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The thirty-eighth collection issue presents content on criminalistics, theory and methodology of forensic science, as well as information about scientific-practical conferences and educational projects and participation of the NSC staff in them.

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

The collection can be used by students and employees of higher education institutions, law enforcement agencies, legal experts, and researchers.

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Forensic Activity as a Component of the Fight Against Obstruction of Justice

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Forensic science and criminalistics play a pivotal role in upholding justice by helping to establish objective truth in criminal proceedings. Simultaneously, current realities show that criminal activity is becoming increasingly complex, emphasizing active resistance of the subject of offense to investigation. Resistance to investigations encompasses a wide range of unlawful acts, from the destruction of evidence to tampering with witnesses and investigators, and has become a systemic phenomenon requiring in-depth scientific understanding and the development of effective methods to neutralize it. The issue's significance is rooted in the rapid growth of crime, its transnational nature, and improvement in the methods used to conceal crime. This makes it more difficult for law enforcement agencies to investigate and solve crimes.

Under such circumstances, criminalistics, as a science that studies patterns of crime mechanisms and how to solve them, should adapt to new challenges. Resistance to investigation is gradually evolving into forms necessitating not only practical but also theoretical approaches to overcoming it. For example, the use of corruption mechanisms, tampering with evidence, or creation of artificial obstacles to the investigation call for recognizing the concept of resistance to crime investigation as an independent object of forensic research. At the same time,

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terminological inconsistencies and the lack of a unified concept on this issue hinder knowledge systematization in this area.

National Scientific Centre «Hon. Prof. M. S. Bokarius Forensic Science Institute» plays an indispensable role in studying this issue and proposes new approaches to developing the forensic doctrine of resistance to investigation. Developing basic principles of such a doctrine will contribute both to improving investigative methodologies and to increasing the efficiency of law enforcement practice in the face of modern threats.

Currently, the *Theory and Practice of Forensic Science and Criminalistics* Research Paper Collection is indexed in the following online databases: *Google Scholar* and international online databases: *Academic Scientific Journals Indexing, Bielefeld Academic Search Engine (BASE), Central and Eastern European Online Library (CEEOL), CORE, Crossref, Directory of Open Access Journals (DOAJ), Directory of Open Access Scholarly Resources (ROAD), ERIH PLUS, Eurasian Scientific Journal Index (ESJI), Europub, Index Copernicus International, MIAR, RefSeek, ResearchBib, Ulrich's, WorldCat*, as well as in the Register of Scientific Publications of Ukraine and in DOI Foundation. The Research Paper Collection's electronic versions are posted on the Internet on sites such as the V. I. Vernadsky National Library of Ukraine, libraries of forensic institutions under the Ministry of Justice of Ukraine, institutions of higher education under the Ministry of Internal Affairs of Ukraine, etc. This facilitates the exchange of scientific developments between the Research Paper Collection's authors and researchers worldwide.

The research papers in this volume of *Theory and Practice of Forensic Science and Criminalistics* are divided into two groups: *Research Papers* and *Case Notes.*

The *Research Papers* Section is introduced by the *Admissibility of Evidence Obtained With Specialist Participation in Criminal Proceedings* research paper authored by ***Yurii Chechil***, PhD in Law, ***Victoriia Bila***, Doctor of Law, Docent, and ***Stanislav Sheptukhovskyi***, PhD in Law (all from Ukraine). The authors analyze in depth conditions under which evidence obtained with the involvement of a specialist may be declared inadmissible. The authors consider a specialist's legal status, and the imperative nature of his/her involvement, which may contradict the principle of voluntary work. Emphasis is made on the paid nature of the specialist's work and potential conflicts with anti-corruption legislation (a ban on engaging in other paid activities for public servants) and labor law (a ban on engaging in forced labor, the issue of unequal pay for equal work). The researchers analyze the recent amendments to the Criminal Procedure Code of Ukraine (Arts. 71 and 214), which expanded the powers of specialists but also introduced restrictions, particularly regarding the involvement of foreign specialists, which is limited to cases involving weapons of mass destruction. The scientists underline the risks of a human rights violation and argue for a systematic review of the institution of a specialist in criminal proceedings.

In the following research paper, ***Iryna Petrova*** and ***Hanna Spitsyna***, two Ukrainian Doctors of Law and Professors, highlight the critical importance of objectively appraising employees' professional levels in forensic institutions as a key staff management tool for improving efficiency within such institutions. The authors thoroughly analyze various methods of collecting information for appraisal, including the study of documents and other written sources, observation, and various types of interviews (biographical, situational, and criterion). The principal tasks and goals of appraisal (informative, motivational, administrative), as well as fundamental principles of its conduct have been considered: publicity, democracy, objectivity, systematicity, and performance. The researchers point to the lack of a single universal methodology and the need for the development of individual appraisal programs adapted to the specifics of each institution. The key competencies to be evaluated (professionalism, work quality, resiliency, initiative, team player, and commitment to growth) have been identified and characterized. The scientists stress the importance of feedback and introduction of automated systems to enhance the efficiency and objectivity of appraisal.

The *Peculiarities of Circumstances to Be Established During Investigation of Criminal Offenses Related to Interference With Activities of Representatives of Public Authorities* research paper by ***Volodymyr Popov*** (Ukraine), PhD in Law, Doctoral Student, determines the peculiarities of the subject matter of proof, i.e., the list of circumstances to be clarified during the investigation into a specific group of crimes. The author analyzes criminal law elements of such acts under the Criminal Code of Ukraine, defines the range of victims, and peculiarities of the objective and subjective sides of crimes. The author proposes to divide the circumstances to be clarified into three groups: 1) circumstances revealing the mechanism of a criminal offense; 2) circumstances related to subjective characteristics of the person who committed offense; 3) other circumstances (procedural costs; causes and conditions which contributed to the criminal offense commission, etc.).

Mykola Kolomoitsev, PhD in Law, Doctoral Student from Ukraine, has delved into complex issues of legal status of a lawyer involved in providing legal aid to a witness in criminal proceedings. The researcher points out that, unlike the status of defense counsel or victim's representative, there is normative uncertainty about this status within the National Criminal Procedure Code, necessitating further theoretical discussions and practical issues. The author analyzes various scientific opinions regarding the type of advocacy carried out by such a lawyer (defense, representation or other type of legal aid) and the scope of his/her powers, and substantiates the position that a witness's lawyer does not acquire a derivative procedural status from the witness, that is, does not have his/her rights: the basic function of his or her participation is to ensure the protection of interests and legal rights of the witness, to prevent violations of those rights, self-incrimination, or the use of psychological pressure against the witness. The researcher discusses specific rights of a lawyer specified in normative documents and considers it expedient to legally consolidate the status of a witness's lawyer. However, the idea of introducing a legal adviser for witnesses (legal adviser/counsel) was rejected as contradicting the current constitutional provisions on legal aid.

The *Forms of Specific Expertise Application in the Investigation of Economic Criminal Offenses: Possibility of Identifying a Non-Procedural Form* research paper authored by ***Vitalii Usatii*** (Ukraine), PhD in Law, Doctoral Student, justifies theoretical and practical expediency of defining non-procedural forms of specific expertise application along with procedural forms in the course of investigating criminal offenses related to economic activity. The author observes that only results obtained by employing procedural forms (forensic examination, participation of specialists in investigative and search actions, and a specialist's opinion in proceedings on criminal misconduct) may possess evidentiary value, and at the same time emphasizes the importance of non-procedural forms (advisory assistance by specialists, information notes, preliminary analysis of physical objects, verification against forensic records, interrogations using a polygraph). The researcher highlights that although results received as a result of using these forms cannot be independent evidence or its underlying basis (to avoid admissibility of evidence), they offer significant guidance for presenting and verifying investigative versions, planning an investigation, determining the expediency of appointing forensic examinations, especially in complex business cases where understanding the specifics of financial transactions requires professional advisory assistance.

The *Forensic Classification of Criminal Offenses Related to Smuggling* research paper by ***Yurii Kovalov***, PhD in Law, Doctoral Student from Ukraine, develops a forensic classification of criminal offenses related to smuggling. The author thoroughly explores different approaches to classifying crimes, including criminal-legal characteristics and forensic criteria, and validates the importance of considering them together. According to the author, the main classification criteria could be the method of implementing the criminal intent of smugglers, topic characteristics of smuggling, and the possibility of the spread and free circulation of contraband items is also underlined. Additional criteria can be: time, situation and place of commission of criminal offenses; tools and means used; some characteristics of smuggler personality or a group of smugglers, etc.

The following research paper *Forensic Characterization Elements of Criminal Offenses Committed by Professional Participants in Justice* by ***Yevhen Sup*** (Ukraine), PhD in Law, Doctoral Student, accentuates the importance of forensic characterization as information basis of the methodology for investigating crimes committed by professional participants in legal proceedings (judges, prosecutors, investigators, inquirers). The researcher points out that the issue of developing an appropriate forensic characterization becomes absolutely urgent due to insufficient study of these crimes in forensic science. The author substantiates key elements of forensic characterization structure and peculiarities of the criminal activity mechanism in this area (method and circumstances of committing a criminal offense, criminal identity, tools and means of committing a criminal offense, as well as typical traces). The scientist notes that such elements as information about the identity of the victim and the subject of the offense are optional since not all crimes of this group directly encroach on a specific person or physical object.

The *Countering Investigation as a Substantive Component of Topic of Criminalistics* research paper by ***Oleksandr Tarkan***, PhD in Law, Doctoral Student from Ukraine, elaborated on such a phenomenon as countering investigation in the context of formation of a separate forensic doctrine of such resistance and its neutralization (overcoming). The need to expand the system of forensic science doctrines and theories, considering the post-criminal activity of subjects involved in criminal offenses, is justified. The researcher emphasizes the relevance of singling out the forensic doctrine of countering investigation by criminals and its neutralization. Prospects for further research are outlined that provide for development, improvement and verification of key provisions of the doctrine of countering investigation and its neutralization (taking into account requests and issues of law enforcement activities).

The *Fundamental Principles of Forensic Expert Activity and Psychological Science in Service of Resolving Forensic Psychological Examination Tasks* research paper by ***Oleksandr Yevsiukov*** (Ukraine), PhD in Education, Docent, Doctoral Student, is devoted to a theoretical and legal analysis of fundamental principles of expert activity provided for in the Law of Ukraine *On Judicial Examination* (legitimacy, independence, objectivity, completeness) and the basic principles of psychological science (determinism, reflection, unity of psyche and activity, development, and systemic nature). The author demonstrates the importance of supplementing Ukrainian legislation with the rule of law principle. The researcher provides an in-depth analysis for aspects of implementing the identified principles and, on the basis of an integrated approach, proposes a system of principles specifically for forensic psychological examinations. This system will be capable of synthesizing the principles of forensic science and psychology while supplementing them with the principle of a forensic psychologist's professional ethics.

The *Overview Related to Exhumation of Animal Corpses: Theoretical, Legal and Organizational Principles* research paper authored by ***Ivan Yatsenko*** (Ukraine), Doctor of Veterinary Medicine, Professor, delves into a comprehensive analysis of problematic issues and the development of principles for the exhumation of animal corpses as an investigative (search) action. It is stressed that there is a lack of proper legal regulation for this procedure in the well-established legislative framework of Ukraine, which may raise doubts about the admissibility of evidence obtained in cases regarding animal cruelty, etc. The researcher offers his definition of the *exhumation of animal corpses* concept, outlines exhumation objects (whole corpses, remains, aborted fetuses), and actual grounds for conducting it (the need for new research, suspicion of violent [sudden] death, conflicting expert data, etc.). The scientist specifies stages of the algorithm for conducting an examination related to exhumation of animal corpses and elaborates on their content: from issuing a resolution and identifying participants (investigator, prosecutor, veterinary medicine specialist, witnesses, specialists of the State Service for Food and Consumer Protection) to technical removal of the corpse, its on-site examination, sampling, drawing up an examination protocol, transportation to an expert institution, and subsequent burial of the animal corpse or cremation, and proposes to supplement the national criminal procedure legislation with a new article that would regulate this procedure.

The *Case Notes* Section begins with the *Comparative Analysis of Smart Lock Breaching Methods and Their Forensic Examination in Ukraine and the USA* research paper by ***Roman Pidnebennyi***. The article explores the nuances of smartlock markets in both countries (popular smart lock brands, common authentication methods) and singles out the main hacking methods (from digital attacks to traditional methods of physical hacking). Outdated software and power outages, a shortage of cybersecurity experts, a lack of unified methods for analyzing digital evidence, limited access to specialized equipment, and insufficient legal framework for electronic evidence were among the issues encountered during the forensic examination of smart lock hacking in Ukraine.

The *Electromagnetic Weapons: Forensic and Ballistic Examination of Railguns and Coilguns* research paper authored by ***Görkem Ardacan Tan*** (Turkey), explores forensic and ballistic aspects of the state-of-the-art types of weapons: electromagnetic guns using electromagnetic fields to accelerate projectiles to ultra-high speeds, as opposed to traditional firearms. From the researcher's perspective, the lack of gunshot ballistic traces (chemical residues of gunpowder, cartridge cases) is a key forensic issue when examining such weapons. The author analyzes technical and physical properties of electromagnetic guns, damage they cause, methods for researching them, and the need to amend relevant international and national regulations on proliferation and research of these and similar weapons.

The research paper authored by ***Anatolii Puhachov, Valerii Suprun, Ruslan Huseinov,*** comprehensively analyzes existing fire hazards in various types of motor vehicles and methods of their forensic examination. The authors emphasize the high fire hazard of vehicles due the presence of flammable and combustible materials (fuel, oils, plastics, rubber, textiles), potential ignition sources (electrical equipment, exhaust gas systems, friction-heated elements), and provides relevant statistical data on vehicle fires and their main causes, which are dominated by electrical and fuel system malfunctions. The researchers have thoroughly examined the mechanisms behind the occurrence of a fire: short circuit, overheating of conductors, leakage of fuel or other liquids (antifreeze, oil) onto hot engine parts (manifold, turbocharger), sparks during a traffic collision, careless handling of fire in the course of repairs. A distinction is made between signs of deliberate arson (using flammable liquids to intensify combustion) and fires caused by technical malfunctions. The algorithm for inspecting the fire site, the method for determining probable source of the fire according to the degree of thermal damage to various zones (engine compartment, cab, trunk), analysis of the condition of glazing, wiring, etc., are provided in the study. The scientists define specific risks and peculiarities of combustion of lithium-ion batteries in electric and hybrid vehicles.

The *Improvised Incendiary Device Components* research paper authored by ***Mykhailo Kuzmenko*** (Ukraine) highlights the lack of definition for improvised incendiary device components in current methodologies and reference literature which hinders the conduct of forensic fire and technical examinations, specifically the identification of a specific source of ignition, leading to probable conclusions and the inability to determine the cause of a fire. The relevance of the issue is amplified by the increase in the use of improvised incendiary devices amid martial law in Ukraine. The author differentiates components of such devices into basic (combustible substance, ignition device) and complementary (body, batteries, switches, target sensors, etc.), and examines in detail types of combustible substances (flammable liquids, pyrotechnic components) and ignition devices (mechanical, electrical, chemical, including clockwork, mobile phones). The researcher notes that defining the overall structure, relationship, and operating principle of these elements will facilitate the development of methodologies for their investigation and contribute to more effective resolution of arson-related crimes.

The last section of the 38th issue of the *Theory and Practice of Forensic Examination and Criminalistics* Research Paper Collection traditionally outlines notable scientific events in the first quarter of the year. The Editorial Board stresses the importance of researchers' participation in national and international forums. Despite the war, this has demonstrated the unwavering strength and resilience of Ukrainian science.

The Editorial Board would like to thank the authors who have provided materials for publication, as well as to all those involved in making this scientific edition possible! We invite scholars and practitioners from various institutions and welcome the opportunity for further cooperation. We are dedicated to the continued support and development of scientific dialogue. We are convinced that working together is a guarantee for future scientific accomplishments!

Together to the Victory!

Glory to Ukraine!

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Admissibility of evidence obtained with specialist participation in criminal proceedings

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[a] Writing – original draft, Validation.
[b] Writing – original draft, Project administration, Supervision.
[c] Writing – original draft, methodology.

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The parties to criminal proceedings collect and verify evidence using, in particular, specific expertise and skills of a specialist involved in conducting relevant procedural actions. Specialist is always an individual who has rights and freedoms, which violation can result in the loss of evidence of admissibility. Competition in criminal proceedings determines focus of efforts on finding the vulnerability of the opposing party's evidence. The purpose of this article is to identify the conditions under which evidence provided by specialist can determine the issue of admissibility of their use in criminal proceedings. Achieving such a goal requires combined application of a number of scientific methods, including dogmatic, hermeneutic and comparative law one. Auxiliary role of a specialist is outlined quite clearly in the legislation: this is performance of paid work, which cannot be refused if the engagement is carried out by decision of the court, investigating judge, investigator or prosecutor. At the same time, lack

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of employment contract, social and compulsory insurance, record of work experience, etc. of such a specialist is poorly consistent with the principles of social protection in Ukraine. The paid nature creates a legal dilemma in the event of a ban on representatives of certain professions from engaging in other paid activities, in addition to their main job. Legislation does not provide equal pay for equal work of specialists. Recent efforts by the legislator to expand the range of cases of involving a specialist in criminal proceedings have led to the need to distinguish them by affiliation with a foreign state or international organization, by specialty and types of work performed. The above legal conditions relate to the sphere of human rights, and they cannot be ignored. The current state of regulation of involving a specialist in criminal proceedings increases the risk of violation of these rights by the party resorting to such involvement, primarily the prosecution. Possible situational solutions: not involving public servants or limiting the circle of involved specialists exclusively to employees of state specialized institutions, accepting the risk of recognizing evidence as inadmissible, changing the government act on the remuneration of specialists with the introduction of complexity (scientific content, safety, hygiene, etc.) of works as the main criterion (and not the level of salary at the specialist's main workplace) and/or involving exclusively persons with an equal level of remuneration, etc. are half-baked and only emphasize the expediency of a systematic review of the institution of a specialist in criminal proceedings.

