relationship between socially dangerous acts and the socially dangerous consequences of these acts in combination with expert practice while research related to electrical injury.

The completeness and objectivity of the expert's opinion on the results of the studies of accidents related to electrical injury depends on the availability of expertise in the field of electrical engineering and requires the mandatory involvement of a forensic expert in relevant field.

Keywords: comprehensive forensic engineering/technical expertise in the field of labor protection and electrical engineering expertise, accidents involving electrical intrusion, cause-effect relations, modern practice analysis.

Formulation of Research Problem. According to information in sources, electrical traumatism in its consequences in comparison with other types of traumatism is the most dangerous and more often than other traumas leads to serious and fatal cases.

According to statistics from KhRIFE experts, electrical injuries account for less than 10% of the total number of accidents, but they are more than 50% of the deaths and serious injuries of people, as electric shock strikes when a person finds himself “connected” to the circuit of the current. In this case, the current damages the tissue throughout its passage through the human body.

In comparison with other types of traumatism, electro traumatism is characterized by the following features:

- person is not able to remotely, without special devices, to determine the presence of voltage, and therefore the action of the current, as a rule, is sudden, and the protective reaction of the body manifests only after being energized;

- current flowing through the human body affects the tissues and organs not only in the places of contact with the current-carrying parts and in the path of flow, but also reflexively, as an extremely strong irritant, affects the whole organism, which can lead to disruption of the functioning of vital systems organism — nervous, cardiovascular systems, breathing, etc.;

- Electro-injuries are possible without human contact to the conductive parts — due to the formation of an electric arc at the breakdown of the air gap between the conductive parts, or between the conductive parts and the person or the earth.

As a rule, the highest percentage of accidents related to electro-traumatism occurs when electrical personnel perform electrical installation work.

Recently the importance of forensic electrical expertise in the system of forensic research has increased. This process is predetermined primarily by the needs of the judiciary and is gaining ground in expanding the practice of using special electrical engineering knowledge in solving problems of economic, civil, criminal and administrative justice.

The subject of electrical expertise is the actual data and circumstances of an event related to the occurrence, development and consequences of abnormal modes in electrical installations or their components, the state of electrical equipment in terms of its compliance with regulatory requirements, etc. The research is conducted on the basis of special knowledge in the relevant areas of electrical engineering.

Forensic Electrotechnical Examination Objects are material and materialized sources of information that are examined by electrical engineers in order to establish factual data about the circumstances of an

event related to the subject of electrotechnical examination. The main object of expertise is the electrical installation of the electricity consumer and its elements; electrical equipment, electrical appliances and their fragments, electrical wiring, cables, electrical protection devices (fuses, circuit breakers), electrical switches, etc.

Materialized objects of electrotechnical examination include information carriers, which contain factual data on the subject of a specific electrotechnical examination – relevant documents of the case file or criminal proceedings and documents provided in due course by the customer of the examination.

The tasks of electrotechnical examination are aimed at establishing the actual data and circumstances of the event pertaining to its subject matter, by examining its objects by appropriate methods. They are divided into diagnostic, classification and situational. The diagnostic task is to determine the state of the electrical object; identifying changes that have occurred as a result of an event, identifying the causes and conditions of these changes based on an analysis of the individual properties and condition of interacting objects to determine the mechanism of the event as a whole or its individual fragments or to identify specific circumstances of the event. In the process of solving the classification problem, an expert electrician determines the belonging of material (materialized) objects of study in the form of any material formation with electrical elements or its display (photographs, description) to a specific standard or special group. The classification task in electrical engineering expertise is to determine, with the help of specialized knowledge, the belonging of the object under study to a particular class of electrical products. Situational tasks are to clarify the technical phenomena and to establish the circumstances associated with the property of the phenomenon. These tasks include: exploring the possibility of a certain phenomenon and the existence of a particular circumstance; identification of circumstances in which specific phenomena occurred; possibility of carrying out certain actions; determining the method and causes of specific damage; establishment of mechanism of certain actions and formation of signs of phenomena (traces) of detected circumstances that led to abnormal modes in electrical equipment, and phenomena that accompanied these modes.

Research on objective cause and effect relationships between the circumstances that preceded the accident in the form of an accident or emergency in the electrical installation, and this event in modern expert practice is one of the important and relevant tasks of engineering expertise. Criminal and other types of law do not consider causation at all, but causation between socially dangerous, unlawful acts (inaction) of a person and socially dangerous consequences.

Recognized cause is only such a phenomenon that is not accidental, but objective, naturally causes the occurrence of the consequence: the action of the subject caused a socially dangerous consequence, the action of the subject precedes a socially dangerous consequence, the action of the subject

contains the inevitability or real possibility of occurrence publicly a dangerous consequence, a socially dangerous consequence naturally arises in the specific conditions of a place, time and circumstance precisely by this act of the subject, and not by the actions of other persons or other external forces and circumstances, as well as the onset of dangerous consequences following actions (inaction) of the subject.

Analysis of recent research and publications.

Causation issues are traditionally and unreasonably considered one of the most difficult in criminal law. Despite the abundance of causal theories (often mutually exclusive) and the large number of scientific publications, a clear, understandable and more or less well-settled solution to the problem of causality in criminal law has not yet been achieved. The original statement by A. A. Piontkovsky that there is a whole “parliament of thought”¹, in the area of legal science, retains its relevance for modern criminal law doctrine, and not only for Ukraine. In doing so, the causal link between action and socially dangerous consequences, as a mandatory feature of the objective side of crimes with material composition, plays an essential role in the process of criminal qualification. In the Criminal Code of Ukraine there is no normative definition of the concept of causation, so the resolution of this issue is at the discretion of the court in the consideration of specific criminal cases and proceedings. Criminal science usually examines the causal link between a socially dangerous act and a socially dangerous consequence from a philosophical standpoint. The reason in philosophy is a kind of determination, a phenomenon that naturally (genetically), with an internal need, gives rise to (causes) another phenomenon — a consequence. Being objectively, outside our consciousness, causation can be known to man. The causal relationship which belongs to the objective world cannot be equated with the judgment of even a very astute observer. The question of the methodological foundations of the criminal law doctrine of causation is one of the discussions.

Causation problem in criminal law has developed in dissertation research: in Ukraine, causation is directly devoted to the dissertations of such scientists as S. Bagirov, O. L. Timchuk, N. M. Yarmysh.

Scientist M. S. Tagantsev argued that criminal law deals not with a philosophical (abstract), but with a practical understanding of causality based on the ideas of life². The scientist himself in solving the issues of causality called for a distinction between reason and reason, without giving, however, a clear answer as to determine the superiority or insignificance of the original human action in comparison with the incoming forces, which interfere with the development of events and contribute to the onset of the

¹ Visnyk Asotsiatsii kryminalnoho prava Ukrainy, 2017, № 1(8) http://nauka.nlu.edu.ua/wp-content/uploads/2017/07/05_Bagirov.pdf.A.A. (data zvernennia 22.07.2019) [in Ukrainian].

²Ibidem

result. A. L. Tymchuk emphasizes that in the context of methodological pluralism, criminal science can and should use its own (specific) understanding of causation, which takes into account the needs of law enforcement¹. The opposite methodological position is consistently observed by N. M. Yarmysh, who believes that the question of causality in criminal law is not separate from the general scientific, philosophical problem of cause and effect. Only by finding out the general patterns can one extrapolate them to specific areas².

The position of A. A. Muzyka and S. R. Bagirov, which recognize the notion of causal connection in criminal law not as associated but consolidated, that is such that, based on the philosophical understanding of causality, at the same time has branch peculiarities and is filled with specific criminal and legal content.

In the theory of criminal law, different opinions (views) have been expressed about causation. M. I. Panov³, P. L. Fries, O. O. Kvasha [7, p. 90-91] and others identify the following three basic theoretical directions for the study of causal relations, each of which, based on different philosophical concepts, considers with greater or less completeness and scientific validity the problem of causality in criminal law:

- theory of prerequisite: the reason should be considered any factor that in one way or another influenced the occurrence of the consequence;
- theory of adequate cause: recognized as such only “standard” reasons, and in cases where the cause is something unusual, it can not be considered as the cause of the phenomenon;
- theory of necessary causality recognizes as a cause only a phenomenon that is not accidental, but objectively, naturally causes the occurrence of the consequence.

The researcher on theory and practice of causation in criminal law, Professor V. B. Malinin, has a much larger system of theoretical views on the problem of causation⁴.

¹ Visnyk Asotsiatsii kryminalnoho prava Ukrainy, 2017, № 1(8) http://nauka.nlu.edu.ua/wp-content/uploads/2017/07/05_Bagirov.pdfA.A. (data zvernennia 22.07.2019) [in Ukrainian].

² Ibidem

³ Panov M. I. Obiektivna storona zlochyynu // Kryminalne pravo Ukrainy [Criminal law of Ukraine]. Zahalna chastyna: Pidruch. dlia studentiv yuryd. spets. vyshch. zakladiv osvity / M. I. Bazhanov, Yu. V. Baulin, V. I. Borysov [ta in.]; za red. M. I. Bazhanova, V. V. Stashysa, V.Ia. Tatsiia. Kyiv; Kharkiv : Yurinkom Inter-Pravo, 2001. S. 121; Fris P. L. Kryminalne pravo Ukrainy [The criminal law of Ukraine]. Zahalna chastyna: Pidruch. dlia studentiv vyshch. navch. zakladiv. 2-he vyd., pererob. i dop. Kyiv : Atika, 2009. S. 149; Mala entsyklopediia kryminalnoho prava [The Small Encyclopedia of Criminal Law]/ Yu. L. Bashytskyi, M. O. Kostenko, Z. A. Trostiuk, O. O. Kvasha [ta in.]; za zah. red. Yu. L. Bashytskoho ta Z. L. Trostiuk. Kyiv : Kondor, 2012. S. 90–91 [in Ukrainian].

⁴ Malinin V. B. Obektivnaja storona prestuplenija [The objective side of the crime]. Jenciklopedija ugolovnoho prava [v 35 t.] / Pod red. V. B. Malinina. T. 4 :

In practice, it is not uncommon for experts to be asked by their criminal nature the question of whether a violator of a particular rule is causally related to the consequences that have arisen. Meanwhile, determining whether there is a causal link between a person's violation of the relevant rules and the resulting consequences is the responsibility of the investigator, prosecutor, court. However, according to E. V. Fesenko, it is time to grow the role of expert studies in establishing causation and, as a consequence, to revise the common law principle that causation should be made first and foremost by a lawyer¹.

Please note that causation is a process that takes place over time. A person's socially dangerous behavior can only be recognized as a cause of a socially dangerous consequence if he or she has preceded his / her occurrence in the first place: an act must be committed first, and subsequently a consequence. It is important, however, that the action gives rise to a consequence, since the external sequence of events does not always indicate that there is a causal link. In a criminal sense, causation means that a socially dangerous consequence is caused by a certain criminal act, not by the behavior of third parties (including the victim) or any other external forces (interference with the forces of nature, technical processes, etc.). In other words, if it had not been for the act, there would have been no socially dangerous consequence.

The general initial rule of procedure for determining the cause that underlies any theory of causation. Such determinants as cause and conditions must be distinguished. The latter, unlike the cause, although they play a role in the development of causation (may accelerate it or, on the contrary, slow down), are not in themselves capable of producing specific consequences in a particular setting. Instead, the cause is a decisive and determining factor in the consequences.

It should be noted that according to the source, the problem of determining causation lies not only in its theoretical aspect, but also in practical terms. In particular, the role of expert research is increasing when addressing specific issues regarding the presence (absence) of such a link between a person's behavior and the consequence (especially in complex cases of complex action alongside the behavior of a person of other forces). After all, the expert as a specialist in the field of special knowledge will most accurately solve the question of the existence and development of certain objective laws. The above gives grounds for raising the question of the revision of the common law postulate that causation must be made, first and foremost, by lawyer.

Sostav prestuplenija. Sankt-Peterburg : Izdanie prof. Malinina, 2005. S. 316–356 [in Russian].

¹ Fesenko Ye. V. Osoblyvosti naslidkiv ta prychnynnoho zviazku u zlochynakh z materialnym skladom [Features of consequences and causation in crimes with material composition]. Chasopys Akademii advokatury Ukrainy. 2010. № 6 URL: <http://e-pub.aau.edu.ua/index.php/chasopys/article/view/589/609> (data dostupu 12.02.2019) [in Ukrainian].

The conclusion about the presence (absence) of a crime character is really the prerogative of a lawyer. But a practical justification for this conclusion without special knowledge is impossible. Therefore, decisiveness in a particular case should nevertheless be given to the expert's opinion, which assesses causation directly from a technical point of view, and the legal assessment can be performed by a court of its own motion.

The purpose of the article. Based on the analysis of the expert practice of KhRIFE specialists, to identify the most characteristic and widespread non-compliance with the regulatory and technical requirements during the operation of power plants and to determine the existence of their causal connection with the occurrence of an accident and electrostatic injury. When investigating the causes of accidents related to the operation of electrical installations, determine the impact of objective and subjective factors on the existence of a causal link between the actions (inaction) of officials and contractors and the consequences of an accident.

Main content presentation. The highest percentage of accidents related to electro-traumatism occurs, as a rule, when electrical personnel perform work in electrical installations.

According to RSOEI 40.1-1.01-97: *Rules for the Safe Operation of Electrical Installations* electrical installations are a collection of machines, apparatus, lines and auxiliaries (together with structures and premises in which they are installed) intended for production, transformation, transformation, transmission, distribution of electrical energy and its transformation into another type of energy.

Work in existing electrical installations refers to high-risk work and requires increased requirements for employees who are permitted to perform such work. With such employees it is necessary to carry out preliminary training and check knowledge of safety requirements in specialized educational institutions licensed to conduct such training, to prepare dress-tolerance and to conduct labor safety instructions according to the developed instructions of the enterprise and to determine the normative and technical requirements of the organization of these work, job preparation and admission of employees to work with constant supervision over their performance by responsible persons.

The analysis of forensic practice of KhRIFE specialists allows to identify objective (technical) and subjective (organizational) factors among the causes of accidents related to the operation of electrical installations.

Objective factors include the creation of safe production processes and the prevention of dangerous emergencies through the use of ergonomic and comfortable production facilities, the rational placement of production equipment, the use of appropriate means of protection.

Subjective (organizational) factors are the professional selection, training of employees and testing of their knowledge and skills of safe work, the inclusion of safety requirements in the regulatory, design, technological documentation and compliance with these requirements, and ensuring the functioning of the safety management system by creating

appropriate services and the appointment of officials to address specific occupational safety issues. Establishment by the employer of an effective control over the operation of a safety management system at the enterprise prevents accidents.

It should be noted that according to sources¹, the occurrence of the adverse event of an accident usually precedes the occurrence of a dangerous circumstance, which is a necessary prerequisite for the occurrence of such undesirable consequences. As a rule, such a circumstance is non-compliance with regulatory requirements. Failure of the equipment to comply with the rules of the arrangement, non-compliance with the requirements of the rules of safe and technical operation of the equipment, lack of technological processes or performance contrary to those designed, admission to the work of untrained personnel, non-use of personal or collective protection, and the like create the conditions under which the consequences of our can happen with a high degree of probability.

The reasons which led to the creation of a dangerous (emergency) situation are the primary reasons in which case an adverse event would not have taken place. The immediate cause is only valid if there is a major cause. A characteristic feature of the immediate cause is that it initiates the effectiveness of all causal communication, ensures its irreversibility until the occurrence of undesirable (harmful) consequences.

The actions of specific functional persons, from a technical point of view, have a causal connection with an undesirable event in the case when such actions are inappropriate (contrary to regulatory requirements), have led to such arrangement of equipment, operating conditions, to perform works contrary to the developed technological processes, admission to the work of untrained personnel and the like, which created the conditions under which the occurrence of an undesirable event could occur with a high degree of probability and occurred.

It should be noted that in our opinion, undesirable adverse effects have a causal relationship with the actions of specific persons only if their actual actions are inappropriate (contrary to the requirements of regulations, company regulations or other regulatory requirements), and these actions give rise to circumstances in which the occurrence of undesirable adverse effects could occur with a high degree of probability and such a dangerous event occurred. Thus, when performing work in existing electrical

¹ Metodyka ekspertnoho doslidzhennia prychynnykh zviazkiv [Methodology of expert investigation of causation], reiestratsiinyi kod 10.5.01. URL: rmpse.minjust.gov.ua/page/9 — (data zvernennia 04.02.2019); Inzhenerno tekhnichna v haluzi bezpeky zhyttiedialnosti, elektrotekhnichna, pozhezhno-tekhnichna, avto-tekhnichna, ekspertyza. Metodyka doslidzhennia prychynnykh zviazkiv pry provedenni inzhenerno-tekhnichnykh ekspertyz, v yakykh vyryshuiutsia sytuatsiini zavdannia [Engineering technical in the field of life safety, electrical, fire-technical, auto-technical, expertise. A technique for investigating causal relationships in conducting engineering and technical assessments that solve situational problems]. Za zah. red.: Horbenka V. O. Kyiv, 2017 [in Ukrainian].

installations, there are often accidents due to failure to comply with the requirements of regulatory and technical acts on safety and rules of safe operation of electrical installations, inconsistency of organizational measures in the preparation for the execution of work and drawing up an outfit, ignoring the proper preparation of the workplace, and the misuse of personal and collective protection.

For the sake of clarity, here are some examples from expert practice.

So, while performing works on checking the condition and adjusting the contact suspension between the supports of the section of the contact network at one of the Southern Railway races in Poltava region due to the failure to comply with the order of work and the uncoordinated actions of the members of the team of electricians of the contact network while being on the insulating platform of the motor car 1420, reached into the console with his hand and was shocked.

On the territory of the power plant in Lviv region as a result of non-compliance by the officials with the requirements of normative-technical acts on labor protection regarding the admission of crew members to work in the existing electrical installation without preparation of the workplace during the work on detachment of loops, extension; contractors were electrocuted.

During the execution of works at one of the machine-building factories of Sumy region the director of the enterprise personally involved a foreign person who performed work of high risk with non-compliance with the requirements of the Rules¹ without carrying out any organizational measures and preparation of the workplace. As a result of such actions, this person was electrocuted incompatible with life.

There are common accidents related to performing work on existing electrical installations and cable lines without having to put on an outfit and carry out on-site targeted instructional work.

Typical example is the accident that occurred with an electrician from the operation of distribution networks during the repair works of the transmission line at the substation of PJSC "Lvivoblenergo". Contrary to the requirements of the Regulations, the relevant officials of REM and the master of the production site did not prepare the workplace, ignored the instruction and the procedure for admission to high-risk works and targeted briefing of the crew members. As a result of such actions, the electrician from the operation of the distribution networks rose with the help of the wires to the electrically resisting electrode and died on the spot from electric shock. In this production situation, both the master of the production site and the chief engineer of REM PJSC "Lvivoblenergo" had the technical opportunity to avoid the occurrence of the harmful consequences of an

¹ NPAOP 40.1–1.01–97 «Pravyla bezpechnoi ekspluatatsii elektroustanovok» [Rules for safe operation of electrical installations]. URL: <https://zakon.rada.gov.ua/go/z0011–98> (data zvernennia 12.02.2019) [in Ukrainian].

accident, by unconditionally observing the above requirements of the normative documents on electrical safety and labor protection.

It should be noted that when performing work on existing electrical installations, accidents often occur due to the non-use and improper use of personal and collective protection.

For example, on the territory of the transformer substation in Dnipropetrovsk region, the contractor staff performed work on the installation of AVR panels. The chief engineer of the contracting entity did not comply with the requirements of the Rules, since being a contractor for electrical contractors to perform the work, and in accordance with the regulatory and technical requirements, he had to enclose nearby live parts, which are in the vicinity of the voltage, and to which a casual touch.

The contractor electrician, for his part, failed to comply with the requirements of the Rules, since he did not use dielectric shoes and an insulating stand (dielectric rug) when working near current-carrying parts of electrical installations up to 1000 V, and did not use an instrument with insulating arms when working near current-carrying parts, and did not use dielectric gloves.

Accidental contact with live conductive parts that were energized by a contractor electromechanical engineer killed him.

It should be noted that according to OO Dudorov in the above production situations directly officials (master of the production site, chief energy engineer, chief engineer of the enterprise), who organized to perform high-risk work in electrical installations, had the technical ability to avoid the occurrence of adverse consequences of an accident, by unconditional compliance with the requirements of the normative documents on electrical safety and labor protection, and their actions (inactivity) from a technical point of view, are causally connected the onset of the investigated accidents.

As a rule, when performing engineering and technical examinations on occupational safety and health and establishing the causes of accidents due to electric shock — it is necessary to establish the mechanism of injury, ie to find out what factor from a potentially dangerous became a real dangerous factor in a specific accident. In the presence of electrical safety devices, it is impossible to establish such circumstances without analyzing the circuit solutions, identifying the real parameters of the protective devices, evaluating the actions of the electrical personnel, etc. Also, when carrying out fire-technical examinations, the subject of which are the actual data and circumstances of criminal proceedings concerning a fire at an electrified object, after the establishment of a fire center and the identification of electrical equipment elements in it, it is necessary to check the expert versions of the involvement of heat manifestations of electricity in the fire. These and other situations have led to the expansion of the scope of research in occupational health expertise in addressing electrical safety issues and the limits of fire engineering research to sources of ignition of electrical nature and the mandatory involvement of electrical engineering professionals.

In view of the above, it should be noted that accidents at the production of accidents related to electrical traumatism, testifies first of all to the unsatisfactory functioning of the system of management of occupational safety at the enterprise, low level of labor and industrial discipline and obliges to take appropriate measures by officials, requires Art. 13 of the Law of Ukraine: *On Labor Protection*¹.

