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In the jubilee, thirtieth edition of the Research Paper Collection, current materials on criminalistics, theories and methods of forensic examination, works on the problems of various classes, genera, types and subtypes of forensic examinations are presented, as well as information about the International Scientific and Practical Conference.

Our authors are representatives of forensic expert institutions, institutions of higher education, law enforcement agencies of Ukraine and foreign countries.

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Contents

Theory and Practice
of Forensic Science and Criminalistics

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Modern Achievements of Forensic Expert Industry in Ukraine

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Forensic industry in Ukraine is constantly developing, despite stormy challenges of our time. Ukrainian statehood has been courageously resisting ruscist invaders for more than a year, civilians strongly support the Armed Forces of Ukraine and hold economic, scientific, educational, cultural and other fronts. Not just keep, but develop all field of life for post-war reconstruction of Ukraine. Despite the martial law, recently forensic industry of Ukraine has been marked by a number of new achievements that improve quality and increase efficiency of forensic expert researches.

In the scientific world, any innovation or exploration, any research or development, any experiment or test should first be tested at theoretical stage, offering colleagues relevant presentations and publications, speeches at conferences, symposia, Round Tables and other similar events. Research Paper Collection: *Theory and Practice of Forensic Science and Criminalistics* is a traditional platform for raising modern theoretical and applied issues of criminalistics, various types of forensic science, application of specific expertise in legal proceedings, issues of legal education and training of forensic experts, a platform known in legal environment for checking the latest developments, modern concepts, innovative scientific ideas and the most daring projects.

This article is translation of the original Ukrainian content, which source is available at the link: *https://khrife-journal.org/index.php/journal* (translated by Andriy Bublikov). The author acknowledges translation as corresponding to the original.

It is worth noting that the 30th issue of the collection also marks the 100th anniversary of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute», founded in 1923 as the Cabinet of forensic science under leadership of Mykola Serhiyovych Bokarius. On the initiative of M. S. Bokarius in 1925, the Cabinet was reorganized into the Institute of forensic science, that he invariably headed during 1925—1931. The purpose of creating such cabinets is formulated very briefly: *"For conducting various kinds of scientific and technical experiments in legal cases"* [1].

After his death, the Kharkiv Institute of Scientific Forensic Expertise was named after M. S. Bokarius (nowadays: *National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute»,* later: *NSC «Hon. Prof. M. S. Bokarius FSI»*) which all the employees of the Center are proud of to this day.

NSC «Hon. Prof. M. S. Bokarius FSI» has become a center of scientific research development in the field of forensic expertology in Ukraine, its employees actively apply modern techniques and technologies, use the latest methods and techniques and exchange experience with foreign scientists and forensic science institutions.

One of the examples of fruitful cooperation with foreign colleagues was recent cooperation with representatives of *Panacea Cooperative Research* (Spain) regarding possibilities of use software for identification of a person using *Skeleton•ID* (craniofacial overlay, face comparison, biological profiling and comparative radiography) by employees of NSC «Hon. Prof. M. S. Bokarius FSI». The *Skeleton•ID* forensic identification software is actively used by law enforcement and government agencies around the world when identification investigations cannot be conducted in any other way.

Using *Skeleton•ID*, a person can be identified within seconds (previously it took hours or even days): the patented technology automatically compares several skulls, bones and faces at the same time. The software can be used to search missing persons databases or to compare unidentified remains in mass graves.

Panacea Cooperative Research representatives offered to train Center specialists to use this software. Application of the tandem available at NSC «Hon. Prof. M. S. Bokarius FSI» of the Artec Leo 3D scanner and the Skeleton•ID software will contribute to solving extremely complex tasks of forensic researches. The support of international partners and institutions in the forensic field of Ukraine is very valuable, especially in conditions of full-scale Russian aggression against our State.

In the context of the above, it is also worth paying attention to genetic-molecular researches. Highly qualified scientists and forensic experts of NSC «Hon. Prof. M. S. Bokarius FSI» are able to solve any issues related to the identification of a person and DNA analysis. Experts do not just conduct research; they help to find answers to important questions that can be crucial for individual citizens and justice in particular and society as a whole. Thanks to advanced equipment and the latest technologies, the experts of the Center quickly and accurately identify and compare genetic profiles, that ensures the reliability of results and contributes to adoption of fair decisions in complex cases.

The list of molecular-genetic researches currently under the control of NSC «Hon. Prof. M. S. Bokarius FSI» professionals are

1 Положення про кабінети науково-судової експертизи : затв. Постановою РНК від 10.07.1923 р. (зі змін. та допов.). URL: https://ips.ligazakon.net/document/view/kp230010?an=2&ed=1925_04_25 (date accessed: 06.03.2023).

quite long: genotyping for identification of a person; determination of paternity; establishment of genetic characteristics (DNA profile) of a sample of buccal epithelium; identification of persons based on traces of biological origin, removed during the inspection of the scene of the incident, etc. For carrying out researches NSC «Hon. Prof. M. S. Bokarius FSI» uses all possible advanced methods and works according to international standards.

International standards at the Center should be followed as while forensic researches as in publishing activities. Traditionally, we draw the attention of our authors and readers to the list of online databases where Research Paper Collection: *Theory and Practice of Forensic Science and Criminalistics* is indexed. Currently, the list covers the following bases: *Academic Scientific Journals Indexing, Bielefeld Academic Search Engine (BASE), Directory of Open Access Journals (DOAJ), Directory of Open Access Scholarly Resources (ROAD), Directory of Research Journals Indexing (DRJI), ERIH PLUS, Eurasian Scientific Journal Index (ESJI), Europub, Index Copernicus International, MIAR, Polska Bibliografia Naukowa, RefSeek, ResearchBib, Ulrich's, Google Scholar* and Register of Scientific Publications of Ukraine. Full-text online versions of the collection are available on the Internet on the platforms of V. I. Vernadskyi National Library of Ukraine libraries of forensic institutions of the Ministry of Justice of Ukraine, higher education institutions of the Ministry of Internal Affairs of Ukraine, etc. The collection is indexed on the website of the DOI Foundation. All this contributes to exchange of best practices between the collection authors and scientists of the world.

Turning directly to the content of the issue № 30 of *Theory and Practice of Forensic Science and Criminalistics*, we will review the main article provisions placed in. Traditionally, collection content is divided into two main groups: Research Papers and Case notes.

The Research Paper section begins with the *Forensic Science and Forensic Expert Activity: a View Through the Prism of Forensic Experts' Opinions* article by ***Valery Shepitko*** *(Ukraine)* Doctor of Legal Sciences, Professor. The article purpose is determined by the need to outline directions for forensic science development in Ukraine in modern conditions and to optimize forensic expert activity, as well as to determine ways to improve expert practice by summarizing opinions of forensic experts. The author raised the issues of forensic science regulatory framework; substantiated the need to unify provisions regulating the conduct of forensic examination; analyzed the means of carrying out forensic science activity (methods, techniques, technologies); noted the importance of cooperation between forensic expert institutions of Ukraine within the European Network of Forensic Expert Institutions, etc.

The next article (in English) is *Revealing Red Flags of Insurance Fraud: A Case Study Research of PT Jiwasraya Indonesia* by ***Wahyu Alimirruchi*** and ***Anis Chariri*** (Indonesia) (Example of *PT Jiwasraya Indonesia*). The authors argue that since insurance companies are prone to fraud due to high profitability, certain signs of fraud need to be identified to help its detection. Studying the cases of *PT Asuransi Jiwasraya (Persero)* from 2006 to 2020, researchers found that during this period there were cases of mega-fraud (corruption, misappropriation of assets, fraudulent financial statements). Indicators of risk ("red flags") about improper disclosure of information are the opinion with a refusal to express the opinion of the Audit Council of the Republic of Indonesia, the

negative opinion of *PwC* and bankruptcy of 2002 and 2004. Such indicators were the facts regarding the time difference: the *Jiwasraya* company bought the shares of the second and third echelons until the end of the quarter of 2019 to resell them on 02.01.2020. These facts of corruption in the *Jiwasraya* company indicate the abuse of interest by the directors of the firm, inadequate bank insurance, acquisition of shares and investment funds at a price that exceeds the market price. An indicator of *Jiwasraya* risk of misappropriation of assets is the purchase of low-quality stocks and mutual funds with proceeds from the sale of the plan savings products. From this, we can conclude that to fight insurance fraud in Indonesia, it is necessary to implement strategies of detective, preventive and repressive work.

The fight against fraud remains a priority for every country on the path to justice, so the experience described by Indonesian colleagues is valuable for lawyers, criminologists and experts of Ukraine and other countries.

The article authored by Doctor of Laws, Professor ***Mykhailo Shcherbakovskyi*** and ***Anna Protsenko*** (both from Ukraine) is devoted to evaluation of forensic research results based on probabilistic approach (based on content of foreign publications). The authors conducted an analysis of evidence evaluation standards (forensic expert conclusions) in the world at different times (general acceptance of the *Frye standard*, justification and verification of *Daubert standard*, plausibility beyond a reasonable doubt). Attention is focused on the fact that provision of probable expert conclusions is conditioned by a continuum of uncertainties, which source of are formation peculiarities of offense traces and methods of collecting traces at crime scene, development level of expert knowledge and methods of forensic research, interpretation and evaluation of forensic examination results. In order to form the expert's conviction in research results, a statistical Bayesian's method of establishing likelihood ratio is proposed that makes possible to assess significance of versions put forward by forensic expert and is the basis for the court to make a reasoned decision. The researchers propose to apply probabilistic approach both to the assessment of a random coincidence of features in case of object identification of examination, to possible errors of laboratory tests, and to the interpretation of results obtained by forensic expert.

The section of research papers continues with the *Epistemological Characteristic and Procedural Significance of Steps and Stages of Appointing and Conducting Forensic Veterinary Examination* manuscript by ***Ivan Yatsenko*** (Ukraine). Doctor of Veterinary Medicine, Professor. The author singled out epistemological characteristics of the stages of appointment and conducting of forensic veterinary examination, carefully described the stages of preparation of materials and appointment of such examination and revealed their procedural significance for pre-trial investigation and judicial review of animal cases. The researcher characterized the main principles of interaction between the subjects of appointment and conducting forensic veterinary examination at each of these stages. The scientist suggests that in procedural document (resolution or resolution) on the appointment of a forensic veterinary examination, permission to use destructive research methods (for the purpose of saving time) should be immediately prescribed, as well as to supplement current legislation of Ukraine (Criminal Procedural Code, Commercial and Procedural Code and Code of Administrative Proceedings) by

clauses and parts regarding conducting an examination to establish the cause of death and/or clarify the severity of damage and the nature of physical injuries caused to animal's health.

The team of authors ***Vladyslav Fedorenko***, Doctor of Law, Professor, ***Igor Havlovskyi*** (both from Ukraine), ***Leszek Wieczorek*** (Poland), Dr. habil. (Doctor habilitatus) investigated the genesis of forensic examination in Ukraine on the eve of the First World War and its subsequent institutionalization in the 1920s The article analyzes in detail prerequisites for establishment of forensic science offices in Kyiv, Odesa, and Kharkiv on the initiative of Mykola Bokarius legendary medical examiner and forensic scientist. An important source of this scientific exploration was legal acts on the organization and conduct of forensic expert work, materials containing information on the legal status of scientific forensic institutes of the People's Commissariat of Justice of the Ukrainian SSR, their tasks, structure and formation order . Researchers paid due attention to determining role in the genesis of forensic science in Ukraine of domestic forensic scientists: M. Bokarius, M. Makarenko, S. Potapov, V. Favorsky and others, who not only laid the foundations of various forensic science species to meet the needs of courts and authorities of pre-trial investigation, but formed the scientific-methodological and methodological foundations of forensic expert activity in Ukraine.

The section with Case Notes begins with an article devoted to comparative research on of the issues of using digital evidence in criminal justice system of Ukraine and the United States. ***Galina Avdeeva****(Ukraine),* PhD in Law, Senior Researcher and ***Elzbieta Żywucka-Kozlowska*** (*Poland*), PhD in Law, Associate Professor distinguish between concepts of *electronic evidence* and *digital evidence*. By analyzing 64 decisions of Ukrainian courts of criminal jurisdiction and 31 decisions of the US Court of Appeals and the Supreme Court, the authors prove that recognition of information in digital form as admissible and reliable evidence causes certain difficulties. The experience of the US judiciary can be useful during the reform of Ukrainian legislation and development of methodological recommendations for digital evidence use. Scientists suggest supplementing Criminal Procedural Code of Ukraine with regulations that would include: definition of the concept of *digital evidence* and its procedural media; distinction between the concepts of *electronic evidence* and *digital evidence*; detailed procedure for extracting digital information, its review, recording and storage (with indication of mandatory information list regarding digital evidence, which should be procedurally fixed); algorithm for assessing reliability of digital evidence and expert's conclusion according to certain criteria, etc.

The *Theory and Practice of Forensic Science and Criminalistics* research paper collection welcomes and actively supports young scientists. The next article in the section of scientific notes authored by ***Oleg Kurdes*** (Ukraine) is devoted to personality transformation of forensic expert in extreme wartime conditions . The author carefully analyzed scientific achievements on this issue and outlined ways to overcome effects of external negative factors on the expert's personality. The research focuses on the need to monitor the emotional and volitional stability of forensic expert and the influence level on his personality of external stressful factors of long-term action in the conditions of his conducting forensic examinations at war crime scenes and consequences of military actions on the territory of Ukraine. In order to successfully perform official duties and

overcome influence consequences of external negative factors in wartime, it is advisable to add psychological training to the system of professional training of a forensic expert (develop a methodology for conducting psychological training as a form of active development of psychological qualities and personality skills: in particular, with addition of group discussions, games methods and psychogymnastic exercises) with its normalization in corresponding by-law departmental acts. In the author's opinion mastering of psychological knowledge, skills and abilities by forensic expert will help him find optimal solutions in order to solve forensic tasks and more carefully perform professional duties. The scientist proposes to create a structural unit of professional training in each state forensic science institution, which (in cooperation with the personnel department) will be tasked with organizing and conducting psychological training of forensic experts.

Anatolii Starushkevych (*Ukraine*) submitted the *Case Investigation Based on Indirect Evidence: The Method by M. Ye. Yevheniev* for publication. The basis of the method of investigating a case based on circumstantial evidence, developed by M. Ye. Yevheniev, Soviet criminalist is the concept of circumstantial evidence which distribution was caused by the political situation of the 1930s and 1940s, in particular aspirations of investigative bodies and the prosecutor's office in cases of *terrorist attacks* and *political conspiracies* to obtain confessions of guilt from the accused, which at that time was considered the main and decisive evidence. The research paper draws attention to positive method qualities: logical structure, perception ease for practical workers, consideration of traditional factors of suddenness and opposition to investigation, use of activity and complex approaches, algorithmicity and stages of crime investigation. It is noted that handling direct evidence is not problematic for investigator: it is indirect evidence that causes difficulties. The accused should be thoroughly questioned on every piece of evidence, and all his explanations carefully checked. Taking into account the above, it can be stated that purpose of this research was the scientific analysis of the method of investigating a case based on circumstantial evidence, developed by M. E. Yevgeniev, in order to clarify its role in formation of forensic doctrine about the methods of investigating criminal offenses.

Pavlo Horobrih (*Ukraine*) devoted his research paper to expert assessment of microcar driver actions in case of traffic collision . The article analyzes the actions of road users who drive micro-mobile means of transportation (unicycle, electric scooter, etc.), with the aim of developing new regulatory approaches to conducting forensic research and providing forensic expert conclusion on a traffic collision involving a person who managed such vehicle. The researcher outlined the issue of the lack of a regulatory framework for operation of such vehicles as unicycles on public roads, and the problem associated with the use of unicycles in public areas (in parks, playgrounds, sidewalks, etc.). The work also shows the design of the unicycle, systematizes its management techniques, and offers a detailed list of equipment necessary to ensure road traffic with the participation of a micro-mobile vehicle. As an example, a part of the author's expert research on criminal proceedings to establish whether an electric scooter belongs to the category of vehicles in accordance with requirements of the Traffic Code in force in Ukraine is presented.

The final article of issue No. 30, authored by ***Oleh Mieshkov***. (Ukraine) is devoted

to the issues of regulatory framework in forensic research on life safety. The scientist claims the system of normative legal acts regulating legal relations in the field of life safety and stipulate technical requirements in various production branches has a rather cumbersome system of laws, bylaws, and technical regulations. Research paper outlines general systemic gaps in the regulatory and technical regulation of labor activities of certain categories of employees. A separate is obsolescence of some acts. In the legal field, there is an urgent need to cancel outdated and adopt modern documents that will determine safety rules in dangerous industries. In general, the system of normative regulation of life safety in Ukraine is not sufficiently adapted to international norms of labor regulation, therefore researcher emphasizes the need to harmonize Ukrainian legislation with international (in particular, European) labor standards. In order to improve the regulatory framework of labor protection. It is proposed to change the general approach to regulation principles, emphasizing preventive actions.

Traditionally, Research Paper Collection: *Theory and Practice of Forensic Science and Criminalistics* contains a section reflecting the current events of scientific life. This time, the Editorial Board of the collection could not ignore International Scientific and Practical Conference: *Implementation of the State Anti-Corruption Policy in the International Dimension*. In our opinion, informing scientific community about this and similar events is an important part of scientific community life. Information popularization about projects, events contributes to consolidation of scientists to adequately respond to the challenges of the present time.

The editorial board of the collection of scientific works "Theory and Practice of Forensic Expertise and Forensics" is sincerely grateful to the authors who provided materials for publication, as well as to the specialists who participated in its preparation for publication. We invite both well-known scientists and novice scientists of Ukraine and foreign countries, post-graduate students of higher education institutions and research institutions, as well as experienced forensic experts and experts with little work experience who have an interest and inclination to both scientific and practical research in the field of expert provision of justice, to publish their findings in the pages of our journal.

Together we will win! Glory to Ukraine!

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Forensic Science and Forensic Expert Activity: a View Through the Prism of Forensic Experts' Opinions

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The primary concerns of this paper are to study the phenomenon of forensic science and determine ways of optimizing forensic expert practice in Ukraine by summarizing opinions of forensic experts. Based on the survey conducted among forensic experts, issues of legal regulation of forensic science have been considered; the need to unify provisions governing conduct of forensic examination is justified; means of carrying out forensic expert activities (methods, methodologies, technologies) have been analyzed. Positions of forensic experts on certain procedural and substantive issues concerning appointment and conduct of forensic examinations have been determined. The role of the forensic expert's automated workstation and electronic registers in forensic expert practice (the Register of Certified Forensic Experts and the Register of Methodologies of Forensic Examinations) is argued. The author underlines possibilities of improving the quality of forensic examination and outlines modern trends of international cooperation in the field of forensic science. The importance of cooperation between forensic science institutions of Ukraine within the European Network of Forensic Science Institutes is stressed. The Article Purpose is conditoned by the need to outline directions for forensic science development in Ukraine in current conditions and optimize forensic expert activity, as well

This article is translation of the original Ukrainian content, which source is available at the link: *https://khrife-journal.org/index.php/journal* (translated by Daryna Dukhnenko). The author acknowledges translation as corresponding to the original.

as to determine ways to improve expert practice by summarizing forensic experts' opinions. General scientific and special research methods have been used.

Keywords: *forensic examination; forensic expert activity; optimization of forensic expert activity; international cooperation in forensic science field; forensic expert practice; forensic report; forensic expert.*

Research Problem Formulation

Forensic science is a component of efficient justice, so the discovery of the truth, the ability to consider a case on its merits, and the achievement of justice depend on a proper reform and optimization of forensic expert activity. In various forms of court proceedings (proceedings), forensic expert activity (as a special type of cognitive activity of a forensic expert) is carried out thanks to the use of specific expertise. Lately, forensic science has been viewed at the level of doctrinal approaches [1] and its choice of European vector of development [2]. In view of the necessity to determine the role of forensic science in proving and optimizing forensic expert activity, the idea has arisen to analyze opinions of subjects of such activity (i.e., forensic experts) on this issue.

The proposed research should contribute to the improvement of forensic expert activities, unification of normative-legal regulation of forensic examination, improvement of the quality of its results, optimization of expert methods and technologies. These cicrumstances determined relevance of selected problematics and the need for this research.

Article Purpose

To identify ways to improve forensic expert practice by summarizing opinions of forensic experts.

Research Methods

To fulfill the set goal, general scientific and special research methods have been applied: analysis, synthesis; modeling; formal logical; sociological, statistical; comparative legal; legal analysis.

Analysis of Essential Researches and Publications

Research papers by distinguished domestic and foreign scientists in the field of forensic science: L. Arotsker, V. Zhuravel, N. Klymenko, O. Kliuiev, Kh. Koletski, V. Kurapka, H. Malievski, Zh. Metenko,

1 Шепітько В., Шепітько М. Доктрина криміналістики та судової експертизи: формування, сучасний стан і розвиток в Україні. *Право України.* 2021. № 8. С. 12—27. DOI: 10.33498/louu-2021-08-012 (date accessed: 20.12.2022) ; Клюєв О., Сімакова-Єфремян Е. Доктринальні підходи до судової експертизи в Україні. *Ibid.* С. 28—43. DOI: 10.33498/louu-2021-08-028 (date accessed: 20.12.2022).

2 Журавель В. А., Шепітько В. Ю. Розвиток криміналістики та судової експертизи в Україні: наближення до єдиного європейського простору / Правова наука України: сучасний стан, виклики та перспективи розвитку : монографія. Харків, 2021. С. 651—669 ; Шепітько В. Ю. Формування доктрини криміналістики та судової експертизи в Україні — шлях до єдиного європейського криміналістичного простору. *Право України.* 2022. № 2. С. 76—90.

M. Sehai, E. Simakova-Yefremian, G. Yuodkaite-Granskiiene, V. Yusupov and others, as well as positions and opinions of well-versed persons (forensic experts), served as scientific basis for this research. To study the problems of forensic expert activity, issues related to forensic expert practice were generalized by interrogating forensic experts, who were asked a series of questions through a specially designed questionnaire.

Main Content Presentation

According to the research plan of the Department of Criminology of Yaroslav Mudryi National Law University for 2022 (with the purpose of determining ways to optimize forensic expert activity), a survey of forensic experts from state specialized institutions and other specialists (forensic experts) in corresponding fields of expertise was planned and conducted. 172 forensic experts took part in the survey: 32 (18.6 %) had up to 1 year of expert experience, 22 (12.8 %) had 1 to 3 years of experience, 15 (8.7 %) had 3 to 5 years of experience, 22 (12.8 %) had 5 to 10 years of experience, 17 (9.9 %) had 10 to 15 years of experience, 24 (14 %) had 15 to 20 years of experience, and 40 (23.2 %) had over 20 years of experience.

Respondents are specialists in various fields of science, technology, arts, and crafts: natural and technical sciences: 112 people (65.1 %); humanitarian sciences: 33 people (19.2 %); legal sciences: 21 people (12.2 %); and other areas: 6 people (3.5 %).

According to the workload associated with forensic expert activities, forensic experts have been divided in the following way: 88 forensic experts (51.2 %) have an extremely excessive workload, 72 forensic experts (41.9 %) have an excessive workload, 9 forensic experts (5.2 %) have a low workload, and 3 experts (1.7 %) have indicated other reasons. Reasons for an excessive workload are considered to be: a significant amount of work: 71 forensic experts (41.28 %); research complexity: 42 forensic experts (24.4 %); a significant number of requests: 34 forensic experts (19.8 %); the lack of an adequate number of forensic experts in the relevant specialty: 27 forensic experts (15.7 %); other reasons: 3 forensic experts (1.7 %).

Forensic expert activity is carried out by a forensic expert: a well-versed person who posssesses specific exeprtise. While investigation, the forensic expert (*forensic scientist)* examines evidence (*objects of research*) and draws a conclusion (*forensic report*). A forensic scientist may be summoned to the court to testify; in this case, his/her procedural status will change (*expert witness*) [3]. The *"specific"* tinge is not in the knowledge itself, but in a person who is trained (knowledgeable). [4] It is quite interesting that according to the ДК 003:2010 Classification of Occupations, a forensic expert belongs to other professionals in the field of legal science (subclass КП 2429) [5].

Attempts to streamline the reliance on specific expertise lead to imposition of additional requirements for a forensic expert: mandatory higher education, inclusion in

3 Шепітько В., Шепітько М. Кримінальне право, криміналістика та судові науки : енциклопедія. Харків, 2021. С. 185.

4 Каминский М. К. Специальные знания — сила? *Криміналіст першодрукований.* 2011. № 3. С. 71.

5 Національний класифікатор України. Класифікатор професій ДК 003:2010 : затв. наказом Держспоживстандарту України від 28.07.2010 р. № 327 (зі змін та доп.). [Чинний від 01.11.2010]. URL: https://zak on.rada.gov.ua/rada/show/va327609-10#Text (date accessed: 20.12.2022).

the Register of Forensic Experts, work in state specialized institutions, etc. Such requirements raise certain objections since the key ones should be a high theoretical and practical level of specific expertise and the ability to provide professional assistance in establishing circumstances (factual data) that are essential for criminal or other proceedings. Restoration of justice should presuppose the possibility to invite independent forensic experts (for example, foreign ones) as well as to conduct independent alternative forensic examinations [6].

Legal regulation of forensic expert activity should be intended for optimizing and improving the quality of performing forensic examinations. For this purpose, various electronic registers (electronic databases) have been introduced in Ukraine: certified forensic experts in accordance with the Law of Ukraine *On Judicial Examination* [7] are included in the State Register of Certified Forensic Experts, which maintenance is entrusted to the Ministry of Justice of Ukraine.

Interoggaton of forensic scientists enabled to determine the attitute towards persons who are entrusted to carry out forensic activities. A substantial number of forensic experts (145 people, i.e., 84.3 %) believe that only forensic experts entered in the Register should carry out forensic expert activties, an opposite view (any well-versed person can implement forensic expert activties) was expressed by 25 forensic experts (14.5 %), 2 forensic experts (1.2 %) noted other reasons.

During forensic examination, 48 forensic experts (27.9 %) do not feel protected, and 31 forensic experts (18 %) have been influenced by other individuals. In particular, 19 forensic experts were influenced by one of the parties to the criminal proceedings (defense or prosecution); 10 forensic experts: by the expert institution head; 9 forensic experts: by an attorney or lawyer; 7 forensic experts: by a participant in civil (commercial, administrative) proceedings; and 2 forensic experts: by a criminal environment representative.

Protection of a forensic expert against external influences may vary, particularly, it can be about providing the expert conclusion from forensic science institution, and not from the forensic expert as a natural person. The following responses were received to the survey question about attitude to the procedure of providing a forensic report on behalf of a forensic science institution: this procedure should be envisaged in some cases: 98 forensic experts (57 %); there is no need for such a procedure: 70 forensic experts (40.7 %); other opinions: 4 forensic experts (2.3 %).

In the course of the servey, forensic experts were also asked questions about their understanding of the essence of specific expertise. "Specific expertise refers to knowledge and skills in fields such as science, technology, art, and crafts, as well as specific types of activities that are essential for use in court proceedings" [8]. As stated by respondents, specific expertise is: knowledge in the field of science, technology, art, crafts, etc.: 96 forensic experts (55.8 %); knowledge in specific types of activities: 68 forensic experts (39.5 %); legal knowledge: 3 forensic experts (1.7 %); general

6 Шепітько В. Ю. Проблеми використання спеціальних знань крізь призму сучасного кримінального судочинства в Україні. *Судова експертиза.* 2014. № 1. С. 11—16.

7 Про судову експертизу : Закон України від 25.02.1994 р. № 4038-XII (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 20.12.2022).

8 Авдєєва Г. К. Знання спеціальні / Велика українська юридична енциклопедія : у 20 т. Т. 20: Криміналістика, судова експертиза, юридична психологія / редкол.: В. Ю. Шепітько (голова) та ін. Харків, 2018. С. 325.

knowledge: 2 forensic experts (1.2 %); other: 3 forensic experts (1.7 %).

The use of specific expertise is regulated in various court proceedings: criminal, civil, economic, administrative or constitutional, during notarization procedure or execution of enforcement proceedings. Performing forensic examination is governed by the Law of Ukraine *On Judicial Examination* [9], Criminal Procedural Code of Ukraine [10], Civil Procedure Code of Ukraine [11], Code of Commercial Procedure of Ukraine [12], Code of Ukraine on Administrative Offenses [13], Law of Ukraine *On Enforcement Proceedings* [14] etc., as well as by the Instructions on Appointment and Conduct of Forensic Examinations and Expert Research [15] and other legal regulations. The comparative analysis demonstrates that statutory regulation do not have uniform approaches, or the law only mentions the possibility of appointing forensic examination and submitting objects for appropriate research. Such problems should be eliminated. A certain unification is also required in case of conducting forensic examinations in different forensic science institutions and departmental services. This applies to unification of expert methodologies, application of expert methods or technologies. The result of forensic examination should not depend on where it is conducted [16]. Reforming forensic examination system is complex and involves introduction of changes to the basic legislation on expert support of justice and related institutions and improvement of procedural legislation [17].

The survey of forensic experts made it possible to find out that a subtantial number of forensic experts (76 forensic experts, i.e. 44.2 %) are not satisfied with statutory regulation of forensic expert activity. In addition, 36 respondents (20.9 %) stressed that the Law of Ukraine *On Judicial Examination* does not correspond to modern realities; while 34 forensic experts (19.8 %) emphasized that certain changes are needed in Ukraininan procedural legislation regulating appointment and conduct of forensic examinations; 34 forensic experts (19.8 %) responded that it is necessary to change approaches to specific expertise in adversarial proceedings; 31 forensic experts (18 %) emphasized that it is essential to harmonize Ukrainian legislation in the aspect of its European integration under current conditions; 28 forensic experts (16.3 %)

9 Про судову експертизу … . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 20.12.2022).

10 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 20.12.2022).

11 Цивільний процесуальний кодекс України від 18.03.2004 р. № 1618-IV (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 20.12.2022).

12 Господарський процесуальний кодекс України від 06.11.1991 р. № 1798-XII (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 20.12.2022).

13 Кодекс України про адміністративні правопорушення від 07.12.1984 р. № 8073-X (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/80731-10#Text (date accessed: 20.12.2022).

14 Про виконавче провадження : Закон України від 02.06.2016 р. № 1404-VIII (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/1404-19#Text (date accessed: 20.12.2022).

15 Інструкція про призначення та проведення судових експертиз та експертних досліджень : затв. наказом Мін'юсту України від 08.10.1998 р. № 53/5 (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 20.12.2022).

16 Шепітько В. Ю. Проблеми використання спеціальних знань … . С. 14.

17 Клюєв О., Сімакова-Єфремян Е. Op. cit. DOI: 10.33498/louu-2021-08-028 (date accessed: 20.12.2022).

highlighted that it is vital to unify by-laws of various departmental services; 11 forensic experts (6.4 %) stressed that there is a need to demonopolize forensic science in Ukraine; 6 forensic experts (3.5 %) provided other reasons.

Even the title of the Instructions on the Appointment and Conduct of Forensic Examinations and Expert Research raises certain doubts. The question is, what is the difference between forensic examination and expert research? Indeed, it is the same thing. In fact, compilers of this legal regulation (with regard to the *expert research* term) aimed to regulate the activity of a specialist (or evaluator) rather than a forensic expert. In this context, one can agree with the need to properly regulate specialists' activities, to determine the procedural essence of the specialist's conclusion or his/her written consultation.

Forensic examination is a procedural form of using specific expertise and scientific and technical achievements in legal proceedings: *"Forensic examintionn is research by a forensic expert based on specific expertise about material (materialized) objects (phisycal evidence) and various types of materials and documents containing evidentiary information, in order to establish factual data that are essential for proper case (proceedings) settlement"* [18].

During the survey, forensic experts' positions as to relationship between forensic examination and forensic expert activity were clarified. The majority of forensic experts (102: 59.3 %) believe that forensic examination and forensic expert research are identical concepts; 59 forensic experts (34.3 %): that forensic examination is broader than forensic expert research; 6 forensic experts (3.5 %) emphasized that expert research is broader than forensic examination; 5 experts (2.9 %) had a different opinion.

In legal regulations attempts are made to classify forensic examinations. Such a class of forensic examinations as criminalistics expert examination deserves special attention. In particular, the Scientific and Methodological Guidelines on the Preparation and Appointment of Forensic Examinations and Expert Research [19] note that criminalistics expert examinations are those raising certain doubts as to their origin: forensic linguistic examination of speech; examination of holograms; examination of materials, substances and products; forensic biological examination, etc. Thus, we have an arbitrary approach to classification of forensic examinations. Under such an approach, any forensic examination can be viewed as criminalistics expert examination. Furthermore, Art. 7 of the Law of Ukraine *On Judicial Examination* stipulates that forensic expert activities related to conduct of forensic, forensic medical and forensic psychiatric examintion are performed solely by state specialized institutions.

The survey made it possible to clarify the attitude of forensic experts towards classification of forensic examinations and separation of forensic examinations. Out of the total respondents, 97 forensic experts (56.4 %) answered positively as to whether there is a need to separate forensic examinations in modern conditions; while 75 forensic experts (43.6 %) answered negatively.

Currenly, national forensic science institutions must interact with forensic

18 Авдєєва Г. К., Шепітько В. Ю. Експертиза судова / Велика українська юридична енциклопедія … . С. 256—257.

19 Науково-методичні рекомендації з питань підготовки та призначення судових експертиз та експертних досліджень : затв. наказом Мінюсту України від 08.10.1998 р. № 53/5. URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 20.12.2022).

science institutions (organizations, laboratories, centers) of other countries. International cooperation of forensic science institutions is vital for exchange of experience, skill upgrading of specialists working in forensic science institutions, taking into account current achievements of science and technology, creation of standardized expert methods. An important focus of cooperation in the field of forensic science is creation and operation of the European Network of Forensic Science Institutes. The success of forensic expert activity is positively influenced by the development of relations within the European Network of Forensic Science Institutes (hereinafter referred to as ENFSI), which involves solving issues of standardization and unification of forensic expert activities, holding thematic conferences, seminars and symposia, exchanging expert methods, technologies and reference materials [20].

The majority of interrogated forensic experts (164, or 95.3 %) are inclined to think about the importance for international cooperation in implementation of forensic expert activities. In particular, according to their views, such cooperation may take form of membership in international expert organizations (for example, ENFSI): 94 forensic experts (54.7 %); in provision of software and technical support by foreign colleagues: 83 forensic experts (48.3 %); in performing joint scientific research on forensic science: 77 forensic experts (44.8 %); in joint scientific activities related to forensic science: 70 forensic experts (40.7 %); in conducting commission forensic examinations with involvement of foreign experts: 63 forensic experts (36.6 %); in improving the quality of forensic examination services: 52 forensic experts (30.2 %); in inviting foreign experts to conduct forensic examinations: 47 forensic experts (27.3 %); in joint publication of research papers: 46 forensic experts (26.7 %); 3 forensic experts (1.7 %) noted other reasons.

The results of expert survey indicate the need to improve the procedure for appointing forensic experts. To the question of whether there is a need to notify a forensic expert of criminal liability for providing a misleading conclusion or to make him swear an oath every time, the following answers have been received: it is advisable to leave the existing procedure: 83 forensic experts (48.3 %); it is necessary to abandon this practice since criminal liability is provided by law: 54 forensic experts (31.4 %); it is expedient to streamline this procedure: 31 forensic experts (18 %); other reasons: 4 forensic experts (2.3 %).

Changes in legislation aim to improve the quality and optimize the processes of forensic expert activities, prevent provision of misleading (false) conclusions, and reduce errors in forensic expert practice. Currently in Ukraine, urgent measures are being taken to develop a number of draft laws related to the reform of forensic expert activities and the introduction of peer-review of forensic reports. In view of this, a few questions arise: what is the purpose of such a peer-review, who benefits from it, who evaluates the forensic report? The question concerning the procedural

20 Заковирко О. М. Європейська мережа судово-експертних установ (ENFSI): історія створення та перспективи розвитку. Актуальні питання стандартизації судово-експертного забезпечення правосуддя в Україні. Перспективи розвитку : мат-ли міжнар. наук.-практ. конф., присвяч. 105-річ. судов. експерт. в Укр. та 95-річ. з дня народж. акад. М. Я. Сегая (Київ, 04—05.07.2018). Київ, 2018. С. 114 ; Клименко Н. І., Купрієвич О. А. Міжнародне співробітництво судово-експертних установ. Вісник кримінального судочинства. 2015. № 4. С. 130—134. URL: http://nbuv.gov.ua/UJRN/vkc_2015_4_19 (date accessed: 20.12.2022) ; Лопата О. Зміст, завдання та форми міжнародного співробітництва у сфері судово-експертної діяльності. *Visegrad Journal on Human Rights*. 2016. Aug. P. 97.

essence of forensic report peer-review is of particular importance. A forensic report is a source of evidence, but what is peer-review? In current conditions, one of the peculiarities of evaluating forensic report is the need to specifically motivate grounds on which the conclusion is rejected. Additionally, if there are doubts concerning forensic examination results, it is deemed expedient to appoint and conduct a re-examintion, involve experts' commission, and conduct the forensic expert's interrogation in court. The survey of forensic experts revealed a conscientious attitude of specialists to their activities and forensic examination results. Most agree on reviewing the expert conclusion by another forensic expert (group of forensic experts): 102 forensic experts (59.3 %) responded positively, 56 forensic experts (32.6 %) responded negatively, 14 forensic experts (8.1 %) expressed a different opinion.

Efficiency of forensic expert activity is closely linked to timelines of conducting forensic examination. Based on the survey results: 118 forensic experts (68.6 %) positively estimate reasonable timelines for conducting forensic examination as it enables to properly organize activities; 46 forensic experts (26.7 %) have a negative attitude since such timelines do not address realities, as well as other 8 forensic experts (4.7 %): since reasonable timelines for conducting forensic examination are also called those exceeding 90 days. The survey revealed the attitude of forensic experts towards the procedural action of interrogating a forensic expert in court. "Interrogaton of the forensic expert in court is an independent judicial action requiring the forensic expert to provide explanations regarding the forensic examination performed and results contained in a forensic report" [21]. Most of forensic experts (119 i.e., 69.2 %) were interrogated during a trial. Among them, 74 forensic experts (43 %) expressed a negative attitude towards the procedural action of interrogation in court, believing that it is unnecessary since the expert's position is already stated in a conclusion (forensic report). On the other hand, 40 forensic experts (23.3 %) considered interrogation of a forensic expert to be necessary, while 5 forensic experts (2.9 %) gave other reasons.

Conducting forensic examinations involves the application of various methods, methodologies and technologies. In particular, *"methodology of conducting forensic examination is a set of guidelines on organization and fulfillment by a forensic expert of her/his professional functions while forensic examination with the purpose of compiling his/her forensic report or developing expert opinion"* [22].

The survey of forensic experts helped to determine principles that they follow when selecting research methods during a forensic examination. The following answers have been obtained: 88 forensic experts (51.2 %) use the expert methodology available in the electronic Register of Forensic Examination Methodologies (hereinafter referred to as *the Register of Methodologies*); 80 forensic experts (46.5 %) choose methods depending on their area of specific expertise and specific research subject; 3 forensic experts (1.7 %) use their own expert methodology; and 1 forensic expert (0.6 %) gave another response.

The Register of Methodologhies was introduced in order to optimize forensic experts' work. Art. 8 of the Law of Ukraine *On Judicial Examinbation* states that *"the methods of conducting forensic examination (excluding forensic medical and forensic*

21 Шепітько М. В., Шепітько В. Ю. Допит експерта в суді / Велика українська юридична енциклопедія … . С. 194.

22 Шепітько В., Шепітько М. Кримінальне право … . С. 286.

psychiatric) are subject to attestation and state registration in the manner prescribed by the Cabinet of Ministers of Ukraine" [23]. Survey results demonstrated how forensic experts perceive the current Register of Methodologies: needs improvement: 70 forensic experts (40.7 %); has great practical importance: 64 forensic experts (37.2 %); does not contain a concise overview of expert methodologies: 34 forensic experts (19.8 %); 4 forensic experts (2.3 %) gave other reasons.

According to the survey results, the attitude of forensic experts to the practice of preparing an exhaustive forensic report (with the provision of the research part) has been clarified: it is essential to adhere to the existing practice:136 forensic experts (79.1 %); it is vital to give up on the practice of providing exhaustive conclusions and only give answers to addressed questions: 35 forensic experts (20.3 %); 1 forensic expert (0.6 %) expressed another opinion.

Forensic expert activity is considered a cognitive activity. The purpose of the survey was to determine the methods of cognition used by forensic experts during the examination process. Specifically, when asked whether forensic experts put forward versions during forensic examination, 110 forensic experts (64 %) answered positively, 58 forensic experts (33.7 %) answered negatively, and 4 forensic experts (2.3 %) expressed a different opinion.

In current conditions, forensic examinations are associated with innovative approaches and information technologies use. According to the survey results, 92 forensic experts (53.5 %) use the automated expert workstation in their practice, 75 forensic experts (43.6 %) do not use it, 5 forensic experts (2.9 %) expressed another opinion.

Conclusions

Stemming from the results of forensic experts' survey, potential ways to optimize forensic expert activities in Ukraine have been identified. The paper addresses the following needs: making changes to legal regulations that govern forensic expert activity, unifying provisions that regulate conduct of forensic examinations, bringing expert support of justice up to modern requirements and European standards, improving the quality of forensic expert activity.

The attitude of forensic experts to a possible change in procedural and substative issues of appointment and conduct of forensic examinations has been determined: a warning of criminal liability for providing a misleading conclusion or constantly taking the forensic expert under an oath; preparation of a peer-review for a forensic report (peer-reviewing procedure); refusal to consider an exhaustive (detailed) forensic report (with provision of the research unit); providing forensic report from a forensic science institution; interoggation of the forensic expert in court, etc.

In current conditions, international cooperation in the field of forensic activty is especially important. The performed research helped to determine the most perspetcive avenues of international cooperation within forensic expert activities: providing software and technical support; conducting joint researches and commision forensic examintions with participation of foreign forensic experts; carrying out joint scientific events on forensic science; improving quality of forensic examintion by inviting foreign experts to perfrom forensic examintions; preparing joint scientific events. The importance of interaction

23 Про судову експертизу ... . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 20.12.2022).

between forensic science institutions in Uktraine within ENFSI is subtantiated.

The role of the Register of Methodologies for forensic expert activity and the need for its improvement are substantiated. The necessity of using electronic resources and automated workstations in a forensic expert's work is argued.

Судова експертиза та судово-експертна діяльність: погляд крізь призму думок експертів

Валерій Шепітько

Досліджено феномен судової експертизи та визначено шляхи оптимізації експертної практики в Україні за допомогою узагальнення думок судових експертів. За результатами опитування експертів розглянуто проблеми нормативно-правового регулювання судової експертизи; обґрунтовано необхідність уніфікувати положення, якими регламентовано проведення судової експертизи; проаналізовано засоби здійснення експертної діяльності (методи, методики, технології). Визначено позиції судових експертів із окремих процедурних і змістовних питань призначення та проведення судових експертиз. Аргументовано роль автоматизованого робочого місця судового експерта й електронних реєстрів в експертній практиці (Реєстру атестованих судових експертів і Реєстру методик проведення судових експертиз). Констатовано можливості підвищення якості судової експертизи та розглянуто сучасні тенденції міжнародної співпраці в галузі судово-експертної діяльності. Підкреслено важливість взаємодії експертних установ України в межах Європейської мережі судово-експертних установ. Мету статті обумовлено потребою окреслити напрями розвитку судової експертизи в Україні в сучасних умовах та оптимізації судово-експертної діяльності, а також визначити шляхи вдосконалення експертної практики за допомогою узагальнення думок судових експертів. Використано загальнонаукові та спеціальні методи дослідження.

Ключові слова: *судова експертиза; судово-експертна діяльність; оптимізація судово-експертної діяльності; міжнародна співпраця в галузі судової експертизи; експертна практика; висновок експерта; судовий експерт.*

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Revealing Red Flags of Insurance Fraud: A Case Study Research of PT Jiwasraya Indonesia

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Insurance companies are prone to fraud due to high yield pressures and hence we need to identify certain red flags for fraud detection. This study is descriptive-analytical research that aims at analyzing the red flags of insurance fraud and at finding the strategies to eliminate potential fraud by learning from insurance fraud cases. Using PT Asuransi Jiwasraya (Persero) from 2006 to 2020 as case study research, the finding shows that mega fraud (corruption, asset misappropriation, fraudulent financial statements) occured during the period. Red flags of improper disclosure are disclaimer opinion from The Audit Board of The Republic of Indonesia, PwC's adverse opinion, and 2002 and 2004 insolvency. Timing differences red flags are Jiwasraya bought second and third tier shares before the end of the 2019 quarter to be resold on January 2, 2020. Red flags of Jiwasraya's corruption are indicated by misuse of interest by Jiwasraya's directors, inappropriate bancassurance, purchase of shares and mutual funds that are more expensive than market prices. Jiwasraya's red flag in asset misappropriation is shown by the purchase of shares and mutual funds of poor quality using income from the sale of saving plan products. These findings imply that detective, preventive, and repressive strategies are needed to combat insurance fraud in Indonesia.

Keywords: *Fraud; Insurance; Red Flags.*

Research Problem Formulation

Association of Certified Fraud Examiners (ACFE) [1] in the Fraud Examiners Manual: Section 1 Financial Transactions and Fraud Schemes states that the insurance business is basically vulnerable to fraud because insurance companies are under great pressure to maximize return on investment against reserve funds thereby increasing the potential fraud by high-yield investment schemes. One example of insurance fraud cases in Indonesia can be seen in the Jiwasraya insurance fraud case which has received much attention. Moving on from this, the researchers intend to reveal the red flags of insurance fraud case at Jiwasraya Indonesia so that new knowledge can be obtained of the insurance fraud.

Article Purpose

The researchers are interested in conducting research with a qualitative research, especially with the case study research method. Insurance fraud is still little qualitative-based research on fraud; so the researchers intended to analyze the fraud methods and its red flags that occurred at Jiwasraya Indonesia from 2006 to 2020. Furthermore, this study also answers how to apply detective, preventive, and repressive strategies to combat potential insurance fraud at Jiwasraya.

Research methods

This research was descriptive analytical research. This study focused on case studies on the identification of red flags in each fraud scheme that occurred at Jiwasraya and its preventive, detective, and repressive strategies to combat insurance fraud. Based on R. K. Yin [2], the case study is an empirical approach to cases where there is a unclear boundary between the phenomenon and the context so that research is carried out to answer the question of why or how related to the case of the phenomenon. Data collection in case studies according to R. K. Yin [3] includes documentation, archival records, interviews, direct observation, participant observation and physical artifacts. So that in this study collect research data through documentation from mass media reports, archival records and physical artifacts in the form of Audit Reports of The Audit Board of The Republic of Indonesia, Jiwasraya Financial Statement from 2006 to 2020, Letter of OJK 46/SEOJK.05/2017. There are five case study analysis tools [4] namely explanation building, pattern matching, time-series analysis, cross-case synthesis, and program logic models. This study used analytical tools by R. K. Yin [5], namely time-series analysis of the chronology of insurance fraud by Jiwasraya, pattern matching on the theory of insurance red flags and fraud tree by the Jiwasraya case, and explanation building analysis by identifying strategies to combat insurance fraud to obtain research results. According to R. K. Yin [6], the validity of case studies is to ensure construct validity (through triangulation), internal validity (through the use of analytical techniques), external validity (through analytical generalizations), and reliability (through case study databases). This study uses triangulation

1 ACFE. Fraud Examiners Manual (International): Insurance Fraud. 2017.
2 Yin R. K. Applications of Case Study Research. SAGE Publication, 2011. 3rd ed. Vol. 34. 264 p.
3 Ibid.
4 Ibid.
5 Ibid.
6 Ibid.

of various sources as a validity tool. In addition, the research results were obtained by analyzing several expert judgments or competent expert opinions. The purpose of using the expert opinion method is to prove the validity and reliability of research [7]. Therefore, research based on the results of competent and experienced expertise can serve as a basis for analyzing insurance fraud red flags along with the application of innovative insurance fraud eradication mechanisms recommended by researchers to obtain the required results. The theoretical approaches related to insurance fraud red flags and insurance fraud eradication mechanisms are based on scientific findings with the following expertise [8].

Analysis of Essential Researches and Publications

There are always changes in social reality that cause social conflict. This is due to the fact that social reality is in the form of illusions and distortions which are not always easy to observe quantitatively. Therefore, in analyzing social reality, a qualitative approach is needed which aims to reveal the actual phenomenon without any distortion at the surface level which usually consists of various levels of reality. Therefore, to get answers to the meaning of the phenomena that occur, qualitative research is needed to obtain quality and in-depth data. This study uses several competent expert opinios or expert judgements.

Main Content Presentation

Economic growth creates a change in crime from what was originally just a conventional economic crime to an unconventional economic crime. Conventional economic crimes or commonly referred to as blue collar crimes are crimes in the form of murder, theft, and so on. Meanwhile, non-conventional crimes or commonly referred to as white collar crimes are criminal acts committed by companies

7 Iriste S., Katane I. Expertise as a Research Method in Education. *Rural Environment. Education. Personality (REEP)* : Proceedings of the 11th International Scientific Conference. 2018. No 11 (May). Pp. 74—80. DOI: 10.22616/reep.2018.008 (date accessed: 02.03.2023).

8 Singleton T. W., Singleton A. J. Fraud Auditing and Forensic Accounting. 4th ed. New Jersey, 2010 ; ACFE. Report To The Nations 2020 Global Study On Occupational Fraud and Abuse. 2020 ; Badan Pemeriksa Keuangan Republik Indonesia. Audit Report on the Management of the Insurance Business, Investment, Income and Operational Costs for 2014 to 2015 at PT Asuransi Jiwasraya (Persero) and other related agencies in Jakarta, Bandung, Batam, Medan and Surabaya. 2016. URL: https://www.bpk.go.id/ihps# (date accessed: 02.03.2023) ; Vahdati S., Yasini N. Factors Affecting Internet Frauds in Private Sector: A Case Study in Cyberspace Surveillance and Scam Monitoring Agency of Iran. *Computers in Human Behavior*. 2015. No 51 (PA). Pp. 180—187. DOI: 10.1016/j.chb.2015.04.058 (date accessed: 02.03.2023) ; Purnomo H. Total Debt of IDR 40 T, Is the Jiwasraya Case Really This Scary? / CNBC Indonesia. Nov, 15 2019. URL: https://www.cnbcindonesia.com/market/20191115114506-17-115525/total-utang-rp-40-t-benarkah-kasus-jiwasraya-seseram-ini (date accessed: 02.03.2023) ; Sayekti N. W. Problems with Jiwasraya Insurance: Dissolution or Rescue. *Expertise Agency Research Center at The House of Representatives, Republic of Indonesia*. 2020. No XII (2). Pp. 19—24. URL: https://berkas.dpr.go.id/puslit/files/info_singkat/Info_Singkat-XII-2-II-P3DI-Januari-2020-163.pdf (date accessed: 02.03.2023) ; Mutmainah D. A. The Ministry of State Owned Enterprises Asks The Audit Board of The Republic of Indonesia to Be Transparent About Jiwasraya / CNN Indonesia. Jan, 07 2022. URL: https://www.cnnindonesia.com/ekonomi/20200107203147-92-463280/kementerian-bumn-minta-bpk-transparan-soal-jiwasraya (date accessed: 02.03.2023) ; Nola L. F. Legal Protection for Jiwasraya Customers. *Expertise Agency Research Center at The House of Representatives, Republic of Indonesia*. 2020. No XII (2). Pp. 1—6. URL: https://berkas.dpr.go.id/puslit/files/info_singkat/Info_Singkat-XII-2-II-P3DI-Januari-2020-209.pdf (date accessed:02.03.2023).

such as fraudulent behavior committed by company management or other stakeholders [9]. In contrast to blue collar crimes, the perpetrator of white collar crime is someone who has a high social status through his/her authorities and positions in an organization. Indeed white collar crime is the latest trend in fraud management due to company psychopaths in their management who are good at manipulating to get their personal goals [10]. The traits of a corporate psychopath are a personality disorder with excessive self-esteem and a lack of guilt, conscience and empathy; so that psychopaths have no remorse for hurting others in order to gain money, power or status [11]. Therefore, it is important for fraud investigators, forensic accountants, fraud auditors, and even managers to know about the red flags of fraud and the rule of law for audit evidence to work in court [12].

In the Indonesia environment, Indonesia Law No. 15/2004 about Audit, Management and Financial Responsibility of State in Article 1 paragraph (6) states that "State Financial Management is the entire activity of state financial management in accordance with their position and authority, from planning, implementation, supervision, and accountability". Government officials have the obligation to manage the financial state/regional with the value of transparent, fair, obedient the regulations, and apply the 3E principles (Economical, Efficient, and Effective) to avoid fraud. Based on Indonesia Law Number 8 of 1995 on Capital Markets, crimes are identified as fraud, market manipulation, and insider trading. Fraud securities trading activities in Indonesia are prohibited directly and indirectly from deceiving other parties by using any means and prohibited from making false statements about material facts with the aim of misleading the situation in order to gain advantages or avoid harm to oneself or another party. While the Crime of Market Manipulation based on Indonesia Law Number 8 of 1995 is that any party is prohibited from committing direct or indirect fraud by creating a false or misleading image related to trading activities, market conditions, or securities prices on the Stock Exchange and is prohibited from providing materially misleading statements that affect the price of securities on the Stock Exchange. So according to P. M. Dechow et al. [13], the capital market will efficiently benefit investors (better returns), analysts (avoiding bad reputation), auditors (avoiding litigation risk), and regulators (increasing investor protection).

Survey on Fraud by ACFE Indonesia Chapter [14] indicates 239 fraud cases consisting of 167 cases of corruption (69,9 % of cases with a total loss of Rp 373.650 millions), 50 cases of asset misappropriation of state and company (20,9 % cases occurred with a total loss of Rp 257.520 millions), and 22 cases of financial statement fraud (9,2 % cases occurred with a total loss of Rp 242.260 millions). Based on the results [15],

9 Gottschalk P. Convenience Triangle in White-Collar Crime: Case Studies of Relationships Between Motive, Opportunity, and Willingness. *International Journal of Law, Crime and Justice*. 2018. No 55. Pp. 80—87. DOI: 10.1016/j.ijlcj.2018.10.001 (date accessed: 02.03.2023).

10 Jeppesen K. K., Leder C. Auditors' Experience with Corporate Psychopaths. *Journal of Financial Crime*. 2016. No 23 (4). Pp. 870—881. DOI: 10.1108/JFC-05-2015-0026 (date accessed:02.03.2023).

11 Ibid.

12 Singleton T. W., Singleton A. J. Op. cit.

13 Dechow P. M., Ge W., Larson C. R., Sloan, R. G. Predicting Material Accounting Misstatements. *Contemporary Accounting Research*. 2011. No 28 (1). Pp. 17—82. DOI: 10.1111/j.1911-3846.2010.01041.x (date accessed: 02.03.2023).

14 ACFE Indonesia Chapter. Survai Fraud Indonesia 2019 / *Survai Fraud Indonesiai Fraud Indonesia*. 2020.

15 Ibid.

government institutions (48,5 %) and state-owned companies or BUMN (31,8 %) are the two highest institutions with the most disadvantaged by fraud in Indonesia. For the average loss of more than ten billion rupiah caused by fraud, 20,8 % was experienced by the government and 11,1 % by BUMN [16]. Meanwhile according to the ACFE Global Report to The Nations [17], it states that occupational fraud with 86 % of cases occurred in asset misappropriation with an average loss of $ 100.000; 43 % of fraud cases occurred in corruption with an average loss of $ 200.000, and 10 % of fraud cases occurred in financial statement fraud with the largest average loss of $ 954.000. L. Brenner et al. [18] conclude that there are two potential concequences of victimization of fraud by white collar crime, namely psychological consequences (loss of trust in financial matters) and economic consequences (decreased net worth). Thus, white collar crime has severe negative impacts on the firm and related stakeholders [19].

S. Repousis [20] states that fraudulent financial statements are intentional errors in the financial condition of a company that can be achieved through misstatements or omissions of amounts or disclosures in financial statements to deceive financial statement users. It is in accordance with the results of a survey by ACFE Indonesia Chapter [21] where the positions and authorities of the fraudsters are 23.7 % managers, 29.4 % owners, 31.8 % employees, and others 15.1 %. Although the percentage of fraud by employees is the highest compared to fraud by managers and directors, fraud by employees causes losses with a relatively small nominal, which is between Rp 10 million to Rp 100 million. Meanwhile, the nominal loss due to fraud by managers and directors reaches Rp 500 million to more than Rp 10 billion [22].

Insurance has the meaning as a legal relationship between the insurer and the insured in which the insurer is bound to compensate for the loss suffered by the insured against the risk of damage, loss, destruction of the object of insurance, loss of expected potential profit, legal liability to third parties, as a result of an unpredictable events that occurs in in the future, including payments resulting from the death or consequences of the life of the insured up to a certain time, in which the insured is bound to pay a premium to the insurer [23]. PT Asuransi Jiwasraya Persero (hereafter called as *Jiwasraya*) is an Indonesian insurance company that was established in 1859 but in 2020 experienced a financial fraud which resulted in massive losses to its customers, including causing losses to the state up to Rp 16.8 trillion. The fraud carried out by Jiwasraya consisted of various fraud schemes from asset misappropriation, corruption, fraudulent financial statements, to money laundering. Jiwasraya is known to have

16 ACFE Indonesia Chapter. Op. cit.

17 ACFE. Report To The Nations ... .

18 Brenner L., Meyll T., Stolper O., Walter A. Consumer Fraud Victimization and Financial Well-being. *Journal of Economic Psychology*. 2019. No 76. Pp. 102243. DOI: 10.1016/j.joep.2019.102243 (date accessed: 02.03.2023).

19 Craja P., Kim A., Lessmann S. Deep learning for detecting financial statement fraud. *Decision Support Systems*. 2020. No 139. Pp. 113421. DOI: 10.1016/j.dss.2020.113421 (date accessed: 02.03.2023).

20 Repousis S. Using Beneish Model to Detect Corporate Financial Statement Fraud in Greece. *Journal of Financial Crime*. 2016. No 23 (4). Pp. 1063–1073. DOI: 10.1108/JFC-11-2014-0055 (date accessed: 02.03.2023).

21 ACFE Indonesia Chapter. Op. cit.

22 Ibid.

23 ACFE. Fraud Examiners Manual ... .

experienced financial problems since 2002 due to insolvency until 2020 which was declared unable to pay insurance claims to its customers. Successful fraud auditors and forensic accountants are experts on red flags and fraud schemes.

It is necessary to understand red flags to make it easier to detect fraud [24]. According to ACFE [25], perpetrators of fraud at work are caused by 42% of fraudsters with high lifestyles exceeding their financial capabilities and 26% of fraudsters with financial difficulties. In addition, the results of the 2019 Indonesia Fraud Survey [26] added that the top five characteristics of fraudsters in Indonesia are a luxurious lifestyle (34.7%), financial difficulties (15.9%), having intimate relationships between buyers and suppliers (13.4%), attitude rationalization (6.7%), and the absence of separation of authority with other employees (4.6%). So because of these problems, this paper will identify the red flags fraud that occurred in the case of Jiwasraya.

Based on the above arguments, this study is intended to analyze the red flags of fraud of Indonesia Insurance company. More specifically, this study aims at analyzing the fraud methods and its red flags that occurred at Jiwasraya from 2006 to 2020. Finally, this study also intends to reveal further about how to apply detective, preventive, and repressive strategies to eliminate the insurance fraud at Jiwasraya.

Fraud Theory

T. W. Singleton and A. J. Singleton [27] define fraud as an action that is planned by an individual or group of people to achieve profit through unfair acts or intentional abuse of authority. ACFE has identified a Fraud Tree (Corruption, Asset Misappropriation, and Fraudulent Financial Statement) with an explanation of each characteristic as follows.

The asset misappropriation scheme is usually carried out by employees with the most frequent occurrences of fraud but having the least financial impact [28]. The motive that encourages employees to commit asset misappropriation is because of personal needs that are beneficial to fraudsters [29], so the most appropriate way to fight this type of fraud is to build employee's fraud awareness and employ an internal auditor to detect this type of fraud [30]. Fraudulent financial statement schemes are usually carried out by company executives with very large company financial losses but the rate of occurrence is the least. Executives's motive to commit fraud is usually related to stock prices (stock bonuses and pressure to maintain higher shares) which benefit the

24 Koornhof C., du Plessis D. Red Flagging as an Indicator of Financial Statement Fraud: The Perspective of Investors and Lenders. *Meditari Accountancy Research.* 2000. No 8 (1). Pp. 69—93. DOI: 10.1108/10222529200000005 (date accessed: 02.03.2023) ; Gullkvist B., Jokipii A. Perceived Importance of Red Flags Across Fraud Types. *Critical Perspectives on Accounting.* 2013. No 24 (1). Pp. 44—61. DOI: 10.1016/j.cpa.2012.01.004 (date accessed: 02.03.2023) ; Yu X. Securities Fraud and Corporate Finance: Recent Developments. *Managerial and Decision Economics.* 2013. No 34 (7—8). Pp. 439—450. DOI: 10.1002/mde.2621 (date accessed: 02.03.2023) ; Cao J., Luo X., Zhang W. Corporate employment, red flags, and audit effort. *Journal of Accounting and Public Policy.* 2020. No 39 (1). DOI: 10.1016/j.jaccpubpol.2019.106710 (date accessed: 02.03.2023).

25 ACFE. Report To The Nations ... .

26 ACFE Indonesia Chapter. Op. cit.

27 Singleton T. W., Singleton A. J. Op. cit.

28 Ibid.

29 Ibid.

30 Smith A. L., Murthy U. S., Engle T. J. Why Computer-Mediated Communication Improves the Effectiveness of Fraud Brainstorming. *International Journal of Accounting Information Systems.* 2012. No 13 (4). Pp. 334—356. DOI: 10.1016/j.accinf.2012.03.002 (date accessed: 02.03.2023).

company and fraudsters but detrimental to other stakeholders [31]. While fraudulent financial statements have very material value, so the audit committee must assign an external auditor to detect and report this type of fraud to law enforcement [32]. Corruption schemes can be in the form of bribes or extortion which usually involve at least two parties (company's internal and external parties), although sometimes one party does it by force [33]. T. W. Singleton & A. J. Singleton [34] and A. Tkachenko et al. [35] stated that the motive for committing corruption is due to persuasion and business relationships that are beneficial for fraudsters. So the way to combat the corruption is have to focus on finding transaction relationships in every parties, especially if the transaction is hidden. The relationship of internal and external parties can not be separated from the agency theory. M. C. Jensen & W. H. Meckling [36] stated that the agency relationship in agency theory is a relationship or contract between one or more people called principals who have capital by involving other parties as agents who are contracted to manage and provide services on behalf of the principal by delegating authority to the agent. The agency relationship will cause two problems, namely information asymmetry and conflict of interest because the principal and agent have their own interests [37]. E. F. Zainudin & H. A. Hashim [38] argue that there is a possibility that there are agents who have the urge to manipulate financial statements by utilizing asymmetric information to fulfill certain objectives that are detrimental to the principal. So the agent compiles an annual report that contains various useful informations for the principal as a way to reduce information asymmetry and conflict of interest [39]. In addition, ACFE [40] stated that insurance companies have great pressure to maximize the return on investment of their customers' reserve funds, thus making them vulnerable to high-yield investment schemes. Due to asymmetric information and conflict of interest between the principal (Jiwasraya customers) and agents (Jiwasraya), it encourages the emergence of insurance fraud that harms Jiwasraya's customers and benefits the insurance fraud perpetrators at Jiwasraya.