Keywords: *forced labor; other paid activities; specialist involvement; evidence admissibility.*

Research Problem Formulation

Specialist is a participant in procedural criminal legal relations. Unlike the parties to criminal proceedings, such participation is not a consequence of his behavior and is not caused by a criminally unlawful infringement of his rights or interests. He is not a participant in such legal relations due to his professional duties (as opposed to investigator, judge, or court secretary). A specialist is situationally involved by an authorized person because he has special knowledge and skills. However, procedural result of such involvement is determined not only by effectiveness of the work performed by the specialist to meet the needs of the court, prosecutor, investigator, or examining magistrate. Under certain formal circumstances and in the case of involvement of certain categories of persons, specialist participation in procedural actions can become a basis for recognizing evidence as inadmissible and procedural actions as illegal. The key factors of such risk are the involuntary involvement, paid nature of the work, limited powers of the specialist and the entities that perform their procedural role with his help. The legislation that should be taken into account when involving a specialist in criminal proceedings does not contain obvious and insurmountable conflicts, but instead has a number of specifics, exceptions to the general rule, which disregard provokes the above-mentioned risk in practical activities.

Analysis of Essential Researches and Publications

Consideration of the problem of admissibility of evidence in criminal proceedings obtained through the involvement of a specialist is significantly facilitated by scientific developments on individual aspects of the issue raised. The procedural aspects of involving a specialist in criminal proceedings were investigated, in particular, by N. Rohatynska and Yu. Pidhorodetska (advantages of involving specialist) [1]; Ye. Demidova (specifics of specialist interrogation) [2]; O. Kuvshynov [3], Ye. Kompanets [4] (evidentiary properties of the specialist's conclusion).Scientific and theoretical basis of our research was formed by the way of research papers of specialists in the field of international and labor law: O. Voytenko (noted the differences between compulsory and forced labor, relying on the work of V. Zhernakov and O. Protsevskyi) [5], T. Parpan (developed the ideas of O. Stasiv, S. Plaskach, O. Starchuk, A. Orlean and outlined the international legal obligations of Ukraine to abolish forced labor) [6], L. Vakariuk (summarized the relevant practice of the European Court of Human Rights, hereinafter referred to as the ECtHR) [7]. V. Yeremenko [8], devoted scientific research to identifying elements of forced labor in legislative acts, and the categories of persons vulnerable to such coercion are discussed in the publications of N. Hladka and O. Yakovets [9], T. Lutskyi and I. Hazdai-

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ka-Vasylyshyna [10]. The science deals with the topic of procedural coercion [11] and the legal effects of a ban on engaging in other paid activities, in addition to the main job, by certain categories of persons [12].

Article Purpose

Identify conditions under which the evidence provided by the involved specialist can raise the issue of admissibility of their use in criminal proceedings.

Research Methods

A number of scientific methods have been applied, including dogmatic, hermeneutic, comparative legal one, extrapolation and analogy.

Main Content Presentation

Involvement in criminal proceedings of a specialist, that is, a person with special knowledge and skills (paragraph 1 of Part 1 of Art. 71 of the Criminal Procedural Code of Ukraine [13]) contributes to a prompt and complete investigation and trial. The application of this knowledge is part of the collection and verification of evidence. Requirements for admissibility of evidence are strict.

Thereby the subject of quite detailed regulation was, among other things, the procedure for applying (for obtaining and verifying evidence) the above-mentioned knowledge and skills. The Criminal Procedural Code of Ukraine provides for the rights and obligations of specialists, determines the content of the work performed by them, cases in which a specialist provides evidence independently, as well as the conditions under which he is a secondary participant in the procedural action. At the same time, an analysis of the relevant norms of the Criminal Procedural Code of Ukraine and their comparison with the provisions of other laws and international treaties of Ukraine forces us, along with the advantages of involving a specialist, to take into account the legal nature of his participation in a broader sense than follows from the norms of the Criminal Procedural Code of Ukraine alone. Imperative nature of the decision to involve him does not have legal precedence over the primacy of human rights stipulated by the Constitution of Ukraine [14]. Participation in procedural

10 Луцький Т. М., Газдайка-Василишин І. Б. Протидія торгівлі людьми: історія та сучасність. *Науковий вісник Львівського державного університету внутрішніх справ. Серія юридична.* 2023. № 1. С. 42—48. DOI: 10.32782/2311-8040/2023-1-6 (date accessed: 06.01.2025).

11 Андрушко О. Примус у кримінальному процесі: питання денотації і конотації. *Підприємництво, господарство і право.* 2018. № 4. С. 215—220. URL: http://pgp-journal.kiev.ua/archive/2018/4/37.pdf (date accessed: 06.01.2025) ; Грицак Х. М. Тимчасове обмеження у користуванні спеціальним правом як захід забезпечення кримінального провадження : дис. … канд. юрид. наук. Львів, 2019. 247 с. URL: https://lpnu.ua/sites/default/files/2020/dissertation/1797/dismukanov-2.pdf (date accessed: 06.01.2025).

12 Пастух І. Д. Службове сумісництво поліцейських. *Юридичний часопис Національної академії внутрішніх справ.* 2018. № 1 (15). С. 283—295. URL: https://elar.naiau.kiev.ua/server/api/core/bitstreams/b985c366-e7fa-4f39-978b-9d82d09ec972/content (date accessed: 06.01.2025) ; Благодарний А. М. Обмеження щодо сумісництва та суміщення з іншими видами діяльності, які пов'язані із конфліктом інтересів. *Юридичний науковий електронний журнал.* 2023. № 7. С. 238—241. DOI: 10.32782/2524-0374/2023-7/54 (date accessed: 06.01.2025).

13 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: 06.01.2025).

14 Конституція України : Закон України від 28.06.1996 р. № 254к/96-ВР (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 06.01.2025).

actions by certain categories of specialists can negatively affect admissibility of obtained evidence. Procedural risks in criminal proceedings are accompanied by inviting a specialist to take actions whose rules do not clearly stipulate this involvement.

Types of procedural actions involving a specialist are limited

One of the recent innovations in Criminal Procedural Code of Ukraine has been the expansion of the powers of specialists [15]. In the explanatory note to the relevant legislative initiative, changes are justified by the need to overcome the following problems: long terms of pre-trial investigation; slow adoption of procedural decisions; workload of forensic science institutions; lack of a sufficient number of experts conducting forensic, immunological, cytological, genetic, construction, ballistic ones and explosive examinations [16]. The proposed changes should contribute to the pre-trial investigation of criminal offenses against peace, human security, and international law [17]. In general, clarification of the norms relating to specialists in criminal proceedings directly affects the issues of collecting and verifying evidence, such as:

- documents as one of the sources of evidence in criminal proceedings (Part 2 of Article 84 of Criminal Procedural Code of Ukraine) include *"certificates, conclusions and other documents of specialists"* (Clause 5 of Part 2 of Article 99 of Criminal Procedural Code of Ukraine) [18];
- receipt of a certificate, conclusion of a specialist may occur within the inspection of the scene at the stage of pre-trial investigation in *"urgent cases"* (Part 3 of Art. 214 of Criminal Procedural Code of Ukraine) [19] before entering information into Unified Register of Pre-trial Investigations.

Unlike the expert conclusion that is an independent type of sources of evidence, the conclusion, certificates and other documents of the specialist belong to such a type of sources of evidence as the *document* [Hereinafter highlighted by us.— *Auth.*].

As noted above, given the innovations (amendments to Part 3 of Art. 214 of Criminal Procedural Code of Ukraine), such evidence can be obtained at the stage of pre-trial investigation, which is carried out before the entry of information in the Unified Register of Pre-Trial Investigations [20]. Therefore, all further evidence in criminal proceedings will most often be somehow derived from the primary evidence in the form of a protocol of inspection of the scene drawn up with the involvement of a specialist or a certificate (conclusion) provided, again by a specialist. This makes necessary to consider the issue of admissibility, legality of obtaining such evidence with all meticulousness.

Since the inspection of (terrain, premises, etc., Part 1 of Article 237 of the Crim-

15 Про внесення змін до Кодексу України про адміністративні правопорушення, Кримінального та Кримінального процесуального кодексів України щодо оптимізації діяльності спеціалістів у кримінальному провадженні : Закон України від 09.10.2024 р. № 4009-IX. URL: https://zakon.rada.gov.ua/laws/show/4009-20#n19 (date accessed: 06.01.2025).

16 Проєкт Закону про внесення змін до Кримінального процесуального кодексу України з метою оптимізації залучення спеціалістів під час досудового розслідування від 20.09.2023 р. № 10075. URL: https://itd.rada.gov.ua/billInfo/Bills/Card/42822 (date accessed: 24.01.2025).

17 Там само.

18 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

19 Там само.

20 Там само.

inal Procedural Code of Ukraine) is an investigative (search) action, a protocol must be drawn up based on its results (in particular, if there are statements from persons in whose presence the inspection is being carried out, Part 4 of Article 237 of the Criminal Procedural Code of Ukraine) [21]. Protocols of procedural actions, annexes to them, as well as media on which procedural actions are recorded, belong to documents (Part 3 of Part 2 of Article 99 of the Criminal Procedural Code of Ukraine), as well as *"materials of photography, sound recording, video recording and other media (including computer data)"* (Part 1 of Part 2 of Article 99 of the Criminal Procedural Code of Ukraine) [22]; mentioned categories of documents are separated from the rest – the aforementioned certificates, conclusions and other documents of specialists (Part 5 of Part 2 of Article 99 of the Code of Criminal Procedure). Participation of a specialist can consist in creating documents, as well as in assisting in performance of procedural actions that ensure the receipt of evidence, primarily material and in the form of other documents, in particular, protocols in the annexes containing explanations of the specialists involved in such action (clause 2 of Part 2 of Article 105 of the Code of Criminal Procedure), specially made copies, samples of objects, things and documents, as well as photo tables, diagrams, casts, computer data carriers and other materials that explain the content of the protocol (clauses 1 and 4 of Part 2 of Article 105 of Criminal Procedural Code of Ukraine), since a specialist *"can be involved to provide direct technical assistance (taking photographs, drawing up diagrams, plans, drawings, selecting samples for examination, etc.) by the parties to criminal proceedings during pre-trial investigation and by the court during the trial"* (clause 2 of Article 71 of the Code of Criminal Procedure) [23].

Independent procedural source of evidence in criminal proceedings is the expert's conclusions. At the same time, this type of evidence can be obtained with the participation of a specialist. Thus, forensic expert has the right to file a motion to provide *additional materials and samples* (clause 2, Part 3, Article 69 of Criminal Procedural Code of Ukraine), but he does not have the right to collect materials for an examination on his own initiative (Part 4, Article 69 of the Criminal Procedural Code of Ukraine) [24]. The expert provides a description of the obtained materials in the conclusion (clause 5, Part 1, Article 102 of the Code of Criminal Procedure) [25]. Although *materials* and *samples* are not identical, forensic expert is probably prohibited from collecting samples on his own; obviously, the obtained samples should be described in the expert's conclusion. If the examination is ordered by the court, it is the court or a specialist involved on its behalf who selects samples for its conduct (Part 1, Article 245 of the Code of Criminal Procedure) [26]. The expert's conclusion cannot be based on evidence deemed inadmissible by the court (Part 5, Article 101 of Criminal Procedural Code of Ukraine) [27]. Therefore, additional samples provided in accordance with his request (in particular, those select-

21 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).
22 Там само.
23 Там само.
24 Там само.
25 Там само.
26 Там само.
27 Там само.

ed by the specialist) should meet admissibility criteria.

The evidence obtained with involvement of a specialist also includes duplicates of the document and copies of information made by the investigator, prosecutor, in particular computer data containing information (automated), electronic communication, information and communication and computer systems and their integral components (Part 4 of Article 99 of the Criminal Procedural Code of Ukraine) [28].

Thus, activities of a specialist in criminal proceedings ensure the receipt of material evidence and documents (drawn up both by the specialist himself and as a result of the procedural actions in which he is involved), as well as expert conclusions.

Possibility of involving (participating) a specialist is provided for by the procedures for conducting a number of procedural actions (paragraphs 4 and 5 of Part 2 of Article 168, Part 8 of Article 228, Part 1 of Article 236, Parts 3 and 7 of Article 237, Part 2 of Article 240, part 2 of Article 241, part 1 of Article 245, Parts 2 and 5 of Article 245-1 of Criminal Procedural Code of Ukraine) and his participation is acceptable during covert investigative (search) actions (Part 1 of Article 262, Parts 1 and 3 of Article 266 of the Criminal Procedural Code of Ukraine) [29], which leads us to think about a certain *restrictive effect*. Thus, in the Code of Civil Procedure, general provisions on the procedural status of a specialist (Part 2 of Article 71 of the Code of Civil Procedure) are supplemented by special provisions on the procedure for conducting specific procedural actions with his involvement (participation) [30]. These special provisions exclude the possibility of a dispute regarding the legality of the involvement or participation of a specialist in these actions. However, the remaining norms regarding procedural actions do not contain the corresponding *"guarantees"*. The rights of the prosecution (which consists exclusively of state bodies and their officials) are not subject to an expanded interpretation (Part 2 of Article 19 of the Constitution of Ukraine) [31], therefore, here one should be guided by the principle *"if something is missing in the law, it should be assumed that it is intentional"* (from the Latin. *Casus omissus pro omisso habendus est*, missed case should be considered to have been missed intentionally) [32]. That is why the involvement of a specialist in the remaining procedural actions mentioned is hardly permissible. In other words, the involvement, application, invitation, participation of a specialist can be considered carried out on the basis, within the limits of the powers and in the manner provided for by the Constitution and laws of Ukraine, only when the right to such involvement is directly stipulated by the norm on the procedure for conducting an investigative (detective), covert investigative (detective), or other procedural action. Where there is no relevant clarification, authority to involve a specialist may become the subject of dispute. Thus, a specialist participates in the study of information already obtained through

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28 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

29 Там само.

30 Там само.

31 Конституція України … . URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 06.01.2025).

32 Кунянський С. Чому практика Верховного Суду України не є обов'язковою / Право без води і бруду : блог. 2019. URL: https://kuniansky.com.ua/all/omitted-case-canon/ (date accessed: 27.01.2025).

the use of technical means (Parts 1 and 3 of Article 266 of the Code of Criminal Procedural Code of Ukraine), but not in its covert receipt by these same means; in obtaining samples for examination (Part 1 of Article 245 of the Criminal Procedural Code of Ukraine) but not in the covert receipt of samples necessary for comparative research (Article 274 of the Code of Criminal Procedure); in a search (of a person's home or other property — Part 1 of Article 236 of the Code of Criminal Procedure) or an inspection (of premises, premises, things, etc., Part 1 of Article 237 of the Code of Criminal Procedure), but not in the examination of a corpse and its exhumation (Articles 238, 239 of the Code of Criminal Procedure) and not in the examination of publicly inaccessible places, homes or other property of a person (Part 1 of Article 267 of the Criminal Procedural Code of Ukraine); in an investigative experiment (Article 240), but not in a special investigative experiment (clause 3 of Part 1, Part 5 of Article 271 of the Code of Criminal Procedure) [33]. There is no clear basis for involving a specialist in some covert investigative and detective actions, the nature of which requires the subject of their conduct to apply both special knowledge and skills: establishing the location of radio equipment (Article 268 of the Criminal Procedure Code), monitoring bank accounts (Article 269-1 of the Criminal Procedure Code) or special production of things and documents, creation and use of specially formed enterprises, institutions, organizations (Article 273 of the Criminal Procedure Code) [34], etc.

Specialist can provide documents only on certain issues

Excessive certainty narrows not only the types of procedural actions discussed above, but also the subject of the conclusion or certificate of a specialist. Taking into account the amended Part 2 of Art. 71 of Criminal Procedural Code of Ukraine [35], such provision has clear documentary forms: *conclusions* in the pre-trial investigation of criminal offenses; *conclusions or certificates* on the identification of a person, weapons, ammunition, explosives, explosive devices, traces of an explosion or shot, narcotic drugs, psychotropic substances, their analogues and precursors, potent medicines; *certificates* on taking readings of technical devices and technical means that have the functions of photo, filming, video recording, or means of photo, filming, video recording.

In addition, a clarification (and therefore a restriction) has been applied to *foreign* specialists: *"If **necessary** and if there are **grounds**, a specialist in the field of chemical, biological, radiation, nuclear or other weapons can be involved from a foreign state or international organization"* (new paragraph 2, Part 1, Article 71 of Criminal Procedural Code of Ukraine) [36]. If before the amendments, specialists were not divided into foreign and national, now such a division has appeared, along with impossibility of involving foreign specialists from other than mentioned fields. In addition, the above construction links the involvement of such a specialist with the combined condition of *necessity* and *grounds*, although in the gen-

33 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

34 Там само.

35 Про внесення змін … . URL: https://zakon.rada.gov.ua/laws/show/4009-20#n19 (date accessed: 06.01.2025).