Conclusions. In our opinion, the following provisions should be taken into account when analyzing and establishing a causal link between non-compliance with safety and inactivity requirements and accident occurrence:

1) Causal link is an objectively existing link between a cause of action (inaction) for non-compliance with regulatory requirements) and a consequence (accident) that exists objectively as a fact of reality. The fact of an accident is always regarded as the result of the causal phenomenon that caused it, preceded it and inevitably led to it. Therefore, the link between cause and effect must be considered objective, real and subject to examination in the course of judicial review in order to establish the other components of the subjective side of the actions (omissions) of the person(s) concerned.

2) When establishing a causal relationship, it should be borne in mind that in nature and society, all phenomena are interdependent, are in close interaction. Their many factors influence each other and are constantly changing. Therefore, in order to establish a specific definite relationship between cause and effect, it is necessary to use tools of philosophy and logic, such as abstraction, analysis, synthesis, that is, to artificially (ostensibly) isolate two phenomena (cause and effect) from the influence of other factors that one way or another interact with the consequences. Only with this approach can one investigate whether a particular action is the cause of the consequence.

3) Causal connection occurs only when the act is a necessary condition, without which an accident is impossible. First of all, it follows from this provision that the primary condition for having a causal link is a time factor, that is, the cause must always precede the time of the accident and must necessarily determine its occurrence. If the occurrence of an accident is objectively determined even before the non-compliance with the regulatory requirements or results from the parallel development of processes, regardless of the actions of the persons concerned, then no causal link can be made.

The reason (non-compliance with regulatory requirements) must not only precede the consequence in time, but also cause it, being the main factor in the accident. In this case, failure to comply with regulatory and technical requirements, as a volitional form of behavior and direct actions of a person, directly causes an accident, that is, directly exerts a negative from

¹ Pro okhoronu pratsi [On labor protection]: Zakon Ukrainy. URL: <https://zakon.rada.gov.ua/go/2694-12> (data zvernennia 20.02.2019) [in Ukrainian].

the point of view of social behavior influence and thus causes the occurrence of socially dangerous consequences.

If action is a directed form of action to achieve a particular result, then inaction causes damage indirectly. This is explained by the fact that a person does not interfere with the development of a causal connection, does not fulfill the duty assigned to him to perform active actions, which he should have prevented harm, although it has the potential and should provide the occurrence of harmful consequences. Due to the passive behavior of the person and the actions of other forces and means (actions of third parties, forces of nature, mechanisms, different processes, etc.), accidents occur as a fact of reality. However, this does not mean that in the latter case there is no causal link between inaction and the consequences. There is such a connection. He is in the subjective side of the action, when the person must know about the presence of dangerous factors, have the ability to influence them and the ability to prevent the occurrence of negative consequences.

After all, an expert, as a specialist in the field of specialist knowledge, can most accurately address the question of the existence and development of certain objective laws, as well as determine whether the person acted in accordance with the requirements of legislative or regulatory acts and whether the actions of that person, with technical point of view, in the causal connection with the onset of an accident.

The conclusion about the presence (absence) of a crime character is really the prerogative of a lawyer; but a practical justification for this conclusion without special knowledge is impossible. Therefore, decisive importance in a particular case should be given to the expert's conclusions.

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I. В. Богданюк, О. В. Бублик, В. Ф. Чернюк,

В. С. Супрун

**ДЕЯКІ ПИТАННЯ ДОСЛІДЖЕННЯ ПРИЧИННО-НАСЛІДКОВОГО
ЗВ'ЯЗКУ ПРИ ВИКОНАННІ КОМПЛЕКСНИХ СУДОВИХ
ІНЖЕНЕРНО-ТЕХНІЧНИХ ЕКСПЕРТИЗ У ГАЛУЗІ ОХОРОНИ ПРАЦІ
ТА ЕЛЕКТРОТЕХНІЧНИХ ЕКСПЕРТИЗ**

Встановлення істини в кримінальному судочинстві при розгляді справ, пов'язаних із невиконанням вимог Закону України «Про охорону праці», неможливе без проведення судових експертиз щодо дослідження причинних зв'язків та встановлення обставин, що передували настанню нещасного випадку. Повнота та об'єктивність висновку експерта за результатами проведених досліджень нещасних випадків, пов'язаних з електроtraвмуванням, залежить від наявності фахових знань у галузі електротехніки та потребує обов'язкового залучення експерта відповідної спеціальності.

Ключові слова: комплексна судова інженерно-технічна експертиза в галузі охорони праці та електротехнічна експертиза, нещасні випадки, пов'язані з електроtraвмуванням, причинно-наслідкові зв'язки, аналіз сучасної практики.

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R. N. Huseinov,

Forensic Expert at KhRIFE

ORCID: <https://orcid.org/0000-0003-3021-3472>,

E-mail: huseinov_ruslan@ukr.net

Yu. V. Panchuk,

Researcher at the KhRIFE

ORCID: <https://orcid.org/0000-0001-8605-6029>,

E-mail: expert.ryndina31071988@gmail.com

I. M. Ryabinin,

Chief Forensic Expert at the Kharkiv SRFC of MIA of Ukraine.

ORCID: <https://orcid.org/0000-0002-3989-0659>,

E-mail: inryabinin@ukr.net

SOME DETERMINATION ISSUES OF ANTHROPOGENIC HAZARDOUS OBJECTS OF ECONOMIC ACTIVITY WHILE PERFORMING MULTIDISCIPLINARY FORENSIC OF FIRE- TECHNICAL AND TECHNICAL ENVIRONMENTAL EXAMINATIONS

The aim of this work is to analyze the sources and factors of danger, their structure and the nature of functioning, which under certain circumstances can initiate or cause the threat of emergency situations, as well as the study of the main stages in determining the compliance with the category of industrial hazard of business objects.

The relevance of the work is due to the fact that on the territory of Ukraine there is a significant number of objects on which hazardous chemical and biological substances, as well as other hazardous sources and hazard factors, are used in carrying out economic activities in technological processes. Such objects are located mainly in areas with a high concentration of the population, which in turn sharply increases the level of threat to human life and health, worsen the state of the environment and, in the event of accidents or catastrophes, can lead to large material losses.

One of the tasks in conducting complex forensic examinations and expert studies is to establish the belonging of a business entity to a certain category of technological safety. For this, it is necessary to analyze their structure and the nature of their functioning in order to establish the fact of the presence or absence of sources of danger, which under certain circumstances can initiate or cause a real threat of emergency situations.

In this paper, we consider an algorithm for solving problems of establishing the availability of sources and hazards, determining their ability to initiate an emergency, and further determining the category of industrial hazard to which economic activity belongs.

The classification of emergencies by the nature of origin, the extent of distribution, the size of human losses, and material losses is determined. The state, regional, local, object levels of emergency are considered.

The main stages are given in determining the compliance with the category of industrial hazard of economic activity objects, which will allow systematizing the

research process when performing complex fire engineering, engineering environmental examinations.

Keywords: technological hazard, potentially dangerous object, object of increased danger, dangerous substance, threshold mass, source of danger, emergency situation.

Formulation of Research Problem. Currently, a large number of business entities that use hazardous chemicals, biological substances, as well as other hazardous sources and risk factors are operating and operating in the territory of Ukraine. The amount (mass) of hazardous substances present on the sites may be insignificant, such as when handling reagents or government samples. In other cases, the more common is the storage of hazardous substances with a total mass of more than 1000 tonnes and even more than 10000 tonnes. Often, contrary to current requirements, such facilities are located in areas with high concentration of population, which dramatically increases the level of threat to life and health of people, environmental degradation and serious material damage in the event of accidents or catastrophes.

If hazardous substances are rotated (stored, processed, transported) at an object, then, in accordance with the current legislation, an economic entity owned or used by such an object or intends to start construction of such object organizes its identification. During the identification, the business entity must analyze the structure of the business objects and the nature of their operation to determine whether or not sources of danger that may trigger emergencies in certain circumstances and determine the levels of potential emergencies. After that, submit the results of the identification to identify the potential danger to the local civil protection authority in order to summarize the results of the identification¹.

Depending on the amount of mass of dangerous substances that rotate on the object, it may refer to a potentially hazardous object (PHO) and a high risk object (HRO) of the first or second class.

Potentially Hazardous Object – An object that uses, produces, processes, stores, or transports dangerous radioactive, fire, chemical and biological agents, hydraulic and transport structures, vehicles, and other objects that create a real the threat of an emergency.

High risk facility: an entity that uses, manufactures, processes, stores, or transports one or more hazardous substances or categories of substances in an amount equal to or in excess of the prescribed threshold masses, as well as other objects as such which, according to the law, is a real threat of an anthropogenic and natural emergency².

¹ Pro obiekty pidvyshchenoi nebezpeky [On high risk objects]: Zakon Ukrainy № 2245–III vid 18.01.2001. URL : <http://zakon.rada.gov.ua/laws/show/2245–14> (data zvernennia 06.06.2019 [in Ukrainian]).

² Pro identyfikatsiiu ta deklaruvannia bezpeky obektiv pidvyshchenoi nebezpeky [On the identification and declaration of safety of high-risk objects].

According to the normative legal acts of Ukraine, economic entities owned (used) by which are PHO or HRO, must plan annually for preventive measures to prevent emergencies and to ensure their realization by appropriate financial and material resources. Contingency plans should be developed on the basis of the materials of the ongoing assessment of man-made safety at the facility (s), the possible consequences of environmental impact in the event of emergencies, including working personnel and the public. They should include specific measures to minimize the risks of emergencies to their acceptable performance, prevent technological accidents, utilize them, dispose of harmful substances and wastes or completely eliminate them, and fulfill other requirements in the field of technogenic safety.

Due to the fact that the implementation of the above measures economic entities need to invest significant financial and material resources each year, in the identification process, they often neglect the current requirements and lower the level of danger, which further affects the actual status of the object and increases risk to life and health of humans and other serious consequences.

Thereafter, a contradictory situation arises between the business entity and the local public oversight body in the field of civil protection regarding the attribution (or not attribution) of the respective entity to the PHOs or the HROs, which they can only resolve by court.

That is, the most important task to be solved during carrying out complex fire-technical, engineering and environmental examinations and expert researches is to establish the business entity belonging to a certain category of technogenic safety.

Analysis of recent research and publications. Recent provisions on the problem of emergencies of anthropogenic nature, which lead to grave consequences and methods and methods aimed at minimizing such consequences, were considered by modern scientists and covered the following issues: determination of the risk of emergencies of anthropogenic nature by the criterion of the state of potential non-potential and preliminary investigation of danger with the purpose of isolation of objects of high risk (O. P. Mikhailuk, V. V. Oliynyk, A. A. Mikhailuk), analysis of fire explosion safety of oil and gas, oil and gas, chemical and energy sectors, fires and explosions that reach the scale of catastrophes (O. P. Mikhailuk, V. V. Oliynyk, I. Y. Kris, P. A. Bily), causes of emergence and prevention of emergencies situations (V. V. Zatsarny, O. V. Zatsarna, O. V. Zemlyanskaya, N. A. Prahovnik).

Article Purpose. The purpose of this article is to analyze the sources and factors of danger, their structure and nature of functioning, which in certain circumstances may initiate or cause a threat of emergencies, as well

(NPAOP 0.00–6.21–02), (NPAOP 0.00–6.22–02) : postanova Kabinetu Ministriv Ukrainy № 956 vid 11.09.2002. URL : <http://zakon.rada.gov.ua/laws/show/956-2002-p> (data zvernennia 06.06.2019) [in Ukrainian].

as to study the main stages in determining the conformity of the category of man-made hazard of economic activities.

Main content presentation. Danger is viewed as an objectively existing reality in the relationship between society and technology, human habitation. According to the definition of the Committee on Perception of Risk and informing it of the National Research Council of the USA is a danger “... *an act or phenomenon that causes potential harm to people or objects* ...”. The American researcher Wilhelm Marshall (1934–1996) states that danger is “... a natural or anthropogenic phenomenon, which can cause phenomena or processes that can affect people, cause material damage, destroy the environment, etc.”.

Human life is constantly accompanied by potential dangers. Unwanted external influences lead to injuries, diseases, poor health and other undesirable effects. The dangers exist in space and time and are realized in the form of flows of energy, matter and information. They do not operate selectively. As a result, hazards affect the entire material environment.

Identify the dangers in view of the principle of “*everything affects everything*”: the source can be all living and non-living, the danger also threatens all living and non-living.

The science that deals with hazard classification is called taxonomy. Depending on the specific needs, hazard classifications are used by different criteria:

- time of action (impulsive and cumulative);
- localization (related to summer, hydro, atmosphere and space);
- consequences (morbidity, mortality, reduction of life expectancy, destabilization of society);
- scale (global, national, regional, local);
- area of expression (household, sports, production);
- structure (simple and derivatives);
- origin (natural, anthropogenic, social, political, combined).

Most often they refer to the classification of sources of danger by origin. Among the natural sources of danger are natural objects, natural phenomena and natural disasters that threaten human life or health (earthquakes, landslides, volcanoes, storms, hurricanes, fogs, lightnings, asteroids). Anthropogenic sources of danger are related to the use of vehicles, technical equipment, the use of combustible, flammable substances, various types of radiation. Social sources of danger include those caused by low spiritual and cultural levels: vagrancy, prostitution, and alcoholism. The sources of political danger are conflicts at the international level, political terrorism, wars. Combined sources of danger are divided into the following subgroups:

- natural-anthropogenic (smog, acid rain, deterioration of soil fertility);
- natural and social (drug addiction, epidemics, infectious and sexually transmitted diseases);

– socio-anthropogenic (occupational diseases, occupational injuries)¹.

All hazards are to some extent caused by striking (negative) factors. Depending on the consequences of exposure to the human body, the risk factors are divided into dangerous and harmful.

Dangerous factors are environmental factors that lead to injuries, burns, frostbite, other damage to the body or its organs and even death.

Somewhat less harmful to human health.

Adverse factors are environmental factors that cause impaired well-being, decreased performance, illness, and more.

By nature, nature and energy, all factors are divided into the following groups: physical, chemical, biological, psychophysiological.

They also distinguish between passive-active factors, which are manifested by the attraction of human energy (sharp fixed objects, uneven or very smooth surfaces, etc.), and passive ones that affect the person indirectly through degradation of the properties of materials (manifested in destruction, explosions, etc.).

Emergencies are classified by nature of origin, extent of distribution, extent of human loss and material loss.

Depending on the origin of the events that may cause emergencies in the territory of Ukraine, emergencies are classified by origin as follows:

– anthropogenic: transport accidents (catastrophes), fires, explosions at explosive objects or their threat, accidents with emissions (threat of release) of dangerous chemical, radioactive, biological substances, sudden destruction of structures and buildings, accidents at engineering power engineering systems., hydrodynamic accidents on dams and so on;

– natural: dangerous geological, meteorological, hydrological, marine and freshwater phenomena, degradation of soils and subsoil, natural fires, changes in the status of the air basin, infectious morbidity of people, farm animals, mass destruction of agricultural plants of pests, pests so on;

– social nature: related to the unlawful acts of a terrorist and anti-constitutional trend: the actual or actual threat of an act of terrorism (armed attack, seizure and detention of important objects, nuclear installations and materials, communications and telecommunications systems, attack or assault on the crew aircraft or ship), abduction (attempt to steal) or destruction of ships, hostage-taking, installation of explosive devices in public places, theft or seizure of weapons, detection of ammunition, etc;

– military nature: violation of the normal conditions of life and activity of people in a particular territory or object on it or in a water object caused by the use of conventional weapons or weapons of mass destruction during which secondary factors of population damage occur.

¹ Pro zatverdzhennia Klasyfikatsiinykh oznak nadzvychainykh sytuatsii [On Approval of the Classification of Emergency Situations]: nakaz MVS Ukrainy № 658 vid 06.08.2018. URL : <http://zakon.rada.gov.ua/laws/show/z0969-18> (data zvernennia 06.06.2019) [in Ukrainian].

Depending on the volumes caused by an emergency situation, the number of casualties and casualties, the volumes of technical and material resources needed to eliminate its consequences, the following levels of emergency situations are determined: state; regional; local; object¹.

The state level includes the NA:

1) that has spread or may extend to the territory of other States;
2) that has spread to the territory of two or more regions of Ukraine, and for its elimination the necessary material and technical resources in volumes exceeding the capabilities of these regions, but not less than 1 percent of the amount of expenditures of the respective local budgets (state emergency in territorial distribution);

3) which resulted in the death of more than 10 persons or the result of which more than 300 persons were injured (victims - persons who were injured by personal injury or ill, resulting in a disability, certified or impaired condition) more than 50 thousand people for a long time (more than 3 days);

4) as a result of which more than 5 persons were killed or more than 100 people were injured, normal living conditions of more than 10 thousand people were violated for a long time (more than 3 days), and losses (estimated in accordance with the procedure established by the law) were caused by an emergency, exceeded 25 thousand minimum wages (at the time of emergency);

5) losses from which exceeded 150 thousand minimum wages;

6) which in other cases provided for by the acts of the legislation, is recognized as a state-level emergency by its features.

The regional level includes the emergency:

1) which has spread to the territory of two or more districts, and for its elimination the necessary material and technical resources in volumes exceeding the capabilities of these areas, but not less than 1 percent of the amount of expenditures of the respective local budgets (regional emergency in territorial distribution);

2) which led to the death of 3 to 5 people or as a result of which 50 to 100 people were injured, or the normal living conditions of 1 thousand to 10 thousand people were violated for a long time (more than 3 days), and the losses exceeded 5 thousand minimum wages;

3) losses from which exceeded 15 thousand minimum wages;

The local level includes the following:

1) that went beyond the territories of a potentially dangerous object, threatens the environment, neighboring settlements, engineering structures, and for its elimination the necessary material and technical resources in the amount exceeding their own potential of a potentially dangerous object;

¹ Про затвердження Порядку класифікації надзвичайних ситуацій за їх рівнями : постанова Кабінету Міністрів України № 368 від 24.03.2004 URL : <http://zakon.rada.gov.ua/laws/show/368-2004-п> (data zvernennia 26.06.2019).

2) as a result of which 1-2 persons were killed or 20 to 50 people were injured, normal living conditions of 100 to 1000 people were violated for a long time (more than 3 days), and the losses exceeded 5 thousand minimum wages payments;

3) losses from which exceeded 2 thousand minimum wages;

The object level includes all emergencies that do not fall within the above definitions.

As noted earlier, all entities that own or use facilities that can use, manufacture, process, store, or transport hazardous substances (PHO), as well as any intended entities start the construction of a PHO, the responsibility is to carry out the identification of the object as a PHO.

The algorithm for carrying out this identification does not apply to:

- potentially hazardous objects that are classified as such due to the presence of radioactive substances on them;

- potentially dangerous mineral exploration, production and development activities, including exploration and development of the seabed, the presence of hazardous substances that are due to natural phenomena and cannot be controlled;

- dangerous substances transported outside the enterprise by road, rail, aviation, river and sea;

- hydraulic structures;

- potentially hazardous objects that are associated with such waste due to the presence of wastes, except those where quantification of hazardous substances in accordance with the regulations is possible.

The identification procedure primarily involves analyzing the structure of business entities and the nature of their operation to determine the fact of the presence or absence of sources of danger, as well as to determine the levels of possible emergencies.

Identification of sources of danger occurs when the factual information about the technological features of specific industries is investigated with the existing criteria necessary to identify the object as potentially dangerous. The main criterion is the presence in the production of a certain amount of dangerous substances, the excess of which means creating a danger for the normal functioning of enterprises and the environment.

An economic activity is recognized as potentially dangerous, provided that it contains at least one source of danger capable of triggering a local, regional or emergency state level, or if it falls within the scope of regulatory acts irrespective of the levels of the emergency. An entity that does not qualify for these requirements is not recognized as an PHO. If according to the results of the conducted research, the object of business activity is recognized as a PHO, then identification must be made to identify it as a HRO.

A potentially hazardous object is considered to be a class HRO in the case where the value of the total mass of hazardous materials (HAZMATs) rotating on the object exceeds the threshold mass norm.

If the total mass of HAZMAT does not exceed the norm of the threshold mass of HM then the identification procedure is considered complete and the ПГО does not apply to the HRO provided that the distance from it to the boundary of the residential area (residential areas, stadiums, hospitals, schools, etc.) exceeds 500 m for HM groups 1 and 2 and 1000 m for HM groups 3.

If the total mass of the HAZMAT on the HRO does not exceed the value of the threshold mass of the HM in accordance with the standards, but the distance from this object to the places of the gathering area is less than the above, then the calculation of the HAZMAT threshold mass, taking into account these distances.

If the total mass of HAZMAT on the HRO exceeds the estimated threshold mass, then the object is assigned the appropriate hazard class, and if it does not exceed — the identification procedure is considered complete and the HRO does not apply to the HRO.

Conclusions. In our opinion, in order to reduce the risk of emergencies at the objects of economic activity, a full and unbiased analysis of their structure and nature of operation is needed in order to identify potential sources of danger. In order to achieve this, it is necessary to conduct research to determine the conformity of the anthropogenic hazard category of business entities.

The results of the conducted research will allow the body that appointed the forensic expert to make the appropriate decision on the merits and will be directed to establish the actual state of the object with the purpose of carrying out by the subject of economic activity of all necessary measures for ensuring anthropogenic safety aimed at preventing emergencies.