Insurance Fraud

Insurance Fraud in Indonesia has been regulated by The Financial Services Authority or FSA (hereafter called as *Otoritas Jasa Keuangan* or *OJK*) through Letter of OJK 46/SEOJK.05/2017 (Fraud Control, Anti-Fraud Strategy Implementation, and Anti-Fraud Strategy Report for Insurance Companies, Sharia Insurance Companies, Reinsurance Companies, Sharia Reinsurance Companies

31 Singleton T. W., Singleton A. J. Op. cit.
32 Ibid.
33 Ibid.
34 Ibid.
35 Tkachenko A., Yakovlev A., Kuznetsova A. 'Sweet Deals': State-Owned Enterprises, Corruption and Repeated Contracts in Public Procurement. *Economic Systems.* 2017. No 41 (1). Pp. 52—67. DOI: 10.1016/j.ecosys.2016.12.002 (date accessed: 02.03.2023).
36 Jensen M. C., Meckling W. H. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics.* 1976. No 3 (4). Pp. 305—360.
37 Ibid.
38 Zainudin E. F., Hashim H. A. Detecting fraudulent financial reporting using financial ratio. *Journal of Financial Reporting and Accounting*. 2016.
39 Chen Y. J., Wu C. H., Chen Y. M., Li H. Y., Chen H. K. Enhancement of fraud detection for narratives in annual reports. *International Journal of Accounting Information Systems.* 2017. No 26. Pp. 32—45. DOI: 10.1016/j.accinf.2017.06.004 (date accessed: 02.03.2023).
40 ACFE. Fraud Examiners Manual … .

or Sharia Units). Insurance fraud is fraud that is intentionally carried out to achieve the aim of deceiving or manipulating the policyholder company, the insured, the participant, or other parties within the company and/or using the company's infrastructure so that the company, policyholder, insured, participant, or other party suffers a loss but the fraudsters obtain financial benefits directly or indirectly [41].

Controls of insurance fraud, anti-fraud strategy implementation, and anti-fraud strategy report based on Letter of OJK 46/SEOJK.05/2017 can be seen on Table 1.

Table 1.

Insurance Fraud Control, Anti Fraud Strategy Implementation, and Anti-Fraud Strategy Report

Insurance Fraud	**Letter of OJK 46/SEOJK.05/2017**	
	Method	**Description**
Control	Active supervision by management	Develop the awareness and culture of anti-fraud. Develop and implement an anti-fraud code of ethics. Develop and monitor the implementation of an anti-fraud strategy. Develop the human resources quality for fraud awareness and control. Monitor, evaluate, and follow up on fraud. Develop the helpdesk and whistleblower hotlines.
	Organizational Responsibility	Develop the organizational structure that fits the characteristics and complexity of the company's business. Define clear duties and responsibilities. Direct accountability to the board of directors or equivalent. Improve competence, integrity, and independence of human resources.
	Control and monitoring through Internal Control System	Adopt anti-fraud control policies and procedures. Conduct a top level review or functional review bt internal audit on the anti-fraud strategy. Impelement rotation, mutation, mandatory off-work, and gathering. Separation of functions in the acceptance, claims, and financial processes to reduce the opportunities for fraud. Improve the procecessing, storage, and security of data ellectronically. Control of physical assets and documentations.
	Education and Training	Anti-fraud education and training at least once a year.

41 Financial Services Authority. Letter of OJK 46/SEOJK.05/2017of Fraud Control, Anti-Fraud Strategy Implementation, and Anti-Fraud Strategy Report for Insurance Companies, Sharia Insurance Companies, Reinsurance Companies, Sharia Reinsurance Companies or Sharia Units / *Otoritas Jasa Keuangan*. URL: https://www.ojk.go.id/en/default.aspx (date accessed: 02.03.2023).

Insurance Fraud	Letter of OJK 46/SEOJK.05/2017	
	Method	**Description**
Prevention	Creating a culture of anti-fraud awareness	Develop and publish an anti-fraud policies. Conduct employee awareness programs (seminars, discussions, training, publcations, transparency of fraud investigations). Conduct customer awareness programs (anti-fraud brochures to policyholders, insured, and participants).
	Identify fraud risk	Identify and analyze the company's activities with potentional fraud. Documenting and informing the analysis results to interested parties. Updating information on potentional fraudulent activities.
	Doing know-your-employee	Implement the recruitment systems and procedures effectively. Implement risk-based qualifications in objective and transparent manner. Develop policy of recognizing and monitoring the character, behavior, and lifestyle of employees.
Detection	Establish policies and whistleblowing mechanisms with effectively implemented	Provide protection and ensure the confidentiality of whistleblowers and their reports Establish internal policies on fraud complaints based on applicable laws. Establish fraud reporting system (procedures, facilities, parties responsible for whistleblowing, and fraud follow-up mechanisms). Establish policies and audit mechanisms for high-risk units of fraud.
Investigation, Reporting, and Sanctions	Implementation of investigation, reporting, and sanctions	Implement the investigation standars (determining the PIC of investigations based on competence and independence as well as developing an investigation mechanism to follow up on the results of fraud detection by maintaining confidentiality). Establish mechanism for reporting the fraud. Establish sanctions for the deterrent affect. Provide reports to law enforcement on the fraud in company.
Monitoring, Evaluation, and Follow-Up	Monitor, evaluate, and follow-up on fraud	Monitor the fraud follow-up process in accordance with applicable laws. Maintain fraud profiling to evaluate chronological information, date of incident, parties involved in fraud, fraudster's position, fraud losses, company actions, causes of fraud, and follow-up actions. Strengthening Internal Control System by making improvements to its weaknesses.

Source: *Otoritas Jasa Keuangan* [42].

42 Financial Services Authority. Letter of OJK 46/SEOJK.05/2017 ... . URL: https://www.ojk.go.id/en/default.aspx (date accessed: 02.03.2023).

There is three basic principles of insurance according to ACFE [43], namely the Principle of Insurable Interest (the risk of loss that can be insured is only a loss to the object of insurance with an ownership relationship with the insured, such as a family relationship or business relationship), Principle of The Utmost Goodfaith (the agreement must be agreed upon by the insurer and the insured based on transparency and integrity), and Principle of Indemnity (the insured cannot receive compensation for more than the amount of the actual loss suffered). With the three insurance principles by ACFE [44], there is clear conditions between the insured, the insurer, and the accident to avoid insurance fraud.

Indonesia Government as a supervisory agency through FSA number 46/SEOJK.05/2017 is trying to eradicate insurance fraud through insurance fraud control efforts (management supervision, organizational accountability, internal control systems, and training), insurance fraud prevention efforts (raising awareness anti-fraud insurance, identifying the risk of insurance fraud, and understanding employees), efforts to detect insurance fraud (approving anti-fraud and whistleblowing policies), efforts to report and sanction insurance fraud, and efforts to evaluate and follow up on insurance fraud [45]. With the implementation of an anti-fraud strategy policy that has been prepared by Indonesia's Financial Services Authority from the prevention level to the repressive level, it is expected to be able to prevent, detect, and provide a deterrent effect so that no other insurance fraud cases occur after the Jiwasraya insurance fraud case.

Red Flags

According to T. W. Singleton and A. J. Singleton [46], red flags are fingerprints of fraud which have the meaning as clues or unusual indications of fraud such as accounting anomalies, transaction anomalies, changes in attitudes, and so on. Accounting professional organizations such as AICPA (American Institute of Certified Public Accountants), ISACA (The Information Systems Audit and Control Association) and IIA (The Institute of Internal Auditors) have included red flags in key fraud detection guidelines because auditors are expected to be able to identify red flags as early warning system in detecting fraud in the process of accounting professional [47]. As a result, auditors are required to increase their professional skepticism in order to identify red flags of fraud through training, seminars, education, and others.

Perpetrators of insurance fraud can be carried out by the insurer (agent or insurance company) or the insured (insurance policy holder). There are several red flags that can be identified to make it easier to detect insurance fraud by the insured [48], including: Claims are made within a short time after the inception of the policy, the insured is very firm and insists on fast settlement, the insured is willing to accept the settlement of claims far below the claim value according to the evidence submitted, the insured complaints and demands prematurely for the delay in the loss process, customers are aggressive and

43 ACFE. Fraud Examiners Manual … .
44 Ibid.
45 Financial Services Authority. Letter of OJK 46/SEOJK.05/2017 … . URL: https://www.ojk.go.id/en/default.aspx (date accessed: 02.03.2023).
46 Singleton T. W., Singleton A. J. Op. cit.
47 Ibid.
48 ACFE. Fraud Examiners Manual … .

sporadic towards insurance companies (such as publishing bad insurance companies in the mass media to get people's attention), the insured is difficult to contact after getting the claim, the insured has a history of many insurance claims and losses, and the documentation provided by the insured is questionable and irregular. Jiwasraya committed three types of fraud according to the Fraud Tree, such as corruption, fraudulent financial statements, and asset misappropriation. These three types of fraud trees can be detected by auditors due to several red flags that have been identified by T. W. Singleton and A. J. Singleton [49].

Table 2.

Red Flags Fraud based on Fraud Tree

Fraud Tree	Identification on Red Flags
Fraudulent Financial Statement	Accounting anomalies. Rapid growth of the company. The company earns unusual profits especially when compared to the industry average. Low of company internal control. Executive management tends to be aggresive, obsessed with stock prices, and performs micromanagement. Complex or unstable organizational structures. Repeated negative cash flows from operations, especially when coupled with increased profits and overall positive cash flows. All significant transactions with related parties are not audited or audited by a different audit firm. There were significant, unusual, or highly complex transactions at the end of the fiscal year. Significant sales volume to entities whose owners are not clearly identified.
Corruption	Special relationship between employees and vendors. There is confidentiality with third parties. Lack of management approval reviews. Anomalies in transaction record and vendor approval.
Asset Missappropriation	Changes in the employee's attitude and lifestyle. The employee's work history is messy. Tends to be unable to make eye contact. Increased irritability. Increased company conflicts because they tend to blame others. Employees are dissatisfied with executives. Employees never take time off or vacations. Employees refuse to be rotated, transferred, or promoted. Employees have financial problems.

Source: *T. W. Singleton and A. J. Singleton.*

49 Singleton T. W., Singleton A. J. Op. cit.

The Chronology of Insurance Fraud at PT Asuransi Jiwasraya (Persero)

The financial problems experienced by Jiwasraya began in 2002 with insolvency and continued until 2004. The Audit Board of The Republic of Indonesia also gave a disclaimer opinion on Jiwasraya's 2006—2007 Financial Statements due to windows dressing. From 2010 to 2011, Jiwasraya undertook a reinsurance scheme as a solution to deficits of Rp 5.7 trillion (2008) and Rp 6.3 trillion (2009). Jiwasraya conducted bancassurance through the JS Saving Plan product on December 12, 2012 and resulted in an increase in premium income until 2014. However, based on the results of the Special Purposes Audit of The Audit Board of The Republic of Indonesia in 2016 on the business management, investment, income, and operational costs of Jiwasraya in 2014—2015 found audit findings that Jiwasraya committed fraudulent financial statements and abused authority by investing without adequate studies. The Audit Board of The Republic of Indonesia again gave a disclaimer opinion on Jiwasraya's 2017 financial statements due to a shortage of Rp 7.7 trillion in reserve funds and Jiwasraya still invests without paying attention to the principle of prudence. In addition, PwC gave an Adverse opinion on Jiwasraya's 2017 financial statements because the liability for future policy benefits was Rp 38.76 trillion from what it should have been Rp 46.44 trillion and corrected Jiwasraya's profit in 2017 from Rp 2.4 trillion to Rp 428 billion. Based on the results of the 2018 Preliminary Investigation of The Audit Board of The Republic of Indonesia, it was stated that there were indications of fraud in the management of saving plan products with very high interest rates above the deposit and bond interest rates that had been massive since 2015, but the proceeds from the sale of these products were invested in stocks and mutual funds of poor quality so that the potential loss to the state. In December 2019, Jiwasraya failed to pay Rp 12.4 trillion and as a result, Attorney General's Office of Indonesia asked the The Audit Board of The Republic of Indonesia, Financial Services Authority, The Ministry of State Owned Enterprises, and Audit Firm to investigate Jiwasraya's fraud investigation. Based on the results of the investigative audit, the Jakarta Corruption Court judged seven defendants including the former President Director (Hendrisman Rahim), Former Finance Director (Hary Prasetyo), Former Head of Investment and Finance Division (Syahmirwan), Former Deputy Commissioner for Capital Market Supervisory 2 of Financial Services Authority (Fakhri Hilmi), President Director of PT Hanson International Tbk (Benny Tjokrosaputro), President Commissioner of PT Trada Alam Minera (Heru Hidayat), and Director of PT Maxima Integra (Joko Hartono Tirto) for the alleged corruption case. As a result of the fraud committed by Jiwasraya, customer claims due reached Rp 16.1 trillion with a potential state loss of Rp 13.7 trillion due to failure to pay the policy. The chronological details of Jiwasraya's fraud can be seen at the Table 3.

Table 3.

Chronology of Fraud at Jiwasraya

Date	Chronology of Fraud at Jiwasraya
Dec 31, 1859	The establishment of Jiwasraya by the Dutch East Indies government.
August 21, 1984	Jiwasraya was changed to PT Asuransi Jiwasraya (Persero).
Year 2002	There was an insolvency of Rp 2,9 trillion at Jiwasraya.
Year 2004	There was an insolvency of Rp 2,76 trillion at Jiwasaya.
Year 2006	The Audit Board of The Republic of Indonesia gave a disclaimer opinion on Jiwasraya's 2006—2007 Financial Statements because the presentation of the reserve funds could not be verified due to negative equity of Rp 3.29 trillion with assets smaller than liabilities which caused windows dressing through false profit bookkeeping *. The Ministry of State Owned Enterprises and FSA assessed Jiwasraya's equity was negative at Rp 3.29 trillion **.
Year 2008	Jiwasraya issued limited investment mutual funds and reinsurance to minimize losses in Jiwasraya's financial statements which had a deficit of Rp 5.7 trillion. The Audit Board of The Republic of Indonesia gave a disclaimer opinion on Jiwasraya's 2006—2007 financial statements due to the presentation of information on reserve funds that could not be trusted, resulting in a deficit of Rp 5.7 trillion (2008) and Rp 6,3 trillion (2009) **.
Year 2009	Jiwasraya continued reinsurance to minimize the Rp 6.3 trillion deficit.
Year 2010	Jiwasraya resumed its reinsurance scheme **.
Year 2011	Jiwasraya continued reinsurance and obtained a surplus of Rp1.3 trillion **.
May 2012	Jiwasraya requested an extension of reinsurance but was refused **.
Dec 12, 2012	JS Saving Plan as Jiwasraya product through bancassurance (in collaboration with bank BTN, Standard Chartered Bank, KEB Hana Bank Indonesia, Bank Victoria, Bank ANZ, Bank QNB Indonesia, and BRI) with high interest offers of 9 % to 13 % permitted by Bapepam-LK as alternative solutions for comprehensive and short-term fundamentals **.
Dec 31, 2012	Jiwasraya received a surplus of Rp 1.6 trillion due to reinsurance, but also a deficit of Rp 3.2 trillion without a reinsurance scheme.
Year 2013	The FSA (switching from Bapepam-LK) supervised Jiwasraya and asked The Ministry of State Owned Enterprises to provide a solution for a solvency ratio of less than 120 %.
Year 2014	Jiwasraya sponsored MU **. There was an increase in shares and mutual funds at Jiwasraya so that there was an increase in premium income of up to 50 %.
Year 2015	The audit of The Audit Board of The Republic of Indonesia *** stated that there were fraudulent financial statements (overstated and understated) and alleged abuse of authority (Jiwasraya bought Medium-Term-Note bonds from a company that had only been established for 3 years which was losing money without any income and also bought shares and second and third mutual funds without adequate review, regulations, and finance).

Date	Chronology of Fraud at Jiwasraya
Year 2016	The results of a special audit by The Audit Board of The Republic of Indonesia in 2016 revealed that there were 16 findings on Jiwasraya's business management, investment, revenue, and operational costs for 2014—2015, such as ***: • the recording of indirect investments amounted to Rp 6.04 trillion of the total investment and the purchase of shares and mutual funds was more expensive than the market price, resulting in a potential loss of Rp 601.85 billion; • TRIO, SUGI, LCGP shares were not supported by an adequate review of the proposed share placement; • there was a potential risk of default in investment transactions for the purchase of PT Hanson Internasional (HI) Medium Term Notes; • Jiwasraya was not optimal in monitoring mutual funds; • Jiwasraya placed shares in a company that performed less well. Based on The Audit Board of The Republic of Indonesia's recommendation, Jiwasraya released its second and third tier shares and mutual funds. FSA asked Jiwasraya to prepare a plan to fulfill the investment adequacy ratio because there was no reinsurance.
Year 2017	The Audit Board of The Republic of Indonesia gave a disclaimer opinion on Jiwasraya's 2017 financial statements because there was a lack of reserve funds of Rp 7.7 trillion. FSA did not find stocks and mutual funds that exceeded the investment limit for each investment manager and FSA also gave the first warning sanction because Jiwasraya was late in submitting its 2017 actuarial report. Jiwasraya experienced an increase in revenue due to the sale of the JS Saving Plan. Jiwasraya evaluated the JS Saving Plan due to FSA's request to assess the suitability of investment capabilities where the JS Saving Plan in 2017 rose 37.64 % from 2016 by generating revenue of Rp21 trillion and profit of Rp 2.4 trillion **. Jiwasraya bought back shares and second and third tier mutual funds. Jiwasraya's financial position is an equity surplus of Rp 5.6 trillion, a shortage of premium reserves of Rp 7.7 trillion (not counting asset losses), understated liabilities resulting in a profit before tax of Rp 428 billion from a loss of Rp 7.26 billion.
Year 2018	The results of the audit by The Audit Board of The Republic of Indonesia *** stated that Jiwasraya invested in risky assets to obtain high returns without using the principle of prudence. Only 2 % of Jiwasraya's investment was placed in quality stocks and mutual funds, while 5 % of Rp 5.7 trillion was in bluechip stocks. As a result, the sale of Jiwasraya's shares and mutual funds, which fell in value by Rp 1.7 trillion and Rp 8.1 trillion in 26 and 107 mutual funds, could not be released ****. The Audit Board of The Republic of Indonesia's Preliminary Investigation 2018 stated that there were indications of fraud in the management of saving plan products with very high interest rates above the deposit and bond interest rates that had been massive since 2015 but the proceeds from the sale of these products were invested in stocks and mutual funds of poor quality thus potentially detrimental to state finances.

Date	Chronology of Fraud at Jiwasraya
Year 2018	FSA punished Jiwasraya for being late in submitting its 2017 financial report with an administrative fine of Rp 175 million. FSA approved the 2016 premium reserve of Rp 10.9 trillion **. PwC corrected Jiwasraya's profit in 2017 from Rp 2.4 trillion to Rp 428 billion and provided an Adverse Opinion on Jiwasraya's 2017 financial statements **. Jiwasraya's President Director and Finance Director were removed **. The customer has started to withdraw the JS Saving Plan.
May 2018	The President Director of Jiwasraya, Asmawi Syam, has been inaugurated and reported irregularities in the financial statements to The Ministry of State Owned Enterprises **.
August 2018	The Ministry of State Owned Enterprises met with directors regarding the potential for default and asked the The Audit Board of The Republic of Indonesia and Finance and Development Supervisory Agency to audit Jiwasraya's investigations **.
Oct 2018	Based on H. Purnomo ****, Jiwasraya failed to pay the JS Saving Plan customer's maturity policy claim of Rp 802 billion due to the weak governance of Jiwasraya and also the weak supervision from the FSA, so Jiwasraya discussed the decrease in premium income due to the decrease in the guaranteed return on the JS Saving Plan with FSA.
Oct – Nov 2018	Jiwasraya's liquidity problems began to be publicized **
Nov 2018	The shareholders replaced the President Director and stated that Jiwasraya needed Rp 32.89 trillion in funds **.
Sept 2019	Jiwasraya had negative liquidity pressures of Rp 23.92 trillion, but liabilities of Rp 49.6 trillion, assets of only Rp 25.68 trillion, while JS Saving Plan's liabilities were Rp 15.75 trillion *****. So S. Makki ** said Jiwasraya needs Rp 32.89 trillion to cover the 120% solvency ratio. The reasons for Jiwasraya's negative performance according to H. Purnomo ****: Errors in product pricing; weak implementation of prudent investment principles; the existence of stock price engineering; and JS Saving Plan liquidity pressure.
Dec 2019	Jiwasraya experienced a default of Rp 12.4 trillion. Jiwasraya's finances deteriorated due to window dressing through the purchase of second and third tier shares before the close of the quarter and then the shares were resold on January 2 of the following year. As a result of buying shares below the market price, the investment results in the financial statements will be recorded as profitable but only false profits.
Dec 30, 2019	Attorney General's Office of Indonesia asked the The Audit Board of The Republic of Indonesia to conduct an investigative audit and calculate the state losses of Jiwasraya along with FSA, The Ministry of State Owned Enterprises, and Public Accounting Firm *.

Date	Chronology of Fraud at Jiwasraya
Year 2019	Based on the examination of the witnesses who managed Jiwasraya until 2015, the list of witnesses ******: • Former General Manager Teknik PT Asuransi Jiwasraya, • Vice Head of Center Bancassurance and Strategic Alliance PT Asuransi Jiwasraya Period 2015—2019, • Head of Division at Bancassurance Finance and Strategic Alliance PT Asuransi Jiwasraya Period 2015—2019, • Head of Division at Wealth Management Head Office BRI Division Bancassurance, and • Head of Division at Bancassurance Accountability and Strategic Alliance PT Asuransi Jiwasraya Period 2015—2018.
Year 2020	The Audit Board of The Republic of Indonesia audited Jiwasraya's and FSA's investments at the request of the Attorney General's Office of Indonesia. The House of Representatives of The Republic of Indonesia formed Panitia Kerja Jiwasraya or Committee Jiwasraya *****. Attorney General's Office of Indonesia examined FSA officials related to Jiwasraya's corruption including: Director of Investment Management of FSA's 2A Capital Market Supervision Department, Head of Product Registration Division of FSA's Directorate of Investment Management's 2A Capital Market Supervision, Head of Sub-Section of FSA's Securities Transaction Supervision Department, and the former President Director of IDX.
Jan 7, 2020	The Ministry of State Owned Enterprises asked The Audit Board of The Republic of Indonesia to examine Jiwasraya in a transparently *****.
Jan 8, 2020	The Audit Board of The Republic of Indonesia gave an official statement regarding Jiwasraya's default **.
Jan 14, 2020	Attorney General's Office of Indonesia detained 5 people suspected of being involved in the Jiwasraya case, which consisted of Hendrisman Rahim (Former Director), Harry Prasetyo (Former Finance Director), and Syamirwan (Former Head of Investment and Finance Division) for Law No. 31 of 1999.
Oct 12, 2020	The panel of judges at the Jakarta Corruption Court sentenced Hendrisman Rahim, Hary Prasetyo, Syahmirwan, Fakhri Hilmi, Benny Tjokrosaputro, Heru Hidayat, and Joko Hartono Tirto for the alleged corruption case in the management of Jiwasraya's investment funds.
Dec 2020	Customer claims due reached Rp 16.1 trillion with a potential state loss of Rp 13.7 trillion due to policy failure.

Notes. * Wicaksono A. The Audit Board of The Republic of Indonesia Doesn't Want the Jiwasraya Case to Become a Century Scandal. Volume II / CNN Indonesia. Jan 08 2020. URL: https://www.cnnindonesia.com/ekonomi/20200108150419-78-463504/bpk-tak-ingin-kasus-jiwasraya-jadi-skandal-century-jilid-ii (date accessed: 02.03.2023).

** Makki S. Chronology of the Jiwasraya Case, Failure to Pay to Allegations of Corruption / CNN Indonesia. Jan 08 2020. URL: https://www.cnnindonesia.com/ekonomi/20200108111414-78-463406/kronologi-kasus-jiwasraya-gagal-bayar-hingga-dugaan-korupsi (date accessed: 02.03.2023).

*** Badan Pemeriksa Keuangan Republik Indonesia. Audit Report ... . URL: https://www.bpk.go.id/ihps# (date accessed: 02.03.2023).

****PurnomoH.Op.cit.URL:https://www.cnbcindonesia.com/market/20191115114506-17-115525/total-utang-rp-40-t-benarkah-kasus-jiwasraya-seseram-ini (date accessed: 02.03.2023).

***** Mutmainah D. A. Op. cit. URL: https://www.cnnindonesia.com/ekonomi/20200107203147-92-463280/kementerian-bumn-minta-bpk-transparan-soal-jiwasraya (date accessed: 02.03.2023).

****** Ridwan M., Ryandi D. Jiwasraya Corruption, 3 Financial Services Authority Officials and Former IDX Boss Asked for Information from Attorney General / JawaPos.Com. Dec 02 2020. URL: https://www.jawapos.com/nasional/hukum-kriminal/02/12/2020/korupsi-jiwasraya-3-pejabat-ojk-dan-eks-bos-bei-digarap-kejagung/ (date accessed: 02.03.2023).

Red Flags on Fraudulent Financial Statement at Insurance Fraud Jiwasraya

Based on the chronology of the Jiwasraya case, it can be identified that Jiwasraya is a complex and systemic case by committing all three types of fraud at once from 2002 to 2020 and this fraud has also spread to Asabri [50]. The first discussed fraud is the fraudulent financial statement which is divided into five types of schemes, including: Timing Differences, Fictitious Income, Hidden Liabilities, Improper Disclosure, and Improper Asset Valuation [51]. So the following is the identification and explanation of the red flags of the Jiwasraya case fraud in the Fraudulent Financial Statement scheme.

Table 4.

Red Flags on Fraudulent Financial Statement Scheme on Fraud Jiwasraya

Fraudulent Financial Statement	Identification of Red Flags
Improper Asset Valuation	Improper Asset Valuation is an increase in nominal assets (receivables, inventories, fixed assets), capitalizing costs, or reducing contra accounts *. Some general red flags of improper asset valuation according to T. W. Singleton and A. J. Singleton * are: Unusual or unexplained increase in the book value of assets (inventory, receivables, long-term assets). Unusual trends in ratios or the relationship of assets to other parts of the financial statements. GAAP violations on the recording of expenses and assets. Management tends to be unresponsive when internal auditors conduct audits. Statement assets are removed from the balance sheet. So that the red flags that occur in the Improper Asset Valuation scheme at Jiwasraya are: Jiwasraya was declared overstated and understated based on the results of the The Audit Board of The Republic of Indonesia's audit in 2015. Understated liabilities in 2017 resulted in a profit before tax of Rp 428 billion from a loss that should have been Rp 7.26 billion.

50 Sayekti N. W. Op. cit. URL: https://berkas.dpr.go.id/puslit/files/info_singkat/Info Singkat-XII-2-II-P3DI-Januari-2020-163.pdf (date accessed: 02.03.2023).

51 Singleton T. W., Singleton A. J. Op. cit.

Fraudulent Financial Statement	Identification of Red Flags
Improper Disclosure	Based on T. W. Singleton and A. J. Singleton *, red flags for improper disclosure are disclosures that are intentionally obscured and there are legal findings that are kept secret. Jiwasraya made inadequate disclosures in its financial statements so that The Audit Board of The Republic of Indonesia and PwC gave a disclaimer opinion for several years until the Ministry of State Owned Companies (called as BUMN) asked The Audit Board of The Republic of Indonesia and Finance and Development Supervisory Agency (BPKP) to audit Jiwasraya to find out the nominal transparency of Jiwasraya's financial statements **. So that the red flags for improper disclosure to Jiwasraya: The Audit Board of The Republic of Indonesia's Disclaimer Opinion on Jiwasraya's 2006—2007 Financial Statements: The presentation of the reserve funds cannot be trusted because the negative equity amounted to Rp 3.29 trillion with assets smaller than liabilities, resulting in an apparent profit. The Audit Board of The Republic of Indonesia's disclaimer opinion on Jiwasraya's 2017 Financial Statements: Lack of reserve funds of Rp 7.7 trillion. Adverse Opinion by PwC on Jiwasraya's 2017 Financial Statements: PwC corrected profit from Rp 2.4 trillion to Rp 428 billion. There were Rp 2.9 trillion and Rp 2.76 trillion insolvency at Jiwasraya in 2002 and 2004.
Timing Differences	Timing Differences is a method used by overestimating income for the current fiscal period by playing with time *. Jiwasraya's red flags doing Timing Differences is that Jiwasraya in December 2019 bought the second and third tier shares before the close of the quarter and then resold the shares on January 2 of the following year.

Notes. * Singleton T. W., Singleton A. J. Op. cit.
** Mutmainah D. A. Op. cit. URL: https://www.cnnindonesia.com/ekonomi/20200107203147-92-463280/kementerian-bumn-minta-bpk-transparan-soal-jiwasraya (date accessed: 02.03.2023).

Red Flags on Corruption at Insurance Fraud Jiwasraya

The second fraud is a corruption scheme which is divided into four types of schemes, including: Economic Distortion, Illegal Gratification, Conflict of Interest, and Bribery [52]. Corruption schemes involve at least 2 parties which are characterized by internal company parties working with external or internal company partners [53]. In the Jiwasraya case, the corruption that occurred was included in the Conflict of Interest Scheme with the following informations.

52 Singleton T. W., Singleton A. J. Op. cit.
53 Ibid.

Table 5.

Red Flags on Corruption Schemes at Fraud of Jiwasraya

Corruption Scheme	Identification of Red Flags
Conflict of Interest	A conflict of interest occurs when an employee, manager, or executive has an undisclosed economic or personal interest in a transaction that has a negative impact on the company *. The red flags of conflict of interest on corruption according to T. W. Singleton and A. J. Singleton * are: There is an abuse of authority **. Transactions with large amounts with certain vendors. There is an undisclosed special relationship between the company and third parties. Low segregation of duties (especially in accounting contracts). While the identification of red flags in the Jiwasraya case related to conflicts of interest are: There was an abuse of authority of Jiwasraya's directors so that there was a change of director by the Shareholders. On 12 December 2012, Jiwasraya conducted bancassurance with bank BTN, Standard Chartered Bank, KEB Hana Bank Indonesia, Bank Victoria, ANZ Bank, QNB Indonesia Bank, and BRI by offering high interest rates of 9 % to 13 % ***. Jiwasraya purchased MTN bonds (Medium-Term-Note) in 2015 from a company that has only been established for three years which continues to suffer losses without any income ****. In 2015, Jiwasraya purchased shares and second- and third-tier mutual funds without proper studies, regulations, and finances. Purchases of shares and mutual funds were more expensive than the market price, resulting in a loss to the state of Rp 601.85 billion in 2016 ****. In 2016, Jiwasraya purchased TRIO, SUGI, LCGP shares which were not supported by an adequate review of the proposed share placement ****. In 2016 Jiwasraya released its second and third tier shares and mutual funds, but bought again in 2017 ****. Based on the results of the 2018 audit by The Audit Board of The Republic of Indonesia, it was stated that Jiwasraya invested 2 % in quality stocks and mutual funds, 5 % invested in blue chip stocks, while the rest was invested in bad investments ***.

Notes. * Singleton T. W., Singleton A. J. Op. cit.

** Vahdati S., Yasini N. Op.cit. DOI: 10.1016/j.chb.2015.04.058 (date accessed: 02.03.2023).

*** Purnomo H. Op. cit. URL: https://www.cnbcindonesia.com/market/20191115114506-17-115525/total-utang-rp-40-t-benarkah-kasus-jiwasraya-seseram-ini (date accessed: 02.03.2023).

**** Badan Pemeriksa Keuangan Republik Indonesia. Audit Report … . URL: https://www.bpk.go.id/ihps# (date accessed: 02.03.2023).

Red Flags on Asset Missappropriation at Insurance Fraud Jiwasraya

The third fraud is asset misappropriation of cash. In the Jiwasraya case, the red flag for asset misappropriation of cash is that in 2018 Jiwasraya received income from the sale of saving plan products but it was misused to invest in stocks and mutual funds of poor quality, potentially causing state losses.

There are three strategies to combat insurance fraud at PT Asuransi Jiwasraya (Persero), including: detective strategy, repressive strategy, and preventive strategy.

The Detective Strategies to Combat Insurance Fraud

The detective strategy aims to identify the causes of insurance fraud through system improvements, follow-up on public

complaints, mandatory periodic financial reporting, and mandatory reporting of the wealth of officials. Occupational fraud is usually detected through information (43 % intensity within a 14-month detection period with a median loss of $ 145,000), internal audit (an intensity 15 % within a 12-month detection period with a median loss of $ 100,000), management reviews (an intensity of 12 % within a 17-month detection period with a median loss of $ 100,000), others (6 % intensity within a 24-month detection period with a median loss of $ 200,000), account reconciliation (4 % intensity within a 7-month detection period) with a median nominal loss of $ 81,000), external audit (an intensity of 4% with a detection period of 24 months with a median loss of $ 150,000), document inspection (an intensity of 3 % within a detection period of 18 months with a median loss of $ 101,000), supervision (intensity of 3 % in a period of 7 months with a median nominal loss ian for $ 44,000), law enforcement (intensity of 2 % over a 24 month period for a median loss of $ 900,000), IT surveillance (intensity of 2 % over a 6-month period for a median loss of $ 80,000), and recognition (intensity of 1 % over a period of 17 months with a median nominal loss of $ 225,000) [54].

The Preventive Strategies to Combat Insurance Fraud

Preventive strategies are carried out internally or externally. External prevention is carried out by minimizing and even eliminating the causes and opportunities for the occurrence of insurance fraud. Several ways that can be done in a preventive strategy are identifying the reasons or causes of insurance fraud, compiling and implementing a code of ethics, improving the quality and welfare of financial managers at PT Asuransi Jiwasraya (Persero), as well as improving services and management control systems. However, this preventive strategy is preventive from the external side so that it has obstacles in the form of the need for synergy and coordination of all national units from the executive, judicial, legislative, and Indonesian people.

The Repressive Strategies to Combat Insurance Fraud

The repressive strategy is an effort to minimize the number of insurance fraud through legal action so that it has a deterrent effect. The repressive process usually begins with the handling of public complaints (whistleblowers) and inspections by external auditors and internal auditors. After that, law enforcement officers carry out investigations, prosecutions and executions. There are several state institutions that are given the authority to combat fraud with repressive functions in the Police, the Prosecutor's Office, the Indonesian Commission for the Elimination of Corruption (KPK), the Ministry of Finance, and Indonesia's Financial Services Authority [55]. However, there is the potential for throwing responsibilities at each other because of the division of authority between repressive agencies in resolving cases, such as the KPK which is reluctant to intervene in the PT Asuransi Jiwasraya (Persero). Y. Wang et al. [56] and L. L. Lisic et

54 ACFE. Report To The Nations ... .

55 Nola L. F. Op. cit. URL: https://berkas.dpr.go.id/puslit/files/info_singkat/Info Singkat-XII-2-II-P3DI-Januari-2020-209.pdf (date accessed:02.03.2023).

56 Wang Y., Ashton J. K., Jaafar A. Money Shouts! How Effective Are Punishments for Accounting Fraud? British Accounting Review. 2019. No 51. Pp. 100824. DOI: 10.1016/j.bar.2019.02.006 (date accessed: 02.03.2023).

al. [57] divide the punishment for accounting fraud in China with the approach of financial sanctions (fines) and non-financial sanctions (reputation) with the aim of deterring fraudsters from repeating their actions again. Repressive strategies in combating fraud are divided into two, namely as repressive as justice enforcement and repressive as legal protection. In a repressive perspective for legal protection, it can be identified four efforts for the case of PT Asuransi Jiwasraya [58].

Table 6.

Repressive Strategy for Customer Legal Protection in the Fraud Case of Jiwasraya

Repressive for Customer Legal Protection	Explaination on Fraud at Jiwasraya
Criminal Law Protection	Attorney General's Office of Indonesia has named a suspect in the Jiwasraya case based on Articles 2 and 3 of the Corruption Crime Law to process criminal charges that cause state losses. So the Attorney General's Office of Indonesia in collaboration with Indonesian Financial Transaction Reports and Analysis Center (called as PPATK) traces Jiwasraya's assets and evidence of corruption.
Civil Law Protection	Civil law protection through ordinary civil lawsuits or bankruptcy. Jiwasraya customer has filed a lawsuit for default on Jiwasraya.
Administrative Legal Protection	Jiwasraya's governance is bad, resulting in Financial Services Authority (FSA) gave administrative sanctions *. If the Public Accounting Firm that has audited Jiwasraya is involved in Jiwasraya's fraud, it could potentially be subject to administrative sanctions by the Minister of Finance.
Ethical Responsibility	The FSA Board of Commissioners imposed ethical sanctions on FSA officials and employees who commit fraud.

Notes. * Purnomo H. Op. cit. URL: https://www.cnbcindonesia.com/market/20191115114506-17-115525/total-utang-rp-40-t-benarkah-kasus-jiwasraya-seseram-ini (date accessed: 02.03.2023).

57 Lisic L. L., Silveri S. D., Song Y., Wang K. Accounting Fraud, Auditing, and The Role of Government Sanctions in China. *Journal of Business Research*. 2015. No 68 (6). Pp. 1186—1195. DOI: 10.1016/j.jbusres.2014.11.013 (date accessed: 02.03.2023).

58 Nola L. F. Op. cit. URL: https://berkas.dpr.go.id/puslit/files/info_singkat/Info Singkat-XII-2-II-P3DI-Januari-2020-209.pdf (date accessed:02.03.2023).

Meanwhile, the repressive strategy for justice enforcement has identified Jiwasraya's efforts against the law by violating several applicable laws and regulations [59].

Table 7.

Repressive Strategy for Justice Enforcement in Fraud Cases of Jiwasraya

Repressive for Justice Enforcement	Explanation on Fraud at Jiwasraya
OJK Law No. 73/POJK.05/2016 (Good Corporate Governance for Insurance Companies) Article 17	Based on the results of the audit by The Audit Board of The Republic of Indonesia, it was stated that the sale and purchase of shares and mutual funds of Jiwasraya indicated fraud by the leadership of Jiwasraya, thus violating the provision that the Board of Directors is prohibited from conducting transactions with conflicts of interest. As a result, they are subject to administrative sanctions and are prohibited from holding certain positions in insurance companies.
Law No. 31 of 1999 (Corruption Crime) Article 2 and 3	The act of enriching individuals and other parties by abusing their authority to the detriment of the state. Punishment in the form of criminal threats and fines. Based on the results of the audit by The Audit Board of The Republic of Indonesia, Jiwasraya was indicated to be corrupt through the marketing of the JS Saving Plan where relevant parties received a fee for the sale of the JS Saving Plan.
Law No. 8 of 2010 (Prevention and Eradication of the Crime of Money Laundering) Article 3	Jiwasraya is suspected of hiding corruption assets, so Attorney General's Office of Indonesia, Indonesian Commission for the Elimination of Corruption, and Indonesian Financial Transaction Reports and Analysis Center are trying to trace the flow of Jiwasraya's corruption money and if proven, they will be sentenced to a maximum of 20 years and a maximum fine of Rp 10 billion.
Law No. 40 of 2007 (Incorporated Company) Article 97	Based on the results of the audit by The Audit Board of The Republic of Indonesia *, the Director of Jiwasraya deliberately did window dressing, proposed cost of funds without involving the relevant divisions, and appointed bancassurance officials who did not comply with the provisions. As a result, it generates false profits and has financial legal consequences.
Law No. 8 of 1995 (Capital Market) Article 90	Based on the results of the audit by The Audit Board of The Republic of Indonesia, Jiwasraya committed fraud through buying and selling shares and mutual funds that did not match the actual nominal value. The result is a maximum imprisonment of 10 years and a maximum fine of Rp 15 billion.

59 Nola L. F. Op. cit. URL: https://berkas.dpr.go.id/puslit/files/info_singkat/Info Singkat-XII-2-II-P3DI-Januari-2020-209.pdf (date accessed:02.03.2023).

Repressive for Justice Enforcement	Explanation on Fraud at Jiwasraya
Law No. 40 of 2014 (Insurance) Articles 11 and 21	Based on the results of the audit, The Audit Board of The Republic of Indonesia stated that Jiwasraya through the JS Saving Plan was carried out without considering the effect of prudence because the JS Saving Plan offered high interest, resulting in a negative spread which reduced Jiwasraya's effect. In addition, Jiwasraya did not implement good corporate governance because based on the results of the audit by The Audit Board of The Republic of Indonesia it was stated that Jiwasraya invested in shares and mutual funds without any study. So that the sanctions given by the FSA are administrative sanctions (warning letters, revocation of licenses, prohibitions on product promotion, business restrictions, and cancellation of approvals.

Notes. * Badan Pemeriksa Keuangan Republik Indonesia. Audit Report ... . URL: https://www.bpk.go.id/ihps# (date accessed: 02.03.2023).

This research was only conducted in one insurance company in Indonesia in the case of insurance fraud at PT Asuransi Jiwasraya (Persero) from 2006 to 2020 so it cannot be generalized to all fraud cases.

Conclusion

Forensic auditors need to understand the red flags in every fraud scheme as an early warning system. The purpose of understanding red flags by auditors is to facilitate the characteristics, processes, detection, and prevention of fraud effectively and efficiently [60]. In the Jiwasraya case, there was a mega fraud involving corruption fraud, asset misappropriation fraud, and financial statement fraud which resulted in the Jiwasraya fraud case being systemic and detrimental to many parties. Jiwasraya's fraudulent financial statement scheme occurred in accordance with the Improper Asset Valuation, Improper Disclosure, and Timing Differences schemes.

The red flags for the fraudulent financial statement scheme on improper asset valuation are based on the Audit Result Report by The Audit Board of The Republic of Indonesia that in 2015 Jiwasraya overstated and understated and in 2017 Jiwasraya understated liabilities which included improper profits. The red flags for the fraudulent financial statement scheme in Jiwasraya's improper disclosure are The Audit Board of The Republic of Indonesia's disclaimer opinion on Jiwasraya's financial statements, adverse opinion from PwC, and Jiwasraya's insolvency in 2002 and 2004 of Rp 2.9 trillion and Rp 2.76 trillion. The red flags for Jiwasraya's fraudulent financial statement scheme on timing differences are that Jiwasraya bought the second and third tier shares before the end of the quarter in December 2019 and then resold them on January 2, 2020. The red flags of Jiwasraya's corruption with the Conflict of Interest Scheme is an abuse of interest which resulted in the removal of the director by shareholders, Jiwasraya did bancassurance against the provisions by offering high interest rates in 2012, Jiwasraya bought MTN bonds at a newly established company that suffered

60 Singleton T. W., Singleton A. J. Op. cit.

losses in 2015, Jiwasraya bought shares and mutual funds more expensive than the market price, Jiwasraya bought shares without review proposed adequate share placements in 2016, and the majority of Jiwasraya's investments (approximately 93%) were placed in underperforming stocks and mutual funds. Meanwhile, the red flags for the misuse of cash assets by Jiwasraya were the purchase of shares and mutual funds of poor quality using income from the sale of saving plan products. So that detective, preventive, and repressive strategies are needed to combat fraud committed in Indonesia in general and PT Asuransi Jiwasraya (Persero).

The detective strategy aims to identify the causes of insurance fraud through system improvements, follow-up on public complaints, mandatory periodic financial reporting, and mandatory reporting of the wealth of officials. Occupational fraud is usually detected through information, internal audit, management reviews, account reconciliation, external audit, document inspection, supervision, law enforcement, IT, recognition, and others [61]. Several ways that can be done in a preventive strategy are identifying the reasons or causes of insurance fraud, compiling and implementing a code of ethics, improving the quality and welfare of financial managers at Jiwasraya, as well as improving services and management control systems. Preventive strategies for insurance fraud need to be implemented internally and externally by identifying the causes of insurance fraud, compiling and implementing a code of ethics, improving the quality and welfare of PT Asuransi Jiwasraya (Persero), as well as improving services and management control systems. The repressive strategy is divided into two, namely repressive as legal protection and repressive as justice enforcement. In the perspective of repressive legal protection, four efforts can be identified in the case of PT Asuransi Jiwasraya (Persero): Criminal Law Protection, Civil Law Protection, Administrative Legal Protection, and Ethical Responsibility. While the repressive strategy of justice enforcement can be identified that Jiwasraya has violated several applicable laws and regulations: OJK Law No. 73/POJK.05/2016 Article 17; Law No. 31 of 1999 Article 2 and 3; Law No. 8 of 2010 Article 3; Law No. 40 of 2007 Article 97; Law No. 8 of 1995 Article 90; and Law No. 40 of 2014 Articles 11 and 21.

61 ACFE. Report To The Nations ... .

Виявлення індикаторів ризику у страховому шахрайстві: аналіз окремого дослідження (на прикладі PT Jiwasraya Indonesia)

Вах'ю Алімірручі, Аніс Чарірі

Страхові компанії є схильними до шахрайства через високу прибутковість, тому потрібно визначити певні ознаки шахрайства, що допоможуть його виявити. Це описово-аналітичне дослідження, метою якого є аналіз ознак страхового шахрайства та пошук стратегій усунення потенційного шахрайства, що ґрунтується на вивченні досвіду таких випадків. Досліджуючи справи PT Asuransi Jiwasraya (Persero) із 2006 по 2020 рр., з'ясовано, що в цей період траплялися випадки мегашахрайства (корупція, незаконне привласнення активів, шахрайська фінансова звітність). Індикаторами ризику («червоними прапорами») про неналежне оприлюднення інформації є висновок із відмовою від висловлювання думки Аудиторської ради Республіки Індонезія, негативний висновок PwC і банкрутство 2002 та 2004 рр. Такими індикаторами стали факти щодо часової різниці: компанія Jiwasraya купила акції другого та третього ешелонів до кінця кварталу 2019 р., щоб перепродати їх 2 січня 2020 р. Ці факти

корупції в компанії Jiwasraya свідчать про зловживання відстотками директорами Jiwasraya, неадекватне банківське страхування, придбання акцій та інвестиційних фондів за ціною, яка перевищує ринкову. Індикатором ризику Jiwasraya щодо незаконного привласнення активів є купівля акцій і взаємних фондів низької якості за рахунок доходу від продажу продуктів заощадження плану. Звідси можна зробити висновок про те, що для боротьби зі страховим шахрайством в Індонезії необхідно впроваджувати детективні, превентивні та репресивні стратегії.

Ключові слова: *шахрайство; страхування; індикатори ризику («червоні прапори»).*

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The authors declare no conflict of interest.

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Evaluation of Expert Research Results Based on the Probabilistic Approach (on Published Foreign Papers)

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The Research Paper Purpose is to analyze the genesis of procedural and scientific principles of modern foreign standards for evaluating expert research results; clarify uncertainty sources that result in ambiguous expert conclusions; substantiate the need to use the probabilistic (Bayesian) approach while formulation of forensic experts' answers. To fulfil this goal, the following research methods have been chosen: historical and legal; systemic and structural; comparative legal; formal and legal. The procedural, epistemological and doctrinal factors complicating evaluation of the objectivity and veracity of the expert conclusion in domestic law enforcement practice are named. Evaluation standards of expert evidence at different times throughout the world have been analyzed (universal adoption of the Frye standard, substantiation and validation of the Daubert standard, prove beyond a reasonable doubt). It is emphasized that provision of probable conclusions by the forensic expert is due to a continuum of uncertainties, which source are peculiarities of the formation of crime traces and methods of collecting traces at the scene, the level of expertise development and methodologies of expert research, interpretation and evaluation of forensic examination results. To shape the expert's conviction in research findings, a statistical Bayesian method of establishing the likelihood ratio is

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proposed, which enables to evaluate significance of versions proposed by the forensic expert and is the basis for the court to take a reasoned decision. The probabilistic approach is proposed to be applied both for evaluation of a random coincidence of features when identifying forensic examination objects, as well as in relation to possible errors in laboratory tests and interpretation of results drawn by a forensic expert.

Keywords: *forensic science, expert conclusion; probability, veracity, expert conclusion uncertainty; Frye standard and Daubert standard; likelihood ratio; Bayes' theorem.*

Research Problem Formulation

The ability of a forensic expert to evaluate results of a conducted research, taking into account circumstances of specific proceedings and scientific provisions, and to submit them to the court in an understandable form is important for any legal process. That is why modern researchers put an increasing emphasis on objectification and unification of the procedure for evaluating forensic research results. The most challenging aspect is associated with evaluation of features coincidence during identification examination of various objects. To establish identity in forensic science, the frequency-probabilistic, or probabilistic-statistical, method of objectifying evaluation significance of identification features is proposed. However, this method has not been widely spread since such an approach in forensic expert practice encountered difficulties in accumulating required statistical data on occurrence frequency and interdependence degree of the qualitative or quantitative characteristics of relevant objects. Accordingly, in domestic forensic expert practice, evaluation of obtained identification features is mostly subjective and depends on the expertise of the forensic expert.

In foreign and domestic specialized literature, researchers have repeatedly tried to solve issues of objective evaluation of expert conclusion veracity. Analysis of judicial and investigative practice demonstrates the existence of several factors significantly impeding evaluation of objectivity and veracity of expert conclusions:

- procedural: acceptance of the adversariality principle in conformity with Art. 22 of the Criminal Procedural Code of Ukraine [1] resulted in performing forensic examinations at the initiative of the prosecution and defense parties and in drawing alternative, oftentimes contradictory expert conclusions; provision of oral consultations and written explanations of specialists regarding unreasonableness of expert conclusions; appearance

1 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 09.01.2023).

of negative reviews on expert conclusions; clear criteria that would enable to objectively evaluate and verify veracity of expert research results by professional participants in procedure are not enshrined in law;

- cognitive (epistemological): *objective*: are due to the fact that acceleration of scientific and technical progress and the growing role of highly specialized fields of expertise have increased dependence of investigators, prosecutors, judges, and defense counsels on forensic experts when adopting decisions (in the lack of specific expertise in such investigators, prosecutors, judges and defense counsels); *subjective*: when expert research results directly depend on a forensic expert's competence (the scope and level of specific expertise, the choice of the expert methodology suitable for a specific situation, interpretation of obtained data, etc.);
- doctrinal conditioned by the strict division in the domestic theory of forensic examinations (forensic science) of expert conclusions based on research results, where conclusions are divided into categorical and probable depending on the degree of certainty. Moreover, probable conclusions are often replaced by assumptions that cannot be considered as evidence, and the fact that probable conclusions are the result of statistical and probabilistic measurements is also being ignored.

Unlike domestic practice, expert conclusions (as a type of the results of any scientific research activity) are viewed as an objective but probabilistic characteristic in the world forensic expert doctrine. Foreign forensic expert practice successfully applies the probabilistic approach based on Bayes' theorem [2] to objectify evaluation of identification examination results. Ukraine's approach towards the international and European community necessitates the analysis of foreign experience in the use of the probabilistic approach to interpreting results of forensic examinations, most frequently identification examinations, which has been formed over the past 20 years.

Article Purpose

To trace the genesis of the procedural and scientific principles of modern foreign standards for evaluating forensic research results; clarify sources of uncertainty that result in ambiguous expert conclusions; substantiate the need to use the probabilistic (Bayesian) approach in formulation of experts' answers.

Research methods

In view of peculiarities of the set goal, the following methods were chosen: *historical-legal* (used for retrospective analysis to regulate evaluation of expert conclusions in court proceedings of the countries of the Anglo-Saxon legal system); *systemic-structural* (contributed to the systematic consideration and identification of sources of uncertainty emerging at all stages of forensic examination); *comparative-legal* (helped to compare provisions regulating admissibility of probable conclusions in domestic and foreign practice, to

2 Bozza S., Taroni F., Biedermann A. Bayes Factors for Forensic Decision Analyses with R. Springer, 2022. 187 p.

establish the possibility of applying positive international experience in domestic judicial practice); *formal-legal* (became the basis for disclosure of certain concepts). The above-mentioned methods were applied as interrelated and complementary, contributing to the research completeness and the validity of formulated scientific conclusions and proposals.

Analysis of Essential Researches and Publications

The majority of scientists have put an emphasis on the study of theoretical questions regarding evaluation and veracity of expert research and expert conclusions (both in forensic, expert, and criminal procedural literature), including: L. Yu. Arotsker, V. D. Arseniev, R. S. Bielkin, V. F. Berzin, A. I. Vinberh, L. M. Holovchenko, V. H. Honcharenko, I. V. Hora, O. O. Eisman, O. M. Zinin, N. I. Klymenko, Yu. H. Korukhov, O. P. Kuchynska, V. K. Lysychenko, Yu. K. Orlov, I. L. Petrukhin, I. V. Pyrih, O. R. Rossynska, T. V. Sakhnova, M. Ya. Sehai, V. V. Sednev, E. B. Simakova-Yefremian, O. R. Shliakhov, V. D. Yurchyshyn, Yu. Yu. Yaroslav, the author of this paper and other researchers. The analysis of literature shows that there is no common understanding of the procedural, formal and meaningful sides of such a phenomenon as the expert conclusion. The procedural side means development of conclusions in compliance with requirements of the current legislation; under formal: consistency of the laws of logic (primarily formal), case files and requirements of fundamental (in relation to a specific examination) science; under the meaningful: argumentation and veracity of the expert's response. Summarizing views expressed by scientists, it is necessary to note the following. The meaningful side is reflected in the conceptual framework of expert conclusions, which are formed on the basis of specific expertise; it is an output, indirect knowledge (not informational, direct, empirical) stemming from objective communication forms. The formal side is embodied in the following requirements to the expert conclusions: they should follow from the introductory and research sections of a conclusion; include evaluation of information obtained in the course of forensic examination; be clear, precise, understandable; be specific, definite, exclude different interpretations; testify about facts on which they are based; do not contain special terms; rely on general rules of science [3].

In line with the subject of our research, categorical and probable conclusions are of particular interest because they are distinguished by the degree of certainty of the forensic expert's statement in forensic science. The forensic expert draws a categorical conclusion when available research results fully confirm the substantiated statement. A probable conclusion means that a statement is partially confirmed. Both categorical and probable conclusions of the forensic expert must be confirmed and argued in compliance with Arts. 101 and 102 of the Criminal Procedure Code of Ukraine [4], Art. 102 of the Civil Procedure Code of Ukraine [5],

3 Щербаковський М. Г. Призначення та провадження судових експертиз : навч. посіб. Харків, 2011. С. 321—342.

4 Кримінальний процесуальний кодекс України ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 09.01.2023).

5 Цивільний процесуальний кодекс України від 18.03.2004 р. № 1618-IV (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 09.01.2023).

Art. 101 of the Code of Administrative Proceedings of Ukraine [6]. Unlike categorical conclusions, probable conclusions do not contain required certainty, which results in difficulties in their evaluation while court proceedings, and the issue of their admissibility and evidential value remains urgent and debatable in legal literature.

While not caving in a long-standing debate, we emphasize that scientists hold opposite positions on evidentiary value of probable conclusions. Some scientists (on the basis of mixing such conclusions with assumptions, reject their evidentiary value) believe that in accordance with Part 3 of Art. 62 of the Constitution of Ukraine [7], Part 3 of Art. 373 of the Criminal Procedure Code of Ukraine[8], Part 6 of Art. 81 of the Code of Civil Procedure of Ukraine [9] proof cannot be based on assumptions. Other researchers give probable conclusions the value of evidence, consider probable expertise as a type of results substantiated by expert research, which cannot be replaced by completely unsubstantiated assumptions and guesses. Judicial practice is also inconsistent in evaluating evidentiary value of probable conclusions. A review of court decisions indicates that expert conclusions in a probative form are accepted as a source of evidence in 86 % of verdicts in criminal proceedings and in 78% of court decisions in civil cases [10].

Let's stress that probable conclusions are the result not only of subjective uncertainty of a forensic expert, but also of objective factors. In recent years, there have been papers in domestic literature in which authors prove that results of a comparative molecular genetic study of biological traces using the most modern instrumental method of DNA analysis, the research on complex objects using information technologies inevitably lead to formulation of expert answers exclusively in the form of probability based on statistical data evaluation [11]. In our viewpoint (taking into account introduction into expert practice of modern scientific technologies, international forensic expert experience), the role of substantiated expert answers expressed in a probable form will likely grow over time. This is conditioned by the stochastic distribution of characteristics of

6 Кодекс адміністративного судочинства України від 06.07.2005 р. № 2747-IV (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 09.01.2023).

7 Конституція України : Закон України від 28.06.1996 р. № 254к/96-ВР (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 09.01.2023).

8 Кримінальний процесуальний кодекс України … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 09.01.2023).

9 Цивільний процесуальний кодекс України … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 09.01.2023).

10 Щербаковский М. Г. Судебная практика оценки вероятных выводов эксперта. *Актуальні питання судової експертології, криміналістики та кримінального процесу* : мат-ли II Міжнар. наук.-практ. конф. (Київ, 19.11.2020). Київ, 2020. С. 647—651. URL: https://m3rkxutm8pk3eqapl5ynjvb3gjps8uao.cdn-freehost.com.ua/wp-content/uploads/2021/06/5fd09ad02772c.pdf (date accessed: 09.01.2023).

11 Shcherbakovskyi M., Stepaniuk R., Kikinchuk V., Petrova I., Hanzha T. Assessment of the conclusions of molecular genetic examination in the investigation of crimes. *Amazonia investiga.* 2020. Vol. 9. No. 25. Pp. 479—486. URL: https://amazoniainvestiga.info/index.php/amazonia/article/view/1097 (date accessed: 09.01.2023) ; Рыбальский О. В., Соловьев В. И., Чернявский С. С., Журавель В. В. Вероятность в современной криминалистике. *Криміналістичний вісник*. 2019. № 1 (31). С. 6—12. DOI: 10.37025/1992-4437/2019-31-1-6 (date accessed: 09.01.2023).

objects submitted for forensic examination, instrumental errors of measurement methods, and subjective evaluation of the analysis results by forensic experts.

The overview of foreign and domestic published papers allows us to state that the problem of objectification and veracity of expert conclusions is of global importance and does not depend either on the legal system and peculiarities of the national judiciary, or on the level of economic development of countries. Thus, generalization of problems within forensic expert activity in the USA, Great Britain, Australia and Switzerland revealed common shortcomings, in particular: lack of a common terminology that could be used by forensic experts and unified approaches to the forms of conclusions; insufficient scientificity of expert methodologies suitable for obtaining veracious data; misunderstanding by judges of experts' conclusions provided in the probable form, etc. [12]. That is why the analysis of theoretical developments of leading foreign researchers in the field of forensic expert activity associated with development of experts' conclusions and implementation of a probabilistic approach to evaluating results obtained in the course of expert analysis will come in handy to domestic specialists.

Main Content Presentation

Let's look at the development history of evaluating the veracity of expert data in the Anglo-American legislation. After a number of well-known court precedents, American lawyers developed certain standards (criteria, rules) for evaluating expert conclusions [13].

Since 1923, the *Frye standard*, which is also known as the *standard of general recognition* [14], *had been prevalent in judicial practice when it came to adopting expert conclusions. Under this standard, the court accepted the forensic expert's testimony only if the scientific principle or discovery on the basis of which a conclusion was provided had been generally accepted by the scientific community. This rule had been used for 70 years until it was replaced by a new one adopted in 1993 in Daubert v. Merrell Dow Pharmaceuticals case, Inc.* which provided its additional clarification [15]. *Daubert standard* identified 5 criteria of admissibility of pieces of evidence obtained with application of expert methods (methodologies). *First,* the scientific method which is based on the evidence and should adhere to Karl Popper's Falsification Principle [16]. This means that a method must be empirically tested for falsification or refutation and tested successfully to be considered

12 McCartney C., Amoako E. N. The UK Forensic Science Regulator: A Model for Forensic Science Regulation?. *Georgia State University Law Review*. 2018. Vol. 34. Is. 4. Pp. 946—948. URL: https://www.researchgate.net/publication/328019895_The_UK_Forensic_Science_Regulator_A_Model_For_Forensic_Science_Regulation_THE_UK_FORENSIC_SCIENCE_REGULATOR_A_MODEL_FOR_FORENSIC_SCIENCE_REGULATION (date accessed: 09.01.2023).

13 Щербаковский М. Г. Стандарты допустимости результатов экспертных исследований в судопроизводстве США и Украины: сравнительный анализ. *Криміналістика і судова експертиза.* 2021. Вип. 66. С. 37—48. DOI: 10.33994/kndise.2021.66.05 (date accessed: 09.01.2023).

14 Frye v. United States, 293 F. 1013 (DC Cir. 1923). Court of Appeals of the District of Columbia. Dec 3, 1923. URL: https://casetext.com/case/frye-v-united-states-7 (date accessed: 09.01.2023).

15 Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U. S. 579 (1993) / Justia U. S. Supreme Court. URL: https://supreme.justia.com/cases/federal/us/509/579/ (date accessed: 09.01.2023).

16 Popper K. R. The Logic of Scientific Discovery Basic. This ed. publ. in the Taylor & Francis e-Library, 2005. 545 p. URL: http://philotextes.info/spip/IMG/pdf/popper-logic-scientific-discovery.pdf (date accessed: 09.01.2023).

scientific. *Second,* frequency (probability), the potential level of errors that can be assumed during method application, must be known. *Third*, the scientific method must be peer-reviewed and published. *Fourth,* the method must be adopted by a corresponding scientific community similar to the Frye standard. *Fifth*, there should be the monitoring mechanism for applying the algorithm of the method actions (individual stages).

As of today, this standard is established in the Anglo-Saxon legal system. The Daubert standard provides increasing demands for expert evidence acceptance. The introduction of the Daubert standard resulted in adoption of the amendment of Rule 702 *Testimony of expert witnesses* of the US Federal Evidence Code (hereinafter referred to as *Rule 702*), where examination of the scientific validity of expert researches is also emphasized [17]. Gradually, criteria for expert evidence admissibility according to the *Daubert standard* began to be applied in court proceedings, in particular, in the Anglo-Saxon legal system [18].

The Daubert standard became the impetus for a substantial revision of scientific principles of forensic examinations and an increase in the role of judges in evaluating and accepting expert conclusions. The most essential results on application of this standard: revision of the empirical principles of traditional types of forensic examinations based on epistemological approaches established in science; determination of uncertainty sources that do not allow to reliably find out event circumstances; searching for ways to identify errors in methods applied by forensic experts; assigning the *"gatekeeper"* function to the judge to protect the courtroom from scientifically unveracious evidence. The set of requirements stipulated by the *Daubert standard* helps to define it as a *standard of substantiation and verification*.