36 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

eral procedure for involving a specialist such conditions are not even mentioned, which seems to be a technical and legal drawback of the special prescription. The list of *types of weapons* seems to be imperfect in this construction. On the one hand, it is casual, on the other hand, it is open. The mentioned types of weapons nuclear, chemical one, etc. do not coincide with the provisions of the articles of the Special Part of the Criminal Code of Ukraine (hereinafter referred to as the Criminal Code): weapons of mass destruction (Articles 209-1, 439 and 440), explosives (paragraph 2 of the note to Article 260), military (note to Article 402), as well as radioactive materials (Articles 262 and 265), war materials (Article 410), radioactive, chemical, biological, etc. materials, substances, objects (Article 261) [37]. In addition to those belonging to other weapons: firearms (Article 201, note to Article 258-4, paragraph 2 of the note to Article 260, Article 262, Part 1 of Article 263, Articles 263-1 and 264 of the Criminal Code) and cold weapons (Part 2 of Article 263, Part 4 of Article 296 of the Criminal Code) [38] apparently, the *mandate* of foreign experts (from a review of Part 1 of Article 71 of the Criminal Code [39]) covers the types of weapons mentioned in the additions to Part 2 of Article 8 of the Rome Statute of the International Criminal Court and the use of which constitutes a war crime *"weapons, the main effect of which is to cause injuries with fragments that are not detected in the human body by X-rays"* and *"laser weapons"*[40]. It could be objected that the Criminal Code refers to objects and instruments of committing a criminal offense, and Article 71 of the Criminal Procedural Code of Ukraine refers to areas of specialization [41]. If the latter is available, for example, a specialist in the field of biological weapons will, of course, be useful for collecting and verifying evidence, for example, regarding violations of the rules for handling microbiological or other biological agents or toxins (Article 326 of the Criminal Code) or regarding an attack on facilities where biological materials are manufactured, stored, etc. (Article 261 of the Criminal Code) [42]. However, even with such an assumption, the involvement of a specialist (not only a foreign one) will have limited forms, because, in view of the new clause 9 of Part 4 of Art. 71 of the Code of Criminal Procedure, the subject of expert reports and conclusions is the identification, in particular, of weapons, ammunition, explosives and devices, traces of an explosion or shot, but not agents, toxins or materials [43]. Therefore, such an expert can be involved in procedural actions, but con-

37 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: 06.01.2025).

38 Там само.

39 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

40 Римський статут Міжнародного кримінального суду : прийнят. 17.07.1998 р. (зі змін. та допов.) ; ратифік. Законом України від 21.08.2024 р. № 3909-IX. URL: https://zakon.rada.gov.ua/laws/show/995_588#Text ; https://zakon.rada.gov.ua/laws/show/995_003-17#n2 ; https://zakon.rada.gov.ua/laws/show/995_004-17#n2 (date accessed: 24.01.2025).

41 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 06.01.2025) ; Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

42 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 06.01.2025).

43 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

clusions and reports on relevant issues cannot be required from him.

It is necessary to distinguish *procedural actions involving* specialist (carried out by the Parties to the criminal proceedings, in particular, the prosecutor and the investigator) from involvement of a specialist to *provide* certificates and conclusions when the specialist *creates* evidence (in order to preserve information about tangible object: Part 1 of Art. 99 of the Criminal Procedural Code of Ukraine [44]), but this creation cannot be considered a procedural action, since this procedure is not regulated by the Criminal Procedural Code of Ukraine [45] and is carried out by a person who does not belong to any of the parties to the criminal proceedings or the court. In both cases, there is a place of involvement limited to foreign specialists with weapons issues.

It would seem that it is necessary to distinguish between *involvement* and participation: this would allow us to distinguish the thematically limited involvement of foreign specialists from possible other forms of their participation in criminal proceedings. Thus, it is precisely the participation of a specialist that is referred to in the norms on the procedure for a search (Part 1 of Article 236 of the Criminal Procedural Code of Ukraine), inspection of the area, premises, things, documents and computer data (Part 3 of Article 237 of the Criminal Procedural Code of Ukraine), investigative experiment (Part 2 of Article 240 of the Criminal Procedural Code of Ukraine), examination of a person (Part 3 of Article 241 of the Criminal Procedural Code of Ukraine), taking readings from technical devices and/or means (Part 2, Part 5 of Article 245-1 of the Criminal Procedural Code of Ukraine), examination of correspondence (Part 1 of Article 262 of the Criminal Procedural Code of Ukraine), investigation of information obtained in the event of the use of technical means (Part 1 of Article 266 of the Criminal Procedural Code of Ukraine, and judicial examination on the spot (Part 1 of Article 361 of the Criminal Procedural Code of Ukraine) [46]. However, comparing Part 3 of Article 237 of the Code of Criminal Procedure (invitation and participation of a specialist) with Part 7 of the same article (*rights of involved specialist*) indicates that at least in this case we are talking about the synonymy of participation and involvement [47]. Accepting the opposite and applying such a logical technique as reduction (reduction) to the absurd (from the Latin: *reductio (reductiones) ad absurdum*) [48] would give us an obviously false statement that the participation of an invited specialist does not create for him the rights that the involved specialist has. In addition, the participation of a person as a specialist in the proceedings excludes his participation in such proceedings as a judge, investigating judge, juror (Part 2 of Part 1 of Article 75 of the Code of Criminal Procedure), investigator, prosecutor, inquirer (Part 2 of Part 1 of Article 77 of the Code of Criminal Procedure), defense attorney or representative (Part 1 of Article 78 of the Code of Criminal

44 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

45 Михайлик Д. О. Поняття процесуальних дій у кримінальному провадженні України. *Право і суспільство*. 2017. № 2. С. 217—221. URL: https://elar.naiau.kiev.ua/server/api/core/bitstreams/7ac3a923-969b-450e-91a7-13e961beb84e/content (date accessed: 24.01.2025).

46 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

47 Там само.

48 Проблеми тлумачення правових норм : посібник / автор-упорядник О. М. Балинська. Львів, 2021. С. 101. URL: https://surl.li/rmuptx (date accessed: 27.01.2025).

Procedure) [49]. The approach of refusing to grant a motion for recusal, based, for example, on the fact that the person in these proceedings did not *participate*, but only provided references (conclusions) as a specialist or was *involved* in the conduct of procedural actions (and not *participated* in), is unlikely to withstand criticism. Therefore, again, by bringing to absurdity the consequences of accepting the above distinction between *participation*, *involvement* and *providing* (conclusions, references) within the limits of the institute of recusal in criminal proceedings, it is possible to determine the content of the *participation* of a specialist in it. In addition, payment of remuneration for the work performed is included in the costs associated with the involvement, in particular, of a specialist (Parts 2, 4, 5 of Article 122 of Criminal Procedural Code of Ukraine [50]), therefore, in the case of a separate interpretation, the specialist should not receive remuneration for providing references or conclusions. However, this is not the case: the aforementioned provision is also participation in criminal proceedings. Other forms of participation (and therefore paid engagement) of a specialist should be recognized as providing oral consultations, written explanations during the examination of evidence by the court (Article 360 of the Code of Criminal Procedure), clarifying information contained in audio and video recordings (Article 359 of the Code of Criminal Procedure), as well as opinions or conclusions of the person giving testimony that are useful for a clear understanding of the testimony and are based on special knowledge (Parts 6 and 7 of Article 95 of the Code of Criminal Procedure) [51].

Thus, the order to involve foreign specialists in criminal proceedings strengthened capacity of the pre-trial investigation only in a rather narrow direction. Involvement of such specialists by the prosecution outside their legally specified function may fall under one of the cases of inadmissibility of evidence, namely their receipt *"after the initiation of criminal proceedings through the exercise by the pre-trial investigation bodies or the prosecutor's office of their powers not provided for by this Code to ensure the pre-trial investigation of criminal offenses"* (paragraph 2, part 3, Article 87 of the Criminal Procedural Code of Ukraine) [52].

Anti-corruption and labor legislation define special rules for the involvement of certain categories of persons as specialists in criminal proceedings

The status of a specialist in criminal proceedings, procedure for his involvement is provided for by a number of articles of the Criminal Procedural Code of Ukraine. However, the norm of law may not only not coincide with the components of a regulatory legal act (Article, Part of an article), but is not always fully reflected in the text of one such act [53]. The above creates a basis for the statement that the provisions of Criminal Procedural Code of Ukraine do not contain an exhaustive regulation of the procedure for involving a specialist in criminal proceedings, that a holistic norm also consists of provisions from other sources of law, in particular those that are not focused on the

49 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

50 Там само.

51 Там само.

52 Там само.

53 Наливайко Л. Р. Теорія і практика правозастосування : конспект лекц. Дніпро, 2016. С. 130. URL: https://dduvs.edu.ua/wp-content/uploads/files/Structure/library/student/lectures/1114/10.1.pdf (date accessed: 06.01.2025).

procedural status of subjects of legal relations and are of a more general nature. If so, then application of only Criminal Procedural Code of Ukraine in the matter of involving a specialist may lead to a violation of the principles of criminal proceedings and other unacceptable consequences, because in this case it would be a question of applying only part of the norm, half-heartedness, selectivity. Specialist in criminal proceedings ensures the receipt and produces evidence himself by performing certain works, practical application of specific expertise and skills available to him and relevant to the subject of proof. Thereby constituent norms on his involvement can be contained in regulatory legal acts, which are usually not considered as sources of criminal procedural legislation due to belonging of the general content of such acts to other areas: constitutional, labor, military, administrative law, education legislation, etc. A broad approach, in which a norm of law can go beyond the limits of a regulatory legal act (and in the context of the rule of law be determined by other sources of law), does not simplify law enforcement, as it blurs and makes the range of sources of virtually any legal norm incomprehensibly wide. Instead, enforcement cannot consist in fulfilling "almost" all the provisions of a norm or in "mostly" fully satisfying its requirements, which necessitates the need to ensure that the addressees of the norms master the entire range of relevant sources.

In particular, the issue of a specialist's remuneration deserves separate consideration. Possibility of its payment implicitly limits the circle of specialists whose involvement is legal. Thus, a specialist has the right to *"receive remuneration for the work performed and reimbursement of expenses related to his involvement in criminal proceedings"* (clause 5, Part 4, Article 71 of the Criminal Procedural Code of Ukraine) [54]. Leaving aside the reimbursement of expenses, let us focus on the fact that such remuneration should be paid for the work performed, if it is not an official duty (Part 4, article 122 of the Criminal Procedural Code of Ukraine) [55]. Therefore, this is a paid activity. At the same time, subjects of responsibility, under the Law of Ukraine: *On Prevention of Corruption* (in particular, but not exclusively, persons authorized to perform state functions, for example, officials and service personnel of state bodies), are prohibited from *"engaging in **other paid activities** (except for teaching, scientific and creative activities, medical practice, instructor and **refereeing** practice in sports) or entrepreneurial activities"* (clause 1, Part 1, Article 25 of this Law with reference to clause 1, Part 1, Article 3 thereof) [56]. And although the above-mentioned prohibition is not absolute, as evidenced by the construction *"unless otherwise provided for by the Constitution or laws of Ukraine"* [57], and the Criminal Procedural Code of Ukraine belongs precisely to laws, this Code does not contain a special permit for the performance of paid activities. For their part, the exceptions to the ban, teaching, scientific and creative activities, medical practice, sports instructor and refereeing practices are not fully applicable to the activities of specialists, because the distinguishing feature of a specialist is the ability to operate with existing special knowledge and skills, and

54 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

55 Там само.

56 Про запобігання корупції : Закон України від 14.10.2014 р. № 1700-VII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1700-18#n26 (date accessed: 06.01.2025).

57 Там само.

not, for example, obtaining new knowledge and/or finding ways to apply it (definition of scientific activity under Clause 12, Article 1 of the Law of Ukraine: *On Scientific and Scientific-Technical Activities* [58]) or *"activity in the creation, interpretation and performance of works"* (the definition of creative activity under Clause 21, Part 1, Article 1 of the Law of Ukraine: *On Culture* [59]).

A person who, despite the prohibition, has performed (by performing the procedural duties of a specialist) "other" paid work, cannot be considered a violator of the above anti-corruption prohibition, since the mechanism of preliminary (before the commencement of the paid activity) refusal to perform duties is exhausted by cases of disqualification of a specialist; a specialist must follow instructions and instructions. The possible refusal of the remuneration by the person himself does not eliminate the fact that payment (possibility of payment) for such activities is provided for by law. The interpretations of the Law of Ukraine: *On Prevention of Corruption* provided by the NAPC in this regard are quite clear:

"The restriction specified in paragraph 1 of Part 1 of Article 25 of the Law is not focused on remuneration based on the results of its activities other than the performance of the functions of the state or local self-government, namely, on engaging in such activities that are paid or can be paid.

Consequently, the fact that a person engages in another paid activity (the conditions for carrying out certain activities on a paid or gratuitous basis may be determined, inter alia, by law, employment or other agreement, charter and other documents of a legal entity), regardless of the financial results of such activities, will indicate a violation of these requirements of the Law" [60].

Since the person is involved as a specialist not by his own decision, the issue of bringing him to administrative responsibility under Art. 172-4: *Violation of restrictions on concurrent and concurrent with other activities* of the Code of Ukraine on Administrative Offenses (does not arise due to the absence of the offense, in particular the subjective party [61]. At the same time, impossibility of bringing to justice for the commission of a certain act is not at all equal to its legality.

According to Part 1 of Article 67 of the Law of Ukraine: *On Prevention of Corruption,* decisions taken in violation of the requirements of this Law are subject to **cancellation** by the body or official authorized to make or cancel them; such decisions may also be declared illegal in court (upon the application of an interested individual, association of citizens, legal entity, prosecutor, state authority, in particular the National Agency, local self-government body) [62]. This norm can be fully extended to decisions taken under the Code of Criminal Procedure, since *"the criminal procedural legislation of*

58 Про наукову і науково-технічну діяльність : Закон України від 26.11.2015 р. № 848-VIII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/848-19 (date accessed: 06.01.2025).

59 Про культуру : Закон України від 14.12.2010 р. № 2778-VI (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2778-17#Text (date accessed: 06.01.2025).

60 Методичні рекомендації щодо застосування окремих положень Закону України «Про запобігання корупції» стосовно запобігання та врегулювання конфлікту інтересів, дотримання обмежень щодо запобігання корупції / НАЗК : офіц. вебсайт. 2022. С. 61. URL: https://wiki.nazk.gov.ua/wp-content/uploads/2022/10/Metodychni-rekomendatsiyi-vid-21.10.2022-13.pdf (date accessed: 06.01.2025).

61 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: 06.01.2025).

62 Про запобігання корупції ... . URL: https://zakon.rada.gov.ua/laws/show/1700-18#n26 (date accessed: 06.01.2025).

Ukraine consists of <…> this Code and ***other laws of Ukraine****”* [63]. Despite preponderance of the Code of Criminal Procedure over other regulatory legal acts, the provisions of which relate to criminal proceedings (Part 3 of Article 9 of Criminal Procedural Code of Ukraine), there is no conflict of procedural and anti-corruption laws as such: they complement each other [64].

Correlation between the right to work and imperative nature of the decision to involve a person as a specialist is important

According to Part 1 and 3 of Article 43 of the Constitution of Ukraine, *“everyone has the right to* ***work*** *which includes opportunity to earn a living by work that he freely* ***chooses or to which he freely agrees****”*, and *“the use of forced labor is prohibited. Military or alternative (non-military) service, as well as work or service performed by a person under a sentence or other court decision or in accordance with the laws on martial law and on a state of emergency, shall not be considered forced labor”* [65].

In Article 2 of the Convention on Forced or Compulsory Labor (hereinafter referred to as Convention No. 29), forced or compulsory labor is defined as *“any work or service which is exacted from any person* ***under menace*** *of any penalty and for which the said person has not offered his services voluntarily”* [66]. The Constitution of Ukraine prohibits only forced labor, while Convention No. 29 prohibits compulsory labor, and in Part 2 of Article 2 it stipulates exceptions to this definition: ordinary civic duties of citizens (b); execution of a sentence passed by a judicial body (c); small community work (e) [67]. While considering nature of the involvement of a specialist, some of the exceptions can be rejected (for example, small community work).

It is worth noting that Convention No. 29 does not so much prohibit as limit the scope of forced labor (its abolition is ensured by another Convention [68]). At the same time, another international treaty of Ukraine contains the same prohibition: according to Part 2 of Article 4 of the European Convention on Human Rights (hereinafter referred to as the ECHR), *“no one shall be required to perform forced or compulsory labor”* [69]. Like Convention No. 29, the ECHR provides for exceptions. They differ somewhat in text, as do Part 3 of Article 4 of the ECHR and Part 3 of Article 43 of the Constitution of Ukraine [70]. In particular, there is a significant difference

63 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

64 Там само.

65 Конституція України … . URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 06.01.2025).

66 Конвенція про примусову чи обов’язкову працю : підпис. Міжнар. орг. праці 28.06.1930 р. № 29 ; ратифік. УРСР 10.08.1956 р. URL: https://zakon.rada.gov.ua/laws/show/993_136#Text (date accessed: 06.01.2025).

67 Там само.

68 Конвенція про скасування примусової праці : підпис. Міжнар. орг. праці 25.06.1957 р. № 105 (зі змін. та допов.) ; ратифік. Законом України від 05.10.2000 р. № 2021-III. URL: https://zakon.rada.gov.ua/laws/show/993_013#Text (date accessed: 06.01.2025).

69 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 допов.). URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed: 06.01.2025).

70 Конвенція про захист прав людини … . URL: https://zakon.rada.gov.ua/laws/show/995_004#-Text (date accessed: 06.01.2025) ; Конституція України … . URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 06.01.2025).

regarding acceptable coercion by court decision: in Article 2 of Convention No. 29 and Subparagraph "a" of Part 3 of Article 4 ECHR refers to permissible *"work which is normally required during <…> period of detention or conditional release"*, in paragraph "c" of Part 2 of Article 2 of Convention No. 29 about work or service required as a result of a sentence, while in the Constitution of Ukraine on sentence or other court decision [71]. On the other hand, the Constitution of Ukraine does not exempt *work or service "which is part of normal civic duties"* (paragraph "d" of Part 3 of Article 4 ECHR) [72]. Due to this difference, the same action can be considered a violation of the law (after all, the current international treaties of Ukraine, the consent to which was granted by the Verkhovna Rada of Ukraine are part of the national legislation, and their texts are an integral part of the laws on their ratification – Part 1 of Article 9, Part 1 of Article 19 of the Law of Ukraine: *On International Treaties of Ukraine* [73]), but not a violation of the constitutional right to work itself. It is also worth considering whether the work of a specialist is not a "normal" civic duty. Thus, the European Commission and the ECHR call "normal civic duties" works and types of service that have something in common with specialist activities: participation in a jury trial, firefighter service or payment of a monetary contribution instead, free medical consultations, emergency medical care [74], etc.