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Р. Н. Гусейнов, Ю. В. Панчук, І. М. Рябінін
ДЕЯКІ ПИТАННЯ ВИЗНАЧЕННЯ КАТЕГОРІЇ ТЕХНОГЕННОЇ
НЕБЕЗПЕКИ ОБ'ЄКТІВ ГОСПОДАРСЬКОЇ ДІЯЛЬНОСТІ ПРИ
ВИКОНАННІ КОМПЛЕКСНИХ СУДОВИХ ПОЖЕЖНО-ТЕХНІЧНИХ
ТА ІНЖЕНЕРНО-ЕКОЛОГІЧНИХ ЕКСПЕРТИЗ

Розглянуто основи визначення особливостей виявлення джерел та чинників небезпеки. Визначено класифікацію надзвичайних ситуацій за характером походження, мірою поширення, розміром людських втрат і матеріальних збитків. Розглянуто державні, регіональні, місцеві, об'єктові рівні надзвичайних ситуацій. Наведено класифікацію небезпек за різними критеріями. Розкрито поняття потенційно небезпечних об'єктів та об'єктів з підвищеною небезпекою. Наведено основні етапи при визначенні відповідності категорії техногенної небезпеки об'єктів господарської діяльності, що дозволить систематизувати процес дослідження при виконанні комплексних судових пожежно-технічних та інженерно-екологічних експертиз.

Ключові слова техногенна небезпека, потенційно небезпечний об'єкт, об'єкт підвищеної небезпеки, небезпечна речовина, порогова маса, джерело небезпеки, надзвичайна ситуація.

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I. V. Yatsenko,

Doctor of Veterinary Medicine, Leading Forensic Expert at the
KhRIFE

ORCID: <https://orcid.org/0000-0001-8903-2129>,

E-mail: yacenko-1971@ukr.net

L. M. Derecha,

Academic Secretary at the KhRIFE, PhD in Biology, Senior
Researcher

ORCID: <https://orcid.org/0000-0002-6044-2068>,

E-mail: derecha@hniise.gov.ua

POSSIBILITIES OF FORENSIC VETERINARY EXAMINATION AS A NEW TYPE OF FORENSIC SCIENCE

The article is devoted to a new type of forensic examination - forensic veterinary examination. Possibilities of forensic veterinary examination are substantiated. A description is given of the subject, objects, subject, tasks of the forensic veterinary examination, a list of questions that are put to the expert to solve them. It is shown that new and existing types of criminal acts contribute to the growth of tension in the world and cause the emergence of new objects and tasks of expert research, and, therefore, new special knowledge, the latest research methods and tools are needed. The need to open a new type of forensic examination in the system of forensic institutions of the Ministry of Justice of Ukraine, forensic veterinary examination, is due to the fact that violation of quarantine conditions, purchase and sale of animals, their improper use for breeding and other purposes, poaching, cruelty to animals, as well as a violation of the rules for the disposal of corpses leads to criminal proceedings and court cases, and, consequently, the need for a forensic examination. Forensic veterinary examination covers a wide range of knowledge and research relating to live animals, their corpses, livestock, medicines used in veterinary medicine, documentation. Opening of a new expert specialty - "Forensic Veterinary Expertise" in the system of the Ministry of Justice of Ukraine contributes to the solution of many issues that arise in law enforcement in investigating offenses related to objects of veterinary medicine and animal husbandry, enriches new opportunities for domestic forensic activities, creates relevant prospects for research in this field.

Keywords: forensic science activity, forensic veterinary, subject and objects of forensic veterinary examination; tasks of forensic veterinary.

Formulation of Research Problem. Discovery of new types of forensic expertise and expertise is dictated, above all, by the needs of the judiciary. New and existing types of criminal activity lead to the emergence of new objects and tasks of expert research, and therefore require new specialized knowledge, new methods and means of investigation. It is only

natural that society should respond to this situation with the introduction of more advanced and progressive methods and means of struggle, and one of such means is forensic examination, which on a scientific basis allows to help highly expose criminal acts, to be a component in proving a person's guilt in committing a crime.

Analysis of recent research and publications. Application issues of new methods of research have been the subject of consideration of a considerable number of domestic and foreign scientists, such as E. B. Simakova-Yefremian, L. M. Golovchenko, V. Yu. Shepitko, V. D. Yurchishin, A. P. Sheremet, R. S. Belkin, V. Ya. Koldin, E. P. Ishchenko, O. R. Rossinskaya, T. V. Averyanova, N. P. Mylis, E. I. Halashina, O. I. Usov, M. V. Saltevsky and others.¹

New types of forensic examination are conditioned by the specifics of the subject matter of the expert investigation, the situation, the conditions of the examination and the questions put to the expert's decision. A qualitatively new forensic assignment is understood to mean expert assignments that were not previously solved within the forensic expertise due to the specificity of the object (novelty, originality, previously unknown nature of the object) and (or) lack of methods for its resolution and application of techniques capable of obtaining a completely new information about the object.

In this regard, KhRIFE practices the development of new expert specialties, and at the scientific level the need to introduce new types of forensics is substantiated. For example, in 2019, at the initiative of KhRIFE, 10 new expert specialties were introduced: 5.4 *Research on circumstances and mechanism of anthropogenic explosions*; 8.10.1 *Investigation of the presence of pesticides in the environment*; 10.21 *Study of urban electric transport*; 10.22 *Investigation of the technical condition of elevators and conditions of their safe operation*; 17.1.1 *Gemstone Research*; 17.1.2 *Exploration of diamonds*; 17.1.3 *Investigation of Organic Origin Gems*; 17.1.4 *Semi-precious stones research*; 17.1.5 "Research on ornamental stones"; 18.1 *Veterinary Research*. In the system of the Ministry of Justice of Ukraine, KhRIFE employees are the first to be qualified as forensic experts with the right to conduct forensic examinations in these specialties,

¹ Дyv., напр.: Simakova-Yefremian E. B. *Kompleksni sudovo-ekspertni doslidzhennia: teoriia ta praktyka* [Complex forensic studies: theory and practice]: monohrafiia. Kharkiv : Pravo, 2016. 456 s.; *Osnovy sudovoi ekspertyzy* [Fundamentals of Forensics]: navch. posib. dlia fakhivtsiv, yaki maiut namir otrymaty abo pidtverdyty kvalifikatsiiu sudovoho eksperta / avt.-uklad.: L. M. Holovchenko, A. I. Lozovyi, E. B. Simakova-Yefremian ta in. Kharkiv : Pravo, 2016. 928 s.; *Kryminalistyka* [Forensics] / za red. V. Yu. Shepitka. 2-he vyd., pererobl. i dopov. Kyiv : Kontsern «Vydavnychi Dim «In Yure», 2004. 728 s.; Yurchyshyn V. D. *Sudovi ekspertyzy (kurs lektsii)* [Forensics (lecture course)]: navch. posib. dlia studentiv yurydychnykh spetsialnostei vyschykh navchalnykh zakladiv. Ivano-Frankivsk, 2013; Sheremet. A. P. *Kryminalistyka* [Forensics]. 2-he vydannia. Kyiv : Tsentр uchbovvoi literatury. 2009. 471 s [in Ukrainian].

and so far they remain the only specialists in this field among the Ukrainian forensic research institutions.

The Research purpose is to substantiate possibilities veterinary forensic science as a new type of forensic science.

Main content presentation. The need to open a new type of forensic examination in the system of forensic institutions of the Ministry of Justice of Ukraine: forensic veterinary expertise, due to the fact that the violation of quarantine conditions, the sale of animals, their misuse for breeding and other purposes, poaching, animal abuse, as well as violation of the rules for the disposal of corpses leads to the emergence of criminal proceedings and court cases, and, therefore, the need for forensic veterinary examination. Forensic veterinary covers a wide range of knowledge and research regarding live animals, their corpses, livestock, medicines used in veterinary medicine, documentation, etc.¹.

It is urgent to solve such expert tasks as: establishment of species belonging to animal remains (under Article 28 of the Criminal Code of Ukraine), ill-treatment of animals (under Article 299 of the Criminal Code of Ukraine), illegal hunting (under Article 248 of the Criminal Code of Ukraine), violation of veterinary rules (for example, the occurrence and spread of epizootic of African swine fever) (under Article 251 of the Criminal Code of Ukraine), etc.

The objects of veterinary forensic science are:

- live animals (domestic, wild, hunting, zoo (exotic);
- animal corpses (anatomically-whole, fragmented, skeletalized);
- raw materials for the veterinary-biological industry (endocrine, enzymatic, special, intestinal, gastric);
- animal feeds, feed additives;
- physical evidence (litter, vomiting, etc.);
- documents (materials of pre-trial investigations and court cases (protocols of autopsy, acts of epizootic inspection of the holding, log of registration and treatment of sick animals, log of veterinary documents issuing, manufacturer's declaration, operating permit, etc.).

The main tasks of forensic veterinary examination are:

- estimation of severity of the caused damages, degree of disorder of health of live animals, loss of their productivity, estimation of timeliness and completeness of carrying out of medical-prophylactic, anti-epizootic, sanitary-hygienic, quarantine and other. events);
- establishment of violent death as a result of gunshot injuries, poisoning, physical and mechanical factors or other causes;

¹ Yatsenko I. V., Zapara S. I., Zakhariev A. V. Suchasnyi stan ta perspektyvy rozvytku sudovo-veterynarnoi ekspertyzy v Ukraini [The current state and prospects of forensic veterinary examination in Ukraine]. *Teoriia ta praktyka sudovoi ekspertyzy i kryminalistyky* : zb. nauk. prats. Kharkiv : «Pravo», 2018. Vyp. 18. S. 568–575 [in Ukrainian].

- assessment of timeliness and completeness of the measures provided for by the current veterinary legislation;
- comprehensive veterinary and animal studies of live animals;
- solving issues in the field of livestock technology and veterinary medicine;
- investigation of medical errors that occurred during the care, treatment, preventive measures and culling of animals (timeliness and adequacy of providing veterinary care to the animal; compliance with the actions of a veterinary medicine specialist during the conduct of diagnostic, therapeutic, preventive and quarantine measures);
- establishment of compliance of veterinary documents with the current legislation of Ukraine.

Indicative list of issues to be resolved:

- what is the cause of the animal's death?
- what is the severity of the damage caused to the animal?
- what is the mechanism of animal injury and what is the sequence and sequence of causation of the injury caused to animal?
- are the animals found in the corpse with bodily injury?
- are there any signs on the corpse of animals that can determine the nature and features of the weapon or other weapon causing the damage?
- what is the duration of damage to the animal?
- what are the injuries to the animal of which the corpse was examined, whether lifelong or posthumous?
- what is the cause and effect relationship between the injury and the cause of the disorder of the health of the live animal or the death of the animal that has been examined?
- what time could the animal whose body was examined be damaged after receiving the damage?
- was the animal whose body was examined able to move independently during the life of the trauma after being injured?
- what health complications arose from the effects of the injuries, or did they cause the animal suffering before death?
- is the cause of the animal's death its poisoning; from which poison did the animal's death come?
- how is the poison introduced into the animal's body (through the mouth, lungs, intact skin or injection) and in what form (powder or tablets, liquid, solution, gas)?
- in what way could the poison enter the animal's body (with feed, water, as a medicine or as an antidote)?
- what concentration of poison is found in the animal's body, is it lethal, could it cause an animal health disorder?
- how quickly did the animal's death come after the poison was introduced?
- if the poison is found in corpse material, did it get into the tissues lifelong or posthumously?
- is the cause of death of the animal related to the poisons detected?

- is a poison in the animal's body detected by a medicinal product and is the presence of the poison related to providing veterinary care to the animal?

- is the poisoning of the animal related to feed and water intake?

- does the nature of the injuries allow you to objectively state the effects of certain (physical, chemical, biological, etc.) environmental factors?

- what life-long illnesses or other factors could have contributed to the onset of death?

- did the animal physical pain, suffering, and torture cause death before death?

Other forensic questions may also be raised before the forensic examination if special knowledge is required to address these tasks.

Forensic veterinary covers a wide range of knowledge and research relating to live animals, dead bodies, and livestock raw materials, medicines used in veterinary medicine, documentation, practical activity of veterinary medicine specialists, etc. So, in the first textbook on forensic veterinary examination, published in Kharkov in 1907, associate professor F. T. Popov wrote: "There is no such amount of counterfeiting, fraud and fraud in any branch of agriculture as in animal husbandry"¹. In the early stages of social development during hunting for wild animals, and then their domestication, during the emergence and development of livestock, the use of domesticated cattle as labor, especially with the emergence of private property, exchange and trade between owners of animals, there were disputes who needed a solution. To this end, the more civilized peoples of the world at various times have legislated resolutions on these issues.

The first mention of such ordinances is found in the books of the Old Testament. Yes, Jewish farmers have long had certain laws regarding the injury of slaves and domestic animals: "If someone steals an ox or a sheep, or kills them or sells meat, then they must return the owner of these animals 5 oxen per ox., or 4 sheep per sheep (Art. 1, para. 22)." In Art. 14 states that "if one borrows from his neighbor an animal and is injured or killed, the one who has lent that animal must pay back twice the value of the animal".

The old Roman laws also have rulings (court laws) called the Edicts on the trade in livestock. These laws were under the control of lower-level special officials — edicts who, in addition to overseeing the sale of animals, acted as police or market judges. The status of the edicts later entered into civil law. Emperor Justinian collected all the decrees written at different times and printed them under the name *Roman Civil Law* (Corpus Iuris Civilis Instiniani). *Civil Law* included all Roman edicts, which were later borrowed from other states of the world.

¹ Aubakirov M. Zh. Sudebnaja veterinarija [Forensic veterinary medicine]: uchebno-metod. posob. dlja studentov special'nosti 5V120100 — «Veterinarnaja medicina». Kustanaj, 2014. 138 s [in Russian].

When veterinary medicine and veterinary doctors did not yet exist, all these laws and regulations were at the disposal of the judges to resolve conflicting cases. In most cases, however, the judges' decisions were incorrect and incorrect because, in addition to knowledge of the laws, theoretical and practical knowledge of veterinary medicine that was not possessed by judges was required. Therefore, butchers, grooms, shepherds, shepherds, blacksmiths, blacksmiths and other professionals were invited to resolve controversial issues related to animal husbandry.

In those days, the practice of resolving disputes and claims was empirical, that is, not scientific. The main evidence was the confession of the guilty person. Guilt was subjectively imposed, which was often the reason for wrong decisions and accusations.

From the time of its birth in the ancient period until the time of Peter, humane and veterinary medicine developed as the only science. For the first time, forensic medicine, as an independent section of medical science, was identified by Johann Bonn in his 1690 monograph: *Specimen medicine forensis* published in Leipzig.

Since the XVI century. and until the middle of the sixteenth century, forensic medicine and the closely related forensic veterinary science were only born. In Russia and in other countries of the world, relevant legislation has been issued to combat diseases of humans and animals, prevent the death of horses and other domestic animals, and the liability of those involved. The necessity of observance of sanitary rules as a means of prevention of general contagious diseases among animals and humans is mentioned in the pre-Peter's period of development of forensic veterinary medicine, during the reign of Tsar Alexei.

The statute of forensic medicine. It systematizes the existing legislation on forensic medicine, which also regulated the veterinary case. Thus, the punishment for non-compliance with the prescription, the order for the use of the means of warning against the introduction of contamination of domestic animals was provided for. The medical statute required veterinary experts to report every case of animal disease in the area they were subordinate to. This responsibility was also assigned to the owners of these animals.

Scientific forensic veterinary science dates back to 1864, since the reform of the judiciary and the introduction of a public court and the adoption of a judicial statute. Since that time, judicial functions have been separated from administrative functions. The issue of providing veterinary surgeons with the duties of forensic experts was discussed in the circular of the Medical Department of the Interior (which also included the Veterinary Committee) of August 17, 1875 under No. 1784. Veterinary doctors were involved in the medical examination.

In the "*The Investigator's Desktop Book* in the section "*Veterinary and zootechnical examinatio*" the place of application of veterinary medicine is determined as follows: "Veterinary examination gives conclusions about the cause of death or disease of animals, the nature of the

disease, the correct mode of isolation, use and maintenance of patients and suspected animals for diseases as well as the suitability for food or use of raw material of animal origin.”

With the emergence of higher education institutions, forensic medicine in them was one of the main special disciplines, which was taught at all faculties of veterinary institutes. The teaching of this discipline was entrusted to outstanding scientists. Thus, lectures on forensic veterinary medicine at the veterinary department of the St. Petersburg Imperial Military Medical Academy have been commissioned since 1871 by II Ravych, and at the Kharkov Veterinary Institute by Professor MI Petropavlovsky.

The first independent textbook on forensic medicine was published by Professor F. Popov, professor of Kharkiv Veterinary Institute, in 1895, and in 1907 he published *Short Course in Forensic Veterinary for Students and Doctors*. A significant contribution to the development of domestic forensic veterinary medicine was made by Professor M. I. Marie, who published *The Meat Inspection Guide for Doctors and Students* (St. Petersburg, 1912). This guide addresses the issues of determining the species of meat of different animal species, which is of great relevance today.

In 1951 the Leningrad Veterinary Institute published for the first time in the USSR a textbook of veterinary pathologists: Professors V. Z. Chernyak, M. A. Dobin, P. I. Kokurichev *Fundamentals of Forensic Veterinary* ", a new edition of which was again published in 1977 under the authorship of PI Kokurichev and MA Dobin. In the same year, the second edition of the book by Associate Professor F. Ya. Sizonenko *Forensic Veterinary Obstetrics* and in 1986 — for the second time published a book by Associate Professor of the Kharkiv Zoological Veterinary Institute V. P. Obratsov *Forensic Veterinary*. In the same year, the Kazan Veterinary Institute published a guide for professors V. V. Vlasenko and V. P. Frolov on forensic veterinary examination of wild animal meat.

Since 1981, several veterinary departments of the Soviet Union, according to a typical curriculum, taught an independent course in forensic veterinary examination (Alma-Ata: Prof. M. F. Shuklin, Vitebsk: Prof. M. S. Zharov, Moscow: prof. K. I. Vertinsky, Professor V. P. Shishkov, Stavropol: Professor A. M. Smirnov, Kharkiv: Associate Professor V. P. Obratsov and others). Independent sections, which were included in the *Veterinary Doctor's Handbook* and were published in 1990 and 1996, devoted to the issues of forensic veterinary examination, were written by associate professors V. P. Obratsov and A. A. Kunakov. Since 1990, he has not been teaching as an independent course *Forensic Veterinary* at higher educational establishments of the faculties of veterinary medicine of Ukraine.

To study this discipline, there is a textbook *Forensic Veterinary Science* (by AV Zharov, 2001), *"Fundamentals of Forensic Veterinary Medicine* (authors: M. V. Skrypka, I. V. Yatsenko, N. B. Kolich), *Practice*

of *Forensic Veterinary Examination* (authors: I. V. Yatsenko and A. M. Trush)¹, *Forensic veterinary examination in cases of asphyxia* (authors: Ya. K. Serdyukov, I. V. Yatsenko, N. M. Bogatko), *Forensic veterinary examination of injuries resulting from the action on the organism of animals of pathogenic physical factors* (authors: Y. K. Serdyukov, I. V. Yatsenko, N. M. Bogatko)², "Forensic veterinary examination of injuries resulting from the action on the organism of animals of pathogenic physical factors" (authors: Ya. K. Serdyukov, I. V. Yatsenko, N. M. Bogatko)"³.

Topic of forensic veterinary examination is factual data (facts, circumstances) that establish on the basis of specialized knowledge in the field of veterinary medicine. For example, forensic veterinary examination concludes the cause of death or disease that is often a consequence of violations of zoo-hygienic conditions of keeping animals, in particular: drafts, increased humidity as a result of disturbance of temperature regimes, increased concentration of ammonia in the air in animal husbandry, etc.), use and maintenance of sick and suspected animals, as well as the suitability for use in food or for the use of animal raw materials in animal health.

Due to the loss of products for various reasons, the farms suffer economic loss. Such court cases arise because of the death or disease of the animals, in the case of the slaughtered animals and the loss of meat productivity. Forensic examination must necessarily take place in the consideration of cases related to the death of pets, with forced slaughter caused by violations of the veterinary rules for their maintenance, feeding, operation and other violations.

The subject of forensic veterinary examination is a specialist who has a higher veterinary education (educational level: not lower than a specialist), a certificate of qualification of a forensic expert in the specialty 18.1 *Veterinary Research* (type: *Forensic Veterinary*) and entered in the State Register of Certified Forensic Experts. The main source of the formation of new methodologies is the scientific developments caused by the need to solve topical expert tasks, which are reflected in the thematic plans of the research institutions of judicial expertise of the Ministry of Justice of Ukraine and the internal plans of the R&D of research institutions of judicial expertise of the Ministry of Justice.

¹ Yatsenko I. V., Trush A. M. *Praktyka sudovo-veterynarnoi ekspertyzy* [Practice of forensic veterinary examination]: Khrestomatiia. Kharkiv : Styl-Yzdat, 2014. 314 s [in Ukrainian].

² Serdiukov Ya. K., Yatsenko I. V., Bohatko N. M. *Sudovo-veternarna ekspertyza u vypadkakh asfiksii* [Forensic veterinary examination in cases of asphyxia]. Kyiv : «TsR «Kompynt», 2016. 42 s [in Ukrainian].

³ Serdiukov Ya. K., Yatsenko I. V., Bohatko N. M. *Sudovo-veterynarna ekspertyza poshkodzen, shcho vynykaiut vnaslidok dii na orhanizm tvaryn patohennykh fizychnykh chynnykiv* [Forensic veterinary examination of injuries resulting from the action of pathogenic physical factors on animals]: metod. vkazivky. Kyiv : TsP «Kompynt», 2015. 51 s [in Ukrainian].

Quality of a qualified and objective examination depends to a large extent on the expertise and experience of the expert. When conducting veterinary research, a forensic expert must have a thorough knowledge of the various fields of veterinary medicine and animal husbandry.

Forensic examination makes extensive use of instruments, optical devices, photographic apparatus, x-ray equipment, chemical analytical instruments, computer and diagnostic equipment and other advanced equipment. This was made possible by the achievements of physics, chemistry, biology, forensics and other sciences, which greatly expands the range of issues that can be addressed in the while this examination.