Another reason that prompted researchers to put emphasis on the level of methodology of forensic examinations was the increasing number of cases of conviction of innocent suspects under erroneous incriminating expert conclusions. Within the framework of the *Innocence* project, it was found that 185 (74 %) out of the first 250 acquitted prisoners were convicted on the basis of unveracious expert conclusions [19]; and as of March 2018, 2,152 recorded acquittals (24 %) are associated with false or misleading forensic evidence [20].

Many of the so-called traditional forensic identification methods

17 Rule 702 — Testimony by Expert Witnesses / Federal Rules of Evidence. Edition 2023. URL: https://www.rulesofevidence.org/article-vii/rule-702 (date accessed: 10.01.2023).

18 Jurs A. W. Balancing Legal Process with Scientific Expertise: A Comparative Assessment of Expert Witness Methodology in Five Nations, and Suggestions for Reform of Post-Daubert U. S. Reliability Determinations. *Marquette Law Review.* 2012. Vol. 95. Is. 4. Pp. 1329—1425. URL: https://scholarship.law.marquette.edu/cgi/viewcontent.cgi?article=5134&context=mulr (date accessed: 10.01.2023) ; Ward T. An English Daubert? Law, Forensic Science and Epistemic Deference. *The Journal of Philosophy, Science & Law: Daubert Special Issue.* 2015. Vol. 15. Pp. 26—36. DOI: 10.5840/jpsl20151513 (date accessed: 10.01.2023) ; Okoye J., Oraegbunam I. Daubert and Frye Models: Implications for Admissibility of Expert Testimony for Nigeria. *International Review of Law and Jurisprudence.* 2019. Vol. 1. No 3. Pp. 10—15. URL: https://nigerianjournalsonline.com/index.php/IRLJ/article/view/278 (date accessed: 10.01.2023).

19 Garrett B. L. Convicting the Innocent: Where Criminal Prosecutions Go Wrong. Harvard University Press, 2012. C. 8.

20 % Exonerations by Contributing Factor / The National Registry of Exonerations. URL: https://www.law.umich.edu/special/exoneration/Pages/ExonerationsContribFactorsByCrime.aspx (date accessed: 10.01.2023).

(handwriting, fingerprinting, traces of weapons, etc.) forensic experts systematically compared with more substantiated and well-studied scientific fields (in particular, molecular genetic DNA analysis) and ultimately came to a conclusion about the lack of fundamental researches and predominant reliance on arbitrary expert conclusions. In the well-recognized report of the National Academy of Sciences of the United States of America of 2009 (where the state of forensic evidence, the problems of forensic examinations and directions for their solution were considered) it is emphasized that a substantial part of *scientific evidence* lacks scientific substantiation. It stressed the lack of fundamental scientific research in the field of forensic science and highlighted the importance of conducting real academic research in this field, particularly to evaluate the suitability (validity) and veracity of methods applied in the course of forensic examination of evidence [21].

Researchers have criticized the postulates of identification examinations carried out within traditional forensic science, the basic principle as to the individuality of objects: *"It is time for traditional forensic science to replace outdated assumptions about the uniqueness of objects with a more reliable empirical and probabilistic basis... The concept of individualization, which lays the basis for many branches of forensic science, exists only in a metaphysical or rhetorical sense. Perhaps, the only scientifically based approach in forensic identification is the use of estimates of the probabilities of accidental coincidence, which are not yet used in any of the traditional forensic identification sciences* [22]*."*

In 2022, a group of researchers from Australia, Great Britain, Canada, the USA, Finland and Switzerland published the *Sydney Declaration*, where 7 fundamental principles of the theory of forensic science are set out, in particular *"forensic science is evaluation of results in the context of the circumstances of an event that took place"* and *"forensic science deals with a continuum of uncertainties"*. Uncertainties exist at every stage of the process starting from the discovery of traces at the scene and continuing during their investigation and subsequent interpretation of obtained data: until the notification of forensic examination results. Uncertainties cannot be completely eliminated, but they can be estimated and taken into account. The presence of uncertainties provides a basis for making probabilistic judgments about an event. Forensic experts cannot determine with great confidence final circumstances of traces formation, but only evaluate a relative significance of results under various probable causes or scenarios [23]. Uncertainty was recognized as one of the most significant circumstances affecting the weight of expert evidence. The analysis of uncertainties conditioning provision of probable conclusions of forensic experts demonstrates that they have several sources: the mechanism (features) of formation of

21 Strengthening Forensic Science in the United States: A Path Forward. The National Academies Press. Washington, DC, 2009. Pp. 22—23, 27—28, 44. DOI: 10.17226/12589 (date accessed: 10.01.2023).

22 Koehler J. J., Saks M. J. Individualization Claims in Forensic Science: Still Unwarranted, *Brooklyn Law Review*. 2010. Vol. 75. Is. 4. Pp. 1194—1195, 1203. URL: https://brooklynworks.brooklaw.edu/blr/vol75/iss4/9 (date accessed: 10.01.2023).

23 Roux C., Bucht R., Crispino F. et al. The Sydney Declaration — Revisiting the Essence of Forensic Science through its Fundamental Principles. *Forensic Science International.* 2022. Vol. 332. P. 4. DOI: 10.1016/j.forsciint.2022.111182 (date accessed: 10.01.2023).

traces of offenses, methods of collecting traces at the crime scene, the level of knowledge development about forensic examination object, methods of expert research, interpretation and evaluation of data obtained by a forensic expert [24].

The doctrine of uncertainty implies the need to specify the degree of conviction for a specific event under investigation, assumptions about past events, or identification of the object under study. A statistical, in particular, the Bayesian method (Bayesian networks), which supports the transition from theoretical analysis to practical tasks, is suggested as the basis for formation of the forensic expert's internal conviction. The application of such a method of computational facilitation for implementation of probabilistic reasoning in practice has opened up prospects for providing experts' conclusions with greater objectivity and validity. It is stressed that researchers' duty is to determine sources of uncertainty, identify their influence on solution of typical expert tasks, establish likelihood ratio [25].

The Bayesian method within the probabilistic approach to interpretation of forensic evidence was first proposed in the 70s of the last century [26]. Since then, numerous research papers dedicated to Bayesian reasoning in a certain form for solving problems in forensic science had been published. In 2011, after a long-standing scientific debate on this issue, over 30 leading scientists in the field of forensic science from 11 countries supported by the leadership of the *European Network of Forensic Science Institutes* (ENFSI) set out 10 basic principles for evaluating results of expert research based on the Bayesian approach, the most significant of which include:

- the theory of probabilities, the Bayesian approach provides a common consistent logical basis for interpreting expert data;
- the ratio of the probability of observations considering the assumption of the prosecution to the probability of observations taking into account the defense assumption, known as the likelihood ratio, provides the most reasonable basis for the court in establishing the significance of forensic examinations results;
- a verbal scale, stemming from the concept of likelihood ratio, is the most expedient for conveying to the court evidentiary value of the expert conclusion [27].

For identification examination, the likelihood ratio (Bayes ratio) is defined as ratio of two conditional probabilities. In the numerator, there is probability

24 Georgiou N., Morgan R. M., French J. C. The Shifting Narrative of Uncertainty: a Case for the Coherent and Consistent Consideration of Uncertainty in Forensic Science. *Australian Journal of Forensic Sciences.* 2022. Pp. 6—9. DOI: 10.1080/00450618.2022.2104370 (date accessed: 10.01.2023).

25 Taroni F., Biedermann A. Uncertainty in Forensic Science: Experts, Probabilities and Bayes' Theorem. *Statistica Applicata — Italian Journal of Applied Statistics.* 2015. Vol. 27. No. 2. Pp. 132—134. URL: http://sa-ijas.stat.unipd.it/sites/sa-ijas.stat.unipd.it/files/Taroni-Biedermann.pdf (date accessed: 10.01.2023).

26 Finkelstein M. O., Fairley W. B. A Bayesian Approach to Identification Evidence. *Harvard Law Review.* 1970. Vol. 83. No. 3. Pp. 489—517. URL: https://www.marcellodibello.com/mathtrial/resources/FinkelsteinFairley1970.pdf (date accessed: 10.01.2023) ; Tribe L. H . Trial by Mathematics: Precision and Ritual in the Legal Process. *Ibid.* 1971. Vol. 84, No. 6. Pp. 1329—1393. URL: https://www.maths.ed.ac.uk/~v1ranick/dreyfus/tribe.pdf (date accessed: 10.01.2023).

27 Berger C. E. H., Buckleton J., Champod C., Evett I. W., Jackson G. Expressing Evaluative Opinions: A Position Statement. *Science and Justice.* 2011. Vol. 51. Is. 1. Pp. 1—2. DOI: 10.1016/j.scijus.2011.01.002 (date accessed: 10.01.2023).

of forensic examination results (for example, the coincidence of the set of features in compared objects), provided that one statement (version) is true (for example, *the object being tested left a trace*). In the denominator, there is probability of features coincidence in objects, provided that the second, opposite statement is true (*the trace was not left by the object being tested*). A likelihood ratio shows support for one of a pair of clearly articulated statements. The peculiarity of the likelihood ratio is that it is not the probability of a specific version — in the given example — *formation of a trace by a specific object that is being tested*. The likelihood ratio only indicates that one version is more likely than the opposite [28]. That is, the value of the likelihood ratio enables to draw a conclusion about the strength of support, significance, degree of confidence that forensic examination results provide for specific source data of one version compared to an alternative one.

Most commonly, the likelihood ratio has a numerical expression. In line with this approach, expert conclusions outline the degree of conviction in a specific statement depending on the likelihood ratio value. For likelihood ratio values closer to one, a conclusion means that the results do not support one version over the other, or the results support each version equally. For the likelihood ratio values greater than one, a conclusion is that received data to some extent supports one version (for example, that the object being tested was correctly identified as the sought one). For values of the likelihood ratio less than one, a conclusion means that obtained data to some extent supports the other version (the object being tested is not the one sought and was mistakenly identified).

The presented probabilistic approach was supported by ENFSI [29] and the Royal Statistical Society in the UK [30]. This testifies to a widespread belief in the foreign expert community under which probability (uncertainty) should be the subject of evaluation, quantitative or qualitative measurement. At the same time, it is emphasized that the probabilistic approach does not deny the quality of scientific evidence or expert conclusions, as long as uncertainty is established, addressed and brought to the attention of uninformed persons (court, jury, etc.) who adopt decisions clearly and transparently [31]. We believe that evaluation and further informing of forensic examination customers about the degree of superiority of one expert version over another is vital for handling objective, legal and fair criminal proceedings or civil cases.

28 Thompson W. C., Kaasa S. O., Peterson T. Do Jurors Give Appropriate Weight to Forensic Identification Evidence? *Journal Empirical Legal Studies.* 2013. Vol. 10. Is. 2. P. 370. DOI: 10.1111/jels.12013 (date accessed: 10.01.2023).

29 ENFSI Guideline for Evaluative Reporting in Forensic Science. Strengthening the Evaluation of Forensic Results across Europe (STEOFRAE). URL: https://enfsi.eu/wp-content/uploads/2016/09/m1_guideline.pdf (date accessed: 10.01.2023).

30 Roberts P, Aitken C. The Logic of Forensic Proof: Inferential Reasoning in Criminal Evidence and Forensic Science. Guidance for Judges, Lawyers, Forensic Scientists and Expert Witnesses. London. Royal Statistical Society, 2014. Pp. 102—143. URL: https://www.researchgate.net/publication/318596438_The_Logic_of_Forensic_Proof_-_Inferential_Reasoning_in_Criminal_Evidence_and_Forensic_Science (date accessed: 10.01.2023).

31 Almazrouei M. A, Dror I. E., Morgan R. M. The Forensic Disclosure Model: What Should be Disclosed *To*, and *By*, Forensic Experts? *International Journal of Law, Crime and Justice.* 2019. Vol. 59. P. 16. DOI: 10.1016/j.ijlcj.2019.05.003 (date accessed: 10.01.2023).

The Bayesian approach to evaluation of identification studies results is exhaustively outlined in the published *ENFSI Guideline for Evaluative Reporting in Forensic Science. Strengthening the Evaluation of Forensic Results across Europe*, which is a standard and methodological document on evaluation of evidentiary significance of expert conclusions provided as a result of conducting identification research in various types of forensic examinations [32]. This document testified to the recognition by the international expert society of the need to develop and implement uniform methodical criteria for forensic interpretation and reporting in ENFSI laboratories. The document provides instructions for the expert's preparation of evaluation results within the framework of the so-called evaluation report (in the domestic interpretation: the forensic report). The *Guideline...* also contains a compilation of practical guidelines for evaluating the significance of the forensic expert's conclusions and presenting results of this evaluation in a conclusion; glossary of basic terms; examples of applying the probabilistic approach to expert research on DNA, glass, video recordings, gunshot residues, and shoe prints. As of today, the *Guideline...* is mandatory for forensic expert organizations of the European Union.

The *Guideline...* is based on several concepts: *true and false statements, probability of research results, the likelihood ratio, explanatory information*. Given the adversarial nature of justice, true and false statements (versions) are made, for example, in relation to the identification question put to the forensic expert: *The object being tested has left a trace* and *Another object has left a trace*. Such an expert conclusion in the form of evaluation differs in that it considers results obtained in view of alternative hypothetical descriptions of an event. Probabilities of research results testify to the event uncertainty in numerical terms (objective probability) or to the expert's personal confidence (subjective probability). A forensic expert determines probability on the basis of availability of scientific, experimental and personal data about objects under study.

Explanatory information refers to information extracted from case materials, which is given to the forensic expert to aid in addressing the issues, proposing alternative versions, and selecting an appropriate research approach. The concept of explanatory information means that in order to clarify issues raised by the initiator of the expert task, the forensic expert must analyze all meaningful information in a case, provided to the forensic expert or requested additionally. What is more, we are talking about not all information in a case, but only about the meaningful information (in accordance with the subject of the examination), since it can affect the future evaluation of evidentiary value of forensic examination results. Within the chosen approach, both theoretically and practically, such information acquires the value of one of the fundamental components necessary for conducting an accurate expert assessment. Additionally, it is recommended to note in the expert conclusion that in case of change of explanatory information, re-evaluation of significance of the identified features should implemented. The aforementioned provision correlates with the provisions of clauses 1 and 2 of Part 3 of Art. 69 of the Criminal Procedural Code of Ukraine [33],

32 ENFSI Guideline ... . URL: https://enfsi.eu/wp-content/uploads/2016/09/m1_guideline.pdf (date accessed: 10.01.2023).

33 Кримінальний процесуальний кодекс України ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 09.01.2023).

which give the forensic expert the right to access case files of criminal proceedings associated with the research subject as well as request provision of additional materials and samples and carry out other actions related to forensic examination.

Stemming from research results, proposed versions, explanatory, scientific and other types of information, probabilities are determined and the likelihood ratio is calculated. Formulating conclusions for those cases where the likelihood ratio is qualitative is to use a verbal qualifier to convey the strength of support for expert conclusions. The following values of the likelihood ratio (hereinafter referred to as LR) and its verbal equivalent are suggested:

$1 < LR \leq 10$ — *slight support / limited support*;

$10 < LR \leq 100$ — *moderate support*;

$100 < LR \leq 1000$ — *moderately strong support*;

$1000 < LR \leq 10\,000$ — *strong support*;

$10\,000 < LR \leq 1\,000\,000$ — *very strong support*;

$LR > 1\,000\,000$ — *extremely strong support* [34].

The verbal scale limits the forensic expert's capabilities to a certain range of indicators and provides an approximate ranking that at best implies that *"strong"* is stronger than *"moderate",* but not as strong as *"very strong".* It should be accepted that discrete limitations are not caused by the verbal scale itself, but rather by the complexity of expert data results and the lack of data for their interpretation [35]. Thus, *The Guideline...,* based on the Bayesian approach, outlines the main principles of forensic interpretation and objectification of identification research results, regardless of the scope of their application.

A close approach to evaluation of forensic examination results in the form of probabilistic statements, where categorical conclusion about identification is not provided, is presented in the Guidelines of the U.S. Department of Justice: *Unified Language for Testimony and Findings* [36]. The guidelines are designed to be used by laboratory experts of the Bureau of Alcohol, Tobacco, Firearms and Explosives (*ATF*), Drug Enforcement Administration (*DEA*), and Federal Bureau of Investigation (*FBI*). The set of documents includes wordings intended to standardize testimony and conclusions of forensic experts. Guidelines are developed for identification research on handwriting, handprints, tires and shoes, firearms, glass, metals, fibres, drugs, DNA, etc. Depending on research objects, the number of proposed conclusions varies, but all documents contain three wordings common to any type of forensic examination: *inclusion,* which is a conclusion that forensic examination results provide convincing support for an assumption about the origin of traces from the object being tested (identification); *exclusion,* which is a conclusion that forensic examination results provide convincing support for an assumption about the origin of traces from different objects (lack of identification); *inconclusive:* results of forensic examination do not allow the forensic expert to include or exclude the object being tested as a source

34 ENFSI Guideline ... . URL: https://enfsi.eu/wp-content/uploads/2016/09/m1_guideline.pdf (date accessed: 10.01.2023).

35 Standards for the Formulation of Evaluative Forensic Science Expert Opinion / Association of Forensic Science Providers. *Science and Justice.* 2009. Vol. 49. Is. 3. P. 162. DOI: 10.1016/j.scijus.2009.07.004 (date accessed: 10.01.2023).

36 Uniform Language for Testimony and Reports / Office of Legal Policy. U. S. Department of Justice. 26 Sept 2022. URL: https://www.justice.gov/olp/uniform-language-testimony-and-reports (date accessed: 10.01.2023).

of traces. Guidelines which are based on a probabilistic approach implying that forensic experts should not apply the *individuality* term to identification objects are common to all objects, as this may give the false impression of examining all existing similar objects in nature. It is stressed that a conclusion on identity is only a probable opinion of the forensic expert.

Upon completion of the consideration of the Bayesian approach to evaluation of forensic examination results, it is worth noting that probabilities are most frequently determined not in the course of expert research, but while preliminary experimental-scientific analysis and testing of several models regarding emergence of traces of crimes of various nature. During experiments, the mechanism of formation of traces and their characteristics are determined, which enables to calculate the probability ratio in advance.

We believe that, given a common purpose and conditions of proof, application of the probabilistic approach indicates the introduction of a new standard of proof into forensic expert practice: *the standard of prove beyond a reasonable doubt*.

As demonstrated above, uncertainties conditioning provision of probable answers by a forensic expert emerge not only due to insufficient knowledge of the mechanism of occurrence and properties of traces of committed offense, but also due to mistakes made by forensic experts in the course of researching and evaluating obtained data. Therefore, the probabilistic approach should be applied not only to evaluation of a random coincidence of features in the case of identification of forensic examination objects, but also to possible errors that a forensic expert could have made during laboratory tests and interpretation of obtained results. In contrast to incomplete knowledge or lack of determinism concerning forensic examination objects, errors are perceived as inaccuracies that can be known or discovered during verification [37]. Note that domestic researchers classified expert errors as procedural, methodological and operational [38]. In our viewpoint, the author unreasonably attributed objective current level of knowledge (which is the bases for forensic science) to subjective methodological errors, which are unintentional wrong reasoning. Moreover, instrumental errors are overlooked in the paper.

The possibility of error (mistake) in the course of laboratory analyzes is an integral aspect of every scientific test and, therefore, it cannot be ignored while forensic examination [39]. Errors are made even in the best expert laboratories and even when all test reports are followed [40]. If the possibility of features coincidence is too small (for example, such as in molecular genetic comparisons where the chance of coincidence can be as low as one in a million or even a billion) or, conversely, the possibility of an error in laboratory tests is very likely, it is advisable to

37 Georgiou N., Morgan R. M., French J. C. Op. cit. DOI: 10.1080/00450618.2022.2104370 (date accessed: 10.01.2023).

38 Абрамова В. М. Експертні помилки: сутність, генезис, шляхи подолання : автореф. дис. … канд. юрид. наук. Київ, 2005. С. 11.

39 Cole S. A. More than Zero: Accounting for Error in Latent Print Identification. *The Journal of Criminal Law and Criminology*. 2005. Vol. 95. Is. 3. Pp. 1034, 1073. URL: https://scholarlycommons.law.northwestern.edu/jclc/vol95/iss3/10 (date accessed: 10.01.2023).

40 Thompson W. C. Tarnish on the «Gold Standard»: Understanding Recent Problems in Forensic DNA Testing. *The Champion*. 2006. Vol. 30. Pp. 10—14. URL: https://www.researchgate.net/publication/287959814 (date accessed: 10.01.2023).

request information about errors from the prosecution as admissibility condition of expert evidence in court. Such information is significant not only for drawing expert conclusions but also for assessing evidence value [41]. Since there are no adequate statistics on the frequency of errors made in different laboratories, the prosecution was asked to determine this indicator for a specific laboratory that carried out forensic examination at the prosecution's request [42].

In addition to the probability of features coincidence in compared objects and instrumental errors, foreign authors emphasize subjective errors made by forensic experts in evaluation, interpretation of obtained results on coincidence of features in compared objects (especially when the comparison is made at a qualitative level). Thus, examination of dactyloscopists found that out of 156 forensic experts, only 64 properly identified 5 prints they were supposed to identify and correctly excluded 2 prints they were not supposed to identify. A total of 48 wrong answers were discovered in relation to coincidences. The combined results of these tests have proved that when examining fingerprints, forensic experts are wrong on average 0.8 % of the time [43]. As a result of incorrect interpretation of relevant features, leading experts in dactyloscopy are calling to abandon *absolute conclusions* and insisting on recognizing the probabilistic nature of dactyloscopy evidence [44]. In the mentioned report, it is recommended (in addition to dactyloscopic examination conclusions) to inform the court about the probability of false-positive results obtained on the basis of duly planned verification studies [45].

Within the context of the probabilistic approach, let's return to the *Frye standard* and the *Daubert standard*. Despite the fact that the Daubert standard is of paramount importance today, both standards coexist side by side in American case law. However, oftentimes, instead of carefully considering scientific validity and methodology of expert evidence (in the spirit of the *Daubert standard*, with a stricter approach to evaluation of forensic examination results), judges, not wanting to delve into scientific foundations of performed examination,

41 Sangero B. Safety from Flawed Forensic Sciences Evidence. *Georgia State University Law Review.* 2018. Vol. 34. Is. 4. P. 1141. URL: https://readingroom.law.gsu.edu/cgi/viewcontent.cgi?article=2943&context=gsulr (date accessed: 10.01.2023).

42 Sangero B., Halpert M. Why a Conviction Should Not Be Based on a Single Piece of Evidence: A Proposal for Reform. *Jurimetrics.* 2007. Vol. 48. No. 1. P. 80. URL: https://www.researchgate.net/publication/228296786 (date accessed: 10.01.2023).

43 Haber L., Haber R. N. Error Rates for Human Latent Fingerprint Examiners. Automatic Fingerprint Recognition Systems ; ed. N. Ratha, R. Bolle. Springer r-Verlag New York Inc., 2004. P. 340. URL: https://link.springer.com/chapter/10.1007/0-387-21685-5_17 (date accessed: 10.01.2023).

44 Champod C., Evett I. W. A Probabilistic Approach to Fingerprint Evidence. *Journal of Forensic Identification.* 2001. Vol. 51. Is. 2. P. 110. URL: https://www.researchgate.net/publication/285822580_A_probabilistic_approach_to_fingerprint_evidence (date accessed: 10.01.2023).

45 Report to the President. Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods. Executive Office of the President. President's Council of Advisors on Science and Technology. Sept 2016. P. 91. URL: https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf (date accessed: 10.01.2023).

turn to a more simplified Frye standard and recognize testimony of forensic experts as scientific evidence, relying only on the *recognition of the methodology by the scientific community* [46].

The need for not only objective but also accessible and understandable evaluation criteria (first of all, the results of identification studies) is due to the fact that judges and jurors are not well-versed about forensic examination. Despite the necessity to verify scientific validity of an expert's testimony or conclusion specified in the *Daubert standard* and Rule 702, this requirement is objectively impossible to fulfil. Judges are trained lawyers who have to adopt decisions on a wide range of issues from all areas of life, including scientific ones. At the same time, whenever a forensic expert participates in trial, he/she becomes the authority (in the epistemological sense) whom the judge and jury are unable to question about the research conducted or dispute her/his conclusions, and on whom the judge and jury have to rely in their judgments. However, if this happens, the decision will actually be adopted by a forensic expert, not the court. This situation is only exacerbated by the fact that forensic experts often have polarized opinions (e.g., defense and prosecution experts). It can easily turn a trial into a *"battle of experts"* in which judges and/or juries are presumed to be unable to make a decision [47]. The objective inability of judges and jurors to fully evaluate answers provided by forensic experts is similar to the domestic one, confirming the existence of common global issues in the use of forensic examination in the judicial system of different states. It is worth mentioning that a distinguished criminalist R. S. Bielkin harshly criticized the theory *"forensic expert is a scientific judge"*, which is an echo of the theory of formal evidence; instead, he suggested to clearly define real and publicly available criteria that the investigator and the court should be guided by when evaluating expert conclusions [48].

The current legal regulations require judges to not only consider the probabilistic approach to scientific evidence, which involves disclosing the level of uncertainty to the court, but also to familiarize themselves with the relevant scientific field. They must check the veracity and validity of the scientific method (methodology or technology) used to obtain the data, and evaluate the expert conclusions before adopting a legal decision. In this context, *veracity* is understood as a methodology that allows different experts to obtain the same result at different points in time. *Validity* means that the method corresponds to the purpose for which it was applied. The methodology may be veracious, but not valid. On the contrary, veracity is a prerequisite for validity. If different experts can reach different results or if results can change later then the methodology or

46 Faigman D. L. Admissibility regimes «The Opinion Rule» and Other Oddities and Exceptions to Scientific Evidence, the Scientific Revolution, and Common Sense. *Southwestern University Law Review*. 2008. Vol. 36. P. 701. URL: https://repository.uchastings.edu/cgi/viewcontent.cgi?article=2033&context=faculty_scholarship (date accessed: 10.01.2023).

47 Godden D. M., Walton D. Argument from Expert Opinion as Legal Evidence: Critical Questions and Admissibility Criteria of Expert Testimony in the American Legal System. *Ratio Juris.* 2006. Vol. 19. Is. 3. P. 265. URL: https://scholar.uwindsor.ca/cgi/viewcontent.cgi?article=1003&context=crrarpub (date accessed: 10.01.2023).

48 Белкин Р. С. Курс криминалистики : учеб. пособ. для вузов. Москва, 2001. С. 623.

method cannot be recognized as valid [49]. Therefore, the standard of *substantiation and verification* obliges judges to verify methods (methodologies) applied by the forensic expert, turning them, as mentioned above, into a kind of *"gatekeepers"* protecting the courtroom from scientifically unveracious evidence. This requirement reflects an important guiding principle, which consists in the fact that the court should not recognize evidence provided by a forensic expert only on the basis of her/his authoritative opinion stemming from the principle of ipse dixit (from Latin, *"he said himself"*), that is, uncritically trusting forensic expert's answers without any further substantiation [50].

Conclusions

Procedural, epistemological and doctrinal factors existing in domestic theory and law enforcement practice significantly complicate evaluation of objectivity and veracity of expert conclusions. The most urgent and debatable in legal literature and practice is the problem of assessing admissibility and evidentiary value of probable conclusions conditioned not only by the subjective uncertainty of a forensic expert but also by the results of statistical processing of data obtained with the help of instrumental methods and using information technologies.

The analysis of foreign papers demonstrates that forensic examination is connected with a continuum of uncertainties, which determine the provision of probable conclusions. The source of uncertainty is the mechanism (peculiarities) of crime traces formation, methods of collecting traces at the scene, the level of expertise development, expert research methodologies, interpretation and evaluation of data obtained by the forensic expert. To shape the expert's conviction in research findings, a statistical Bayesian method of establishing the likelihood ratio is proposed, which enables to evaluate significance of versions proposed by the forensic expert and is the basis for the court to take a reasoned decision. Examples of practical application of the mentioned probabilistic approach to developing the expert conclusions are provided in the guidance documents of ENFSI and the US Department of Justice. The probabilistic approach is suggested to be applied both to evaluation of a random coincidence of features in case of identifying forensic examination objects as well as to possible errors in laboratory tests and interpretation of results obtained by the forensic expert.

We believe that theoretical analysis and adaptation of certain provisions of probabilistic approach into expert research findings for domestic use will significantly contribute to innovative development of Ukrainian forensic science in particular and forensic expert activity in general. The above is primarily concerned with the spread of the Bayesian method and application of likelihood ratio concept both in the methodology and in practice of domestic forensic expert activity. The value of the likelihood ratio allows us to conclude on the strength of support and significance of forensic examination results for specific source data of one version compared to the alternative one.

49 Sangero B. Safety from False Convictions. Jerusalem, 2016. P. 104. URL: http://sangero.co.il/wp-content/uploads/2017/11/SAFETY-Sangero-final-280716.pdf (date accessed: 10.01.2023).

50 Gutheil T. G., Bursztajn H. Avoiding Ipse Dixit Mislabeling: Post-Daubert Approaches to Expert Clinical Opinions. *The Journal of the American Academy of Psychiatry and the Law.* 2003. Vol. 31. No. 2. P. 206. URL: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=59696238b68d23de80a2348ee98b3350d7f28051 (date accessed: 10.01.2023).

Оцінка результатів експертного дослідження на підставі ймовірнісного підходу (за матеріалами закордонних публікацій)

Михайло Щербаковський, Анна Проценко

Мета роботи — проаналізувати генезис процесуальних і наукових засад сучасних закордонних стандартів оцінки результатів судово-експертних досліджень; уточнити джерела невизначеності, що спричиняють неоднозначні експертні висновки; обґрунтувати необхідність застосування імовірнісного (баєсівського) підходу до формулювання відповідей експертів. Для досягнення поставленої мети обрано такі методи дослідження: історико-правовий; системно-структурний; порівняльно-правовий; формально-юридичний. Названо процесуальні, гносеологічні та доктринальні чинники, які ускладнюють оцінку об'єктивності й достовірності висновку експерта у вітчизняній правозастосовній практиці. Проаналізовано стандарти оцінки експертних доказів у світі в різний час (загального визнання Frye standard, обґрунтування та перевірки Daubert standard, правдоподібності поза розумним сумнівом). Акцентовано, що надання ймовірних висновків експерта обумовлено континуумом невизначеностей, джерелом яких є особливості утворення слідів правопорушень і способи збирання слідів на місці події, рівень розвитку експертних знань і методики експертного дослідження, інтерпретування і оцінка результатів експертизи. Для формування переконання експерта в результатах дослідження запропоновано статистичний баєсівський метод установлення відношення правдоподібності, що дає змогу оцінити значущість версій, висунутих експертом, та є підставою для ухвалення судом обґрунтованого рішення. Імовірнісний підхід запропоновано застосовувати як до оцінки випадкового збігу ознак у разі ідентифікації об'єктів експертизи, до можливих помилок лабораторних випробувань, так і до інтерпретування експертом здобутих результатів.

Ключові слова: *судова експертиза, висновок експерта; імовірність, достовірність, невизначеність висновку експерта; стандарти доказування Frye та Daubert; відношення правдоподібності; теорема Баєса.*

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Authors declare no conflict of interest.

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Epistemological Characteristic and Procedural Significance of Steps and Stages of Appointing and Conducting Forensic Veterinary Examination

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The Research Purpose is to single out epistemological characteristics of steps of appointing and conducting forensic veterinary examination and to reveal their procedural significance for pre-trial investigation and trial of cases concerning animals. It has been proven that these steps differ by subject, purpose, methods and include their own components: 1) preparation of materials and appointment of forensic veterinary examination (adopting a decision on forensic examination appointment; singling out forensic examination subject; defining forensic examination category according to procedural features; order of its performance, choosing time for its conduct; preparing source information; obtaining objects for subsequent research; selection of the conducting subject; issuance of a procedural document on forensic examination appointment and the accused's (suspect, defendant) familiarization with its content; determining feasibility of the presence of process participants while forensic examination; sending the procedural document on forensic examination appointment and research objects to the conducting subject; interaction between subjects involved in appointment and conduct of forensic examination); 2) carrying out research by a forensic expert using specific veterinary expertise; 3) research, evaluation and verification of the expert conclusion (seeking clarifications from a forensic expert

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or interrogating him/her in court; appointment of additional examination or re-examination (if needed); acquainting the parties with the expert conclusion). The research methodological basis is the systematic approach (general scientific and special scientific methods).

Keywords: *forensic veterinarian; steps of appointing and conducting forensic veterinary examination; forensic examination appointment subject; stages of materials preparation for forensic veterinary examination; epistemological characteristic.*

Research Problem Formulation

The most complete and well-developed procedural form of applying specific expertise in court proceedings is forensic examination, as rightly stressed by S. F. Briukhan [1]. The significance of forensic examination lies in the fact that it provides judiciary with research findings on any proceedings (cases), and is also one of the means of ensuring human rights and freedoms [2].

In scientific sources, emphasis is made on the issue of appointing and conducting forensic examinations, especially on the development of the modern theoretical framework of forensic expert activity in Ukraine [3], in particular under globalization conditions [4]. As the expert conclusion is a source of evidence (oftentimes: the most vital), postponing appointment of a forensic examination delays the pre-trial investigation and may lead to the closure of a criminal proceeding without achieving appropriate outcomes [5].

In particular, the reform of forensic expert activity in Ukraine was reflected in the introduction of new types of forensic examinations, one of which is forensic veterinary examination. Currently, the latter is being actively developed by specialists of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute»of the Ministry of Justice of Ukraine (hereinafter referred to as *NSC «Hon. Prof. M. S. Bokarius FSI»*). Kharkiv Scientific School of Forensic Veterinarians develops its own theoretical framework,

1 Брюхань С. Ф. Проблемні питання підготовки матеріалів для проведення судово-почеркознавчих експертиз. *Актуальні питання судової експертизи і криміналістики* : зб. мат-лів міжнар. наук.-практ. конф.-полілогу (Харків, 15—16.04.2021). Харків, 2021. С. 115—116.

2 Клюєв О. М. Удосконалення експертного забезпечення правосуддя: теоретичні, правові та організаційні аспекти. *Теорія та практика судової експертизи і криміналістики*. 2019. Вип. 19. С. 102—117. DOI: 10.32353/khrife.1.2019.08 (date accessed: 15.03.2023).

3 Угровецький О. П., Маланчак В. Є. Напрямки формування сучасного теоретичного підґрунтя судово-експертної діяльності в Україні. *Судова експертиза: сучасність та майбутнє* : зб. мат-лів кругл. столу (Львів, 25.01.2018). Львів, 2018. С. 132—135.

4 Кіпоурас П., Овсянникова І. Судово-експертна діяльність в умовах глобалізації. *Теорія та практика судової експертизи і криміналістики.* 2021. Вип. 3 (25). С. 169—184. DOI: 10.32353/khrife.3.2021.12 (date accessed: 15.03.2023).

5 Сімакова-Єфремян Е. Б. Про необхідність удосконалення законодавства щодо здійснення судово-експертної діяльності в Україні. *Ibid.* 2019. Вип. 19. С. 118—129. DOI: 10.32353/khrife.1.2019.09 (date accessed: 15.03.2023).

methodology and praxeology [6]. At the same time, the issue of developing and substantiating the stages of material preparation by an authorized person (body) for appointment and conduct of forensic examination, specifically forensic veterinary examination, has been addressed since this stage is of primary importance for criminal procedure, processes in other areas of law, theory and practice forensic science.

Therefore, a proper understanding of procedural significance of material preparation stages when it comes to appointing and conducting forensic veterinary examination is vital for a clear and substantiated determination of grounds for appointment and conduct of such forensic examination, as well as for ensuring correct implementation of the legal norms of this procedure.

Analysis of Essential Researches and Publications

Forensic veterinary examination is a means of providing evidence and powerful tools for asserting the truth in court proceedings of both Ukraine [7] and foreign countries [8] in cases involving animals, concerning: cruel treatment [9]; violation of animal welfare

6 Яценко І. В. Вплив новітніх наукових здобутків Харківської наукової школи судово-ветеринарних експертів на ефективність призначення та проведення судово-ветеринарної експертизи. *Progressive Research in the Modern World* : Proceedings of VI International Scientific and Practical Conference (March 2—4, 2023). BoScience Publisher, Boston, USA, 2023. Pp. 27—44. URL: https://sci-conf.com.ua/wp-content/uploads/2023/03/PROGRESSIVE-RESEARCH-IN-THE-MODERN-WORLD-2-4.03.23.pdf (date accessed: 02.03.2023).

7 Синоверська Т. І. Міжнародний досвід розслідування жорстокого поводження з тваринами та напрями його запровадження у вітчизняну практику. *Науковий вісник публічного та приватного права.* 2019. Вип. 1. Т. 1. С. 222—228. DOI: 10.32844/2618-1258.2019.1-1.38 (date accessed: 02.03.2023) ; Уварова Н. В. До проблеми кримінальної відповідальності за жорстоке поводження з тваринами. *Науковий вісник Дніпропетровського державного університету внутрішніх справ.* 2018. № 4 (97). С. 138—140. DOI: 10.31733/2078-3566-2018-6-138-140 (date accessed: 02.03.2023) ; Полтава К. О. Кримінологічна оцінка рівня і динаміки жорстокого поводження з тваринами в Україні та напрями його запобігання. *Право і суспільство*. 2020. № 1. Ч. 2. С. 129—136. DOI: 10.32842/2078-3736/2020.1-2.22 (date accessed: 15.03.2023).

8 Stern A. W., McEwen B., McDonough S. P., Viner T., Brooks J. W., Kagan R., Brower A. Veterinary forensic pathology standards. *Journal of Forensic Science*. 2021. Vol. 66. Is. 3. Pp. 1176. DOI: 10.1111/1556-4029.14683 (date accessed: 15.03.2023) ; Kritchevsky J. Adding evidence-based medicine to forensic evidence. *Veterinary Journal.* 2014. Vol. 199. Is. 3. Pp. 315—316. DOI: 10.1016/j.tvjl.2013.10.039 (date accessed: 15.03.2023) ; Cooper J. E., Cooper M. Veterinary involvement in forensic medicine. *The Veterinary Record.* 2021. Vol. 189. Is. 6. Pp. 249—250. DOI: 10.1002/vetr.1004 (date accessed: 15.03.2023).

9 Hannah H. W. The Impact of Animal Welfare and Animal Anti-Cruelty Laws on Veterinarians. *Veterinary Clinics of North America: Small Animal Practice.* 1993. Vol. 23. Is. 5. Pp. 1109—1119. DOI: 10.1016/s0195-5616(93)50139-0 (date accessed: 15.03.2023) ; Monsalve S., Souza de P. V., Lopes A. S., Leite L. O., Polo G., Garcia R. Veterinary Forensics, Animal Welfare and Animal Abuse: Perceptions and Knowledge of Brazilian and Colombian Veterinary Students. *Journal of Veterinary Medical Education*. 2021. Vol. 48. Is. 6. Pp. 640—648. DOI: 10.3138/jvme-2019-0138 (date accessed: 10.03.2023) ; Bartelink E. J., Clinkinbeard Sh., Spessard C., Kilmartin A., Spangler W. L. Documenting non-accidental injury patterns in a dog abuse investigation: A collaborative approach between forensic anthropology and veterinary pathology. *Journal of Forensic Science.* 2022. Vol. 67. Is. 2. P. 756—765. DOI: 10.1111/1556-4029.14948 (date accessed: 15.03.2023).

conditions [10]; traffic collisions [11]; thefts [12]; sudden death [13]; deliberate poisoning [14] and starvation [15]; deaths [16]; electric shock [17]; drowning [18]; infliction of injuries [19],

10 Väärikkälä S., Koskela T., Hänninen L., Nevas M.. Evaluation of Criminal Sanctions Concerning Violations of Cattle and Pig Welfare. *Animals*. 2020. Vol. 10. Is. 4. P. 715. DOI: 10.3390/ani10040715 (date accessed: 15.03.2023).

11 Campos Fonseca Pinto de A. C. B., Massad M. R. R., Ribas L. M., Baroni C. O., Tremori T. M., Reis S. T. J., Rocha N. S. Complete cardiac and bronchial avulsion in a dog: Post-mortem computed tomography and forensic necropsy analysis. *Journal of Forensic Radiology and Imaging*. 2017. Vol. 8. Pp. 45—47. DOI: 10.1016/j.jofri.2016.11.006 (date accessed: 15.03.2023).

12 Rubini S., Barbieri S., Gaudio R. M., Govoni G., Berna G. R., Fico R., Lorenzini R., Fontana M. C., Taddei R., Tassinari M. at all. Veterinary forensic sciences to solve a fatal case of predation on flamingos (*Phoenicopterus roseus*). *Veterinaria Italiana*. 2018. Vol. 54. Is. 2. Pp. 175—180. DOI: 10.12834/VetIt.1360.7488.1 (date accessed: 15.03.2023).

13 Piegari G., Cardillo L., Alfano F., Vangone L., Iovane V., Fusco G. Pathological, Bacteriological and Virological Findings in Sudden and Unexpected Deaths in Young Dogs. *Animals*. 2020. Vol. 10. Is. 7. P. 1134. DOI: 10.3390/ani10071134 (date accessed: 15.03.2023).

14 Fukushima A. R., Peña-Muñoz J. W., Leoni L. A. B., Nicoletti M. A., Ferreira G. M., Delorenzi J. C. M. O. B., Ricci E. L., Brandão M. E., Paula Pantaleon de L., Gonçalves-Junior V., Waziry P. A. F., Maiorka P. C., Souza Spinosa de H. Development, Optimization, and Validation of Forensic Analytical Method for Quantification of Anticholinesterase Pesticides in Biological Matrices from Suspected Cases of Animal Poisoning. *Toxics*. 2022. Vol. 10. Is. 5. Art. 269. DOI: 10.3390/toxics10050269 (date accessed: 15.03.2023) ; Botelho A. F. M., Machado A. M. D., da Silva R. H. S., Faria A. C., Machado L. S., Santos H., Braga S. D., Torres B. B. J., Miguel M. P., Chaves A. R., Melo M. M. Fatal metaldehyde poisoning in a dog confirmed by gas chromatography. *BMC Veterinary Research*. 2020. Vol. 16. Is. 1. Art. 139. DOI: 10.1186/s12917-020-02348-w (date accessed: 15.03.2023).

15 Ricci E., D'Aquino I., Paciello O., Whitfield V., Ressel L. Quantitative histologic evaluation reveals different degree of liver atrophy in cachectic and starved dogs. *Journal of Veterinary Diagnostic Investigation*. 2022. Vol. 34. Is. 6. Pp. 937—943. DOI: 10.1177/10406387221128326 (date accessed: 15.03.2023).

16 Moore M. J., van der Hoop J., Barco S. G., Costidis A. M., Gulland F. M., Jepson P. D., Moore K. T., Raverty S., McLellan W. A. Criteria and case definitions for serious injury and death of pinnipeds and cetaceans caused by anthropogenic trauma. *Diseases of Aquatic Organisms*. 2013. Vol. 103. Is. 3. Pp. 299—264. DOI: 10.3354/dao02566 (date accessed: 15.03.2023).

17 Viner T. C., Kagan R. A., Lehner A., Buchweitz J. P. Anticoagulant exposure in golden eagle (*Aquila chrysaetos*) power line electrocution and wind turbine mortalities. *Journal of Wildlife Diseases*. 2022. Vol. 58. Is. 2. Pp. 348—355. DOI: 10.7589/JWD-D-21-00144 (date accessed: 15.03.2023).

18 Piegari G., Biase De D., d'Aquino I., Prisco F., Fico R., Ilsami R., Pozzato N., Genovese A., Paciello O. Diagnosis of Drowning and the Value of the Diatom Test in Veterinary Forensic Pathology. *Frontiers in Veterinary Science*. 2019. Vol. 6. Art. 404. DOI: 10.3389/fvets.2019.00404 (date accessed: 15.03.2023).

19 Neto R. L. A. L. T., Vieson M. D. Brain Tissue Pulmonary Embolism Due to Severe Blunt Force Head Trauma in a Dog. *Journal of Comparative Pathology*. 2020. Vol. 175. Pp. 75—78. DOI: 10.1016/j.jcpa.2020.01.001 (date accessed: 15.03.2023) ; Hsiou Ch.-L., Hsu Ch.-Ch., Liao P.-W., Yang F.-H., Lee A. N., Huang W.-H. Forensic Death Investigations of Dog Bite Injuries in 31 Cats. *Animals (Basel)*. 2022. Vol. 12. Is. 18. Art. 2404. DOI: 10.3390/ani12182404 (date accessed: 15.03.2023).

mutilations [20], gunshot injuries [21] and injuries of the musculoskeletal system and internal organs [22], etc.

The majority of researchers, including the author of this research paper, analyzed the issue of appointment and conduct of forensic examinations [23]. Certainly, their achievements contributed to resolution of certain issues, although particular issues have not been dully addressed by researchers to date.

Many Ukrainian theoreticians and practitioners have devoted their research to procedural issues of appointing various types of forensic examinations, namely: S. F. Briukhan [24] (preparation of materials during appointment of forensic handwriting examinations: the algorithm of actions of an authorized person carrying out pre-trial investigation); O. V. Hladilina [25] (forensic medical examinations during investigation of intentional homicides; interaction of pre-trial investigation agencies with state specialized forensic medicine institutions); S. O. Ivanytskyi [26] (forensic trace evidence analyses); M. H. Polishchuk [27] (forensic examination as a form of specific expertise application in civil procedure); M. H. Shcherbakovskyi [28], E. B. Simakova-Yefremian [29], Ye. I. Makarenko [30], A. M. Lazebnyi and I. I. Bozhuk [31] (forensic experts in a criminal proceeding);

20 Hull K. D., Jeckel S., Williams J. M., Ciavaglia Sh. A., Webster L. M. I., Fitzgerald E., Chang Y.-M., Martineau H. M. Fox (*Vulpes vulpes*) involvement identified in a series of cat carcass mutilations. *Veterinary Pathology*. 2022. Vol. 59. Is. 2. Pp. 299—309. DOI: 10.1177/03009858211052661 (date accessed: 15.03.2023).

21 Bradley-Siemens N., Brower A. I. Veterinary Forensics: Firearms and Investigation of Projectile Injury. *Veterinary Pathology.* 2016. Vol. 53. Is. 5. Pp. 988—1000. DOI: 10.1177/0300985816653170 (date accessed: 15.03.2023).

22 DeLay J. Postmortem findings in Ontario racehorses, 2003—2015. *Journal of Veterinary Diagnostic Investigation.* 2017. Vol. 29. Is. 4. Pp. 457—464. DOI: 10.1177/1040638717700690 (date accessed: 02.03.2023).

23 Яценко І. В. Проблеми укладання уповноваженою особою постанови про призначення судово-ветеринарної експертизи та шляхи їх вирішення. *Форум Права.* 2022. Вип. 73. № 2. С. 6—21. DOI: 10.5281/zenodo.6471059 (date accessed: 02.03.2023).

24 Брюхань С. Ф. Op. cit.

25 Гладіліна О. В. Призначення судово-медичних експертиз: проблеми та перспективи. *Актуальні проблеми вітчизняної юриспруденції.* 2018. № 2. Т. 2. С. 61—63.

26 Іваницький С. О. До питання призначення трасологічної експертизи. *Актуальні питання судової експертизи і криміналістики* : зб. мат-лів міжнар. наук.-практ. конф.-полілогу (Харків, 15—16.04.2021). Харків, 2021. С. 169—170.

27 Поліщук М. Г. Експертиза як форма використання спеціальних знань у цивільному процесі. *Юридичний науковий електронний журнал.* 2021. № 3. С. 125—127. DOI: 10.32782/2524-0374/2021-3/30 (date accessed: 02.03.2023).

28 Щербаковський М. Г. Обов'язкове призначення судових експертиз у кримінальному провадженні. *Теорія та практика судової експертизи і криміналістики.* 2016. Вип. 16. С. 148—157.

29 Сімакова-Єфремян Е. Б. До питання про призначення та проведення судової експертизи у кримінальному процесі України. *Сучасні напрями розвитку судової експертизи та криміналістики* : тези доп. наук.-практ. конф., присвяч. пам'яті Засл. проф. М. С. Бокаріуса (Харків, 20.12.2016). Харків, 2016. С. 254—256.

30 Макаренко Є. І., Здор В. М. Проблеми призначення судової експертизи у кримінальному провадженні. *Право і суспільство.* 2019. № 3. С. 218—222. DOI: 10.32842/2078-3736-2019-3-1-36 (date accessed: 02.03.2023).

31 Лазебний А. М., Божук І. І. Актуальні питання призначення криміналістичних судових експертиз в Україні. *Актуальні проблеми права: теорія і практика.* 2021. № 1 (41). С. 68—76. DOI: 10.33216/2218-5461-2021-41-1-68-76 (date accessed: 02.03.2023).

R. L. Stepaniuk and V. V. Ionova [32] (forensic molecular genetic examination at the stage of pre-trial investigation).

As a result, when the steps of appointment and conduct of forensic veterinary examination lack epistemological characteristic and procedural significance, it negatively affects the practice of conducting forensic veterinary examination, leading to unjustified refusals to perform it, its substitution with alternative procedural actions, and asking questions that exceed the forensic expert's competence, etc.

Article Purpose

To single out epistemological characteristics of the steps of appointment and conduct of forensic veterinary examination and to reveal their procedural significance for pre-trial investigation and trial of cases related to offenses against life and health of animals.

Research Methods

The research methodological basis is a systematic approach conditined by the specifics of the discussed topic and associated with the use of general scientific and special scientific methods, including:

- *analysis, synthesis, analogy*: to define the essence of the categorical apparatus of epistemological characteristic and procedural significance of the steps of appointment and conduct of forensic veterinary examination;
- *formal and logical:* to organize the algorithm of appointment and conduct of forensic veterinary examination;
- *logical and grammatical:* to clarify etymological content of the concept of *steps of appointing and conducting forensic veterinary examination;*
- *logical and legal:* to research and resolve problematic issues of legal norms;
- *system and structural:* to systematize and structure issues on the appointment and conduct of forensic veterinary examination
- *modeling:* to forecast and develop issues of appointment and conduct of forensic veterinary examination, as well as outline ways of its improvement.

Main Content Presentation

The regulatory and legal framework governing the procedure for forensic examination appointment, in particular forensic veterinary examination, is the Criminal Procedure Code of Ukraine [33], Civil Procedure Code of Ukraine [34], Code of Commercial Procedure of Ukraine [35], Code of Administrative Proceedings of Ukraine [36],

32 Степанюк Р. Л., Іонова В. В. Призначення судової молекулярно-генетичної експертизи на стадії досудового розслідування: проблеми та шляхи їх вирішення. *Вісник Луганського державного університету внутрішніх справ ім. Е. О. Дідоренка.* 2020. Вип. 3 (91). С. 307—319. DOI: 10.33766/2524-0323.91.307-319 (date accessed: 02.03.2023).

33 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

34 Цивільний процесуальний кодекс України від 18.03.2004 р. № 1618-IV (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

35 Господарський процесуальний кодекс України від 06.11.1991 р. № 1798-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

36 Кодекс адміністративного судочинства України від 06.07.2005 р. № 2747-IV (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

Law of Ukraine *On Judicial Examination* (hereinafter referred to as *the specialized law*) [37], Instructions on the Appointment and Conduct of Forensic Examinations and Expert Research (hereinafter referred to as *Instructions No. 1*) [38], Instructions on the Peculiarities of Carrying Out Forensic Expert Activity by Certified Forensic Experts Who Do Not Work in State Specialized Forensic Science Institutions (hereinafter reffered to as *Instructions No. 2*) [39], Scientific and Methodological Guidelines on the Preparation and Appointment of Forensic Examinations and Expert Research (hereinafter referred to as *the specialized SMGs*) [40].

It is appropriate to note that we fully share the scientific position expressed by Yu. I. Azarov [41] as to the need to replace special terms used in the current legislation of Ukraine on forensic expert activity. Specifically, the author suggests replacing the term *examination* with *forensic examination*, the term *expert* with *forensic expert*, and the term *expert conclusion* with *forensic expert conclusion*. Such a principled approach will define a specific field of expert activity: forensic, and not any other.

As is known, appointment of forensic examination at the pre-trial investigation stage is a procedural action of an authorized person (public prosecutor, investigator, inquiring officer) or investigating judge to establish factual data and circumstances with the help of specific expertise. Appointment and conduct of forensic examination in criminal proceedings is possible only after the opening of a criminal proceeding and the drawing up of a procedural document on its appointment by the authorized person (body). In other types of court proceedings: after the conclusion of a contract with a private forensic expert or a forensic science institution at the written request of a person (clause 1.8 of Section I of Instructions No. 1 [42]) or upon issuance of the court ruling if the examination was appointed by the court (Arts. 103–104 of the Civil Procedure Code of Ukraine [43]).

The grounds for appointing forensic examination in a criminal proceeding

37 Про судову експертизу : Закон України від 25.02.1994 р. № 4038-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 02.03.2023).

38 Інструкція про призначення та проведення судових експертиз та експертних досліджень : затв. наказом Мін'юсту України від 08.10.1998 р. № 53/5 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

39 Інструкція про особливості здійснення судово-експертної діяльності атестованими судовими експертами, що не працюють у державних спеціалізованих експертних установах : затв. наказом Мін'юсту України від 12.12.2011 р. № 3505/5 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z1431-11#Text (date accessed: 02.03.2023).

40 Науково-методичні рекомендації з питань підготовки та призначення судових експертиз та експертних досліджень : затв. наказом Мін'юсту України від 08.10.1998 р. № 53/5 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

41 Азаров Ю. І. Щодо окремих питань призначення та проведення експертизи у кримінальному провадженні. *Наукове забезпечення досудового розслідування: проблеми теорії та практики* : зб. тез доп. V Всеукр. наук.-практ. конф. (Київ, 08.07.2016). Київ, 2016. С. 34—36. URL: https://www.naiau.kiev.ua/files/naukova-diyalnist/naukovi-zaxodi/zbirnuki/2016/zbirn_nayk_zabezpech.pdf (date accessed: 02.03.2023).

42 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 25.03.2023).

43 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

are a decision of the authorized person conducting pre-trial investigation, availability of motions from the participants in criminal procedure, the legal norm that emphasizes the need for forensic examination appointment, recommendations from special forensic methodologies related to investigating certain types of offenses. A procedural document issued by the authorized person (body) on the appointment of forensic examination (the judgment of the investigating judge or the ruling of the public prosecutor, investigator, inquiring officer (at the stage of pre-trial investigation) or court (at the stage of judicial investigation)) initiates procedural relations between the subjects involved in appointment and conduct of forensic examination. Organizational, control functions and functions related to procurement of forensic examination are assigned to the head of an institution in which it is performed (clauses 1.10 and 1.11 of Section I of Instructions No. 1 [44]).

The basis for appointing forensic veterinary examination is the need to incorporate specific veterinary expertise. In each specific case, these circumstances are determined by the authorized person (body) who appoints forensic veterinary examination or involves a forensic expert.

In the light of the above, it should be emphasized that the need to carry out forensic veterinary examination arises when it is necessary to carry out research using specific scientific expertise in veterinary medicine in order to clarify circumstances essential for a case; when there is a doubt about veracity of data obtained in the course of investigation; when it is vital to check the version put forth by an authorized person who conducts pre-trial investigation. Let's stress that there is no need to appoint forensic veterinary examination if factual data and circumstances of an offense can be established quite effectively by conducting other investigative actions: interrogation, inspection, search, etc. However, such situations do not take place often.

The process of appointing and conducting forensic veterinary examination, as well as any other forensic examination, consists of three steps *(see Fig. 1)*.

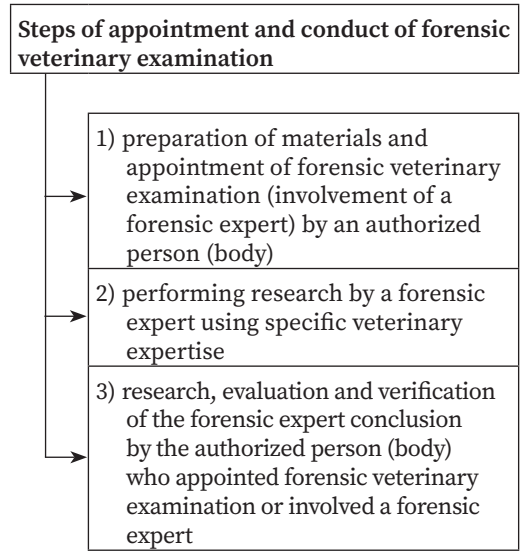


Fig. 1. Steps of appointment and conduct of forensic veterinary examination

Please note that the outlined steps differ in subject, purpose, and methods. Additionally, each of the stages has its own components. Let's describe each of them.

According to the right opinion of M. H. Shcherbakovskyi, preparation of materials for forensic examination appointment is a system of procedural, organizational, tactical and technical actions for collection, preparation and registration of forensic research objects needed for

44 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 25.03.2023).

forensic examination [45]. As stated by the author of this research, the specialist (expert) who is involved in the investigation by an authorized person (body) is of particular importance for forensic veterinary examination preparation. Most frequently, this is scene inspection or inspection of a place where the animal carcass was found [46].

A favorable situation for a specialist's participation in investigative actions is as follows: *first,* the specialist purposefully helps the authorized person conducting the pre-trial investigation in a proper seizure of various material sources of information since it is a specialist who possesses knowledge about features of objects and about essential possibilities of conducting subsequent forensic veterinary examination*; secondly,* the specialist is able to examine not individual objects and traces artificially isolated from the environment in which they were found for research in laboratory conditions, but the entire set of these traces, which form a comprehensive understanding of a crime event. For example, a description of distinguishing features of a corpse (species, sex, age, breed), evaluation of body, indicating a posture and arrangement of various body parts of the animal carcass, establishing cadaveric phenomena (corpse cooling, rigor mortis, livor mortis, cadaveric dessication, autolysis, putrefactive changes); description of the condition of the skin and its derivatives, individual parts of the body and organs accessible for inspection from the outside; finding out localization and nature of injuries, existence of blood-like traces and other layers on the animal's corpse and on other objects found at the scene; deathbed description. In light of the above, the peculiarity of trace evidence is that it can be studied as an independent, holistic formation within the diverse system of system-structural connections.

I step. Preparation of materials and appointment of forensic veterinary examination (involvement of a forensic expert) by an authorized person (body)

The specifics of the *first stage* of appointing forensic veterinary examination is to investigate the event circumstances, put forward versions about the event, identify the physical source of information and address a task for the forensic veterinarian. This stage of preparation of materials and appointment of forensic veterinary examination includes stages, the list of which is provided in fig. 2.

Let's provide a more detailed description of each stage.

1. Adoption of a decision to appoint forensic veterinary examination by an authorized official

In order to make an informed decision regarding the necessity of conducting forensic veterinary examination within a criminal proceeding, as well as to determine its potential and effectiveness for pre-trial investigation of offenses [47], it is necessary to analyze an investigative situation, determine the mechanism of the offense, and identify the interacting objects.

45 Щербаковский М. Г. Судебные экспертизы: назначение, производство, использование : учеб.-практ. пособ. Харьков, 2005. С. 187.

46 Яценко І. В. Проблеми використання спеціальних ветеринарних знань під час огляду трупа тварини на місці події та шляхи їх вирішення. *Юридичний науковий електронний журнал*. 2023. № 1. С. 485—505. DOI: 10.32782/2524-0374/2023-1/114 (date accessed: 15.03.2023).

47 Яценко І. В., Дереча Л. М. Можливості судово-ветеринарної експертизи як нового виду судових експертиз. *Теорія та практика судової експертизи і криміналістики*. 2019. Вип. 19. С. 550—567. DOI: 10.32353/khrife.1.2019.044 (date accessed: 15.03.2023).

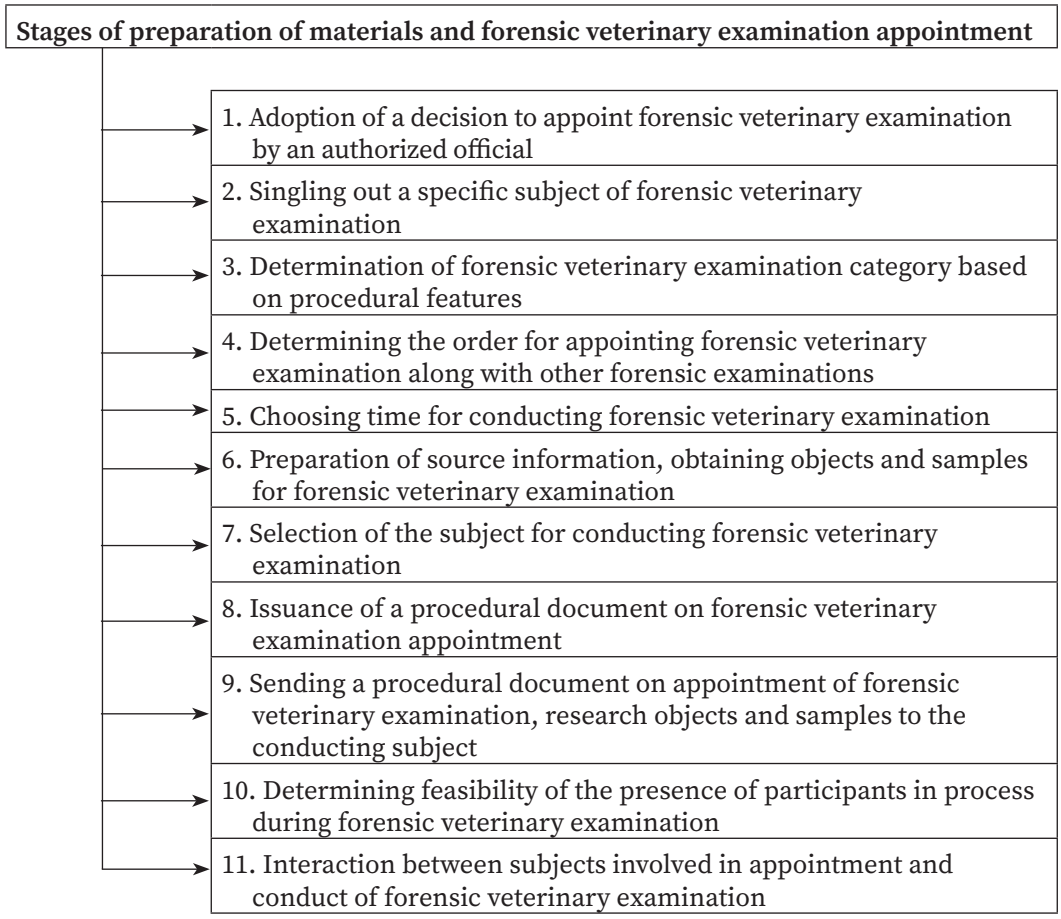


Fig. 2. Stages of preparation of materials and forensic veterinary examination appointment

Based on personal experience in forensic veterinary examination, it should be noted that quite often the subjects responsible for appointing forensic examination are not sufficiently familiar with its procedure, especially investigators and inquiring officers who may be appointing it for the first time. Scientific and methodological guidelines have been developed and published to assist units of the National Police of Ukraine in providing information on peculiarities of appointing forensic veterinary examinations and organization of proving these facts in criminal proceedings [48].