ECHR used Convention No. 29 to form its own position on the content of the prohibition specified in Part 2 of Article 4 of the ECHR [75], the key components of which: coercion can be not only physical, but also any work; coercion can take the form of a threat of any punishment; work is needed contrary to the will of the person concerned, for whom she did not offer her services [76].

Regarding the latter aspect, we note that the Criminal Procedural Code of Ukraine does not provide for the consent of a person who is involved as a specialist, even when it comes to an "invitation" to participate in a procedural action. We cannot speak of "tacit consent" (lack of objection by the specialist to his involvement), since the relevant appeal can be expressed only after the pre-trial investigation, and therefore, in a significant number of cases, after the work has been performed. The offer of his services by the person involved is not provided for in the case of a specialist. The situation with an expert is somewhat different: certified forensic experts who are not employees of state special institutions are included in the relevant Register on the basis of an application (clause 7 of

71 Конвенція про примусову … . URL: https://zakon.rada.gov.ua/laws/show/993_136#Text (date accessed: 06.01.2025) ; Конвенція про захист прав людини … . URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed: 06.01.2025) ; Конституція України … . URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 06.01.2025).

72 Там само ; Конвенція про захист прав людини … . URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed: 06.01.2025).

73 Про міжнародні договори України : Закон України від 29.06.2004 р. № 1906-IV (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1906-15#Text (date accessed: 06.01.2025).

74 Довідник із застосування статті 4 Європейської конвенції з прав людини — Заборона рабства і примусової праці. 2-ге вид. Рада Європи ; ЄСПЛ, 2014. С. 8—9, 12—13. URL: https://ks.echr.coe.int/documents/d/echr-ks/guide_art_4_ukr (date accessed: 06.01.2025).

75 Конвенція про захист прав людини … . URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed: 06.01.2025).

76 Там само.

the Procedure for Maintaining the State Register of Certified Forensic Experts) [77]. Thus, the expert assumes the possibility of his involvement and the Register of Certified Forensic Experts is a means for the expert to offer his professional services to an indefinite circle of persons, an offer.

The decision to involve a specialist entails the obligation to perform certain actions. Despite the fact that some norms on the procedure for conducting investigative (search) actions refer to inviting a specialist (for example, in the case of a search: under Part 1 of Article 236 of the Criminal Procedural Code of Ukraine, *"investigator, prosecutor has the right to invite specialists to participate in the search"* [78]), the imperativeness of the investigator's (prosecutor's) decision does not disappear. Thus, the specialist is obliged to arrive upon summons to the investigator, inquiry officer, prosecutor, court and have the necessary technical equipment, devices and instruments with him; to follow the instructions of the party to the criminal proceedings that involved him, or to the court, and to provide explanations on the questions posed (Parts 1 and 2 of Part 5 of Article 71 of the Criminal Procedure Code) [79]. It is appropriate to consider the act of such involvement from the standpoint of the scientific literature on procedural coercion [80], range of objects of which is not limited to the suspect or the accused.

The degree of decision imperativeness on the involvement (participation, invitation) of a specialist confirms not only the procedure for its adoption, but also the review. An exhaustive list of decisions of the prosecutor, investigator or inquirer, complaints about which may be considered during the pre-trial investigation, is given in Part 1 of Art. 303 of Criminal Procedural Code of Ukraine; this list does not cover complaints about the involvement of a specialist: they are considered (like any other) during the preparatory court session (Part 2 of Art. 303 of Criminal Procedural Code of Ukraine) [81]. This means that the involvement of a specialist in procedural actions during the pre-trial investigation, the provision of certificates, conclusions has already taken place and such a specialist has performed paid work.

For determining the signs of imperative nature of the decision to involve a specialist, one should take into account the existence of responsibility for *"malicious evasion <...> from appearance"* in court (Part 3 of Art. 185-3 of the Code of Administrative Offenses) [82], pre-trial investigation bodies or the prosecutor (Art. 185-4 of the Code of Administrative Offenses) [83] and for refusing to perform the duties assigned to them without valid reasons, in particular, in court or during the pre-trial investigation (Part 1 of Art. 385 of the Criminal

77 Порядок ведення державного Реєстру атестованих судових експертів : затв. наказ. Мін'юсту України від 29.03.2012 р. № 492/5 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0484-12#Text (date accessed: 06.01.2025).

78 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

79 Там само.

80 Грицак Х. М. Зазнач. твір. С. 47. URL: https://lpnu.ua/sites/default/files/2020/dissertation/1797/dismukanov-2.pdf (date accessed: 06.01.2025).

81 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

82 Кодекс ... про адміністративні правопорушення ... . URL: https://zakon.rada.gov.ua/laws/show/80731-10#Text (date accessed: 06.01.2025).

83 Там само.

Code [84]). Thus, punishment is possible. Instead, there is no free offer of services by a specialist.

Therefore, if a specialist is not engaged on the basis of a court decision, his forced (even paid) labor is prohibited. The exception is the engagement of a specialist from among military staff, in case of corresponding decision by their commanders (superiors). Performance of duties or provision of services by a specialist as part of his official duties within the limits of *freely chosen work* is not forced labor, which makes acceptable to engage an employee of a state special institution as a specialist.

Evidence obtained as a result of a *significant* violation of human rights and freedoms guaranteed by the Constitution and laws of Ukraine, international treaties ratified by the Verkhovna Rada of Ukraine, as well as any other evidence obtained through information obtained as a result of such a significant violation are inadmissible (Part 1 of Art. 87 of the Criminal Procedural Code of Ukraine) [85]. The Criminal Procedural Code of Ukraine provides a list of significant violations (Part 2 of Art. 87), but inexhaustible (*"the court is obliged to recognize significant violations of human rights and fundamental freedoms, **in particular**, such acts"*) [86]. Therefore, at the same time as deciding on the existence of a human rights violation in case of forcing a specialist to perform certain work in criminal proceedings during the recognition of the admissibility of evidence, it is necessary to assess the "materiality" of such a violation.

With simultaneous involvement of several specialists, they should ensure equal pay

Remuneration of specialists is regulated by Article 122 of the Criminal Procedural Code of Ukraine, which, in particular, determines that *"the costs associated with the involvement of witnesses, specialists, translators and experts shall be borne by the party to the criminal proceedings who filed a motion to summon witnesses, involved a specialist, translator or expert, except in cases established by this Code"* (Part 1) and *"experts, specialists and translators must be paid remuneration for the work performed, unless this is their official duty"* (Part 4) [87]. The subordinate legislation corresponding to this Article [88] stipulates (Parts 1, 4 and 6) the following types of remuneration for specialists:

- preservation of average salary for all the time spent by them in connection with the *appearance and summons* to the pre-trial investigation bodies, the prosecutor's office, the court (to persons who are not employees of enterprises, institutions or organizations, pay *compensation* (reimbursement) for the break from normal classes);
- remuneration *for work performed*, if such work is not their official duty.

84 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 06.01.2025).

85 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 06.01.2025).

86 Там само.

87 Там само.

88 Інструкція про порядок і розміри компенсації (відшкодування) витрат та виплати винагороди особам, що викликаються до органів досудового розслідування, прокуратури, суду або до органів, у провадженні яких перебувають справи про адміністративні правопорушення, та виплати державним спеціалізованим установам судової експертизи за виконання їх працівниками функцій експертів і спеціалістів : затв. постанов. КМУ від 01.07.1996 р. № 710 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/710-96-%D0%BF#Text (date accessed: 06.01.2025).

> The amount of remuneration of a specialist, if the work performed is not their official duty, is calculated for each hour in proportion to the *average salary of the person* calculated in accordance with paragraph 3 of clause 2 of the Procedure for calculating the average salary [89] (total amount of payment *cannot exceed* the amount calculated for the relevant time, taking into account the *triple amount of the subsistence minimum* for able-bodied persons).

Thus, the Procedure for Calculating Average Wage determines the amount of the average wage based on payments received by an employee, in particular, *"for the last two calendar months of work preceding the month in which the event to which the relevant payment relates occurs"* (paragraph 4, clause 2) [90]: that is, if two or more specialists whose salaries differ by their main place of work perform completely identical work in criminal proceedings, they receive different remuneration. This approach contradicts part 2 of Article 23 of the Universal Declaration of Human Rights: *"Everyone, without any discrimination, has the right to equal pay for equal work"* [91]. This problem is absent only when the amount of payment for each specialist is limited to the maximum amount three times the subsistence minimum. Therefore, it is advisable to involve specialists with the same level of salary.

Conclusions

Obtaining evidence with involvement of a specialist or directly providing them with relevant documents has a number of specifics:

- range of areas from which specialists of foreign states or international organizations can be involved in procedural actions is limited to weapons (chemical, biological, radiation, nuclear or another one). The types and content of the documents created by them are limited;
- before entering data on the committed criminal offense into the Unified Register of Pre-Trial Investigations, the specialist may, in urgent cases, provide *reference* on any issues within the scope of his/her knowledge. After such introduction, there are restrictions: it is possible to provide *conclusions* (on any issues) in the investigation of criminal misconduct, *certificates or conclusions* on the identification of a person, weapons, drugs, etc., as well as *certificates* in the case of fixing the indications of technical devices or means. The requirements for the form are conditioned only on conclusions of a specialist in the investigation of criminal offenses, such conclusions should meet requirements for forensic expert conclusion;
- product of activities of a specialist in criminal proceedings is not only evidence, but consultations, explanations and testimonies that are useful for a clear testimony understanding;
- not all norms on the procedure for carrying out procedural actions clearly mention the possibility of in-

89 Порядок обчислення середньої заробітної плати : затв. постанов. КМУ від 08.02.1995 р. № 100 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/100-95-%D0%BF#Text (date accessed: 04.02.2025).

90 Там само.

91 Загальна декларація прав людини : прийн. і проголош. резол. 217 A (III) Генасамбл. ООН від 10.12.1948 р. URL: https://zakon.rada.gov.ua/laws/show/995_015#Text (date accessed: 06.01.2025).

volving a specialist. Involving a specialist in conducting certain investigative (search) actions and covert investigative (search) actions, which rules do not provide for this, may result in the recognition of the prosecution's evidence as inadmissible. The same consequences arise from involving a specialist in matters that are outside his procedural subject matter competence, in particular, obtaining conclusions from a foreign specialist: a specialist in matters not related to weapons, as well as obtaining certificates or conclusions from a specialist, for example, regarding cultural values, special technical means of covertly obtaining information (and not weapons and ammunition, etc.), forged documents, falsified (and not potent) medicines, etc., i.e. on matters that are outside the scope defined by law;

- costs associated with the involvement of specialists are procedural. Specialists are entitled to remuneration for the work performed, which they are paid if this is not their official duty. Such work is a paid activity. The requirements of labor and anti-corruption legislation indicate the admissibility of involving as a specialist in criminal proceedings those categories of persons for whom the performance of the relevant work is due to official duties for freely chosen work (for example, in a state research institution of forensic examinations) or the duties of military service.

A rather significant number of specifics and discussion points that can restrain the parties to criminal proceedings from involving a specialist obviously require a comprehensive review of the institution of a specialist in criminal proceedings.

Допустимість у кримінальному провадженні доказів, отриманих за участі спеціаліста

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Сторони кримінального провадження збирають і перевіряють докази із застосуванням, зокрема, спеціальних знань та навичок спеціаліста, залученого до проведення відповідних процесуальних дій. Спеціалістом завжди є фізична особа, яка має права та свободи, наслідком порушення яких може стати втрата доказом ознаки допустимості. Змагальність у кримінальному провадженні зумовлює спрямованість зусиль на пошук вразливості доказів протилежної сторони. Мета цієї статті — виявити умови, за яких надані спеціалістом докази здатні зумовити питання про допустимість їх застосування у кримінальному провадженні. Досягнення такої мети потребує сукупного застосування низки наукових методів, включно із догматичним, герменевтичним і порівняльно-правовим. У законодавстві допоміжну роль спеціаліста окреслено доволі чітко: це виконання оплачуваних робіт, відмовитися від яких не можна, якщо залучення здійснено за рішенням суду, слідчого судді, слідчого або прокурора. Водночас відсутність трудового договору, соціального й загальнообов'язкового страхування, обліку трудового стажу тощо такого спеціаліста погано узгоджується із засадами соціального захисту в Україні. Оплатний характер утворює юридичну дилему в разі заборони представникам певних професій здійснювати, окрім основної роботи, іншу оплачувану діяльність. Законодавство не забезпечує рівної оплати за рівну працю спеціалістів. Нещодавні зусилля законодавця розширити коло випадків залучення спеціаліста до кримінального провадження призвели до необхідності розрізняти їх за належністю до іноземної держави або міжнародної *організації, за фахом і видами виконуваних робіт. Наведені правові умови стосуються сфери прав людини, і їх не можна ігнорувати. Наявний стан унормування залучення спеціаліста у кримінальному провадженні підвищує ризик порушення цих прав стороною, що вдається до такого залучення, насамперед — стороною обвинувачення. Можливі ситуативні рішення: незалучення публічних службовців або обмеження кола залучених спеціалістів виняткового працівниками державних спеціалізованих установ, прийняття ризику визнання доказів недопустимими, зміна урядового акта про оплату праці спеціалістів із запровадженням як основного критерію складності (наукомісткості, безпечності, гігієнічності тощо) робіт (а не за рівнем заробітної плати за основним місцем роботи спеціаліста) і/або залучення виняткового осіб із рівним рівнем оплати праці тощо — є половинчастими й лише підкреслюють доцільність системного перегляду інституту спеціаліста у кримінальному провадженні.*

Ключові слова: *примусова праця; інша оплачувана діяльність; залучення спеціаліста; допустимість доказу.*

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Authors declare no competing interests

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Modern Approaches to Appraising Employee Professionalism in Forensic Institutions

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The research paper's purpose is to outline current approaches to appraising employees' professional level in forensic institutions, and to determine peculiarities of identifying and defining professional qualifications of an individual employee. For this purpose, the following general scientific methods have been applied by the authors: analysis, generalization, description, systematization, etc. The grounds for appraising forensic institution employees are singled out and its importance for ensuring employees' sustainable activities is stressed. It is argued that employees' appraisal is a rather complex staff work in terms of methodology and organization. What is more, it is part of staffing in forensic institutions. Additionally, it is emphasized that there is no single universal methodology suitable for solving the entire set of tasks arising during employees' appraisal, and this issue should be studied separately. Competent appraisal of forensic staff activities has been shown to improve staff selection and placement; development initiatives and employee activities; assess

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creative and professional capabilities of employees; identify needs for professional development; career planning and personal development of an employee; optimize the process of planning and organizing labor activities in forensic institutions.

Keywords: *employee; appraisal; potential; forensic expert institution; staffing; advanced training; professionalism appraisal; staff; human resources; competencies; competence; business qualities.*

Research Problem Formulation

The core resource of any institution is its staff, whose performance depends on professional development, qualification level, corresponding abilities, and acquired skills. However, sometimes there are difficulties in determining the employee's ability to perform specific tasks and his/her professionalism relying solely on official documents. This indicates the significance of human resource work with staff. It intends to optimize employee appraisal, which is designed to identify his/her long-term capabilities and level of professionalism. At the same time, properly conducted performance appraisal will enable each employee not only to understand one's strengths and weaknesses, but also to prevent mistakes while carrying out official duties in the future and will have a positive effect on further work.

The experience of the world's leading companies indicates that the best-performing institutions are those that give full focus to resolving staff issues. A special tool in this system is employee appraisal. It helps to receive information about the institution's needs for staff with required qualifications and their performance potential, draw up psychological portraits of employees and define their professional strengths and weaknesses, motivational needs, etc. The accumulated information serves as the basis for solving staff tasks and adopting efficient decisions. That is why an effective management system cannot exist without staff appraisal, which is a leading element in staff management. A qualitative appraisal of professionalism enables to assess the potential of each employee, compile training and further development programs, which is important for forensic institutions. Enhancing the efficiency of employee appraisal is impossible without the use of current methods; involvement of employees in periodic appraisal; self-analysis and self-development, etc.

Considering the above, the proposed study topic is relevant, since it is highly important to develop a comprehensive approach in order to appraise staff so that it would ensure efficient management of any forensic institution.

Analysis of Essential Researches and Publications

Many researchers have studied the essence of theoretical and methodological aspects of staff appraisal, including: staff appraisal efficiency; principles from which this process should stem; indicators determining the appraisal system, etc. L. Balabanova and O. Sardak once stressed that staff appraisal helps heads gain information about employees' performance, their potential capabilities and development prospects; identify the reasons for the ineffective performance of individual specialists; define ways to improve work organization, etc. What is more, the results of staff appraisal are based on a number of management decisions on recruitment and placement issues; acknowledging the contribution of each employee to the overall result; developing employee career paths; strengthening relationships between heads and subordinates, etc. However, during staff appraisal there are various obstacles that can prevent you from getting an objective result, namely: appraisal bias; misunderstanding by the employee of the necessity to implement it; inaccurate interpretation of received results, etc. [1].

K. Didur's research papers prove that domestic practice of staff appraisal tends to be incomplete, eclectic, when results are obtained using unrelated methods; there is a lack of systematicity and consistency in the application of appraisal procedures. The characteristic features of the current staff appraisal systems in Ukraine are a focus on simplified procedures and a lack of efficient feedback between participants in appraisal process. To enhance staff performance, it is proposed to: implement modern appraisal methods for all categories of staff; expand the access of each employee to his/her appraisal results; encourage greater employee participation in the appraisal process, etc. [2].