During the research of objects of forensic veterinary examination, they are described in detail, identify morphological features, establish species identity, sex, breed, fatness, size, presence of pathological changes. In some cases, biological material is removed from the object under study. Only by having informative research material can one proceed to the selection of appropriate and reliable research methods for a comprehensive and objective justification of the results.

Nowadays, veterinary expertise is being actively developed as a field of veterinary medicine, the field of law, independent science and educational discipline in higher agricultural educational institutions of Ukraine: I. V. Yatsenko Professor (Kharkiv State Veterinary Academy), G. I. Kotsyumbas, Professor (Lviv National University of Veterinary Medicine and Biotechnology named after S. Z. Gzhysky), M.V. Violin, Professor (Poltava State Agrarian Academy); G. A. ZonProfessor (Sumy NAU), B. V. Borisevich, Professor and Ya.K. Serdyukov, Docent (National University of Life and Environmental Sciences of Ukraine (Kyiv) and others.

The Department of Veterinary and Sanitary Expertise and Forensic Veterinary Medicine was established in Kharkiv State Zoological Veterinary Academy in 2010, and in 2014 the Bureau of Forensic Veterinary Research was established in Ukraine for the first time (Professor I. V. Yatsenko, Head of the Department). At the Lviv National University of Veterinary Medicine and Biotechnology. The Department of Normal and Pathological Morphology and Forensic Veterinary Medicine (headed by Professor G. I. Kotsyumbas) was organized.

Specialists who have worked and worked at KhRIFE have passed Kharkiv school of prominent figures of veterinary and sanitary and forensic veterinary expertise, have experience in the field of forensic veterinary expertise in criminal, civil, economic cases were appointed by law enforcement agencies since the XIX century¹.

¹ Yatsenko I. V., Dehtiarov M. O., Bondarevskyi M. M., Trush A. M. Kharkivska shkola vydatnykh diiachiv veterynarno-sanitarnoi ta sudovo-veterynarnoi ekspertyzy [Kharkiv school of prominent figures of veterinary and sanitary and forensic veterinary expertise]. Problemy zoonzhenerii ta veterynarnoi medytsyny : zb. nauk.prats KhDZVA. Kharkiv, 2014. Vyp. 28, ch. 2. S. 20–28 [in Ukrainian].

Currently, the following measures have been taken:

- separate methods of forensic veterinary research have been developed, algorithms of forensic veterinary examination have been developed¹;
- declaration patents for utility model of Ukraine were obtained²;
- Software have been developed: *Discriminant*, *Osteo*, *Manus Vacca*, *Pes Vaccae*, *Skull Cattle*, which automate the expert review process and are now actively used in forensic practice;
- monographs, manuals, scientific and practical recommendations on forensic veterinary medicine have been prepared³;

¹ Yatsenko I. V., Bondarevskiy M. M., Kamianskyi V. V. Diahnostychna informatyvnyist osteoskopichnykh ta osteometrychnykh parametriv kistok stupni velykoi rohatoi khudoby u sudovo-veterynarnii ekspertyzi [Diagnostic informative content of osteoscopic and osteometric parameters of bones of bones of a foot of cattle in forensic veterinary examination]. Problemy zoonzhenerii ta veterynarnoi medytsyny : zb. nauk. prats KhDZVA. Kharkiv : RVV KhDZVA, 2010. Vyp. 21, ch. 2, t. 2. S. 334–340 [in Ukrainian].

² Deklaratsiyni patent Ukrainy na korysnu model № 99469 Sposib vyznachennia viku ta stati velykoi rohatoi khudoby za osteometrychnymy parametramy nosomozkovoho viddilu cherepa [Declaration patent of Ukraine for utility model No. 99469 A method for determining the age and sex of cattle by the osteometric parameters of the cerebellar]/ Karem R. S. Abuznaid, I. V. Yatsenko, O. M. Hetmanets; zaiavleno 24.11.2014 r.; opublikovano 10.06.2015 r., Biul. № 11. 4 s [in Ukrainian].

³ Dyv.: Yatsenko I. V., Bondarevskiy M. M. Strukturni osoblyvosti kistok plesna i tazovoi kintsivky velykoi rohatoi khudoby molochnoho napriamu produktyvnosti v aspekti sudovoi veterynarnoi ekspertyzy [Structural features of the bones of the metatarsal and pelvic limbs of dairy direction of productivity in the aspect of forensic veterinary examination]: monohrafiia. Kharkiv : Styl-Yzdat, 2012; Yatsenko I. V., Kamianskyi V. V., Bondarevskiy M. M. Sudovo-veterynarne znachennia parametriv kistok piastka ta paltsiv hrudnykh kintsivok dlia vyznachennia viku velykoi rohatoi khudoby molochnoho napriamu produktyvnosti [Forensic veterinary value of parameters of the bones of the metacarpus and fingers of the thoracic limbs for determining the age of cattle of dairy direction of productivity]: monohrafiia. Kharkiv : Styl-Yzdat, 2013; Yatsenko I. V., Tkachuk S.A., Bilyk R. I., Kamianskyi V. V. Strukturni osoblyvosti kistok velykoi rohatoi khudoby molochnoho napriamu produktyvnosti v aspekti sudovo-veterynarnoi ekspertyzy [Structural features of bones of dairy cattle productivity in the aspect of forensic veterinary examination]: monohrafiia. Kyiv : Bioprom, 2013; Tkachuk S.A., Yatsenko I. V., Havrylin P. M. Sudovo-veterynarne znachennia strukturnykh parametriv skeleta dlia vyznachennia vydovoi nalezhnosti biolohichnoho materialu [Forensic and veterinary significance of the skeletal structural parameters for determining the species belonging to biological material]: monohrafiia. Kyiv : TsP «Kompynt», 2015. 329 s.; Yatsenko I. V., Abuznaid Karem R. S., Averianova L. O., Hetmanets O. M. Sudovo-veterynarni kryterii vyznachennia viku i stati velykoi rohatoi khudoby molochnoho napriamu produktyvnosti za morfolohichnymy osoblyvostiamy nosomozkovoho viddilu cherepa [Forensic veterinary criteria for determining the age and sex of dairy cattle productivity by morphological features of the cerebellar section of the skull]: monohrafiia. Kharkiv : FOP Brovin, 2017. 218 s.; Abuznaid Karem R. S., Yatsenko I. V. Vyznachennia viku i stati velykoi rohatoi

– опубліковано численні наукові статті у фахових виданнях¹;

The need for forensic veterinary examinations on the grounds of the crime under Art. 251 of the Criminal Code of Ukraine: violations of veterinary rules, in particular, the emergence and spread of epizootic of African swine fever (in particular, in the Dergachiv district of Kharkiv region and in the Novorossiysk district of Mykolaiv region), as well as abuse².

Protection of animals from suffering and death as a result of ill-treatment of them, protection of their natural rights and strengthening of morality and humanity of the society is provided by the Law of Ukraine: *On the Protection of Animals from Brutal Treatment*.³ Unfortunately, animal abuse, killing and killing are still rare. Here are some terrifying examples. Thus, it is known from the results of the forensic veterinary examination that an unidentified person entered the territory of Kharkiv's private homeownership and struck, presumably with a stick, a dog called *Amur*, as a result of which the latter died. During inspection of a scene the corpse of a dog without signs of life was found. A forensic veterinary examination is used to determine objectively the causes of the animal's death.

On the basis of a forensic veterinary study of the dog's corpse by the name "Amur", the panel of forensic experts registers: life-long significant

khudoby molochnoho napriamu produktyvnosti za kospleksom kraniolohichnykh parametriv [Determination of age and sex of cattle of milk direction of productivity by a complex of craniological parameters]: nauk.-metod. Rekomend. RVV KhDZVA, 2015. 141 s [in Ukrainian].

¹ Dyv.: Yatsenko I. V., Holovko N. P., Kyrychenko V. M., Balyanian T. Ye., Bohatko N. M., Bukalova N. V., Serdiukov Ya.K. Ekspertnyi vypadok doslidzhennia frahmentiv tila losia yevropeiskoho (Alces alcess L.) za materialamy dosudovoho rozsliduvannia kryminalnoho provadzhennia shchodo brakonierstva [Expert Case Study of European Moose Body Fragments Based on Pre-Criminal Investigation in Poaching]. Problemy zooinzhenierii ta veterynarnoi medytsyny : zb. nauk.prats KhDZVA. X. 2017. Vypusk 35, t.1, ch. 2. S. 115–126; Kamianskyi V. V., Yatsenko I. V., Bondarevskyi M. M., Hetmanets O. M. Osteonna orhanizatsiia kompaktnoi rechovyny diafiza kistok plesna velykoi rohatoi khudoby molochnoho napriamu produktyvnosti dlia vyrishennia diahnostychnykh zavdan u sudovo-veterynarnii ekspertyzi [Osteon organization of compact substance of diaphysis of the bones of the dairy cattle productivity to solve diagnostic problems in forensic examination]. Problemy zooinzhenierii ta veterynarnoi medytsyny : zb. nauk.prats KhDZVA. Kharkiv, 2015. Vyp. 30, ch. 2. S. 346–353 [in Ukrainian].

² Yatsenko I. V., Zapara S. I., Zakhariyev A. V., Skrypka M. V., Serdiukov Ya. K. Sudovo-ekspertni vypadky doslidzhennia trupiv tvaryn z oznakamy nasylnoy smerti vid zhorstokoho povodzhennia [Forensic expert cases of animal carcasses with signs of violent death from ill-treatment]. Problemy zooinzhenierii ta veterynarnoi medytsyny : zb. nauk.prats KhDZVA. X., 2018. Vypusk 36, ch. 2. S. 130–138 [in Ukrainian].

³ Pro zakhyst tvaryn vid zhorstokoho povodzhennia [On the Protection of Animals from Cruelty]: Zakon Ukrainy. Vidomosti Verkhovnoi Rady Ukrainy, 2006, № 27. St. 230. <https://zakon.rada.gov.ua/laws/show/3447–15> (data zvernennia 21.04.2019) [in Ukrainian].

blood loss: cardiac dumping syndrome, poor vein filling, low volume and poorly expressed hypostasis and cadaveric spots; closed traumatic brain injury caused by a blunt solid object; polytrauma of the head with loss of individual teeth, fractures of the skull bones, tears of the soft tissues of the head with hemorrhages into these tissues, damage to the eyeball (Fig. 1-3), open fracture of the 2nd and 3rd metacarpal bones of the right hand and corresponding proximal the phalanges of the right hand with the destruction of the metacarpophalangeal joints of the 2nd and 3rd fingers (Fig. 4).



Fig. 1. The absence of incisors of the lower dental arcade, fracture of the crown of the canine tooth



Fig. 2. Wounds of the cheek and temporal area of the head



Fig. 3. Hemorrhage under the fascia of the head, rupture of the temporalis muscle (shown by a scalpel)



Fig. 4. Right hand wound, fracture of the 2nd and 3rd bones of the metacarpus

The injuries found on the corpse of the dog *Amur* during the forensic veterinary examination are of a lifelong nature. The death of the dog "Amur" occurred within 30 minutes to 1-2 hours, depending on the speed of development of the state of shock from the moment of their application from acute traumatic-pain shock and blood loss. The nature of the fatal injuries caused to the dog, their location (head, right thoracic limb) and their pathomorphological characteristics indicate that they are not compatible with life without the provision of emergency veterinary care, and damage to the dog *Amur* is inflicted repeatedly in a vital area of the body — head, as well as in the area of the brush of the right thorax. The death of the dog *Amur* was violent, premature from the pain of shock, gradual blood loss and cardiac arrest, as a result of political trauma caused by a blunt solid object, which could have been: a stick, a stick from a shovel, a metal rod, etc.

Between bodily injuries (polytrauma) revealed in the body of a dog by the nickname *Cupid* and a life-threatening condition of an animal that developed in the clinical course of injuries (wounds, hemorrhages, skull bones fractures in the frontal region, maxillary maxillary, maxillary, maxillary lower jaw and traumatic damage to the eyeball; open fracture of the 2nd and 3rd metacarpal bones of the right hand and upper phalanges of the 2nd and 3rd fingers of the right hand with destruction of the metacarpophalangeal joints of the 2nd and 3rd n The experts have established a direct cause and effect relationship.

The materials of another forensic veterinary examination indicate that a police officer in the Odessa region received a message from "102" that on August 26, 2018, on the territory of the suburban town, a citizen caused her abusive dog by the nickname *Zenya* death.

During a forensic veterinary examination of the corpse of the dog *Zenya* the following injuries were revealed:

- penetrating damage in the dorsal part of the chest on the left side of the animal's body revealed on the external examination of the corpse at the level of 3-4 ribs; the wound found had a rounded shape, up to 5 mm in diameter; the wound canal in the subcutaneous adipose tissue is angled (up to 75°) in the caudal direction, the edges of the wound soaked in blood;

- opening of the wound canal of oval-rounded shape, with a diameter of 6–7 mm in the area of the lateral chest wall, in the dorsal section of the costal pleura and in the intercostal muscles at the level of 6–7 intercostal spaces (photo 2);

- rupture of the wall of the thoracic aorta;
- hemothorax (hemorrhage into the pleural cavity);
- mechanical damage to the wall of the caudal vena cava (Figs. 3, 4);
- subendocardial ecchymosis;
- ischemia (weak blood supply) of brain tissue, lungs, liver;
- damage to the soft tissues of the head of the suborbital area to the left.

The above pathomorphological changes occurred due to a ball-blind penetrating chest injury and a bullet injury to the head. These injuries could have been caused by a shotgun from a rifle.

The injuries identified in the corpse of the dog by the nickname *Zenya* are serious bodily injuries because they are expressed in the wound of the chest with penetration into the pleural cavity with the damage of large

blood vessels and at the time of causing the injury caused life-threatening and non-life-threatening injuries. their usual course, ended with the death of the animal; led to the loss of organs and their functions (aorta, caudal venae cavae, hemorrhage).

The mechanism of death of the dog by the nickname *Zenya* is acute blood loss due to internal bleeding. Damage found in the corpse of the dog by the nickname *Zenya* was caused two days before the forensic opening of the corpse. Damage found on the dog's corpse is life-long. The death of the dog by the nickname *Zenya* is violent. There is a direct cause and effect relationship between the injuries and the cause of death of the dog. After the injuries, the dog, nicknamed *Zenya*, could live for 1-2 minutes. Damage to the body of the dog *Zenya* was painful in nature and caused the animals suffering before death (Figs. 5-8).



Fig. 5. Third-party object, similar to a round ball, firmly fixed to adjacent tissues in the left orbital region



Fig. 6. General view of the wound surface of the skin in the dorsal part of the chest on the left side of the body



Fig. 7. Damage area of caudal venae cavae with a ball-like object (study conducted in the chest cavity while removing an object from the wall of a blood vessel)



Fig. 8. Fragment of a caudal vena cava with a site of damage to a ball-like object.

Conclusions. Thus, the opening of a new Area of specialization: *Forensic Veterinary Science* in the system of the Ministry of Justice of Ukraine helps to resolve many issues that arise in law enforcement agencies in the investigation of offenses related to the objects of veterinary medicine and animal husbandry, enriches new ones. opportunities of domestic forensic activity, creates actual prospects for scientific activity in this field.

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І. В. Яценко, Л. М. Дереча

МОЖЛИВОСТІ СУДОВО-ВЕТЕРИНАРНОЇ ЕКСПЕРТИЗИ ЯК НОВОГО ВИДУ СУДОВИХ ЕКСПЕРТИЗ

Стаття присвячена новому виду судових експертиз — судово-ветеринарній експертизі. Обґрунтовано можливості судово-ветеринарної експертизи. Зазначено предмет, об'єкт, суб'єкт, завдання судово-ветеринарної експертизи, перелік питань, які ставляться експерту для їх вирішення. Відкриття нової експертної спеціальності — «Судово-ветеринарна експертиза» у системі Міністерства юстиції України сприяє розв'язанню багатьох питань, які виникають у правоохоронних органів під час розслідування правопорушень, пов'язаних з об'єктами ветеринарної медицини і тваринництва, збагачує новими можливостями вітчизняну судово-експертну діяльність, створює актуальні перспективи для наукової діяльності в цій сфері.

Ключові слова: судово-експертна діяльність, судово-ветеринарна експертиза, предмет та об'єкти судово-ветеринарної експертизи; завдання судово-ветеринарної експертизи.

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M. Yu. Rombovsky,

PhD in Mathematics, Forensic Expert at the Sumy Scientific
Research Forensic Center of MIA of Ukraine;

ORCID: <https://orcid.org/0000-0002-2296-3452>,

E-mail: rombovsky_m@ukr.net

R. V. Radchenko,

Director of Sumy Scientific Research Forensic Center of MIA of
Ukraine;

E-mail: expertrrv@ukr.net

AUTOMATION OF RECOGNITION OF A RESEARCH AREA AT WEAKLY CONTRAST BORDERS ON THE IMAGE OF TRANSPARENT OBJECTS

Recently, due to the active development of computer technologies, in the field of science dealing with visual objects, there are problems of creating systems for automatic image recognition. This class of problems does not have a universal way of solving and this leads to the fact that, depending on the needs of a particular branch of science and engineering, the developers of such systems are forced to solve problems of a private nature.

The purpose of this work is to create a software product by the authors that would allow automatic recognition of the study area of objects having a weakly expressed boundary between the separation of object and background to further determine the values of the optical characteristics of transparent objects, as common features in identification trace evidence analysis the whole by parts.

One of the main problems of detecting the boundaries of the separation of objects in an image is the poor contrast of the transition region between adjacent areas of the divided space, which leads to the need for image processing to segment and correct the contrast. To develop an effective way to limit the recognition area and identify the boundaries of the studied object under the condition of low contrast between the light background and the space occupied by a transparent medium, which differs from the background in optical properties, there is a need to analyze existing image enhancement algorithms and their further practical implementation using mathematical software products of numerical analysis.

Thus, the paper reviews modern algorithms for image recognition methods and algorithms for changing image quality by segmentation and contrast correction. The proposed algorithms are implemented in a computer program developed by the authors of the Sumy Research Institute of the Ministry of Internal Affairs of Ukraine on the basis of the mathematical software MATLAB, which allows to carry out automatic comparative analysis of the studied samples on the basis of their digital images. The questions posed to the authors for further development of this topic are outlined.

Keywords: image recognition; identification of trasological studies of the whole by parts; segmentation; contrast correction; brightness gradient

Formulation of Research Problem. Any field of science or engineering that deals with visual objects gets the benefit of creating their

own image recognition systems. The very need to develop such a system arose in the identification of tracological studies of the whole in parts, in the framework of the study of the optical properties of transparent media, on the example of glass. The authors of the Ministry of Internal Affairs of Sumy have started designing a software product that would allow to automatically identify the area of study of objects that have a weak boundary between the separation of object and background and to perform a comparative analysis of their optical properties. Thus, the initial task of creating this program is to develop an effective way of limiting the area of recognition and detection of the boundaries of the object under the condition of a weak contrast of the transition between light background and space occupied by a transparent environment that differs from the background in optical properties.

Analysis of recent researches and publications. As is known, a great deal of information is presented in the form of static or dynamic images, which are viewed and analyzed by a person through the mechanism of visual perception. The human eye is a unique mechanism that provides adaptive adjustment according to external conditions. The visual system responds differently to radiation, which is identical in power but differs in the radiation range (spectral sensitivity of the eye).

Ability of the eye to distinguish the minimum difference in brightness of adjacent areas of the image is characterized by contrast sensitivity. Also, the visual system is characterized by different sensitivities to the color tone, that is, to radiation from different parts of the spectrum. The visual system is also characterized by a sensitivity to color saturation.

Thus, the feeling of color is determined by three main characteristics — luminosity, color tone and saturation. Color spaces are used to classify colors.

On the basis of properties and characteristics of visual systems, various models of color vision are created, enabling the construction of image recognition systems based on algorithms, the general structure of which is presented in Fig.1¹.

Information tasks of image recognition systems consist of two stages:

- conversion of the original data to a view that is easy to recognize;
- direct recognition (setting an object to a particular class).

In these tasks, you can introduce the concept of analogy or similarity of objects and formulate rules by which the object is assigned to one class or to different classes.

It is difficult to identify formal theories and use classical mathematical methods for recognition problems. This is due to the limitation of the information for the exact mathematical model or the lack of benefits from using the model compared to the cost.

¹ URL : http://old.ci.ru/inform03_06/p_24.htm (accessed 29.05.2019)

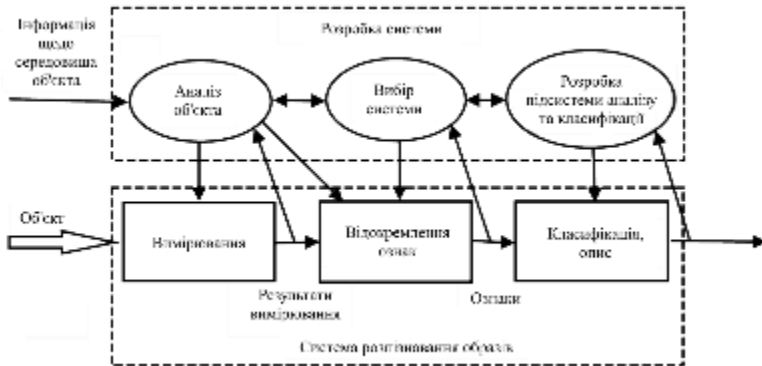


Fig. 1. Structure of the pattern recognition system.

One of the most powerful tools for modeling and exploring image processing methods is the MATLAB numerical analysis software, namely the Image Processing Toolbox¹ application suite. It is on the basis of the above software environment that the authors began to develop a program to determine the values of the optical characteristics of transparent objects, as a general feature in the identification of whole pathological studies, by which it is possible to carry out automatic recognition of the boundaries between slightly contrasting objects, to identify certain areas of study on images and more.