48 Цуцкіридзе М. С., Орлова Т. А., Яценко І. В. та ін. Криміналістична характеристика проявів жорстокого поводження з тваринами. Особливості призначення судово-ветеринарної експертизи та організація доказування цих фактів у кримінальних провадженнях / Як захистити тварин від жорсткого поводження: організаційні, кримінальні, кримінальні процесуальні та криміналістичні аспекти : наук.-метод. рек. для підрозд. Нацполіції України. Харків, 2023. 87 с.

Forensic examinations are appointed for two primary reasons: *firstly*, based on direct provisions of the law, and *secondly*, when establishing factual data relevant to the case necessitates specific expertise application. It should be emphasized that assessing the cause of an animal's death (for example, in cases of improper veterinary care) or determining harm inflicted on health (for instance, excessive presence of xenobiotics or any pathogens in feeds or feed additives, particularly those life-threatening to animals and capable of causing poisoning), or establishing the severity of harm inflicted on an animal's health (such as physical injuries or mutilation) etc., cannot be accomplished by any means other than through conduct of forensic veterinary examination with the use of specific veterinary expertise [49].

However, in the current Criminal Procedure Code, there are no direct legal norms on mandatory conduct of forensic veterinary examination, unlike forensic medical examination (Part 2 of Article 242 of the Criminal Procedure Code [50]), therefore we suggest amending Part 2 of Art. 242 *Grounds for expert examination* of the Criminal Procedure Code by adding paragraphs 7 and 8 of the following content:

"7) establishing the cause of an animal's death;

8) ascertaining the severity of harm and the nature of physical injuries inflicted on the animal's health."

It worth noting that unjustified refusal by an authorized person to appoint forensic veterinary examination during pre-trial investigation may result in an incomplete examination of evidence, which in turn can lead to the return of a criminal proceeding for further investigation.

According to procedural legislation, forensic examination (in particular, forensic veterinary examination) is appointed upon the request of the parties to a criminal proceeding, as well as on behalf of the investigative judge, court, or authorized person conducting pre-trial investigation, in accordance with the requirements of Part 1 of Article 242 of the Criminal Procedure Code [51]. The Criminal Procedure Code also regulates the procedure for involving a forensic expert (Article 243), consideration by the investigating judge of a motion to conduct forensic examination (Article 244), and conduct of forensic examination upon the court ruling (Article 332 of the Criminal Procedure Code) [52].

The Civil Procedure Code stipulates: appointment of expert examination by the court (Article 103), passing of a ruling by the court on the appointment of an expert examination (Article 104), conducting an expert examination at the request of the case parties (Article 106), collection of materials for expert examination (Article 107) [53].

The Code of Commercial Procedure of Ukraine envisages appointment of expert examination by the court (Article 99), a ruling on the appointment of examination (Article 100), conducting an

49 Яценко І. В. Предмет судово-ветеринарної експертизи та його значення в теорії і практиці судової експертизи. *Науковий вісник Ужгородського Національного Університету. Серія Право.* 2022. Вип. 73. Т. 2. С. 163, 165. DOI: 10.24144/2307-3322.2022.73.55 (date accessed: 25.03.2023).

50 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 25.03.2023).

51 Ibid.

52 Ibid.

53 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

expert examination at the request of the case parties (Article 101), collection of materials for expert examination (Article 102) [54].

The Code of Administrative Proceedings of Ukraine stipulates appointment of an expert examination by the court (Article 102), the court's ruling on the appointment of an expert examination (Article 103), conducting an expert examination at the request of the case parties (Article 104), and collection of materials for expert examination (Article 105) [55].

Let us emphasize that the customer of forensic veterinary examination must specify in the motion specific questions to which a forensic veterinarian should provide answers. The subject responsible for appointing forensic veterinary examination shall approve the request of the participants in the process to order and conduct forensic examination when circumstances requiring expert analysis may be relevant to a criminal proceeding and cannot be established by other means (i.e., interoggation, search, etc.). If the motion on forensic veterinary examination appointment is wholly or partially rejected, the grounds for refusal must be justified.

2. Singling out a specific subject of forensic veterinary examination

The subject of forensic veterinary examination encompasses a set of factual data and circumstances in a proceeding (case) related to the harm inflicted on the health and life of an animal (in particular: the nature, mechanism, sequence, severity, injuries inflicted before or after death, and age of formation of physical injuries; occurrence and spread of diseases; cause of mutilation or death; defective provision of veterinary care; safety and quality of feeds and feed additives), which the forensic veterinarian determines using specific expertise in order to solve identification, diagnostic, and situational tasks [56].

Understanding the subject of forensic veterinary examination enables the subject of its appointment to:

- formulate questions that simultaneously serve as tasks assigned to the forensic expert for resolution;
- outline the range of factual data that should be established through expert means;
- provide the forensic science institution or private forensic expert only with those material objects that serve as physical data carriers (within the subject matter of a specific forensic veterinary examination or multidsciplinary forensic examination).

In practice, preference is given to the integrated approach: simultaneous consideration of multiple criteria allows for accurate identification of the subject of forensic veterinary examination and proper formulation of a clear set of questions that the forensic expert must address.

3. Determination of forensic veterinary examination category based on procedural features

The class, type and kind of forensic examination in accordance with its classification by specific expertise depend on the nature of a data carrier (provided for researching forensic examination object)

54 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

55 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

56 Яценко І. В. Предмет судово-ветеринарної експертизи … . С. 154—173. DOI: 10.24144/2307-3322.2022.73.55 (date accessed: 01.04.2023).

and the factual data and circumstances to be established (forensic examination subject) [57]. The categories of forensic veterinary examination are also differentiated by procedural features: preliminary (main), additional, re-examination, commission, or multidisciplinary. Research on objects oftentimes necessitates the application of specific expertise from several scientific fields (for example, the establishment of species affiliation of skeletal bones or individual animal remains requires expertise from veterinary science, biology, and molecular genetics; cases involving poisoning: expertise from veterinary science, chemistry, and/or toxicology may be required). In such cases, *multidisciplinary forensic examination* is appointed (for example, forensic veterinary-biological, veterinary-molecular-genetic, veterinary-medical, or veterinary-trace evidence, etc.).

The subject of *re-examination* or *additional forensic examination*, in addition to providing the examination object(s), submits conclusions of previous examinations with all annexes, as well as additional materials related to forensic examination subject collected after a preliminary conclusion was provided. The procedural document on appointing forensic examination (involving a forensic expert) justifies reasons for such appointment (clause 3.3, Section III, Instructions No. 1 [58]). The expediency of such a procedure is confirmed by the author's own practice as a forensic expert.

4. Determining the order for appointing forensic veterinary examination along with other forensic examinations

Forensic veterinary examination can be a component of a set of different forensic examinations related to the same object or group of objects, comprehensive research within a single forensic examination. From an epistemological perspective, these concepts are similar, but they have procedural differences, although they generally indicate an integrated approach to forensic examination subject.

In such a set, the authorized person conducting pre-trial investigation must determine the order of conducting forensic examinations: if the same objects need to undergo different expert researches; if results of one forensic examination will determine results of others; if application of destructive research methods to the object will significantly alter its properties and make it impossible (partially or completely) to conduct re-examination or other subsequent examinations. For example, to calculate damages in the case of bee mortality due to poisoning by chemicals (pesticides) of fields with nectar-bearing plants, it is necessary to first determine the cause of insects' death. This can be achieved through expert research by establishing a cause-and-effect relationship between the presence of pesticides in their bodies and in the soil and plants. It is done through conducting a multidisciplinary forensic veterinary-toxicological examination and only later forensic economic examination may be appointed. If necessary, in conjunction with other forensic examinations in a criminal proceeding concerning the death of mammals, the following are performed: first, forensic veterinary examination (to determine the pathomorphological changes in the carcasses); forensic toxicological examination (to exclude poisoning as the cause of death) or forensic ballistic

57 Сімакова-Єфремян Е. Б. Теоретико-правові та методологічні засади комплексних судово-експертних досліджень : дис. … д-ра юрид. наук. Харків, 2017. С. 71—90.

58 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

examination (to determine the cause of death: gunshot or explosive trauma) and forensic merchandising examination (to calculate the value of dead animals) based on the results of previously conducted examinations. Due to the use of destructive methods (i.e., when dissecting the organs of an animal's carcass, etc.) while forensic veterinary examination, it is customary to photograph (according to the rules of forensic photography) all research steps and include photographs as annexes to the expert conclusion.

5. Choosing time for conducting forensic veterinary examination

Criminal procedural legislation does not establish time limits for appointing any forensic examination, including forensic veterinary examination. This is the task of forensic examination appointing authority who considers the specific situation and tactical considerations (anticipated volume and nature of evidentiary information). The main priority is, on the one hand, the timely scheduling of forensic examinations in order to avoid delays in the investigation, and on the other hand, to prevent irreversible changes to objects of research. For example, in the animal's carcass [59] processes of autolysis and putrefaction develop within one day [60] (during the late postmortem period) due to the action of rapidly multiplying microorganisms and enzymes in the tissues. As a result, organoleptic, physical, and chemical characteristics of the organs and tissues change, which can distort the assessment of macro- and microscopic features and lead to errors in forensic veterinary diagnosis as well as complicate determination of the mechanism of injury and time of death, etc. [62]. In addition, the complexity of research in forensic veterinary examination means that it takes a long time to carry out.

The subsequent (re-examination, additional) forensic veterinary examination can be hindered even by freezing because during the freezing and thawing process, crystals of the frozen liquid partially damage the tissues, leading to changes in tissue coloration and elasticity. As a result, specific features that could be pathognomonic for certain types of injuries or diseases that caused the animal's death are significantly lost. What is more, freezing of the carcass of an animal which death resulted from poisoning can completely or partially destroy poison traces, making it difficult to detect it in organs and tissues even with the use of high-precision technical devices, thus preventing reaching an accurate conclusion as to the cause of the animal's death.

Freezing of the carcass of an animal which death resulted from the action of a pathogenic agent, alters or destroys the pathomorphological picture, which prevents the correct establishment of a forensic veterinary diagnosis and provision of an expert conclusion in a probable form.

Any postmortem changes in an animal's carcass, in the case of its cooling, freezing or deep-freezing, affect not only the expert evaluation and establishment of forensic veterinary diagnosis of fractures of skeleton bones, dislocations of joints, as well as rupture of muscles, ligaments, tendons, synovial bursas, internal organs, etc.

The most optimal solution (due to the inability to conduct forensic veterinary examination as quickly as possible) is to cool

59 An animal carcass is considered fresh within 24 hours at ambient temperature of +18 °C.

60 Yatsenko I., Kazantsev R. Cytomorphological characteristics of necroptates of internal organs of dogs in the early post-mortem period in the aspect of forensic veterinary examination. *Ukrainian Journal of Veterinary Sciences.* 2022. Vol. 13. No. 4. Pp. 60—74. DOI: 10.31548/ujvs.13(4).2022.60-74 (date accessed: 02.03.2023).

the animal carcass (0...+4°C) for a period of 2–3 days. If there is a need to preserve the animal carcass for a longer period, it should be frozen (at a temperature of 0...-2°C) or deep-frozen (at -8 °C). To temporarily store animal carcasses, it is necessary to establish refrigeration chambers (for example, in animal shelters, laboratories of the State Service of Ukraine for Food Safety and Consumer Protection, or forensic science institutions of the Ministry of Justice of Ukraine), which can be accessed by authorized individuals or body conducting pre-trial investigations regarding offenses against animals. For example, specialists of the NSC «Hon. Prof. M. S. Bokarius FSI» perform forensic veterinary autopsy at the municipal utility Animal Treatment Center (the corpses of animals undergoing expert examination are temporarily stored there in a refrigerating chamber) according to the agreement between the institutions.

The same applies to the immediate forensic veterinary examination of a living animal undergoing expert examination: as time passes, wounds heal, bruises disappear, and the morphology of scar tissue on the skin changes, which either makes it impossible to determine the time of injury formation or makes the expert conclusion more probable. If an immediate forensic veterinary examination is not possible, the authorized person (body) conducting pre-trial investigation may involve specialists in the relevant field of veterinary medicine who hold a specialist or master's level of education. These specialists provide information on the results of their examinations in a written advisory report with their personal signature, duly certified. It is worth noting that these specialists do not determine the severity of the harm inflicted on the animal's health [61].

Therefore, the subject of forensic veterinary examination appointment should collect case materials as soon as possible, adopt a procedural document on forensic examination appointment and send them to the expert institution for execution.

It is necessary to appoint forensic veterinary examination as quickly as possible for several reasons. Firstly, conducting forensic examination and preparing the expert conclusion requires a certain amount of time, which is determined by research complexity. Another criterion for readiness of the authorized person or body to carry out forensic veterinary examination is collection of all necessary materials in full scope. Thus, if the object of the forensic veterinary examination is an animal carcass, the appointing subject must organize an inspection of the carcass at the scene with the participation of a forensic veterinarian and draw up a corresponding inspection report; if the animal that received veterinary care at a veterinary clinic is alive, then veterinary documents (medical history or medical card of the sick animal, etc.) should be collected and included in a criminal proceeding; if the object of forensic veterinary examination is feeds or feed additives: involve a specialist in veterinary medicine to examine them on-site, collect samples for laboratory analysis and package them.

6. Preparation of source information, obtaining objects and samples for forensic veterinary examination

This is an important procedural stage that significantly affects the quality of expert research and substantiation of the expert conclusion. All information sources needed for forensic veterinary examination appointment should be categorized as *proce-*

61 Яценко І. В., Париловський О. І. Правила судово-ветеринарного визначення ступеня тяжкості шкоди, заподіяної здоров'ю тварини (методичні рекомендації). Харків, 2022. 47 с.

dural (judgment of the investigating judge or court, records of investigative actions, research objects, samples for comparative analysis, conclusions of the preliminary forensic veterinary examination, materials of a criminal proceeding [upon the motion of the forensic expert]: inspection records with annexes, records of physical evidence seizure of, etc.) and n*on-procedural* (legal regulations and subordinate documents, standards, collections, literature sources, software products, etc.).

Source information must meet general conditions: *admissibility*, meaning it must be suitable from the standpoint of the legality of sources, techniques, and methods of obtaining it (Art. 86 of the Criminal Procedure Code of Ukraine [62], Art. 78 of the Civil Procedure Code of Ukraine [63], Art. 77 of the Code of Commercial Procedure of Ukraine [64], Art. 74 of the Code of Administrative Proceedings of Ukraine [65]); *adequacy* : if there is a connection with a specific case (Art. 85 of the Civil Procedure Code of Ukraine [66], Art. 77 the Civil Procedure Code of Ukraine [67], Art. 76 the Code of Commercial Procedure of Ukraine [68], Art. 73 the Code of Administrative Proceedings of Ukraine [69]); *reliability*: compliance with true case circumstances, certainty of origin (Art. 79 of the Civil Procedure Code of Ukraine [70], Art. 78 of the Code of Commercial Procedure of Ukraine [71], Art. 75 of the Code of Administrative Proceedings of Ukraine [72]), *sufficiency* (Art. 80 of the Civil Procedure Code of Ukraine [73], Art. 76 the Code of Administrative Proceedings of Ukraine [74]) and *representativeness* : quality and quantity corresponding to research methodological requirements.

The question of the scope of information provided to the forensic veterinarian is carefully considered and determined on a case-by-case basis by the appointing authority. The forensic veterinarian also has

62 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).
63 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
64 Господарський процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
65 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
66 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).
67 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
68 Господарський процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
69 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
70 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
71 Господарський процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
72 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
73 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
74 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

the right to submit a motion for the provision of additional materials (para. 3 of cl. 2.1 of Sec. II of Instructions No. 1 [75]).

In accordance with para. 1 of cl. 2.1 of Section II of Instructions No. 1 [76], the appointing subject of forensic veterinary examination shall provide the forensic expert with materials related to forensic examination subject (including records of investigations, veterinary documents, etc., containing factual information about the research object). The procedural document on forensic veterinary examination appointment (specifically the contract with a private forensic veterinarian or expert institution) must specify the list of objects provided for forensic examination. The customer of forensic veterinary examination is obliged to guarantee reliability of all materials submitted for forensic examination, eliminate any misinterpretations regarding the same objects, as well as prevent procedural failures during collection and fixation of evidence, violation of rules for handling physical evidence and its substitution. For example, the name of an animal undergoing examination, tattoo number, address where the animal was seized, etc., should not differ within a single document and across all documents provided to the forensic veterinarian for forensic examination. (Experience confirms that inaccuracies in these data, which investigators may make when appointing forensic veterinary examination, negatively impact the speed and effectiveness of forensic examination.)

Depending on the circumstances, materials for conducting forensic veterinary examination are submitted personally, by a courier, mail, directly from the place of their storage or location. During preparation of materials for conducting forensic veterinary examination, the authorized person or body conducting the pre-trial investigation must:

- define the scope of research objects: physical evidence;
- obtain comparison samples to solve identification tasks, including the involvement of a veterinary medicine expert, especially during inspection of the scene;
- clarify source data;
- to delineate the part of the criminal proceeding materials that is relevant for establishing the facts necessary to provide an objective, well-founded, accurate and truthful conclusion of the forensic expert.

We share the viewpoint of S. F. Briukhan [77] that the level of professional knowledge and skills in the field of forensic science of a person (body) appointing forensic examination is important for preparation of materials and formulation of questions to the forensic expert.

The key to successful conduct of forensic veterinary examination and resolution of questions addressed to a forensic expert lies in the proper and qualitative collection of physical evidence. Additionally, the forensic expert is provided with case files which content depends on the questions posed for forensic examination.

Therefore, ensuring authenticity, completeness and quality of objects submitted for forensic examination falls within the competence of an authorized person (body) responsible for appointing forensic veterinary examination. It is the duty of the forensic veterinarian to conduct a comprehensive, thorough, and objective research on objects.

Let's emphasize that the legal basis for selection of samples for forensic examination is the relevant legislation norm, as well

75 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

76 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

77 Брюхань С. Ф. Op. cit.

as a procedural document, which can be a judgement of the investigating judge or court and also a ruling of the investigator or inquiring officer.

The document on forensic examination appointment specifies: a person who will receive samples; which specific samples and in what quantity are provided; when and to whom samples are transferred after their receipt.

For forensic veterinary examination, selection of samples from multiple pieces of physical evidence (including feeds and feed additives) is carried out in compliance with provisions of the Procedure for Sampling Animal, Plant, and Biotechnological Origin Products for Research Purposes [78] (hereinafter: *the Procedure for Sampling Products*), Procedure for Sampling and Transportation (Dispatch) of Samples to Authorized Laboratories for the Purposes of State Control [79] (hereinafter: *the Procedure for Sampling and Transportation*), as well as the Rules on Sampling Pathological Material, Blood, Feeds, Water, and their Dispatch for Laboratory Analysis [80] (hereinafter: *the Rules on Sampling Pathological Material*) with mandatory mention of the last name of the specialist who participated in the sampling of such samples.

Each research object and sample are placed in a clean inert container (which ensures proper protection against contamination and damage during transportation), registered with the date and place of their collection, sealed at the collection site, and labeled with explanatory inscriptions and identification code (corresponding to the identification code of the sampling act, allowing identification of the batch or portion of animal feeds or feed additives from which samples were taken) on the packaging (see Fig. 3–4); a sampling act should be drawn up and indicated in *the scene inspection record*. The procedure for sampling samples and items in a criminal proceeding is established in accordance with provisions on granting provisional access to items and documents (Arts. 160–166 of the Criminal Procedure Code [81]).

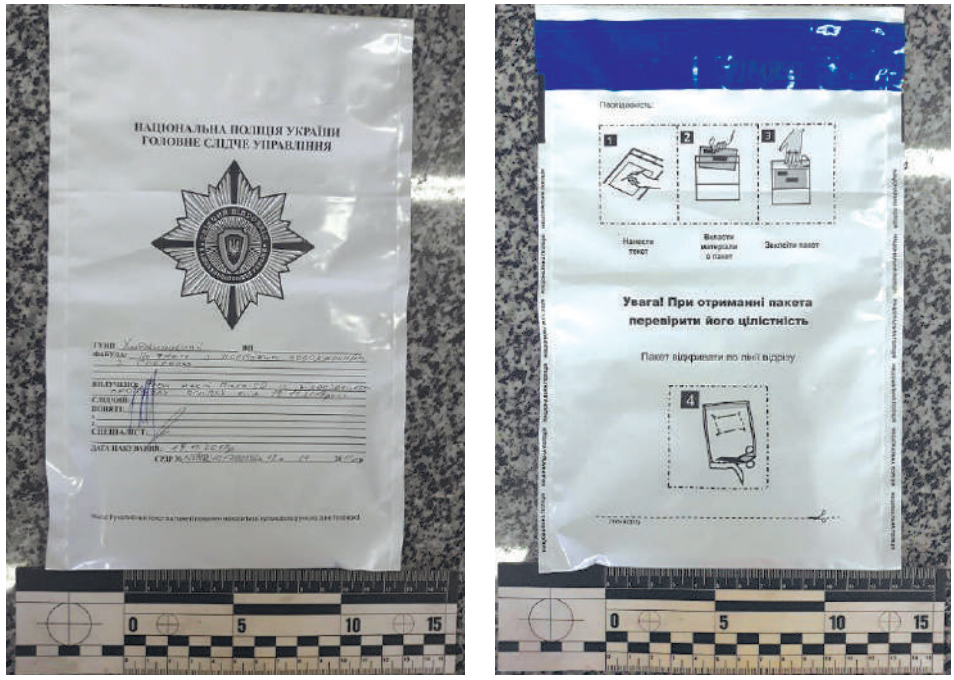
Fig. 3. A packaged forensic veterinary examination object with an explanatory inscription written on paper (from the archives of the NSC «Hon. Prof. M. S. Bokarius FSI»)

78 Порядок відбору зразків продукції тваринного, рослинного і біотехнологічного походження для проведення досліджень : затв. Постановою КМУ від 14.06.2002 р. № 833. URL: https://zakon.rada.gov.ua/laws/show/833-2002-%D0%BF#Text (date accessed: 02.03.2023).

79 Порядок відбору зразків та їх перевезення (пересилання) до уповноважених лабораторій для цілей державного контролю : затв. наказом Мінагрополітики України від 11.10.2018 р. № 490. URL: https://zakon.rada.gov.ua/laws/show/z1464-18#Text (date accessed: 02.03.2023).

80 Правила відбору зразків патологічного матеріалу, крові, кормів, води та пересилання їх для лабораторного дослідження : затв. голов. Держветмедицини Мінсільгосппроду України від 15.04.1997 р. № 15-14/111. URL: http://vetlabkr.pp.ua/Content/files/%D0%9F%D1%80%D0%B0%D0%B2%D0%B8%D0%BB%D0%B0%20%D0%B2%D1%96%D0%B4%D0%B1%D0%BE%D1%80%D1%83%20%D0%B7%D1%80%D0%B0%D0%B7%D0%BA%D1%96%D0%B2%20%D0%BF%D0%B0%D1%82%D0%BE%D0%BB%D0%BE%D0%B3%D1%96%D1%87%D0%BD%D0%BE%D0%B3%D0%BE%20%D0%BC%D0%B0%D1%82%D0%B5%D1%80%D1%96%D0%B0%D0%BB%D1%83.pdf (date accessed: 02.03.2023).

81 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).



a) b)

Fig. 4. General view of evidence packaging to be sent to a forensic veterinarian: a) front side; b) back side (from the archives of the NSC «Hon. Prof. M. S. Bokarius FSI»)

In a criminal proceeding, obtaining samples for examination is regulated by Article 245 [82], and collection of samples from items and documents is governed by Arts. 160–166 of the Criminal Procedure Code [83]. In a civil proceeding, collection of materials for expert examination is regulated by Article 107 of the Civil Procedure Code [84], in a commercial proceeding: by Art. 102 of the Code of Commercial Procedure of Ukraine [85], in an adminstrive proceeding: by Art. 102 of the Code of Administrative Proceedings of Ukraine [86]. When determining which specific materials are necessary for conducting forensic examination, the court takes into account opinions of the parties involved and may also consider the opinion of the appointed forensic expert. Necessary materials are provided to the expert, although copies of these materials may be retained in the case files.

82 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).
83 Ibid.
84 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
85 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
86 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

A forensic expert is not entitled to independently collect materials for conducting forensic examination (including forensic-veterinary), nor to selectively choose source data that are ambiguously reflected in materials provided to him/her (Pt. 4 of Art. 69 of the Criminal Procedure Code of Ukraine [87]; Pt. 2 of Art. 107 of the Civil Procedure Code of Ukraine [88], Art. 102 of the Code of Commercial Procedure of Ukraine [89] and Art. 105 of the Code of Administrative Proceedings of Ukraine [90]; para. 4 of cl. 2.3 of Sec. II of Instructions No. 1 [91]). When deciding which materials to submit for forensic examination, the court (if necessary) also resolves the issue of obtaining relevant materials.

The forensic expert must ensure preservation of forensic examination object; if not, he/she should obtain an appropriate permission from a person (body) who appointed forensic examination or involved a forensic expert (cl. 3 of Part 5 of Art. 69 of the Criminal Procedure Code of Ukraine [92]; Pts. 3 and 4 of Art. 108 of the Civil Procedure Code of Ukraine [93], Art. 103 of the Commercial Procedure of Ukraine [94], Art. 106 the Code of Administrative Proceedings of Ukraine [95]; para. 7 of cl. 2.2 of Sec. II of Instructions No. 1 [96]).

Let's stress that obtaining permission to use destructive research methods prolongs terms of conducting forensic examination (including forensic veterinary examination). So, in order to save time, it is more expedient to immediately outline such permission in a procedural document (judgment or ruling) on forensic examination appointment [97].

Therefore, the appointing authority of forensic veterinary examination should adhere to the following basic rules when preparing objects and materials for analysis:

1) to collect samples of pathological material, blood, feeds, water, and dispatch them for laboratory analysis with involvement of a specialist in

87 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).
88 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
89 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
90 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
91 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).
92 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).
93 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
94 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
95 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
96 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).
97 Яценко І. В. Проблеми укладання … . С. 17. DOI: 10.5281/zenodo.6471059 (date accessed: 02.03.2023).

veterinary medicine in conformity with the Rules on Sampling [98];
2) to send significantly voluminous or massive research objects and objects for comparative analysis as samples to a forensic expert;
3) to dry and transport animal excrements and manure in closed containers weighing 100–120 grams;
4) to send the carrier item (such as a gauze swab, cotton, etc.) when examining micro-objects;
5) to cover areas on carrier objects with stains or traces of biological origin, use clean paper and secure the edges of an object (proceed similarly in case no traces are found, but their presence is possible) [99];
6) ensure inspection by a forensic expert of the research object at the location of the latter (if it is impossible to deliver the object). In this case, the subject of forensic veterinary examination appointment is obliged to transport a forensic expert to the place of object storage, to ensure free access to it and to create conditions necessary for conducting forensic examination.

If it is necessary to preserve the object at the crime scene, the authority responsible for the appointment of the forensic veterinary examination or the involvement of a forensic expert shall organize its protection and take measures to preserve an object. She/He indicates it in the scene inspection report or in a document on relevant examination appointment.

Furthermore, a subject responsible for forensic veterinary examination appointment or involvement of a forensic expert must promptly respond to the need for additional materials, collection, and documentation of new evidence.

In a criminal proceeding, samples are taken for forensic examination by an authorised person conducting a pre-trial investigation or at the request of an investigating judge who appointed forensic veterinary examination. During the trial stage of a case, taking of samples shall be carried out by the court or, at its request, by a specialist in veterinary medicine (Art. 245 the Criminal Procedure Code of Ukraine [100]), for instance, by an employee of a respective accredited laboratory (the SSUFSCP, SMSU, etc.), who possesses special knowledge and skills in sample collection (the forensic expert acquires legal status of a specialist after such involvement: see Art. 71 the Criminal Procedure Code of Ukraine [101], Art. 74 the Civil Procedure Code of Ukraine [102], Art. 71 the Code of Commercial Procedure of Ukraine [103], Art. 70 the Code of Administrative Proceedings of Ukraine [104]).

98 Правила відбору зразків патологічного матеріалу … . URL: http://vetlabkr.pp.ua/Content/files/%D0%9F%D1%80%D0%B0%D0%B2%D0%B8%D0%BB%D0%B0%20%D0%B2%D1%96%D0%B4%D0%B1%D0%BE%D1%80%D1%83%20%D0%B7%D1%80%D0%B0%D0%B7%D0%BA%D1%96%D0%B2%20%D0%BF%D0%B0%D1%82%D0%BE%D0%BB%D0%BE%D0%B3%D1%96%D1%87%D0%BD%D0%BE%D0%B3%D0%BE%20%D0%BC%D0%B0%D1%82%D0%B5%D1%80%D1%96%D0%B0%D0%BB%D1%83.pdf (date accessed: 02.03.2023).

99 Яценко І. В. Проблеми використання … . С. 499. DOI: 10.32782/2524-0374/2023-1/114 (date accessed: 15.03.2023).

100 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

101 Ibid.

102 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

103 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

104 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

In a civil, commercial, and administrative proceeding (if the court appoints forensic veterinary examination), all necessary materials are provided by the court. In the event that a party to the case initiates forensic examination, it is his/her obligation to provide relevant case materials to either the expert institution or a private forensic expert (Pt. 1 of Art. 107 the Civil Procedure Code of Ukraine [105], Art. 102 the Code of Commercial Procedure of Ukraine [106] and Art. 105 of the Code of Administrative Proceedings of Ukraine [107]).

Only originals or properly certified copies of veterinary documents should be provided for examination purposes. These copies must be signed by a veterinarian who treated an animal and should be compiled in accordance with originals. The originals should exhaustively outline information about the nature, location, and clinical presentation of injuries, as well as other necessary information that is vital for forensic examination [108].

Let us note that fiscal receipts for payment for veterinary services indicating names and costs of veterinary drugs, as well as other similar materials, are not considered veterinary documents and therefore do not hold any significance for conducting forensic veterinary examination (at the same time serving as evidence of veterinary services provision). Veterinary documents include: an extract from the register of sick animals; an extract from the animal's ambulatory medical record or from medical history (epicrisis) if the animal has received treatment or undergone clinical examination prior to forensic veterinary examination appointment; results of blood, urine, milk, and other biological fluid tests; protocols of ultrasonography, endoscopy, radiography, magnetic resonance imaging, and spiral computed tomography examinations, etc.

In order to establish, for example, animal mutilation, an authorized person (body) carrying out pre-trial investigation may provide the forensic expert with the animal's photos (with a detailed description provided by the veterinarian who examined the animal immediately after infliction of the injury, attached to a criminal proceeding or a case on other types of legal proceedings). However, this is only done in exceptional cases where signs of mutilation are evident and it is not possible to bring the animal to the forensic expert [109].

In the case of appointing an additional examination or forensic veterinary re-examination at this stage, the forensic expert must be provided with conclusions of previous forensic examinations, including their appendices, as well as additional materials related to the subject of the forensic veterinary examination and collected after preliminary forensic examination.

Within the scope of our research, the position is important that conducting forensic veterinary examination will have much more effectiveness, validity and result in much lower risk of making an expert error compared to the research based on proceeding (case) materials.

Since obtaining samples and/or objects of research is an investigative action in a criminal procedure, execution of a rele-

105 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

106 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

107 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

108 Яценко І. В., Париловський О. І. Op. cit.

109 Яценко І. В. Методика судово-ветеринарного дослідження тварин з метою встановлення їх каліцтва. Харків, 2021. 50 с.

vant ruling or judgment is obligatory. The record drawn up on the basis of the results of obtaining samples is signed by all participants of a specified procedure. In the case of a person's refusal to sign, the authorized person (body) must make a corresponding entry in the record. Received samples are attached to the record in a packaged and sealed form. In the procedural document, it is necessary to specify precise names, quantities, weight, and other distinctive individual features of each object being submitted for forensic veterinary examination (for example: *To familiarize the forensic expert with materials from a criminal proceeding, provide one cardboard box containing the dog's body for forensic examination*).

If case materials contain information regarding peculiarities of identification, seizure, and preservation of examination object, or other circumstances that could affect its properties and features, it should be indicated in a procedural document (for example: *"After the death, the cat's corpse was kept frozen for five days"* or *"The animal's corpse was submitted for forensic examination after exhumation"*).

In the lack of the ability to provide forensic veterinary examination object to a forensic expert, the forensic veterinary examination is performed on the basis of photographs or other copies of the object, its descriptions, and other materials attached to a case in compliance with the stipulated legal procedure, as long as it does not contradict the methodological approaches to conducting forensic veterinary examination (for example, if the animal's carcass was dissected in the SSUFSCP laboratory in case of suspicion that the animal's death resulted from a disease, including an infectious one, the carcass of such an animal is subjected to cremation, and the customer is issued a research protocol. This protocol is attached to a proceeding by the authorized person (conducting investigation) and may subsequently become forensic veterinary examination subject. It is stated in the procedural document on forensic veterinary examination appointment (involvement of a forensic expert) or is notified in writing to the forensic expert (cl. 3.5, Section III, Instructions No. 1 [110]).

After conducting forensic veterinary examination, the forensic expert attaches packed and sealed forensic examination objects to her/his conclusion, specifies them in an accompanying document, and returns them to the subject that appointed forensic examination (involved a forensic expert). For instance, in the *Rules for Forensic Veterinary Examination of Animal Carcasses* [111] methodological guidelines developed by the author of this paper in collaboration, it is stipulated that the animal carcass or its remains after examination, as well as documentary materials of a proceeding, should be returned to a person who appointed forensic examination.

Therefore, S. F. Briukhan's viewpoint that the guarantee of research completeness and a reasoned categorical conclusion of the forensic expert is first of all the provision of samples for forensic examination in a sufficient quality, of the required quality and of unquestioned origin, etc., is valid. Thus, investigators and judges must constantly improve their knowledge and skills regarding rules for preparing materials for forensic examination by receiving appropriate consultations and involving specialists [112].

110 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

111 Яценко І. В., Казанцев Р. Г. Правила судово-ветеринарної експертизи трупів тварин : метод. рек. Харків, 2022. 29 с.

112 Брюхань С. Ф. Op. cit.

If the court reverses the ruling on appointing forensic veterinary examination, the forensic expert is obliged to immediately return to the court materials and other documents used for conducting such examination. (Pt. 4 of Art. 107 of the Civil Procedure Code of Ukraine [113] and Art. 105 of the Code of Administrative Proceedings of Ukraine [114], Pt. 5 of Art. 102 of the Code of Commercial Procedure of Ukraine [115]).

There is no provision in procedural legislation that would require a private forensic expert or an expert institution to immediately return materials and other documents used for conducting forensic examination to the participant in a case (forensic examination customer who involved a forensic expert). In this connection, we suggest amending Art. 107 *Collection of materials for expert examination* of the Civil Procedure Code of Ukraine [116] and Art. 105 *Collection of materials for expert examination* of the Code of Administrative Proceedings of Ukraine [117] with Pt. 5, Art. 102 *Collection of materials for expert examination* of the Code of Commercial Procedure of Ukraine [118] with Pt. 6 of the following content:

"On the demand of the participant in a case (forensic examination customer who involved the forensic expert independently), an involved forensic expert is obliged to immediately return materials and other documents used by him/her for forensic examination."

7. Selection of the subject for conducting forensic veterinary examination

The involvement of a forensic expert and conduct of forensic examination are investigative actions, specifically provided by legislation as a special form of obtaining new information that is significant for all types of court proceedings (criminal, civil, commercial, and administrative).

Among forensic science institutions under the Ministry of Justice of Ukraine, only NSC «Hon. Prof. M. S. Bokarius FSI» conducts forensic veterinary examination: you can find information about the list of objects, tasks, and issues solved through this type of forensic examination in the laboratory of physical, chemical, biological, and veterinary examinations on the institution's website.

Private forensic experts who are certified in the expert specialization 18.1 *Forensic Veterinary Examination* (as of today, there is only one such specialist in Ukraine) also have the right to conduct forensic veterinary examination, even if they do not work in a state specialized expert institution [119].

113 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

114 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

115 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

116 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

117 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

118 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

119 Перелік видів судових експертиз та експертних спеціальностей, за якими присвоюється кваліфікація судового експерта фахівцям, які не є працівниками державних спеціалізованих установ : дод. 6 до Положення про Центральну експертно-кваліфікаційну комісію при Міністерстві юстиції України та атестацію судових експертів, затв. наказом Мін'юсту України від 03.03.2015 р. № 301/5 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0249-15#Text (date accessed: 02.03.2023).

It's worth noting that selection of a state expert institution or a private forensic expert is the right of the subject appointing forensic examination. Thus, in civil (Pt. 3 of Art. 103 of the Civil Procedure Code of Ukraine [120]), commercial (Pt. 3 of Art. 99 of the Code of Commercial Procedure of Ukraine [121]), and administrative (Pt. 3 of Art. 102 the Code of Administrative Proceedings of Ukraine [122]) proceedings, during appointment of forensic examination by the court, a forensic expert or expert institution are chosen by mutual agreement. If no agreement is reached, the choice is up to the court.

The authorized person (body) sends a copy of a procedural document on forensic examination appointment (ruling or order) to the expert institution, in which the forensic expert is notified of the criminal liability for misleading (Art. 384 of the Criminal Code of Ukraine [123]) a court or other authorized person (body), for refusal of a forensic expert to perform their duties (Art. 385 of the Criminal Code of Ukraine [124]), and also gives permission to use destructive research methods [125].

Veterinary medicine professionals who are not certified forensic experts but possess theoretical knowledge and practical skills in the field of forensic veterinary medicine (often veterinary discipline lecturers at higher education institutions or employees of research institutions) may also be involved in performing forensic examination as forensic experts. Such specialists acquire the status of a forensic expert, in particular of a forensic veterinary expert, only after the issuance of a procedural document by the subject responsible for forensic veterinary examination appointment (Part 1, Article 7 of the specialized Law [126]).

8. Issuance of a procedural document on forensic veterinary examination appointment

In a criminal proceeding, forensic examination appointment is legally formalized by drafting a procedural document: a judgment by an investigative judge (court) or a ruling by a public prosecutor (investigator or inquiring officer), which are procedural decisions (Pt. 1 of Art. 110 of the Criminal Procedure Code of Ukraine [127], Chp. 9 of Sec. II of the Civil Procedure Code of Ukraine [128] and the Code of Administrative Proceedings of Ukraine [129]). In conformity with Pt. 3 of Art. 110 of the Criminal Proce-

120 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
121 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
122 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
123 Кримінальний кодекс України від 05.04.2001 р. № 2341-III (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 02.03.2023).
124 Ibid.
125 Яценко І. В. Проблеми укладання … . DOI: 10.5281/zenodo.6471059 (date accessed: 02.03.2023).
126 Про судову експертизу … . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 02.03.2023).
127 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).
128 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
129 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

dure Code of Ukraine [130], a ruling is issued in cases stipulated by this code, as well as when the investigator, inquiring officer or public prosecutor deems it necessary.

To conduct forensic examination, a forensic expert is involved, in particular a forensic veterinarian (Article 243 of the Criminal Procedure Code [131]). Thus, the defense can appeal to the investigating judge with a motion to conduct forensic examination if the prosecution did not involve an expert to resolve issues that are essential for a criminal proceeding, or if the prosecution asked the expert questions that do not allow a full and appropriate opinion on the issues to be examined, or there are sufficient grounds to believe that a forensic expert involved by the public prosecution lacks the necessary knowledge, is biased or for other reasons will provide or provided an incomplete or incorrect conclusion (cl. of 1 Pt. 1 of Art. 244 of the Criminal Procedure Code of Ukraine [132]). We share the viewpoint of I. V. Hloviuk [133] concerning the need to improve the procedure for considering the defense counselor's motion by the investigating judge on a forensic expert's involvement.

The motion shall be considered no later than five days from the date of its receipt by the investigating judge of the local court within whose territorial jurisdiction the pre-trial investigation is conducted (Pt. 3 of Art. 244 of the Criminal Procedure Code of Ukraine [134]). A ruling of an investigating judge on assigning an expert examination shall include the questions posed before the expert by the person who has filed the respective motion. The investigating judge shall have the right to not include the questions posed by the person who has filed the respective motion into his ruling, having provided reasons for such decision, where the answers to such questions are not related to the criminal proceedings or are irrelevant for the court proceedings. (Pt. 7 of Art. 244 of the Criminal Procedure Code of Ukraine [135]). Where necessary, the investigating judge shall have the right on obtaining samples for examination (Pt. 8 Art. 244 the Criminal Procedure Code of Ukraine [136]).

In civil, commercial, and administrative proceedings, an examination is appointed by the court upon the motion of a party or at its own initiative (Art. 103 of the Civil Procedure Code of Ukraine [137], Art. 99 of the Code of Commercial Procedure of Ukraine [138], Art. 102 of the Code of

130 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

131 Ibid.

132 Ibid.

133 Гловюк І. В. Розгляд слідчим суддею клопотання про залучення експерта. *Eurasian Academic Research Journal.* 2016. № 2 (02). С. 23—28. URL: http://dspace.onua.edu.ua/bitstream/handle/11300/8544/%d0%93%d0%bb%d0%be%d0%b2%d1%8e%d0%ba%20%d0%b7%d0%b0%d0%bb%d1%83%d1%87%d0%b5%d0%bd%d0%bd%d1%8f%20%d0%b5%d0%ba%d1%81%d0%bf%d0%b5%d1%80%d1%82%d0%b0.pdf?sequence=1&isAllowed=y (date accessed: 02.03.2023).

134 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

135 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

136 Ibid.

137 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

138 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

Administrative Proceedings of Ukraine [139]). The court issues a judgment (Art. 104 of the Civil Procedure Code of Ukraine [140], Art. 100 of the Code of Commercial Procedure of Ukraine [141], Art. 103 of the Code of Administrative Proceedings of Ukraine [142]) and sends it to the forensic expert to conduct forensic examination, as well as to participants in a case.

Thus, the grounds for appointing forensic examination by the court in types of proceedings other than criminal proceedings (Art. 103 of the Civil Procedure Code of Ukraine [143], Art. 99 of the Code of Commercial Procedure of Ukraine [144], Art. 102 of the Code of Administrative Proceedings of Ukraine [145]), are as follows: the need to apply specific expertise to clarify factual data and circumstances; neither party has provided an expert conclusion on these issues; there are reasonable doubts about the accuracy of expert conclusions provided by the parties; a motion by a party in a case where valid reasons are provided for the impossibility of providing an expert conclusion within the terms prescribed for submitting evidence (particularly due to the impossibility to obtain required materials for conducting the examination).

The mandatory appointment of forensic examination is governed by Art. 105 the Civil Procedure Code of Ukraine, in particular:

"The appointment of an expert examination by a court shall be obligatory in the case of a petition for the appointment of an expert examination by both parties. The appointment of an examination by a court shall be also mandatory at the request of at least one of the parties, if the case requires the establishment of the following:

1) the nature and degree of damage to health» [146].

However, the indicated norms relate solely to human beings: there are no grounds for appointing forensic veterinary examination in the current Civil Procedure Code. Analysis of our own expert practice from 2010 to 2022 demonstrates that it is impossible to find out the truth regarding offenses against the life and health of animals (especially in cases of cruelty towards them) without using such a means of proof as forensic veterinary examination or specific veterinary expertise in conjunction with specific expertise from another scientific field, i.e., through the conduct of forensic veterinary examination or multidisciplinary examination. In this respect, we suggest amending Pt. 1 of Article 105 of the Civil Procedure Code [147] *Mandatory court appointment of*

139 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
140 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
141 Господарський процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
142 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
143 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
144 Господарський процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).
145 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).
146 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).
147 Ibid.

expert examination with clause 4 of the following content:

"4) the cause of death, nature, and degree of severity of harm inflicted on an animal's health".

It should be emphasized that during the pre-trial investigation stage in a criminal proceeding, rulings and judgments are among the types of court decisions. The structure of a ruling issued by an investigator, inquiring officer, or public prosecutor on forensic examination appointment is stipulated in Pt. 5 of Art. 110 of the Criminal Procedure Code of Ukraine [148] shall consist of three parts (introductory, motivating and resolutive). The ruling of an investigator, inquiring officer or prosecutor shall be issued on an official letterhead, signed by the official who has taken the appropriate procedural decision (Pt. 6 of Art. 110 of the Criminal Procedure Code of Ukraine [149]).

We thoroughly examined components of a ruling on forensic examination appointment (in particular, forensic veterinary) in 2022 [150]. One of the relevant issues of compiling a procedural document on forensic examination appointment is formation of an expert task (list of questions) that should be resolved by the forensic expert.

The content of the court ruling (in particular, on forensic veterinary examination appointment) is governed by Art. 372 of the Criminal Procedure Code of Ukraine [151], Art. 260 of the Civil Procedure Code of Ukraine [152], Pt. 1 of Art. 234 the Code of Commercial Procedure of Ukraine [153], Pt. 1 of Art. 248 of the Code of Administrative Proceedings of Ukraine [154]. Let's emphasize that improperly or inaccurately worded questions indicate a lack of understanding by the investigation of the purpose of appointing forensic examination as well as complicate research or make it impossible.

The forensic expert is prohibited from independently correcting questions addressed to her/him for resolution, at the same time he/she is given the right to submit a request for clarification of these questions (para. 4 of cl. 2.1 of Instructions No. 1 [155]). This suspends forensic examination conduct (until resolution of the submitted motion by the subject requesting its appointment), thus delaying the conduct of the forensic examination and, as a result, prolonging the pre-trial investigation.

Therefore, as rightly stated by S. O. Ivanytskyi [156], for a thorough, comprehensive, and objective investigation aimed at resolving questions posed to a forensic expert, they must be clearly formulated (in accordance with submitted objects) and their content should be understandable. For forensic veterinary examination, an approximate list of such questions is provided

148 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

149 Ibid.

150 Яценко І. В. Проблеми укладання … . DOI: 10.5281/zenodo.6471059 (date accessed: 02.03.2023).

151 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

152 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

153 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

154 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

155 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

156 Іваницький С. О. Op. cit.

in cl. 10.3 of the Sec. X of the specialized SMGs [157]. The author of this research paper has developed, systematised, substantiated and proposed for use in practice a list of questions that can be asked in a procedural document for the appointment of forensic veterinary examination of a dead animal [158], a live animal, a dead animal suspected of being poisoned, feeds or feed additives [159]. Our developments on peculiarities of appointing forensic veterinary examinations and organizing proof of these facts in criminal proceedings has been summarized in methodological guidelines for the units of the National Police of Ukraine [160].

9. Sending a procedural document on appointment of forensic veterinary examination, research objects and samples to the conducting subject

At this stage of conducting forensic examination, the main task of the appointing subject is to prepare objects for their transportation to the expert institution or private forensic expert.

Proceeding (case) files are submitted along with objects of research and a procedural document on forensic examination appointment (judgment of the investigating judge or court, or ruling of the prosecutor, investigator, or inquiring officer), as well as with a covering letter addressed to the head of the expert institution or to the private expert.

Let's stress the fact that in criminal proceedings or other areas of court proceedings, additional expert conclusions with annexes are added to case materials if an additional examination or re-examination is ordered. Additionally, other supplementary materials related to forensic examination subject, collected after provision of the preliminary expert conclusion by the forensic expert, are included (with indication of motives and grounds for its appointment; para. 3.6 of Instructions No. 1 [161]).

E. B. Simakova-Yefremian notes that the number of multidisciplinary forensic examinations has increased recently [162]. From our part, we have to acknowledge that their conduct increasingly requires application of specific veterinary expertise. For example, veterinary-biological, veterinary-trace evidence, veterinary-ballistic, veterinary-molecular-genetic, veterinary-art-historical, veterinary-medical, etc. (multi-discipline examinations have more capabilities compared to single-discipline forensic examinations).

Let us remind that a document on forensic examination appointment or involvement of forensic expert to conduct a multidisciplinary examination shall include the name of the forensic science institution(s),

157 Науково-методичні рекомендації … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

158 Яценко І. В., Париловський О. І., Коломоєць Д. К. Обґрунтування питань, що ставляться в ухвалі суду та постанові слідчого при призначенні судово-ветеринарної експертизи трупа тварини з ознаками насильницької смерті від жорстокого поводження. *Ветеринарія, технології тваринництва та природокористування*. 2019. № 4. С. 184—197. DOI: 10.31890/vttp.2019.04.34 (date accessed: 02.03.2023).

159 Яценко І. В. Проблеми укладання … . С. 11—15. DOI: 10.5281/zenodo.6471059 (date accessed: 02.03.2023).

160 Цуцкірідзе М. С., Орлова Т. А., Яценко І. В. та ін. Op. cit.

161 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

162 Сімакова-Єфремян Е. Б. Інтеграційні процеси в судовій експертизі: сутність та проблемні питання комплексних досліджень. *Теорія та практика судової експертизи і криміналістики*. 2016. Вип. 16. С. 172—183. URL: https://khrife-journal.org/index.php/journal/article/download/81/79/ (date accessed: 02.03.2023).

specifying forensic experts entrusted with conducting such examination. In the case of participation of forensic experts who do not work in state specialized expert institutions, their full names, education, specialization, occupational affiliation, place of registration, and other details are also provided (para. 1 of cl. 3.7 of Instructions No. 1 [163]).

"If forensic examination is entrusted to experts from multiple expert institutions, a document on forensic examination appointment specifies which institution is the leading one that is, which of them organizes forensic examination, in particular coordination of forensic experts' work and communication with the body (person) that appointed forensic examination (involved an expert).

If multidisciplinary forensic examination is entrusted to employees of the expert institution and a person who is not an employee of such an institution, the priority is given to the expert institution (paras. 1 and 2 of cl. 3.7 Instructions No. 1 [164]).

In case of conducting a multidisciplinary forensic examination, the document on its appointment (involvement of a forensic expert) is sent to each institution which employees participate in forensic examination, as well as to the forensic expert who is not employed in a state specialized expert institution. Objects of research and criminal proceeding materials in other types of court proceedings are directed to a leading expert institution (paras. 3 and 4 of cl. 3.7 of Instructions No. 1 [165]).

Objects and materials to be examined are sent to a person entrusted with performing forensic examination (a leading forensic expert or expert institution); Pt. 3 of Art. 104 of the Civil Procedure Code of Ukraine [166], Pt. 3 of Art. 100 of the Code of Commercial Procedure of Ukraine [167] and Pt. 3 of Art. 103 of the Code of Administrative Proceedings of Ukraine [168]) in sealed packaging ensuring their preservation and preventing unauthorized tampering without violating the integrity of the packaging. Physical evidence and comparative samples are packaged separately.

In forensic veterinary examinations, there are sometimes bulky research objects (for example: elephants, giraffe, moose, horse, cattle, etc.) that are difficult to transport. In such cases, a forensic veterinarian travels to the scene or conducts forensic examination of the object at its location. Under these circumstances, the authorized person (body) who appointed forensic veterinary examination must ensure the expert's arrival at the scene, unimpeded access to research object, as well as suitable working conditions (cl. 3.9 of Instructions No. 1 [169]).

"Bulky items and other objects that are not eligible for postal delivery <...> are received personally at the expert institution or by a representative authorized by the body (person) who appointed forensic examination (involved a forensic expert), upon presentation of identification document" (para. 2 of cl. 4.20 of Instructions No. 1 [170]).

163 Інструкція про призначення та проведення ... . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

164 Ibid.

165 Ibid.

166 Цивільний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

167 Господарський процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

168 Кодекс адміністративного судочинства ... . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

169 Інструкція про призначення та проведення ... . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

170 Ibid.

10. Determining feasibility of the presence of participants in process during forensic veterinary examination

The appointing authority of forensic veterinary examination has the right to be present during the conduct of expert researches related to items and objects of research (cl. 3 of Pt. 3 of Art. 69 of the Criminal Procedure Code of Ukraine [171], cl. 4 of Pt. 6 of Art. 72 of the Civil Procedure Code of Ukraine [172], cl. 4 of Pt. 6 of Art. 69 of the Code of Commercial Procedure of Ukraine [173], cl. 4 of Pt. 6 of Art. 68 of the Code of Administrative Proceedings of Ukraine [174], cl. 3 of Pt. 1 of Art. 13 of the specialized Law[175], para. 5 of cl. 2.1 of Sec. II of Instructions No. 1 [176] and subcl. 3 of cl. 1 of Sec. II of Instructions No. 2 [177]).

During individual forensic examinations, in case of adoption of the corresponding decision by the authorized person (body), a participant in the process or his/her representative who is informed of the time and place of forensic examination may also be present. The absence of the notified person does not prelude forensic examination conduct. Persons present during forensic examination are mentioned in the expert conclusion.

From our perspective, the following individuals may be present during forensic veterinary examination:

- the prosecutor, investigator, inquiring officer;
- the accused, suspect (with the permission of the subject appointing forensic examination);
- veterinarians who treated an animal under examination (with the permission of the subject appointing forensic examination);

We consider personal presence of the subjects appointing forensic veterinary examination (involving a forensic expert) necessary in the following cases:

- obtaining up-to-date information from a forensic expert on research object (for example, the nature of bodily injuries and instruments of injury based on morphological features of injuries on the body). Such information can be immediately used for carrying out crime detection and investigation;
- direct perception by the subject appointing forensic examination (involving a forensic expert) of properties of an object (for example, during the dissection of an animal carcass, one can observe the nature and morphological features of bodily injuries, their localization, etc.);
- clarification of questions addressed to the forensic expert for resolution; presenting additional questions if new data are discovered while research;

171 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

172 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

173 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

174 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

175 Про судову експертизу … . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 02.03.2023).

176 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

177 Інструкція про особливості здійснення … . URL: https://zakon.rada.gov.ua/laws/show/z1431-11#Text (date accessed: 02.03.2023).

- timely provision of additional materials to a forensic expert for conducting forensic examination.

The presence of the accused or the suspect during forensic veterinary examination is expedient when addressing issues related to her/his professional or official activities (most frequently, these are cases of inadequate provision of veterinary care or organization of veterinary sanitary measures: for example, mass animal mortality due to the spread of an acute infectious disease, clarification of technological processes in production of animal feeds and feed additives, etc.).

The individuals present should not interfere in the course of research but may provide explanations to a forensic expert regarding forensic examination subject. If a participant in the process obstructs the forensic expert's activities, the latter has the right to suspend research. The forensic expert (or the expert committee) prepares a conclusion in the absence of participants in the process.

11. Interaction between subjects involved in appointment and conduct of forensic veterinary examination

Interaction between subjects involved in conduct and appointment of forensic veterinary examination is a professional communication between the investigator, public prosecutor, court, head of the expert institution, and the forensic expert. Let's stress that activity of a forensic veterinarian (as well as a forensic expert in other expert specializations), although independent of the other subjects involved in conduct and appointment of forensic examination, is inseparably linked to the subjects appointing the examination exclusively within the framework of the law.

Based on the analysis of expert practice, we would like to express our own opinion on the praxeological aspects of the interaction between the subjects appointing and conducting forensic veterinary examinations for a successful investigation of offences since they involve coordination of positions concerning:

- forensic examination purpose, which is to obtain factual data;
- forensic examination capabilities;
- quantity and quality of objects submitted for forensic examination;
- identification of new objects and physical evidence by a forensic expert;
- obtaining permission for destruction of objects;
- forensic examination subject, specifically questions (tasks) that need to be resolved in the course of forensic examination;
- peculiarities of selecting samples for research;
- place of performing forensic examination (forensic science institution, at the workplace of a private expert, or at the location of objects);
- time of forensic examination;
- clarification of results received while forensic examination;
- other circumstances arising during investigative actions, preparation and conduct of forensic examination (including in the presence of a public prosecutor, investigator, inquiring officer, or a client ordering forensic examination), evaluation and verification of the expert conclusion.

Let's point out that procedural interaction between the investigator and the forensic veterinarian can be direct or indirect, meaning it can be realized through the head of the forensic science institution. In relationships prescribed by legislative norms, the authorized person (body) conducting the pre-trial investigation, the forensic expert, and the head of the forensic institution are the subjects of interaction and have subjective rights and legal obligations. As

stated by A. O. Polianskyi [178], competence of subjects involved in the appointment and conduct of forensic examinations (including forensic veterinary examinations) is exercised exclusively within the framework of relevant legal relationships, in order to achieve a common goal: conducting an unbiased research on relevant materials as well as clarifying factual data and circumstances of a committed offense.

Anyone involved in procedural relations can initiate such interaction. For example, the authorized person (body) appointing the forensic veterinary examination initiates its conduct, and the forensic expert is obligated to accept the ruling on its appointment and proceed with forensic examination (para. 3 of cl. 2.2 of Sec. II of Instructions No. 1 [179]). At the same time, a forensic expert has the right to request additional materials and refuse to perform forensic examination if they are not provided (Pt. 7 of Art. 69 of the Criminal Procedure Code of Ukraine [180], Pt. 6 of Art. 104 of the Civil Procedure Code of Ukraine [181], Pt. 6 of Art. 100 of the Code of Commercial Procedure of Ukraine, Pt. 6 of Art. 103 of the Code of Administrative Proceedings of Ukraine, para. 3 of cl. 2.1 of Instructions No. 1 [182]). The subject appointing forensic veterinary examination must grant the forensic expert's motion, and in case of refusal, provide justification for it.

During preparation for any investigative action involving a forensic expert in the field of forensic veterinary medicine, the authorized person (body) conducting the pre-trial investigation and the expert jointly plan the course of forensic examination. Such interaction (before, during, and after forensic examination) involves close communicative communication between the investigator and the forensic expert, involving exchange of information within the law.

Procedural interaction between the subject appointing forensic veterinary examination and the expert involves advising the subject appointing forensic veterinary examination by a forensic veterinarian prior to its appointment and during its conduct. It also includes the forensic expert's appeal to the client ordering forensic examination for clarification of the research task after receiving the procedural document appointing it, as well as the explanation of the expert conclusion upon its completion, etc.

Procedural interaction between the head of the forensic science institution and the forensic expert is manifested in entrusting forensic veterinary examination to the latter. The head of the specialized forensic institution may initiate involvement of other forensic experts in conducting forensic veterinary panel examination or multidisciplinary forensic examination (such as veterinary-biological, veterinary-molecular-genetic, veterinary-trace evidence, etc.). Non-procedural relations between

178 Полянський А. О. Адміністративно-правові засади взаємодії судово-експертних установ з правоохоронними органами : дис. … д-ра юрид. наук. Суми, 2021. 406 с. URL: https://dspace.hnpu.edu.ua/server/api/core/bitstreams/9878f381-57f1-4bfa-b84c-7418ddb59fef/content (date accessed: 02.03.2023).

179 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

180 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

181 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

182 Інструкція про призначення та проведення … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 02.03.2023).

the head and the forensic expert lie within their official duties.

Interaction of forensic experts involved in conducting panel or multidisciplinary forensic examinations is based on equality and independence among panel members and has an informal interpersonal nature. Collaborative efforts of all parties involved should be directed towards assisting each other for full fulfilment of their professional duties.

As stated by A.O. Polyanskyi, it is relevant to single out two groups of interaction principles between forensic science institutions and law enforcement agencies, general legal (humanism and legality) and specific (organizational independence, competence, mutual interest, etc.) [183].

Within our research, the following principles of interaction between the subjects appointing and conducting forensic veterinary examination are important:

- adherence to legality by the interacting subjects in the performance of functions assigned to them;
- organizational role of the authorized person (body) conducting pre-trial investigation in appointment of forensic examination and seizure of research objects;
- delineation of competencies of interacting subjects. Each of them acts within the scope of rights and powers granted to him/her, which presupposes the forensic expert's independence in choosing research methods and her/his independence during forensic examination and expert conclusion compilation;
- alignment of actions between the subject appointing forensic examination (involving a forensic expert) and the forensic expert (expert panel members);
- it is necessary for a forensic expert to be fully familiarised with the circumstances of an event and a specific investigative situation within the subject of expert research. This is essential for a forensic expert's orientation in determining research tasks, identifying objects and their informational fields, creating flow-charts, and evaluating forensic examination results;
- it is necessary for the authorised person (body) to be fully acquainted with conducting pre-trial investigation, with possibilities of scientific and technical research of specific objects, efficiency of alternative expert methodologies, taking into account the perspective of investigative situation development.

It should be stressed that if forensic veterinary examination is carried out in a specialized expert institution, then the institution head (head of the structural unit) organizing the research and taking into account questions posed to a forensic expert independently appoints forensic experts who must be involved in its conduct (provided that the initiator did not name a specific forensic expert [experts]). For example, a forensic veterinarian or a panel of forensic veterinarians (as holders of specific veterinary expertise) are involved in forensic veterinary examination. On the other hand, forensic veterinarians (as holders of specific veterinary expertise) and a forensic biologist (as a holder of specific biological expertise) are involved in conducting a multidisciplinary forensic veterinary-biological examination, etc.

183 Полянський А. О. Op. cit. URL: https://dspace.hnpu.edu.ua/server/api/core/bitstreams/9878f381-57f1-4bfa-b84c-7418ddb59fef/content (date accessed: 02.03.2023).

II step. Performing research by a forensic expert using specific veterinary expertise

The second step in organizing forensic veterinary examination is performing research by a forensic expert using specific veterinary expertise. During this step, a forensic veterinarian:

- familiarizes himself/herself with a procedural document on forensic examination appointment, as well as with other materials of a criminal proceeding (case materials in other types of court proceedings) related to research subject;
- if necessary, directs his/her motion to the appointing subject (who has involved a forensic expert) for provision of additional materials needed for drawing up the expert conclusion or for conducting an investigative action with his/her participation;
- conducts a scientifically substantiated research on objects according to the following stages: preparatory (preliminary examination), analytical (separate examination), comparative, synthesis (evaluative) [184];
- draws up the expert conclusion based on results of conducted forensic examination [185].

III step. Examination, evaluation, and verification of the expert conclusion by the authorized person (body) who appointed forensic veterinary examination or involved a forensic expert

During *the third* and *final* step, the authorized person (body) who appointed forensic examination in a criminal proceeding or involved a forensic expert in other types of court proceedings evaluates and verifies the expert conclusion by obtaining clarifications from the forensic veterinarian or through his/her interrogation in court; orders an additional forensic examination or forensic veterinary re-examination (if necessary); acquaints the defense with the expert conclusion if the forensic veterinarian was involved by the prosecution.

The expert conclusion is recognized as a source of evidence on which basis the court determines the existence (lack) of factual data or circumstances substantiating claims and objections of parties involved in a case, as well as other circumstances relevant to case resolution (Art. 84 of the Criminal Procedure Code of Ukraine [186], Art. 76 of the Civil Procedure Code of Ukraine [187], Art. 73 of the Code of Commercial Procedure of Ukraine [188], Art. 72 of the Code of Administrative Proceedings of Ukraine [189]).