O. Krushelnytska and D. Melnychuk view staff appraisal as an element of general staff management and as a system of institutional personnel certification in various formats. Since appraisal results determine the employee's condition in the workplace, they should be considered a motivational factor for improving work performance and attitude to work [3].

V. Maltyz and Yu. Tarasenko delved into the essence of the staff appraisal concept, the purpose, principles, methodological approaches, and tools for its implementation. The researchers emphasized the significance of staff appraisal as a component of staffing policy in a modern institution and the need to utilize current staff appraisal methods to enhance the efficiency of institution management [4].

V. Pankova highlighted that staff appraisal plays a pivotal role in the selection of candidates for various positions, as psychological features, professional competence, and qualifications of a candidate for a position are identified using current appraisal methods. She reviewed the methods and outlined the staff appraisal system developed for all categories of institution employees. From the researcher's perspective, objective appraisal is possible only if all professional, qualification, personal,

1 Балабанова Л. В., Сардак О. В. Управління персоналом : підручник. Київ, 2011. 468 с. URL: http://moodle.nati.org.ua/pluginfile.php/12435/mod_resource/content/1/balabanova_l_v_sardak_o_v_upravlinnya_personalom.pdf (date accessed: 14.11.2024).

2 Дідур К. М. Сучасні методи оцінки персоналу. *Ефективна економіка*. 2011. № 11. URL: http://www.economy.nayka.com.ua/?op=1&z=776 (date accessed: 14.11.2024).

3 Крушельницька О. В., Мельничук Д. П. Управління персоналом : навч. посіб. Вид. друге, перероб. та допов. Київ, 2005. 308 с. URL: http://moodle.nati.org.ua/pluginfile.php/12135/mod_resource/content/1/file1.pdf (date accessed: 14.11.2024).

4 Малтиз В. В., Тарасенко Ю. В. Оцінка персоналу: сучасні методи та інструменти її проведення. *Економіка та управління підприємствами*. 2018. Вип. 19. С. 484—489. DOI: 10.32782/2524-0072/2018-19-73 (date accessed: 14.11.2024).

and business qualities of an employee are taken into account [5].

V. Chevhanova, relying on the analysis and systematization of scientific research in the field of staff appraisal, developed functions and criteria for such an appraisal system. She proved that appraisal process is aimed at recognizing a constructive link between the participants in this process as the main element of staff management system [6].

However, a wide range of scholars' papers did not focus on the specifics of evaluating the forensic institution staff. Moreover, the multifaceted nature of this topic and the need to apply a systemic approach to it necessitate additional research to enhance the efficiency of employee appraisals in forensic institutions under current conditions.

Article Purpose

Outline current approaches to appraising the professional level of forensic institution employees as well as point out peculiarities of identifying and determining the professional qualifications of a particular employee.

Research Methods

To distinguish between peculiarities in evaluating the professional level of forensic institution employees, general scientific methods have been applied: analysis, generalization, description, systematization, etc.

Main Content Presentation

The need to optimize the quality and composition of business entity staff, in particular, forensic institution staff, is due to the transition to market relations. Current trends in the development of human resources encompass:

- growing demand for skilled labor, increasing the price of the labor services it generated;
- significant strengthening of the human factor role in production or service sector;
- transition into strategic management within an organization, requiring high creative output from each employee [7].

Current human resources management involves expanding the use of employee appraisal results, since each institution aims to retain the best staff, establish the environment for their professional growth and development, and simultaneously eliminate inert, unskilled, and unpromising employees. The corresponding reaction of forensic institutions to the mentioned trends in personnel development should be a heightened focus on the development and implementation of efficient methods for appraising employees.

5 Панкова В. Д. Методики оцінки персоналу підприємства. *L Науково-технічна конференція факультету менеджменту та інформаційної безпеки Вінницького національного технічного університету* : мат-ли (Вінниця, 10—12.03.2021). Вінниця, 2021. URI: http://ir.lib.vntu.edu.ua//handle/123456789/37514 (date accessed: 14.11.2024).

6 Чевганова В. Я. Система оцінювання персоналу підприємства. *Ефективна економіка*. 2014. № 4. URL: http://www.economy.nayka.com.ua/?op=1&z=2906 (date accessed: 14.11.2024).

7 Суліменко Д. В. Щодо питання поняття й правового значення оцінювання працівників. *Право і суспільство*. 2020. № 2. Ч. 2. С. 82—86. URI: https://elar.naiau.kiev.ua/handle/123456789/29313 (date accessed: 14.11.2024).

We propose that the main objective institution's needs during employee appraisal are those related to obtaining information for the purpose of:

- identifying ways to improve skills and develop employees' abilities;
- developing differentiation of material reward amount;
- defining individual labor contribution of each employee;
- elucidating the best approach to the employee's tasks in a given position in the institution, etc. [8].

The employee's needs in the course of performance evaluation include:

- information about strengths and weaknesses of his/her performance;
- receiving material rewards that are adequate, from his/her perspective, to the work accomplished;
- comparing one's own contributions with those of colleagues to boost competitiveness [9].

One of the principal issues when appraising employees is collecting information. In practice, three main groups of information collection methods are employed:

- study of documents and other written sources;
- conversations and surveys;
- observation [10].

One of the leading methods of collecting information is an *appraisal interview*. A head conducts it with his/her subordinate. The purpose of such an interview is to analyze the result of resolving staff issues and the employee's performance of assigned tasks. This type of interview can also be used to make a decision about promoting a subordinate or upgrading his/her skills. In large institutions, especially when selecting leading specialists, an interview is conducted in two stages: first, with the HR department, and then with the head of a particular structural unit. Oftentimes, before the final interview, certificates about a candidate for a vacant position are received, as they enable to supplement information about the applicant's professional and personal characteristics [11]. Scholars distinguish between biographical, situational, and criterion interviews:

- A *biographical interview* is based on the applicant's personal data and comes down to addressing questions about his or her previous work and education. The disadvantages of this type of interview are that it does not provide corresponding appraisal of the applicant's actual situation;
- A *situational interview* is intended to substantiate the model for solving a specific situation, when the applicant for a position must lay out his/her vision for resolving a task. It usually has something to do with the future professional activity of an applicant for the

8 Петрова І. Окремі аспекти оцінювання професійно-кваліфікаційного рівня працівників судово-експертних установ. *Актуальні питання судової експертизи і криміналістики* : зб. мат-лів міжнар. наук.-практ. конф. з нагоди 100-річ. від дня народж. М. С. Романова (Харків, 17.05.2024). Харків, 2024. С. 199—201. URL: https://drive.google.com/file/d/1iixsJQVFIYr3-6qJCAIRtYNctCbPxWQS/view (date accessed: 14.11.2024).

9 Чевганова В. Я. Зазнач. твір. URL: http://www.economy.nayka.com.ua/?op=1&z=2906 (date accessed: 14.11.2024).

10 Петрова І. Зазнач. твір. URL: https://drive.google.com/file/d/1iixsJQVFIYr3-6qJCAIRtYNctCbPxWQS/view (date accessed: 14.11.2024).

11 Грішнова О. А., Наумова О. О. Оцінювання персоналу: сучасні підходи до забезпечення ефективності. *Формування ринкової економіки*. 2005. Т. 2. С. 42—50.

position in this institution. The value of such an interview is the opportunity to assess the applicant's practical skills;

- A *criterion interview* with a job applicant is carried out to obtain answers to questions relevant to future professional activities, and the applicant's answers are compared with previously defined criteria. The principal advantages of such an interview are the ability to evaluate the job applicant's actions in the simulated professional activity and arrange them in the order of achieving results. The disadvantages of such an interview include the limited characteristics of the job applicant to be assessed [12].

In the course of interview, it is important to note that conversation is a method of obtaining psychological information relying on speech (verbal) communication. Adequate conduct of an interview alongside other methods of staff appraisal ensures a high degree of efficiency in predicting how an applicant will work in a specific position.

The method of supervising employees' activities by heads is also employed as a source of information obtained during business games, trainings, internships, performance of tailored tasks, etc.[13]. An essential component of employee appraisal is the procedure itself, which should give answers to a number of questions:

- "Who conducts appraisal?";
- "What is the procedure for its implementation?";
- "What hardware and software are used?";
- "How are appraisal results drawn up?";
- "How are they going to be used in the future?"

Appraisal of an employee belongs to the procedure carried out to identify the degree of compliance of the employee's personal qualities, quantitative, and qualitative results of his/her activities with certain requirements and criteria. The employee's capabilities must align with the requirements of certain job duties, content and nature of work, as well as the requirements determined by the effective organization of specific forensic institution activities, the use of most reasonable work methods, hardware and software, etc.

Let us stress that not only the employee's potential capabilities, his/her professional competence are evaluated, but also utilization of this professional potential in the course of fulfilling assigned tasks; compliance of the process of performing these tasks with the imaginary ideal model, specific conditions of activity, and work results with regulatory requirements, planned indicators, goals [14].

The task of appraising an employee's business characteristics is to reveal his or her labor potential; the extent to which this potential is realized; the employee's suitability for the position or his/her

12 Монстович-Артем'єва П. Ефективні методи оцінки персоналу на різних підприємствах. *Вісник Київського інституту бізнесу та технологій.* 2016. № 2. С. 53—54. URL: http://nbuv.gov.ua/UJRN/Vkib_2016_2_40 (date accessed: 14.11.2024).

13 Бондаревська К. В., Сорокотяга Т. Л. Оцінка персоналу: сучасні методи та інструменти її проведення. *Проблеми і перспективи розвитку підприємництва.* 2013. № 2. С. 28—32. URL: http://nbuv.gov.ua/UJRN/piprp_2013_2_8 (date accessed: 14.11.2024).

14 Данилюк І. О. Теоретичні аспекти оцінки трудового потенціалу підприємства. *Вісник економічної науки України.* 2006. № 1. С. 50—52.

readiness to hold a particular position. It is conducted in order to characterize the efficiency of his/ her performance and, at the same time, to determine an employee's value for a forensic institution. Another task of this appraisal type is to deliver feedback: an employee should know how the forensic institution leadership evaluates results of his/her activities, assesses his/her desire for qualitative performance.

The position of western experts in the field of management regarding the appraisal of an employee's business qualities is quite reasonable: such an appraisal should be viewed as an opportunity to candidly talk about the progress of the employee's activity and choose ways to enhance this activity. It is necessary for the employee to understand:

- what types of mistakes he/she makes;
- what mistakes are linked to his/her personality;
- how to reach full potential [15].

Let us emphasize that appraisal of an employee's business qualities is directly linked to improving the efficiency of any organization, specifically the forensic institution, as its results provide the opportunity to:

- improve staffing by selecting applicants most suitable for a specific position;
- enhance the use of employees' abilities, promote their career advancement;
- identify ways to provide advanced training;
- encourage employee engagement by ensuring a closer link between remuneration and performance;
- improve forms and methods of work of institution heads and its structural units;
- cultivate a positive mindset to work;
- increase job satisfaction, enhance both its prestige and human-centered qualities [16].

Researchers point out that evaluation of an employee's business qualities will meet the goal, provided that it is carried out in conformity with certain principles (which should also be taken into account by forensic institutions), such as:

- *Publicity* is deeper acquaintance of employees with the procedure and methodology of appraisal, communicating the results to all persons concerned;
- *Democracy* is public involvement in the appraisal process;
- *Simplicity, clarity and accessibility* of the appraisal procedure;
- *Unity of appraisal requirements* for all specialists in related positions;
- *Efficiency* is timeliness and speed of appraisal, its regularity;

15 Овчиникова М. О., Делієва Є. С. Забезпечення ефективного проведення оцінки персоналу. *Вісник Херсонського національного технічного університету*. 2020. № 1 (2). С. 62–67. URL: http://nbuv.gov.ua/UJRN/Vkhdtu_2020_1%282%29__10 (date accessed: 14.11.2024).

16 Стахів О. Проведення оцінки персоналу на підприємстві з метою стимулювання працівників до підвищення кваліфікації. *Україна: аспекти праці*. 2007. № 1. С. 29–35. URI: http://dspace.nbuv.gov.ua/handle/123456789/20039 (date accessed: 14.11.2024) ; Ушкальов В. В. Особливості оцінки ефективності процесу розвитку персоналу. *Глобальні та національні проблеми економіки*. 2018. Вип. 23. С. 326–329. URL: http://global-national.in.ua/archive/23-2018/64.pdf (date accessed: 14.11.2024).

- *performance* is mandatory and prompt adoption of measures based on appraisal results;
- the highest possible *automation* of the appraisal procedure [17].

Employee appraisal is a complex methodologically and organizationally complex staff work that is part of staffing for forensic institutions. It is worth mentioning that no single universal methodology is suitable for solving the entire range of tasks set for appraising the forensic institution staff, and it is unlikely that anyone will offer it in the short term. There are no well-established methodologies for employee appraisal abroad either. This situation necessitates the development of its own appraisal program, including the methodology for conducting it, or the amendment of standard guidelines, use the experience of other institutions and adapt it to the specifics of its activities [18].

There are a number of ways to evaluate a forensic institution's work by areas of activity. If it is necessary to evaluate an employee's personal qualities in a specific position, then it is required to specify what kind of qualities:

- chosen from a large list,
- considered basic for an employee holding a specific position;
- defining for a certain category of employees, etc.

This raises the question of whether the selected qualities or traits will help to objectively appraisal all employees using the same methodology, or whether the set of qualities should be different for each group of employees? What is more, appraisal of different forensic staff categories should be considered from various angles, as it may cover work process determined by external signs, assessment of labor costs and the complexity of tasks performed.

Each of the above approaches has the right to exist, has its own purpose, and provides guidelines for enhancing its application efficiency. When appraising performance, you need to have a clear idea of what results to appraise, whether they are the output of a particular employee's work efforts or a product of a collaborative effort. In this scenario, it is required to further evaluate the work of a particular employee.

The purpose of appraising employees' performance is quite diverse, covers many components, and heads expect a lot from the results of its accomplishment. Developed by D. McGregor, a distinguished specialist in staff development, it combines:

- *informative purpose* consisting in providing heads of various management tiers with all needed data on the work of their subordinates, as well as all appraised employees with data on their individual contributions and shortcomings;
- *motivational purpose* which involves linking material rewards and incentives to the employee's work behavior and performance, thus directing employees to improve activities in directions ensuring stability and competitiveness within an organization;
- *administrative purpose* that is implemented with the help of staff decisions drawn up on an objective

17 Данюк В. М., Петюх В. М., Цимбалюк С. О. та ін. Менеджмент персоналу : навч. посіб. Вид. 2-ге, без змін / за заг. ред. В. М. Данюка, В. М. Петюха. Київ, 2006. 398 с. ; Цимбалюк С. О., Білик О. М. Оцінювання персоналу : навч. посіб. Київ, 2021. 312 с. URI: https://ir.kneu.edu.ua:443/handle/2010/35638 (date accessed: 14.11.2024).

18 Петрова І. Зазнач. твір. URL: https://drive.google.com/file/d/1iixsJQVFIYr3-6qJCAIRtYNctCbPxWQS/view (date accessed: 14.11.2024).

and regulatory basis (decisions on promotion or demotion; assignment of another, more complex task; retraining and re-qualification; incentives or penalties; termination of the employment agreement, etc.) [19].

The principal function of appraising an employee's business qualities should be recognized as a motivational one. It encourages specialists of a forensic expert institution to expand their expertise and gain experience required for efficient task resolution not only in the present but also in the future.

Let us point out that the current state of forensic expert support for justice places new demands on the quality of forensic activities. Thus, it should be borne in mind that the success of any case is conditioned by:

- creative efficiency of an institution's employee;
- their willingness to take responsibility for their decisions;
- ability to work consciously, at full capacity, etc. [20].

Having the most qualified specialists at each stage of the production process, whose work is impeccable, is crucial to achieving the best results. Today, there are two ways to achieve this goal:

- *The first approach* involves making requirements for employees more stringent; strengthening control over their activities; replacing under-skilled or insufficiently trained employees, etc. This approach enables to organize and strengthen discipline. However, results achieved are usually inconsistent, and negative consequences can be quite noticeable, since the fear of losing a job or making a mistake cripples the initiative and creativity in employees, which inevitably leads to a psychological barrier between employees and heads;
- *The second approach* is aimed at involving all employees in forensic institution management. Its appeal lies in the fact that it is possible to employ various methods to motivate employees, foster intrinsic motivation in employees; provide each of them with a chance to feel like a natural fit for the forensic institution; form the need to work in a team and develop continuously both professionally and personally [21].

It should be emphasized that in the conditions of increased competition on the labor market, such characteristics of the institution's staff as education, professional knowledge, practical abilities and skills, compliance of psychophysical and socio-psychological traits of a person with

19 McGregor D. The Human Side of Enterprise. N. Y. : McGraw-Hill, 1960. 256 p.

20 Спіцина Г., Лубенцов А., Угровецький О. Оцінювання діяльності працівників як засіб оптимізації роботи судово-експертної установи. *Актуальні питання судової експертизи і криміналістики* : зб. мат-лів міжнар. наук.-практ. конф. з нагоди 100-річ. від дня народж. М. С. Романова (Харків, 17.05.2024). Харків, 2024. С. 248—250. URL: https://drive.google.com/file/d/1iixsJQVFIYr3-6qJCAIRtYNctCbPxWQS/view (date accessed: 14.11.2024).

21 Петрова І. А., Курдес Е. П. Окремі аспекти оцінки ефективності діяльності працівників державних спеціалізованих судово-експертних установ. *Актуальні питання юриспруденції: теоретичний та практичний виміри* : мат-ли Третьої Міжнар. наук.-практ. конф. (Суми, 23.04.2020). Суми, 2020. С. 63—66. URL: https://ur.snau.edu.ua/wp-content/uploads/2021/01/%D0%B7%D0%B1%D1%96%D1%80%D0%BD%D0%B8%D0%BA-2020.pdf (date accessed: 14.11.2024).

profession requirements, diligence and motivation become important. Forensic institutions are not an exception.