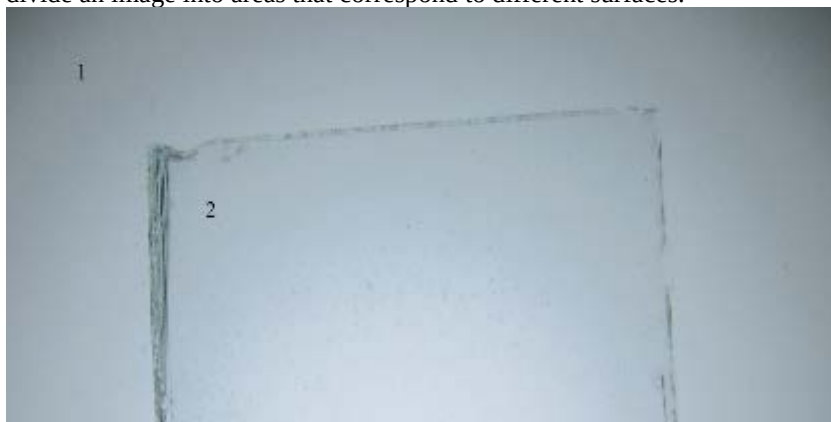
Research Purpose. The purpose of this work is to create a software product by the authors, which would allow to automatically identify the area of study objects that have a weak boundary separation of the object and background to further determine the optical characteristics of transparent objects, as common features in the pathological studies of the whole parts.

Main content presentation. In the program of recognition and selection of the study area to determine the values of the optical characteristics of transparent objects, as common features in the identification of whole pathological studies developed by the authors, the input data is a photograph of the object that will be further processed (Fig. 2). In this photo, according to Fig. 1, is presented with information about the object environment and the object of study itself. In Fig. 3 presents a code snippet that is responsible for converting the source data to a readable look. When solving the problem of image recognition, initially there is a need to differentiate the background and the area of the study, which is the study of optical properties, ie solves the problem of isolation and localization of the boundaries of the separation of objects in the image. Along the boundary there is a sharp change in brightness or its derivatives

¹ URL : <https://www.mathworks.com/products/image.html> (accessed 29.05.2019).

by spatial variables. The most common types of boundaries are the areas where the orientation of the surface changes abruptly or one object obstructs another, there is a boundary of the discarded shadow or there is no continuity in the reflective properties of the surface, etc.

Brightness change noise limits the ability to separate border information. There is a contradiction between sensuality and precision and, as a result of this contradiction, leads to the conclusion that the short separation boundary should have more contrast than the long one, in order to recognize it more effectively. Separating borders can be seen as an adjunct to the task of image segmentation, since borders can be used to divide an image into areas that correspond to different surfaces.



2. Outgoing image that needs further processing: 1 — background area; 2 — the area where the transparent object of study (glass) is located.

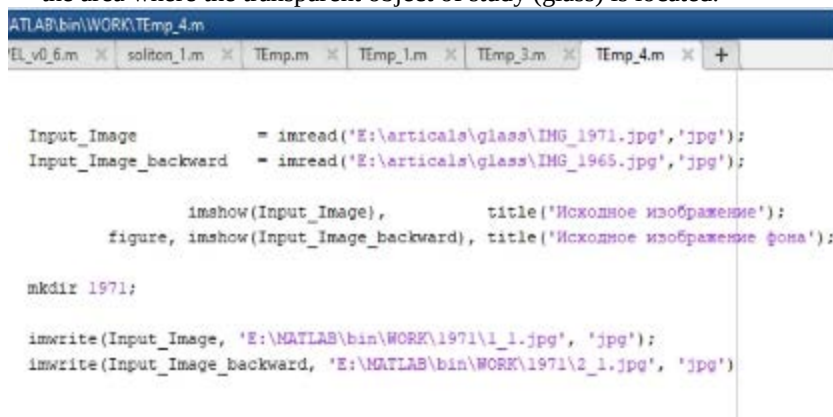


Fig. 3. The code snippet of the program responsible for uploading the original image to the computer for further processing.

When considering the intersection of the brightness function along a straight line that is perpendicular to the boundary, there is usually a jump in its values, but in practice, the difference may not be sharp due to the blurring and limitation made by the image locking device.

Brightness, in the general case, can be written in the form of some function $E(x, y)$ and partial derivatives in the form $\frac{\partial E}{\partial x} \frac{\partial E}{\partial y} \frac{\partial E}{\partial x} \frac{\partial E}{\partial y}$. These differential operators are directed because the result of their action depends on the orientation of the boundary. Then the vector $(\frac{\partial E}{\partial x}, \frac{\partial E}{\partial y})$ is a brightness gradient that does not depend on the selected coordinate system. To use the brightness gradient for automatic image processing, sampling is necessary.

When considering a group of 2×2 image elements, the discrete values of the brightness function can be represented in the form proposed in Fig. 4.

$E_{i,j+1}$	$E_{i+1,j+1}$
$E_{i,j}$	$E_{i+1,j}$

4. Schematic representation of the sampling of the brightness function

Derivatives at the central point of this group are defined as:

$$\frac{\partial E}{\partial x} = \frac{dE}{dx} \approx \frac{1}{2l} [(E_{i+1,j+1} - E_{i,j+1}) + (E_{i+1,j} - E_{i,j})], \quad (1)$$

$$\frac{\partial E}{\partial y} = \frac{dE}{dy} \approx \frac{1}{2l} [(E_{i+1,j+1} - E_{i+1,j}) + (E_{i,j+1} - E_{i,j})], \quad (2)$$

where l is the distance between the centers of adjacent elements.

The gradient square can be represented as:

$$\left(\frac{\partial E}{\partial x}\right)^2 + \left(\frac{\partial E}{\partial y}\right)^2 = \left(\frac{dE}{dx}\right)^2 + \left(\frac{dE}{dy}\right)^2 \approx \frac{1}{2l} [(E_{i+1,j+1} - E_{i,j})^2 + (E_{i,j+1} - E_{i+1,j})^2]. \quad (3)$$

While performing the proposed calculations for the whole image, where the brightness changes rapidly, the square of the gradient is greater, in places of constant brightness, the square of the gradient is zero, and in noise, the square of the gradient is small. After processing, the results are stored in a new array of images in which the edges are already enhanced.

If the signal obtained as a result of the reinforcement of the boundaries substantially exceeds the noise, one can conclude that a particular point of the boundary is present. This is not an absolute solution, as point noise can be significant. Therefore, to reduce the likelihood of such an event, you must select the input data so that the number of misclassified

points is irrelevant within acceptable limits. If the data value is too high, the low bounds will be omitted. Thus, there is a contradiction between the two types of errors. By increasing the size of the areas under which the approximation is made, it is possible to reduce the impact of noise and simplify the possibility of delimitation. However, with the increase of sites, they may reach other boundaries. Thus, border recognition requires that they be more contrasting.

Sharp-edged images will have more brightness not only in pixels placed directly at the border, but also in some adjacent ones. This is especially evident in images where pre-smoothing is performed to reduce noise.

In addition to using a gradient square to enhance the image, it is possible to use the Laplace operator. The difference is that when processing an image using a gradient square, a crest with a height proportional to the square of the difference of brightness will correspond to the image, and in the case of a Lapsasian, two parallel crests will appear on each side of the border, these ridges will have opposite signs and a border will pass along the line of change of sign.

One of the problems with the development of boundary methods is that the assumptions on which they are based are often inapplicable in real cases. Although most surfaces actually have a constant reflectivity, their images can have an irregular brightness, the value of which depends on many factors. On the other hand, image elements that correspond to the points of the surface of different objects may have identical halftone images¹.

If we consider Fig. 2, it can be seen that the boundaries between the area of glass and background are poorly expressed. In fact, the above figure presents one of the significant drawbacks of existing methods of obtaining initial data: in most of them they provide the formation of low-contrast images. Therefore, the main purpose of the enhancement methods is to convert the image to a look that makes them more contrasting and therefore more informative². Often, the image contains distortions in certain local surroundings caused by light diffraction, optical system defects, or defocusing. This leads to the need to perform local transformations on the image. In other words, this adaptive approach makes it possible to separate the information areas in the image and to process them accordingly. The stated requirements meet the methods of adaptive conversion of local contrast³. Methods of this class can be represented by a generalized block diagram (Fig. 5), which uses the following symbols:

¹ URL : <http://matlab.exponenta.ru/imageprocess/book2/14.php> (accessed 29 May 2019).

² Dhawan A. P. Enhancement of mammographic features by optimal adaptive Neighbourhood image processing / A.P. Dhawan, G. Buelloni, R. Gordon. IEEE Trans. Med. Imaging, 1986. 5. P. 8–15.

³ Bowyer K. W. State of the Art in Digital Mammographic Image Analysis / K. W. Bowyer, S. Astley. World Scientific Publishing Co. Pte. Ltd, 1994.

$L(i, j)$ – the original image and its element with coordinates, (i, j) respectively;
 $C(i, j)$ – contrast of the image element with the coordinates (i, j) ;
 $F(C(i, j))$ – converted contrast value $C(i, j)$;
 ε, σ, H_s – local neighborhood characteristics (ε – entropy, σ – root mean square deviation, H_s – histogram length function);
 $L^*(i, j)$ – element of the processed image with coordinates (i, j) .

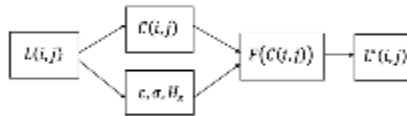


Fig. 5. Generalized block diagram of image enhancement methods using adaptive conversion of local contrasts.

For each element of the image $L(i, j)$, calculate the local contrast $C(i, j)$ values in a particular neighborhood W centered in the coordinate element (i, j) and then calculate the local sliding circle statistics W . The next step is to transform (contrast) the local contrast $C(i, j)$, using nonlinear functions and taking into account the local sliding circle statistics. For the conversion of local contrasts use nonlinear monotonic functions, and to form an adaptive function for the transformation of local contrast, choose power function and set the minimum α_{min} and maximum α_{max} values of the degree α . Adaptation is to form an additional operand to α_{min} by determining it based on local statistics in the sliding neighborhood. The parameters that will characterize the sliding circles are the histogram length function H_s , entropy ε and the standard deviation σ of the brightness values of the sliding element elements. Therefore, depending on the task, the methods of this class may differ in the function of local contrast transformation and the characteristics of the sliding circle. Finally, the last step in implementing the structural diagram is to restore the brightness of the image $L^*(i, j)$ with enhanced contrast.

The implementation of the above algorithm using the features of the Image Processing Toolbox application package is possible using one of the ways to improve the contrast of color images – the transformation of color spaces, which change the values of color components. One such transformation is the change of the color space RGB to $L^* a^* b^*$, its implementation is represented by a fragment of the program code in Fig. 6.

```

33
34 - Input_Image_contrast = Input_Image;
35
36 - srgb2lab=makecform('srgb2lab');
37 - lab2srgb=makecform('lab2srgb');
38 - shadow_lab=applycform(Input_Image_contrast, srgb2lab);

```

Fig. 6. Color space conversion code snippet.

The next step in the program is to change the image quality using the standard image processing feature of the Image Processing Toolbox, which is based on the action of the *adapthisteq* local contrastive adaptive conversion algorithm described above. In addition, comparative analysis used the image contrast enhancement function by changing the *imadjust* source image range and the *histeq* histogram¹. equalization operation. Part of the program code for the application of these functions and the results of image processing using them are presented in Fig. 7 and fig. 8. All three functions give a satisfactory result for further processing of the image in order to locate the area of optical properties of the transparent medium as part of the image recognition task. But as you can see in Fig. 8, the boundary between the separation of the observation area and the surrounding background becomes sufficiently blurred. This problem would be important if the authors were interested not only in the space occupied by the sample, but also in the direct form of the object. The latter, at this stage of the program implementation, is not significant, since for the determination of the optical properties, in the case of a homogeneous medium, the clarity of the shape of the object under study is not particularly important.

```

37 % Значение интенсивности из диапазона от 0 до 100, преобразуется в диапазон
38 % [0 1] (преобразования выполняются в формате double)
39 % и далее применяются некоторые методы повышения контрастности
40
41 - max_luminosity=120;
42 - L=shadow_lab(:, :, 1)/max_luminosity;
43
44 - shadow_imadjust=shadow_lab;
45 - shadow_imadjust(:, :, 1)=imadjust(L)*max_luminosity;
46 - shadow_imadjust=applycform(shadow_imadjust, lab2srgb);
47 % shadow_histeq=shadow_lab;
48 % shadow_histeq(:, :, 1)=histeq(L)*max_luminosity;
49 % shadow_histeq=applycform(shadow_histeq, lab2srgb);
50 % shadow_adapthisteq=shadow_lab;
51 % shadow_adapthisteq(:, :, 1)=adapthisteq(L)*max_luminosity;
52 % shadow_adapthisteq=applycform(shadow_adapthisteq, lab2srgb);
53
54 - figure, imshow(shadow_imadjust);
55 - title('Imadjust');

```

Fig. 7. Snippet of classic image contrast enhancement application code for MATLAB Numerical Analysis Application Pack

¹ URL : <http://matlab.exponenta.ru/imageprocess/book2/29.php> (accessed 29.05.2019).



Fig. 8. Example of image processing result using standard contrast enhancement features from MATLAB numerical analysis application suite.

After receiving an image that has undergone a contrast enhancement procedure, it is converted to black and white (binary) to facilitate further noise-related processing (see Figure 9).

The next step in the program is a mechanism for detecting and delineating the boundary of the separation of two environments: background and glass. In addition, by presenting the original and processed images in the form of matrices, it is possible to delineate the space of the study area to further determine the values of the optical characteristics of transparent objects (Fig. 10).

```
Input_Image_Gray = rgb2gray(shadow_imadjust);
threshold        = graythresh(Input_Image_Gray);
Black_White      = imbinarize(Input_Image_Gray, threshold);

figure, imshow(Black_White), title('Черно-белое изображение');

% удалим объекты, которые не являются объектами нашего интереса, т.е. шум
% удаление всех объектов, содержащих меньше чем 30 пикселей

Black_White      = bwareaopen(Black_White,10000);

% заполнение пустот

se               = strel('disk', 2);
Black_White      = imclose(Black_White, se);
Black_White      = imfill(Black_White,'holes');

figure, imshow(Black_White), title('Заполненное изображение');
```

Fig. 9. The code snippet of the program responsible for implementing the image conversion to binary and noise elimination.

```
[B_W, L] = bwboundaries(Black_White, 'noholes');

% отображение матрицы точек и числовые грани

figure, imshow(L), title('Полученное пространств изображение в фоне');
hold on

for k=1:length(B_W)
    boundary=B_W(k);
    plot(boundary(:, 2), boundary(:, 1), 'r', 'LineWidth', 1)
end

% создание маскированной маски

Black_White_1 = impaintx(Black_White);

Temp_1 = cat(3, Black_White_1, Black_White_1, Black_White_1);

% наложение маски на исходное изображение

Output_Image = Input_Image;
Output_Image_backward = Input_Image_backward;

Output_Image(Temp_1==0) = 0;
Output_Image_backward(Temp_1==0) = 0;

figure, imshow(Output_Image), title('Исходное изображение с маской');
figure, imshow(Output_Image_backward), title('Исходное изображение фона с маской');

imwrite(Output_Image, 'E:\MATLAB\bin\WORK\1971\1.jpg', 'jpg');
imwrite(Output_Image_backward, 'E:\MATLAB\bin\WORK\1971\2.jpg', 'jpg');
```

Fig. 10. A snippet of the program code that is responsible for identifying the boundary between the background and the study area and the immediate restriction of research area.

Fig. 11 presents the results of the program to identify the boundary of the separation of two media and limit the area of direct study after using algorithms for image enhancement. Although, as you can see, the boundary between the separation of the background and the study area is sufficiently blurred, within the scope of the task to determine the values of the optical characteristics of transparent objects, as common features in identifying trace evidence research in whole, such accuracy was sufficient.



Fig. 11. The results of the program to identify the boundary of the separation of two environments (right) and the limitation of the study area (left).

In more detail, issues related to reducing the error of detection of borders, as well as ways of recognizing transparent objects by their optical characteristics will be discussed in the following works of the authors.

Conclusions. Thus, the paper provides an overview of modern algorithmic circuits of image recognition and image quality improvement by segmentation and contrast correction. The proposed algorithms are implemented in a computer program developed by the authors at the Sumy Research Institute of the Ministry of Internal Affairs of Ukraine on the basis of the mathematical software MATLAB, which allows an automatic comparative analysis of the studied samples based on their digital images. The questions posed to the authors for further development of this topic are outlined.

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М. Ю. Ромбовський, Р. В. Радченко

АВТОМАТИЗАЦІЯ РОЗПІЗНАВАННЯ ОБЛАСТІ ДОСЛІДЖЕННЯ ПРИ СЛАБКО КОНТРАСТНИХ МЕЖАХ НА ЗОБРАЖЕННІ ПРОЗОРИХ ОБ'ЄКТІВ

При створенні систем автоматичного розпізнавання об'єктів виникають проблеми виявлення межі переходу сусідніх областей розділеного простору при слабкій контрастності зображення, що призводить до необхідності проведення додаткової обробки зображення. В роботі проведено огляд сучасних алгоритмічних схем розпізнавання і підвищення якості зображення шляхом сегментації та корекції контрастності. Дані алгоритми реалізовані в розробленій авторами комп'ютерній програмі, яка дозволяє

проводити автоматичний аналіз досліджуваних зразків для подальшого визначення значень оптичних характеристик прозорих об'єктів, як загальних ознак при ідентифікаційних трасологічних дослідженнях цілого по частинах.

Ключеві слова: розпізнавання зображень; ідентифікація трасологічних досліджень цілого по частинах; сегментація; корекція контрастності; градієнт яскравості

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I. L. Shebalkov,
Senior Researcher at the KhRIFE
ORCID: <https://orcid.org/0000-0002-8325-8327>,
E-mail: shebalkov@ukr.net.

SOME ISSUES OF THE EXPERT RESEARCH OF THE ADMINISTRATION OF THE MANAGEMENT DECISION BY THE COMMANDER WHILE MILITARY FORENSIC EXAMINATIONS

Analysis of the participation of military units of the Armed Forces, law enforcement agencies and military formations of Ukraine in the fighting showed that more effective use of the combat capabilities of units and military formations in modern conditions, the decisive value is used as a factor a control. One of the main tasks of managerial activity is decision making. In many spheres of life of any person, whether a Manager at work or the commander (chief) of military unit, the decision-making process is the basis of management activity.

The purpose of this article is a study by theoretical analysis of the procedure for adoption of administrative decisions of the commander (chief) at the court of military forensic examination.

The analysis of scientific works of modern Ukrainian and foreign scientists who were engaged in the study of the theoretical and practical aspects of the process of decision-making has shown that these works contain provisions that are different from each other. For the result of the analysis was reviewed and revealed the contents of the concepts "decision", "management decision", "management activities of the commander (chief)".

It should be noted that the main activity of an officer (chief) at any level is the management activity, which determines the form, content and direction of the entire military team, because the commander's decision is the basis of the process of managing the military team.

It was also revealed the main aspects and factors that affect the decisions of the commander (chief) of military unit with the participation in the fighting. After all, in the course of his professional activity there are tasks that are different in meaning and that are constantly changing over time. Conducted by forensic experts, the content and sequence of the commander's work in the execution of the combat mission provided opportunities for optimization of research methods, in determining the effectiveness of managerial decisions that were made by the commander using the study algorithm. The attention is focused on the existence of a deficit of scientific and methodological support of judicial expertise of the military.

Keywords: decision, management decision, management officer (chief), court of military expertise, military conflict, situational, solution, study algorithm of the decision of the commander (chief).

Formulation of a scientific problem. In modern conditions, management is of decisive importance for the effective use of combat capabilities of military formations in the performance of their combat missions. The actions of the military units will be clearly directed only after they have been assigned specific tasks and indicated appropriate methods of warfare. Participation in the armed conflict of power agencies, military

formations, and the Armed Forces of Ukraine has led to a reduction in the effective use of all capabilities in the performance of combat missions by military units. Lack of coherence and interaction between leaders of military groups, low level of training of commanders led to loss of territorial integrity of Donbass and Crimea.

It should be noted that one of the main tasks of management is the decision-making, which is the basis of management activity in the economic, production, military sphere of human life.

Analysis of recent research and publications. Recent methodological provisions on the problem of decision-making by the manager, including the commander (chief), were considered by modern scientists and covered the following issues: organization of the manager work¹; psychology of the commander's decision²; questions of the psychology of military management³; conditions of development of managerial thinking⁴; formation of the commander's tactical thinking⁵; basics of military management⁶.

The purpose of the article is to investigate some issues of theoretical analysis of the order of management decision making by the commander (chief) during the conduct of military examination.

Presentation of Research Content.

No country in the world does without government, and the basis of management theory is the process of decision-making, that is, the ability to make the decision that is necessary for the implementation of management

¹ Skribitska L. I. Orhanizatsiia pratsi menedzhera [Organization of work of the manager]: navch.posib. Kyiv Tsentr uchbovoi literatury. 2010 [in Ukrainian].

² Rjabchuk V. D. Psihologija reshenija komandira [Psychology of the decision of the commander]. Moskva : Voenizdat, 1976. 206 s [in Russian].

³ Dyv.: Shemchuk V. A. Model rozvytku upravlinskoho myslennia v protsesi viiskovo-profesiinoi diialnosti komandira [Model of development of managerial thinking in the process of military-professional activity of commander]. Kyiv : NUOU, 2010. S. 114–117; Shemchuk V. A. Pedahohichni umovy rozvytku upravlinskoho myslennia maibutnikh mahistriv viiskovoho upravlinnia v systemi pisladiplomnoi osvity [Pedagogical conditions for the development of managerial thinking of future masters of military management in the system of postgraduate education]: dys. kand. ped. nauk: 13.00.04. Kyiv, 2012. 175 s [in Ukrainian].