184 Яценко І. В. Стадії експертного дослідження та їх застосування у судово-ветеринарній експертизі трупів тварин. *Теорія та практика судової експертизи і криміналістики*. 2022. Вип. 1 (26). С. 52—78. DOI: 10.32353/khrife.1.2022.04 (date accessed: 02.03.2023).

185 Яценко І. В., Дереча Л. М., Париловський О. І. Особливості структури висновку судово-ветеринарного експерта за результатами дослідження трупа тварини з ознаками насильницької смерті. *Ibid.* 2020. Вип. 21. С. 615—639. DOI: 10.32353/khrife.1.2020.44 (date accessed: 02.03.2023).

186 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.03.2023).

187 Цивільний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.03.2023).

188 Господарський процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.03.2023).

189 Кодекс адміністративного судочинства … . URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.03.2023).

Thus, singling out epistemological characteristic of stages of appointment and conduct of forensic veterinary examination has enabled to reveal their procedural significance during pre-trial investigation and court investigation of animal-related offenses, as well as to outline ways to improve it through interaction of subjects of forensic expert activity at each stage of appointment, conduct, and evaluation of forensic veterinary examination.

Conclusions

Forensic veterinary examination is appointed and conducted in three steps: 1) preparation of materials and appointment of forensic veterinary examination (involvement of a forensic expert) by an authorized person (body); 2) conducting research by a forensic expert using specific veterinary expertise; 3) examination, evaluation, and verification of the forensic expert's conclusion by the authorized person (body) who appointed or involved the forensic expert for forensic veterinary examination.

Preparation of materials and appointment of forensic veterinary examination comprises the following steps: 1) the authorized subject's decision to appoint forensic veterinary examination; 2) singling out a specific subject of forensic veterinary examination; 3) determination of the category of forensic veterinary examination based on procedural features; 4) determination of the order of forensic veterinary examination appointment in conjunction with other forensic examinations; 5) choosing time for conducting forensic veterinary examination; 6) source information preparation, obtaining objects and samples for performing forensic veterinary examination; 7) selecting a subject for forensic veterinary examination conduct; 8) issuing a procedural document on forensic veterinary examination appointment; 9) sending a procedural document on forensic veterinary examination appointment, objects of research, and samples to the subject responsible for its conduct; 10) determining feasibility of participants' presence during forensic veterinary examination; 11) interaction between subjects involved in appointment and conduct of forensic veterinary examination.

The main principles of interaction between subjects involved in appointment and conduct of forensic veterinary examination at each stage are as follows: 1) compliance with legality by the interacting subjects while fulfilling their assigned functions. 2) the organizational role of the authorized person or body conducting pre-trial investigation in appointment of forensic examination and seizure of research objects; 3) delineation of competencies among the interacting subjects. Each of them acts within the scope of rights and powers granted to her/him, which involves independence of a forensic expert in choosing research methodologies and his/her autonomy during forensic examination and formulation of the expert conclusion; 4) alignment of actions between the appointing subject (involved in appointment of a forensic expert) and the forensic expert (members of the expert panel); 5) comprehensive familiarization of a forensic expert with event circumstances and a specific investigative situation within the scope of expert research subject. This is necessary for the forensic expert's orientation in determining research tasks, identifying objects, their informational fields, creating flow charts, and evaluating forensic examination results; 6) comprehensive familiarization of the authorized person (body) conducting pre-trial investigation with possibilities of

scientific and technical research on specific objects, with efficiency of alternative expert methodologies, taking into account the perspective of the investigative situation development.

Summarizing the above, we propose the following.

1. In order to save time, it is recommended that permission for the use of destructive examination methods be explicitly stated in a procedural document (judgement or ruling) on forensic veterinary examination appointment.

2. To amend Part 2 of Article 242 *Grounds for expert examination* of the Criminal Procedure Code of Ukraine with clauses 7 and 8 of the following content:

"7) establishing the cause of an animal's death;

8) ascertaining the severity of harm and the nature of physical injuries inflicted on the animal's health."

3. To amend Article 107 *Collection of materials for expert examination* of the Civil Procedure Code of Ukraine and Article 105 *Collection of materials for expert examination* of the Code of Administrative Proceedings of Ukraine with the fifth part, and Article 102 *Collection of materials for expert examination* of the Code of Commercial Procedure of Ukraine with the sixth part of the following content:

"At the request of a party in a case (forensic examination customer), who independently involved a forensic expert, the appointed forensic expert is obliged to promptly return materials and other documents used by him/her for conducting forensic examination".

4. To amend Part 1 of Article 105 *Mandatory court appointment of expert examination* of the Civil Procedure Code of Ukraine with clause 4 of the following content:

"4) the cause of death, nature, and degree of severity of harm inflicted on an animal's health."

Гносеологічна характеристика та процесуальне значення етапів і стадій призначення та проведення судово-ветеринарної експертизи

Володимир Яценко

Мета дослідження: виокремити гносеологічні характеристики етапів призначення і проведення судово-ветеринарної експертизи та розкрити їх процесуальне значення для досудового розслідування й судового розгляду справ щодо тварин. Доведено, що ці етапи різняться за суб'єктом, метою, способами й містять свої складові: 1) підготовка матеріалів і призначення судово-ветеринарної експертизи (ухвалення рішення про призначення експертизи; виокремлення предмета експертизи; визначення категорії експертизи за процесуальними ознаками, черговості її виконання, обрання часу її проведення; підготовка вихідної інформації; отримання об'єктів для дослідження; обрання суб'єкта проведення; винесення процесуального документа про призначення експертизи й ознайомлення з ним обвинувачуваного (підозрюваного, підсудного); визначення доцільності присутності учасників процесу під час проведення експертизи; скерування процесуального документа про призначення експертизи й об'єктів дослідження суб'єктові її проведення; взаємодія суб'єктів призначення та проведення експертизи); 2) проведення судовим експертом досліджень із використанням спеціальних ветеринарних знань; 3) дослідження, оцінка й перевірка висновку судового експерта (отримання роз'яснень від експерта або його допит у суді; призначення додаткової або повторної експертизи (за потреби); ознайомлення сторін із висновком). Методологічне підґрунтя дослідження — системний підхід (загальнонаукові та спеціальні наукові методи).

Ключові слова: *судово-ветеринарний експерт; етапи призначення та проведення судово-ветеринарної експертизи; суб'єкт призначення судової експертизи; стадії підготовки матеріалів до проведення судово-ветеринарної експертизи; гносеологічна характеристика.*

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The Genesis of Institutes of Scientific and Forensic Examination in Kharkiv, Kyiv and Odesa in 1922—1929: Historical and Legal Aspect

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The genesis of forensic examination in Ukraine on the eve of the First World War and its further institutionalization in the 1920s are considered. The prerequisites for the establishment of scientific forensic examination offices in Kyiv, Odesa, and Kharkiv at the initiative of, in particular, the legendary forensic physician and forensic scientist Mykola Bokarius are studied. The normative legal acts on the organization and conduct of forensic work, the legal status of the institutes of scientific and forensic examination of the People's Commissariat of Justice of the Ukrainian SSR, their tasks, structure, and formation procedure were analyzed. The determining role in the genesis of forensic examination in Ukraine in the 1920s of domestic forensic scientists M. Bokarius, M. Makarenko, S. Potapov, V. Favorskyi and others, who not only laid the foundations of various types of forensic examination to meet the needs of courts, is substantiated and pre-trial investigation bodies but also formed the scientific-methodological and methodical foundations of forensic expert activity in Ukraine. It has been proven that already in the 1920s, domestic schools of forensic examination were formed in Ukraine (in particular, the Kharkiv school of M. Bokarius); a community of highly professional forensic

This article is translation of the original Ukrainian content, which source is available at the link: *https://khrife-journal.org/index.php/journal* (translated by Tetiana Droshchenko). The authors acknowledge translation as corresponding to the original.

experts was formed and a high-quality system of their training was developed; new types of forensic examinations were introduced and the methods of their conduct were scientifically substantiated; the publication of fundamental scientific works on the issues of forensic examination and criminology is organized; In Kharkiv, a specialized and authoritative journal "Archives of Criminology and Forensic Sciences" was launched. The research uses general scientific methods: analysis, synthesis, analogy, systematization and generalization.

Keywords: *forensic examination; genesis of forensic examination in Ukraine; office of scientific and forensic examination; institute of scientific and forensic examination, institute of scientific; Kharkiv Institute of Forensic Science, Mykola Bokarius.*

Research Problem Formulation

The large-scale military aggression of the Russian Federation, which has been ongoing in Ukraine for more than a year, poses serious and difficult tasks to the Ukrainian scientific and research institutions of forensic examinations (hereinafter referred to as *SRIFE*) of the Ministry of Justice. Their content consists, *first*, in the formation of an appropriate evidence base for national and international courts to hold the Russian Federation accountable for war crimes committed since February 24, 2022, in Ukraine [1], and also, *secondly*, in determining the losses and damage caused by the aggressor to our state, territorial communities, natural and legal entities. At the same time, these main tasks and functions of forensic expert activity require proper scientific and methodical justification.

In parallel with the applied scientific research works systematically carried out at the *SRIFE* of the Ministry of Justice with the aim of developing and introducing new methods and methodical recommendations into forensic expert practice, scientists in the field of forensic examination also address questions of the theory and history of forensic examination in Ukraine. Currently, an important task for Ukrainian experts-scientists is a critical rethinking of the genesis of forensic examination in Ukraine at the beginning of the 20th century and its objective achievements during its stay, first as part of the Russian Empire, and from 2022 - as part of the former USSR.

The Russian Federation's appropriation of the Ukrainian history of state formation and law-making led, starting from the second half of the 20th century to the spread of false narratives about the inferiority and secondary nature of Ukrainian science, technology, and art. Important achievements of Ukraine in the establishment and development of forensic examination were unreasonably silenced by the authorities at the time, replaced by the thesis of the whimsical "Soviet school of forensic examination".

After the declaration of Ukraine's independence, this led to a cycle of scientific research on the establishment of Ukrainian scientific and expert institutions at the beginning of the 20th century in Kyiv, Odesa, and Kharkiv. In the year when National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science

1 Fedorenko V., Fedorenko M. Russia's Military Invasion of Ukraine in 2022: Aim, Reasons, and Implications. *Krytyka Prawa. Niezależne Studia nad Prawem.* 2022. Vol. 14. Is. 1. Pp. 38—39. DOI: 10.7206/kp.2080-1084.506 (date accessed: 06.03.2023).

Institute» (hereinafter referred to as *NSC «Hon. Prof. M. S. Bokarius FSI»*) is celebrating its 100th anniversary, this research aims to form the conceptual foundations of the genesis of this and other forensic institutions of Ukraine in 1920th.

Analysis of Recent Researches and Publications

The issue of the genesis of forensic expert activity and the establishment and development of scientific research institutions of forensic examination in Ukraine remains one of the traditional ones for Ukrainian jurisprudence. They were actively studied by such Ukrainian scientists as V. Honcharenko; A. Ishchenko, V. Koloniuk and V. Yusupov [2]; V. Komakha [3]; Yu. Kravchenko, V. Lisovyi, V. Olkhovskyi and V. V. Miasoiedov [4]; E. B. Simakova – Yefremian with co-authors [5]; Yu. Foris with co-authors [6] and others, as well as authors of this research paper — in Ukraine [7] and Poland [8].

Important sources for the study of M. Bokarius's contribution to the genesis of institutes of scientific and forensic examination in Ukraine are also the results of historical and biographical investigations of scientists of the NSC «Hon. Prof. M. S. Bokarius FSI», embodied in a number of reference and presentation publications that popularize the scientific heritage of honored professor M. Bokarius [9].

2 Іщенко А. В., Колонюк В. П., Юсупов В. В. 105 років наукової діяльності Київського науково-дослідного інституту судових експертиз. *Криміналістика і судова експертиза* : міжвідом. наук.-метод. зб., присвяч. 105-річ. засн. судов. експерт. в Україні. 2018. Вип. 63. Ч. 1. С. 9—20. URL: http://nbuv.gov.ua/UJRN/krise_2018_63(1)__4 (date accessed: 06.03.2023).

3 Комаха В. О. Становлення і розвиток судової експертизи та судово-експертних установ на Півдні України: за матеріалами перших двох етапів становлення і розвитку Одеського НДІ судових експертиз 1914—1941 рр. Одеса, 2002. 512 с.

4 Лісовий В. М., Ольховський В. О., Кравченко Ю. М., М'ясоєдов В. В. Слово про Вчителя: до 150-річчя з Дня народження Заслуженого професора М. С. Бокаріуса. *Актуальні питання судової експертизи і криміналістики* : зб. мат-лів міжнар. наук.-практ. конф., присвяч. 150-річ. з дня народж. Засл. проф. М. С. Бокаріуса (Харків, 18—19.04.2019). Харків, 2019. С. 4—7. URL: https://repo.knmu.edu.ua/bitstream/123456789/24187/1/1olxov.pdf (date accessed: 06.03.2023).

5 Головченко Л. М., Лозовий А. І., Сімакова-Єфремян Е. Б. та ін. Основи судової експертизи: навчальний посібник для фахівців, які мають намір отримати або підтвердити кваліфікацію судового експерта. Харків, 2016. С. 11—24. URL: https://expertize-journal.org.ua/attachments/article/924/ose.pdf (date accessed: 06.03.2023).

6 Колонюк В. П., Форіс Ю. Б., Юдіна О. В., Виноградова В. С. Деякі аспекти діяльності співробітників Київського науково-дослідного інституту судових експертиз у різних політико-соціальних умовах (1913—2022 роки). *Криміналістика і судова експертиза.* 2022. Вип. 67. С. 688—694. DOI: 10.33994/kndise.2022.67.69 (date accessed: 06.03.2023).

7 Федоренко В. Л., Коваленко В. В., Кравчук В. М. Ґенезис і розвиток судової експертизи в Україні: від Руської Правди — до військової агресії РФ. *Експерт: парадигми юридичних наук і державного управління*. 2022. № 3 (21). С. 23—50. DOI: 10.32689/2617-9660-2022-3(21)-12-22 (date accessed: 06.03.2023).

8 Wieczorek L. Przestępczość na Ukrainie na początku XXI wieku. Studium prawno-kryminologiczne. Białystok, 2019. 473 s.

9 Пам'яті Заслуженого професора Миколи Сергійовича Бокаріуса — видатного судового медика, криміналіста, засновника Харківського науково-дослідного інституту судових експертиз [Буклет]. Харків, 2016. 8 с. ; Кабінет-музей видатного судового медика, криміналіста, засновника Харківського науково-дослідного інституту судових експертиз, Заслуженого професора Миколи Сергійовича Бокаріуса [Буклет]. Харків, 2016. 28 с.

At the same time, in scientific studies devoted to the initiation of forensic institutes in Ukraine, insufficient attention is paid to their formation during the Soviet era, during the implementation of the New Economic Policy (hereinafter referred to as *NEP*), before the beginning of mass collectivization in 1929 and the policy that followed it, which was detrimental to Ukraine Holodomor and Stalinist repressions. Although this historical period became the starting point for the institutionalization of forensic expert activity in Ukraine.

Article Purpose

It consists in the formation based on the generalization, analysis and systematization of the provisions of normative legal acts and scientific sources, the theoretical and methodological foundations of the establishment and development of forensic activity and institutes of scientific forensic examination in Ukraine in the 1920s.

Research Methods

In order to achieve the set method, general scientific research methods are applied: analysis, synthesis, analogy, systematization and generalization.

Main Content Presentation

As is well known, the history of forensic institutions in Ukraine dates back to the beginning of the 20th century. The Law "On the Establishment of Scientific Forensic Examination Offices in the Cities of Moscow, Kyiv and Odesa" of July 4, 1913[10], approved by the State Council and the State Duma of the Russian Empire, established the first state-specialized expert institutions in Ukraine: scientific and forensic examination offices (hereinafter referred to as *SFEO*) under prosecutors of the Kyiv and Odesa Chambers. These two offices worked continuously from the day of their foundation in early 1914 and throughout the First World War, and after the February Revolution of 1917, and during the times of the Ukrainian People's Republic, the Hetmanate and the Directory, and after the Bolshevik expansion in Ukraine [11].

The dedicated work of Ukrainian criminologists in 1914-1922 was not hindered by the small number of staff of the SFEO and the lack of trained personnel, nor the absence of a regulatory and legal framework, nor the lack of proper scientific, methodological and methodical support — all this made it difficult, but did not stop the development the first forensic expert institutions of Ukraine.

The first years of the existence of the SFEO in Kyiv and Odesa (since 1923 and in Kharkiv) remain an important subject of thorough scientific investigations by expert scientists, primarily employees of the modern SRIFE of the Ministry of Justice of Ukraine. These studies analyzed the general trends of the genesis of Ukrainian forensic institutions, which became the cradle of not only practice but also, first of all, theories and methods of forensic examination for the whole of Ukraine.

Ceremonially opened on February 2 (15), 1914, the Kyiv SFEO first functioned with 8 people (S. Potapov, Head of the office; M. Tufanov, Head of the Criminal and Technical Department; V. Favorskyi, Head of the Photographic Department and

10 Об учреждении кабинетов научно-судебной экспертизы в городах Москве, Киеве и Одессе : Закон, одобренный Государственным Советом и Государственною Думою 4 (17) июля 1913 г. *Собрание узаконений и распоряжений правительства*. 1913. Отд. 1. № 158. Ст. 1441.

11 Федоренко В. Л., Коваленко В. В., Кравчук В. М. Op. cit. С. 39. DOI: 10.32689/2617-9660-2022-3(21)-12-22 (date accessed: 06.03.2023).

A. Sementsov, Assistant; three technical employees and a translator) [12], who in the first year of activity conducted more than 200 expert studies. The material base of the institution amounted to thousand gold rubles [13].

In Odesa SFEO under the prosecutor of the Odesa Judicial Chamber, solemnly opened on February 15 (28), 1914, 4 employees (at the beginning of 1922 — 12) worked under the leadership of M. Makarenko, who *"showed himself to be an outstanding scientist, teacher, forensic expert, as well as a very talented manager"* [1] [14] and headed his institution until 1938.

Achievements in the scientific field are evidenced by the reports of Ukrainian scientists-experts who participated in the Congress of Heads of Forensic Expert Institutions on July 19, 1915, in Petrograd, namely: S. Potapov — on the most important features of handwriting for comparative research; V. Favorskyi — on the method of reading the etched text using luminescence; M. Tufanov — on the peculiarities of the study of hair, blood stains and semen; M. Makarenko — on the most interesting cases, as well as about certain methods of forensic research in the Odesa SFEO; Ye. Yelchaninov — on the significance of the foreign mission of 1914 for the development of domestic expert work [15]. In the same year, the world saw the first issue of the famous work by M. Bokarius "Forensic Medicine Presented for Lawyers" (1915) [16].

After the First World War, forensic expert activity in Ukraine received a new push for development and further institutionalization, although the normative-legal, scientific-methodological, methodical, organizational and financial support of forensic examination in Ukraine in 1917—1922 can hardly be considered satisfactory (in particular, due to the eclecticism of contemporary politics and legislation — procedural and criminal) [17].

The bodies of the Ukrainian state, and later the Bolshevik government and regional Soviet entities (the Galician Socialist Republic of Soviets, Donetsk-Kryvorizka Republic, etc.) failed to develop new procedural codes, so all this time in Ukraine they used the procedural legislation of the tsarist times. For example, Art. 8 of Decree No. 2 on Courts dated March 7, 1918, stated that judicial proceedings should be carried out according to the rules of the court statutes of the Russian Empire of 1864, since the Central Executive Committee of the Workers', Soldiers' and Cossacks' Deputies and the Soviet People's Committee have not abolished them to this day [18].

12 Іщенко А. В., Колонюк В. П., Юсупов В. В. Op. cit. С. 10. URL: http://nbuv.gov.ua/UJRN/krise_2018_63(1)__4 (date accessed: 06.03.2023).

13 Колонюк В. П., Форіс Ю. Б., Юдіна О. В., Виноградова В. С. Op. cit. С. 689. DOI: 10.33994/kndise.2022.67.69 (date accessed: 06.03.2023).

14 Макаренко Н. П. Техника расследования преступлений: практическое руководство для судебных работников. Репр. изд. 1925 г. ; предисл.: А. И. Рипенко. Херсон, 2013. С. 1.

15 Іщенко А. В., Колонюк В. П., Юсупов В. В. Op. cit. URL: http://nbuv.gov.ua/UJRN/krise_2018_63(1)__4 (date accessed: 06.03.2023).

16 Бокаріусъ Н. С. Судебная медицина въ изложеніи для юристовъ: опытъ изложения основъ судебной медицины для юристов съ присоединеніемъ необходимых общих свѣдѣний изъ анатомии, гистологіи, физіологіи, химіи, патологіи и других медицинских дисциплинъ. Т. I : О крови и сосудистой системѣ ея. О кожѣ. О скелетѣ человѣка. Харьковъ, 1915. VIII, X, 779 с. URL: https://dspace.nlu.edu.ua//jspui/handle/123456789/5172 (date accessed: 06.03.2023).

17 Wieczorek L. Op. cit. S. 22—24, 32—33.

18 Гринюк В. О. Суд радянської доби. *Часопис Національного університету «Острозька академія». Серія «Право».* 2012. № 2 (6). URL: http://lj.oa.edu.ua/articles/2012/n2/12hvosrd.pdf (date accessed: 06.03.2023).

However, as early as 07/23/1918, the People's Committee of Justice approved the order "On the Organization and Operation of Local People's Courts", normalizing the status of experts as participants in the judicial process with the permission of the courts to interrogate them on an equal basis with witnesses and warn of liability for false testimony (Art. 24). Therefore, the institute of "informed persons" started by the tsarist court statutes of 1864 continued to work in 1917—1921 and after the Bolshevik expansion and the accession of Ukraine to the Soviet Federation.

In 1918, a forensic medical examination was transferred to the sphere of management of the People's Commissariat for Health. In 1919—1920, M. Makarenko was confirmed as the Head of the Odesa SFEO, which in 1923 received the status of a regional office [19]. In the same year 1923, Professor M. Bokarius assumed the position of chief state forensic medical inspector of the Ukrainian SSR.

Since 1922, the legislation on the judiciary, legal proceedings, and forensic examination, as well as the organizational and legal status of forensic institutions have changed significantly in Ukraine. Adoption of the 1922 Regulation on the Judiciary of the USSR [20] and the Criminal Procedure Code of the USSR (hereinafter referred to as *CPC*) [21] normalized the grounds for the creation of preliminary investigation bodies (People's investigators) and courts (People's judges), as well as such evidence as conclusions expert (Art. 62 of this CPC) [22], which generally contributed to the establishment of forensic expert activity and its institutionalization.

At this time, forensic experts conduct examinations and clarify their conclusions in courts and investigative bodies. For example, Clause 4 of the Instructions on the Procedure for Remuneration of Witnesses and Other Persons Summoned to Courts and Investigative Bodies in Criminal Matters (Annex to the Toggle the table of contents Circulaire of the People's Commissariat of Justice of December 23, 1922, Part 207) provided that for the appearance to the court or pre-trial investigation body, forensic experts should not receive any remuneration, since according to Art. 78 of the then Code of Labor Laws, they set the average earnings *"at the place of work or position"* [23].

The following year, the People's Commissariat of Justice of the Ukrainian SSR approved the regulation of forensic science offices [24] (hereinafter referred to as *Regulation of 1923*) and the Instruction on the activities of scientific forensic science offices. Instructions on the activities of scientific and forensic examination offices. In order to implement the functions of the SFEO, special sections were established (chemical and physicochemical research, forensic, macro- and microscopic research, identification of a person: dactyloscopic,

19 Комаха В. О. Op. cit. С. 325.

20 Положение о судоустройстве УССР : утв. Всеукр. Центр. Исполн. Комитет. 16.12.1922 г. Изд.-е офиц. Харьков, 1923. 16 с.

21 Уголовно-процессуальный кодекс УССР : утв. ВЦИК 13.09.1922 г. Харьков, 1922. 60 с.

22 Ibid.

23 Інструкція про порядок винагороди свідків та инших осіб, що викликаються по кримінальних справах до судових місць та до слідчих органів : дод. до обіжника Нарком'юсту від 23.12.1922 р., ч. 207. *Бюлетень Народнього Комісаріяту Юстиції УСРР*. 27.12.1922. Ч. 20. С. 165.

24 Положення про кабінети науково-судової експертизи : затв. Постановою РНК від 10.07.1923 р. (зі змін. та доп.). URL: https://ips.ligazakon.net/document/view/kp230010?an=2&ed=1925_04_25 (date accessed: 06.03.2023).

poroscopic, anthropometric, etc.), and in the Kharkiv office, there was also a section for body research a person [25].

According to Art. 2-4 of the Regulations of 1923, the Head of the office, his assistants and technical staff belonged to the personnel of the SFEO; the manager and his assistants were appointed and dismissed by order of the People's Commissariat, the rest of the employees — on the basis of the order of the manager; SFEO was maintained at the expense of the People's Commissariat of Justice, reported to the prosecutor's office, and general management of SFEO activities on the ground was carried out by provincial prosecutors [26].

Almost 100 years ago, on November 1, 1923, SFEO in Kharkiv joined the network of forensic expert institutions in Ukraine. Its founder and leader was the legendary Ukrainian forensic physician, outstanding criminal expert and scientist M. Bokarius. The office was first organized at the Department of Forensic Medicine of the Kharkiv Medical Institute [27].

The work of SFEO in Ukraine was managed by the People's Commissariat of the USSR, issuing circulars and instructions on improving the organization and conducting forensic examinations. For example, in paragraph 4 of the circular dated February 28, 1925 "On the elimination of errors that inhibit the work of the Scientific and Forensic Examination Office" it is noted that *"when sending material evidence to the Offices for examination, their significance or use in the case and the circumstances of the case are not submitted, which makes it difficult to carry out the examination"* [28].

It should be noted that the SFEO carried out expert research in criminal cases free of charge, and in civil cases - in accordance with the Fee for research carried out by scientific and forensic examination offices, approved by a joint resolution of the People's Commissariat of Justice and the People's Commissariat of Finance dated September 18, 1925, for example:

"B. Documents and banknotes examination, i.e. determination of their forgery by various persons, restoration of scraped, etched text, determination of the time when the document was written, etc.

1. Examination of a single document without restoration of scraped, etched, or even invisible text..... 10 KRB

<...>

C. Research of a person identification on the identification of crime instruments research at the crime scene.

<...>

4. Identification of traces of hands, feet, teeth, etc., of one person, as well as by photos..... 10 KRB

Identification of the same object by traces, photographic maps of other persons, for each identification..... 5 KRB" [29].

25 Головченко Л. М., Лозовий А. І., Сімакова-Єфремян Е. Б. та ін. Op. cit. С. 15—16. URL: https://expertize-journal.org.ua/attachments/article/924/ose.pdf (date accessed: 06.03.2023).

26 Положення про кабінети науково-судової експертизи ... . URL: https://ips.ligazakon.net/document/view/kp230010?an=2&ed=1925_04_25 (date accessed: 06.03.2023).

27 Пам'яті Заслуженого професора Миколи Сергійовича Бокаріуса. С. 6.

28 Про усунення хиб, що гальмують працю Кабінетів Науково-Судової Експертизи : обіжник Нарком'юсту від 28.02.1925 р., ч. 34. *Бюлетень Народнього Комісаріяту Юстиції УСРР*. 23.06.1925. Ч. 19. С. 148.

29 Такси оплати досліджень, що їх виконують кабінети науково-судової експертизи : Постанова Нарком'юсту й Наркомфіну від 18.09.1925 р. *Бюлетень Народнього Комісаріяту Юстиції УСРР*. 22.10.1925 р. Ч. 55. С. 450—451.

In 1925, these SFEOs were transformed into institutes of scientific and forensic examination (hereinafter referred to as *ISFE*) in Kharkiv, Kyiv and Odesa. Their organizational and legal status, functions, structure and order of organization of forensic examination and scientific activities were regulated by the Regulation on the Judicial System of the Ukrainian SSR dated October 23, 1925, in Art. 12 of which it is stated: *"In order to conduct various scientific and technical studies and provide expert opinions regarding court cases, as well as to conduct scientific works and experimental studies regarding the issues of criminal technology and the methodology of investigating crimes and investigating the identity of a offender in the cities of Kharkiv, Kyiv and Odesa are institutes of scientific and forensic examination, the area of their activity is determined by the instruction of the People's Commissariat of Justice"* [30].

It should be noted that the Heads of the ISFE in Ukraine constantly confirmed their scientific authority with their scientific developments (remember at least the fundamental work by M. Makarenko "Techniques for the investigation of crimes: a practical guide for judicial officers" (1925) [31]). The development of science in ISFE was also facilitated by entrusting them with the functions of scientific and methodological support of forensic examination in Ukraine. This made it possible to plan and coordinate relevant scientific research.

In 1926, on the initiative of M. Bokarius, Kharkiv ISFE launched one of the first specialized scientific periodicals in Ukraine — *"Archives of Criminology and Forensic Sciences"*. By Order of the People's Commissariat of Justice of the Ukrainian SSR dated June, 2, 1927, the publication is defined as the *"permanent scientific publishing body of the institute of forensic science"* (p. 52) [32].

"Archives of Criminology and Forensic Sciences" contained scientific articles by both domestic and foreign forensic scientists - from Belgium, Bulgaria, Spain, Italy, Germany, Finland and France [33]. In 1926-1927, 5 issues of the magazine were published. In a relatively short time, this periodical has established itself as an important platform for professional discourse on the theory and practice of criminology, criminalistics, forensic examination, and forensic medicine.

The organization and conduct of forensic examinations (respectively, the legal regulation of forensic expert activity of ISFE in Ukraine) were constantly improved. In particular, on July 12, 1926, M. Mykhailyk, Deputy People's Commissariat of Justice and Prosecutor General of the Republic (repressed in 1937) issued a circular "In what cases and in what order are objects of research sent to forensic institutes for additional or repeated examination in of criminal cases (To all judges, prosecutor's offices, investigations and institutes of scientific and forensic examination)", which referred to the negative practice of additional research, when the pre-trial investigation authorities repeatedly applied for the conclusions of experts - or to the same ISFE (in the case of obtaining new materials of the pre-trial investigation), or to the other (in case of doubts about the previous conclusion) according to the so-called *control examination*: this practice *"caused unwanted*

30 Положення про Судоустрій УСРР : Постанова ВЦВК від 23.10.1925 р. (зі змін. та доп.). URL: https://ips.ligazakon.net/document/view/kp250018?an=0&ed=2022_04_21 (date accessed: 06.03.2023).

31 Макаренко Н. П. Op. cit. 164 с.

32 Інститутам науково-судової експертизи : наказ Нарком'юсту УСРР від 02.06.1927 р. *Бюлетень Народнього Комісаріяту Юстиції УСРР*. 1927. № 25—26. Арт. 97.

33 Кабінет-музей видатного судового медика … . С. 16.

complications for the institutes" [34]. *This document emphasizes the need for court and investigative bodies to properly prepare an application to ISFE for conducting an examination (Art. 2), the appropriateness of a second examination (to confirm or verify the conclusions of the first) only in the event that the first examination is recognized as "not sufficiently clear, or uncertain, as well as when the findings of the examination clearly contradict the circumstances of the case"* (Art. 5), and investigative bodies are also prohibited from *"simultaneously sending requests for the examination to different institutes of SFE"* [35]. Some of the issues raised in the aforementioned circular of the People's Commissariat are relevant to the organization and conduct of the forensic examination to this day.

The order to institutes of scientific and forensic examination, issued by the People's Commissariat of the USSR in 1927 (hereinafter referred to as *ISFE*), actually approved the rules for the existence of ISFE as part of this People's Commissariat [36].

Adopted on July 20, 1927, the new Criminal Procedure Code of the USSR which was based on the *"general principles of the criminal legislation of the Union of Soviet Socialist Republics"* [37], regulated, in particular, the grounds for the appointment of a forensic examination (Art. 64), the prohibition to evade execution duties of a court expert (Art. 65), application of a statement about an expert (Art. 46), an expert's right to remuneration for the performance of his duties (Art. 66), questioning of an expert by an investigator and his appointment of additional or new examination (Art. 160, 167—172), clarification of the expert's opinion at the court hearing (Art. 276), grounds for the court's appointment of a new (repeated) examination (Art. 277), reopening of the case (in case the expert gives a "crooked" (false) opinion) etc. [38], therefore, comprehensively regulated the procedural status of the forensic expert(s) and the conclusion(s) drawn up by him/her.

The analysis of the Order's provisions on ISFE makes it possible to reproduce the peculiarities of the legal status of the current ISFE in Ukraine. According to Art. 2 part I of this order ISFE was subordinated to the Department of the Judicial System and Care of the People's Commissariat in the administrative and organizational sense, and operationally to the Department of the Prosecutor's Office of the People's Commissariat of Justice [39]. Therefore, ISFE carried out, in fact, expert support of both pre-trial investigation and justice.

Regarding tasks of ISFE, Art. 19 of the Order on ISFE imposed on them the duty *"to assist the court, prosecutor's office and bodies of judicial and investigative authorities in establishing the crime and exposing the culprit by conducting scientific examinations and giving conclusions on certain issues that require the adaptation of scientific methods of research or special technical experience"* [40]. Therefore, from the moment scientific

34 За яких випадків та в якому порядкові направляються об'єкти дослідування до інститутів науково-судової експертизи для додаткової або повторної експертизи в кримінальних справах (до всіх суддів, органів прокуратури, слідства та інститутів науково-судової експертизи) : обіжник Нарком'юсту від 12.07.1926 р. *Бюлетень Народнього Комісаріяту Юстиції УСРР*. 1926. Ч. 26. Арт. 125.

35 Ibid.

36 Інститутам науково-судової експертизи ... .

37 Wieczorek L. Op. cit. S. 55.

38 Кримінально-Процесуальний Кодекс УСРР від 20.07.1927 р. Вид. офіц. Харків, 1927. 123 с.

39 Інститутам науково-судової експертизи ... .

40 Ibid.

and expert institutions were established in Ukraine, the Soviet authorities did not require them to conduct an independent and objective forensic examination, but to assist *"the court, the prosecutor's office and the bodies of the judicial authority and the investigation in establishing the crime and exposing the culprit"*, because of which ISFE as non-independent and auxiliary subjects in the 1930s will turn into a component of a gigantic punitive and repressive system, and many talented scientists-experts and forensic experts-practitioners will become its innocent victims. Instead, the next task *"to conduct scientific works and experimental research on the issues of criminal technique and methodology of crime investigation, and in the section of criminal-psychological and psychopathological research and the identity of the burglar"* [41] contributed not only to the development of forensic science in Ukraine, but also systematized its connection with criminalistics and criminology.

The implementation of these main forensic and scientific research tasks provided for the optimal structure of ISFE in the administrative and legal sense and ensured the ubiquity of their activities on the territory of Ukraine.

According to the circular of the People's Commissariat of Justice *"On the distribution of districts between regional offices of scientific and forensic examination"* [42], ISFE served the following regions of Ukraine (service areas could change in the event of re-examination):

a) *Kharkiv region*: Kharkiv, Sumy, Izium, Kupiansk, Artemivsk, Luhansk, Mariupol, Starobilsk, Stalinsk, Poltava, Kremenchutsk, Dnipropetrovsk, Zaporizhzhia and Melitopol;
b) *Kyiv region*: Kyiv, Berdychiv, Bila Tserkva, Cherkasy, Lubensk, Romensk, Prylutsk, Chernihiv, Hlukhiv, Konotop, Nizhyn, Zhytomyr, Shepetivka and Korosten districts;
c) *Odesa region*: Odesa, Mykolaiv, Kherson, Pershomaisk, Zinoviv, Umansk, Kryvyi Rih, Vinnytsia, Proskurivsk, Mohylivsk, Tulchynsk, Kamianets districts and Moldavian Autonomous SSR [43].

The ISFE was managed by directors (in the Order on the ISFE, the word "Director" is written with a capital letter), who were appointed and dismissed by the People's Commissariat at the request of its own Department of Justice and Care (Art. 11). The Director became a key subject of the administrative and management, forensic expert and scientific research work of ISFE. In subsection 1 "Management of the Institute of Scientific-Forensic Examination" part II "Management of the Institute of Scientific-Forensic Examination, functions of sections and duties of their employees" was about the legal status, in particular the rights and duties of the Director of ISFE. The principal duty of the Director is to *"generally manage the activities of the SFE Institute, communicate on behalf of the Institute with all institutions and individuals, charge it with loans and conduct reporting on the affairs and funds of the Institute"* (Art. 59) [44].

The leadership of ISFE also included the Deputy Director (Articles 61—62) and the Academic Secretary (Articles 63—64). The first *"performed the duties of*

41 Інститутам науково-судової експертизи ... .

42 Про розподіл округ між крайовими кабінетами науково-судової експертизи : обіжник Нарком'юсту з 25.08.1925 р., ч. 129. *Бюлетень Народнього Комісаріяту Юстиції УСРР*. 1925. Ч. 46. Арт. 67.

43 Інститутам науково-судової експертизи ... .

44 Ibid.

the Director of the SFE Institute in all cases when the Director is not present", and the second *"systematized all the work of the SFE Institute and compiled reports on its activities"* [45].

According to Art. 5 of Order on ISFE included sections (chemical and physico-chemical experiments; biological experiments; identification of a person; forensic medical experiments; criminal-psychological and psychopathological experiments) [46], the Heads of which were appointed and dismissed by the People's Commissariat at the request of the Director ISFE (sections of ISFE should be distinguished from laboratories, museums, and other divisions, which will be discussed later).

In order to carry out forensic expert work, at the request of the Director of ISFE, the People's Commissariat of the USSR established auxiliary institutions at ISFE: for example, a library and laboratories (forensic-chemical, physical, photographic, serum, etc.), an X-ray room and a room for experimental and biological research, artistic dummy workshop, etc. (Art. 7) [47].

ISFE offices provided record keeping, document management, and archiving and reported to the Deputy Director. All ISFEs operated museums, the collections of which were used to gain knowledge about the methods of committing crimes and their investigation. All ISFE employees (except the Deputy and Heads of sections) were appointed and dismissed directly by the Director.

The relative organizational and managerial autonomy of ISFE in Kharkiv, Odesa and Kyiv contributed to the choice by the Directors of these institutions of priority areas of scientific research and forensic expert activity, as well as the formation of unique scientific and expert teams.

Conclusions

It is obvious that the period from 1922 to 1929 was marked, on the one hand, by the accession of Ukraine to the USSR and the introduction of the Soviet legislative system, and on the other, by a certain liberalization of economic relations during the NEP, the involvement of experienced scientists to work in the bodies state power and scientific institutions, the introduction of the Ukrainian language into the system of the People's Commissariat of Justice, and generally had a positive effect on the genesis of forensic examination and the formation of scientific and expert institutions on the territory of Ukraine.

The above-described administrative and legal status of ISFE in Kharkiv, Kyiv and Odesa operated until the Second World War. He ensured the rational autonomy of ISFE until the early 1930s when the Soviet authorities began to actively replenish and/or replace the leadership of ISFE with representatives of the party nomenclature.

The achievements of such Ukrainian scientists-experts as M. Bokarius, M. Makarenko, S. Potapov, etc., whose achievements in the field of theory and practice of forensic examination were used not only in the USSR, but also had a positive effect on the development of domestic forensic expert activity in Western Europe, Asia and both Americas. The exchange of experience of the world forensic expert community in the columns of Ukrainian specialized publications, in particular in the journal "Archives of Criminology and Forensic Sciences", which was published under the editorship of M. Bokarius, deserves special attention.

During 1922—1929, domestic schools of forensic examinations were formed

45 Інститутам науково-судової експертизи ... .
46 Ibid.
47 Ibid.

(in particular, the Kharkiv school of M. Bokarius); a community of highly professional forensic experts was formed and a high-quality system of their training was developed; new types of forensic examination were introduced and the methods of their conduct were scientifically substantiated; the publication of fundamental scientific works on the issues of forensic examination and criminology is organized; In Kharkiv, a specialized and authoritative journal "Archives of Criminology and Forensic Science" was launched. Therefore, it can be stated that even within the former USSR, domestic forensic examination in the 1920s developed independently and formed at least three powerful schools of forensic examination - Kharkiv, Odesa, and Kyiv.

Генезис інститутів науково-судової експертизи в Харкові, Києві й Одесі в 1922—1929-му роках: історико-правовий аспект

Владислав Федоренко, Лєшек Вечорек, Ігор Гавловський

Розглянуто генезис судової експертизи в Україні напередодні Першої світової війни та її подальшу інституціоналізацію в 1920-ті рр. Досліджено передумови започаткування кабінетів науково-судової експертизи в Києві, Одесі та Харкові за ініціативою, зокрема, легендарного судового медика й науковця-криміналіста Миколи Бокаріуса. Проаналізовано нормативно-правові акти з питань організації та проведення судово-експертної роботи, правовий статус інститутів науково-судової експертизи Народного комісаріату юстиції Української СРР, їхні завдання, структуру й порядок формування. Обґрунтовано визначальну роль у генезисі судової експертизи в Україні в 1920-ті рр. вітчизняних учених-криміналістів М. Бокаріуса, М. Макаренка, С. Потапова, В. Фаворського та інших, які не лише заклали підвалини різних видів судової експертизи для забезпечення потреб судів і органів досудового слідства, а й сформували науково-методологічні та методичні засади судово-експертної діяльності в Україні. Доведено, що вже в 1920-ті рр. в Україні сформовано вітчизняні школи судової експертології (зокрема, харківську школу М. Бокаріуса); утворено спільноту високопрофесійних судових експертів і розроблено якісну систему їх підготовки; запроваджено нові види судових експертиз і науково обґрунтовано методики їх проведення; організовано видання фундаментальних наукових праць з питань судової експертизи та криміналістики; у Харкові започатковано спеціалізований і авторитетний у тогочасному світі часопис «Архів кримінології та судової медицини». У дослідженні застосовано загальнонаукові методи: аналіз, синтез, аналогію, систематизацію та узагальнення.

***Ключові слова**: судова експертиза; генезис судової експертизи в Україні; кабінет науково-судової експертизи; інститут науково-судової експертизи; Харківський інститут науково-судової експертизи; Микола Бокаріус.*

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Problems of Using Digital Evidence in Criminal Justice of Ukraine and the USA

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Current issues of using digital evidence in criminal justice of Ukraine and the USA have been considered and proposals have been provided for their resolution. For this purpose, methods of theoretical analysis and synthesis, formal legal analysis, comparative legal method, and special methods of cognition have been applied. The concepts of "electronic evidence" and "digital evidence" have been differentiated. Analysis of 64 decisions of Ukrainian courts of criminal jurisdiction and 31 decisions of the US Court of Appeal and the Supreme Court has revealed certain challenges in recognizing information in digital format as admissible and veracious evidence. The experience of the US judiciary can be useful for reforming Ukrainian legislation and the development of methodological guidelines for digital evidence use. It has been proposed to amend the Criminal Procedural Code of Ukraine with regulations that would contain the definition for the digital evidence concept and its procedural media; differentiation of the concepts of "electronic evidence" and "digital evidence"; introduction of a detailed procedure for seizing digital information, its review, recording and storage

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(with indication of the list of mandatory information on digital evidence which must be procedurally established); an algorithm for assessing veracity of digital evidence and an expert conclusion relying on certain criteria. It has been proved that a rapid change in technologies for detecting, seizing, recording and researching digital information has presented certain challenges for investigators, judges, prosecutors and employees of investigative agencies of Ukraine. It is recommended to improve the efficiency of using digital evidence in court proceedings by developing guidelines for working with such evidence and correspondingly improving qualifications of employees in law enforcement agencies.

Keywords: *digital evidence; electronic evidence; electronic devices; admissibility of evidence; sources of evidence; digital information; criminal proceedings; recording evidence.*

Research Problem Formulation

In the early 1990s, in view of advancement of digital and network technologies, law enforcement agencies started to work with evidentiary information in electronic (digital) format obtained from various electronic devices and telecommunication networks, namely: computers, phones, photo and video cameras, GPS-navigators, social networks, various Internet sites, etc. Particularly, *GPS* technology is helpful in establishing the presence of suspected persons at the crime scene, while the analysis of e-mails, text messages, digital photographs, audio recordings, and video recordings determines persons' involvement in illegal activities.

The development of information technologies, the emergence of new fields of their application and introduction of new electronic devices have led to an increase in the number of types of digital information and methods of its encoding and transformation. To view and research certain types of information, it is not enough to use ordinary computer equipment with standard software: specialized electronic devices as well as software are required for this purpose. This poses certain difficulties for investigators, judges, prosecutors, lawyers, forensic experts, etc.

The problem of using digital evidence in criminal proceedings became especially urgent after the open, full-scale armed invasion of the Russian Federation troops in the territory of Ukraine, which roughly violated the rights of Ukrainian citizens enshrined in Sec. I of the Convention for the Protection of Human Rights and Fundamental Freedoms (hereinafter referred to as *the Convention*) and its protocols, namely: right to life (Art. 2 of the Convention), prohibition of torture (Art. 3 of the Convention), prohibition of slavery (Art. 2 of the Convention), prohibition of discrimination (Art. 14 of the Convention), the right to property (Article 1 of Protocol No. 1), the right to education (Article 2 of

Protocol No. 1), the right to liberty and security (Article 5 of the Convention), the right to a fair trial (Article 6 of the Convention), no punishment without law (Article 7 of the Convention), etc. [1].

Ukrainian law enforcement agencies and human rights organizations from around the world have collaborated to create multiple electronic resources for collecting information on war crimes. According to the General Prosecutor's Office of Ukraine, digital information on approximately 70,000 such crimes [2] has been recorded as of December 2022, which will subsequently help not only to establish that these crimes were indeed committed but also to find out a connection between crimes and specific individuals (criminals) and charge them with reasonable accusations as well as ensure that they are brought to justice. However, investigators and judges often face difficulties in collecting and evaluating digital evidence due to the lack of its clear definition, as well as the lack of established procedures for its recording and evaluation in Ukrainian legislation. Also, Ukrainian courts sometimes do not recognize digital evidence as admissible, while investigative journalists frequently use developments of EU and US researchers and lawyers in this area. That is, Ukrainian legislation is not adequately keeping pace with the rapid advancements in information technologies, and gaps in legal regulation often require resolution through decisions made by the judiciary.

Analyzing positive experience of digital evidence use within the US judiciary will help to determine directions for overcoming the indicated problems in the Ukrainian judiciary.

Article Purpose

The Research Purpose is to analyze correlation between the concepts of *electronic evidence* and *digital evidence*, clarify the *digital evidence* concept, generalize judicial practice of Ukraine and the USA in order to emphasize problems that arise when using digital evidence in the criminal proceedings of both countries, conduct comparative analysis of Ukrainian legislation and the US one as to the use of digital information in the judiciary, determine ways to increase the efficiency of using digital evidence in Ukrainian criminal justice system. The authors also aim to provide suggestions for improving Ukrainian criminal procedural legislation in terms of studied problems.

Research Methods

To fulfil set goals, 11 court orders, 9 decisions and 25 Resolutions of the Supreme Court of Ukraine (hereinafter referred to as *Ukraine SC*), 18 decisions of local courts of Kharkiv and Kharkiv region, 17 decisions of the Kharkiv Court of Appeal and the Court of Appeal of Kharkiv Region, 12 decisions of the U.S. Court of Appeals and 19 decisions of the US Supreme Court (hereinafter referred to as *the US SC*), posted on relevant official websites, have been studied in this research. What is more, results of analyzing judicial practice of the Kharkiv Court of Appeal on the use of electronic evidence have been studied, positions of the judges of the Criminal Court of Cassation as part of the Supreme Court of Ukraine (hereinafter referred to as *the CCC as part of Ukraine SC*) concerning the problem of admissibility

1 Конвенція про захист прав людини і основоположних свобод (Європейська конвенція з прав людини) : від 04.11.1950 р.; ратифік. Законом України від 17.07.1997 р. № 475/97-ВР; чинна для України з 11.09.1997 р. (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed: 02.02.2023).

2 Офіс Генерального прокурора / Офіц. сайт. URL: https://gp.gov.ua/ (date accessed: 08.02.2023).

of digital evidence have been analyzed, international and national standards for working with digital evidence have been carefully studied (ISO/IEC 27037:2012 [3] and ДСТУ ISO/IEC 27037:2017 [4]), research papers of domestic scientists and individual papers of the Scientific Working Group on Digital Evidence (USA) regarding the efficient use of digital information in court proceedings (in particular, the Berkeley Protocol on Digital Open Source Investigations) [5] (hereinafter referred to as *the Berkeley Protocol*), Guidelines for law enforcement agencies and prosecutors on the use of digital evidence in court (hereinafter referred to as *the Guidelines on Digital Evidence Use*) etc.). The analysis also includes the rules of domestic legislation (in particular, the Criminal Procedural Code of Ukraine) and the US Federal Rules of Evidence (hereinafter referred to as *FRE USA*) [6] on the use of digital evidence in criminal proceedings.

Methods of theoretical analysis and synthesis as well as scientific papers by both foreign and domestic researchers have been summarized to study the content of legal rules and concepts contained in legal regulations and court decisions. Individual issues required application of systems analysis method (primarily to clarify problems of assessing veracity of digital evidence in Ukraine and the USA and to determine ways to overcome them in Ukraine).

The formal and legal analysis of the legislation of Ukraine and the USA regarding the use of electronic (digital) evidence while court proceedings enabled to identify inherent deficiencies of legal acts and to provide suggestions for improving legal regulation (in particular, concerning improvement of efficiency of digital evidence use in criminal proceedings). With the help of comparative legal method, experience of using digital evidence in criminal proceedings in Ukraine and the USA has been studied. The solution of research tasks was also facilitated by application of special methods of cognition: formal-logical (to typify the grounds for recognizing digital evidence as inadmissible), functional (to establish dependence of efficiency of digital evidence use in court proceedings on the quality of its recording), etc.

Analysis of Essential Researches and Publications

In 2012, a special international standard ISO / IEC 27037:2012 [7] was adopted containing guidelines for working with digital evidence. By complying with this

3 ISO/IEC 27037:2012 Information technology — Security techniques — Guidelines for identification, collection, acquisition and preservation of digital evidence. URL: https://www.iso.org/standard/44381.html (date accessed: 07.02.2023).

4 ДСТУ ISO/IEC 27037:2017 Інформаційні технології. Методи захисту. Настанови для ідентифікації, збирання, здобуття та збереження цифрових доказів (ISO/IEC 27037:2012, IDT) : прийнято наказом ДП «УкрНДНЦ» від 06.12.2017 р. № 400. [Чинний від 01.01.2019]. Київ, 2018. 31 с. URL: http://online.budstandart.com/ua/catalog/doc-page?id_doc=74978 (date accessed: 07.02.2023).

5 Протокол Берклі з ведення розслідувань з використанням відкритих цифрових даних / Управлін. Верховн. комісара ООН з прав людини та Центру з прав людини Каліфорн. ун-ту в Берклі, Юрид. шк., 2020. 119 с. URL: https://www.law.berkeley.edu/wp-content/uploads/2022/03/Berkeley-Protocol-Ukrainian.pdf (date accessed: 11.02.2023).

6 Federal Rules of Evidence (FRE). Dec 1, 2020 / Legal Informational Institute. URL: https://www.law.cornell.edu/rules/fre (date accessed: 05.02.2023).

7 ISO / IEC 27037:2012. URL: https://www.iso.org/standard/44381.html (date accessed: 07.02.2023).

standard, investigative journalists of the *Bellingcat* Internet-edition based on the analysis of digital information (telephone conversations, video recordings, satellite images, etc.) established that specific military service members of the Russian Federation were involved in the passenger Boeing-777 MH17. The national standard of Ukraine ДСТУ ISO / IEC 27037:2017 [8] is the only official document in Ukraine that is applicable to digital evidence. It sets out guidelines for identification, collection, acquisition and preservation of digital evidence; however, these guidelines have not been legislated yet.

In 2020, The Office of the United Nations High Commissioner for Human Rights of Human Rights Center of the University of California, Berkeley presented a *Practical Guide on the Effective Use of Digital Open Source Information in Investigating Violations of International Criminal, Human Rights and Humanitarian Law* including standards and methodological approaches to *"collection, preservation and analysis of publicly available information that can be presented as evidence in criminal proceedings"* [9]. *The Berkeley Protocol outlines the algorithms for searching, accumulating, analyzing and saving digital information from public sources in conformity with the principles of objectivity, competence, accountability, compliance with legislation, security, accuracy, independence, transparency, respect for human rights, etc. The authors of the Berkeley Protocol provide recommendations for determining boundaries of a task to be solved in order to save time and ensure the safety of witnesses and victims, as well as to protect hardware and software.*

Individual issues of using electronic (digital) evidence in criminal proceedings have been studied by the following domestic researchers: M. Hutsaliuk, Yu. Orlov, S. Stolitnii, V. Khakhanovskyi, D. Tsekhan, V. Shevchuk, V. Shepitko, and others. Employees of the U.S. National Institute of Justice (Shon E. Hudison, Robert K. Devis, Brian A. Jackson, Hari S. Kesler, Martin Novak, etc.) cite research findings on identification and prioritization of criminal justice needs associated with collection, management, analysis and use of digital evidence in their research papers. Despite a substantial number of published papers on the problems of using digital evidence in court proceedings, certain issues necessitate subsequent research. Specifically, the issues of legislative consolidation of the digital evidence concept, procedural regulation of its seizure, recording and storage, considering the US experience, remain unresolved.

Main Content Presentation

Current tasks of digital forensics are the search and analysis of digital traces, data analysis (in particular, metadata [10]), collection of evidentiary information in the digital environment. The most complex and extensive tasks are publicly available search and analysis of potential evidence sources: a wide range of publicly available video and audio recordings, photos and satellite images, texts, reports, posts in social media. Electronic devices are a repository of general and personal information, digital information about various events and phenomena, individual persons' actions, etc. Since modern phones are multi-functional (making and receiving calls, phone book and voice recorder, photo and video camera, creating and editing text

8 ДСТУ ISO / IEC 27037:2017. URL: http://online.budstandart.com/ua/catalog/doc-page?id_doc=74978 (date accessed: 07.02.2023).

9 Протокол Берклі … . С. 6. URL: https://www.law.berkeley.edu/wp-content/uploads/2022/03/Berkeley-Protocol-Ukrainian.pdf (date accessed: 11.02.2023).

10 Metadata is data characterizing or explaining other data.

files and messages, Internet search and cloud storage use, e-mail and social media, messengers and communication services etc.), they store digital traces of using these functions and are a kind of personal information archives. Such information can become a component of the evidential base only if it is identified, seized, researched and procedurally consolidated with respect for human rights and taking into account personal data protection.

Researchers in criminal law field use the terms *electronic* and *digital* evidence interchangeably, although the terms are not identical. At present, digital devices have completely replaced analog devices, and the difference between analog and digital information is that analog information is continuous, while digital information is discrete. We should agree with N. Zozulia's viewpoint that the *digital evidence* term is more accurate and *"better reflects the cybernetic aspect of information transmission, processing and preservation in view of the processes of information transformation using a binary (binary) code,"* and *"devices and machines processing and saving digital information should be called electronic"* [11]. To be more precise, evidence is *"factual data obtained from proper sources, and their material basis is not the source itself, but an artificially created corresponding procedural medium. <...> Evidence is a unity of factual data and their procedural media"* [12].

D. M. Tsekhan understands digital evidence as *"factual data presented in digital (discrete) format and recorded on any type of medium and that become accessible for human perception after computer processing"* [13]. This definition needs clarification. In particular, not all media are capable of storing information in digital format (paper and magnetic tape are also information carriers). Also, decoding and researching some types of digital information do not require a computer, but specialized electronic devices with specific software (for example, for viewing records of flight recorders). Therefore, ***digital evidence*** *should be considered factual data which are presented as a binary code and contain information that is significant for objective case resolution.*

Unlike the Civil Procedure Code of Ukraine (Art. 100) [14], Commercial and Procedural Code of Ukraine (Art.

11 Зозуля Н. Електронні чи цифрові докази: удосконалення змін до процесуального законодавства. *Українське право*. 08.05.2018. URL: https://www.bitlex.ua/uk/blog/news/post/elektronni_chy_tsyfrovi_dokazy__udoskonalennya_zmin_do_protsesualnogo_zakonodavstva (date accessed: 02.02.2023).

12 Тертишник В. М. Кримінальний процес України. Загальна частина : підручник. Академічне видання. Київ, 2014. С. 288. URL: https://rd.ua/storage/lessons/434/512%D0%A2%D0%B5%D1%80%D1%82%D0%B8%D1%88%D0%BD%D0%B8%D0%BA%20%D0%92.%20%D0%9C.%20-%20%D0%9A%D1%80%D0%B8%D0%BC%D1%96%D0%BD%D0%B0%D0%BB%-D1%8C%D0%BD%D0%B8%D0%B8%CC%86%20%D0%BF%D1%80%D0%BE%D1%86%D0%B5%D1%81%20%D0%A3%D0%BA%D1%80%D0%B0%D1%96%CC%88%D0%BD%D0%B8.%20%D0%97%D0%B0%D0%B3%D0%B0%D0%BB%D1%8C%D0%BD%D0%B0%20%D1%87%D0%B0%D1%81%D1%82%D0%B8%D0%BD%D0%B0,%20%D0%BF%D1%96%D0%B4%D1%80%D1%83%D1%87%D0%BD%D0%B8%D0%BA.%20%D0%90%D0%BA%D0%B0%D0%B4%D0%B5%D0%BC%D1%96%D1%87%D0%BD%D0%B5%20%D0%B2%D0%B8%D0%B4%D0%B0%D0%BD%D0%BD%D1%8F.pdf (date accessed: 02.02.2023).

13 Цехан Д. М. Цифрові докази: поняття, особливості та місце у системі доказування. *Науковий вісник Міжнародного гуманітарного університету. Юриспруденція*. 2013. Вип. 5. С. 257. URL: http://nbuv.gov.ua/UJRN/Nvmgu_jur_2013_5_58 (date accessed: 02.02.2023).

14 Цивільний процесуальний кодекс України від 18.03.2004 р. № 1618-IV (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1618-15#Text (date accessed: 02.02.2023).

96) [15] and the Code of Administrative Proceedings of Ukraine (Art. 99) [16], the Criminal Procedural Code does not include provisions on electronic (digital) evidence. Information in digital format is considered to be documents or electronic documents which are recognized as procedural sources of evidence (Part 2 of Article 84) [17]. The documents also include *"materials of photography, sound recording, video recording and other media (including computer data)"* (clause 1, Part 2, Article 99 of the Criminal Procedural Code) [18] and *"data media on which procedural actions have been fixed by technical means"* (clause 3, Part 2, Article 99 of the Criminal Procedural Code) [19]. The original of an electronic document is indicated as *"its representation, which is given the same weight as the document itself"* (Part 3, Article 99 of the Criminal Procedural Code) [20]. A duplicate of the document and copies of information in digital format produced by the investigator, prosecutor with specialist's involvement may be found by court to be the original of the document (Part 4, Article 99 of the Criminal Procedural Code) [21].

Documents as digital evidence are not only text documents, figures, photographs, audio and video recordings, but also computer programs and databases. They differ both in form and content, as well as in their source of origin. Some documents are created by a person, others emerge as a result of operation of electronic devices and systems and do not depend on human actions (information from navigation and monitoring systems, electronic digital signature, information from mobile service providers, network technological information, etc.).

Art. 237 of the Criminal Procedural Code regulates computer data examination, which *"is carried out by the investigator, prosecutor by reflecting in the examination protocol the information they contain in a way suitable for perceiving their content (using electronic means, photography, video recording, shooting and/or video recording of the screen etc. or on paper)"* (clause 2 Part 2) [22]. However, there is a lack of a mandatory list of information for recording digital evidence.

In recent years, digital evidence has gained significance as a research subject in Ukrainian courts; however, when considering cases in courts of various jurisdictions, judges encounter certain challenges in recognizing information in digital format as admissible and veracious evidence. Lawyers often file motions about inadmissibility of digital evidence in view of the fact that information was first copied from the phone to a computer and only later to an optical disc, which was further submitted to the court as procedural evidence medium. Defense counsels hold a belief that such a copy does not correspond

15 Господарський процесуальний кодекс України від 06.11.1991 р. № 1798-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1798-12#Text (date accessed: 02.02.2023).
16 Кодекс адміністративного судочинства України від 06.07.2005 р. № 2747-IV (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2747-15#Text (date accessed: 02.02.2023).
17 Кримінальний процесуальний кодекс України від 13.04.2012 р. № 4651-VI (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.02.2023).
18 Ibid.
19 Ibid.
20 Ibid.
21 Ibid.
22 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.02.2023).

to the original because the file format changes when the media is changed [23]. This statement is misleading since one of the main features of information in digital format is that all its copies recorded on different media maintain identity with the original (a complete correspondence in all respects, including the file format). Despite this, in its ruling in case No. 397/2588/13-k, the Supreme Court of Ukraine upheld the decision made by the courts of the first and appellate instances and recognized the video and audio recording of the act of bribing a judge in his office, made during crime detection and investigation operations, as inadmissible evidence. The court ruled that records are copies and, subsequently, recognized protocols on the implementation of covert investigation (search) operations (hereinafter referred to as CISOs) as inadmissible evidence, which annex is this digital evidence, recording inspection protocol, where the investigator provided transcript of conversations about giving bribes, conclusions of three forensic examinations, as they are derived from this record. The accused was acquitted [24].

In the Resolution of the Supreme Court of Ukraine dated December 18, 2019, in case No. 588/1199/16-k, the court declared inadmissible the protocol of audio and video monitoring of a person along with its annexes, media inspection protocol obtained during CISOs and the Resolution on their recognition as physical evidence. The grounds for such a decision was the motion of the defense counsel on non-issuance of the mandate to conduct CISOs by the accused in accordance with Art. 290 of the Criminal Procedural Code, in the course of which a video recording was made. This time, the official suspected of bribery was also acquitted [25].

The Supreme Court of Ukraine, in its Resolution in case No. 426/12149/17 on narcotic drugs, emphasized that *"the lack of original technical data carriers in the criminal proceedings materials, on which the procedural actions were recorded, serves as a basis to deem such evidence (video phonograms) inadmissible, according to the practice of the Supreme Court <...> the mandatory presence of original video recordings made during covert investigative (search) operations, in particular, control over crime commission, is intended to provide possibility of expertly establishing the veracity of information displayed in a video recording"* [26].

In case No. 675/1046/18 (Chapter 3 of Article 369 of the Criminal Code of Ukraine: providing an improper advantage to an official [27]) the Supreme Court of Ukraine, on the contrary, refused the defense's request to appoint a video and audio examination. The examination purpose was to assess whether the digital video recording of CISOs had been edited or altered. The Supreme Court independently reviewed and examined the video recording and

23 Судді ККС ВС обговорили проблемні питання допустимості електронних доказів під час судового розгляду. 28.10.2021 / ВСУ. URL: https://supreme.court.gov.ua/supreme/pres-centr/news/1202347/ (date accessed: 03.02.2023).