Staff appraisal in the staffing of forensic institutions is regarded as an element of management and a system of employee attestation applied in the institution. This is an essential means of studying the quality of staff capacity within the forensic institution, its strengths and weaknesses, as well as a groundwork for improving the individual work abilities of an employee and upgrading his/her qualifications [22].

Therefore, *appraisal of employees* is the process of assessing the efficiency of fulfilling job duties and achieving the organizational purpose of the forensic institution, or the process of determining the conformity of qualitative staff (abilities, skills, motives, etc.) characteristics with the requirements for a position. Earlier we emphasized that appraisal of employees' performance in forensic institutions is carried out with the aim of:

- improving recruitment and placement;
- enhancing employees' initiative and creativity;
- assessing creative potential of employees;
- identifying needs for advanced training;
- career planning and personal development of staff;
- optimizing the planning process and organization of work within a forensic institution;
- analyzing adherence to job instructions [23].

Separately, we should pinpoint that that there is currently an increased focus on employee appraisal, both during recruitment and employment. This is driven by the need to ensure better performance within an institution. That is why, in today's realities, the issue of employee appraisal has become highly acute, and the need to address and implement it is no longer in doubt [24]. Nearly every aspect of staffing within a forensic institution is involved in appraising employee performance.

Appraising the performance of employees helps to identify and unleash the potential of each employee and direct this potential toward achieving the forensic institution's strategic goals. Keep in mind that in large institutions and companies, it is challenging to monitor and appraise the performance of employees as a whole and to determine the success rate of each individual employee. What is more, the more different positions in an institution, the more difficult it is to unify the procedure for appraising performance of employees and to develop such criteria and choose methods of their evaluation that can provide a comprehensive understanding of the success of an individual employee.

It should be borne in mind that if tasks and responsibilities are not well understood, any employee may experience anxiety affecting his/her work quality. That is why it is essential to formulate objective and understandable criteria for all employees

22 Стахів О. Зазнач. твір. URI: http://dspace.nbuv.gov.ua/handle/123456789/20039 (date accessed: 14.11.2024).

23 Спіцина Г., Лубенцов А., Угровецький О. Зазнач. твір. URL: https://drive.google.com/file/d/1iixsJQVFIYr3-6qJCAIRtYNctCbPxWQS/view (date accessed: 14.11.2024).

24 Бучинська Т. В. Оцінка персоналу як важливий елемент ефективного управління. *Проблеми системного підходу в економіці.* 2017. Вип. 1 (57). С. 59—64. URL: http://nbuv.gov.ua/UJRN/PSPE_print_2017_1_12 (date accessed: 14.11.2024).

by which leadership will appraise performance of an individual employee [25]. Each forensic institution develops these criteria following a certain algorithm in compliance with its purpose and the specifics of its activities. A number of issues related to low performance and low employee involvement in management can be addressed by supplementing the appraisal process with a one-on-one meeting between the head and each of his/her subordinates to provide feedback. It is advisable to plan such meetings at the end of the reporting period, when summing up and planning tasks for the next period.

We have already stressed that a properly organized event within the framework of the staff appraisal system in a forensic expert institution can contribute to a number of positive results:

- reaching agreements when appraising results of an employee's activity for the reporting period;
- documenting results of assigned tasks;
- providing feedback on employee performance effectiveness;
- defining tasks that an employee must fulfil during the next reporting period;
- determining the limits of an employee's development and career growth [26].

Let us point out that the result of performance appraisal should be the employee's awareness of what mistakes he/she has made and what needs to be changed to unlock his or her professional potential.

Currently, in forensic institutions, HR departments practice measures that open up new opportunities and perspectives in employee appraisal. Automated employee performance appraisal systems developed at the time enable to perform full certification and appraise staff efficiency according to various parameters, significantly reduce the time and effort spent on employee appraisal, namely on collecting information, analyzing appraisal forms, and compiling analytical reports for each employee, etc.

We observed separately that external evaluation and self-appraisal are utilized in practice. *External appraisal* refers to the activity of the institution's head and the work team in evaluating the performance of an individual employee. *Self-appraisal* is performed directly by an employee: it stems from his/her own reflection on one's life purpose and performance results, prohibited ways of fulfilling them, and moral qualities required for high-quality task performance (conscientiousness, honesty, dedication to work, etc.) [27].

Employee appraisal in forensic expert institutions should be based on recognized principles, including objectivity, comprehensiveness, obligation, systematicity, etc. Integrated appraisal of employees utilizing a points-based system is quite often employed. The purpose of such an appraisal is to determine, by means of points, the most important characteristics (qualities or traits) of both the employee himself/herself and the work performed. When creating the profile of an employee's professionalism, we evaluate the following:

- professional qualifications;
- business qualities;
- complexity of fulfilled tasks;
- achieved result, etc.

25 Данилюк І. О. Зазнач. твір.

26 Спіцина Г., Лубенцов А., Угровецький О. Зазнач. твір. URL: https://drive.google.com/file/d/1iixsJQVFIYr3-6qJCAIRtYNctCbPxWQS/view (date accessed: 14.11.2024).

27 Там само.

An employee's professional qualification is determined by objective criteria common to all categories of the forensic institution staff: education; record of service in the specialty; professional development activity and professional skills upgrading. Each of these features is evaluated by a certain number of points. Other appraisal elements characterizing business qualities, complexity, and performance of both specialists and heads of various management tiers vary slightly in content and significance.

It is worth mentioning the fact that appraisal of employee performance results in forensic institutions must simultaneously take into account quantitative and qualitative characteristics of accomplished tasks, as well as their rhythmicity. Integrated appraisal of forensic institution heads and specialists should include an evaluation of their business qualities, complexity of tasks performed, and work results.

Most human resource management theorists consider professional qualifications as the key standard for appraising the level of staff training. It is a certain list of qualitative indicators that the institution's leadership must usually meet [28]. However, many practitioners suggest focusing on the study and evaluation of employees' professional competencies. This is due that staff reserve formation is viewed as an important direction in HR management. Employees are selected for managerial roles based on their leadership, organizational skills, and ability to take on responsibilities [29].

Relying on the results of analyzing scientists' achievements and summarizing expert practice, we have identified and systematized the main competencies that are important when assessing the professionalism of forensic institution employees, such as:

- *Professionalism*: an objective criterion of professionalism is defined by staff performance evaluation experts as an employee's in-depth knowledge of his/her professional duties, institution's principles and operational system, mastery of hardware and software to perform tasks in a particular position, etc.;
- *Work quality:* it is hard to assess the efficiency of employees without knowing how well each of them works (how many and what kind of mistakes they make, how often they postpone the completion of tasks, how responsible and attentive they are to their professional duties, etc.);
- *Resiliency:* a fair amount of attention receives such an indicator as resiliency (the ability to maintain professional qualities under conditions of increased workload intensity, amount of work, etc.) when appraising the performance of employees. Based on this indicator, a decision regarding the possibility or impossibility of promoting a particular employee is made in a forensic institution following the appraisal;

28 Виноградський М. Д., Виноградська А. М., Шканова О. М. Управління персоналом : навч. посіб. 2-ге вид. Київ, 2009. 502 с. URL: https://econom.lnu.edu.ua/wp-content/uploads/2018/07/Vynohradskyy-Pidruchnyk.pdf (date accessed: 14.11.2024).

29 Дмитренко Г. А., Шарапатова Е. А., Максименко Т. М. Мотивация и оценка персонала : учеб. пособ. Киев, 2002. 248 с. URL: https://maup.com.ua/ua/navchannya-u-maup/library/pidruchniki/upravlinnya-personalom/motivaciya_i_ocenka_personala.html (date accessed: 14.11.2024).

- *Results orientation* is one of the key indicators in the forensic institution human resources management system based on the goal, which is necessarily taken into account when appraising the performance of employees;
- *Initiative:* when an employee is proactive and independent, this indicates a high level of his/her motivation, as well as his/her willingness to work with limited supervision. When appraising employees' performance, this indicator must be kept in mind, since independent and proactive staff require a small amount of attention or time from their head, perform their duties perfectly, can bring something innovative, and are therefore ready for promotion;
- *Team player:* demonstrates the ability to work in a team, focusing on collective rather than personal success. These are also important indicators when evaluating an employee's performance;
- *Commitment to growth:* determines the employee's dedication; willingness to learn, improve, and develop; his/her personal goal coincides with the institution's goal. This is a huge advantage for the employee according to the results of evaluating his/her efficiency.

We have summarized and systematized the information obtained and argue that in the course of determining competencies of a forensic institution employee, the following should be considered:

- Each of the competencies should be defined by a group of experts (human resources staff, department heads, specialized employees, etc.) who are well versed in the specifics of a particular position;
- All competencies must be explicitly defined and clarified so that there is no ambiguity regarding their interpretation and understanding;
- Formulation of competencies should be available to all employees;
- The competence system should combine a reflection of the institution's current needs and a vision for its future development.

In practice, competencies are evaluated in compliance with the organizational scale developed in a specific forensic institution. To appraise forensic institution employees' business qualities, a certain set of evaluated attributes is pre-determined. We firmly believe that it is expedient to use the following common attributes when appraising forensic institution specialists:

- general training in the relevant subject area;
- ability to plan and organize work accurately;
- responsibility for assigned work;
- initiative and independence;
- ability to master new areas and methods and apply them in work;
- performance;
- communication skills, etc.

Selection of signs for appraising business qualities of heads of various management tiers within a forensic institution should be somewhat different, as it should take into account their ability to organize and educate subordinates. Forensic institution heads of various management tiers can be appraised in the following areas:

- qualification (comparison with a standard);
- work output (quality of performed tasks);
- personal characteristics (comparison with ideal characteristics required for the position).

To briefly summarize, we can stress that staffing is a system of measures taken by a forensic institution to attract the most qualified employees with excellent personal qualities. Staffing is one of the components of the institution's workforce management. It is a set of management decisions that have a decisive and long-term impact on the activities within an institution.

Recruiting should be deemed a rather expensive event, but crucial. This is due that its implementation requires a long time and certain experience, which is always a compromise between the desired and the real. Let us specify that funds for the development of forensic institution staff must be used efficiently. One of the important tasks of the recruitment agency is to analyze the required and actual number of employees according to available positions.

We underline that appraisal of the qualified professional staff in forensic institutions is a purposeful process of determining the conformity of employees' qualitative characteristics (abilities, capabilities, skills) to the requirements for a position. In turn, employee appraisal involves comparing certain characteristics of a specific institution's employee (professional qualifications, business qualities, work output, etc.) with relevant parameters, requirements, and standards for the position he/she is going to hold. Employee appraisal involves determining to what extent each employee achieves expected results in performance of assigned tasks and meets requirements of his or her job duties. Analysis of qualified professional staff is a procedure which is carried out with the purpose of determining the degree of conformity of the employee's personal qualities, quantitative and qualitative work results with regulatory requirements, the goal according to the position in a forensic institution.

Conclusions

In forensic institutions, employee performance appraisal is carried out in order to improve selection and placement of staff, cultivate initiative and creativity in staff; assess the creative potential of subordinates; identify needs for advanced training; ensure career planning and personal development; optimize the planning process and organization of work within a forensic institution. Overall, appraisal of forensic institution staff provides leadership with information about:

- employee performance;
- potential capabilities of staff and prospects for their growth;
- reasons for individual subordinates working inefficiently;
- training/advanced training needs and priorities.

At the same time, it should be emphasized that the following points should be taken into account when determining employees' competencies:

- Each of the competencies should be defined by a group of experts (human resources staff, department heads, specialized employees, etc.) who are well versed in the specifics of a particular position;
- All competencies must be explicitly defined and clarified so that there is no ambiguity regarding their interpretation and understanding;
- Formulation of competencies should be available to all employees;
- The competence system should combine a reflection of the institution's current needs and a vision for its future development.

Сучасні підходи до оцінювання професійного рівня працівників судово-експертних установ

Ірина Петрова, Ганна Спіцина

Мета статті — висвітлити сучасні підходи до оцінювання професійного рівня працівників судово-експертних установ, окреслити особливості виявлення та визначення професійної кваліфікації окремого працівника. Для досягнення мети застосовано такі загальнонаукові методи: аналізу, узагальнення, опису, систематизації тощо. Виокремлено підґрунтя для оцінювання фаховості працівників судово-експертних установ і зауважено про його важливість для забезпечення стабільної діяльності таких працівників. Аргументовано, що оцінювання працівників — доволі складна в методичному й організаційному плані кадрова робота, яка є складовою кадрового забезпечення судово-експертних установ. Окрім того, зазначено, що єдиної універсальної методики, придатної для розв'язання всього комплексу завдань, які виникають під час оцінювання працівників, не існує, і це питання потребує окремого дослідження. Доведено, що грамотне оцінювання діяльності працівників судово-експертних установ сприяє поліпшенню добору й розстановки кадрів; розвиткові ініціативи й активності працівників; з'ясуванню творчого й фахового потенціалу працівників; виявленню потреб у підвищенні кваліфікації; плануванню кар'єри й особистісного розвитку працівника; удосконаленню процесу планування й організації трудової діяльності судово-експертної установи.

Ключові слова: *працівник; оцінювання; потенціал; судово-експертна установа; кадрове забезпечення; підвищення кваліфікації; оцінювання професіоналізму; кадри; кадрові служби; компетенції; компетентності; ділові якості.*

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The authors state that there is no conflict of interest relating to this topic; although they are members of the advisory board of the collection, they did not participate in the decision to publish, and this article has been subjected to a full peer review and editing process.

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Research Papers

Peculiarities of circumstances to be established during investigation of criminal offenses related to interference with activities of representatives of public authorities

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The purpose of this study is to determine the peculiarities of the subject matter of proof in criminal offenses related to interference with activities of public authorities. For achieving this goal, the author uses general scientific methods (analysis, synthesis, abstraction, generalization), special and philosophical methods (dialectical, comparative legal, systemic and structural, and prognostic ones). Author analyzes issues of subject matter of proof in criminal offenses related to interference with activities of representatives of public authorities. Author determines composition of criminal offenses of the group under study, analyzes the approaches of scholars to interpretation of the list of circumstances to be clarified that makes possible to group them into three groups 1) circumstances revealing the mechanism of a criminal offense; 2) circumstances related to subjective characteristics of the person who committed offense; 3) other circumstances (amount of procedural costs; circumstances which are the basis for closing criminal proceedings; causes and conditions which contributed to the criminal offense commission, forms of counteraction to the investigation, etc.). The author outlines prospects for further researches within the issue scope under research.

Keywords: *criminal proceedings; criminal offense; proof; proof topic; interrogation; public authority; circumstances to be established.*

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Research Problem Formulation

Formation of an effective system of forensic support for investigation of criminal offenses related to activities of representatives of public authorities requires an indepth analysis of scientific best practices, study of judicial and investigative practice in cases of this category. This approach is necessary for development of theoretical principles that will contribute to development of effective practical recommendations for the investigation of these offenses and the definition of optimal approaches to their application in criminal procedural activities.

Bringing person to criminal liability is based exclusively on evidence assessment, therefore scientists pay significant attention to the issues of proving in criminal proceedings. Evidence theory is a component of criminal procedure science that studies the process of forming, verifying and evaluating evidence during pre-trial investigation and trial of the case. As S. Stakhivskyi rightly notes, the goal of criminal procedural proof is to establish the objective truth, which is achieved by fully and reliably clarifying all facts and circumstances that are important for correct resolution of the case. The set of such facts and circumstances determines the topic of proof in criminal proceedings [1].

In forensics science, the concept of "circumstances to be established (explained)" is used to denote qualitative guidelines vectors of investigation that are decisive for ensuring the procedure of proving. The place of these circumstances in the structure of methods for investigating individual criminal offenses, their content, essence and structure still do not have a unified interpretation. This is especially true of circumstances that need to be clarified during the investigation of criminal offenses related to interference in the activities of representatives of state authorities.

Agreeing with the opinion that circumstances to be clarified are a traditional component of certain forensic investigation methods, as they give the investigation purposefulness, determine the formulation of tactical tasks and contribute to its completeness and comprehensiveness in research on the course of the event that occurred [2], we believe that understanding these categories in the context of criminal offenses related to interference in activities of representatives of state authorities is a relevant task of modern scientific investigations.

Article Purpose

Determine the peculiarities of circumstances to be established during investigation of criminal offenses related to interfering with activities of representatives of public authorities.

Research Methods

General scientific (analysis, synthesis, abstraction, generalization), special and philosophical methods (dialectical, com-

1 Стахівський С. М. Теорія і практика кримінально-процесуального доказування : монографія. Київ, 2005. 272 с. URL: https://library.nlu.edu.ua/POLN_TEXT/UP/STAXIVSKIY_2005.pdf (date accessed: 13.02.2025).

2 Журавель В. А. Обставини, що підлягають з'ясуванню, у структурі криміналістичної методики. *Теорія та практика судової експертизи і криміналістики*. 2010. Вип. 10. С. 12–20. URL: http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/Tpsek_2010_10_6.pdf (date accessed: 13.02.2025).

parative law, systemic-structural, prognostic ones) were comprehensively applied.

Analysis of Essential Researches and Publications

Forensic methods and certain aspects of the pre-trial investigation of criminal offenses are thoroughly covered in research papers by: H. Avdeeva, L. Arkusha, V. Bakhin, R. Blahuta, V. Vapnyarchuk, A. Volobuyev, I. Hloviuk, V. Husieva, M. Danshina, V. Drozd, O. Dufeniuk, V. Zhuravlya, O. Kaplina, N. Klymenko, A. Kovalenko, V. Kovalenko, I. Kohutych, O. Kolesnichenko, V. Kolmakov, V. Konovalova, V. Kuzmichov, V. Lukashevych, Ye. Lukyanchikova, B. Lukyanchikova, O. Motlyakha, V. Nora, O. Oderia, I. Pyroha, O. Pchelina, V. Pchelina, O. Sainchina, E. Simakova-Yefremian, R. Stepanyuk, V. Stratonov, H. Teteryatnyk, V. Tishchenko, T. Fomina, A. Khytry, D. Tsekhan, K. Chaplynskyi, S. Cherniavskyi, Yu. Chornous, V. Shepitko, V. Shevchuk, M. Shcherbakovskyi, B. Shchura, V. Yusupov, et al.