⁴ Shemchuk V. A. Pedahohichni umovy rozvytku upravlinskoho myslennia maibutnikh mahistriv viiskovoho upravlinnia v systemi pisladiplomnoi osvity [Pedagogical conditions for the development of managerial thinking of future masters of military management in the system of postgraduate education]: dys. kand. ped. nauk: 13.00.04. Kyiv, 2012. 175 s [in Ukrainian].

⁵ Babichev P. N. Revoljucija v voennom dele i formirovanie takticheskogo myshlenija komandirov podrazdelenij (po opytu Suhoputnyh vojsk) [he revolution in military affairs and the formation of tactical thinking of unit commanders (based on the experience of the Ground Forces)]: dis. kand. ped. nauk: 13.00.08. Moskva, 1967. 175 s [in Russian].

⁶ Rolin I. F., Kaverin O. D. Osnovy viiskovoho upravlinnia [Fundamentals of Military Management]: navch. posib. Kharkiv, 2008 [in Ukrainian].

functions. Competent and professional management is manifested primarily in the form of administrative decisions in any sphere of life of the state as a whole, and of any team, including the military.

Scientific works of domestic and foreign scientists, who have studied the theoretical and practical aspects of decision-making processes, contain provisions that differ from each other and do not have a common opinion, but all of them are based on the results of objective studies of management theory and practice. In order to define and clarify the basic concepts of the theory of managerial decision making, which characterize the main points, their complex analysis was conducted.

Thus, according to D. Darlow: “The decision is the point where the choice is made between alternatives and, as a rule, competing opportunities”. However, competing opportunities may be non-systematic and probabilistic.

As A. Dekhtyar notes in his work¹, by decision he understands: “the result of a person's mental activity that leads to any conclusion or to the necessary actions, such as complete inaction, development of any action or choice of action from a set of alternatives and its realization”. Since total inaction and action are part of a set of alternatives, this definition is redundant.

Under the managerial decision A. V. Ignatiev and M. M. Maksymtsov offer to understand “the choice of an alternative by the manager within the limits of his official powers, aimed at achievement of the goals”. In other words, a management decision is a “concentrated expression of the final management process”.

E. A. Smirnov in his work notes that the managerial decision “always has a social character, because the collective of the company implicitly influences the process of its adoption.” When considering a managerial decision in the social aspect, the individual peculiarities of its adoption are lost or reduced, since one of the tasks of the management unit of a manufacturing enterprise includes the maintenance of its life support. Management decision-making can be an individual process, and ensuring the stability of the socio-economic system is only one of the tasks of the management entity.

As A. Kuzmin and O. Melnyk point out, a management decision is the result of economic formalization of economic, technological, social and psychological, administrative methods of management, on the basis of which the management system of the organization directly influences the managed².

¹ Dekhtiar A. Systemnyi pidkhid do pryiniattia derzhavno-upravlinskykh rishen [A systematic approach to public administration decision-making]. Visn. Nats. un-tu vnutr. sprav. 2002. Vyp. 20. S. 192–196 [in Ukrainian].

² Kuzmin O. Ye., Melnyk O. H. Osnovy menedzhmentu [Fundamentals of management]; pidruchnyk. Kyiv : Akademvydav, 2003. 416 s [in Ukrainian].

V. M. Kolpakov¹ notes that «a management decision is a social act prepared on the basis of variant analysis and adopted in the established order of evaluation, which has a decisive value, contains the statement of goals and justification of the means of their implementation, organizes the practical activity of the subjects and management aimed at achieving this goal. " In our view, this definition does not fully reflect the specificity of the term and does not claim universality, because the management decision does not contain the statement of goals and justification of the means to achieve them.

“A creative act of a management entity that defines the program of activities of the team to effectively solve a mature problem based on knowledge of the objective laws of the operation of the managed system and analysis of information about its state” understands under the management decision DB. Judin in his work.

So the scientist N. Podvirna² in his work under the managerial decision proposes to understand the process of developing and implementing a rational solution to a problem or task, or as a fixed legal act (normative or individual).

Modern management and management science identifies two basic methods of making management decisions depending on the subject: individual or individual (decision is made by one person), and group or collective (decisions are made at a general meeting or a separate group of employees).

It should be noted that the main activity of an officer (chief) at any level is management. When considering the activity of an officer (chief) as a military leader, it should be understood that all his activities are primarily aimed at protecting the national interests of the state. According to the law of Ukraine: “... The national interests of Ukraine are vital interests of the individual, society and state, the realization of which ensures the state sovereignty of Ukraine, its progressive democratic development, as well as safe living conditions and well-being of its citizens ...”.

The fulfillment of the tasks of ensuring the national interests of the state creates the form, direction and content of the activity of the military collective, and requires the officer, as a leader, to have the flexibility of thinking and mobility, accuracy and error. At first glance, negligible managerial misconduct may further reduce the unit's combat readiness, material and property losses, or lead to personnel losses.

Based on the tasks facing the Armed Forces of Ukraine and military formations created in accordance with the legislation of Ukraine, the main

¹ Kolpakov V. M. Teorija i praktika prinjatija upravlencheskih reshenij [Theory and practice of managerial decision-making]: ucheb. posob. K. : MAUP, 2000. 256 s [in Russian].

² Podvirna N. Ukrainska natsionalna ideja: realii ta perspektyvy rozvytku [Ukrainian national idea: realities and prospects of development]. Zb. nauk.prats. Natsionalnoho universytetu «Lvivska politehnika MON Ukrainy». 2011. Vyp. 23 [in Ukrainian].

are the preparation for warfare in peacetime and the destruction of the enemy — during the war.

The General Procedure for Making a Management Decision by the Commander (Chief), enshrined in Articles 28 and 30 of the Statute of the Internal Service of Ukraine (hereinafter referred to as Statute)¹: “... Art. 28. Uniformity is one of the principles of construction and leadership of the Armed Forces of Ukraine and is:

- giving the commander all the full authority of the subordinate authority and subjecting him to personal responsibility before the state for all aspects of the life and activities of the military unit, unit and each serviceman;

- giving the commander (chief) the right to make decisions individually, to give orders;

- ensuring the implementation of these decisions (orders), based on a comprehensive assessment of the situation and guided by the requirements of the laws and statutes of the Armed Forces of Ukraine...

Art. 30. The chief has the right to give the subordinate orders and is obliged to check their execution.

The subordinate is obliged to unconditionally obey the orders of the chief, except in cases of issuance of a clearly criminal order, and to treat him with respect ... ”.

Form of submission of the administrative decision of the commander (chief) is fixed in Art. 35 (of the Statute)²: “... The order may be given to one or a group of servicemen orally or in writing, including by means of technical means of communication.

The order must be clearly stated and must not be allowed for double interpretation ... ”.

The Charter clearly states the responsibility of the commander (chief) for the correctness (legality) of making a management decision³: “... Article 36. The commander (chief) is responsible for the order given, its consequences and compliance with the law, as well as for not taking measures to execute it, for abuse, abuse of power or official authority.

The perpetrators are held liable under the law for issuing and executing a clearly criminal order (order)”.

¹ Pro Statut vnutrishnoi sluzhby Zbroinykh Syl Ukrainy [On the Statute of the Internal Service of the Armed Forces of Ukraine]: Zakon Ukrainy vid 24.03.1999 № 22–23. Vidomosti Verkhovnoi Rady Ukrainy. 1999. № 548–XIV [in Ukrainian].

² Pro Statut vnutrishnoi sluzhby Zbroinykh Syl Ukrainy [On the Statute of the Internal Service of the Armed Forces of Ukraine]: Zakon Ukrainy vid 24.03.1999 № 22–23. Vidomosti Verkhovnoi Rady Ukrainy. 1999. № 548–XIV [in Ukrainian].

³ Ibidem.

As I. V. Bogdanyuk noted in his research¹: "... the regularities of the decision-making process and the issue of optimization of the decision are the subject of scientific researches, which are conducted in two directions. The first direction was reflected in decision theory. The second area examines the behavioral aspects of human decision-making and is the subject of psychological decision-making theory ...". Based on the above, the process of managerial decision-making by the commander (chief) is complex and multifaceted. Management decision making by the commander (chief) depends on the tasks facing the military unit, the moral, physical and psychophysiology state, both individual soldiers and the entire unit, their combat training, the state of military equipment and weapons, the ability of personnel to effectively use the tasks assigned. The process of management, that is, the decision-making, puts forward requirements for the personality of the officer (chief), namely his personal qualities (education, experience, his mental abilities, ability to predict and analyze a situation that can change instantly). Also, the officer (chief) in decision making should consider the possible risks (negative consequences due to wrong decisions), as well as the interdependence of the decisions taken, when one decision leads to the necessity of making several equally important decisions.

During research on decision making by the commander (chief) in the framework of the military expertise, it is found that the majority of officers (chiefs), when making any decision, make this majority intuitively, taking into account a considerable number of factors, namely: real conditions, personal experience and knowledge, features of intelligence, information about circumstances. The analysis of the decision-making process by commanders on the basis of the same conditions and elements of the situation makes it possible to state that the decision taken may be different in content.

Performed by I. V. Bohdaniuk researches the content and sequence of work of the commander (staff) in organizing the execution of combat (service-combat) tasks and the conclusions drawn on the basis of this study, give reason to note the following:

1. The decision-making process is one of the most difficult stages in all the management activities of the commander (chief) to organize the execution of combat (service-combat) tasks and relates to mental work.

2. The decision, as the final action plan of the commander to accomplish the task, which determines the order of use of available forces and means in the future battle (actions), is made according to the methodology, which is based on determining the conclusions of the assessment of the elements of the situation.

¹ Bohdaniuk I. V. Sudovo-ekspertne doslidzhennia zmistu pryiniattia rishennia komandyrom taktychnoho rivnia. Teoriia ta praktyka sudovoi ekspertyzy ta kryminalistyky [Forensic expert study of the content of decision making by the tactical level commander]: Zbirnyk naukovykh prats. Vyp.17. 2017 [in Ukrainian].

3. Comparison of the conclusions drawn on individual elements in the process of clarifying the task, assessing the situation and tactical calculations allows you to finally determine the necessary components of the decision and make it.

The above statement, taking into account the peculiarities of the objects of study, enables the expert in conducting a military study of the commander's decision, taking into account the analysis of all established factors and evaluation of the elements of the situation, to conclude on the legality and expediency of the decision by the commander.

It should be noted that in order to improve and improve the methodology of forensic research during the conduct of military research, the KNDIS experts initiated and performed research work on the topic: "Methodology of forensic research of the work of commanders (headquarters) and military formations in the preparation and execution of combat (service-combat) tasks"¹, in which the authors defined the essence of the concept: "... the technique of forensic military examination — a system of methods, techniques and techniques used in a specific and the necessity of studying the objects of forensic military examination for solving expert tasks in order to establish facts pertaining to a subject of a certain kind, type or subspecies of forensic examination... ", as well as certain methods of research were proposed and algorithm of forensic research of work was developed commander (chief) for making management decisions.

According to the proposed algorithm, the solution of the questions posed for the decision of the judicial military expertise on the study of the work of commanders (chiefs) of military formations in the preparation and execution of combat (service-combat) tasks should be organized as follows:

1. Determine how and on the basis of which ordinance combat documents of the unit assigned a combat (service-combat) task, by examining the content of all documents sent by the senior commander (or instructions).

2. Investigate the procedure for finding out (awareness) of the task received by the commander and determine what conclusions he has made.

3. Investigate the order and content of the unit commander after finding out a combat (service-combat) task.

4. Investigate the procedure for the assessment of the situation (it should be borne in mind that the results of the situation assessment commander makes conclusions and outlines individual elements of the decision), paying attention to:

- a) evaluation of the enemy;

¹ Metodyka sudovo-ekspertnoho doslidzhennia roboty komandyriv (shtabiv) i viiskovykh formuvan pry pidhotovtsi i vykonanni boiovykh (sluzhbovo-boiovykh) zavdan [Methods of forensic research of the work of commanders (headquarters) and military formations in the preparation and execution of combat (service-combat) tasks] [in Ukrainian].

- b) an assessment of its units, units and support units;
- c) evaluation of neighbors;
- d) terrain assessment;
- e) taking into account the weather, the time of year, the time of day and their impact on the preparation and conduct of combat (performance of combat mission).

5. To analyze the decision of the commander, which made on the basis of the assessment of the situation and information on his report to the senior commander.

6. To investigate the concept of battle (actions), which is the basis of the decision and depends on the task received, the place of the unit in the battle order of higher formation and is to determine the order and ways of accomplishing the task.

7. Investigate the order of the commander's decision on his work card.

8. Investigate the content of the commander's combat order.

9. Investigate the organization of subordinate unit interaction.

10. Investigate the order of practical work of the commander in subordinate units.

11. Investigate the organization of comprehensive support (intelligence, ammunition replenishment, maintenance, supply of fuel and lubricants, etc.).

12. Investigate management organization.

13. Investigate the order of action of the unit commander in combat.

14. Investigate the procedure for reporting to the senior commander, paying attention to the frequency and content.

15. Investigate (if necessary) the content of immediate reports to the senior commander.

The algorithm of forensic expert study of the work of the commander (chief) on management decision making is offered, scientifically substantiated, its application is scientifically proved and will give confidence to the expert that his conclusion will be true (correctly reflects the true state of affairs) and can serve as evidence in criminal proceedings. At present, this technique is undergoing testing in the KhRIFE forensic practice.

Conclusions. In any sphere of public administration, the decision-making process, i.e. the ability to make decisions, cannot be overestimated. Of particular interest is the role of the commander (chief) in making managerial decisions in the execution of professional tasks to resolve issues of strategic and tactical nature, as well as problem-management situations during the military service. So the decision-making by the commander (chief) is done individually as a result of the choice of options of action from the set of alternatives under the influence of external factors in most cases intuitively. It is the understanding of the course of these processes, during the conduct of judicial military expertise allowing the expert to apply his special knowledge, experience, intuition and creative thinking, using

rational logic and scientific experience, to conduct research on the appropriate decision by the commander (chief) and to determine its correctness.

Considering the current situation in the east of Ukraine and the total number of forensic investigations conducted in the framework of criminal proceedings on war crimes and crimes, the use in the expert activity developed by specialists of Kharkiv Research Institute "Methods of forensic expert study of the work of commanders (staffs) and military formations in the preparation and execution of combat (service-combat) tasks" is timely and helps to increase the reliability of expert opinions. But in view of the nature of offenses and crimes in the military sphere (their variety and number), as well as the lack of a significant number of necessary methodological developments, it is advisable to continue to carry out research work on the development and improvement of scientific and methodological support of expert activity focused on solving forensic military examination.

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I. Л. Шебалков

**ДЕЯКІ ПИТАННЯ ЕКСПЕРТНОГО ДОСЛІДЖЕННЯ ПРИЙНЯТТЯ
УПРАВЛІНСЬКОГО РІШЕННЯ КОМАНДИРОМ (НАЧАЛЬНИКОМ)
ПІД ЧАС ВИКОНАННЯ СУДОВИХ ВІЙСЬКОВИХ ЕКСПЕРТИЗ**

Наведено зміст понять «рішення», «управлінське рішення», «управлінська діяльність командира (начальника)». Розкрито порядок прийняття рішення командиром (начальником). Зазначена можливість судових експертів визначати доцільність рішення, яке прийняте командиром, шляхом застосування алгоритму дослідження. Акцентовано увагу на існування дефіциту науково-методичного забезпечення судових військових експертиз.

Ключові слова: управлінське рішення, управлінська діяльність офіцера (начальника), судова військова експертиза, збройний конфлікт, оцінка обстановки, рішення.

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SCIENTIFIC LIFE STORY

Interdepartmental Scientific Practical Workshop Problematic Issues in Appointing and Conducting Forensic examinations (Kharkiv, 16.01.2019)

Interdepartmental Scientific and Practical Seminar “Problematic Issues of Appointment and Conduct of Forensic Expertise” was held on January 16, 2019 at KhRIFE

The workshop was attended by O. M. Kliuiev, director of Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations, Doctor of Laws, Professor, Honored Lawyer of Ukraine; O. P. Uhrovetskyi, First Deputy Director, Doctor of Law, Docent, Honored Lawyer of Ukraine; E. B. Simakova-Yefremian Deputy Director for Academic Affairs, Doctor of Law, Senior Researcher; O. O. Sviderskyi, Deputy Director, Responsible for Forensic Examinations; V. V. Abroskin, First Deputy Head of the National Police of Ukraine Chief of Criminal Police, Second Rank General of Police ; Head of the Main Directorate of the National Police in Kharkiv Oblast, Third Rank Police General O. V. Bekh; Head of the Criminal Investigation Department of the National Police of Ukraine, Third Rank General Police S. V. Tikhonov; Rector of Kharkiv National University of Internal Affairs, General police officer of the third rank, Doctor of Law, Professor, Honored Lawyer of Ukraine V. V. Sokurenko; the first Vice-rector of Kharkiv National University of Internal Affairs D. V. Shvets; management of the criminal block of bodies and units of the National Police of Ukraine.



The seminar was attended by the heads and staff of the KhRIFE structural units.

Director of KhRIFE, Oleksandr Kliuiev addressed the participants with the opening speech, who emphasized that the effectiveness of the use of special knowledge in the investigation of crimes depends entirely on the level and quality of organizational and methodological support of the interaction between the judicial-expert institution and units of Ukraine. One form of interaction is the conduct of joint scientific and practical activities that enhance the experience of using specialized knowledge to solve the problems of crime prevention, detection and investigation. First Deputy Head of the National Police of Ukraine — Chief of Criminal Police, Second Rank Police General Vyacheslav Abroskin stressed that establishing smooth functioning of mechanisms of interaction of operational units and bodies of pre-trial investigation with specialists of the Ministry of Justice of the Ministry of Justice Ukraine on crime disclosure. In his opinion, this meeting is a unique opportunity to discuss topical issues of interaction, to exchange experience, new experiences, achievements, discoveries, to get acquainted with modern forensic equipment and equipment.

The following issues were addressed during the Interdepartmental Scientific Workshop: *Issues of Appointment and conducting of Forensic Examinations*

- forensic expert support of the National Police of Ukraine by Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations;

- problems of legal regulation of forensic expert activity;

- problems of preparation of materials for the purpose of examination of narcotic and psychotropic substances, their analogs and precursors;

- offenses related to the use of firearms and cold weapons: problems with the appointment and examination of weapons and ammunition;

- explosive technical examination — preparation of materials for its purpose;

- crimes with the use of modern electronic means and the work of experts in this field, etc.

The result of the Interdepartmental Scientific and Practical Seminar “Issues in Appointing and Conducting Forensic Examinations” was recognition of ways of further effective cooperation in intensifying crime eradication work in the state, which was embodied in the study manual “Features of Preparation of Materials for Assigning Forensic Expertise. The manual contains information for employees of operational units, investigative bodies of pre-trial investigation, court, prosecutor office on preparation of materials for the purpose of forensic examination of narcotic drugs, psychotropic substances, their analogues of precursors of substances of chemical manufactures and special chemicals; paints and varnishes; polymeric materials and articles thereof; research of oil products and fuel

and lubricants; objects of plant and animal origin; fibrous materials and articles thereof; alcohol-containing mixtures; explosives; products of explosion and shot; soils; weapons, explosive devices, traces and circumstances of explosion; objects of art history etc.

Introducing new standards of justice, KhRIFE employees are building a new system of bringing their work closer to the needs of law enforcement practitioners in Ukraine. Institute priority is to ensure a high level of coordination of joint actions in the interaction between judicial and expert institutions and representatives of law enforcement agencies. After all, of great importance in the pre-trial investigation of crimes, along with the involvement of experts, consulting them, forensic examination as one of the main forms of use of specialized knowledge in criminal proceedings.

*The information was prepared by Tetiana Filippova,
Researcher of KhRIFE, PhD in Philosophy*

Round table Session: Forensic Science: Present and Future

The Round Table: *Forensic Science: Present and Future* dedicated to the 50th anniversary of the establishment of Lviv Lviv Research Institute of Forensic science of the Ministry of Justice of Ukraine on January 25-26, 2019 was held in Lviv.

More than 100 people took part in the Round Table: representatives of the Ministry of Justice of Ukraine, other state and local self-government bodies, law enforcement agencies, the judiciary, forensic science institutions of the Ministry of Justice of Ukraine, the Ministry of Internal Affairs of Ukraine, Institution of higher educations, other institutions and organizations of Ukraine and countries abroad. KhRIFE was attended by Ella Simakova-Yefremian, Deputy Director for Academic Affairs, Doctor of Laws, Senior Researcher and Vadym Khosha the Head of the Graduate School, PhD in Law.



Greetings to the participants of the round table were addressed by Olena Franyshkovna Kurileva Director of Lviv RIFE, who presented to the participants a presentation-report on the topic: “Lviv RIFE: History and Modernity”, which noted that the formation and development of forensic expert studies in the western region of Ukraine with the functioning of Lviv RIFE. The Institute conducts research, scientific and methodological work, search researches, prepares for publication and introduces into the practice of practice new methods of expert research, methodical recommendations for judicial investigative bodies. It is thanks to the coordinated work of the team and management that the professional level of employees is constantly increasing.

At the meeting, scientists presented reports, discussed the most important issues of forensics, problems and prospects of forensic activities in Ukraine.

During the round table the main achievements in the field of forensic expertise, problems of its development were discussed, ways of their solution were suggested. The international experience of the organization of forensic expert activity is considered. It is determined that in the realities of today are relevant:

- issues of normative-legal regulation of scheduling and conducting forensic examination;
- issues related to the improvement of professional and ethical principles in the system of forensic examination, formation of legal culture of employees.