24 Ухвала ВСУ від 29.05.2018 р. Справа № 397/2588/13-к. Провадження № 51-3650км18 / Єдиний державний реєстр судових рішень. URL: http://reyestr.court.gov.ua/Review/74475933 (date accessed: 05.01.2023).

25 Постанова ВСУ від 18.12.2019 р. Справа № 588/1199/16-к. Провадження № 51-3127км19 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/86505861 (date accessed: 06.01.2023).

26 Постанова ВСУ від 17.03.2020 р. Справа № 426/12149/17. Провадження № 51-112км20 / ЄДРСР. URL: http://www.reyestr.court.gov.ua/Review/88401663 (date accessed: 05.01.2023).

27 Кримінальний кодекс України від 05.04.2001 р. № 2341- III (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 02.02.2023).

found no grounds for examination appointment [28].

When considering bribery cases, in individual cases, the Supreme Court of Ukraine *"does not perceive any obstacles to presenting duplicates of protocols of procedural actions, as well as materials such as photography, sound recordings, video recordings, and other media (including electronic formats) that have been produced by the investigator or prosecutor with specialist's involvement. The court views these duplicates as the original documents"* [29].

In the case of abuse of power during forceful dispersal of protest actions by police, the Supreme Court of Ukraine recognized digital video recording of events as admissible evidence even without specifying who carried it out and how they were involved in criminal proceedings. This evidence became the basis for the official's conviction [30].

The Supreme Court of Ukraine also accepted copies of digital video recordings of a robbery at a pawnshop which was captured from CCTV camera (on DVD discs) as admissible evidence, although the Resolution does not specify how the investigation obtained copies of these recordings. Forensic examination conclusion as to identification of a person based on this video recording became the basis for issuing the guilty verdict [31]. In another robbery case, the court also a copy of the CCTV footage (on a DWD-RW disc), voluntarily submitted by an employee of a pawnshop, recognized as admissible evidence, despite the defense's objection. The court stressed that case files contain a request for video recording issuance, a cover letter submitted with a DVD disc and a protocol of its inspection, by which the disc was recognized as physical evidence (in the court's view: *"in the manner enshrined by the Criminal Procedure Code of Ukraine")* [32].

In case of illegal drug trafficking, civilians handed over a video recording showing crime commission to investigation. The investigator drew up a video inspection protocol, showing the video to the accused, his defense counsel and attesting witnesses. This procedural implementation helped the court to recognize the video recording as admissible evidence [33].

In one of the cases, the court recognized the video recording from two CCTV cameras as applicable evidence in a case involving violation of traffic safety rules, although technical characteristics of devices used to capture video recordings, their certification and the procedure for transferring information to the server were not established [34]. In another case, the court

28 Постанова ВСУ від 18.12.2019 р. Справа № 675/1046/18. Провадження № 51-3942км19 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/86505906 (date accessed: 05.01.2023).

29 E.g.: Постанова ВСУ від 15.01.2020 р. Справа № 161/5306/16-к. Провадження № 51-3498км19 / ЄДРСР. URL: http://www.reyestr.court.gov.ua/Review/87053591 (date accessed: 03.01.2023).

30 Постанова ВСУ від 20.02.2018 р. Справа № 750/4139/15-к. Провадження № 51-36км18 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/72460327 (date accessed: 04.01.2023).

31 Постанова ВСУ від 27.02.2018 р. Справа № 759/8643/16-к. Провадження № 51-1031км18 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/72642168 (date accessed: 03.01.2023).

32 Постанова ВСУ від 02.10.2019 р. Справа № 159/2377/17. Провадження № 51-4466км18 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/84788575 (date accessed: 03.01.2023).

33 Постанова ВСУ від 15.03.2018 р. Справа № 760/11451/15-к. Провадження № 51-727км18 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/72909394 (date accessed: 22.12.2022).

34 Ухвала ВСУ від 25.03.2019 р. Справа № 754/2178/18. Провадження № 51-920ск19 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/80716282 (date accessed: 27.12.2022).

recognized the copy of the CCTV camera recording and the automotive examination conducted on its basis as inadmissible evidence due to the fact that *"it is impossible to determine technological properties of the videogram from the copy in the absence of the original and the original device"* and the expert conclusion *"relies on inaccurate data obtained from video recording copies"* [35]

In criminal proceedings on theft, the court recognized a copy (on a DVD) of the video recording of an event as inadmissible evidence in connection with fact that investigation received it from the victim without the investigating judge's ruling [36]. The court did not recognize a copy of the theft video recording from a CCTV camera as admissible evidence in view of the fact that there is no request for discovery of this video recording and information about a person who received it in case files of criminal proceedings[37]. The court also recognized as inadmissible evidence a copy of a video recording from a CCTV camera on another theft since it is not an original [38].

That is, under the same conditions, judges adopted contradictory decisions until recently. In individual cases, they recognized copies of digital records as permissible evidence, in others: inadmissible (especially regarding corruption crimes). However, lately judges have been trying to raise their level of awareness as to technical characteristics of digital evidence in order to avoid judicial errors. In particular, the judge of the Cassation Criminal Court of Ukrainian Supreme Court, Nadiia Stefaniv, highlights that *"judges are responsible for pursuing their own expertise in electronic evidence use. It's the judge's personal duty to stay informed about the latest news about documents and standards in order to apply them correctly within the framework of current procedural legislation."* [39]

Recently, judges of all jurisdictions have been trying to adhere to the Guidelines of the Committee of Ministers of the Council of Europe on Electronic Evidence in Civil and Administrative Proceedings [40]. Courts in Ukraine are increasingly rejecting motions from the defense counsel that seek to challenge the admissibility and veracity of copies of digital evidence, its inspection protocols, and forensic expert conclusions during consideration of cases across various categories. Judges carefully

35 Постанова ВСУ від 31.10.2019 р. Справа № 404/700/17. Провадження № 51-4451км19 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/85390646 (date accessed: 28.12.2022).

36 Постанова ВСУ від 12.04.2018 р. Справа № 366/1400/15-к. Провадження № 51-1528км18 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/73438093 (date accessed: 21.12.2022).

37 Постанова ВСУ від 04.09.2019 р. Справа № 369/3713/18. Провадження № 51-3536км19 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/84120855 (date accessed: 22.12.2022).

38 Постанова ВСУ від 15.11.2018 р. Справа № 140/2668/15-к. Провадження № 51-624км17 / ЄДРСР. URL: http://reyestr.court.gov.ua/Review/78110946 (date accessed: 23.12.2022).

39 Стефанів Н. Матеріальний носій — лише спосіб збереження інформації, який має значення тільки тоді, коли Е-документ виступає речовим доказом / Інформагентство «ADVOKAT POST». 02.11.2021. URL: https://advokatpost.com/materialnyj-nosij-lyshe-sposib-zberezhennia-informatsii-iakyj-maie-znachennia-tilky-todi-koly-e-dokument-vystupaie-rechovym-dokazom-suddia-stefaniv/ (date accessed: 02.02.2023).

40 Керівні принципи Комітету Міністрів Ради Європи CM(2018)169-add1final щодо електронних доказів у цивільних та адміністративних провадженнях : прийнято Ком. Міністр. 30.01.2019 р. на 1335-му засід. заст. міністр. / Мін'юст України. URL: https://minjust.gov.ua/m/rekomendatsii-parlamentskoi-asamblei-ta-komitetu-ministriv-radi-evropi (date accessed: 12.02.2023).

assess veracity of the forensic expert's findings and examine digital evidence directly (including information from phones) [41].

Court decisions of the last 2–3 years differ from previous ones in a more detailed consideration and explanation of digital evidence technical characteristics, which provides more chances for recognizing a copy of information in digital format as admissible evidence. In particular, in case No. 677/2040/16-к, the court rejected the cassation appeal of the defense counsel concerning non-recognition of copies of video recordings as admissible evidence and emphasized:

"According to Art. 7 of the Law of Ukraine No. 851-IV 'On Electronic Documents and Electronic Documents Circulation' dated May 22, 2003, each of the electronic copies shall be considered the original electronic document in a case of storing information on several electronic media.

A physical medium is only a way of storing information, which is important only when an electronic document is physical evidence. The main feature of an electronic document is the absence of a strict linkage to a specific material medium. The same electronic document (video recording) can exist on different media. All copies of an electronic document that are identical in their content can be viewed as originals and differ from each other only by the time and date of creation" [42].

The same decision includes the Resolution of the Cassation Criminal Court of Ukrainian Supreme Court in case No. 236/4268/18 dated 25.01.2021 [43] and the Order of the Supreme Court of Ukraine in case No. 756/8124/19 dated 19.08.2021 [44], in which the court rejected appeals of defense counsels on inadmissibility of digital information copies as evidence.

According to the results of practice generalization of cassation court on the issues of conducting and evaluating results of CISOs in criminal proceedings, it has been established that the reasons why digital audio and video recordings made during their conduct are not generally recognized as admissible evidence are as follows: providing copies of digital information to the court instead of the originals; conduct of CISOs by employees of operational subdivision without authorization from the investigator, the prosecutor and without the investigating judge's decision; non-issuance of the mandate to conduct CISOs to the defense counsel in conformity with Art. 290 of the Criminal Procedural Code; lack of procedural implementation of the investigator's or prosecutor's decision to involve "another person" in carrying out CISOs, non-fulfilment of requirements

41 E.g.: Вирок Дзержинського райсуду м. Харкова від 21.06.2019 р. Справа № 638/5928/18. Провадження № 1-кп/638/585/19. URL: https://zakononline.com.ua/court-decisions/show/82552131 (date accessed: 12.02.2023) ; Вирок Вищ. антикорупц. суду від 17.02.2022 р. Справа № 991/4996/20. Провадження № 1-кп/991/53/20. URL: http://iplex.com.ua/doc.php?regnum=103409303&red=1000033ab78a5efaf99e232b33e4b495c626d6&d=5#:~:text=%D0%B7%D0%B0%20%D1%87.,%D0%B2%D0%B8%D0%BA%D0%BE%D (date accessed: 22.02.2022).

42 Постанова ККС ВСУ від 22.10.2020 р. Справа № 677/2040/16-к. Провадження № 51-5738км19. URL: http://iplex.com.ua/doc.php?regnum=92458395&red=1000035e35a331e82f61d9818795df8ecd0762&d=5 (date accessed: 22.12.2022).

43 Постанова ККС ВСУ від 25.01.2021 р. Справа № 236/4268/18. Провадження № 51-3124км20. URL: http://iplex.com.ua/doc.php?regnum=94905297&red=10000347f1960a9ea9dcf00a1e2414ca33651f&d=5 (date accessed: 22.12.2022).

44 Ухвала ККС ВСУ від 19.08.2021 р. Справа № 756/8124/19. Провадження № 51-601ск21. URL: http://iplex.com.ua/doc.php?regnum=94874011&red=1000037c6dddd0bd0c253b026e82724e953e47&d=5 (date accessed: 22.12.2022).

outlined in Section 4, Article 271 of the Civil Procedural Code concerning the immediate drafting of a protocol based on the results of crime control in the presence of a person who was subject to CISOs, immediately after openly recording the final stage of crime control and his/her subsequent actual detention [45].

The use of digital evidence is less "regulated" in US law. Even at the end of the 20th century digital evidence in the USA was treated as a category of evidence due to peculiarities of its creation, storage, detection, research and evaluation of its admissibility and veracity. In 1995, law enforcement agencies of the USA, Canada, and some European countries jointly created the *International Organization on Computer Evidence (IOCE)* [46], and in 1998, the *Scientific Working Group on Digital Evidence* (SWGDE) [47] that brings together law enforcement, academic, and commercial organizations actively engaged in the field of digital forensics to develop cross-disciplinary guidelines and standards for the recovery, preservation, and examination of digital evidence. The SWGDE group has developed basic standards and principles for working with digital evidence ensuring relevance and admissibility of this evidence in court proceedings. Particular attention was drawn to procedural recording of all operations with such evidence, ensuring access to it by all participants in procedure, allowing only qualified IT specialists to examine digital evidence in order to maintain its integrity [48].

The Federal Rules of Evidence of the USA (FRE USA) [49], which were adopted in 1975 and which regulate the work with evidence in civil and criminal proceedings in US federal courts, had been repeatedly amended and supplemented to address digital evidence, given the standards developed by researchers and methodological approaches to collection, preservation and analysis of digital evidence [50] as well as recent court decisions involving digital evidence. Specifically, Clauses 13 and 14 have been added to Rule 902 [51] in *FRE USA*. These clauses outline the procedure for determining the authenticity of certain digital evidence (excluding witness statements) and providing the parties involved in a case with the opportunity to verify (challenge) the veracity of certified records generated using electronic systems and data, as well as copied from electronic devices or

45 Узагальнення практики суду касаційної інстанції з питань проведення та оцінювання результатів НСРД у кримінальному провадженні (*оновлено*). Тренінговий центр прокурорів України. 2021. С. 51. URL: https://ptcu.gp.gov.ua/wp-content/uploads/2021/11/uzagalnennya_praktyky_sudu_po_nsrd_z_qrkodamy_1.pdf (date accessed: 12.02.2023).

46 International Organization on Computer Evidence (IOCE) / UIA. Global Civil Society Database. URL: https://uia.org/s/or/en/1100029648 (date accessed: 02.02.2023).

47 Scientific Working Group on Digital Evidence (SWGDE). URL: https://www.swgde.org/ (date accessed: 12.02.2023).

48 Kessler G. C. Judges' Awareness, Understanding, and Application of Digital Evidence. *Journal of Digital Forensics, Security and Law*. 2011. Vol. 6. No. 1. Art. 4. Pp. 54—72. DOI: 10.15394/jdfsl.2011.1088 (date accessed: 12.02.2023).

49 Federal Rules of Evidence … . URL: https://www.law.cornell.edu/rules/fre (date accessed: 05.02.2023).

50 Протокол Берклі … . URL: https://www.law.berkeley.edu/wp-content/uploads/2022/03/Berkeley-Protocol-Ukrainian.pdf (date accessed: 11.02.2023).

51 Federal Rules of Evidence … . URL: https://www.law.cornell.edu/rules/fre (date accessed: 05.02.2023).

mediums. Clarifications to these clauses further explain that when it comes to challenging the veracity of digital evidence, technical information obtained by involving a forensic expert or a specialist from the IT industry may be necessary. Additionally, Rule 702 allows for the engagement of forensic experts who possess not only knowledge and skills in technology and science, but also who are experienced in specific fields (doctors, bankers, architects, physicists, etc.) [52]. At the same time, expert testimony and conclusions must be veracious (meet the *Daubert standard* [53]) and admissible under the principles of Rule 104(a) [54] of *FRE USA*.

US courts ascertain authenticity (accuracy, veracity) of digital evidence in compliance with Rule 901 [55] of FRE USA. In particular, the court checks the information to ascertain whether the digital evidence *"was obtained from a specific computer or other electronic device"* or *"whether a complete and exact copy of it was recorded and has remained unchanged since the moment of recording."* [56] Veracity of a large array of data in digital format often necessitates the examination of a complete copy of the data from the electronic device, which is created by a forensic expert or specialist specifically engaged for this purpose. Such a copy preserves the logical structure of information storage, including even deleted files. This enables to carry out additional examination as well as re-examination later [57].

Authenticity of a separate file, its part or a group of files is checked using their hash code (a unique code for each such object). The same hash code values for the original file (especially from an exact disk copy) and the file being checked testify to their identity [58]. To compare files by hash code, a forensic expert or an IT specialist is involved, and veracity of the expert's testimony or conclusions is checked according to the *Daubert standard* (Rule 702).

The court can ascertain the authenticity of digital evidence by relying on witnesses' statements, even in the lack of relevant data in case files or protocols [59]. Such witnesses, in particular, can be law enforcement agencies who seized electronic devices or

52 Federal Rules of Evidence ... . URL: https://www.law.cornell.edu/rules/fre (date accessed: 05.02.2023).

53 *Daubert standard* was developed on the basis of three legal cases — Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U. S. 579 (1993). URL: https://supreme.justia.com/cases/federal/us/509/579/ (date accessed: 07.01.2023); General Electric Co. v. Joiner, 522 U. S. 136 (1997). URL: https://supreme.justia.com/cases/federal/us/522/136/ (date accessed: 07.01.2023) and Kumho Tire Co. v. Carmichael, 526 U. S. 137 (1999). URL: https://supreme.justia.com/cases/federal/us/526/137/ (date accessed: 07.01.2023) is intended to establish veracity of the expert's testimony and conclusions.

54 Federal Rules of Evidence ... . URL: https://www.law.cornell.edu/rules/fre (date accessed: 05.02.2023).

55 Ibid.

56 United States v. Budziak, 697 F.3d 1105 (2012) / Caselaw Access Project. URL: https://cite.case.law/f3d/697/1105/ (date accessed: 07.01.2023).

57 United States v. Burdulis, 753 F.3d 255 (1st Cir. 2014). URL: https://casetext.com/case/united-states-v-burdulis (date accessed: 05.01.2023).

58 United States v. R. Burke. 633 F.3d 984 (10th Cir. 2011). URL: https://casetext.com/case/united-states-v-r-burke (date accessed: 03.01.2023).

59 United States v. Bush. 727 F.3d 1308 (11th Cir. 2013). URL: https://casetext.com/case/united-states-v-bush-30 (date accessed: 02.01.2023).

recorded (copied) information in digital format [60].

Researchers from the US National Institute of Justice underline the importance of detailed recording of authentication processes (authenticity determination) and all other actions taken with digital evidence (seizure with a detailed description of an electronic device, indicating its owner and persons who had access to it, methods and means of information seizure, copying on an external medium, research with outline of methods and means involved, etc.). This enables to prove the fact of storing information in its original format [61]. The prosecution has an obligation to timely disclose digital evidence to the defense counsel otherwise the court may return materials for further investigation.

In order to prevent mistakes when working with digital evidence, US police academies have expanded the digital evidence curriculum based on guidelines for working with this kind of evidence [62]. Authors of Guidelines stress that digital evidence is useless without determining its veracity and detailing the "chain of custody" over the evidence, so they developed an algorithm for recording actions taken with digital evidence and listed issues that should be noted in protocols [63].

Authors of the guidelines place particular emphasis on the following issues:

- the need to enhance advanced training for investigators and prosecutors on technical aspects of digital evidence; [64]
- advice on verifying e-mails authenticity; [65]
- procedural significance of information printouts from a computer, explanation of the concepts of *original*, *copy* and *duplicate* related to digital information; [66]
- procedure for determining authenticity of digital photographs, etc. [67]

Until 2014, US law enforcement agencies would seize individuals' phones during their arrest and examine information stored on them. However, the US SC ruled that searching and seizing digital information from a phone without a warrant contradicts the US Constitution and violates citizens' rights [68]. In addition, the situation with obtaining information from mobile phones was complicated by the

60 Goodison S. E., Davis R. C., Jackson B. A. Digital Evidence and the U. S. Criminal Justice System: Identifying Technology and Other Needs to More Effectively Acquire and Utilize Digital Evidence. RAND Corporation, 2015. P. 11. URL: https://www.ojp.gov/pdffiles1/nij/grants/248770.pdf (date accessed: 25.12.2022).

61 Ibid. P. 13.

62 Hagy D. W. Digital Evidence in the Courtroom: A Guide for Law Enforcement and Prosecutors. U. S. Department of Justice. Office of Justice Programs. National Institute of Justice. Washington, Jan 2007. 81 p. URL: https://www.ojp.gov/ncjrs/virtual-library/abstracts/digital-evidence-courtroom-guide-law-enforcement-and-prosecutors (date accessed: 23.12.2022).

63 Ibid. Pp. 15—17.

64 Ibid. P. 23.

65 Ibid. P. 31.

66 Ibid. P. 33.

67 Ibid. P. 50.

68 Riley v. California, 573 U. S. 373 (2014). URL: https://supreme.justia.com/cases/federal/us/573/373/ (date accessed: 23.12.2022).

refusal of representatives from *Apple* and *Google* to grant access to user information even at the official requests from law enforcement agencies. This encourages litigants to focus on digital traces left by mobile devices on the Internet. The task of subjects of proof is to carefully record such digital evidence, analyze its integrity, authenticity and reliability, as well as assess admissibility and veracity.

Researchers from the US National Institute of Justice, by interviewing employees of law enforcement agencies, found that respondents face multiple problems when working with digital evidence. Specifically, they lack expertise in mastering technical characteristics of digital information and understanding the rules for its seizure and storage. Investigators require sets of scientific and technical tools to effectively work with digital evidence, such as Faraday bags, which are used to isolate electronic devices. With the rapid development of technologies of digital devices and methods of extracting digital information from them, significant difficulties arise when evaluating digital evidence by the criterion of veracity (its compliance with the *Daubert standard*) [69]. Researchers argue that prosecutors (due to insufficient knowledge of the digital evidence technical characteristics) try to seize more information than needed and overload forensic experts with unnecessary work, and some judges lack expertise in methods of processing and seizing digital evidence. Police officers and detectives often lack knowledge on how to properly record and store digital evidence; whereas, forensic experts require up-to-date research methodologies. We propose to solve these problems by developing guidelines for working with digital evidence (separately for each department) and improving qualifications of all employees of law enforcement agencies who handle digital evidence in their work [70].

Consequently, when working with digital evidence, investigators, judges, prosecutors, security officers and forensic experts in the United States face similar challenges when working with digital evidence as their counterparts at all levels of Ukrainian criminal justice. At the same time, in contrast to the Criminal Procedural Code, FRE USA contains an extensive system of amendments that relate to the procedure for seizure of digital evidence, its recording, storage, authentication (authenticity verification), evaluation of admissibility and veracity, etc. Veracity of digital evidence, scientific testimonies of specialists and expert opinions about it in the USA is determined according to the *Daubert standard*. When handling digital evidence, US criminal justice officials at all levels are guided by the Berkeley Protocol and Guidelines for the Use of Digital Evidence.

The Criminal Procedural Code does not contain a specific definition for the *digital evidence* term, nor does it offer a comprehensive procedure outlining the steps for its seizure, examination, documentation, and storage. This may lead to errors when working with digital information and to not recognizing it as admissible and veracious evidence in court.

The above demonstrates that the US judiciary has more opportunities for efficient application of digital evidence in contrast to the Ukrainian judiciary.

69 Goodison S. E., Davis R. C., Jackson B. A. Op. cit. P. 16. URL: https://www.ojp.gov/pdffiles1/nij/grants/248770.pdf (date accessed: 21.12.2022).

70 Ibid. P. 25.

Conclusions

Currently, analog devices have been completely replaced by digital ones (that is, continuous information has been replaced by discrete). Therefore, the *digital evidence* term is more accurate and better reflects the essence of information in digital format (in the form of a binary code); whereas, devices, tools and machines that create, transmit, process and store digital information should be called electronic. ***Digital evidence*** *should be considered factual data that is presented in the form of binary code and contain information that is essential for objective case resolution.*

Investigators, judges, prosecutors, employees of crime detection and investigation authorities and forensic experts of Ukraine and the USA encounter certain challenges when handling digital evidence due to the rapid development and change in digital device technologies and, as a consequence, changes in technologies for detecting, seizing, recording and researching digital information.

Courts of Ukrainian criminal jurisdiction oftentimes take conflicting decisions as to recognition of digital information as admissible evidence under the same conditions. Reasons for not recognizing digital information as admissible evidence by the court: providing the court with a copy of digital information instead of the original; conducting CISOs and obtaining digital information without a mandate from the investigator, prosecutor and without the investigating judge's decision; failure to disclose to the defense counsel of the mandate to conduct CISOs; lack of procedural implementation of the investigator's or prosecutor's decision to involve "another person" in CISOs, etc.

The US judiciary has more options for efficient application of digital evidence than the Ukrainian judiciary. Legal regulations and methodological literature on digital evidence use (used in the US judiciary), are a worthy reference point for reforming Ukrainian legislation and developing methodological guidelines on outlined issues.

As it depends on competence and accurate decision of employees within law enforcement agencies (investigators, judges, prosecutors, operative officers) whether a particular piece of digital evidence will play a crucial role in solving a specific case, these employees should know the basic technological characteristics of digital devices and digital information. Therefore, appropriate methodological and reference literature should be developed and added to professional development programs separately for each category of such employees.

It is advisable to supplement the Criminal Procedural Code with the following novel provisions: adding the definition for the digital evidence concept and its procedural media; differentiating the concepts of *electronic evidence* and *digital evidence*; adding a detailed procedure for the seizure of digital information, its examination, recording and storage (with a list of mandatory information on digital evidence which should be procedurally established); the procedure for assessing admissibility and veracity of digital evidence and the expert conclusion according to certain criteria.

Проблеми використання цифрових доказів у кримінальному судочинстві України та США

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Розглянуто актуальні проблеми використання цифрових доказів у кримінальному судочинстві України та США й надано пропозиції щодо їх розв'язання, для

чого застосовано методи теоретичного аналізу й синтезу, формально-юридичного аналізу, порівняльно-правовий метод, спеціальні методи пізнання. Розмежовано поняття «електронний доказ» і «цифровий доказ». Аналіз 64 рішень українських судів кримінальної юрисдикції та 31 рішення Апеляційного й Верховного Суду США показав, що визнання допустимими та достовірними доказами інформації у цифровій формі спричиняє певні труднощі. Досвід судочинства США може стати в пригоді реформуванню законодавства України й розробленню методичних рекомендацій із використання цифрових доказів. Запропоновано доповнити Кримінальний процесуальний кодекс України нормами, які б містили визначення поняття «цифрові докази» і їх процесуальних носіїв; розмежування понять «електронний доказ» і «цифровий доказ»; докладний порядок вилучення цифрової інформації, її огляду, фіксування і зберігання (із зазначенням переліку обов'язкової інформації щодо цифрових доказів, яку має бути процесуально закріплено); алгоритм оцінювання достовірності цифрового доказу й висновку експерта за певними критеріями. З'ясовано, що швидка зміна технологій із виявлення, вилучення, фіксування й дослідження цифрової інформації спричиняє певні труднощі для слідчих, суддів, прокурорів і співробітників оперативно-розшукових органів України. Поліпшити ефективність використання цифрових доказів у судочинстві рекомендовано шляхом розроблення настанов щодо роботи із ними та відповідного підвищення кваліфікації співробітників правозастосовних органів.

***Ключові слова**: цифрові докази; електронні докази; електронні пристрої; допустимість доказів; джерела доказів; цифрова інформація; кримінальне провадження; фіксація доказів.*

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Transformation of Forensic Expert Personality in Extreme Conditions of Wartime

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Through the use of dialectical, systematic, comparative methods and methods of analytical abstraction, modeling, and interpretation, the phenomenon of transformation of the forensic expert personality in extreme conditions (in particular, wartime) is analyzed; scientific achievements regarding this issue are summarized; the ways of overcoming effects of external negative factors on their personality are outlined. Attention is focused on the need to monitor the emotional and volitional stability of the forensic expert and the level of influence on their personality of external stressful factors of long-term action in the conditions of their conducting forensic examinations at the sites of war crimes and the consequences of military actions on the territory of Ukraine. In order to successfully perform official duties and overcome the consequences of the influence of external negative factors in wartime, it is advisable to add psychological training to the system of professional training of the forensic expert (develop a methodology for conducting psychological training as a form of active development of psychological qualities and personality skills: in particular, with the addition of group discussions, games methods, and psycho-gymnastic exercises) with its normalization in the corresponding by-law departmental acts. The mastering of psychological knowledge, skills and abilities by the forensic expert will contribute to detecting optimal solutions by them for the purpose of conducting forensic analysis and more thorough performance of professional

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duties. This paper proposes to create a structural division of professional training in each state forensic expert institution, which would (in cooperation with the personnel division) be tasked with organizing the psychological training of forensic experts.

Keywords: *personality in wartime; transformation of the psyche; forensic expert activity; forensic expert; professional training; psychological preparation; psychological training.*

Research Problem Formulation

Due to the war in Ukraine, there was an acute need for scientific research on the transformation of forensic expert personality under the negative influence of its consequences. Conducting expert research at the scene associated with human casualties and mass destruction worsens the psychological state of the expert, which negatively affects the quality of the conclusions drawn by them. In addition, living in a war zone significantly increases their level of anxiety.

The professional activity of forensic expert involves increased requirements for their individual and psychological properties: emotional and volitional, cognitive and communicative spheres. Therefore, it is urgent to study the specifics of the influence of extreme situations on the forensic expert's personality and to develop psychological methods and technologies that would provide free his psyche from the influence of negative factors, especially in wartime conditions.

Article Purpose

To study the phenomenon of the transformation of forensic expert personality in the extreme conditions of wartime and to determine the ways to overcome consequences of the influence of external negative factors on their personality.

Research Methods

The theoretical and methodological basis of this research are provisions contained in scientific works of foreign and Ukrainian scholars, educational and methodological manuals, specialized literature related to issues of influence of extreme conditions and negative factors on the personality, as well as the methodology of conducting psychological training. As a result of the dialectical method, the theoretical features of the psychological training of forensic experts have been clarified. The systematic approach made it possible to consider psychological training as a single system of forms and methods of improving personal characteristics. The method of analytical abstraction contributed to elucidating the mechanism of this preparation. The comparative method was applied to track the transformation of the forensic expert personality in the extreme conditions of wartime. For the purpose of scientific substantiation of psychological training, the method of modeling was used. The interpretation method was used during the study of the methodology's content of psychological training of forensic experts.

Analysis of Essential Researches and Publications

The issues on influence of the external environment on the psyche of the individual

was investigated by: Yu. I. Andrusyshyn [1], L. V. Vavryk [2], T. M. Dziuba together with co-authors [3], N. H. Ivanova [4], V. O. Lefterov [5], S. S. Makarenko [6], V. M. Onyshchenko [7], A. I. Poltavska [8], O. B. Stoliarenko [9], V. O. Tiurina with co-author [10], I. M. Khorzhevska [11], O. L. Khrystuk [12] and V. V. Yahupov [13]. Foreign scholars, in particular, S. R. Murthy and R. Lakshminarayana [14] also paid attention to the influence of the consequences

1 Андрусишин Ю. І. Вплив емоційно-вольової стійкості особистості на її поведінку в екстремальних умовах. *Проблеми екстремальної та кризової психології :* наук. журн. 2013. Вип. 14. Ч. 1. С. 11—18. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__4 (date accessed: 20.01.2023).

2 Ваврик Л. В. Психологічні передумови успішної діяльності правоохоронців в екстремальних умовах. *Ibid.* С. 33—41. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__7 (date accessed: 20.01.2023).

3 Дзюба Т. М., Волошина Н. М., Пампуха І. В. Механізм інформаційно-психологічного впливу на психіку людини у гібридній війні. *Збірник наукових праць Військового інституту Київського національного університету імені Тараса Шевченка.* 2016. Вип. 51. С. 91—99. URL: http://nbuv.gov.ua/UJRN/Znpviknu_2016_51_14 (date accessed: 20.01.2023).

4 Іванова Н. Г. Формування мотивації фахівця до діяльності в екстремальних умовах. *Проблеми екстремальної та кризової психології* ... . С. 130—138. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__19 (date accessed: 20.01.2023).

5 Лефтеров В. О. Особистісно-професійний розвиток фахівців екстремальних видів діяльності засобами психологічного тренінгу. *Психологія і суспільство* : наук. журн. 2012. № 2 (48). С. 91—107. URL: http://library.wunu.edu.ua/images/stories/naukovi%20zhurnaly/psyhologia%20i%20suspilstvo/2012/2_2012.pdf (date accessed: 20.01.2023).

6 Макаренко С. С. Методи і способи психологічного захисту особистості в умовах екстремальних ситуацій. *Проблеми екстремальної та кризової психології* ... . С. 203—211. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__28 (date accessed: 20.01.2023).

7 Онищенко В. М. Трансформація особистості в процесі подолання життєвих криз. *Актуальні проблеми психології :* зб. наук. пр. 2020. Т. І. Вип. 56. С. 118—124. URL: http://appsychology.org.ua/data/jrn/v1/i56/20.pdf (date accessed: 20.01.2023).

8 Полтавська А. І. Роль та функції емоцій в екстремальних ситуаціях, що пов'язані із професійною діяльністю в особливих умовах. *Проблеми екстремальної та кризової психології* ... . С. 253—260. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__34 (date accessed: 20.01.2023).

9 Столяренко О. Б. Психологія особистості : навч. посіб. Київ, 2012. 280 с.

10 Тюріна В. О., Солохіна Л. О. Вплив військових конфліктів на психічне здоров'я людини: короткий огляд зарубіжних досліджень. *Особистість, суспільство, війна* : тези доп. учасн. міжнар. психол. форуму (Харків, 15.04.2022). Харків, 2022. С. 116—118. URL: http://dspace.univd.edu.ua/xmlui/handle/123456789/13818 (date accessed: 20.01.2023).

11 Хоржевська І. М. Професіоналізм та професійний розвиток особистості. *Наукові праці. Серія: Державне управління.* 2013. Вип. 202. Т. 214. С. 110—113. URL: https://lib.chmnu.edu.ua/pdf/naukpraci/govermgmt/2013/214-202-22.pdf (date accessed: 01.12.2022).

12 Христук О. Л. Теоретико-методологічний аналіз вивчення проблеми психологічної травми: від історії до сучасності. *Науковий вісник Львівського державного університету внутрішніх справ. Серія психологічна*. 2017. Вип. 2. С. 183—191. URL: http://nbuv.gov.ua/UJRN/Nvldu_2017_2_22 (date accessed: 20.01.2023).

13 Ягупов В. В. Професійний розвиток особистості фахівця: поняття, зміст та особливості. *Наукові записки НаУКМА : Педагогічні, психологічні науки та соціальна робота*. 2015. Т. 175. С. 22—28. URL: http://nbuv.gov.ua/UJRN/NaUKMApp_2015_175_4 (date accessed: 20.01.2023).

14 Murthy S. R., Lakshminarayana R. Mental health consequences of war: a brief review of research findings. *World Psychiatry*. 2006 Feb; Vol. 5. Is. 1. Pp. 25—30. URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1472271/ (date accessed: 26.11.2022).

of military conflicts on the psyche of people. I. A. Petrova and O. S. Dontsova [15] were interested in the phenomenon of the transformation of the forensic expert personality as an object of scientific research.

Hostilities in the territory of Ukraine caused the urgent need to study the emotional and volitional stability of the forensic expert, the impact of external factors on the transformation of their personality during forensic expert activity and life under the long-time influence of stressful factors. Achievements of specialists on the problems of personality transformation under the influence of external factors should become the basis for a scientific study of the phenomenon of the personality transformation of a forensic expert in extreme wartime conditions and the development of a methodology for conducting psychological training in the system of professional training of a forensic expert.

Main Content Presentation

The formation of the expert's professional knowledge and its application in forensic expert activity directly proportionally depend on the totality of the psychological qualities of the individual. The use of acquired knowledge is successful when the available psychological qualities of the individual correspond to the type of professional activity. Carrying out forensic expert activity in the extreme conditions of wartime not only affects the psychological qualities of an individual, but also causes the transformation of such an individual.

In the dictionary of basic concepts from the course "Pedagogy" the concept of *"personality"* is interpreted, on the one hand, *"as a subject of relations and conscious activity, which is capable of self-knowledge and self-development",* and on the other hand, as a stable system of *"socially significant qualifies, attitudes, movies that characterize a person as a representative of society [16]. So, individuals are born and become individuals in the process of development.*

"The personality is characterized by the following signs:

- Activity, the subject's desire to expand the scope of their activity, to act beyond the requirements of the situation and role instructions;
- orientation — a stable dominant system of motives — interests, beliefs, etc.;
- deep meaning formations (dynamic meaning systems) that are formed in the joint activity of groups and collectives;
- degree of awareness of one's attitude to reality: ступінь усвідомлення свого ставлення до дійсності: adjustment, disposition, etc." [17].

Academic Explanatory Dictionary of the Ukrainian Language interprets the concept of *"transformation"* in the first sense as

15 Петрова І. А., Донцова О. С. Особливості формування професійних компетентностей судового експерта-товарознавця. *Теорія та практика судової експертизи і криміналістики*. 2020. Вип. 21. С. 165—178. DOI: 10.32353/khrife.1.2020_11 (date accessed: 20.01.2023).

16 Словник базових понять з курсу «Педагогіка» : навч. посіб. для студент. внз. Вид. 2-ге, доп. і перероб. / укладач О. Є. Антонова. Житомир, 2014. С. 60. URL: http://eprints.zu.edu.ua/12633/1/%D0%A1%D0%9B%D0%9E%D0%92%D0%9D%D0%98%D0%9A%20%D0%91%D0%90%D0%97%D0%9E%D0%92%D0%98%D0%A5%20%D0%9F%D0%9E%D0%9D%D0%AF%D0%A2%D0%AC%20%D0%90%D0%BD%D1%82%D0%BE%D0%BD%D0%BE%D0%B2%D0%B0.pdf (date accessed: 20.01.2023).

17 Ibid. С. 61.

follows: *"Change, transformation of a form, shape, essential properties, etc. of anything"* [18].

Analyzing the above, we propose to define the concept of *"transformation of the forensic expert's personality"* as *"a change in the system of their socially significant qualities, attitudes, instructions, and motives under the influence of social reality during their forensic expert activity"*. The consequences of military actions affect the consciousness of a forensic expert directly both during their research of objects that were related to these actions and during their perception of changes in the surrounding social environment (death and injury of people, destruction of social infrastructure, deterioration of life quality and security, etc.).

According to V. M. Onyshchenko, personality transformation has its own stages, structure, and mechanism and is the result of external and internal influence. According to the scientist, thanks to this influence, the personality is transformed, which leads to a change in its value sphere, the accumulation of the necessary experience and the activation of abilities [19].

O. B. Stoliarenko's views on personality development deserve attention. In her opinion, this development takes place in the social environment under the influence of the environment and is called *"formation"* in adulthood. The following provisions put forward by her deserve attention:

- personality formation is the process of acquiring new forms and features of the psyche in the process of development (character, thinking, etc.);
- mental development of an individual is manifested in heterochrony (uneven nature of the development of individual mental processes depending on age), staging (stages of mental development related to the social situation and leading activity), differentiation and integration of mental processes (a sequential complication of the psyche), change in the ratio of determinants mental development (social factor as a determinant of mental development), plasticity (the ability of the psyche to change);
- specificity of the personality consists in organic active maturation in the conditions of involvement in social culture, the ratio of natural and social, born and acquired. The genotype of the individual is the foundation on which mental neoplasms are forced under the influence of the social environment;
- social environment as a source of mental development of the individual, which has the following components: macro-environment (a socio-economic and political system of the state), meso-environment (social-cultural and national-cultural features of society), micro-environment (family and close environment);
- close combination of internal and external conditions of personality development;
- driving force of mental development lies in the contradiction between the individual and the environment, on the one hand, and

18 Академічний тлумачний словник української мови : в 11 т. / за ред. І. К. Білодіда. Київ, 1970—1980. Т. 10. 1979. С. 233. URL: http://sum.in.ua/s/transformacija (date accessed: 26.11.2022).

19 Онищенко В. М. Op. cit. С. 122. URL: http://appsychology.org.ua/data/jrn/v1/i56/20.pdf (date accessed: 20.01.2023).

between individual components of the individual's psyche, on the other;
- external contradictions lead to the development of personality only in the case of their active actions aimed at resolving internal contradictions and developing new rules of behavior;
- progressive development of personality occurs in the case of awareness and resolution of contradictions [20].

The above should be taken into account during the scientific study of the transformation of the forensic expert's personality in the extreme conditions of wartime.

We agree with the opinion of V. V. Yahupov regarding the role of the social factor in personality development. The researcher believes that individuals are not born, they become individuals much later in ontogenesis. The concept of *"personality"* has a social component, because personality can be formed only in society. The personality of a specialist is an imprint of a certain society and professional environment [21].

The definition of the concept of *"professional development of personality"* by I. M. Khorzhevskyi is convincing, which sees in it the development of personality in general which includes the acquisition of new knowledge, skills and experience with the subsequent transformation of the motivation and interests of a specific personality [22].

Yu. I. Andrusyshyn's conclusions regarding the psychological characteristics of the behavior of a person with increased anxiety are interesting, namely:
- a high-anxious personality reacts more emotionally to failure than a low-anxious person;
- a stressful situation significantly worsens work productivity;
- a highly anxious person is characterized by a fear of failure and a premonition of danger;
- a message of success is a stimulus for a high-anxious personality, and for a low-anxious one, on the contrary, the prospect of possible failure;
- an increased level of anxiety leads to the perception of objectively safe situations as dangerous [23].

According to L. V. Vavryk, the presence of two components is important for successful actions in extreme conditions [24]:
1) appropriate level of professional training (knowledge, skills and abilities);
2) psychological readiness (the presence of the necessary psychological and psychophysiological personality qualities).

The scientist emphasizes that for the successful performance of job duties in extreme conditions, specialists must be psychologically prepared. The following conclusions of his regarding the mentioned issues are worthy of attention [25]:
- extreme conditions during professional activity include those

20 Столяренко О. Б. Op. cit. С. 120—122.
21 Ягупов В. В. Op. cit. С. 23. URL: http://nbuv.gov.ua/UJRN/NaUKMApp_2015_175_4 (date accessed: 20.01.2023).
22 Хоржевська І. М. Op. cit. С. 113. URL: https://lib.chmnu.edu.ua/pdf/naukpraci/govermgmt/2013/214-202-22.pdf (date accessed: 01.12.2022).
23 Андрусишин Ю. І. Op. cit. С. 14—15. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__4 (date accessed: 20.01.2023).
24 Ваврик Л. В. Op. cit. С. 35. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__7 (date accessed: 20.01.2023).
25 Ваврик Л. В. Op. cit. С. 39—40. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__7 (date accessed: 20.01.2023).

that threaten the life or health of a specialist, cause a high level of neuropsychological stress;

- performance of job duties in extreme conditions puts increased demands on the specialist's personality and, due to excessive psychological stress, reduces his work capacity, as well as worsens his health;
- for successful professional activity in extreme conditions, professional and psychological training, personal and business qualities and a set of relevant psychological factors are required;
- professional and psychological training of a specialist is a purposeful and organized process of formation of professional competence, psychological characteristics, professionally important qualities, and motivation to work;
- psychological readiness for activity in extreme conditions is the mental state of a specialist as a result of professional training, which is expressed in his understanding of the importance of professional activity and depends on the level of intellectual development, professional experience, and emotional and volitional self-regulation;
- professional qualities of a specialist are their psychological psychophysiological characteristics, which are formed and developed during professional training and further activities.

N. H. Ivanova notes that for the successful performance of official duties in extreme conditions (in addition to developed physiological, cognitive and emotional-volitional characteristics), motivation to work is necessary. In her opinion, the formation and development of this motivation are changeable, and dynamic, occur under the influence of certain factors and depend on the motivational sphere [26].

We consider the opinion I. A. Petrova and O. S. Dontsova to be correct about the independence of the duration of the professional formation of a forensic expert on the personal qualities of the specialist and the ability of management and colleagues to provide him with necessary assistance [27].

According to S. S. Makarenko, throughout life, an individual simultaneously receives positive and negative mental energy, which destroys this individual. To correct the mental state, the scientist suggests using a set of special methods, techniques and ways of psychological protection of the individual in conditions of the negative influence of certain factors of social, professional and personal life. Thanks to the acquired experience, a person is able to apply specific techniques and methods of psychological protection in extreme situations [28].

A. I. Poltavska's opinion about the importance of emotions in special conditions as a regulator of behavior is interesting. She considers an extreme situation to be emetiogenic and an integral component of professional activity, which is connected with the influence of extreme factors. Performance of official duties in extreme

26 Іванова Н. Г. Op. cit. С. 130. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__19 (date accessed: 20.01.2023).

27 Петрова І. А., Донцова О. С. Op. cit. С. 173. DOI: 10.32353/khrife.1.2020_11 (date accessed: 20.01.2023).

28 Макаренко С. С. Op. cit. С. 210. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__28 (date accessed: 20.01.2023).

situations requires a high level of individual and psychological characteristics of a specialist, and significant activation of emotional, volitional and cognitive aspects of self-regulation [29].

The conclusions of V. O. Lefterov regarding the personal and professional development of specialists in extreme types of activities by means of psychological training require detailed study. Among his main scientific provisions, the following should be singled out [30]:

- personal and professional development of a specialist is a socially determined individual, active, integrated process of professional and psychosocial growth of an individual, which aims at professional self-realization and self-affirmation;
- the success of professional activity depends on the level of personal and professional development of the specialist and the quality of their training;
- psychotherapy, psychocorrection and psycho-training should belong to the psychological means of specialist development;
- psychological training is a universal integrated system of targeted psychological training and personality development in accordance with the tasks of their professional activity;
- during the training, the intellectual, communicative, emotional, volitional and motivational potential of the individual is activated.

Considering the issue of informational and psychological influence on the population during hybrid warfare, T. M. Dziuba emphasizes the use of methods of manipulating the psyche and mass consciousness: thanks to the use of mass media, one piece of information displaces another, due to which true information is replaced by false information in the psyche of an individual [31].

A review of foreign scientific publications by V. O. Tiurina and L. O. Solokhina on the impact of the consequences of military operations on the mental state of an individual shows that most often it leads to the following negative manifestations: depression, anxiety, psychotic illnesses, post-traumatic stress disorder, aggressiveness and sometimes — to suicidal intentions. Scientists emphasize the need to use preventive and therapeutic measures, strengthening social support to reduce acute stress reactions [32].

We must state that, as of today, due to the long war in Ukraine, a significant part of the population is affected by stressful situations and (as a result) feels a certain uncertainty. In such a state, an individual cannot adequately control their actions, which leads to a change in their mental qualities, namely: lack of confidence in their own strength; fear, panic and anxiety; constant depression; loss of their identity; inability to control their mental state. A forensic expert (as a member of society) is exposed to the same stressful situations as any other

29 Полтавська А. І. Op. cit. С. 259. URL: http://nbuv.gov.ua/UJRN/Pekp_2013_14(1)__34 (date accessed: 20.01.2023).

30 Лефтеров В. О. Op. cit. С. 104. URL: http://library.wunu.edu.ua/images/stories/naukovi%20zhurnaly/psyhologia%20i%20suspilstvo/2012/2_2012.pdf (date accessed: 20.01.2023).

31 Дзюба Т. М., Волошина Н. М., Пампуха І. В. Op. cit. С. 97. URL: http://nbuv.gov.ua/UJRN/Znpviknu_2016_51_14 (date accessed: 20.01.2023).

32 Тюріна В. О., Солохіна Л. О. Op. cit. С. 118. URL: http://dspace.univd.edu.ua/xmlui/handle/123456789/13818 (date accessed: 20.01.2023).

person. In addition, in this state, the forensic expert must still conduct a full expert investigation and provide an objective expert opinion. Therefore, today there is a need for a scientific study of the raised issue and the application of appropriate scientifically based practical response measures.

The formation of professional experience and its further improvement directly depends on the personal characteristics of the forensic expert. The more mental qualities of an expert correspond to the specifics of forensic expert activity, the higher productivity of their work. Any negative impact on the psyche affects the expert's ability to work, and the higher the level of this impact, the lower the expert's ability to perform their official duties.

First of all, the individual psychophysiological feature of the forensic expert, such as perception characterized by psychological guidance, i.e. selectivity, is prone to negative influence. During the expert investigation, the forensic expert focuses attention on those points that belong to the object of the investigation. In addition, the presence of traces of human victims and mass destruction around the object of research reduces the level of concentration of his attention and negatively affect his mental processes. Conducting expert research involves the perception and processing of the obtained information, which directly depends on the features of the expert's mental processes. It is during the analytical stage of expert research that such psychophysiological qualities as feelings and perceptions are involved, which are the first to be affected by the negative effects of the brutal consequences of war. The stressful and tense psychological state of the expert reduces the level of his observation, and the ability to concentrate in accordance with the target instruction. In addition, the mobility of mental processes decreases.

At the stage of a comparative study, deficiencies in the expert's working memory, which is important during a specific examination, can cause an expert error. Obtaining excessive operational information during the investigation at the scene, which does not relate to the object of the investigation and distracts the expert from the task set before them, reduces the quality of this investigation. A stressful or tense state of the expert's psyche reduces the speed of physiological processes involved in the operation of working memory.

Psychological traumas suffered by the expert during their stay in war zones may be the result of, for example, loss of home, change of residence with the subsequent acquisition of the status of a displaced person, the humiliation of human dignity in the case of a temporary stay in the occupation (sometimes even in the form of temporary deprivation of liberty), etc. The concept of *"psychological trauma"* is not clearly defined in modern Ukrainian psychology. O. L. Khrystuk defines it as a residual phenomenon of affective experiences of the individual, caused by external stimuli that cause mental discomfort and have a pathogenic effect on the individual [33].

Researchers S. R. Murthy and R. Lakshminarayana concluded that almost half of the population from the war zone remained mentally resistant to the effects of being there, while other victims needed immediate psychological help and rehabilitation. To this end, the World Health Organization and some other organizations associated with the United Nations have created a task force to develop mental and psychosocial

33 Христук О. Л. Op. cit. С. 189. URL: http://nbuv.gov.ua/UJRN/Nvldu_2017_2_22 (date accessed: 20.01.2023).

support for people in emergency situations [34].

Professionally significant mental qualities of a forensic expert develop throughout their professional activity and are based on their individual potential. The dynamics of this development are influenced by both positive and negative factors, including the consequences of the war. In this regard, the process of development of professionally significant qualities of a forensic expert should be coordinated by control or management entities, as well as the expert themselves (by self-regulation methods).

Thus, the negative impact on the psyche of the forensic expert in the extreme conditions of wartime is caused both by their direct participation in forensic expertise and by the psychological trauma they suffer as a result of being in war zones. However, in both cases, their mental qualities, which have come under this negative influence, require mandatory correction.

A necessary condition for successfully overcoming the effects of external negative factors on the personality of a forensic expert in the extreme conditions of wartime should be the development of a methodology for conducting psychological training in the professional training system as a form of active development of psychological qualities and skills. During these trainings, it is appropriate to apply the following teaching methods: lectures, seminars, business and role-playing games, computer programs, group discussion, psychical therapy, mediation techniques, etc. Psychological training is primarily aimed at changing the consciousness of the individual, as well as the formation and development of such personal characteristics: a high level of stress resistance, self-control, decisiveness, poise, perseverance, the ability to make optimal decisions in extreme conditions and lack of time, etc.

Academic Explanatory Dictionary of the Ukrainian Language interprets the concept of *"training"* as *"training, as well as a special training regime"* [35].

Training (as an interactive form of training of a forensic expert) contributes to the maximum accumulation of existing knowledge, abilities and skills, and is also aimed at finding and mastering new ones. Interactive learning belongs to the practical form of learning, during which the teacher and the student actively interact. During training (as the most common form of group training), a person makes sense of their own actions and behavior, acquires psychological qualities aimed at personal growth, and establishes interpersonal relationships. The training also promotes the acquisition of new reflective skills and methods of mutual assistance, teaches empathy, etc [36]. For the personality of a forensic expert in the extreme conditions of wartime, the most useful thing from the use of a training form of training is learning to adequately perceive and understand both oneself and others, to expose one's own stereotypes and outdated worldview or behavioral patterns, as well as to overcome them.

Responsibilities for the organization of psychological training for forensic experts should be assigned to separate structural units of professional training, creating them in each specialized state institution of forensic examination. It is appropriate to

34 Murthy S. R., Lakshminarayana R. Op. cit. Pp. 28—29. URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1472271/ (date accessed: 26.11.2022).

35 Академічний тлумачний словник … . С. 245. URL: http://sum.in.ua/s/treningh (date accessed: 02.12.2022).

36 Карпенко Є. В. Основи психотренінгу : навч. посіб. Дрогобич, 2015. 78 с. URL: https://dspace.lvduvs.edu.ua/handle/1234567890/2360 (date accessed: 02.12.2022).

involve both specialists of the psychological research units of these institutions, as well as scientific and pedagogical workers of educational institutions, etc., in conducting trainings.

During the training sessions, the tutor models interpersonal interaction, gives examples of difficult work and life situations and guides experts in finding adequate and effective ways to solve them. Thanks to group facilitation, the working capacity of each training participant increases and interpersonal support increases, which contributes to the growth of the effectiveness of the educational process, and the intensity and effectiveness of individual work on psychological qualities.

It is necessary to distinguish between the concepts of *"education"* and *"psychological training"*. According to the Academic Explanatory Dictionary of the Ukrainian Language, *"teaching is an action meaning to teach and learn"* [37]. That is, learning is the process of acquiring new knowledge, abilities and skills. In the same dictionary, training is *"training, as well as a special training regime"* [38]. Thus, **training** is a form of educational process. Therefore, **psychological training** is a form of teaching behavioral skills and developing psychological qualities. We believe that any training always has a psychological component (except the cognitive component). It should be noted that mentally healthy individuals participate in professional psychological training (as opposed to those who suffer from various nervous, mental or somatic diseases and require the intervention of specialist psychotherapists). Psychological training is not a treatment: its leading task is to provide psychological assistance to specialists who have suffered a negative psychological impact from the consequences of military actions.

The benefit of psychological training lies both in the development of discrete characteristics of an individual's inner world and their holistic development [39]. Training (as a form of educational process) is characterized by the same methods as training. Although the training is a practical type of learning, it still contains elements of lectures and seminars. However, given the specifics of forensic expert activity, it should be dominated by role-playing games and group discussions, combined with a short course of lectures and seminars.

We emphasize that the success of psychological training depends on the personal interest of the expert, because the main goal of the training is the formation and development of the desired type of personality behavior. In addition, a necessary condition for achieving the goal of the training is feedback from each of its participants.

The following rules should become the basis of the psychological training of forensic experts:

- proper preparation of the tutor for the training and their constant reflection of what is happening in the group with further coordinating influence;
- activity of all participants throughout the entire training;
- personal interest of each participant in achieving the set goal;
- creating an atmosphere of trust, a creative approach to the generation of ideas and business criticism;

37 Академічний тлумачний словник … . Т. 5. 1974. С. 43. URL: http:// http://sum.in.ua/s/navchannja (date accessed: 03.12.2022).

38 Ibid. Т. 10. 1979. С. 245. URL: http://sum.in.ua/s/treningh (date accessed: 03.12.2022).

39 Карпенко Є. В. Op. cit. С. 10. URL: https://dspace.lvduvs.edu.ua/handle/1234567890/2360 (date accessed: 02.12.2022).

- ensuring the gradual transfer of participants' behavior from an impulsive level to an objective one;
- composition of the training group should not exceed 5-10 people.

When preparing for the training, the following factors should be taken into account: the specifics of the situation, the capabilities of the tutor, the content of the training, and the specifics of the group of participants. The topic of psychological training should correspond to its purpose. The success of the training depends on the originality and novelty of the information, the personal experience of the tutor and their psychological and pedagogical abilities, and interest in the material.

We offer the following stages of psychological training of a forensic expert:

1st stage — a concise theoretical course with a problem statement;

2nd stage — introducing training participants to the topic (activation);

3rd stage — direct work of the entire group according to the *"information processing — action"* scheme;

4th stage — summarizing the results of the training.

It is important to follow the sequence of stages of psychological training, 90 % of which time is practice and only 10 % is theory. It is also worth noting that the effectiveness of the training is influenced by the interior and spaciousness of the room in which it is held. Each participant of the training program should feel comfortable and nothing should distract them during the session. The tutor does not force but helps to solve the problem with the active role of the participant in this process. Each participant should be interested in solving the problem posed at each training, which will contribute to increasing the level of their mental readiness to work in the specific conditions of forensic expert activity during martial law.

The leading task of psychological training is personal growth, which consists in the awareness of each participant of their negative instructions and internal beliefs that hinder their development, and the creation of conditions for achieving a life goal. During this training, the participant has the opportunity to consider their problem in a different way, to understand the circumstances and to change negative instructions. Psychological training also helps to overcome personal fears and anxiety, harmonize their own life, to adjust their values, therefore, review their past and present, to plan for the future. The result: a person's ascent to another level of life, in which self-confidence reigns.

As a part of psychological training, it is necessary to single out as a subspecies the training of emotional stabilization of the personality, the main goal of which is to get rid of internal tension due to the influence of external negative factors. Such training is usually conducted in a circle for greater openness of the participants to each other with the help of eye contact. The positive effect of the use of emotional stabilization training is due to:

- the formation of internal guidelines and psychological positions thanks to various forms of communication of the participants;
- creating an atmosphere of self-acceptance (self-acceptance in general);
- focus on the communication partner.

In its essence, psychological training has all the characteristics of an educational process. Thus, during the training, the participants acquire new knowledge, skills and abilities: the ability to act rationally in difficult situations, and to change their behavior in a professional manner and in a timely manner depending on the situation. The knowledge, skills and abilities

acquired during the training can be useful in any life situation. In addition, new information on the basics of psychology increases the general educational level of an expert. Ultimately, all this should emotionally stabilize the forensic expert, which will have a positive effect on their performance of official duties.

It is worth emphasizing that it is in the group that emotional warmth arises from contact with another person. The exchange of experience under the guidance of a tutor contributes to finding the optimal solution for further actions and stabilization of the emotional state of the individual. The advantage of group learning is also feedback when participants are able to support each other. During communication, a person identifies themselves by comparing himself with the environment, and evaluates their own behavior, experiences and feelings. A positive aspect of group training is also the simultaneous involvement of quite a large number of people who need help or strengthening of their emotional state for further work in the conditions of the influence of negative factors on the psyche of the individual.

A necessary condition for the success of the training system for the training of forensic experts is the optimal choice of the goal, which should unite all participants, namely:

- identification of psychological problems with further assistance;
- improving the subjective well-being of individuals, strengthening their mental health;
- promoting the development of self-awareness to prevent emotional disturbances;
- harmonization of the optimal level of life activity;
- adjusting the psyche of the individual to achieve success at work and in personal life.

We believe that it is appropriate to use basic methods, including group discussion, game methods, and psychogymnastic exercises, to conduct psychological training of forensic experts.

During a group discussion, the individual gradually moves away from their egocentric thinking and begins to listen to the opinions of others. At the same time, the motivation of each participant to solve the existing problem increases, their work capacity is activated, and their emotional state improves, which contributes to the formation of an optimal solution. A group discussion with the participation of forensic experts in training, in particular psychological training, is primarily a joint discussion of a professional problem. In such a discussion (thanks to the opinions, positions and instructions of all participants) the truth is born. Such a discussion should be structured, i.e. plan the topic for discussion in advance, regulate and coordinate its course. The most useful for forensic experts are thematic discussions, during which the participants discuss the most problematic issues, and biographical ones, aimed at analyzing the mental problems of the individual, related to both professional activities and the personal life of the expert. The most useful for forensic experts are thematic discussions, during which the participants discuss the most problematic issues, and biographical ones, aimed at analyzing the mental problems of the individual, related to both professional activities and the personal life of the expert. The advantage of this method is the opportunity for each participant in the discussion to find out their own position, compare it with the positions of others and (on the basis of various approaches and points of view on the problem) find their own understanding. In addition, the benefit of the discussion for each of its participants lies in mastering the following skills:

- analyze real situations;
- listen to others and interact in a group;
- distinguish the important from the secondary;
- overcome stereotypes and fear of the unknown, and see a variety of possible ways to solve a problem.

A Group discussion involving forensic experts must comply with the following principles:

- equality regardless of position;
- free conduct of the discussion with its topic;
- programmed driving order;
- admissibility of a reasonable compromise.

We suggest structuring the group discussion in the following stages:

1st stage — indicative: definition of the topic and purpose of the discussion;

2nd stage — gathering information about each participant necessary to achieve the goal of the discussion;

3rd stage — direct discussion using the methodology of its conduct;

4th stage — summarizing the results of the discussion and providing recommendations to its participants for further self-training.

It is worth noting that procedural moments of group discussion of the psychological training, intensity and duration depend on the set goal and the psychological characteristics of its participants.

Game methods of psychological training contribute to increasing the level of activity of its participants thanks to the use of the sensory system. We believe that game methods are quite useful during the psychological training of forensic experts, as they allow to work out situations that are as close as possible to real ones (especially to the conditions of conducting expert investigations at the scene of the incident). The benefit of game methods also lies in practicing the professional skills and abilities of a forensic expert as a practical form of training. Therefore, during the training system, a complex result of both professional and psychological training of the forensic expert is achieved (thanks to the modeling method - theoretical and practical mediated cognition, creation, and manipulation of an object that replaces a real object). The main goal of the game method is to practice actions in conditions that correspond to the real situation. Training participants are offered a problem situation and organize joint work to find ways to solve it. During the game, experts work out some psychological nuances of professional activity, thanks to which they get a scenario of behavior in the future. Each training participant must master a selection of ways to behave in extreme situations and psychologically prepare for them. Therefore, it is advisable for forensic experts to organize psychological trainings using a role-playing game with elements of dramatization, i.e. with the creation of a situation similar to the real one, which should contribute to the change of the psychological instructions available in the individual and the formation of new, more functional ones. This will improve the emotional, cognitive and behavioral components of the individual's psyche.

So, the benefit of using a role-playing game to improve the psychological qualities of a forensic expert's personality is as follows:

1) participants revealing their feelings and highlighting the problem;
2) finding ways to solve personal problems through joint discussion;
3) change in psychological guidelines of the individual thanks to the application of the method of active action;

4) elimination of the gap between real professional activity, personal life and training of a forensic expert;
5) change in psychological characteristics of the individual;
6) strengthening self-control over feelings and emotions.

During group discussion and game methods of psychological training of forensic experts, it is advisable to use elements of psychological gymnastics, including various verbal and non-verbal exercises that contribute to the creation of a group atmosphere to ensure the success of psychological training. Psychological gymnastics restores working capacity and reduces the level of anxiety of the individual.

Taking into account the challenges of today, in particular the full-scale invasion of Ukraine, there is an urgent need to start psychological training as a component of the professional training of forensic experts, which, in turn, requires appropriate administrative and legal support, in particular the reform of the entire personnel policy of forensic institutions and its implementation in their work modern forms and methods of working with personnel [40]. The successful psychological training of forensic experts will be facilitated by the development and introduction of a special legal act, which should regulate all types of professional training of forensic experts, in particular psychological [41].

Conclusions

Therefore, the transformation of the forensic expert's personality in the extreme conditions of wartime is an objective reality that needs to be monitored and corrected. In order to successfully overcome the consequences of the impact of external negative factors on the personality of a forensic expert related to the consequences of war, they must be personally interested in the development of their personal characteristics, which will reduce the impact of external negative factors on the psyche and generally increase work productivity.

Adding psychological training to the professional training system of a forensic expert will contribute to improving his general professional level and reducing the negative impact on their psyche of the consequences of the war. The main form of psychological training should be psychological training. The question of the training system of forensic expert preparation has great prospects for further scientific research.

The development in the system of professional training of forensic experts of psychological training methods, aimed at acquiring the necessary knowledge and developing emotional and volitional qualities, is very relevant today. The mastering of psychological knowledge, skills and abilities by a forensic expert will help them find optimal solutions for the purpose of solving forensic research and more thorough performance of professional duties. For this purpose, it is expedient to create a structural unit of professional training in each state forensic expert institution, which would (in cooperation with the personnel department) take care of the psychological training of forensic experts.