The circumstances to be clarified during investigation are the subject of researches by: A. Antoshchak [3], V. Zhuravel [4], S. Knizhenko [5], V. Kolesnikov [6], O. Pchelina [7] and V. Pchelin [8], Z. Toporetska [9], O. Fedosova [10], et al.

Ukrainian scholars pay attention to development of certain aspects of foren-

3 Антощак А. Р. Обставини, що підлягають встановленню під час розслідування привласнення, розтрати або заволодіння майном, шляхом зловживання службовою особою своїм службовим становищем. *Науковий вісник Ужгородського національного університету. Серія: Право*. 2016. Т. 2. Вип. 38. С. 95—98. URI: https://dspace.uzhnu.edu.ua/jspui/handle/lib/12317 (date accessed: 13.02.2025).

4 Журавель В. А. Зазнач. твір. URL: http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/Tpsek_2010_10_6.pdf (date accessed: 13.02.2025).

5 Книженко С. О. Криміналістична характеристика злочинів, що вчиняються шляхом незаконного втручання в діяльність судових органів або протиправного впливу на учасників судочинства. *Право і суспільство*. 2016. № 2. С. 196—200. URL: http://pravoisuspilstvo.org.ua/archive/2016/2_2016/part_1/36.pdf (date accessed: 13.02.2025).

6 Колесніков В. В. Обставини, які підлягають доказуванню в кримінальному провадженні при розслідуванні злочинів, пов’язаних із пожежами. *Теорія та практика судової експертизи і криміналістики*. 2016. Вип. 16. С. 84—90. DOI: 10.32353/khrife.2016.10 (date accessed: 13.02.2025).

7 Пчеліна О. В. Обставини, що підлягають з’ясуванню під час розслідування кримінальних правопорушень, і їхнє місце у структурі окремої криміналістичної методики. *Прикарпатський юридичний вісник*. 2020. Вип. 2 (31). С. 187—190. DOI: 10.32837/pyuv.v0i2(31).590 (date accessed: 13.02.2025).

8 Пчеліна О. В., Пчелін В. Б. Обставини, що підлягають з’ясуванню під час розслідування колабораційної діяльності. *Вісник Кримінологічної асоціації України*. 2024. № 3 (33). С. 370—381. DOI: 10.32631/vca.2024.3.34 (date accessed: 13.02.2025).

9 Топорецька З. М. Особливості початку кримінального провадження та обставини, які підлягають встановленню при розслідуванні службової недбалості. *Вісник кримінального судочинства*. 2018. № 1. С. 115—122. URL: https://vkslaw.com.ua/index.php/journal/article/view/249 (date accessed: 13.02.2025).

10 Федосова О. В. Обставини, які підлягають встановленню у ході розслідування корисливо-насильницьких злочинів, що вчиняються неповнолітніми. *Науковий вісник Дніпропетровського державного університету внутрішніх справ*. 2014. № 1. С. 305—313. URL: http://nbuv.gov.ua/UJRN/Nvdduvs_2014_1_42 (date accessed: 13.02.2025).

sic support for investigation of criminal offenses related to interference with activities of representatives of public authorities, in particular, circumstances to be clarified. For example, V. Husieva analyzed in detail the circumstances to be established during the investigation of interference with the activities of a law enforcement officer, noting that they are a separate independent structural element of the forensic methods for investigating criminal offenses [11]. Related issues, in particular, circumstances to be established during the investigation of interference with the activities of a defense counsel or a representative of a person, are studied by D. Rusanivska [12], and forensic expert activities by A. Posashkov [13]. At the same time, no systematic research on circumstances to be established during investigation of interference with the activities of representatives of public authorities has been conducted that indicates the urgency of addressing this issue.

Main Content Presentation

The correlation between the categories *proof topic* and *circumstances to be clarified* in scientific literature is still a matter of debate. Thus, O. Pchelina notes that the subject of proof covers all the circumstances to be clarified and determines the tasks of the investigation. At the same time, forensic characterization outlines the circumstances that could actually exist and the possible options for committing crime [14]. In our opinion, it is the mechanism of committing a criminal offense that reflects the events that took place and are related to the preparation, commission or concealment of a criminal offense. With regard to topic proof and the fact that it determines the tasks of the investigation, we should indeed agree with the scientist, since there is a certain correlation between these categories, since clarification of the subject matter of proof is the prosecution duty (except in certain circumstances), as the legislator has stated in the relevant legal provisions and therefore each of its substantive components should correspond to certain tactical task.

Circumstances to be established play important role in the construction of forensic recommendations for the investigation of certain types of criminal offenses. This is due to their functions that consist in defining and formulating a set of pre-trial investigation tasks and determining the means of their implementation. Pre-trial investigation tasks are classified according to various criteria. According to the scope of the issues to be solved, they are divided into basic (general, core) and local (intermediate) ones and according to the

11 Гусєва В. О. Обставини, що підлягають з'ясуванню під час розслідування втручання в діяльність працівника правоохоронного органу. *Право і безпека.* 2021. № 2 (81). С. 97—103. DOI: 10.32631/pb.2021.2.12 (date accessed: 13.02.2025).

12 Русанівська Д. Д. Розслідування втручання в діяльність захисника чи представника особи : дис. … д-ра філос. Київ, 2023. 260 с. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/87c654d4-47e0-4e7b-ae7c-8ecfdc784aaf/content (date accessed: 13.02.2025).

13 Посашков О. О. Методика розслідування втручань в діяльність судового експерта : дис. … канд. юрид. наук. Харків, 2020. 200 с. URL: https://uacademic.info/ua/document/0420U101202 (date accessed: 13.02.2025).

14 Пчеліна О. В. Особливості предмета доказування у кримінальних справах про економічні злочини та їх вплив на методику розслідування : автореф. дис. … канд. юрид. наук. Харків, 2010. 19 с. URL: http://dspace.univd.edu.ua/xmlui/handle/123456789/2689 (date accessed: 13.02.2025).

scope of implementation, they are divided into strategic and tactical ones. Basic tasks are of a strategic nature, since they are the result of circumstances to be proven are aimed at achieving the goal of the investigation, are more stable and less dependent on situational factors. In contrast, local tasks are of a tactical nature and are clearly defined by situational conditions [15]. Guided by such principles, V. Zhuravel suggests making the basis of such circumstances of proof topic of, criminal-legal and forensic characteristics of a certain type of criminal offense [16]. We agree with V. Husieva, who notes that correct definition of the content of circumstances ensures planning and purposefulness of actions of the pre-trial investigation bodies, the prosecutor's office and the court, and also contributes to advancement of investigative versions and the development of tactical operations [17]. In addition, as V. Tishchenko notes, the circumstances to be clarified determine the final tasks of the investigation, influence the direction of investigative versions, the formulation of intermediate tasks at different stages of the investigation, and are taken into account in various investigative situations [18].

Thus, the circumstances to be investigated play important role in forensic investigation methods, as they determine the program of actions of authorized entities aimed at collecting reliable, sufficient, admissible and appropriate evidence. As E. Lukyanchykov notes, the prosecution accumulates information and selects it from the standpoint of relevance, admissibility and significance for the case [19].

Another debatable issue that arises while determining the circumstances to be clarified during the evidence is their place in the structure of forensic investigation methods. O. Pchelina suggests integrating these circumstances into the structure of the methods without isolating them in a specific section or subsection. She believes that it is advisable to consider them in connection with typical forensic situations, tactical tasks, versions and planning. This approach involves clarifying circumstances at the stages of collecting and verifying information about the crime, as well as at initial and subsequent stages of the pre-trial investigation. This position is logical, since it is consistent with the concept of a local topic of evidence and takes into account peculiarities of criminal proceedings in certain categories of crimes.

As for systematization of circumstances that are subject to clarification, for example, V. Tishchenko, while developing a methods for investigating mercenary and violent crimes, proposed to distinguish the following groups of circumstances:

15 Журавель В. А. Зазнач. твір. URL: http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/Tpsek_2010_10_6.pdf (date accessed: 13.02.2025).

16 Там само.

17 Гусєва В. О. Методика розслідування злочинів проти авторитету органів державної влади у сфері правоохоронної діяльності : монографія. Харків, 2020. 452 с. URL: https://files.znu.edu.ua/files/Bibliobooks/Inshi71/0052079.pdf (date accessed: 13.02.2025).

18 Тищенко В. В. Корыстно-насильственные преступления: криминалистический анализ : монография. Одесса, 2002. 360 с. URL: https://coollib.cc/b/425251-valeriy-vladimirovich-tischenko-koryistno-nasilstvennyie-prestupleniya-kriminalisticheskiy-analiz/read (date accessed: 13.02.2025).

19 Лук'янчиков Є. Д. Методологічні засади інформаційного забезпечення розслідування злочинів : монографія. Київ, 2005. 360 с.

1) circumstances related to the crime event, in particular the fact of existence of a criminal event, method of its commission, tools and means, time, place and other conditions for the crime commission;
2) circumstances relating to the crime object, namely the criminal offense topic, victim identity and civil plaintiff;
3) circumstances related to the persons who committed the crime, in particular personal data, information of criminal law significance, as well as information about the group of persons who committed the crime or engaged in mercenary and violent activities;
4) circumstances confirming the guilt of accused, criminal intent and mercenary motive;
5) circumstances characterizing consequences of the crime (degree of implementation of criminal intent; the fact of the seizure of property; nature and severity of the bodily injuries inflicted on the victim, or the fact of his death; amount of damage caused, as well as the share of stolen property at the time of the crime being solved) [20].

Thus, the author based the model on the circumstances that are primarily related to the composition of the criminal offense, as well as those that are the topic of proof. We share this approach. Thereby while analyzing the studied group of criminal offenses, we will be guided by this approach, focusing on each corpus delicti.

There are other approaches to grouping the studied circumstances. For example, O. Oderii distinguishes three main groups of circumstances:
1) directly related to the crime event;
2) characterizing offender identity;
3) additional ones, that can be relevant for criminal proceedings [21].

We are impressed by the approach of O. Pchelina and V. Pchelin, who propose to combine the circumstances into three groups:
1) characterizing the event of criminal offense;
2) characterizing offender identity;
3) affecting the adoption of procedural decisions.

According to the position of scientists, these circumstances are clarified by: 1) recording the results of procedural, investigative (search) and covert investigative (search) actions; 2) identifying, collecting and investigating the traces of a criminal offense; 3) maintaining forensic records; 4) attracting special knowledge and conducting examinations [22].

Agreeing with this approach, we note that determination of the circumstances to be clarified should be carried out taking into account the type of criminal offense (its composition), circumstances to be proved and investigative situation at a certain stage of the proceedings. This approach will contribute to more effective planning of investigative (search) actions

20 Тіщенко В. В. Концептуальні основи розслідування корисливо-насильницьких злочинів : автореф. дис. … д-ра юрид. наук. Харків, 2003. 53 с. URL: https://dspace.nlu.edu.ua/bitstream/123456789/13974/1/Tischenko_2003.pdf (date accessed: 13.02.2025).

21 Одерій О. В. Проблеми теорії та практики розслідування злочинів проти довкілля : дис. … д-ра юрид. наук. Харків, 2015. 499 с. URL: https://uacademic.info/ua/document/0515U000869 (date accessed: 13.02.2025).

22 Пчеліна О. В., Пчелін В. Б. Зазнач. твір. DOI: 10.32631/vca.2024.3.34 (date accessed: 13.02.2025).

and implementation of the tasks of criminal proceedings.

Interference in activities of judicial bodies has a number of specific signs. Its direct object is social relations in the activity field of judges and other persons involved in the administration of justice on any legal basis. The suffered from of such a criminal offense are judges, jurors, candidates for judges and other persons participating in legal proceedings. The topic of social relations is the legal rights and obligations of professional judges, jurors, candidates for judges, as well as the rights of other participants in the trial (both voluntary and forcibly involved) provided for by law. Essence of interference covers any forms of active socially dangerous action aimed at implementing illegal methods of influence, in particular, obstructing activities of judges, examining magistrate during consideration of criminal, administrative, civil, economic and constitutional cases, as well as making decisions during pre-trial investigation and conducting operational and investigative activities. Therefore, a criminal offense provided for in Part 1 of Article 376 of the Criminal Code of Ukraine can be committed exclusively with direct intent [23].

Intellectual signs of intent aimed at interfering in the activities of judicial bodies: 1) awareness by perpetrator of the fact of illegal influence on a judge or juror; 2) understanding of the status of person being influenced; 3) awareness of nature of such influence by the judge or juror; 4) use of official position to exert influence (under Part 2 of Article 376 of the Criminal Code) [24]. The volitional component of intent consists in the perpetrator's desire to influence a judge or juror through requests; threats; instructions; criticism in the media (not related to the legal assessment of the judge's activities); other illegal methods of influence.

If intervention prevented the prevention of a crime or the detention of the offender (Part 2 of Article 376 of the Criminal Code) [25], the fault can be of a mixed nature (intent regarding intervention and negligence regarding consequences) or be intentional in general.

Mandatory composition element of criminal offense under Article 376 of the Criminal Code is availability of a purpose to influence a judge or juror. The subject of the offense can be any physical convicted person who has reached the age of 16 years. Such an age is justified, since at this age a person is able to realize social danger of influencing the judicial system.

Interference with activities of a law enforcement officer has a number of specific signs. The main direct object of this criminal offense is authority of a law enforcement officer that is embodied in social relations that regulate his powers and role in maintaining law and order. These social relations are based on the recognition of the right of a law enforcement officer: 1) exercise control and supervision over compliance with the Constitution of Ukraine, laws and other regulatory legal acts; 2) ensure law and order and protect the rights of citizens; 3) apply state coercive measures to offenders within the limits of their powers. The victims of this criminal offense are law enforcement officers. This status is determined on the basis

23 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: 13.02.2025).

24 Там само.

25 Там само.

of the Law of Ukraine: *On State Protection of Court and Law-Enforcement Bodies Staff* [26] that covers representatives of the prosecutor's office, the National Police, SSU, SBI, State Border Guard, penal institutions, etc. Most often, victims are employees of the National Police, prosecutor's offices, and penal institutions.

Any unlawful interference or encroachment on activities of a law enforcement officer undermines his authority and poses a threat to effective performance of state functions in the field of law enforcement.

Interference in activities of law enforcement officer can only occur through active actions. The methods of such interference include: blackmail, deception, breach of trust, bribery, illegal demands, picketing of law enforcement agency premises, failure to provide a law enforcement officer with technical or material means necessary for performance of official duties, etc. These actions are always aimed at obstructing performance of official duties or achieving the adoption of an illegal decision. Criminal offense is considered completed regardless of whether an illegal decision was made.

Forms of interference include coercion, blackmail, threats, denial of legitimate benefits, or other unlawful methods of influence. It is necessary to determine whether these actions were one-time or systematic ones, as well as the duration of their commission.

The subject of this criminal offense is any natural person of sound mind who has reached the age of 16. If the crime is committed by an official, subject may only be a person who has reached the age of majority.

This criminal offense belongs to those that have a formal composition and can be committed only with direct intent. The intellectual component of intent is the awareness of the social danger of interference in activities of law enforcement officer and the volitional component is the desire to commit such an act.

In order to bring to criminal responsibility, it is necessary to be aware of all the signs that form the objective side of the crime. Under Part 2 of Article 343 of the Criminal Code, the offender has to understand that his act creates the conditions for the commission of a criminal offense by another person or prevents the offender from being detained [27].

The criminal offense provided for in Part 2 of Article 343 of the Criminal Code has a material composition and is characterized by a double or mixed form of guilt if the consequence of the act is failure to prevent a criminal offense. The mental attitude towards the consequences in the form of non-avoidance of the detention of a criminal can be both intentional and careless.

Motives that prompt a person to interfere with the activities of a law enforcement officer can be diverse and do not affect qualification of a criminal offense. Instead, they may be taken into account when imposing a sentence. Mandatory specific of subjective side of this criminal offense is a specific goal for preventing the law enforcement officer from performing his official duties or to achieve the adoption of illegal decisions.

26 Про державний захист працівників суду і правоохоронних органів : Закон України від 23.12.1993 р. № 3781-XII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2023).

27 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2025).

The list of persons who can be victims of interference in the activities of a statesman: the President of Ukraine, the Chairman of the Verkhovna Rada of Ukraine, people's deputies of Ukraine, the Prime Minister of Ukraine, members of the Cabinet of Ministers of Ukraine, judges of the Constitutional Court of Ukraine, members of the High Council of Justice, representatives of NABU, SBI, ESBU, Prosecutor General, Chairman of Accounting Chamber and other high-ranking officials [28]. It is important that these persons can be injured only during the direct performance of their official duties. At the same time, the term *statesman* does not have a clear normative definition that can generate discussions among scientists and practitioners, as well as create ambiguity in law enforcement.

The main direct object of the criminal offense provided for in Article 344 of the Criminal Code is legal relations that ensure the legal procedure for the activities of statesmen as a prerequisite for the proper performance of their official duties, in particular administrative and economic, control and audit or registration functions [29]. Additional object may be the authority of public administration bodies and legal entities of public law on whose behalf statesmen act.

Illegal influence on a public figure can be considered as a way of committing a criminal offense, but it is not a mandatory feature of the objective side of criminal offense. Such forms of influence are more technical and forensic than criminal and legal significance that is taken into account during pre-trial investigation.