In the report of E. B. Simakova-Yefremian, Deputy Director for Academic Affairs it was stated that holding a round table was a very important event because it was possible to exchange experiences, opinions on solving urgent issues of forensic science and changes in the legislation. In her speech, E. B. Simakova-Yefremian paid special attention to the Law of Ukraine: *On Forensic Examination* and suggested clarification of some concepts.

V. V. Khosha made a report on the issue of training of high-level scientific specialists in the field of law on the profile of forensic activity, who emphasized that HNDISE is a state institution that belongs to the sphere of administration of the Ministry of Justice of Ukraine and, according to the legislation of Ukraine, forensic, scientific, technical, scientific, organizational and educational activities in the field of forensic, criminalistics and law. It is one of the oldest state judicial and expert institutions of Ukraine. Preparation of scientific staff of higher qualification at the third higher educational qualification level of higher education in the Area of specialization: 081 *Law* is one of the guarantees of qualitative realization of forensic activity in Ukraine.

In addition, written materials were sent to the organizing committee of the round table: O. M. Kliuiev, Director of KhRIFE, Doctor of Law, Professor, Honored Lawyer of Ukraine: *Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations in the socio-cultural space of*

the country and the city; O. P. Uhrovetskyi, First Deputy Director of KhRIFE, Doctor of Law, Docent; O. O. Sviderskyi, Deputy Director, Responsible for Forensic Examinations, PhD in Law: *Directions of Formation of Modern Theoretical Grounds for Forensic Science in Ukraine*; S. H. Hasparian, Senior Researcher: *Features of Legal Culture Formation in Forensic Experts*; L. V. Svyrydova, Head of the Laboratory of Handwriting Analysis, Forensic linguistics, Forensic Psychology and Art Forensics V. G. Abrosimova, Senior Researcher N. V. Syrotenko; I. V. Hubanova, Head of Department of Forensic Economics, Finance and Credit Analysis of Economic Enterprise Activity *Conducting financial and economic expertise of bankruptcy-related enterprises*; S. O. Kozub, Head of the Accounting and Tax Research and Reporting Department: *“Management of a Trading Company Based on Budgeting”*; Deputy Chairman of the Kharkiv Court of Appeal, postgraduate student KhRIFE . graduate student of KhRIFE, D. V. Puchko prosecutor of Kharkiv local prosecutor's office # 2 of Kharkiv region: *On the development of theoretical and legal provisions for general methodological provisions of forensic construction and technical expertise*; O. Yu. Govorova KhRIFE research associate *Determination of the total cost of credit in the study of documents of financial and credit operations*; I. M. Ovsyannikova Senior Researcher of KhRIFE: *Organization of Activity of Forensic Expert Institutions in Ukraine as a Complex System* and others.

According to the results of the Round Table, abstracts of the reports were published in the collection of materials *Forensic Expertise: Present and Future*, which is dedicated to the 50th anniversary of the establishment of the Lviv Scientific Research Institute of Forensic Science of the Ministry of Justice of Ukraine.

*Information was prepared by the Head of Department,
PhD in Law, V. V. Khosha*

Meeting of the Ukrainian Working Group on the Study of Psychoactive Substances in the framework of the EU-EU Action: EU Drugs and Organized Crime Action

The second meeting of the Ukrainian Working Group on Psychoactive Substances Research within the framework of the EU-EU Action Project was held on March 27-28, 2019 at the KhRIFE of the Ministry of Justice of Ukraine.

The project started on the territory of Ukraine on January 30, 2019, when the first meeting of the Working Group on the Kyiv Scientific Research Institute Of Forensic Expertise was held. During the working meeting, a number of important issues were discussed, including plans for organizing the work of the Working Group and the main points of the roadmap, in particular those planned for implementation in the short term. First of all, there is a need to review the legislation on new psychoactive

substances. The overall purpose of the EU-EU Project is to promote the prevention and effective fight against organized crime, including the drug trafficking along the so-called "heroin route".

Combating illicit trafficking in narcotic drugs, psychotropic substances, their analogues and precursors is an important state task. An important role in countermeasures belongs to the state specialized agencies of the ministries and departments to which they belong. One of the levers of influence in the implementation of measures to combat drug crime has become the EU-EU Action Project: Action on Drugs and Organized Crime, Intensive Cooperation and Capacity Building to Combat Organized Crime in the Trafficking of Drug Trafficking Trail.

The project is funded by the European Union.

Customer organization: European Commission, Directorate for International Cooperation and Development.

The beneficiary of the project is the Ministry of Justice of Ukraine, the Ministry of Internal Affairs of Ukraine, the State Fiscal Service of Ukraine, the Security Service of Ukraine, and the State Judicial Administration of Ukraine.

The aim of the Project is to promote the prevention and effective fight against organized crime, including the drug trafficking along the so-called "heroin route" from/to Afghanistan, to more effectively combat organized crime in the drug trade and build trust and networking between them. that will intensify cooperation at interregional and regional levels by:

to assist in the adoption of effective policies and operational measures that are in line with international human rights standards and the rule of law, and are consistent with relevant EU strategies and policies;

creating an enabling environment for enhancing interregional and inter-national cooperation in the fight against organized crime and drug trafficking, while ensuring respect for human rights and the rule of law.

The event was attended by Regional Action Coordinator of the EU — EU Action Project Jose Manuel Kolodras and project experts Dariusz Zuba and Mario Rick.

The Ministry of Justice of Ukraine participated in the work of the Ukrainian Working Group, the Head of the Judicial and Bankruptcy Expert Support Department of the Department of Judicial Work and Bankruptcy, Candidate of Legal Sciences Natalia Tkachenko (Chairman of the Working Group).

The Ministry of Health of Ukraine was represented by Kateryna Kakhanovska and Felix Kakhanovsky. Serhiy Denysenko, Yuriy Filipchuk, Natalia Svistunova joined the event from the Ukrainian Research Institute of Special Engineering and Forensic Services of the Security Service of Ukraine. The State Investigation and Forensic Expert Center of the Ministry of Internal Affairs of Ukraine was represented by Alexey Zavyalov, Alexander Zamoshnets, and Pavel Zeleny. From the Department of Tax and Customs Expertise of the State Fiscal Service of Ukraine – Lyubov Kisilenko.

Oleg Posilsky represented the Kiev Research Institute of Forensic Expertise of the Ministry of Justice of Ukraine. The Center for Mental Health and Drug and Alcohol Monitoring of the Ministry of Health of Ukraine was represented by Sergiy Shum and Victoria Kurylova.



The meeting of the Working Group was attended by the leadership of KhRIFE: Oleksandr Kliuiev, Director of the institute; Oleh Uhrovetskyi, First Deputy Director; Ella Simakova-Yefremian, Deputy Director for Academic Affairs, member of the Ukrainian Working Group, Vasyl Ostropilets, Head Criminalistics Laboratory and Maryna Zarubina – Head of Department of Forensic Chemistry and Physics.

The congratulations were given to the participants of the Ukrainian Working Group by Oleksandr Kliuiev, Director of KhRIFE, Doctor of Law, Professor, Honored Lawyer of Ukraine. In his speech, he stressed that the organization and holding of such meetings is a continuation of the implementation of the EU-EU Action Project. Since the previous meeting of the group, Ukraine has approved a plan of activities for 2019-2020 to implement the State Drug Policy Strategy for the period up to 2020. The plan defines directions and measures for resolving issues related to activation of activities of drug policy subjects in the sphere of combating crime and adoption of legal acts to improve the system of control over the circulation of narcotic drugs, psychotropic substances, their analogues and precursors, prevent their leakage into illicit traffic and at the same time, ensuring the availability of narcotic drugs for patients; actualization of the

fight against organized crime, corruption and drug business; further improve legislation in this area.

Oleksandr Kliuiev noted that the KhRIFE is updating existing and developing the newest methods for research of psychoactive substances. In addition, the Institute, in collaboration with ENFSI members and the United Nations Office on Drugs and Crime, generates information and prepares background materials.

Participants of the Ukrainian Working Group emphasized the importance of coordinating and integrating the efforts of partners, enhancing synergies within specific programs and strategies. Particularly important is the implementation of joint scientific and practical activities that enhance the experience of using specialized knowledge to solve the problems of preventing, detecting and investigating drug-related crimes.

This meeting is a unique opportunity to discuss topical issues of developing synergies and coordination of joint efforts in the fight against drugs and organized crime and to share experiences.

The work of the Ukrainian Working Group on Psychoactive Substances Research within the framework of the *EU-EU Action* project resulted in:

- enhanced knowledge and advanced advancement of best practices in reducing supply and demand for drugs and multilateral issues that meet international human rights standards and are in line with EU strategies and policies;
- strengthening trust and interregional cooperation on drug issues between beneficiary countries and their EU counterparts;
- enhancing the capabilities and operational skills of criminal justice authorities, especially in their ability to conduct criminal investigations based on analytics (intelligence) and evidence, as well as strategic analysis and assessment of threats to organized crime in the field of human trafficking in human trafficking the rule of law.

Following the meeting, the parties agreed on further fruitful cooperation. The second stage of the discussion on drug and organized crime issues within the framework of the *EU-EU Action: EU Drugs and Organized Crime* project took place on 11-12 July 2019 at the National University of Odessa Law Academy, where the Ukrainian Working Meeting was held of the Psychoactive Substance Research Unit (SDG): *Action-EU* project.

At the meeting, full members spoke about the adoption of comments and additions to the draft normative document prepared by SSRFC of the Ministry of Internal Affairs of Ukraine, which provides for the exchange of standard samples. Previously, in the territory of Ukraine, expert institutions from different agencies were not able to communicate directly with sample accounting. Approval of the relevant document will allow the transfer of "standard samples" of controlled substances between all laboratories for testing, joint inter-laboratory exercises or for other scientific purposes. The

participants agreed to submit their comments before the next Working Group meeting.

In general, it should be noted that participation in the meeting is extremely important for the coverage of scientific developments, the implementation of best practices, quality control etc.

KhRIFE specialists systematically improve their skills and participate in international scientific events dedicated to drug research. Cooperation in this area is active in the Working Group on Drugs of the European Network of Judicial Expert Institutions (ENFSI).

*The information was prepared by N. E. Filipenko,
Department Head of the at the KhRIFE,
PhD in Law, Docent*

All-Ukrainian scientific-practical conference: Psychological and pedagogical problems of the professional world and patriotic education of the personnel of the Ministry of Internal Affairs of Ukraine

04/04/2019 Oleh Petrovych Uhrovetskyi, First Deputy Director of Kharkiv Research Institute, Doctor of Law, Docent, Honored Lawyer of Ukraine participated in the All-Ukrainian Scientific and Practical Conference: *Psychological and Pedagogical Problems of Vocational Education and Patriotic Education of the Staff of the Ministry of Internal Affairs of Ukraine* held at the Kharkiv National University of the Interior.

The event was attended by scientists from higher education institutions and scientific institutions of Ukraine.

Rector of KhNUiA, General Police of the third rank, Doctor of Laws, Professor, Honored Lawyer of Ukraine Valery Sokurenko opened the scientific meeting and emphasized the relevance of the topic of the conference. He noted that the conference was due to the urgency of the training of highly qualified law enforcement professionals. Higher educational institutions of the Ministry of Internal Affairs of Ukraine are called upon to provide this level of training. An important role in this process is assigned to providing professional and psychological support and moral and patriotic education of future police officers. Employees of the psychological service should ensure a sufficient level of psychological readiness of law enforcement officers to professional activity and competence in the field of legal psychology in the sphere of interaction with the population said Valery Sokurenko. It is necessary to develop and provide psychological training of different orientation with first-time employees, candidates for management positions and executives, as well as certain categories of employees who are most in contact with the population. During the training period it is necessary to train future specialists in the techniques of controlling emotional states and relieving stress, to form and develop in them the ability to communicate with persons of all ages and social status, to be ready to work with people who have got into difficult or crisis life circumstances. All this necessitates the urgent

need for the organization of national-patriotic training of future police officers during their training, the strengthening of the psychological component in the preparation of cadets for professional activity, the establishment of interaction of law enforcement agencies with family, educational institutions, youth and public.

In his speech, Academician of the National Academy of Legal Sciences of Ukraine, Doctor of Laws, Professor Oleksandr Bandurka emphasized that professional training and patriotic education are two sides of the same coin. Alexander Markovich said: "There can be no professional without patriotic foundations of his activity, as there can be no real patriot who does not have a profession and can do nothing for the benefit of the Motherland" . In his speech, he elaborated on the main aspects of the psychology of a police officer's professional behavior, his professional ethics and tact in the performance of his or her duties, which affect the results of the work and contribute to increasing the authority of law enforcement agencies among the population.

In his greetings to the participants of the conference, Oleg Petrovich Ugrovetsky emphasized that the relevance of the topic of the conference is beyond doubt, since the materials presented for discussion give the opportunity to create on the basis of national and human values a single space that will provide education of a true patriot and professional of the Ministry of Internal Affairs of Ukraine. The issues under consideration will help to develop a sense of patriotism in the staff of the National Police, formation of personality on the basis of spirituality, morality, tolerance, will provide conditions for the intellectual and cultural development of the police officer's personality, which will improve the quality of their professional education. This event will be a good achievement in expanding the spheres of interaction between KhRIFE and Kharkiv National University of Internal Affairs

Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations institution with a high level of carrying out the most complex expert researches and the latest scientific developments, which are of theoretical and practical importance and are essential for ensuring a high level of forensic activity in the state.

The Institute is known not only in Ukraine but also far beyond its borders. Expanding international contacts testifies to its successful activity, high authority. The Institute is a member of the most representative international organization in Europe — the European Network of Judicial and Expert Institutions (ENFSI). The KhRIFE laboratories have received the accreditation certificate for compliance with the requirements of the international standard ISO / IEC 17025 in twelve areas of expert research. Work is continuing to bring the KhRIFE standards in line with the international standard ISO/IEC 17020, which enables law enforcement, judicial and prosecutorial authorities to be assured that other KhRIFE can provide a scientifically sound and competent expertise. Hon. Prof. M. S. Bokarius Kharkiv Research Institute of Forensic Examinations the first

among the specialized institutions of Ukraine received a license for educational activities of the third educational and scientific level of training of doctors of philosophy. Postgraduate and doctoral studies are open at the institute, as well as a specialized Scientific Council for the defense of dissertation works.



We have accumulated a wealth of positive experience of cooperation with KhNUIA in conducting joint scientific-practical conferences, seminars, round tables. Such cooperation between Kharkiv National University of Internal Affairs and KhRIFE will provide an opportunity to stabilize the criminal situation and increase the level of crime detection.

Conference will be a good achievement in expanding the spheres of interaction between KhRIFE and Kharkiv National University of Internal Affairs.

Among the main measures of interaction are the celebrations to mark the memorial board of M. S. Bokarius at the house where his family lived; Interdepartmental Scientific and Practical Seminar “Issues of Assigning and Conducting forensic examinations”, etc. In addition, at the invitation of KhRIFE management, the staff of KhRIFE conducts trainings with employees of the leadership of the criminal block of bodies and units of the National Police of Ukraine within the framework of short-term training courses. Joint binary sessions are held on topical issues of crime detection and investigation (traffic accidents; drug and psychotropic drug trafficking; weapons and explosives; crimes committed using modern electronic means, etc.).

As a result of the conference, a collection of abstracts was published, which covered topical issues of vocational education and patriotic education of the personnel of the Ministry of Internal Affairs of Ukraine.

*Information was prepared by A. S. Tiapkin,
Senior Researcher of KhRIFE*

III International Scientific and Practical Conference: Public Administration in the Conditions of Change and Transformation: Problems of Organization and Legal Support.(4/11/2019)

On April 11, 2019, scientists of Kharkiv Research Institute participated in the III International Scientific Practical Conference *Public Administration in the Conditions of Change and Transformation: Problems of Organization and Legal Support* organized by the Yaroslav Mudryi

National Law University. The reports for the conference were prepared by O. V. Agapova, O. V. Sharapova, O. V. Sevidov, A. O. Kazarov and I. M. Ovsyannikov and others.

Teachers, PhD students, representatives of scientific institutions, executive and local self-government bodies, judicial authorities and foreign experts from the Belarusian State University, the Belarusian State Economic University (Minsk, Belarus) and the Mykolas Romeris University were invited to participate in the event. (Vilnius, Lithuania). This year the conference brought together 186 participants.

The international scientific-practical conference is dedicated to the discussion of a wide range of issues related to the current stage of public administration development and its perspectives: administrative law as the legal basis of public administration; administrative reform and problems of development of public administration; legal regulation of public service; administrative procedure and administrative services; development of e-governance; public administration in various administrative and political fields, etc.

The event was opened by the first Vice-Rector of the University, Doctor of Laws, Professor, Academician of the National Academy of Law Sciences of Ukraine Yu. P. Bytyak, who stressed that under the current conditions, improving the efficiency of public administration becomes a prerequisite for maintaining competitiveness and ensuring the stability of the state. The growing importance of public administration is recognized by science and confirmed by the practice of many states. The task is to rethink public administration reforms from the point of view of further improving democracy and the rule of law.

V. M. Garashchuk, Doctor of Laws, Professor, Head of the Department of Administrative Law of the Yaroslav Yaroslav Mudryi National Law University; N. P. Matyukhin Doctor of Law, Professor, Department of Administrative Law, National Law University; R. S. Melnyk Head of the Department of Administrative Law, Taras Shevchenko National University of Kyiv, Doctor of Laws, Professor; Doctor of Laws, Professor of Kyiv National Taras Shevchenko University A. S. Pronevych and other scientists.

The abstracts of the reports of the KHRIFE scholars were reflected in the conference proceedings. In particular, a researcher of the department of postgraduate studies, Candidate of Law, O.V. Agapova, prepared a report on the topic "Interconnectedness of administrative law and public administration". She noted that administrative law is an important component of public administration. At the same time, the activities of public administration entities, their powers and competences are implemented within the range of norms established by administrative legislation. Such an organic connection creates a legal basis for public administration entities to act in the *public interest* for the sake of achieving the *common good*.

The joint report of O. V. Sharapova, Leading Researcher of KhRIFE, PhD in Technology and O. V. Sevidov, Researcher on the topic: *Problems of administrative and legal regulation of electronic document circulation in institutions and organizations of Ukraine* outlines the main problems of regulation of electronic document circulation, issues of preservation and protection of official texts of regulations, electronic securities (stocks, bonds, etc.) that are issued. Despite the problems of the legislative nature of the introduction of electronic document flow, such document flow has a number of undeniable advantages over paper.



Post-graduate student KhNDISE, Senior Researcher AO Kazarov prepared a report on the topic *Forensic Activities in Administrative Offenses Related to Road Traffic Accidents as an Object of Administrative and Legal Regulation*. The report noted that conducting an independent, objective forensic auto-technical examination of this category of cases is quite common, and therefore the consideration of the peculiarities of the use of specialized knowledge is becoming more relevant.

Graduate student, Senior Researcher I. M. Ovsyannikov prepared a report on the topic *Social Audit of Forensic Expertise in Ukraine*, which emphasized that in Ukraine the Institute of Public Audit has not yet received its active implementation. In view of this, the lack of theoretical and methodological foundations for the strategy of its formation, implementation and development adversely affects the functioning of democratic foundations of both public and public administration and financial control. Accordingly, there is no clear methodology for conducting a social audit of forensic activities in Ukraine.

According to the results of the conference, a collection of scientific papers *Public administration in the conditions of changes and transformations: problems of organization and legal support* was prepared, materials of which reflect the scientific interests, assets and research of the participants of the conference.

*Information was prepared by the Head of Department,
PhD in Law, O. V. Agapova*

International Scientific and Practical Conference: Topical Issues of Forensic Science and Criminalistics » dedicated to the 150th anniversary of Mykola Serhiyovych Bokarius, Honored Professor



International Scientific and Practical Conference: *Topical Issues of Forensic Science and Criminalistics* » dedicated to the 150th anniversary of Mykola Serhiyovych Bokarius Honored Professor was held at KhRIFE on April 18-19, 2019.

The purpose of the conference is to highlight the scientific heritage of M. S. Bokarius, Honored Professor; its impact on the formation and development of forensic expertise in Ukraine, as well as the study of problems of scientific and methodological and information support of forensic activities, tasks and trends of forensics at the current stage of development of our country.

The conference was attended by more than 150 people, including representatives of the Ministry of Justice of Ukraine, state authorities, local

self-government, judicial and expert institutions, law enforcement agencies, higher education institutions, scientific institutions, foreign guests, etc. In total, more than 210 reports and scientific reports were received at the conference.

The topics of the conference covered the following areas: history, theory and methodology of forensics; legislative support of forensic activities in Ukraine; current methods and technologies of forensic examination; expert didactics — prospects for development; international experience and prospects for the development of forensic expertise in Ukraine and abroad; problems of reforming forensic activity in Ukraine; ways of development and improvement of science and education in the field of forensic science etc.

During the conference, celebrations were held to mark the monument to a prominent domestic scientist, forensic expert Mykola Serhiyovych Bokarius. The celebrations were attended by descendants of the famous family — his grandson — Serhii Vitaliiyovych Bokarius with his son Mykola Serhiyovych Bokarius.

Oleksandr Mykolaiovych Kliuiev, Director of the Institute, Doctor of Law, Professor, Honored Lawyer of Ukraine addressed the conference with the opening address and emphasized importance of honoring the memory of the founder of the Institute – M. S. Bokarius.

O. M. Kliuiev stressed that the history of forensic expertise in Ukraine, especially the history of Hon. Prof. M. S. Bokarius is inalienable on behalf of M. S. Bokarius, a person who has undoubtedly become one of the most prominent figures of the Ukrainian forensic science community and criminologists of the late nineteenth and early twentieth centuries, founder, organizer, and permanent leader of the institute. In the year of celebrating his anniversary, we summarize the years that have passed, noting the successes achieved by the professors in the development of forensic science and criminalistics.