40 Курдес О. В. Щодо кадрової політики судово-експертних установ України. *Проблеми та перспективи розвитку судової експертизи та криміналістики* : мат-ли Міжнар. наук.-практ. конф. (Одеса, 16.10.2020). Одеса, 2020. С. 312.

41 Його ж. Особливості психологічної підготовки судових експертів як складової процесу адаптації до умов праці. *Теорія та практика судової експертизи і криміналістики*. 2021. Вип. 23. С. 118. DOI: 10.32353/khrife.1.2021.08 (date accessed: 03.12.2022).

Трансформація особистості судового експерта в екстремальних умовах воєнного часу

Олег Курдес

За допомогою діалектичного, системного, порівняльного методів і методів аналітичної абстракції, моделювання й інтерпретації досліджено феномен трансформації особистості судового експерта в екстремальних умовах (зокрема воєнного часу), узагальнено наукові досягнення із цього питання й окреслено шляхи подолання наслідків впливу зовнішніх негативних чинників на його особистість. Акцентовано увагу на потребі відстежувати емоційно-вольову стійкість судового експерта та рівень впливу на його особистість зовнішніх стресових чинників довготривалої дії в умовах проведення ним судових експертиз на місцях воєнних злочинів та за наслідками воєнних дій на території України. Для успішного виконання посадових обов'язків і подолання наслідків впливу зовнішніх негативних чинників у воєнний час доцільно додати до системи професійної підготовки судового експерта підготовку психологічну (розробити методику проведення психологічних тренінгів як форми активного розвитку психологічних якостей і навичок особистості: зокрема із долученням групових дискусій, ігрових методів та психогімнастичних вправ) із унормуванням її у відповідних підзаконних відомчих актах. Опанування судовим експертом психологічних знань, вмінь і навичок сприятиме знайденню ним оптимальних рішень із метою розв'язання судово-експертних досліджень та більш ретельному виконанню професійних обов'язків. Запропоновано в кожній державній судово-експертній установі створити структурний підрозділ професійної підготовки, на який би (у співпраці з підрозділом роботи з персоналом) покласти обов'язок організувати психологічну підготовку судових експертів.

***Ключові слова**: особистість у воєнний час; трансформація психіки; судово-експертна діяльність; судовий експерт; професійна підготовка; психологічна підготовка; психологічний тренінг.*

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Case Investigation Based on Indirect Evidence: The Method by M. Ye. Yevheniev

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It has been proven that the basis of the method for case investigation according to indirect evidence developed by the Soviet criminalist M. Ye. Yevheniev is the concept of indirect evidence; dissemination of the concept was due to the political situation of the 1930s and 1940s; in particular, the desire of investigative bodies and prosecutors to obtain confessions of guilt from the accused in cases of "terrorist acts" and "political conspiracies", which at that time was considered the main and decisive evidence. Method positive qualities have been specified: logical structure, simplicity of perception by practitioners, consideration of traditional factors of suddenness and counteraction to investigation, use of activity and integrated approaches, algorithmicity and phasing of crime investigation. Handling direct evidence is not challenging for the investigator: it is indirect evidence that lead to difficulties. The accused should be carefully interrogated about each piece of evidence, and all his/her explanations thoroughly checked. It has been found that the method developer did not disclose types of circumstantial evidence connections, paid insufficient attention to peculiarities of evaluating indirect (circumstantial) evidence. At the same time, it has been determined that M. Ye. Yevheniev's method is a significant step towards the formation of the doctrine about methods of criminal offenses investigation and the development of theoretical bases of current forensic methodology. The Article Purpose is a scientific analysis of the method of investigating a case based on circumstantial

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evidence developed by M. Ye. Yevheniev in order to clarify its role in the development of forensic doctrine about the methods of investigating criminal offenses. The following methods of scientific cognition were applied while research: observation, comparison, abstraction, analysis, synthesis, modeling, etc.

Keywords: *cognition method in criminalistics; investigation method; investigation of criminal offenses; history of criminalistics; forensic methodology; indirect evidence; circumstantial evidence.*

Research Problem Formulation

From our perspective, scientific research in which origins, prerequisites, process of formation and development of the studied subject are analyzed within certain historical time spans and local territorial ranges, given the general historical and cultural contexts [1], is considered to be more successful and precise. It is in this context that we viewed case investigation method based on indirect evidence developed by M. Ye. Yevheniev.

In 1930—1940s, a totalitarian system was fully formed in the Soviet Union: the opposition had been liquidated, and one party government gained uncontrolled power. Party power quickly fused with authorities, resulting in creation and spread of the administrative-command governance system. The struggle in party leadership strengthened sole authority, leading to mass repressions accompanied by "purging" both in the party itself and in the state apparatus.

All these processes took place simultaneously with ideological review of many scientific fields. The administrative-command system of management harshly directed the development of the legal system, as well as the state apparatus in general, towards its own strengthening and further centralization. A characteristic feature of the legal system at that time was the priority of Soviet Union legislation over the republican one [2]. Similar trends accompanied reorganization of the Prosecutor's office, court, and the police. Prosecutorial bodies were taken away from the People's Commissariat of Justice and subordinated to the Prosecutor's Office of the USSR; unified the judicial system; public order protection bodies were introduced into the system of state security bodies; in addition, the latter, along with executive management functions, also began to fulfil judicial ones. Political trials began in the state which had a demonstrative nature and a substantial role in determining the sentence played materials of investigative

1 Старушкевич А. В. Історична періодизація (історико-хронологічний аспект) «методів розслідування» кримінальних правопорушень. *Криміналістика і судова експертиза.* 2021. Вип. 66. С. 313. DOI: 10.33994/kndise.2021.66.30 (date accessed: 22.01.2023).

2 Музыченко П. История государства и права Украины :учеб. пособ. 6-е изд., испр. и доп. Киев, 2008. С. 413. URL: http://irbis-nbuv.gov.ua/ulib/item/UKR0001348 (date accessed: 22.01.2023).

bodies usually obtained with gross violations of procedural rules [3].

Deformation of the criminal procedural legislation conditioned the elimination of the democratic principles of the judiciary, neglect of the principles of orality, publicity and competition. Repressive and punitive bodies acted according to their own instructions, contrary to rules of criminal procedural law. Since 1937, with the permission of the supreme Party authority, physical influence had been applied to suspects of crime commission [4] in the practice of the People's Commissariat of Internal Affairs. The development of criminal law was accompanied by expansion of types and subjects of crimes, more severe punishments [5].

During this period, in the USSR textbooks on criminalistics, investigative bodies were addressed with "political tasks": *"Criminal repression blows must be quick and efficient. To be able to quickly solve a crime, expose a disguised class enemy, show her/his true counter-revolutionary face to masses and impede his/her harmful activities in a timely manner: these are demands that the party and the government put forward to investigative agencies"* [6].

Criminalistics is becoming criminal policy tool: *"Defining criminology as a technical and applied science, we must at the same time emphasize its efficiency and inextricable connection with practice, which make this science the most flexible criminal policy tool,"* [7] and further: *"It is clear that we are talking about criminalistics based on our theory and practice, that is, the Soviet criminalistics"* [8].

The authorities explained the lagging behind the development of the criminalistics science from investigative practice, the problems of legal education, solely by "malicious activity": *"The lagging of criminalistics from Soviet investigative practice was not accidental. It is explained by harmful activities of people's enemies in the field of law. These criminals, who tried to eliminate Soviet law for counter-revolutionary purposes, implemented the same 'instruction' in relation to criminalistics: it was made less important. Legal journals did not publish articles on criminalistics, new scientific personnel of criminalists were not trained by research and training legal institutes, and criminalistics course had even been removed from the curricula of legal institutes for several years. All this, undoubtedly, affected the development of Soviet criminalistics and created a disrespectful attitude towards it among some lawyers"* [9].

3 Музыченко П. Op. cit. С. 413.

4 Іванов В. М. Історія держави і права України : навч. посіб. Київ, 2003. Ч. 2. С. 90—91 ; Idem. Історія держави і права України : підручник. Київ, 2013. Ч. 2. С. 583. URL: http://kul.kiev.ua/doc/IDPU_Ivanov.pdf (date accessed: 22.01.2023) ; Шифротелеграмма И. В. Сталина секретарям обкомов, крайкомов и руководству НКВД — УНКВД о применении мер физического воздействия в отношении «врагов народа» от 10.01.1939 г. № 26/ш (док. № 8) / Фонд Александра Н. Яковлева. URL: https://www.alexanderyakovlev.org/fond/issues-doc/58623 (date accessed: 22.01.2023).

5 Захарченко П. П. Історія держави і права України : підручник. Київ, 2005. С. 309—312. URL: http://irbis-nbuv.gov.ua/ulib/item/UKR0001080 (date accessed: 22.01.2023).

6 Бобров Н. А., Винберг А. И., Голунский С. А., Громов В. И., Зицер Е. У. и др. Криминалистика. Техника и тактика расследования преступлений / под ред. А. Я. Вышинского. Москва, 1938. С. 10—11.

7 Бобров Н. А., Винберг А. И., Голунский С. А., Громов В. И., Зицер Е. У. и др. Op. cit. С. 3.

8 Ibid. С. 7.

9 Ibid. С. 9—10.

Therefore, criminalistics becomes a hostage to political ambitions of the ruling party, a tool for resolving issues of the class struggle; moreover, the theory for its development must be only *Soviet*, that's why any foreign borrowings are inadmissible, and previous ones necessitate substantial adaptation. The *Soviet criminalistics* term is being used as opposed to *bourgeois criminalistics*, but with the remark that *"even the technical techniques of criminalistics, borrowed by us from bourgeois criminalistics, possess a* ***special quality*** *in our conditions"* [10].

The translated editions of foreign theorists and practitioners in criminalistics, which were widespread at the time in the USSR, were recognized as *secondary* and *minor*, and their authors: *reactionary and bourgeois*: *Translations of several secondary, minor research papers of reactionary bourgeois authors had been published: V. Hai, Shneikert, Anushata and others."* [11] The most *reactionary* is heritage of criminalists of Western Europe leading countries: *"During the post-war period, the Italian and German forensic literature displayed signs of extreme reactionism, obscurantism, signs of the Middle Ages, terrible dullness, degradation of criminal science. These developments coincided with the occurrence of the fascist coup. Fascism criminal policy is reflected, obviously, in the use of forensic means. Most frequently means of fascism criminal policy are those that have nothing to do with science, but are not even masked with the help of scientific terminology. These include provocation, ordered search, use of criminals' 'services', torture in fascist torture chambers, etc.* [12].

The following recommendations are provided as to the use of "bourgeois" criminalists' work in criminalistics: *"Investigative work is political work, and political science is a science designed to serve investigation success. It is possible to use the scientific and technical information developed by bourgeois criminalists, but at the same time it is necessary to identify and resolutely expose the reactionary line of development of bourgeois criminalistics and all the pseudo-scientific methods of identifying and investigating evidence recommended by bourgeois researchers* [13]. Therefore, expanding the indirect evidence concept in investigative and judicial practice set out in the research paper by the "bourgeois" proceduralist William Vilz *The Experience of Indirect Evidence Theory Illustrated by Examples* [14], A. Ya. Vyshynskyi (the ideologist of Stalinist justice) thought that this theory should be implemented in a "special way" in conditions of Soviet realities.

A. Ya. Vyshynskyi's adherence to indirect evidence concept can be explained by the fact that at that time, even with the help of physical influence, it was sometimes not possible to force individual accused of "terrorist activities" or "political conspiracies" to slander themselves or other detainees. The investigation was not capable of providing any direct evidence of criminal activities of such persons to the courts, because it did not exist. Instead, the concept of indirect evidence provided Stalin's prosecutor A. Ya. Vyshynskyi with a tool with which mere hints at alleged criminal activity confirmed "terrorist acts" and "political conspiracies" that did not actually exist.

At one of the political trials, A. Ya. Vyshynskyi noted in his speech: "*No*

10 Бобров Н. А., Винберг А. И., Голунский С. А., Громов В. И., Зицер Е. У. и др. Op. cit. С. 8.
11 Ibid. С. 9.
12 Ibid. С. 40.
13 Винберг А. И., Шавер Б. М. Криминалистика : учебник. Москва, 1940. С. 7.
14 Уильз У. Опытъ теоріи косвенныхъ уликъ, объясненной примѣрами : пер. съ 3-го изд. Москва, 1864. 251 с.

sane person can ask questions like that in cases of government conspiracy. Thus, we have a number of documents on this. But even if there were none, we would still believe that we have the right to charge relying on statements and explanations of the accused and witnesses and, if you wish, on indirect evidence. In this case, I have to refer at least to such a brilliant proceduralist as a distinguished old English lawyer William Wiles, who in his book 'The Experience of Circumstantial Evidence Theory' asserts how strong indirect evidence is and how indirect evidence is often much more convincing than the direct one [15].

In one of his speeches during trial, A. Ya. Vyshinskyi accurately explains how the prosecution should be built solely on the basis of only indirect evidence: *"We will be told that some of the defendants <...> were not caught red-handed, that there is only indirect evidence against them. Yes, precisely indirect evidence <...>. But indirect evidence is often no less convincing than so-called direct evidence. It is this kind of indirect evidence — real evidence—that we have in this case"* [16], and further:

"The presence of only indirect evidence in a case poses huge procedural challenges, but they are inevitable, they must be considered and overcome. Thus, there is only indirect evidence, individual lines, individual remarks, fragments of opinions or facts in this case.

All these pieces and fragments must be collected together, compared with each other and with other facts, analyzed and synthesized, and they should be unified into a single system, one harmonious whole. Harmoniously combined into a system, indirect evidence grows into a terrible, inescapable force, turns into a chain of evidence surrounding the accused with a deaf wall, which is impossible to break through, it is impossible to go anywhere. But for this, the evidence itself must be flawless and harmonious, logically related <...> with all its links" [17].

Additionally, in the procedural literature of that time, there was an opinion that the refusal of the accused to testify, as well as the fact that he/she provided misleading testimony, can be viewed as indirect evidence of her/his guilt [18].

Therefore, Stalin's justice in cases of "terrorist attempts", "political conspiracies", "espionage", etc. only entailed the necessity to "choose the criminal", and then she/he had to admit his/her guilt, oftentimes under conditions of applying physical violence against her/him. However, if such a confession did not take place, then the defendant's guilt was proved in court by indirect evidence, because such cases were usually group cases, so it was always possible to interrogate relevant "witnesses" or refer to the fact that the defendant was abroad for a certain time, where he/she was recruited by the intelligence of the bourgeois state or where she/he had a meeting with representatives of the opposition of Stalin's entourage.

All these factors contributed to the fact that at the end of the 1930s, M. Ye. Yevheniev attempted to develop a holistic forensic method for investigating a case based on indirect evidence, referring

15 Как они боролись против Ленина. Речь Государственного обвинителя Прокурора СССР тов. А. Я. Вышинского. Заседание 28 января ; по изд. Процесс антисоветского троцкистского центра (23—30 января 1937 года). Москва, 1937. С. 211 / Б-ка Михаила Грачева. URL: http://grachev62.narod.ru/Tr_proc/chapt34_42.htm#chapt35 (date accessed: 22.01.2023).

16 Вышинский А. Я. Судебные речи. 4-е изд. Москва, 1955. С. 58. URL: https://library.khpg.org/files/docs/1359741502.pdf (date accessed: 22.01.2023).

17 Ibid. С. 182.

18 Мотовиловкер Я. О. Показания и объяснения обвиняемого как средство защиты в советском уголовном процессе. Москва, 1956. С. 17.

to the research paper of A. Ya. Vyshinsky's favourite "bourgeois" proceduralist William Vills *Experience of Indirect Evidence Theory*... [19], A. Ya. Vyshinskyi's famous at that time speech in the Semenchuk case [20] and investigative practice of the Ukrainian SSR.

Analysis of Essential Researches and Publications

In the 1920s and 1930s, several foreign forensic manuals were published in the USSR, which authors considered advantages and disadvantages of using *the indirect evidence concept* during investigation of crimes, in particular by H. Shneikert [21] and A. Helvig [22], who in the *Modern Criminalistics. Crime Investigation Methods* manual devoted an entire chapter to methods of exposing a suspect with the help of: indirect evidence that *relates to a suspect*; indirect evidence obtained *through witnesses*; indirect physical evidence.

In the 1920s, the pioneer of Soviet criminalistics I. M. Yakymov formulated a common approach to crime investigation that relied on indirect evidence [23], and V. I. Hromov demonstrated possibilities of using direct evidence while investigation of criminal crimes in multiple papers [24].

For that reason, considering historical foundations of forensic methodology in the 1980s, I. O. Vozghrin wrote about the book by M. Ye. Yevheniev: *"In addition to the general statement about the role of planning in crime investigation, this paper reflected the already known provisions of forensic methodology theory,"* [25] although he emphasized that this book *"studies complex problems of the methodology of investigating*

19 Уильз У. Op. cit.

20 Вышинский А. Я. Op. cit. С. 147—190. URL: https://library.khpg.org/files/docs/1359741502.pdf (date accessed: 22.01.2023).

21 Шнейкерт Г. Тайна преступника и пути к ее раскрытию. (К учению о судебных доказательствах) / пер с нем. Москва, 1925. С. 26 ; Idem. Введение в уголовную технику: руководство для школ и курсов по подготовке работников милиции и уголовного розыска / пер. с нем. Москва, 1926. С. 148, 155.

22 Гельвиг А. Современная криминалистика. Методы расследования преступлений / пер. с нем. Москва, 1925. С. 82—93.

23 Якимов И. Н. Практическое руководство к расследованию преступлений. Москва, 1924. С. 167—171 ; Idem. Криминалистика. Уголовная тактика. Москва, 1929. С. 161—168. URL: https://sci-lib.biz/kriminalistika-pidruchniki/kriminalistika-rukovodstvo-ugolovnoy-tehnike.html (date accessed: 22.01.2023) ; Старушкевич А. В. Розроблення методів розслідування злочинів у 20-х роках минулого століття (на прикладі «загального методу розслідування злочинів» І. М. Якимова). *Криміналістика і судова експертиза*. 2022. Вип. 67. С. 249—260. DOI: 10.33994/kndise.2022.67.26 (date accessed: 22.01.2023).

24 Громов В. Дознание и предварительное следствие. Теория и техника расследования преступлений. Москва, 1928. С. 57, 63, 73, 85—88, 92, 114, 118, 132—134 ; Idem. Вещественные улики и научно-уголовная техника: пособие для органов расследования. 2-е изд. Москва, 1932. С. 6, 58, 69, 78, 79, 83 ; Громов В. Л., Лаговиер Н. Искусство расследования преступлений. Достижения и недочеты розыскной и следственной практики. Опыт анализа доказательственных улик : пособ для органов расследован. Москва, 1930. С. 5, 32, 35, 58—65, 78. URL: https://cyberleninka.ru/article/n/iskusstvo-rassledovaniya-prestupleniy-izvlechenie (date accessed: 22.01.2023).

25 Возгрин И. А. Криминалистическая методика расследования преступлений. Минск, 1983. С. 31—32 ; Idem. Научные основы криминалистической методики расследования преступлений : курс лекций. Санкт-Петербург, 1992. Ч. 1. С. 32—33.

crimes relying on indirect evidence" [26] in subsequent papers.

In the 1990s and 2000s, authors of individual papers only indicated contribution of M. Ye. Yevheniev to the development of crime [27] investigation methods without any analysis of the method developed by him.

Article Purpose

To analyze the method of case investigation based on indirect evidence developed by M. Ye. Yevheniev in the 1930s, trying to clarify its role in the development of forensic science about methods of investigation of criminal offences and forensic methodology as a component of modern criminalistics in general.

Research Methods

To fulfil this goal, the research applies methods of scientific cognition: observation, comparison, abstraction, analysis, synthesis, modeling, etc.

Main Content Presentation

Mark Yevhenovych Yevheniev (later known as M. Ye. Yevgeniev-Tish) graduated from the Faculty of Law of Kyiv Saint Volodymyr Imperial University (1912—1918), and then gained considerable experience in investigative practice: had worked for more than 10 years as a senior investigator, an investigator for the most critical cases, a prosecutor of the Prosecutor's Office of the Ukrainian SSR (1922—1936), later as a senior consultant at forensic science institutions of the People's Commissariat of Justice of the Ukrainian SSR/USR (1936—1941) [28]. In 1940, he published the book *"Methodology and technique of crime investigation: a study guide on criminalistics for law schools and employees of investigative bodies"* [29] under the general editorship of Professor S. M. Potapov and with the recommendation of the Ukrainian Institute of Legal Sciences (Kyiv), where M. Ye. Yevheniev held the position of a senior researcher, and later: head of criminal law and procedure section.

26 Возгрин И. А. Введение в криминалистику. История, основы теории, библиография. Санкт-Петербург, 2003. С. 231. URL: https://mybook.ru/author/igor-vozgrin/vvedenie-v-kriminalistiku-istoriya-osnovy-teorii-b/read/ (date accessed: 22.01.2023) ; Idem. История зарождения и развития криминалистической методики расследования преступлений / Курс криминалистики : учеб. пособ. В 3 т. ; под ред. О. Н. Коршуновой. 2-е изд. Т. 2: Общие положения криминалистической методики. Методика расследования преступлений против личности. Методика расследования преступлений против собственности. Санкт-Петербург, 2016. С. 25. URL: https://bstudy.net/834520/pravo/istoriya_zarozhdeniya_razvitiya_kriminalisticheskoy_metodiki_rassledovaniya_prestupleniy_vozgrin (date accessed: 22.01.2023).

27 Белкин Р. С. История отечественной криминалистики. Москва, 1999. С. 369 ; Тищенко В. В. Корыстно-насильственные преступления: криминалистический анализ. Одесса, 2002. С. 38. URL: https://coollib.com/b/425251-valeriy-vladimirovich-tischenko-koryistno-nasilstvennyie-prestupleniya-kriminalisticheskiy-analiz (date accessed: 22.01.2023) ; Тіщенко В. В. Теоретичні і практичні основи методики розслідування злочинів : монографія. Одеса, 2007. С. 45.

28 Иванов А. Н. Марк Евгеньевич Евгеньев-Тиш (к 120-летию со дня рождения). *Вестник криминалистики.* 2012. Вып. 2 (42). С. 102—106.

29 Евгеньев М. Е. Методика и техника расследования преступлений: учебное пособие по криминалистике для юридических школ и работников органов расследования / под общ. ред. проф. С. М. Потапова. Киев, 1940. С. 3.

In the preface to this manual, S. M. Potapov highlighted that *"in modern forensic literature, there is no study guide that quite exhaustively and in detail outlines methods of investigating crimes in investigative process, that is, in the way in which the criminal case investigation and investigators' work usually unfold"* [30].

As stated by M. Ye. Yevheniev, investigation of criminal cases consists in search, detection, collection, research and evaluation of evidence [31]. To submit high-quality materials to the court, the investigator has to *"determine certain circumstances and facts in each case. During the preliminary investigation of crimes, these facts, firstly, must be established accurately and unerringly, and, secondly, each of them separately and all of pieces of evidence in their totality must generate sufficient confidence in the investigator, the prosecutor and the court that investigated crime was really committed and that it was committed by a particular person"* [32]. To establish a certain fact or a circumstance means to prove that this fact really exists or existed; that in the investigated case, it has only a certain significance and that it is connected in some specific way to other facts (circumstances) of this case. M. Ye. Yevheniev calls evidence the main component of the investigator's work when handling criminal cases [33].

Developing this idea, M. Ye. Yevheniev emphasizes that *"in every criminal case there is an issue about the existence of crime and the accused's guilt;"* in addition, the investigator proves these two main facts for each case: *"The fact of crime existence and the fact of its commission by the accused. These facts must be established in a predetermined sequence"* [34]. If at least one of these main facts is not determined in a case, it shall be the subject to dismissal. If the investigator fails to establish that a crime has been committed, the case is closed due to the absence of constituent elements of an offense. If the investigator determines that a crime was committed but does not provide sufficient evidence to prove that it was committed by a specific person, the case is closed due to insufficient evidence against that person [35].

According to M. Ye. Yevheniev, the investigator examines evidence by interrogating witnesses, victims, forensic experts, the accused, i.e. persons whose testimonies can assist the investigator in obtaining answers to the major questions related to the case. After collecting and organizing the necessary evidence, the investigator analyzes and evaluates each piece of evidence individually as well as in its totality. Ultimately, the investigator aims to prove whether a crime was committed and identify the individual responsible for it. In addition: "*In some cases, establishment of certain evidence directly leads to an answer to the main questions of the case: whether there was a crime and who committed it; in other cases, specific evidence establishment does not enable to immediately and directly get an answer to both of these questions or to one of them; in such a case, identified evidence is similar to an intermediate one, it does not immediately and directly prove a crime or the accused's guilt but contributes to establishing* ***other*** *facts and helps to provide answers to major questions of a case"* [36].

30 Евгеньев М. Е. Op. cit. С. 3.
31 Ibid. С. 258.
32 Ibid.
33 Ibid.
34 Ibid.
35 Ibid. С. 259.
36 Ibid.

The evidence that immediately and directly proves the existence of any fact (in particular, the main facts of a case: a crime or the accused's guilt) is called *direct evidence*. Those pieces of evidence that do not immediately and directly prove the existence of any fact, but which (on the basis of the collateral facts established by them) lead to a conclusion about the existence of this fact (in particular, about crime existence and the accused's guilt), are called *indirect evidence*. The same evidence, depending on the nature of the fact established by it, can be direct and indirect [37].

As to evidence handling, M. Ye. Yevheniev stresses: *"Analysis, evaluation and handling of direct evidence does not cause any particular difficulties. If direct evidence is of good quality, if its accuracy does not raise any doubts, conviction about the fact validity, which existence is established with the help of this direct evidence, develops easily, immediately"* [38]. While handling indirect evidence, conviction in authenticity of the facts established by it does not arise directly. It is a conclusion or inference that relies on reasoning and analysis, which accuracy depends both on the quality of the analysis of indirect evidence collected in the course of investigation and on the quality of indirect evidence itself. Therefore, *"it would be a mistake to believe that this somewhat reduces the value of circumstantial evidence in a criminal case; indirect evidence, dully collected, properly systematized, rightly researched and analyzed, acquires irrefutable evidentiary value"* [39].

From the above, M. Ye. Yevheniev states: *"Indirect evidence, which is not inferior to direct evidence in terms of importance and strength, requires high-quality investigative work by the investigator. If a false conclusion about the existence of the crime or the guilt of the accused is inevitable in a case based on direct evidence of poor quality, then it is obvious that a false, incorrect answer to the main questions about the existence of the crime or the accused's guilt is inevitable in a case based on indirect evidence of poor quality,"* [40] at the same time emphasizing that dully collected circumstantial evidence and its impeccable good quality do not always guarantee proper resolution of a case on the merits (in contrast to a case based on direct evidence, where appropriate collection and study of direct evidence and its good quality fully ensure such a guarantee). Cases built on circumstantial evidence, in addition to proper collection of high-quality circumstantial evidence, also necessitate its rigorous examination, as well as obtaining accurate and valid conclusion on the basis of such analysis. Therefore, the methodology of investigating a case based on indirect evidence should consist of both evidence collection and analysis and evaluation of collected evidence [41].

For convenience in handling circumstantial evidence, M. Ye. Yevheniev suggests combining them into two large groups: 1) indirect evidence of crime existence, 2) circumstantial guilt evidence. The first group includes circumstantial evidence in its totality and in combination with other case data on the basis of which a conclusion about crime commission is developed. The second group consists of indirect evidence in its totality and in combination with other data, which help to formulate a conclusion about crime commission by a particular person.

37 Евгеньев М. Е. Op. cit. С. 262.
38 Ibid. С. 263.
39 Ibid. С. 264.
40 Ibid.
41 Ibid.

Further, M. Ye. Yevheniev logically explains that *"an inaccurate conclusion about crime existence must inevitably entail an incorrect conclusion about the accused's guilt"* [42]. If on the basis of poor-quality indirect evidence or on the basis of a poor-quality analysis of collected indirect evidence, an inaccurate conclusion is made about the existence of a crime that was not committed, then *"the conclusion that the crime was committed by a particular person will also be inaccurate because if there is no crime, then there is no one to blame"* [43].

Working with indirect pieces of evidence, the investigator has to accurately determine which of them establish crime existence and which establish the accused's guilt in a specific case; mixing or substituting these pieces of evidence may lead to erroneous conclusions and potentially result in judicial errors. In fact, it is not always easy to isolate circumstantial evidence of crime existence from indirect evidence of guilt, but *"primarily it is always possible and necessary to do it",* which, for its part, *"considerably facilitates analysis and evaluation of all pieces of evidence and prevents possible mistakes that often take place in practice"* [44]. What is more, a clear distinction between circumstantial evidence collected in a case allows the investigator to accurately establish whether all pieces of evidence are collected and whether it is important to supplement them with other, additional ones, as well as to avoid the danger of substituting evidence of crime existence with evidence of guilt and vice versa [45].

M. Ye. Yevheniev's proposal to single out and summarize *conditions for accuracy of investigation of cases based on indirect evidence of crime existence"* is constructive:

1) if existence of a crime is established using indirect evidence, the latter should be collected with such exhaustive completeness as to exclude any possibility of the existence of *"any significant undetected refuting evidence"*. Collected indirect evidence must be of such a good quality and examined with such thoroughness and utmost clarity that only *one* conclusion can be drawn from it;
2) if existence of a crime is established by indirect pieces of evidence, they must be causally linked to a committed crime, and at the same time testify to individual circumstances under which a crime was committed;
3) if the question of whether a crime has been committed is resolved on the basis of indirect evidence, circumstantial crime evidence available in a case should be separated from circumstantial evidence of guilt and analyzed individually and collectively. If, proceeding from such analysis, it is possible to conclude that the existence of a crime cannot be proven, this conclusion should be verified both on the basis of guilt evidence available in a case and other case data;
4) when analyzing and evaluating circumstantial evidence of crime existence, one should always check whether the specific evidence is not an artificial, mechanical result of unifying individual, isolated, unrelated circumstances that cannot have the weight of independent evidence;

42 Евгеньев М. Е. Op. cit. С. 265.
43 Ibid.
44 Ibid.
45 Ibid. С. 265—266.

5) when analyzing and evaluating indirect evidence of crime existence, it is vital to check whether this evidence is real or just supposed [46].

Further, the researcher emphasizes that *"before solving the question of whether a crime has been committed, and if a crime has been committed, what exactly and for what reasons, the question of the accused's guilt cannot be resolved"* [47].

Developing the above provisions, M. Ye. Yevheniev highlights that indirect evidence establishing the guilt of the accused can be facts (circumstances) that: 1) preceded crime commission; 2) accompanied it; 3) followed its commission. If indirect evidence of guilt available in a case is categorized into these three groups, after verifying the quality of each piece of evidence separately and each of evidence groups collectively, it is possible to simplify evaluation and analysis of these pieces of evidence [48].

Indirect evidence of guilt preceding crime commission is considered by the researcher to be: 1) actions of the accused or other circumstances that may indicate his/her preparation for crime commission; 2) circumstances pointing to the accused's interest in crime commission (crime motives); 3) circumstances revealing her/his intentions to commit a crime (threats expressed by him, inducement of other persons to commit a crime, etc.).

The researcher calls indirect evidence of guilt *that accompanies crime commission* as following:

1) data on presence of the accused at the crime scene (testimony of witnesses who saw him/her at the crime scene; fingerprints and shoeprints of the accused at the crime scene and on the surrounding object in this place; crime tools or other items that belonged to the accused and which were found at the scene; dirt, dust, paint, etc. on the clothes or body of the accused, identical to the dirt, dust, paint detected at the scene, etc.);
2) data about involvement of the accused in crime commission (traces of crime on the accused and on objects belonging to her/him: blood and semen stains on the clothes or body of the accused; blood stains on instrument of crime; establishing identity between traces left by instrument of crime and traces left by the same weapon found in the accused, etc.) [49].

Indirect evidence, according to M. Ye. Yevheniev, are accused's actions aimed at concealing a crime, concealing or destroying crime traces, creating misleading (false) traces, incitement to providing false testimony, using fruits of a crime, the escape of the accused, her/his refusal to provide exculpatory evidence or provision of unconvincing evidence, etc. [50].

Among indirect evidence, M. Ye. Yevheniev also singles out behavioural evidence, that is, actions and statements of the accused in connection with a crime charged against him/her [51].

The scientist suggests categorizing cases where guilt is established through indirect evidence into two types:

1) relying on indirect evidence, both crime existence and the accused's guilt are determined;

46 Евгеньев М. Е. Op. cit. С. 270.
47 Ibid.
48 Ibid.
49 Ibid. С. 271.
50 Ibid.
51 Ibid. С. 271—272.

2) existence of a crime is established using direct evidence, and the accused's guilt: by indirect evidence [52].

No less constructive is M. Ye. Yevheniev's proposal to single out and summarize *"conditions for correctness of the investigation of cases where the accused's guilt is determined on the basis of indirect evidence of guilt":*

1) regardless of whether the evidence is direct or indirect, when establishing the existence of a crime in a case, it is vital to collect and investigate evidence meticulously and comprehensively to indisputably and accurately prove the presence of a crime. Only through this process can the accused's guilt be determined based on indirect evidence;
2) if the guilt of the accused is established on the basis of indirect pieces of evidence of guilt, then each of them must be carefully verified for good quality and for a causal link with the main fact: crime existence or other investigated facts; crime existence must clarify the existence of indirect evidence of guilt, while collected pieces of evidence should, in turn, confirm crime existence;
3) evaluating the quality of specific indirect evidence of guilt or a whole group of pieces of evidence collectively, the question should also be asked whether there is no other fact or circumstance not revealed by the investigation that could serve as counter-evidence as to a specific indirect evidence or group of such pieces of evidence;
4) if the accused's guilt is established based on circumstantial evidence, it is essential to verify each of these pieces of evidence to see if a particular evidence of guilt is not interpreted as evidence of crime existence or vice versa;
5) if the accused's guilt is established on the basis of indirect evidence, it is vital that specific facts that are circumstantial evidence be established not only by other circumstantial evidence but also by direct evidence of such facts;
6) indirect pieces of evidence of guilt available in a case during their evaluation and analysis should be divided into evidence of facts that preceded a crime, accompanied its commission and were detected after its commission. Dividing circumstantial evidence into such groups facilitates their evaluation for quality, veracity, and completeness of research; each of evidence groups must be evaluated both separately and in conjunction with other case data;
7) if the accused's guilt is proved on the basis of the so-called behavioural evidence, then each of these pieces of evidence and all of them collectively should be evaluated impartially, not considering the fact that the accused is guilty. The evaluation of *behavioural evidence* carried out objectively, not through the prism of the guilt of the accused, guarantees both completeness and accuracy of research on these pieces of evidence, and correctness of their analysis and synthesis;
8) each piece of the accused's *behavioural evidence* must be highlighted and explained in detail, therefore it is essential that for each piece of the accused's behavioural evidence available in a case, the accused should be questioned in detail and that all his/her explanations should be carefully checked [53].

Conclusions

During 1930s–1940s, The Soviet Union's interest in the development of crime

52 Евгеньев М. Е. Op. cit. С. 272.
53 Ibid. С. 280—284.

investigation methods based on the *concept of indirect evidence* was determined by political situation in the prison of peoples, in particular, by the desire of preliminary (pre-trial) investigation agencies and the prosecutor's office at the stages of the pre-trial investigation and trial (usually in cases of "terrorist acts" and "political conspiracies") to receive from the defendants admission of their guilt, which at that time was viewed as the main and decisive evidence. Sometimes (even in conditions of officially authorized physical violence against the accused) such confession was not obtained, and there was no direct evidence. Therefore (at the initiative of Stalin's Chief Prosecutor A. Ya. Vyshynskyi, who at that time was interested in scientific and teaching activities in the field of criminal procedure), the *concept of indirect evidence* with a "special practice" of its application in Soviet territory became widespread.

In Ukraine, a negative role in travestied practice of using the *concept of indirect evidence* was played by the political intervention of party bodies in criminalistics development, imposition of "special trends" in its formation under conditions of "socialist reality" and "class struggle". During this period, "Soviet criminalistics" was opposed to the "bourgeois", strict adherence to the *class approach* in science was required, the pseudo-principle of *partisanship of science* was promoted, "political tasks" were addressed to investigative authorities in textbooks and manuals on criminalistics, and forensic scientists were required to expose the "pseudo-scientific bourgeois methods" of detecting and researching evidence.

In contrast to the above-mentioned trends, the study guide by M. Ye. Yevheniev, published in 1940, is devoid of any political slogans or criticism of foreign criminalistics. It fairly professionally and in detail outlines the method of investigating cases based on circumstantial evidence, using numerous examples of investigative practice. We believe that the author quite correctly defined the purpose of applying the method: to assure the investigator, the prosecutor as well as the court that the crime under investigation was indeed committed and that it was committed by a specific person. The investigator had to prove these facts in a certain sequence, and failure to do so could result in case dismissal. In fact, these are two major tactical tasks that the investigator solved through the use of this crime investigation method.

Traditionally for that time, the researcher divided evidence (depending on the established fact) into two main types: direct and indirect. Additionally, M. Ye. Yevheniev rightly emphasized that handling direct evidence is not a problem for the investigator: it is challenging to handle indirect evidence because it depends on its high quality and the quality of analysis thereof.

From our perspective, in his method, the researcher aptly used elements of the activity approach: he singled out conditions under which a case is properly investigated with the use of circumstantial evidence; indirect evidence of guilt was determined depending on the stages of criminal activity (preceded crime commission, accompanied crime commission, contributed to crime concealment); among indirect evidence, he distinguished *behavioural evidence* (certain activity: *behaviour, state, reactions*) indirectly confirming involvement of a specific person in crime commission.

The scientist's use of an integrated approach deserves attention: a person's guilt can be established by combining direct and indirect evidence.

The suggestion of M. Ye. Yevheniev to single out clear conditions for accuracy of investigating cases where the accused's guilt is established on the basis of indirect evidence of guilt is of certain scientific interest: such evidence should be collected and investigated as early and as comprehensively as possible; carefully verified for good quality; causal link with the main fact must be confirmed by other pieces of evidence.

We believe it is correct that the investigator cannot use this method only as accusatory method: the investigator must look not only for evidence of the guilt of a specific person, but also for counter-evidence, to carefully check whether evidence of crime existence has been replaced by evidence of guilt. It is rightly pointed out: the accused must be carefully questioned about each piece of evidence, and all his/her explanations carefully checked. The viewpoint of M. Ye. Yevheniev that facts during the investigation established not only through indirect evidence but also through direct evidence is equally valid.

The method developed by M. Ye. Yevheniev is devoid of any schematization, although it contains certain elements of an algorithmic nature, that is, it offers a certain sequence of actions as to its implementation. And this is not surprising, because A. Nicheforo's [54] crime investigation method, A. Weinhart's [55] method of identifying and exposing a criminal based on traces and other circumstances (behavioural evidence) had been criticized in the textbook on criminalistics (1938) edited by A. Ya. Vyshynskyi with the rhetoric traditional for that time: "*All these schemes belong to the period of bourgeois criminalistics development, when aggravation of class contradictions in bourgeois society forced the bourgeoisie to search for new, stronger means to fight its class enemies. Therefore, a characteristic feature of all these schemes is, along with their seemingly apolitical nature, a deeply reactionary nature. None of the indicated authors directly talks about the dependence of investigation tactics and methods on political case importance. However, they all think through their scheme in such a way as to ensure a real strengthening of repression*" [56]. I. M. Yakymov's [57] general method of investigating a crime relying on indirect evidence was subjected to a more constructive but no less devastating criticism: "*Without stopping at a detailed criticism of attempts to create a typical scheme for investigation made in Soviet forensic literature <...>, which were mostly a combination of various elements of the above-mentioned schemes of bourgeois criminalistics , we can undeniably state that there is no single typical investigation scheme for all crimes and cannot be. Any attempt in this direction is doomed to be inherently futile and can only be harmful, because it can lead the investigator to an unacceptable schematization of investigation, to its formalization*" [58].

Unfortunately, M. Ye. Yevheniev did not disclose types of indirect evidence links (genetic, chronological, local, correlational, etc.) in his method, paid little attention to peculiarities of evaluating

54 Niceforo A. La Police et l'Enquête judiciare scientifiques. Paris: Librairie universelle, 1907. P. 397—410.

55 Вейнгартъ А. Уголовная тактика. Руководство къ разслѣдованію преступленій / пер. съ нѣм. Санктъ-Петербургъ, 1912. С. 65—69.

56 Бобров Н. А., Винберг А. И., Голунский С. А., Громов В. И., Зицер Е. У. и др. Op. cit. С. 333.

57 Якимов И. Н. Криминалистика ... . С. 161—168.

58 Бобров Н. А., Винберг А. И., Голунский С. А., Громов В. И., Зицер Е. У. и др. Op. cit. С. 334.

indirect pieces of evidence, and stopped at only one traditional classification of them. At the same time, the developed method is logically structured, easy to understand by practitioners, takes into account traditional factors of suddenness and counteraction to investigation in criminalistics.

The scientist's position concerning the "enduring" evidentiary value of circumstantial evidence is noteworthy: it will be so only when it is rightly collected, correctly systematized, researched and analyzed.

From our perspective, M. Ye. Yevheniev's statement that circumstantial evidence includes the accused's refusal to provide exculpatory evidence in his/her favour or submission of unconvincing evidence is debatable.

As to widespread implementation of this method in judicial and investigative practice, the researcher rightly warned: not inferior to direct evidence in terms of its importance and strength, indirect evidence requires high quality investigative work and application of considerable practical investigative experience from the investigator.

The above-analyzed method of investigating a case based on indirect evidence developed by M. Ye. Yevheniev is a substantial contribution to the development of forensic science about the methods of investigating criminal offenses and the theoretical bases of current forensic methods.

Розслідування справи за непрямими доказами: метод М. Є. Євгеньєва

Анатолій Старушкевич

Доведено, що основою методу розслідування справи за непрямими доказами, розробленого радянським криміналістом М. Є. Євгеньєвим, є концепція непрямих доказів, поширення якої зумовила політична ситуація 1930—1940-х рр., зокрема прагнення органів слідства та прокуратури у справах про «терористичні акти» і «політичні змови» отримувати від обвинувачених зізнання вини, яке на той час вважали основним і вирішальним доказом. Зазначено позитивні якості методу: логічна структурованість, простота для сприйняття практичними працівниками, урахування традиційних чинників раптовості та протидії розслідуванню, використання діяльнісного та комплексного підходів, алгоритмічності та етапності розслідування злочинів. Оперування прямими доказами не є проблемним для слідчого: складнощі спричиняють саме непрямі докази. За кожним доказом обвинуваченого слід докладно допитати, а всі його пояснення ретельно перевірити. З'ясовано, що розробник методу не розкрив форми зв'язків непрямих доказів, приділив недостатньо уваги особливостям оцінки непрямих доказів. Водночас констатовано, що метод М. Є. Євгеньєва є вагомим кроком до становлення вчення про методи розслідування кримінальних правопорушень і теоретичних основ сучасної криміналістичної методики. Мета статті — науковий аналіз методу розслідування справи за непрямими доказами, розробленого М. Є. Євгеньєвим, для з'ясування його ролі у становленні криміналістичного вчення про методи розслідування кримінальних правопорушень. У дослідженні застосовано методи наукового пізнання: спостереження, порівняння, абстрагування, аналіз, синтез, моделювання тощо.

Ключові слова: *метод пізнання в криміналістиці; метод розслідування; розслідування кримінальних правопорушень; історія криміналістики; криміналістична методика; непрямі докази; побічні докази.*

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Forensic Expert Evaluation of Microcar Driver Actions in Case of Traffic Collision

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Actions microcar drivers (electric unicycle, electric scooter, etc.) were analyzed with the aim of developing new regulatory approaches to conducting forensic research and providing a forensic expert conclusion on a traffic collision involving the person driving such a vehicle. The lack issue of a regulatory framework for operation of such means of transportation as unicycles on public roads is outlined, as well as the issue associated with the use of unicycles in public areas (in parks, playgrounds, sidewalks, etc.). The design of the unicycle is presented, the methods of its control are systematized, and a detailed list of equipment necessary for ensuring road traffic with microcar participation is offered. As an example, a part of the author's expert research on criminal proceedings to establish whether an electric scooter belongs to the category of vehicles in accordance with requirements of traffic codes in force in Ukraine is presented. This article purpose is to supplement the legislative framework of Ukraine with conditions and rules for driving microcars , as well as to determine functions of a person driving a unicycle while traffic collision. To achieve this goal, general scientific and special methods (formal logic (analysis, synthesis, deduction, induction, analogy, abstraction), special legal, system analysis) were used.

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Keywords: *microcar; electric unicycle; motorized scooter; road user; traffic codes; traffic collision; forensic expert; road accident analysis.*

Research Problem Formulation

When traveling on the public roads of our country (this especially applies to large cities of Ukraine: Kharkiv, Kyiv, Dnipro, Odesa, etc.), today in the flow of traffic you can often see people moving at a fairly high speed along the roadway on a one-wheeled device, namely: a unicycle (in particular, those who have not reached the age of majority: namely: children). Such means of transportation are extremely mobile, even compared to a motorcycle, let alone a regular car. The unicycle is capable of rapid acceleration and sideways maneuvering without giving any warning signs/gestures. Such actions of persons driving a unicycle provoke dangerous situations on the highways, which can even cause physical injuries to road users, and sometimes, unfortunately, fatalities. Currently, there is no legal regulation regarding the movement of people on a unicycle on the roadway. There is no mechanism for bringing such persons to responsibility (administrative, criminal) in case of their involvement in a traffic accident (hereinafter referred to as traffic collision).

In view of the above, it is now necessary to identify such persons as belonging to a certain category of road users (from technical positions), submitting proposals for appropriate changes in the legislative framework, the which documents in Ukraine regulate road traffic and the rights of its participants. There was also an urgent need to change the expert approaches to the examination of accident with participation of the person who driving microcar (electric unicycle, electric unicycle, etc.).

It is worth remembering Ukrainian active progress towards full membership in the European Union, and one of the strategic and long-term directions of the EU development is environment preservation and protection. For example, Sustainable and Smart Mobility Strategy of the EU [1] (SSMS), adopted by European Commission in 2020, provides for reduction of greenhouse gas emissions from transport: the development of public transport, micromobility, replacement of air transport and intercity bus services by rail, optimization of freight transportation and creation of transport hubs. It is clear that adapting the Sustainable and Smart Mobility Strategy of the EU in Ukraine is extremely necessary not only for joining the EU, but also for the sustainable development of our state. In addition, Ukraine is already paving the way to securing and preserving the environment: in 2021, the National Economic Strategy for the period until 2030 [2] was approved,

1 Sustainable and Smart Mobility Strategy / European Commission. URL: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12438-Sustainable-and-Smart-Mobility-Strategy_en (date accessed: 02.06.2022).

2 Національна економічна стратегія на період до 2030 року : затв. Постановою КМУ від 03.03.2021 р. № 179 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/179-2021-%D0%BF#n25 (date accessed: 02.06.2022).

according to which our state should become, in particular, climate neutral by 2060. This means that each of the sectors of the economy, in particular, transport should emit no more greenhouse gases into the atmosphere than natural ecosystem [3]. can absorb. Therefore, it is appropriate to predict an increase in the number of microcars (and therefore environmentally friendly) means of transportation on domestic roads in the coming years which movement, unfortunately is not yet regulated by the regulatory and legal acts of Ukraine.

Analysis of Essential Researches and Publications

Unfortunately, the issue of determining belonging microcar users to a certain category is not new.

Chinese scientists Sh.-Ch. Fang, I-Ch. Chang i T.-Yi Yunote: *"At present, there are approximately 3,500 electric scooters in the Penghu region. The government has set up 332 charging columns at 27 key locations to facilitate the charging of these scooters. <...> This study also classifies users into one of three types: "one-time charging," "repeat charging," and "high-frequency charging"»* [4].

In Europe, there are some issues with definition of functions of a person driving a microcar. Examining this problem in Norway, M. Pazzini, L. Cameli, C. Lantieri, V. Vignali, G. Dondi and T. Jonsson note: *"Some local governments are not yet ready to integrate e-scooters into their transport systems. Indeed, the legislation is unclear as it is not easy to determine whether the e-scooter is more like a bicycle or a vehicle. Moreover, it is difficult to predict the impact of e-scooters on road traffic, as well as the type of road infrastructure chosen by e-scooter drivers or the possible interaction of such vehicles with weak road users, such as pedestrians or cyclists"* [5].

This issue was addressed in research papers of: G. Underwood [6]; S. Lin, M. He, Yo. Tan [7]; S. G. Hosking, Ch. C. Liu and M. Bayly [8]; T. Bellet and A. Banet [9]; K. Bassil, H. Rilkoff, M. Belmont, A. Banaszewska,

3 Як українським містам скорочувати викиди парникових газів від транспорту / Екодія. 16.07.2021. URL: https://ecoaction.org.ua/iak-mistam-skorochuvaty-vykydy.html (date accessed: 02.06.2022).

4 Fang Sh.-Ch., Chang I-Ch., Yu T.-Yi. Assessment of the behavior and characteristics of electric scooter use on islands. *Journal of Cleaner Production*. 2015. Vol. 108. Part A. Pp. 1193—1202. DOI: 10.1016/j.jclepro.2015.07.095 (date accessed: 02.06.2022).

5 Pazzini M., Cameli L., Lantieri C., Vignali V., Dondi G., Jonsson T. New Micromobility Means of Transport: An Analysis of E-Scooter Users' Behaviour in Trondheim. *International Journal of Environmental Research and Public Health*. 2022. Vol. 19. Is. 12. DOI: 10.3390/ijerph19127374 (date accessed: 02.06.2022).

6 Underwood G. Visual attention and the transition from novice to advanced driver. *Ergonomics*. 2007. Vol. 50. Is. 8. Pp. 1235—1249. DOI: 10.1080/00140130701318707 (date accessed: 02.06.2022).

7 Lin S., He M., Tan Yo. Comparison Study on Operating Speeds of Electric Bicycles and Bicycles: Experience from Field Investigation in Kunming, China. *Transportation Research Record*. 2008. Vol. 2048. Is. 1. Pp. 52—59. DOI: 10.3141/2048-07 (date accessed: 02.06.2022).

8 Hosking S. G., Liu Ch. C., Bayly M. The visual search patterns and hazard responses of experienced and inexperienced motorcycle riders. *Accident Analysis & Prevention*. 2010. Vol. 42. Is. 1. Pp. 196—202. DOI: 10.1016/j.aap.2009.07.023 (date accessed: 02.06.2022).

9 Bellet T., Banet A. Towards a conceptual model of motorcyclists' risk awareness: A comparative study of riding experience effect on hazard detection and situational criticality assessment. Ibid. 2012. Vol. 49. Pp. 154—164. DOI: 10.1016/j.aap.2011.10.007 (date accessed: 02.06.2022).

M. Campbell [10]; S. Bernardi and F. Rupi [11]; R. Aldred [12]; L. Abend [13]; E. Bahk [14]; Ch. Teh and T. T. Wei [15]; V. Choudhary, M. Shunko, S. Netessine and S. Koo [16]; W. E. Marshall and N. N. Ferenchak [17]; S. O'Hern and J. Oxley [18] et al. [19].

In Ukraine (similarly to Norway), the legal status of persons driving microcar has not yet been defined, their qualifications are lacking in accordance with requirements of traffic codes [20] and the legal framework for the operation of such vehicles has also not been approved. on public roads.

Article Purpose

Highlight the issues of operating such a means of transportation as a unicycle

10 Bassil K., Rilkoff H., Belmont M., Banaszewska A., Campbell M. Pedestrian and Cyclist Safety in Toronto. *Toronto Publis Health.* June, 2015. DOI: 10.13140/RG.2.1.4477.1680 (date accessed: 02.06.2022).

11 Bernardi S., Rupi F. An Analysis of Bicycle Travel Speed and Disturbances on Off-street and On-street Facilities. *Transportation Research Procedia*. 2015. Vol. 5. Pp. 82—94. DOI: 10.1016/j.trpro.2015.01.004 (date accessed: 02.06.2022).

12 Aldred R. Inequalities in self-report road injury risk in Britain: A new analysis of National Travel Survey data, focusing on pedestrian injuries. *Journal of Transport & Health*. 2018. Vol. 9. Pp. 96—104. DOI: 10.1016/j.jth.2018.03.006 (date accessed: 02.06.2022).

13 Abend L. Cyclists and E-Scooters are Clashing in the Battle for Europe's Streets. Time. August 27, 2019. URL: https://time.com/5659653/e-scooters-cycles-europe/ (date accessed: 02.06.2022).

14 Bahk E. Electric scooter accidents on the rise. The Korea Times. December 6, 2019. URL: https://m.koreatimes.co.kr/pages/article.asp?newsIdx=277033 (date accessed: 02.06.2022).

15 Teh Ch., Wei T. T. E-scooter that knocked into cyclist in fatal Bedok accident should not have been used on public paths: LTA. The Straits Times. Sept 26, 2019. URL: https://www.straitstimes.com/singapore/transport/e-scooter-that-knocked-into-65-year-old-cyclist-in-fatal-accident-was-non (date accessed: 02.06.2022).

16 Choudhary V., Shunko M., Netessine S., Koo S. Nudging Drivers to Safety: Evidence from a Field Experiment. INSEAD Working Paper. No. 2020/28/TOM. 51 p. DOI: 10.2139/ssrn.3491302 (date accessed: 02.06.2022).

17 Marshall W. E., Ferenchak N. N. Why cities with high bicycling rates are safer for all road users. Journal of Transport & Health. 2019. Vol. 13. DOI: 10.1016/j.jth.2019.03.004 (date accessed: 02.06.2022).

18 O'Hern S., Oxley J. Pedestrian injuries due to collisions with cyclists Melbourne, Australia. Accident Analysis and Prevention. 2019. Vol. 122. Pp. 295—300. DOI: 10.1016/j.aap.2018.10.018 (date accessed: 02.06.2022).

19 Yao L., Wu Ch. Traffic Safety for Electric Bike Riders in China: Attitudes, Risk Perception and Aberrant Riding Behaviors. *Transportation Research Record*. 2012. Vol. 2314. Is. 1. Pp. 49—56. DOI: 10.3141/2314-07 (date accessed: 02.06.2022) ; Xu C., Li Q., Qu Zh., Tao P. Modeling of speed distribution for mixed bicycle traffic flow. *Advances in Mechanical Engineering*. 2015. Vol. 7. Is. 11. Pp. 1—9. DOI: 10.1177/1687814015616918 (date accessed: 02.06.2022) ; Guthold R., Stevens G. A., Riley L. M., Bull F. C. Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants. *The Lancet*. 2020. Vol. 4. Is. 1. Pp. 23—35. DOI: 10.1016/S2352-4642(19)30323-2 (date accessed: 02.06.2022) ; Hawkins A. J. Lime's electric scooters will be able to tell when you're too drunk to ride / Talking scooters and safety with co-founder Brad Bao. *The Verge*. Apr 17, 2019. URL: https://www.theverge.com/2019/4/17/18411127/lime-brad-bao-electric-scooter-drunk-detection-vergecast (date accessed: 02.06.2022).

20 Правила дорожнього руху : затв. Постановою КМУ від 10.10.2001 р. № 1306 (зі змін. та доп.). URL: https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%BF#Text (date accessed: 02.06.2022).

on public roads. Propose to supplement the legal framework of Ukraine with conditions and rules for driving microcars, as well as to determine status, rights and responsibilities of a person who was driving a unicycle as a road traffic participant during an accident. Draw attention to issues arising for investigators, forensic experts and judges, if necessary, to provide an assessment of a similar traffic situation within the limits of their competence, as well as to the issues of providing a legal assessment by the relevant authorized person (body) and the legal qualification of a specific situation in the case.

Research methods

For achieving his goal, this research paper used general scientific and special methods that made it possible to optimally take into account the specifics of the object and the subject of research, in particular: methods of formal logic (analysis, synthesis, deduction, induction, analogy, abstraction) for detailed clarification the content of the issues under consideration; special legal methods (first of all, comparative law) while analysis of substantive and procedural law norms, scientific categories, definitions and approaches; the method of system analysis in the context of determining areas of activity to improve the application of specific expertise while forensic examination of traffic collisions involving microcars.

Main Content Presentation

In the European Union, in particular in France, vehicles such as a mono-wheel are moved in accordance with the approved legislative norms with appropriate restrictions. So, in France, movement on monowheels is allowed only on bicycle paths with a speed limit of up to 25 km/h or on roads where the maximum speed does not exceed 50 km/h, it is forbidden to drive on the sidewalk, carry passengers and use headphones while driving [21].

In Germany, movement of sidewalks using electric unicycles is strictly prohibited. It is allowed to move exclusively by bicycle paths, and in their lack to go to the carriageway. Under German law, the speed limit for microcars, which electric unicycle to, within the city limits should not exceed 20 km/h [22].

In Spain, the use of an electric unicycle is allowed on bike lanes and streets, where the speed of transport is limited to 30 km/h. In three cities (Madrid, Barcelona and Valencia), different rules apply to use of microcars. Electric unicycle drivers must wear helmets and give way to other road users, primarily pedestrians [23].

In Japan, it is generally forbidden to move freely on electric unicycles and other ultramodern means of transportation. It is a bicycle country.

Let us consider in more detail how the issue of movement of microcars on public roads, in parks and other places is regulated in Ukraine.

21 Code de la route, partie réglementaire, version consolidée au 8 septembre 2011. *Légifrance* : Journal officiel de la République Française (JORF). URL: https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006074228/2023-02-09/ (date accessed: 02.11.2022).

22 Straßenverkehrs-Ordnung (Deutschland) : der ab 01.04.2013 gültigen / STVO.de. URL: https://www.stvo.de/strassenverkehrsordnung (date accessed: 02.11.2022).

23 Normas de tráfico. Todo lo que necesitas saber para conducir en España / Just Landed. URL: https://www.justlanded.com/espanol/Espana/Guia-Espana/Ocio-Viajes/Normas-de-trafico (date accessed: 02.11.2022).

In addition to trucks and cars, buses and fixed-route vehicles, agricultural machinery and bicycles in domestic traffic rules, following vehicles are defined:

- ***"Wheelchair is a specially designed wheelchair*** *designed for the movement on the road of persons with disabilities or persons belonging to other groups of people with limited mobility. The wheelchair has at least two wheels and is equipped with an engine or is driven by the muscular force of a person* [24]*".* Consequently, wheelchair can move both with the help of the engine and with the help of force of the person on;
- ***"motor vehicle*** *means a vehicle propelled by an engine. This term applies to tractors, self-propelled machines and mechanisms, as well as trolleybuses and vehicles with an electric motor with a capacity of more than 3 kW"* [25]. This category includes most of the vehicles in operation on the territory of our State;
- "***moped is a*** *two-wheeled vehicle that has an engine with a working volume of up to 50 cubic cm or an electric motor with a capacity of up to 4 kW"* [26];
- ***"motorcycle*** *is a two-wheeled power-driven vehicle, with or without a side-trailer, having an engine with a displacement of 50 cm or more. Motorcycles are equated to motor scooters, motorcycle sidecars, tricycles and other motor vehicles, the permissible maximum mass of which does not exceed 400 kg"* [27]. These vehicles are mostly two-wheeled, designed to carry usually one passenger, do not have a body and are unstable during operation in winter.

According to terminology of the traffic codes, ***"vehicle is a*** *device designed to transport people and (or) cargo, as well as special equipment or mechanisms installed on"* [28].

Therefore, taking into account the above definitions of traffic codes, electric unicycle can be considered a vehicle, since it transports one person.

At the same time, according to the traffic rules, ***"road user*** *is a person who is directly involved in the process of driving on the road as a pedestrian, driver, passenger, animal driver, cyclist, as well as a person moving in a wheelchair"* [29]. In this definition, there is no mention of persons driving microcars (electric unicycle, motorized scooter, etc.). It is not consistent with the term "vehicle" of these same traffic codes.

Analysis of the above definitions indicates that means of transportation such as a unicycle, having an electric drive of less than 3000 W, correspond to only one of the above terms, "vehicle". However, a unicycle does not fall under any of the qualifications specified in requirements of traffic rules, thus, this vehicle cannot be defined as belonging to any of categories provided for by the traffic rules. Because of this, operation

24 Правила дорожнього руху ... . URL: https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%BF#Text (date accessed: 02.06.2022).
25 Ibid.
26 Ibid.
27 Ibid.
28 Ibid.
29 Ibid.

of a unicycle does not make it possible to consider it a road traffic participant in accordance with the term specified in the traffic rules. At the same time, some microcars, such as *InMotion V10F (Black)* unicycle, have a power of 2000 W and a speed of up to 40 km/h. This speed of travel is well above the conventional wisdom of pedestrian speeds in places where pedestrian traffic is allowed, and is currently not very significant compared to the speeds of vehicles on public roads.

Taking into account the above, we systematize a range of issues related to the use of such transportation means as unicycles on public roads of Ukraine:

- lack of an appropriate legislative framework for regulating participation of microcars in road traffic;
- lack of legal mechanisms for bringing person driving electric unicycle to responsibility, as well as determining the degree of such responsibility in case of traffic collision involving the electric unicycle and its driver;
- injury or even death of traffic collision participants caused by the electric unicycle driver and/or malfunction of this electric unicycle;
- danger inevitability of further operation of the monowheel in case of its collision with an obstacle (hitting a pit it slows down and does not have time to compensate for driver inclination, causing him to fall from the monowheel, that is capable of causing bodily harm;
- sudden shutdown of the electric unicycle in case of its use at maximum speed (working at the limit of its capabilities, electric unicycle is not technically able to reach even more power and is not able to warn about the lack of driver power), which result is driver can fall off the electric unicycle and suffer bodily injuries.

Consequently, the use of an electric unicycle as a microcar on the territory of Ukraine primarily requires regulation at the legislative level, that is, making appropriate changes to domestic legislation, namely, to Law of Ukraine: On Traffic [30] (hereinafter referred to as the *Profile Law*) and to traffic codes.

In our opinion, it is appropriate to consider as drivers of mechanical vehicles all those who drive a unicycle (motorized scooter, self-balancing scooter); thus, we consider it appropriate: to add part 2 of Art. 14: *Road users* of the relevant Law and para. 25 paragraph 1.10 of traffic codes with a mention of persons who move on unicycles, electric scooters, self-balancing scooters and other microcars n), and point 1.10 of the traffic codes defining the terms *microcar* and *unicycle*.

In addition to the mentioned, it is extremely important to determine the minimum age that gives the right to drive a unicycle from 16 years. Such a restriction is due to the fact that being responsible for one's own actions on the road, being fully aware of the extent of possible danger associated with the operation of a microcar, correctly understanding the behavior of other road users and reacting to it in a timely manner may not be before the age of 16.

Mandatory requirements for the driver equipment when traveling on a unicycle must also be made regarding the presence

30 Про судову експертизу : Закон України від 25.02.1994 р. № 3353-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/3353-12#Text (date accessed: 25.11.2022).

of: a protective helmet, gloves, elbow pads and knee pads, and in the dark and/or in conditions of insufficient visibility (for timely detection by other road users) reflective elements (tape, stickers, vest, etc.) or clothing already equipped with reflective elements. Clause 2.3 of traffic codes must be supplemented with such mandatory requirements.