The Institute has a unique intellectual and scientific and technical potential. With its dedicated work, professionalism and innovative approach to carrying out scientific works and judicial examinations, the staff of the Institute raises the level of forensic activity of the state. Knowledge, experience and high professional qualities of scientists — forensic experts and specialists made it possible to effectively modernize the domestic judicial and expert system and bring Ukrainian expertise to the world level.

It is during these events that there is an opportunity to exchange views on a wide range of complex and multifaceted problems of forensic theory and practice, and to consider ways to solve them. Scientific reports and discussions during the conference allow the participants to share their experience and make significant progress in finding the best ways of solving forensic and forensic issues and will increase the rating of forensic institutions in Ukraine and in the world.

The organizing committee received the materials of the report, which is included in the collection of conference materials, the specific weight of

which is the work of the KhRIFE scientists. Director of the Institute, Doctor of Laws, Honored Lawyer of Ukraine **O. M. Kliuiev** in his speech considered *Problems of professional level development of employees of judicial and expert institutions of the Ministry of Justice of Ukraine*. Deputy Director for Scientific Work, Doctor of Laws, Senior Researcher, **E. B. Simakova-Yefremian** considered *Amendments to the By-Laws on Judicial Expertise and Their Relationship with the Laws*. Deputy Director, Responsible for Forensic Examinations, PhD in Law, **O. O. Sviderskyi** outlined *Ways to Overcome Issues During Forensic Examination* (Based on the Summary of Expert Practice). Senior Researcher **S. H. Hasparian** dedicated her report *On the Issue of Forming the Skills of a Forensic Expert During His Preparation*. Scientific Secretary, Senior Researcher, PhD in Biology **L. M. Derecha** and Leading Researcher, PhD in Biology. **T. E. Balinyan** reported on the results of a complex study of biological damage to fibrous structure materials by scanning electron microscopy. Head of the Laboratory, Doctor of Law, Associate Professor **H. O. Spitsina** and PhD in Philology, Associate Professor **S. O. Belevtsova** conducted an analysis of the formation of the newest paradigm of the theory and practice of forensic expertise in Ukraine. The Head of the Laboratory, PhD in Law, **Vasyl Ostropilets** considered the theoretical and applied problems of improving the legal regulation of forensic examinations. Head of the Laboratory, PhD in Law **L. V. Svyrydova** reported on the results of generalizing the expert practice of conducting linguistic expertise on threat texts. Head of the Laboratory, PhD in Law **A. V. Lubentsov** and Head of the Sector **V. O. Varlahov** devoted their report to the issue of involvement in the criminal proceedings of specialists in the field of motor vehicles during the conduct of investigative experiments. Head of the Laboratory, Candidate of Law **I. V. Bohdaniuk** and forensic expert **R. E. Miroshnichenko** considered some methodological approaches in the expert study of exceeding of the maximum permissible discharges of pollutants into the water body. Researcher **O. V. Manulenko**, Head of the Laboratory, PhD in Law Mykhalskyi and Senior Researcher **O. S. Dontsova** conducted research on the problem of assessing pets during forensic examinations. The chief researcher, Doctor of Law, Docent **E. M. Popovich** and PhD in Law, **S. A. Andrenko** considered some issues of intensification of forensic activity. The Head of the Graduate School, PhD in Law **V. V. Khosha** considered some aspects of improving the legal regulation of forensic activities. The Head of Sumy Branch of KhRIFE S. M. Naumenko in his report touched upon the competence of experts as a subject of interaction with law enforcement agencies. Grandson of M. S. Bokarius S. V Bokarius and PhD in Law, Docent Leading Researcher **N. E. Filipenko** dedicated the performance of the person of Vitaliy Bokarius — the famous continuer of the great dynasty. Chief researcher, Doctor of Laws, Professor **I. A. Petrova** and Senior Researcher **A. V. Bublikov** addressed the issue of the effectiveness of scientific research in the field of forensic science.

In general, even the outline of the topics presented at the conference does not reveal the multifaceted nature of the issues raised during its work.

Within the framework of the plenary session, the presentation of the scientific edition *Dedicated to the 150th Anniversary of M. S. Bokarius, Honored Professor* was held. Based on the materials received at the conference, a collection of scientific theses and reports was published and the resolution of the conference was adopted. The resolution of the conference was brought to the attention of the staff of judicial and expert institutions, scientific organizations and institutes in order to continue discussing the developed issues in the format of a dialogue for joint resolution of these and other important tasks of forensic expertise and forensic science.

*Information was prepared by L. M. Derecha,
Academic Secretary
of KhRIFE, PhD in Biology*

Authors

Last, first and middle names	Job position
V. G. Abrosymova	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: abrosymova@gmail.com
O. V. Agapova	PhD in Law, Department Head at KhRIFE, Kharkiv, Ukraine, e-mail: : agapova-lena-@ukr.net
Ye. S. Alexeieva	PhD in Law, Docent, Leading Researcher of Scientific and Research Laboratory for Innovations in the Field of Civil Security of Cherkasy Institute of Fire Safety named after Chernobyl Heroes of National University of Civil Defense of Ukraine, E-mail: Alekseeva@ukr.net
V. V. Balanovskyi	Head of the Forensic Expertise Department of Victims, Accused and Other Persons of Kharkiv Regional Bureau of Forensic Expertise, Email: sme_khnmu@email.ua
A. V. Batig	Senior Researcher of Railway Research Laboratory, at Lviv RIFE, Master Email: batigasha1992@gmail.com
I. V. Bohdaniuk	PhD in Law, Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: bogdanyuk.hniise@gmail.com
O. V. Bublyk	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: olexbublyk@ukr.net
O. D. Bui	PhD in Law, Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: b.olga.d.75@gmail.com
O. Yu. Bululukov	PhD in Law, Associate Professor at the Department of Criminalistics of Yaroslav Mudryi National Law University, E-mail: : oblehrer@gmail.com
V. O. Varlakhov	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: 19varlahov84@gmail.com

D. I. Gaydamakina	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: dianagayd@yahoo.com
O. A. Herasimenko	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: olga_gerasi993@ukr.net
I. V. Hubanova	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: irinarybalchenko1999@gmail.com
V. M. Hubareva	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: victoriy2006@ukr.net
M. V. Hubin,	PhD in Medicine, Docent, Associate professor associate professor of the Department of Forensic Medicine, medical law named after prof. M.S. Bocarius, E-mail: n-gubin@ukr.net
R. N. Huseinov	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: huseinov_ruslan@ukr.net
K. M. Danshina	Senior Researcher at KhRIFE, Kharkiv, Ukraine
L. M. Derecha	L. M. Derecha, Academic Secretary at KhRIFE, PhD in Biology, Senior Researcher Kharkiv, Ukraine, E-mail: derecha@hniise.gov.ua
O. S. Dontsova	Senior Forensic Expert, Kharkiv, Ukraine, E-mail: olgadoncovan@ukr.net
O. S. Drobysheva	Senior researcher of KhRIFE, Kharkiv, Ukraine, E-mail: 13335789@ukr.net
V. V. Yehorov	PhD in Medicine, Psychiatrist at the Poltava Regional Clinical Psychiatric Hospital named after A. F. Maltsev, Poltava, Ukraine Email: tet- egorova@meta.ua
T. M. Yehorova	Department Head at KhRIFE, Kharkiv, Ukraine E-mail: tet-egorova@meta.ua
G. I. Yelagin,	PhD in Chemistry, Senior Researcher, Engineer of Scientific and Research

- Laboratory for Innovations in the Field of Civil Security of Cherkasy Institute of Fire Safety named after Chernobyl Heroes of National University of Civil Defense of Ukraine Email: gyelagin@ukr.net
- V. A. Zhuravel Doctor of Law, Professor, Academician of the National Academy of Legal Sciences of Ukraine Chief Academic Secretary of the National Academy of Legal Sciences of Ukraine, Kharkiv, Ukraine E-mail: zhur.crim@gmail.com
- M. V. Zarubina Head of the Department of Forensic Chemistry and Physics at KhRIFE Kharkiv, Ukraine, e-mail: 17171785@ukr.net
- O. S. Ziubrii Senior Forensic Expert of Kharkov SSRFC of the Ministry of Internal Affairs of Ukraine Kharkiv, Ukraine, E-mail: sonya.zuybrij@gmail.com
- P. A. Kaplunovskyi PhD in Medicine, Docent, Associate professor associate professor of the Department of Forensic Medicine, medical law named after prof. M. S. Bocarius, E-mail: petrkaplunovskiy@gmail.com
- P. V. Karnozhytskiy PhD in Law, Senior Researcher, Associate Professor at the Department of National Technical University Kharkiv Polytechnic Institute, e-mail: lab.vtii@gmail.com
- S. O. Kiriakov Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: sergey_kiryakov@ukr.net
- A. F. Klimchuk Senior researcher of KhRIFE, Kharkiv, Ukraine, E-mail: klimchuk.alla1965@gmail.com
- O. M. Kliuiev, Doctor of Law, Professor, Honored Lawyer of Ukraine, Director of KhRIFE, Kharkiv, Ukraine, E-mail: hniise@hniise.gov.ua
- S. O. Kozub Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: skozub78@ukr.net

- N. N. Kosmyna, PhD in Law, Senior Researcher, Head of the department of research of materials, substances and products of Kharkiv SSRFC of MIA of Ukraine
- V. K. Kostenko Doctor of Technology, Professor, Head of Department of Environmental Protection at the Donetsk National Technical University (Pokrovsk), E-mail: vk.kostenko@gmail.com
- M. O. Krayuk Head of Sector, Odessa Research Institute of Forensic Expertise, MJ of Ukraine, E-mail: m-kraluk@ukr.net
- A. A. Krupka PhD in Technology, Leading Forensic Expert of Odessa Scientific Research Institute of Judicial Expertise of the Ministry of Justice of Ukraine, E-mail: krupka666@gmail.com
- A. Ya. Kuzyshyn Researcher, at Lviv Research Institute of Forensic Examinations, Master, E-mail: kuzyshyn1993@gmail.com
- D. V. Kurylenko, PhD in Law, Prosecutor at the Kharkiv Local Prosecutor's Office №1, Kharkiv, Ukraine, E-mail: kurilenkodima89@gmail.com
- A. V. Lubentsov PhD in Law, Head of the Laboratory of KhRIFE, Kharkiv, Ukraine, E-mail: Lubencov_av@ukr.net
- Kh. V. Lutsenko, Researcher at KhRIFE Kharkiv, Ukraine, E-mail: about-work@ukr.net
- O. O. Meshkov Researcher at KhRIFE. Kharkiv, Ukraine, E-mail: meshkov@hniise.gov.ua
- O. O. Mykhalskyi PhD in Law, Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: mix3103@ukr.net
- M. L. Mikheieva Head of the laboratory of the KVD Donetsk NDYSE Ukraine, E-mail: mary.mikheeva@ukr.net
- O. I Mikheieva Forensic Expert of Donetsk NDYSE, Sloviansk, Ukraine, E-mail: mary.mikheeva@ukr.net
- K. G. Mkhitaryan Head of Forensic Medical Expertises Department, National Bureau of Expertise, National Academy of Sciences, Yerevan,

- Republic of Armenia Email:
mkhitaryan.k@inbox.ru
- V. V. Nakonetcnyi Docent, Engineer of Labor safety at the
Cherkasy Institute of Fire Safety named after
Chornobyl Heroes of National University of
Civil Defense of Ukraine Email:
valnakon@gmail.com
- L. V. Nardid Senior Researcher of the Department of
Forensic Chemistry and Physics of
Criminalistics Laboratory at KhRIFE,
Kharkiv, Ukraine, E-mail: E-mail:
nardidlily@gmail.com
- E. V. Nimande Doctor of Law, Associate Professor at the
Department of the Department of Criminal
and Legal Sciences of the University of Latvia
- K. V. Nikulin Researcher at KhRIFE. Kharkiv, Ukraine, E-
mail: knikulin87@gmail.com
- R. A. Hovhannesyan Doctor of Medicine, Professor, Head of the
Department of Biomedicine, Yerevan State
University, Yerevan, Republic of Armenia
Email: hovrouben@googlemail.com
- A. N. Ovsepyan, PhD in Medicine, Docent, Director of the
National Bureau of Expertise, National
Academy of Sciences, Yerevan, Republic of
Armenia, Email:
argam.hovsepyan@gmail.com
- V. O. Olkhovskyi PhD in Medicine, Professor, Associate
professor associate professor of the
Department of Forensic Medicine, medical
law named after prof.
M. S. Bocarius, E-mail:
prof_olkhovskyi@ukr.net
- Yu. V. Panchuk Researcher at KhRIFE, Kharkiv, Ukraine, E-
mail: expert.ryndina31071988@gmail.com
- I. V. Parfylo Postgraduate Student at the Department of
Criminalistics at Yaroslav Mudryi National
Law University, Kharkiv, Ukraine, E-mail: :
parfilo.igor@gmail.com
- O. M. Pashkova Forensic Expert of the Department of Forensic
Chemistry and Physics of Criminalistics
Laboratory at the KhRIFE, Kharkiv, Ukraine,

	e-mail: lab.vtii@gmail.com
I. A. Petrova	Principal Researcher at KhRIFE, Kharkiv, Ukraine, E-mail: ekobezpeka.ira@gmail.com
I. V. Parfylo	Head of Kherson Branch of Odessa Scientific Research Institute of Judicial Expertise of the Ministry of Justice of Ukraine, E-mail: ipeskov64@gmail.com
Ye. M. Popovich	Doctor of Law, Docent, Honored Lawyer of Ukraine, Principal Researcher at the KhRIFE, E-mail: E.Popovich@i.ua
R. V. Radchenko	Director of the Sumy Research Expert Forensic Center of the Ministry of Internal Affairs of Ukraine, Sumy, Ukraine; E-mail: expertrrv@ukr.net
A. I. Ripenko	PhD in Law, Director of Odessa Research Institute of Forensic Science of the Ministry of Science of Ukraine
S. V. Rohalin	Researcher at KhRIFE, Kharkiv, Ukraine, E-mail: rohalin@i.ua
M. Yu. Rombovsky	PhD in Mathematics, Forensic Expert at the Sumy Scientific Research Forensic Center of MIA of Ukraine Email: rombovsky_m@ukr.net
V. A. Rudniev	Leading Researcher of KhRIFE, PhD in Chemistry Kharkiv, Ukraine, E-mail: vasiliiy.rudniev@gmail.com
K. E. Rudnieva	Forensic Expert of the Department of Forensic Chemistry and Physics of Criminalistics Laboratory at the KhRIFE, Kharkiv, Ukraine, E-mail: rudneva770@ukr.net
I. M. Ryabinin	Principal Forensic Expert of SRFC of MIA of Ukraine Ukraine. E-mail: inryabinin@ukr.net
I. V. Sabadash,	PhD in Law, Senior Researcher at KhRiFE, Kharkiv, Ukraine, E-mail: saba-inna@ukr.net
T. V. Savkina	Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: tsavkina55@gmail.com
L. V. Svirydova	PhD in Law, Laboratory Head at KhRIFE, Kharkiv, Ukraine, E-mail: ludmila.sviridova@hniise.gov.ua

- V. S. Sezonov PhD in Law, Senior Forensic Expert at Kharkiv SRFC of MIA of Ukraine, Kharkiv, Ukraine, E-mail: sv26031985@gmail.com
- O. V. Sydorenko Forensic Expert of Kharkiv SRFC of the MIA of Ukraine, Kharkiv, Ukraine, E-mail: Novitskaya/elena88@gmail.com
- N. V. Syrotenko Senior Researcher of KhRIFE, Kharkiv, Ukraine, E-mail: shunya1964@gmail.com
- A. A. Sych Researcher at KhRIFE, Kharkiv, Ukraine, E-mail: anna82017@ukr.net
- E. B. Simakova-Yefremian Doctor of Law, Senior Researcher, Deputy Director for Academic Affairs at the KhRIFE, E-mail: simakova@hniise.gov.ua
- V. K. Slovinskyi PhD in Technology, EOD Forensic scientist at the Cherkasy SRFC of the MIA of Ukraine
- V. S. Suprun V. S. Suprun, Researcher at the KhRIFE, Ukraine, E-mail: valeriy.suprun@hniise.gov.ua
- V. N. Terehovich Doctor of Law, Docent, Advocate of the Latvian Collegium of Sworn Advocates
- V. I. Fenenko, PhD in Technology, Associate Professor at the Department of Automotive Roads of the Geodesy and Land Management of Pridniprovskoya Academies of the Budva and Architects, Forensic Expert of Dnipropetrovsk RIFE dniprondise@ukr.net
- T. A. Filonenko Forensic Expert at KhRIFE Kharkiv, Ukraine, E-mail: E-mail: limbo5@ukr.net
- D. I. Fokin Senior Forensic Expert, Kharkiv, Ukraine, E-mail: den4ikfox507@ukr.net
- T. H. Kharina Researcher at the KhRIFE, Ukraine, E-mail: larinatiana111@gmail.com
- V. V. Khosha PhD in Law, Department Head at KhRIFE, Kharkiv, Ukraine, E-mail: khosha@hniise.gov.ua
- V. F. Chernyuk Researcher at the KhRIFE, Ukraine, E-mail: Vcernuk81@gmail.com
- I. L. Shebalkov Senior Researcher at KhRIFE, Kharkiv,

- Ukraine,
E-mail: shebalkov@ukr.net.
- V. M. Shechuk PhD in Law, Associate Professor at the Department of Criminalistics of Yaroslav Mudryi National Law University, E-mail: : Shevchuk_viktor@ukr.net
- V. Yu. Shepitko Doctor of Law, Professor, Academician of National Academy of Legal Sciences of Ukraine, Head of the Department of Criminalistics at the Yaroslav Mudryi National Law University, Kharkiv, Ukraine, E-mail: kafkrim1@gmail.com
- M. V. Shepitko Doctor of Law, Associate Professor at the Department of Criminal Law Yaroslav Mudryi National Law University, Senior Researcher, Kharkiv, Ukraine, E-mail: shepitko.michael@gmail.com
- M. G. Shcherbakovskiy Doctor of Law, Associate Professor, Head of the Department of Criminal Procedure, Forensic Science and Expertology, Kharkiv National University of Internal Affairs, Kharkiv, Ukraine Email: shcherbakovskiy@gmail.com
- E. I. Urets Head of the Department at the Dnipropetrovsk Research Institute of Forensic Expertise, E-mail: panikaxi@ukr.net
- Yu. I. Yaremko доктор економічних наук, доцент, професор кафедри Херсонського державного аграрного університету, судовий експерт Херсонського відділення Одеського НДІ судових експертиз МЮ України, E-mail: pivden-zemlja@ukr.net
- I. V. Yatsenko Doctor of Veterinary Medicine, Leading Forensic Expert at KhRIFE, Kharkiv, Ukraine, E-mail: yacenko-1971@ukr.net

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REQUIREMENTS FOR CONTENT

scientific, theoretical and practical content regarding coverage of criminalistics modern problems, actual issues of performing various types of forensic examinations and special knowledge application in legal proceedings are published on the pages of Scientific Journal.

Scientific style of the material presentation (accuracy, logic, conciseness, clarity, connectivity, integrity, completeness) and its high scientific level.

Structural elements should include:

a) **Formulation of Research Problem**, its connection with with scientific and practical interests (it is necessary to reveal essence and state of the scientific problem in general terms, theoretical, practical significance of a research in connection with scientific and practical tasks, substantiation of the research relevance);

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1.4. Scientific novelty of research results should be characterized by the following features: rationality, validity, authenticity, logical non-contradiction, compliance with fundamental scientific principles.

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Total scope of a scientific article (information about the author, article title, abstract, keywords, article text, subordinate bibliographic references, extended resume, References: list of used sources) should be 10-20 pages.

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Article is submitted for publication in Ukrainian or in English.

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academic degree, academic rank;

institutional affiliation;

*ORCID: http://orcid.org/****-****-****-****,*

E-mail: _____@_____;
 Second Author full name
academic degree, academic rank;
institutional affiliation;
*ORCID: http://orcid.org/****_****_****_****,*
E-mail: _____@_____.
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 First Author full name,
academic degree, academic rank;
institutional affiliation;
*ORCID: http://orcid.org/****_****_****_****,*
E-mail: _____@_____;
 Second Author full name
academic degree, academic rank;
institutional affiliation;
*ORCID: http://orcid.org/****_****_****_****,*
E-mail: _____@_____.

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Bytiak, Yu.P. (2005). *Derzhavna sluzhba v Ukraini: orhanizatsiino-pravovi zasady*. Kharkiv: Pravo [in Ukrainian].

Bibliographic description rules for References:

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Films (DVDs, video files)

Producer A. A. (Producer A) Director, B. B. (Director). (Year). Film title [File format].

Production Country: Studio.

Video, online (video streaming)

Publication Name. [File format]. (Publish Date). URL: <http://>

Video, Internet (YouTube)

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Music

Composer A. A. (Copyright year). Composition title [Recorded by B. B. Performer, if he/she is different from Composer]. According to Album title

[Record: CD, cassette, etc]. Release city: Studio. (Record date if it is different from song authorship date).

TV serial, episode

Director B. W. (Scriptwriter), & Director, D. D. (Director). (Release Date). Episode name [TV serial episode]. (Producer) Part title. Production city, Production country: Studio or distributor.

Broadcasting

TV presenter name. (Broadcasting date). Broadcasting Production city, Production country: Studio or distributor.

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Painter (canvas date creation). Title [genre]. Production city, Production country: Museum

Map, diagram, drawing, table, chart

Author, A. Name [Format]. Zoom. Publication city: Publisher.

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