In addition, electric unicycle driver should receive appropriate training on the rules of movement of carriageway in general use, confirmed by a certificate for the right to drive a vehicle of the appropriate category. For this purpose, in paragraph 2.13 of traffic codes, such road users should be added to category A1.

Timely detection of microcars on the roadway by other road users will contribute to limiting the speed on a mono-wheel to 30 km/h, which needs to be supplemented by paragraph 12.9 of the traffic codes with the corresponding norm.

Let us illustrate the above proposed additions to the traffic codes and the relevant Law with a detailed consideration of a typical design of a unicycle. The basic element of a unicycle is, of course, a wheel (diameter of the wheels can vary) with a closed housing made of polymer materials. At the top are the handle, control panel and display or status indicators. On the sides there are stands that can be lowered or raised. Inside the case, there is not only a wheel, but also an electric motor, a battery, a center of gravity, magnets, gyroscopes, that maintain balance and participate in steering.

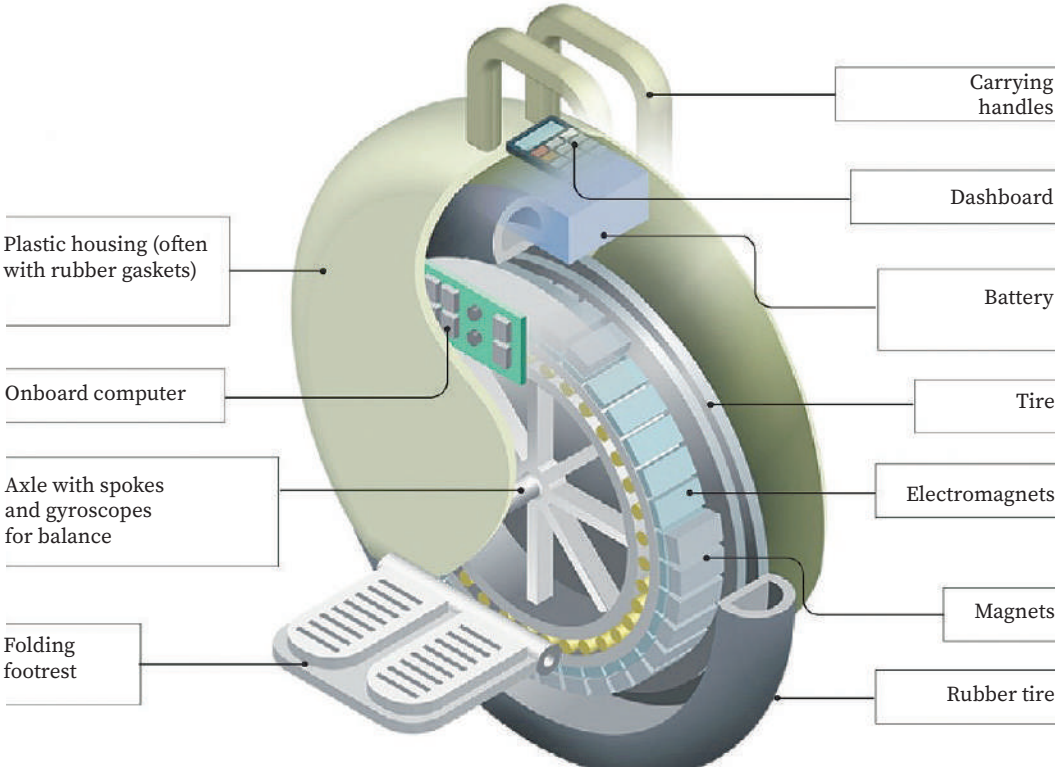

Fig. 1. Unicycle in section

Electric unicycle works on the principle of calculating position of the one who controls it with the help of gyroscopes. The engine start buttons are located on the control panel. Under influence of electromagnetic induction, motor rotor starts electric unicycle, forcing it to move from its place. When the driver, being on electric unicycle, leans forward or backward, electric unicycle moves in the direction chosen by the driver; when the driver leans sideways, the electric unicycle turns.

Let us consider the actions of driver when moving on electric unicycle and its driving, since the actions of this person depend on his own safety, safety of others, as well as road safety. When tilting the torso forward, the driver makes more effort to the front of the pedals and accelerates the movement of the unicycle, leaning back and increasing the force on the rear of the steps, the driver slows down this movement: gyroscopes fix the change in the position of the center of gravity, trigger the electromagnetic field and combine the poles of the magnets (the same poles: forward movement, different: backward movement). The larger and stronger the inclination of the torso to the side during turns, the greater the turn will be. If the gyroscopes are working, then it is enough for the driver to keep the balance for lateral collapse: the same skill is required for driving on the road.

The above design features of the monowheel confirm our opinion about the need for careful training for its controlling. Such training should begin with the formation of a sense of the gyroscopic system, gradually mastering the efforts on the pedal first with one foot, remembering the movement and the degree of pressure, then with both feet. Standing on a unicycle with both feet at the beginning of training, you should stick to a person or a wall.

The design features of the unicycle are unique and are designed to protect the life and health of the driver: in the case of acquiring a very sharp angle of inclination of the body by the manager, the gyroscopes instantly give the command to electric motor of the unicycle to accelerate, driving under driver and preventing it from falling.

Bicycle has the same balance characteristics as a unicycle. However (unlike a person who drives a microcar, such as a unicycle) clause 1.10 of the Traffic codes contains a definition of the terms *bicycle*, *cyclist* (as well as *bicycle path*, *bicycle lane* and *bicycle crossing*), and section 6 of the traffic codes requirements for the cyclist himself (his clothing and age, equipment with reflective elements) and for his movement on the territory of Ukraine.

Since the movement of a bicycle depends on muscular strength of a person, and movement of a unicycle is ensured by operation of an electric motor, the unicycle driver (unlike a cyclist) must receive appropriate training for moving on public roads, that is, obtain a certificate for the right to drive a vehicle of appropriate category.

For this purpose, paragraph 7 of clause 2.13 of traffic codes that specifies vehicles that belong to category A1 (mopeds, scooters and other two-wheeled vehicles that have an engine with a working volume of up to 50 cm^3 or an electric motor with a capacity of up to 4 kW), should be added a single-wheeled vehicle, namely: electric unicycle.

In order to streamline the movement of persons driving microcars, in particular unicycle, on the territory of Ukraine, it

is necessary to add such road users to category A1 or equate them.

Currently, the norms proposed by us are absent in both the traffic codes and the profile Law, which provokes ambiguous approaches to the technical and legal assessment of the actions of the person who, at the time of the accident, was driving a micro-mobile vehicle: in one case, this person is qualified as a pedestrian, in the other as a driver. If we consider the manager a pedestrian mono-wheel, then during an accident with a mono-wheel hitting another pedestrian and injuring the latter, it is impossible to classify this event as an accident: after all, *such technical analysis contradicts the term* "***traffic collision***" is an *event that occurred during the movement of the vehicle, as a result of which people were killed or injured or material damage was caused* [31], given in clause 1.10 of the traffic rules.

Similar issues arise for investigators during investigation of criminal proceedings involving such a microcar as an electric scooter. Let us look at some examples from expert practice.

Example 1. To *National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute»*(hereinafter referred to as NSC «Hon. Prof. M. S. Bokarius FSI») from the Department for Investigation of Crimes in the Field of Transport of Investigative Department of the Main Directorate of the National Police in the Kharkiv region received a decision of investigator on the appointment of a forensic engineering and transport examination for criminal proceedings, as well as a certified photocopy of the operating instructions for the *Like.Bike Titan* electric scooter on 10 sheets.

Questions put to the decision of forensic examination:

- "Based on specifications of the *Like.Bike Titan* motorized scooter, does it belong to the vehicle category; if so, to which vehicle category"?;
- "Is it possible to use the *Like.Bike Titan* electric scooter on public roads?"

Circumstances of traffic collision. 02.10.2021, at about 21:00, near the house № X on the street. I.v. in Kh. there was a collision of a bus of BASES on S.I. Petrov, who was driving a motorized scooter *Like.Bike Titan*. As a result of this traffic collision, s. Petrov with bodily injuries was taken to the hospital (from the decree on appointment of examination).

Input data:

- maximum speed of the *Like.Bike Titan* electric scooter is 60 km/h, engine power is 2 × 1000 W (from a photocopy of vehicle license of the *Like.Bike Titan* motorized scooter);
- In accordance with the instructions for use of the *Like. Bike Titan* motorized scooter, the motorized scooter is not a vehicle and a road user, it cannot be used on public roads, highways (in particular, of state importance). Persons under 16 years of age are not allowed to use the electric scooter without adult supervision, and you should wear a helmet during use (from photocopies of the instructions for use of the *Like.Bike Titan* motorized scooter).

31 Правила дорожнього руху ... . URL: https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%B-F#Text (date accessed: 02.06.2022).

The result of performed researches. Forensic expert found out that the motorized scooter *Like.Bike Titan*, on which S.I. was moving, Petrov, designed for operation by adults and equipped with two electric motors with a capacity of 1000 watts each. In addition, according to the instructions for use of the *Like.Bike Titan* motorized scooter, the *Like.Bike Titan* electric scooter is not a vehicle and a road user, it cannot be used on public roads.

Since there is no definition of the term *motorized scooter* in domestic traffic laws (instead, it is stated that vehicles are devices designed to transport people and/or cargo, as well as special equipment or mechanisms installed on it, and mechanical vehicles are those that drive in motion with the help of an engine or electric motor with a power of more than 3 kW), the expert came to the conclusion that the electric scooter Like.Bike Titan, driven by S. I. Petrov, belongs to non-mechanical vehicles (the total power of its electric motors is 2000 W, i.e. less than 3 kW stipulated in Clause 1.10 of the traffic codes). Current traffic regulations do not outline a place for the movement of electric scooters, and the instruction manual for the operation of the *Like.Bike Titan* motorized scooter states that this means of transportation is not intended for operation on public roads, therefore, S. I. Petrov did not have the right to use the *Like.Bike Titan* motorized scooter on public roads.

Example 2. To *NSC «Hon. Prof. M. S. Bokarius FSI»* from the Investigative Department of the Main Department of the Main Department of the National Police in Vinnytsia region from the senior investigator for forensic examination received a resolution on the appointment of an examination and a photocopy of the criminal proceedings on the fact of hitting a MAZ car (driver V. S. Shevchenko) on minors D. A. Korzhov and V. K. Kryzhanova, who were moving on an electric scooter *Like.Bike One*.

Questions put to the decision of forensic examination:

- "Is motorized scooter (traffic collision participant) a vehicle (in accordance with the technical requirements of traffic codes of Ukraine)?";
- "Is motorized scooter a mechanical vehicle (in accordance with the technical requirements of traffic codes of Ukraine)?";
- "Is it possible to equate an electric scooter in these road conditions to a bicycle (in accordance with the technical requirements of the traffic codes of Ukraine)?";
- "Is it possible to equate the movement of an electric scooter with a bicycle path and a roadway in these road conditions to pedestrian traffic (in accordance with the technical requirements of the traffic codes of Ukraine)?".

Circumstances of traffic collision. 28.04.2021, at about 17:25, the driver V.S. Shevchenko, driving a MAZ car and moving D. in the city of V., during the execution of the turn to the right maneuver on the D. A. Korzhova and V. K. Kryzhanova, who crossed the roadway on the *Like.Bike One* motorized scooter, were hit by minors. D. within the right-to-left bike lane relative to the MAZ vehicle direction of travel. As a result of this accident, V.K. Kryzhanov died on the spot from his injuries (from decree on the examination appointment).

Initial data: dimensions of the motorized scooter *Like.Bike One*: height from the road surface 116 cm, length from the front to the rear dimension 110 cm,

length from the axle of the front wheel to the axle of the rear: 90 cm, height from the road surface to the top of the footrest: 16 cm (from the decree on the examination appointment).

The result performed researches. According to vehicle license of motorized scooter *Like.Bike One*, forensic expert compiled table. 1 *Technical characteristics of the motorized scooter: Like.Bike One*.

Table 1

Technical characteristics of motorized scooter Like.Bike One

Parameter	Value
Model	Electric scooter: *Like.Bike One*
Designation	For adults
Dimensions	1200 × 430 × 500 (folded), 1200 × 430 × 1140 (unfolded)
Battery Capacity	216 W × g
Charge time	3 h.
Wheel diameter	8 inches
Brake	Rear, disk
Wheelbase	1200 mm
Maximum load	80
Maximum speed	25 km/h
Capacity	250W

In accordance with technical characteristics of motorized scooter *Like.Bike One* is equipped with an electric motor with a capacity of 250 watts and is designed for operation by adults. Data sheet states that the *Like.Bike One* electric scooter is not allowed on the public road.

The conducted research and analysis of the provided materials of the criminal proceedings made it possible to establish that the *Like.Bike One* electric scooter, on which minors D. A. Korzhov and V. K. Kryzhanova were riding, is not a bicycle (since a bicycle is a "vehicle, except for wheelchairs , which is set in motion by the muscular power of the person sitting on" [32]) and does not belong to pedestrians (since a pedestrian is, in particular, "person who participates in road traffic outside of a vehicle" [33]). In other words, according to

32 Правила дорожнього руху … . URL: https://zakon.rada.gov.ua/laws/show/1306-2001-%D0%B-F#Text (date accessed: 02.06.2022).

33 Ibid.

the current traffic regulations, the *Like. Bike One* electric scooter with a 250 W electric motor, on which the minors D. A. Korzhov and V. K. Kryzhanova were riding, cannot be equated with a bicycle, and the movement of the *Like.Bike One* electric scooter with a bicycle path or roadway cannot be equated to pedestrian traffic.

In addition, currently in reference literature there are no parameters for the stable deceleration of a technically serviceable motorized scooter, motorized scooter and microcar on the road surface in an accident (data on the delay time of the brake drive and on the growth time of deceleration). The lack of this information leads to provision of incomplete conclusions by forensic experts and inability to resolve the issue of the presence or absence of an motorized scooter, gyro board or other microcars, the technical ability to prevent a traffic collision, as well as to find out presence or absence of inconsistencies in the actions of the driver with the requirements of traffic rules, which from a technical standpoint would be in causal connection with the occurrence of traffic collision in question.

In view of the above, there is also an urgent need to find out the technical characteristics of Ukrainian microcars, determine the parameters mentioned above experimentally, as well as to develop forensic expert methods for studying such traffic collisions.

Conclusions

Since the number of microcars (for example, electric unicycle, motorized scooters and gyroboards) on the territory of our state will increase permanently, their safe use needs to be regulated in the current legislation of Ukraine (in particular, traffic codes and Specialized Law).

In view of the above, we propose:

1) Part 2 of Article 14 "Participants of road traffic" of the relevant Law shall be worded as follows:

"Road users include drivers and passengers of vehicles, pedestrians, persons moving in wheelchairs, monowheels, electric scooters, gyroboards and other microcars, cyclists, animal drivers";

2) paragraph 25 of clause 1.10 of traffic codes shall be amended as follows:

*"**driver** is a person who drives a vehicle and has a driver's license (tractor driver's license, temporary permit for the right to drive a vehicle, temporary coupon for the right to drive a vehicle) of the appropriate category, or a person who drives a mono-wheel, electric scooter, gyro-board, other microcars. The driver is also a person who teaches driving while in the vehicle."*

3) supplement clause 1.10 of the traffic rules with the definition of the terms:

***"microcars** mean an electric or self-balancing or mechanical vehicle intended for one person";*

***"electric unicycle** is electric microcar, self-balancing unicycle "(monocycle), with one wheel and feet located on both sides of the wheel, designed to move one person".*

4) determine the minimum age from which the right to drive an electric unicycle comes from 16 years;

5) supplement paragraph 2.3 of the traffic codes with the following mandatory requirements for the driver of any microcars: during the movement should be worn in a protective helmet, protective gloves, elbow pads and knee pads; and in the dark and in conditions of insufficient visibility (for timely detection by other road users) use light-reflecting elements (tape, sticker,

vest, etc.) or be in clothes that have light-reflecting elements;

6) add drivers of any microcar to category A1 of road users (paragraph 2.13 of the traffic codes) with the corresponding rights and obligations;
7) add to clause 12.9 of the traffic codes the requirements for limiting the speed of a micro-mobile vehicle to 30 km/h.

Експертне оцінювання дій керувальника мікромобіля в разі дорожньо-транспортної пригоди

Павло Хоробрих

Проаналізовано дії учасників дорожнього руху, які керують мікромобільними засобами пересування (моноколесом, електросамокатом та ін.), із метою виробити нові нормативні підходи до процесу виконання експертних досліджень і надання висновку експерта за дорожньо-транспортною пригодою, у якій брала участь особа, що керувала таким засобом. Окреслено проблему відсутності нормативної бази щодо експлуатації на дорогах загального користування таких засобів пересування, як моноколесо, а також проблему, пов'язану із використанням моноколіс на територіях загального користування (у парках, на дитячих майданчиках, тротуарах та ін.). Наведено конструкцію моноколеса, систематизовано прийоми керування ним, запропоновано докладний перелік оснащення, необхідного для убезпечення дорожнього руху за участі мікромобільного транспортного засобу. Як приклад презентовано частину виконаного автором експертного дослідження за кримінальним провадженням зі встановлення належності електросамоката до категорії транспортних засобів згідно з вимогами чинних в Україні Правил дорожнього руху. Метою статті є доповнити законодавчу базу України умовами та правилами керування мікромобільними засобами пересування, а також визначити функції особи, яка керує моноколесом, під час дорожньо-транспортної пригоди. Для досягнення цієї мети використано загальнонаукові та спеціальні методи (формальної логіки (аналіз, синтез, дедукцію, індукцію, аналогію, абстрагування), спеціально-правові, системного аналізу).

Ключові слова: *мікромобільний засіб пересування; моноколесо; двоколісний транспортний засіб (електросамокат); учасник дорожнього руху; Правила дорожнього руху; дорожньо-транспортна пригода; судовий експерт; автотехнічна експертиза.*

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Author declare no conflict of interest.

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Issues of Legal Regulation in Forensic Expert Researches on Life Safety

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Current state of legal regulation on occupational and life safety in Ukraine is analyzed. It was found that the system of normative legal acts regulating legal relations in the field of life safety and determine technical requirements in various branches of production, has a rather cumbersome appearance and contains laws, by-laws, and technical regulations. General system gaps in the regulatory and technical regulation of the labor activity of certain categories of employees are outlined. The purpose of the work is to highlight individual issues of regulatory framework and outline ways for their solving with the aim of improving the regulatory framework of relations in the field of occupational health and safety, which will have a positive effect on the procedure of forensic expert research on life safety and increase effectiveness of accident investigations. A separate problem is the obsolescence of some acts. Attention is focused on the need to cancel outdated and adopt new documents defining safety rules in dangerous industries. In general, the system of normative regulation of life safety in Ukraine is not sufficiently adapted to international norms of labor regulation, therefore the need to harmonize Ukrainian legislation with international (in particular, European) labor standards is emphasized. In order to improve the legal regulation of labor protection, it is proposed to change the general approach to the

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principles of regulation, emphasizing "preventive actions". Research methods: formal-logical, systemic-structural, comparative-legal, as well as the method of systemic analysis.

Keywords: *legislation on occupational and life safety, normative regulation, normative legal acts on occupational safety, accident prevention, improvement of normative acts.*

Research Problem Formulation

Constitution of Ukraine recognizes that a person, his life and health, inviolability and security are the highest social value, every citizen has the right to work, proper, safe and healthy working conditions and social protection [1].

Realizing their right to work, citizens while labor activities are constantly faced with issues of occupational safety. The state takes care of observing and ensuring human right to safe working conditions.

Unfortunately, accidents still happen while production. In order to find out actual circumstances and determine the cause of the accident, a forensic engineering on life safety is appointed. During its implementation, forensic expert methods are used, which provide a toolkit for conducting research, among which information modeling method plays a leading role. It provides for the creation at a certain stage of a model of a safe (normative) situation, containing a list of organizational and technical measures aimed at the safe performance of a specific type of work. In other words, it is a model of "how it should be", or "how it is necessary to do the work correctly" so that it is safe.

Practice indicates that while creation of such a safe model, forensic experts often have difficulties due to imperfection and certain shortcomings of legal regulation of occupational safety.

Legal regulation of occupational safety is a process of constant and purposeful influence of the state on social relations in the field of occupational safety with the help of special legal means and methods. Such legal regulation is carried out by determining the legal norms and standards of safe working conditions and mechanisms to ensure their observance.

This law-making activity is reflected in certain forms — normative legal acts (hereinafter referred to as *NLA*) in the form of laws and by-laws. A set of legal acts related to organization and regulation of safe work activities forms a system of legislation on occupational safety.

Currently, Ukraine has a fairly extensive system of legislation on occupational safety that can be divided into separate areas:

- general legal norms: laws, resolutions and orders of the Cabinet of Ministers of Ukraine and other central executive bodies that operate throughout the State territory and apply to all fields of economic activity;

1 Конституція України від 28.06.1996 р. (зі змін. та допов.). URL: https://www.president.gov.ua/documents/constitution (date accessed: 20.10.2022).

- inter-sectoral acts: normative acts operating within all branches of the economy (labor safety standards, sanitary norms and rules, hygienic standards, rules for handling harmful and dangerous substances, etc.);
- sectoral acts: normative acts, which effect applies only to a certain branch of national economy (metallurgical, chemical, mining, etc.) and have no legal force in other sectors. Such acts are developed and adopted by individual ministries and departments in relation to a particular industry;
- regulatory legal acts of enterprises, institutions and organizations in the form of documents on occupational safety which validity applies to a particular business entity (orders, regulations, instructions, etc.).

Since Ukraine is a social State, its policy is aimed at creating favorable conditions that should ensure the preservation of human life and health during production activities. In the field of social and labor relations, labor protection issues cover a wide range of concepts and directions. Occupational health and safety provide for the safety of life and the preservation of health of the employee during his work and consists of socio-economic, organizational-technical, sanitary-hygienic, treatment-prophylactic, rehabilitation and other measures. Such a place of occupational safety makes it possible to consider it as a special configuration of social relations of people for their protection from negative factors and dangerous conditions of the production process. On the other hand, labor protection should be considered as a component of labor law that is a set of legal and technical means of ensuring life safety.

Statistics on occupational injuries in Ukraine in recent years indicate a certain tendency to increase in the number of accidents. Thus, the number of victims of accidents that led to disability (including fatalities) in 2018 was 5424 people, 2019 — 4394, 2020 — 6646, 2021 — 12 315 people [2].

Therefore, the issues of occupational safety in Ukraine are currently relevant and require an integrated approach to their solution. One of the main directions of increasing the effectiveness of measures aimed at minimizing the negative socio-economic impact of occupational injuries is improvement of the system of occupational safety regulatory framework, identification of systemic shortcomings and problems in this area.

Analysis of Essential Researches and Publications

Research on economic, social, legal and technical aspects of labor protection in modern Ukraine is devoted to the work of domestic scientists. Certain issues of regulatory and legal regulation of life safety (in particular, occupational safety) are thoroughly covered in the works of such scientists and researchers as V. O. Vynohradov, M. P. Handziuk, Ye. O. Hevryk, H. H. Hohitashvili, V. D. Hubenko, M. O. Dei, V. Ts. Zhydetskyi, D. V. Zerkalov, P. O. Izuita, L. P. Kerb, T. A. Koliada, I. I. Koriakina, O. P. Rudnytska, A. V. Rusalovskyi, R. T. Cherneha, et al.

For example, Ye. O. Hevryk notes that the study of worldwide experience of determining economic and social effectiveness of measures to improve

2 Травматизм на виробництві в Україні. 2018—2021 / Держстат України. URL: http://ukrstat.gov.ua/operativ/operativ2007/oz_rik/oz_u/arch_travm_na_vyrob.htm (date accessed: 20.10.2022).

conditions and occupational safety is relevant and important for improvement of current methods, since (despite the large number of research papers devoted to this topic) certain aspects of it are insufficient developed and highlighted [3].

For its part, P. O. Izuita reasonably proves importance of international documents that enshrine certain norms in the field of occupational safety that significantly affect development of national legislation on life safety. Thus, Ukraine has ratified a number of acts, including the International Covenant on Economic, Social and Cultural Rights, the European Social Charter (revised), C081 — *Labour Inspection Convention*, 1947 (No. 81), C129 — *Labour Inspection (Agriculture) Convention*, 1969 (No. 129), C159 — Vocational Rehabilitation and Employment (Disabled Persons) Convention, 1983 (No. 159). The scientist also proposes to make certain changes to the Code of Labor Laws of Ukraine, which would consolidate the general principles of safety technology, determined by the provisions of international legal acts regarding the implementation of necessary measures so that employers of employees of other enterprises, involved in work at such enterprises or production, receive the appointed for them, information about threats to safety and health, as well as protective and preventive measures at the enterprise or production in general, as well as for each workplace or type of work; the number of workers for providing first aid, fire fighting and evacuation of workers, their training and equipment at their disposal [4].

This position is supported by R. T. Cherneha, at the same time asserting that it is necessary to bring the legal provision of labor protection into line with international legislation, changing not the norms of law, but standards and regulations, since the latter do not meet any legal requirements and principles. It is important not only to transfer the legal norm to Ukrainian legal acts, but also to harmonize it with others and adjust it according to the peculiarities of social relations on labor protection in Ukraine [5].

Worthy of attention is the research of O. S. Varenyk, who defines the content of legal regulation as a system of instruments of state influence, aimed at regulating a specific circle of social legal relations, and their assigning to the legal field that determines legal compliance [6].

Versatility and diversity of legal acts regulating occupational safety requires a comprehensive approach to identifying problematic issues that exist in this area of legal relations.

Article Purpose

Highlighting individual problems of regulatory regulation and outlining ways to solve them in order to improve the regulatory framework of relations in the field of occupational health and safety that will have a positive effect on the process of

3 Геврик Є. О. Охорона праці : навч. посіб. для студ-тів вищ. навч. закл. Київ, 2003. 280 с. URL: http://pdf.lib.vntu.edu.ua/books/2020/Gevrik_2003_280.pdf (date accessed: 20.10.2022).

4 Ізуїта П. О. Правове регулювання охорони праці в умовах ринкової економіки : дис. ... канд. юрид. наук. Харків, 2008. 177 с.

5 Чернега Р. Т. Практичні проблеми у сфері правового забезпечення охорони праці в Україні. *Соціальне право.* 2019. № 2. С. 93—101. URL: http://nbuv.gov.ua/UJRN/sopr_2019_2_16 (date accessed: 20.10.2022).

6 Вареник О. С. Наукова інтерпретація, сутність і значення локального правового регулювання охорони праці. *Ibid.* 2018. № 2. С. 20—25. URL: https://soclaw.com.ua/index.php/journal/article/view/77 (date accessed: 20.10.2022).

expert research on life safety and increase effectiveness of accident investigations.

Research methods

The article uses such methods of scientific knowledge and research as formal-logical, system-structural, comparative-legal, as well as the method of system analysis.

Main Content Presentation

Currently in Ukraine there is a system of regulatory regulation in the field of labor protection as a system of legal, socio-economic, organizational, technical and other measures aimed at preserving the life and health of a person during his work. The basis of such regulation is *Constitution of Ukraine* [7], *Labor Code of Ukraine* [8], the *Civil Protection Code of Ukraine* [9], *Criminal Code of Ukraine* [10], *Code of Ukraine on Administrative Offenses* [11] and the Laws of Ukraine, *On Labor Protection* [12], *Fundamentals of the Legislation of Ukraine on Health Protection* [13], *On the Use of Nuclear Energy and Radiation Safety* [14], *On Ensuring Sanitary and Epidemiological Welfare of the Population* [15], *On mandatory state social insurance* [16], *On objects of increased danger* [17], *On collective agreements and agreements* [18].

The main RLA in the field of labor protection is the Law of Ukraine: *On Labor Protection* defining the basic provisions for implementation of constitutional right of employees to life and health protection while labor activity, to proper, safe and healthy working conditions, regulates (with participation of relevant state bodies) relations between the employer

7 Конституція України … . URL: https://www.president.gov.ua/documents/constitution (date accessed: 20.10.2022).

8 Кодекс законів про працю України : Закон України від 10.12.1971 р. № 322-VIII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/322-08#Text (date accessed: 17.10.2022).

9 Кодекс цивільного захисту України від 02.10.2012 р. № 5403-VI (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/5403-17#Text (date accessed: 17.10.2022).

10 Кримінальний кодекс України від 05.04.2001 р. № 2341-III (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 17.10.2022).

11 Кодекс України про адміністративні правопорушення від 07.12.1984 р. № 8073-X (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/80731-10#Text (date accessed: 17.10.2022).

12 Про охорону праці : Закон України від 14.10.1992 р. № 2695-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2694-12#Text (date accessed: 17.10.2022).

13 Основи законодавства України про охорону здоров'я : Закон України від 19.11.1992 р. № 2801-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2801-12#Text (date accessed: 17.10.2022).

14 Про використання ядерної енергії та радіаційну безпеку : Закон України від 08.02.1995 р. № 39/95-ВР (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/39/95-%D0%B2%D1%80#Text (date accessed: 17.10.2022).

15 Про забезпечення санітарного і епідемічного благополуччя населення : Закон України від 24.02.1994 р. № 4004-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/4004-12#Text (date accessed: 17.10.2022).

16 Про загальнообов'язкове державне соціальне страхування : Закон України від 23.09.1995 р. № 1105-XIV (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1105-14#Text (date accessed: 17.10.2022).

17 Про об'єкти підвищеної небезпеки : Закон України від 18.01.2001 р. № 2245-III (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2245-14#Text (date accessed: 17.10.2022).

18 Про колективні договори і угоди : Закон України від 01.07.1993 р. № 3356-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/3356-12#Text (date accessed: 17.10.2022).

and the employee on safety, occupational health and the working environment and generally establishes a unified procedure for organizing occupational safety in Ukraine. Other regulations on the regulation of legal relations in the field of life safety should comply with this Law.

On the other hand, labor relations in Ukraine are regulated by a codified collection of laws: *Labor Code of Ukraine*, in where chapter XI: *Occupational Safety* is singled out, and separate norms of legal regulation of labor protection are also regulated in other chapters (in particular, *Employment contract*, *Working time*, *Rest time*, *Women's work*, *Youth work*, *Trade unions*, *Supervision and control over compliance with labor legislation*) [19].

The provisions of the Labor Code of Ukraine on labor protection largely duplicate the requirements of the Law of Ukraine: *On Labor Protection*. Such a construction of legislation leads to problems of duality and dispersion of legal regulation, creates inconvenience in the interpretation of norms and difficulties in practical application. The priority of the Labor Code of Ukraine as the main legal act in the field of labor law is also reduced. On the other hand, it is built on morally outdated principles of Soviet legislation and does not meet the requirements of the present and is not adapted to the norms of international law.

A separate issue in Ukraine is the lack of such important legislative acts in the field of labor protection and life safety as the Labor Code of Ukraine, Law *On Industrial Safety*, etc., which should adapt Ukrainian legislation and harmonize its regulatory functions with international standards.

International legal regulation of labor is a system of labor regulation standards regulated by international treaties, which states that have ratified the relevant international agreement use as a component of national labor legislation. With the aim of protecting rights in the world of work, encouraging decent work, strengthening social protection, strengthening the dialogue on labor issues, developing international standards in the field of labor and supervising their observance, that is, coordinating international labor regulation, a special body was created as early as 1919 — International Labor Organization (hereinafter referred to as *ILO*) that is a specialized agency of the UN.

The ILO aims to solve the following tasks: development of coordinated policies and programs aimed at solving social and labor problems; development and adoption of international labor standards (conventions and recommendations) for the implementation of adopted policies; assistance to ILO members in solving employment problems and reducing unemployment; development of programs to improve working conditions; development of social security; development of measures to protect the rights of socially vulnerable groups of workers, such as women, youth, the elderly, migrant workers; assistance to organizations of employees and entrepreneurs in their work together with governments to resolve social and labor relations [20].

19 Кодекс законів про працю ... . URL: https://zakon.rada.gov.ua/laws/show/322-08#Text (date accessed: 17.10.2022).

20 Грищук М. В. Нормативно-правове регулювання охорони праці в Україні: реалії та перспективи. *Часопис Національного університету «Острозька академія». Серія «Право».* 2012. № 2 (6). URL: http://lj.oa.edu.ua/articles/2012/n2/12hmvrtp.pdf (date accessed: 03.10.2022).

Noteworthy is the European experience of occupational safety management. Thus, UK law requires that employers have appropriate measures at their disposal to manage and control occupational safety and health in the enterprise. To achieve these requirements, employers must have an effective health and safety management system that is clearly defined and documented. The basis of the management system of labor protection is the model of "plan — action — check — act" and the principle of continuous improvement [21].

Legislation on labor protection in ***Switzerland*** is based on two main laws: the labor law defines the technical requirements for the work process (working hours, health requirements, construction and hygiene standards at the workplace, etc.), the law on accident insurance — requirements for the prevention of accidents and their prevention.

In ***Germany***, the occupational safety management system also has a dual structure and contains public safety and health regulations on the one hand and accident insurance on the other, regardless of the institution. German occupational health and safety management system is constantly being improved, focusing on encouraging employers to strengthen occupational health and safety measures.

In ***Austria***, occupational safety and health is understood as the protection of the life and health of workers in the workplace. The main idea of this concept is to protect individuals who are financially dependent on their employer. Therefore, usually self-employed persons are not subject to the rules on safety and labor protection [22].

The European Commission has adopted a new EU Strategic Framework on Health and Safety at Work 2021—2027. Safety and health at work in a changing world of work, which" *is based on a tripartite approach in which workers, employers and governments are actively involved in the development and implementation of these CBRN activities at EU and national level*" [23]. This strategy aims to mobilize the EU institutions, Member States, social partners and other stakeholders around common priorities to protect the health and safety of workers. Its effect extends to all parties that take care of health and safety at work (national administrations, in particular labor inspection bodies, employers, workers and other subjects in the field of safety and health at work) and forms the basis for actions, cooperation and exchange [24].

The EU Framework Strategy states that *"in a globalized world, threats to health and safety do not disappear at borders. Countries around the world share best practices and learn from each other's experiences. Strengthening cooperation with EU partner countries, regional and international organizations and other international forums is of key importance in order to improve*

21 Швагер Н. Ю., Заікіна Д. П. Аналіз систем управління охороною праці зарубіжних країн. *Вісник Криворізького національного університету*. 2016. Вип. 41. С. 69—73. URL: http://nbuv.gov.ua/UJRN/Vktu_2016_41_17 (date accessed: 17.10.2022).

22 Ibid.

23 Рамкова стратегія ЄС із безпеки та здоров'я на роботі на 2021—2027 роки. Безпека та здоров'я на роботі в мінливому світі праці. URL: https://oppb.com.ua/sites/default/files/files/doc/wcms_811859.pdf (date accessed: 27.10.2022).

24 Ibid.

standards of safety and health at work on a global scale" [25]. This approach of the EU to the resolution of regulatory issues in the field of occupational health and safety only emphasizes the urgency of adapting Ukrainian legislation to European and international legislation on occupational health and safety.

In 2015, the State Labor Service of Ukraine was established, which is the central body of the executive power and implements state policy in the field of occupational and life safety, carries out comprehensive management of occupational safety state regulation and control of occupational safety and industrial safety [26].

The main regulatory acts in the field of labor protection and life safety are regulatory legal acts on occupational safety (hereinafter referred to as *LAOS*). Since 2004, the State Register of Labor Protection Regulations has been operating in Ukraine — it is a data bank that is maintained in order to ensure unified accounting and the formation of an appropriate information fund of such acts. The register of LAOS [27] contains acts approved by the central executive authorities, which ensures the formation of the state policy in the field of labor protection, as well as the NPA of the former USSR on labor protection that is still in force in Ukraine (for example, the industry standard OST 36-100.3.13-85: *Labour safety standard system. Processing equipment installation. General safety requirements* [28]).

LAOS is designed to regulate the requirements for the production environment, equipment, technological processes, structure and technical condition of machines and mechanisms, tools, means of individual and collective protection, determining safe methods and methods (procedure) of work. They clarify, deepen and specify the provisions of labor protection legislation. Now in the State Register there are more than 420 LAOS [29].

Also important among regulatory acts on labor protection and life safety (except LAOS) are the state (national) standards of Ukraine (DSTU, Technical Regulations), state construction standards (Building code, DSTU B), sanitary norms and rules (sanitary regulations, DSanPiN, DSN, DSP), acts on fire safety (AFS), etc.

The effectiveness of legal regulation in such a socially important and economically significant sphere of public relations as life safety and labor protection primarily depends on a clear system of legislation and regulatory and technical acts of Ukraine. As P. O. Izuita rightly points out,

25 Рамкова стратегія ЄС ... . URL: https://oppb.com.ua/sites/default/files/files/doc/wcms_811859.pdf (date accessed: 27.10.2022).

26 Про затвердження Положення про Державну службу України з питань праці : Постанова Кабміну України від 11.02.2015 р. № 96 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/96-2015-%D0%BF#Text (date accessed: 27.10.2022).

27 Про затвердження Положення про Державний реєстр нормативно-правових актів з охорони праці : наказ Державного комітету України з нагляду за охороною праці України від 08.06.2004 р. № 151 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0778-04#Text (date accessed: 27.10.2022).

28 ОСТ 36-100.3.13-85 ССБТ. Монтаж технологического оборудования. Общие требования безопасности. Москва, 1986. 26 с.

29 Про затвердження Покажчика нормативно-правових актів з охорони праці : наказ Державної служби України з питань праці від 06.07.2022 р. № 110. URL: https://zakon.rada.gov.ua/rada/show/v0110880-22#n6 (date accessed: 27.10.2022).

"the legal regulation of labor protection is based on the fact that the state recognizes the obligation to protect the employee as a party that is actually weaker in the labor legal relationship in order to preserve his life, health and high level of working capacity for a long time" [30].

Current system of normative and legal regulation of occupational and life safety in Ukraine is still far from perfect, it is characterized by certain shortcomings. Currently, main problematic aspects of normative regulation of life safety include, firstly, the obsolescence of a significant number of LAOS which do not take into account the requirements and current realities, as well as modern technologies and foreign experience. This is evidenced by a significant number of acts of the State Register of escalators, developed and implemented even during the USSR, for example: LAOS 0.00-1.06-77: *Rules for the construction and safe operation of escalators*, adopted on December 27, 1977, LAOS0.00-1-51-88: *Rules for the installation and safe operation of freon refrigeration units*, adopted on February 27, 1988 (although the use of freon-containing substances has long been abandoned due to their harmful effect on the ozone layer of the atmosphere), LAOS0.00-1.64-77: *Rules for safety technology and industrial sanitation in industry of building materials* adopted on 21.12.1977, LAOS 0.00-3.06-22: *On the issue of soap at enterprises*, adopted on 06.08.1922 NKT of the RSFSR that is already over 100 years old, LAOS 41.0-1.01-79: *Rules of safety technology for the operation of water supply and drainage systems in populated areas*, adopted on October 4, 1977 [31] , etc. These RLFs contain outdated requirements that ignore new technologies, methods and ways of performing work, do not correspond to modern technical and technological equipment of production.

Unfortunately, almost all current LAOS were built according to the principles or model of the times of the USSR. They were usually developed based on the ideological basis of the time, which was primarily aimed at meeting the needs of the planned economy and was designed for large and powerful industrial enterprises that had extensive production and a large trade union organization. However, current realities require something else, because the outdated system is not able to adapt to regulatory regulation in the conditions of a market economy, the appearance of a significant number of small enterprises of small and medium-sized businesses, where the role of trade unions is reduced to almost nothing, and labor protection services practically do not exist (for example, Art. 15 of Law of Ukraine: *On Labor Protection* specifies that if the enterprise has less than 50 employees, the functions of the labor protection service can be performed by specialists on a part-time basis, or third parties can be involved on a contractual basis [32]).

Secondly, weak coordination between the development and entry into force of new or revised regulations, organizational shortcomings of systematization and regulation.

The list of RLFs in the field of labor protection and life safety is reviewed almost annually, certain acts are canceled, corrected, and new ones come into

30 Ізуїта П. О. Op. cit. С. 17.

31 Про затвердження Покажчика … . URL: https://zakon.rada.gov.ua/rada/show/v0110880-22#n6 (date accessed: 27.10.2022).

32 Про охорону праці … . URL: https://zakon.rada.gov.ua/laws/show/2694-12#Text (date accessed: 17.10.2022).

force. It happens that a normative act is canceled, and a new one comes to replace it only after a certain time. For example, on 13.12.2016, by order of the Ministry of Social Policy of Ukraine [33], LAOS 0.00-5.18-96: *Standard instruction on safe work for crane operators (drivers) of bridge-type cranes (overhead, gantry, semi-gantry cranes)* was canceled, LAOS 0.00-5.05-95: *Typical instructions for persons responsible for the safe carrying out of work with the movement of goods by cranes*, LAOS 0.00-5.07-94 "*Standard instructions for persons responsible for maintaining load-lifting cranes in good condition*, LAOS0.00-5.20-94: *Standard instructions for engineering and technical employees who supervise the maintenance and safe operation of lifting cranes*, LAOS 0.00-5.03-95: *Standard instructions for safe operation of crane operators (drivers) of jib self-propelled (vehicle, crawler, railway, pneumatic wheel) cranes*, LAOS0.00-5.04 -95: "*Typical instructions on safe work for slingers (hookers) who service lifting cranes* and on 21.05.2017 by order of the Cabinet of Ministers of Ukraine was also canceled LAOS 0.00-1.01-07: *Rules for construction and safe operation of lifting cranes* [34]. These documents regulated an extremely important field of production activity related to the operation of lifting cranes, defined technical requirements for the design and condition of machines and mechanisms, regulated the procedure for safe work, the organization of supervision and control over cranes, as well as typical duties of a separate category of officials' persons in order to prevent incidents and accidents. Since the cancellation of these LAOSs, the entire sphere of economic and industrial activity remained without regulatory regulation, which negatively affected the state of labor protection during the performance of loading and unloading operations with the help of cranes. This situation lasted for almost a year, only on 04/10/2018 LAOS 0.00-1.80-18: *Labor safety rules during the operation of load-lifting cranes, devices and related equipment* came into force, which to some extent regulated the issue of safe operation of such equipment.

In our opinion, it will be expedient if the old RLF loses its validity only from the moment the new one enters into force.

The order of the State Committee of Ukraine on Technical Regulation and Consumer Policy: *On Approval of National Standards of Ukraine* provides for the entry into force of *international standards as a national method of "confirmation" in the original language with the provision of the corresponding national designation in Ukraine from April 1, 2009* [35]. This order contains, in particular, DSTU EN 749:2008: *Equipment for sports games. Handball goal. Operational requirements and safety requirements, test methods* (international standard EN 749:2008 Playing field equipment — Handball goals — Functional and safety requirements, test methods) and DSTU EN 748:2008: *Equipment for sports games. Football goal. Operational requirements and safety requirements,*

33 Про визнання такими, що втратили чинність, деяких нормативно-правових актів з охорони праці : наказ Мінсоцполітики України від 27.10.2016 р. № 1231. URL: https://zakon.rada.gov.ua/laws/show/z1494-16#Text (date accessed: 28.10.2022).

34 Про скасування деяких наказів міністерстві та інших центральних органів виконавчої влади : розпорядження КМУ від 10.03.2017 р. № 166-р. URL: https://zakon.rada.gov.ua/laws/show/166-2017-p#Text (date accessed: 28.10.2022).

35 Про затвердження національних стандартів України : наказ Держспоживстандарту України від 26.12.2008 р. № 506. URL: https://zakon.rada.gov.ua/rada/show/v0506609-08#Text (date accessed: 27.10.2022).

test methods (international standard EN 748:2004: *Playing field equipment — Football goals — Functional and safety requirements, test methods*). However, there is no authentic certified translation of these regulatory documents into Ukrainian. Current Ukrainian-language Building code: B.2.2-13-2003 *Buildings and structures. Sports and physical culture and health facilities* [36] does not contain any requirements for the design or installation procedure of football or handball goals. This approach complicates the application of international standards, because interested organizations are forced to independently translate the document, which does not exclude ambiguous interpretation of individual provisions of the standard.

This, so-called, half-hearted approach to the adoption of international regulatory documents negatively affects the effectiveness of the system of regulatory regulation in this important area of legal relations.

It should be noted that the new normative acts that come into force to replace the canceled ones and regulate the issues of life safety and occupational health and safety have certain shortcomings, which greatly complicates their practical application: sometimes entire sections (regarding the regulation of certain technological processes) disappear in the updated acts. or individual RLFs are turned into a collection of references to other acts. There are cases of unclearly written norms and requirements, which allows for their ambiguous or double interpretation. The RLF on labor protection must be meaningful, logical, regulate really important norms, and also be convenient to use.

Thirdly, the lack of regulatory regulation of certain spheres of production activity, categories of work performers. The order of the State Enterprise: Ukrainian Research Center for Standardization, Certification and Quality: *On the cancellation of interstate standards of Ukraine developed before 1992* [37] defines a list of legal acts (in particular in the field of labor protection) that came into force during Soviet times and later expired. Such acts include interstate systems of labor safety standards, for example, GOST 12.1.010-76: *SSBP. Explosion protection. General requirements*, GOST 12.1.004-91: *SSBP. Fire safety. General requirements*, GOST 12.2.003-91: *SSBP. Production equipment. General safety requirements*, GOST 12.2.124-90: *SSBP. Food equipment. General safety requirements*, GOST 12.3.002-75: *SSBP. Production processes. General safety requirements* etc.

Although cancellation of these acts was known in advance, the concerned agencies did not develop Ukrainian standards to replace them. Part of the technical requirements that were regulated by specific documents of the labor safety standards system, are specified in other normative acts. However, they are not systematized, moreover, they are written in fragments. In this case, for the proper organization of occupational safety at the

36 ДБН В. 2.2-13-2003 Будинки і споруди. Спортивні та фізкультурно-оздоровчі споруди. Зміна № 1 : затв. наказом Мінрегіонбуду України від 30.12.2009 р. № 704 і від 15.07.2010 р. № 265. [Чинний від 01.10.2010]. URL: https://www.minregion.gov.ua/wp-content/uploads/2017/12/62.2.-DBN-V.2.2-13-2003.-Zmina-N-1.-Budinki-i-sporudi.-S.pdf (date accessed: 27.10.2022).

37 Про скасування міждержавних стандартів в Україні, що розроблені до 1992 року : затв. наказом ДП «УкрНДНЦ» від 14.12.2015 р. № 188. URL: https://zakon.rada.gov.ua/rada/show/v0188774-15#Text (date accessed: 27.10.2022).

enterprise, it is necessary to work out a significant number of RLF looking for necessary provisions.

A separate problem of regulatory regulation is the delay in the development of RLF: with appearance of new types of activities, competent departments (institutions) do not have time to develop and adopt a new regulatory act, as a result, at the state level, individual economic and production activities of business entities may not be regulated in any way; each of them the participant at his own discretion determines the rules of conduct, requirements for the arrangement and construction of equipment, the order of execution (safe ways and methods) of certain works, based on his own perception of safety. However, the opposite situation is possible — the subjects of legal relations do nothing, because there are no rules to follow. For example, LAOS 92.7-1.01-06: *Rules for the construction and safe operation of amusement equipment* [38], that does not apply to inflatable attractions and does not contain technical requirements for the construction and arrangement of rope towns and attractions of the "jumper" type, therefore this field of activity remains without regulatory regulation.

In general, LAOS regulate legal relations, first of all, between employers and employees, determine their generalized duties and rights, and determine certain requirements. As defined by Art. 1 of the Law of Ukraine: *On Labor Protection*", *"employee is a person who works at an enterprise, organization, institution and performs duties or functions in accordance with an employment contract (contract)"* [39], the same definition of an employee is provided for in all LAOS (for example, LAOS 0.00-7.14-17: "*Requirements for safety and health protection during the use of production equipment by employees* [40] and LAOS 0.00-4.12-05: *Standard provision on the procedure for conducting training and testing knowledge on labor protection issues* [41], operating in categories of employer and employee). However, recently, the performance of work by a specific person (who is not an employee of any enterprise) at the customer's facility under a subcontract or under a civil law agreement has become widespread. Such a person performs certain works for the customer (at his facility, with his tools, on his equipment), but he is not an employee in the sense of the above definition, as a result of which the requirements of the LAOS do not apply to. This applies to self-employed persons.

Such gaps in the regulatory regulation of certain categories of citizens lead to the fact that often unscrupulous employers disguise the performance of work by employees under subcontracts and civil law agreements, removing responsibility

38 НПАОП 92.7-1.01-06 Правила будови і безпечної експлуатації атракціонної техніки : затв. наказом МНС України від 01.03.2006 р. № 110. [Чинний від 18.04.2006]. URL: http://sop.zp.ua/norm_npaop_92_7-1_01-06_02_ua.php (date accessed: 17.10.2022).

39 Про охорону праці … . URL: https://zakon.rada.gov.ua/laws/show/2694-12#Text (date accessed: 17.10.2022).

40 Про затвердження Вимог безпеки та захисту здоров'я під час використання виробничого обладнання працівниками : наказ Мінсоцполітики України від 28.12.2017 р. № 2072. URL: https://zakon.rada.gov.ua/laws/show/z0097-18#Text (date accessed: 27.10.2022).

41 Про затвердження Типового положення про порядок проведення навчання і перевірки знань з питань охорони праці та Переліку робіт з підвищеною небезпекою : наказ Держнаглядохоронпраці України від 26.01.2005 р. № 15 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0231-05#Text (date accessed: 27.10.2022).

for safe working conditions and placing the risk of an accident on the executor that ultimately allows for employer to avoid liability defined by law.

Fourthly, in contrast to foreign occupational safety management systems (in particular, the countries of the European Union), regulatory regulation of occupational safety in Ukraine is mostly a descendant of the Soviet system, built on the principle of "corrective actions" (i.e., responding to cases that have already occurred). Instead, the application of the principle of "precautionary actions" (accident prevention) makes it possible to concentrate efforts on identifying dangerous and harmful factors of each workplace, to determine really important measures to improve the occupational health and safety management system, and to rationally distribute the company financial and material resources.

In order to improve the normative regulation of life safety and occupational safety in Ukraine, it is necessary to:

- during the development of the Labor Code of Ukraine (to replace the Labor Code of Ukraine), qualitatively develop and revise the norms of the Law of Ukraine: *On Labor Protection* and other RLF in this area and include them in the code in a separate section and Law of Ukraine: *On Labor Protection* and provisions on protection cancel works in other legislative acts;
- strengthen the coordinating role of the State Labor Service of Ukraine as the central body of the executive power for the implementation of State policy in the field of occupational safety management;
- outdated regulatory legal acts on labor protection should expire only after new ones come into force;
- review LAOS in order to exclude outdated and those that have lost relevance;
- determine branches of economic and industrial activity, certain types of it, which today do not have regulatory and technical regulation regarding safety and occupational health and safety;
- immediately begin the development of regulatory and legal frameworks for the regulation of performance of works under subcontracts and civil law agreements;
- while development of new RLFs, the principle of "precautionary actions" and the "plan — action — check — act" model should be more widely applied;
- ensure authentic translation into Ukrainian of international acts and standards in the field of occupational safety;
- create a single state electronic resource of LAOS, to ensure free access to it on a free basis.

Conclusions

Currently, the legal regulations of life safety and its integral component — labor protection — has functional deficiencies and systemic gaps that negatively affects the general state of labor protection and makes it impossible to encourage employers to improve working conditions.

Having analyzed the mentioned shortcomings, it was determined that they are of a systemic nature, since during the creation of the LAOS, outdated provisions and methodology were widely

used (which affected the implementation of the principle of "corrective actions"), designed for enterprises with a large number of employees in the conditions of a planned economy. Current realities require adapting legal regulation to the conditions of a market economy, taking into account the interests and rights of all labor protection subjects (employers and employees) and covering all areas of economic and industrial activity (in particular, medium and small businesses).

The need to improve legal regulation and introduce fundamental changes in occupational safety management system, adapting and harmonizing it with international legal acts is substantiated.

The main areas of improvement of labor protection legislation are outlined, which will contribute to the solution of certain theoretical and practical problems of the institute of labor protection in Ukraine.

Проблеми нормативного регулювання в експертних дослідженнях із безпеки життєдіяльності

Олег Мєшков

Проаналізовано сучасний стан нормативного регулювання з питань охорони праці та безпеки життєдіяльності в Україні. Виявлено, що система нормативно-правових актів, які регулюють правовідносини у сфері безпеки життєдіяльності й визначають технічні вимоги в різних галузях виробництва, має досить громіздкий вигляд і містить закони, підзаконні нормативні акти, технічні регламенти. Окреслено загальні системні прогалини в нормативно-технічному регулюванні трудової діяльності окремих категорій працівників. Метою роботи є висвітлення окремих проблем нормативного регулювання та окреслення шляхів їх розв'язання з метою удосконалення нормативно-правового регулювання відносин у сфері охорони праці та безпеки життєдіяльності, що позитивно позначиться на процесі експертного дослідження з безпеки життєдіяльності та підвищить ефективність розслідування нещасних випадків. Окрема проблема — застарілість деяких актів. Акцентовано увагу на потребі скасування застарілих і ухваленні нових документів, що визначають правила безпеки в небезпечних галузях виробництва. Загалом система нормативного регулювання безпеки життєдіяльності в Україні недостатньо адаптована до міжнародних норм регулювання праці, тому наголошено на необхідності гармонізації законодавства України з міжнародними (зокрема європейськими) стандартами праці. Із метою удосконалення правового нормування охорони праці пропоновано змінити загальний підхід до принципів регулювання, зробивши акцент на «запобіжних діях». Методи дослідження: формально-логічний, системно-структурний, порівняльно-правовий, а також метод системного аналізу.

Ключові слова: *законодавство з охорони праці та безпеки життєдіяльності, нормативне регулювання, нормативно-правові акти з охорони праці, запобігання нещасних випадків, удосконалення нормативних актів.*

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International Scientific and Practical Conference: *Implementation of the State Anti-Corruption Policy in International Dimension*

On December 8-9, 2022, the VII International Scientific and Practical Conference: Implementation of State Anti-Corruption Policy in the International Dimension was held. The Conference was jointly organized and conducted by the Ministry of Internal Affairs of Ukraine, National Academy of Internal Affairs, European Union Advisory Mission Ukraine and National Academy of Legal Sciences of Ukraine.

This time, the conference dedicated to the International Anti-Corruption Day was held in extraordinary conditions: during the Russian military aggression, which became the basis for the expansion of corruption offenses, illegal seizure of military and private property, embezzlement of humanitarian and charitable aid, as well as the limitation of transparency of public procurement processes. Another urgent issue is introduction of anti-corruption measures in the process of reviving Ukraine in peacetime. Despite restrictions caused by martial law, the conference was held both offline and online.

The event was attended by representatives of all branches of our state government (members of relevant committees of the Verkhovna Rada of Ukraine, the Ministry of Internal Affairs of Ukraine, Prosecutor General's Office of Ukraine, the Ministry of Justice of Ukraine, National Police of Ukraine, Security Service of Ukraine, the State Fiscal Service of Ukraine, National Bank of Ukraine, National Anti-Corruption Bureau of Ukraine, court officials), leading scientists of higher education and research institutions, as well as experts of the EU Advisory Mission in Ukraine.

The conference was actively attended by: ***Volodymyr Cherniei***, Rector of National Academy of Internal Affairs, Doctor of Law, Professor; he addressed the participants with a welcoming speech; ***Bohdan Drapiatyi***, Deputy Minister of Internal Affairs of Ukraine; ***Lynn Sheehan***, EUAM Head of Operations ***Oleh Nemchinov***, Minister of the Cabinet of Ministers of Ukraine, ***Andrii Haichenko***, Candidate of Sciences in Public Administration; Deputy Minister of Justice of Ukraine for the Executive Service, Doctor of Philosophy in the Field of "Law"; ***Volodymyr Zhuravel***, Acting President of National Academy of Legal Sciences of Ukraine, Doctor of Law, Professor, Academician of the National Academy of Legal Sciences of Ukraine and others.

National Scientific Center «Hon.

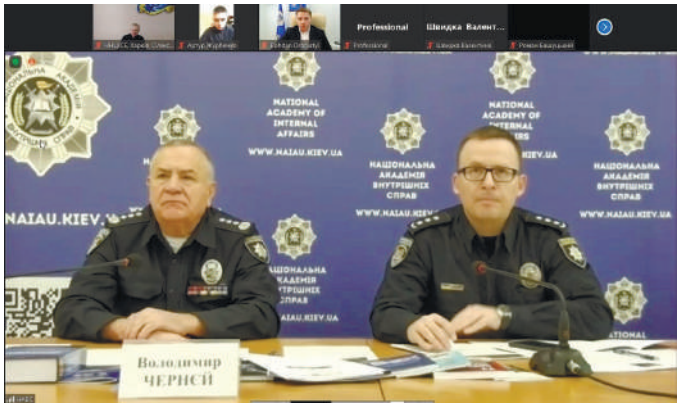
Prof. M. S. Bokarius Forensic Science Institute» at this event was presented by: ***Oleksandr Kliuiev***, Director, Doctor of Law, Professor, Honored Lawyer of Ukraine with a welcoming speech; ***Ella Simakova-Yefremian***, Deputy Director for Academic Affairs, Doctor of Law, Professor, Honored Worker of Science and Technology and ***Nataliia Martynenko***, Leading Researcher, Doctor of Philosophy in Public Administration with a scientific report on topical issues of conducting forensic examinations in criminal proceedings to investigate corruption offenses.

The conference was moderated by ***Serhii Cherniavskyi***, Vice-Rector of the National Academy of Internal Affairs, Doctor of Law, Professor.

Representatives of various institutions highlighted specifics of combating corruption in respective fields. Thus, during the first session of the plenary session, conference participants got acquainted with a report by ***Mykhailo Kostytskyi*** (Professor at the Department of Philosophy of Law and Legal Logic of the National Academy of Internal Affairs, Doctor of Law, Professor, Academician of National Academy of Legal Sciences of Ukraine, corresponding member of National Academy of Educational Sciences of Ukraine) on the dialectical approach to social and legal analysis of corruption.

Two reports with further discussions were devoted to analysis of provisions of Criminal Code of Ukraine: "Can the criminal offense under Art. 201-2 of the Criminal Code of Ukraine belong to corruption?"(***Andrii Savchenko*** Deputy Head of the Department of Organizational and Methodological Support of Pre-Trial Investigations of the Main Investigation Department of State Bureau of Investigation, Doctor of Law, Professor) and "Definitions of corruption crimes in the Criminal Code of Ukraine should be as accurate as possible" (***Mykola Khavroniuk*** Professor of the Department of Criminal and Criminal Procedural Law of the National University "Kyiv-Mohyla Academy", Doctor of Law, Professor).

Oleksandr Dudorov, Professor of the Department of Criminal and Legal Policy and Criminal Law of Educational and Scientific Institute of Law of Taras Shevchenko National University of Kyiv, Doctor of Law raised the issue of reflecting "background corruption" in the draft Criminal Code of Ukraine.



The topic of quality improving legislative activity in Ukraine was delved

into by ***Bohdan Holovkin***, Principal Researcher of Academician Stashis Scientific Research Institute for the Study of Crime Problems, Doctor of law , Professor, corresponding member of the National Academy of Sciences of Ukraine in in his speech Corruption risks in the field of State control over security traffic.

Vasyl Shakun, Professor of Department of Criminal Law of the National Academy of Internal Affairs, Doctor of law, Professor, Academician of the National Academy of Legal Sciences of Ukraine, Head of Coordination Bureau for Problems of Criminology of the National Academy of Sciences of Ukraine, Head of Kyiv city branch of Association of Criminal Law of Ukraine paid attention to the problems of rule-making in the field of corruption prevention with the Anti-corruption legislation: history and effectiveness report

The first plenary session ended with a speech by ***Serhii Yaremenko***, Deputy Head of Department for Corruption Prevention of the Ministry of Internal Affairs of Ukraine Head of the Department for Corruption Risk Management and Methodological Support on Some issues of implementing anti-corruption policy in the Ministry of Internal Affairs system during 2020-2022.

Second session of the first day of the event was opened by ***Volodymyr Baranets***, Deputy Head of the Main Service Center of the Ministry of Internal Affairs of Ukraine, with research paper: Anti-corruption policy in the field of providing administrative services in the system of service centers of the Ministry of Internal Affairs. Other participants familiarized audience with reports on functioning of relevant branches of government in the field of combating corruption during the war: Role and place of the Bureau of Economic Security of Ukraine in protecting the state economy from threats and manifestations of corruption (***Andrii Hrama***, Head of Department of Prevention and Detection of Corruption of the Bureau of Economic Security of Ukraine), Certain activity aspects of authorized units (authorized persons) on issues of prevention and detection of corruption in the conditions of martial law in Ukraine (***Ihor Opryshko***, Deputy Director of State Research Institute of Ministry of Internal Affairs of Ukraine, PhD in law, Senior Researcher, Docent), Corruption risks in work of employees of the State Criminal Enforcement Service: the current challenges (***Viktor Koshchynets***, First Deputy Head of Department for Execution of Criminal Punishments of the Ministry of

Justice of Ukraine) and Hearing of corruption cases: challenges of martial law (***Tetiana Havrylenko***, Judge of the High Anti-Corruption Court).

During this section, practical aspects of dealing with the objects of criminal corruption offenses were also considered: Problematic issues of recognizing assets as unjustified and collecting them as state income (***Vira Mykhailenko***, Judge of the Higher Anti-Corruption Court, PhD in Law) and Preventing the legalization of corruption proceeds from using gambling business (***Zoriana Toporetska***, Leading Researcher of department of scientific activity organization and protection of intellectual property rights of the National Academy of Internal Affairs, PhD in Law, Docent). ***Viktor Kateryniuk*** Senior detective Deputy Head of detective Department of National Anti-corruption Bureau of Ukraine introduced the participants to the topic: Confidential cooperation as the main preventive anti-corruption measure in the conditions of martial law and the post-war period that has been relevant since introduction of the institute of whistleblowers.

In addition to the above topics, conference participants discussed urgent issues and exchanged scientific achievements and best practices.

Speakers' reports caused a lively discussion, as most of the topics raised are of great importance for the field of forensic science support to justice, because effectiveness of forensic examination directly depends on transparency and independence of authorities investigating corruption criminal offenses. The virtuous performance of their duties by representatives of all branches of government is a signpost on the way to establishment of the rule of law and civil society development.

Conference organizers achieved their goal: they identified ways to solve urgent issues of implementing the State anti-corruption policy while deterring military aggression and post-war revival of Ukraine.

The State anti-corruption policy needs to be systematized and should cover various society fields: politics, business, education, science, etc. Involvement of government officials, deputies, heads of departments and all stakeholders is an important step in formation of mechanisms that will help prevent corruption, identify and punish corrupt officials.

Information was prepared by ***Yulia Shpak***,
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