Plenum of the Supreme Court of Ukraine in the resolution: *On the application by the courts of legislation providing for responsibility for encroachment on the life, health, dignity and property of judges and law enforcement officers* stipulates that interference can be carried out through persuasion, blackmail, threats to refuse to provide legitimate benefits or through other forms of influence [30]. In forensic literature, these forms are supplemented with illegal requirements, physical or mental influence, threats and other methods of obstructing activities of law enforcement officers.

Illegal interference in activities of a statesman has specific features that distinguish it from similar actions against law enforcement officers. The main difference is the use of exclusively intellectual forms of influence on the consciousness and will of a statesman. Such forms include: persuasion, blackmail, threats to refuse to provide legal benefits, dissemination of false information, provision of forged documents that can change or terminate performance of official duties.

If intellectual influence is combined with physical violence, death threats or damage to property, person's actions should be qualified by a set of criminal offenses. This approach provides an ade-

28 Попов В. Ю. Особа потерпілого від втручання у діяльність представників органів державної влади: іманентні ознаки елементу криміналістичної характеристики. *Вісник Кримінологічної асоціації України.* 2024. № 2 (32). С. 334—343. DOI: 10.32631/vca.2024.2.24 (date accessed: 13.02.2025).

29 Кримінальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2025).

30 Про застосування судами законодавства, що передбачає відповідальність за посягання на життя, здоров'я, гідність та власність суддів і працівників правоохоронних органів : постанова Пленуму ВС України від 26.06.1992 р. № 8 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/v0008700-92#Text (date accessed: 13.02.2025).

quate assessment of the public danger of the act.

The subject of a criminal offense may be a natural person of sound mind (citizen of Ukraine, foreigner or a stateless person) who has reached the age of 16. If the criminal offense is committed by an official using his official position (Part 2 of Article 344 of the Criminal Code), the subject may be a person who has reached the age of 18 years [31].

The main object of criminal offense provided for in Article 344 of the Criminal Code is legal relations that ensure the legal procedure for the activities of statesmen necessary for performance of their official duties. An additional object can be authority of public administration bodies or legal entities of public law.

Regarding criminal offenses under Part 4 of Article 157 of the Criminal Code, the main object is electoral and reference rights of citizens. Victims can be voters, candidates, members of election commissions, official observers, proxies of candidates and other participants in the election process. Obstruction of the exercise of voting rights can be groundless refusal to register a candidate, coercion to vote for a certain candidate, interference with campaigning activities, obstruction of broadcasting of campaign programs or illegal seizure of campaign materials. This act is aimed at creating artificial obstacles for citizens to exercise their voting rights and can be committed in the form of both action and inaction [32].

Such actions can include unlawful interference in the activities of proxies of candidates, representatives of political parties or blocs participating in electoral or reference processes, as well as in the activities of election commissions at all levels, if they are aimed at obstructing the exercise of voting rights.

Work obstruction of election commissions or referendum commissions can be manifested in sabotage of meetings, illegal interference in the registration of candidates, creation of artificial obstacles to decision-making within competence of the commission. If such actions are not intended to restrict the electoral rights of citizens, they can be classified as other crimes, in particular, encroachment on the activities of State bodies or public order.

If the obstruction is accompanied by violence or threats, it is regarded as a more serious crime (Part 2 of Article 157 of the Criminal Code) [33]. Violent actions may include physical violence, threats, damage or destruction of property, as well as psychological pressure.

The means of committing this criminal offense are bribery, deception and coercion. Bribery consists of offering material benefits (money, services, privileges, or other property benefits) with the aim of influencing exercise of an electoral or referential right. Deception is misleading the victim by spreading false information, falsifying documents, or concealing important facts. Coercion is expressed in illegal demands to change one's behavior in electoral procedure under the threat of dismissal, expulsion, restriction of rights, or other sanctions. The criminal offense has a formal component, in other words, it is considered completed from the moment the obstacles are created, regardless of actual impact on the electoral procedure.

31 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2025).

32 Там само.

33 Там само.

The subjective side of a criminal offense is characterized by direct intent. The subject can be any natural person of sound mind. Qualified types of offenses involve the use of violence or threats that significantly increases the social danger of the act.

Thus, the analysis of components of criminal offenses related to interference in the activities of representatives of state authorities allows us to state that this group should include the following mandatory components: 1) identity of the victim and his/her qualitative characteristic, such as belonging to a state authority; 2) subject of the crime is an individual who should have reached the age of 16, and in exceptional cases, when it comes to interference through abuse of official position, 18 years; 3) method of interference, which can be any; 4) special purpose of the interference; 5) availability of material consequences of the criminal offense provided for in Article 343 of the Criminal Code [34].

The circumstances to be determined during investigation of criminal offenses related to interfering with the activities of representatives of public authorities include those specified in Article 91 of Criminal Procedure Code of Ukraine [35].

Synergistic approach to taking into account composition of the criminal offense and the circumstances to be proved is reflected in the work of V. Husieva that reveals the circumstances under research on the example of interference in activities of law enforcement officer.

Circumstances to be clarified, according to the scientist, are:

1) identity of the victim (personal data, professional status, occupation);
2) official or public activities of the victim (confirmation of his/her performance of functions to ensure law and order or public safety);
3) obstruction event (time, place, situation and other circumstances under which occurred intervention);
4) means, tools and means of intervention (methods used in the preparation, implementation or concealment of a crime);
5) personality of the offender (personal data, professional and psychological characteristics, criminal record, relationship with the victim, financial status);
6) accomplices (persons who participated in the crime commission and their roles);
7) form of guilt, purpose and motive of the criminal offense (desire to interfere with legitimate activities of the victim);
8) damage (type, nature and amount of damage caused: physical, moral or material one);
9) circumstances mitigating or aggravating guilt;
10) grounds for exemption from criminal liability or closure of criminal proceedings;
11) reasons and conditions that contributed to the commission of a criminal offense [36].

Confirmation of a person's affiliation with a law enforcement agency is made by obtaining a copy of the order of appoint-

34 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2025).

35 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: 13.02.2025).

36 Гусєва В. О. Обставини, що підлягають з'ясуванню … . DOI: 10.32631/pb.2021.2.12 (date accessed: 13.02.2025).

ment, service certificate or other documents confirming the professional status of the victim. For example, for members of the security forces, such signs are official identity card, special badge, a uniform and police symbols. An important stage of the investigation is to find out the content of the victim's official duties, since it is obstruction of their performance that is the objective aspect of the criminal offense. Duties are set out in regulations and job descriptions (functional responsibilities).

It is especially important during investigation to determine and certify the status of the victim, the fact that he was performing official duties at the time of interference and the purpose of the criminal offense, which should be to obstruct performance of official duties or coerce him into making illegal decisions [37].

While determining the method of intervention, it is important to find out whether it had a complete structure, which contains the stages of preparation, direct commission and concealment, or was truncated. This approach makes possible to identify additional circumstances that can confirm the commission preparation for the criminal offense. For example, establishment of the fact of searching for accomplices can indicate preparation for the criminal offense commission and documentary evidence of these actions may be evidence of a previous conspiracy of a group of persons.

The mandatory stage of investigation is to establish the circumstances under which the act was committed (in particular, the time, place, situation, traces of a criminal offense, as well as the tools and means of its commission). Intervention can be carried out both orally and in writing, with or without the use of technical means. Analysis of investigative and judicial practice indicates that most often intervention is carried out by expressing verbal demands or using physical force without special tools.

Special role during the investigation is played by the identification of offender on the following grounds:

- socio-demographic data;
- physiological and psychological state;
- existence of criminal convictions or administrative offenses;
- employment location:
- financial condition (availability of real estate, vehicles, cash assets).

Particular attention should be paid to finding out the form of guilt, motives and purpose of the criminal offense. Interference in activities of a law enforcement officer may be committed only with direct intent, and its purpose is to interfere with the performance of official duties or coercion to make an illegal decision. If intervention is carried out to prevent a criminal offense or to detain the offender, the actions are qualified under Part 2 of Art. 343 of the Criminal Code [38].

Circumstances mitigating or aggravating guilt, grounds for exemption from criminal liability, as well as circumstances for which criminal liability is stipulated are also subject to proof. One of aggravating circumstances is the commission of a criminal offense in a state of alcohol or

37 Карпова Н. Проблемні питання визначення потерпілого від втручання в діяльність захисника чи представника особи. *Национальный юридический журнал : теория и практика*. 2017. Т. 25. № 3. С. 109—114. URL: http://www.jurnaluljuridic.in.ua/archive/2017/3/24.pdf (date accessed: 13.02.2025).

38 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2025).

drug intoxication (paragraph 13 of Part 1 of Article 67 of the Criminal Code) [39]. However, the analysis of investigative and judicial practice shows that only 33% of proceedings consider this fact as an aggravating circumstance. This is due to the insufficient work of investigators and inquirers to confirm such facts in the procedural order.

If a criminal offense is committed by a group of persons, it is necessary to determine the role of each accomplice. Particular attention should be paid to finding out the type and amount of damage caused, if any. Forensic examinations are the most effective way of such determination, but the amount of damage can be confirmed by other evidence.

An important element of the investigation is to find out the causes and conditions that contributed to the commission of a criminal offense. For example, during illegal extraction of amber in the Rivne region, interventions in the activities of police officers are often recorded by blocking roads, preventing video recording or sabotaging procedural actions. In such cases, it is advisable to organize the protection of open areas by law enforcement agencies and public formations. A similar list of circumstances is subject to clarification during the investigation of interference in the activities of a statesman (Article 344 of Criminal Code) [40].

As for the investigation of interference in activities of the judiciary, the method of interfering is also important. Most often, it consists in the expression of vague threats, other in content than they are due to Part 1 of Art. 377 of the Criminal Code (80% of verdicts we studied), in intrusive request (10% of the same verdicts).

Conclusions

A thorough definition of the composition of criminal offenses of the group under research and an analysis of scholars' approaches to the interpretation of the list of circumstances to be clarified, makes possible to group them into three groups:

1) circumstances that reveal the mechanism of the criminal offense (regarding the method and situation of commission; related to the person of the victim and the person of the offender that characterize criminal offense consequences);
2) circumstances related to the subjective characteristics of the person who committed a socially dangerous act (form of guilt, intent, purpose; onerous or mitigating guilt; which are grounds for exemption from criminal liability or punishment that exclude criminal liability; presence of accomplices);
3) other circumstances (amount of procedural costs; circumstances that are the basis for the closure of criminal proceedings; reasons and conditions that contributed to the commission of a criminal offense, forms of counteraction to the investigation, etc.).

We see prospects for further research in determining the tactical tasks of the investigation, taking into account the peculiarities of investigative situations, formation of which is typical during the investigation of criminal offenses related to involvement of representatives of State authorities in the activities, as well as procedural mechanisms for certifying the outlined circumstances.

39 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 13.02.2025).

40 Там само.

Особливості обставин, що підлягають установленню під час розслідування кримінальних правопорушень, пов'язаних із утручанням у діяльність представників органів державної влади

Володимир Попов

Мета роботи — визначити особливості предмета доказування у кримінальних правопорушеннях, пов'язаних із утручанням у діяльність представників органів державної влади. Для її досягнення застосовано загальнонаукові (аналіз, синтез, абстрагування, узагальнення) спеціальні й філософські методи (діалектичний, порівняльно-правовий, системно-структурний, прогностичний). Проаналізовано проблематику предмета доказування у кримінальних правопорушеннях, пов'язаних із утручанням у діяльність представників органів державної влади. Визначено склад кримінальних правопорушень досліджуваної групи, проаналізовано підходи вчених до тлумачення переліку обставин, які підлягають з'ясуванню, що дає змогу об'єднати їх у три групи: 1) обставини, що розкривають механізм кримінального правопорушення; 2) обставини, пов'язані із суб'єктивними характеристиками особи, яка вчинила правопорушення; 3) інші обставини (розмір процесуальних витрат; обставини, що є підставою для закриття кримінального провадження; причини й умови, які сприяли вчиненню кримінального правопорушення, форми протидії розслідуванню тощо). Окреслено перспективи подальших досліджень у межах досліджуваної проблематики.

Ключові слова: *кримінальне провадження; кримінальне правопорушення; доказування; предмет доказування; утручання в діяльність; орган державної влади; обставини, що підлягають установленню.*

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Declaration of Competing Interest

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Provision of Legal Assistance to Witness in Criminal Proceedings: Specifics and Problematic Issues

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This article purpose is to clarify specifics of determining legal status of a lawyer involved in providing legal assistance to a witness in criminal proceedings, to outline the problematic issues of his practical activity. General scientific methods were applied (analysis and synthesis, system analysis, logical-structural, generalization, comparative law one, etc.). It was found that legal status of lawyer involved in providing legal assistance to a witness remains undefined by law to this day, as is the legal status of defense attorney and representative of a person in criminal proceedings that creates basis for scientific controversy, in particular regarding the issue of defining powers of lawyer during practical activity. It was found that scientists define such activities and the powers of a lawyer differently. Under legislation of Ukraine, lawyer engaged to provide legal assistance to a witness does not provide either protection or representation, so this form of activity should be understood as another type of advocacy: lawyer does not acquire a derivative procedural status from the witness, that is, does not have his rights. At the same time, the lawyer prevents the violation of the witness's rights, is a guarantor of inadmissibility of arbitrariness or abuse of authority by representatives of security forces, ensures realization of the witness's procedural interests, his right to freedom from self-incrimination, preventing prosecution of knowingly innocent person and application of methods of psychological pressure, falsification or fabrication of individual information, things and documents, etc. Thus,

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the engaged lawyer contributes to implementation of many tasks, but his basic function is to ensure protection of witness's procedural interests and the realization of his rights. It is substantiated that involved lawyer has rights based on the general principles of criminal proceedings and guarantees that apply to him as a participant in the procedural action, as well as the powers guaranteed to him by the Law of Ukraine: On the Bar and Legal Practice. Despite supporting position on normative consolidation of the legal status of a lawyer involved in providing legal assistance to a witness, expediency of introducing such an entity as a legal consultant to the witness (legal attorney / procedural legal advisor) into criminal proceedings is refuted, since this contradicts constitutional rights.

Keywords: *criminal proceedings; lawyer; legal aid; witness; right to defense; legal status.*

Research Problem Formulation

One of inalienable rights of modern man is the right to protection. This cornerstone principle is enshrined in legislation of most democratic States that is a natural result of democratization and humanization of criminal justice field strengthening legal guarantees in terms of protecting the rights and legitimate interests of all its participants and ensuring fair and impartial justice for each person.

Traditionally, the right to protection is identified with the right of the suspect to use all available methods of legal protection of himself and defend his own legal position: namely, protection strategy. The right to protection is provided for in Article 59 of the Constitution of Ukraine: "Everyone has the right to professional legal assistance. In cases provided by law, this assistance is provided free of charge. Everyone is free to choose a defender of their rights" [1].

In order to implement this constitutional guarantee, the Law of Ukraine: *On the Bar and Legal Practice* (hereinafter referred to as *Law on the Bar*) defines powers and legal principles of the activities of the self-governing human rights institute of the Bar is the provision subject of professional legal assistance [2].

At the current stage of the state development, the issue of reforming the Bar has long been a pressing one. This is primarily due to the course of European integration chosen by Ukraine and introduction of European values, which will undoubtedly affect the reform of criminal justice system, lead to changes in a number of provisions of criminal procedure legislation, etc. At the same time, balanced opinions on the need to reform the Bar as one of the key components of the legal system of Ukraine have been voiced by academic community and human rights organizations for quite some time. Strengthening the Bar plays an important role in

1 Конституція України : Закон України від 28.06.1996 р. № 254к/96-ВР (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/254к/96-вр#Text (date accessed: 05.02.2025).

2 Про адвокатуру та адвокатську діяльність : Закон України від 05.07.2012 р. № 5076-VI (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/5076-17#Text (date accessed: 05.02.2025).

the process of democratization of society, as lawyers are the main participants in ensuring fair trial and providing legal aid [3].

Analysis of judicial practice, media content and social networks shows that the level of public trust in lawyers currently is quite low, sometimes even lower than in representatives of pre-trial investigation bodies and judges [4]. In the conditions of the legal regime of martial law, issue of functioning of the Bar institution has become significantly aggravated (in particular, in the field of protection of the rights of citizens) and is becoming a powerful catalyst in realizing the urgent need to develop concept of reform of this institution as soon as possible [5].

Obviously, during armed conflict, realization of everyone's right to defense is significantly complicated, since both constitutional level and basic legislation provide for mechanisms that imply restrictions on certain human and civil rights and freedoms. Among numerous consequences of this state of affairs, it is the issue of improving mechanisms for providing legal assistance to witnesses in criminal proceedings that attracts our attention: this institution of criminal procedure is one of the basic ones, as it is related to ensuring rights of a person who, in practice, often acquires the status of suspect that leads to legally significant consequences for a particular person. The current legislation is the least clear on the rights of witnesses (in particular, the right to legal aid), so we believe that this issue requires immediate attention from both legal practitioners and academic community.

Conceptually recognizing the need to reform institution of advocacy and legislation in Ukrainian society, which constitutes the legal basis of advocacy [6], as well as unconditionally sharing axiomatic nature of the thesis that it is the advocacy system that guarantees implementation of the principles of the rule of law in a democratic State [7], we consider it necessary to outline basic guidelines in the context of increasing the legal protection of witnesses in criminal proceedings. First of all, we will focus on the analysis of organizational and legal framework for providing legal assistance to witnesses in criminal proceedings.

Article Purpose

Find out the legal status peculiarities of a lawyer involved in providing legal assistance to a witness in criminal proceedings and to analyze problematic issues of his/her practice.

3 Маркович Х. М. Права і свободи людини в умовах воєнного стану: фокус пріоритетів. *Аналітично-порівняльне правознавство*. 2023. № 4. С. 95—99. DOI: 10.24144/2788-6018.2023.04.13 (date accessed: 05.02.2025).

4 Пошиванюк Т. Проблеми забезпечення права на захист під час війни. *Публічне право*. 2024. № 3 (55). С. 5—12. DOI: 10.32782/2306-9082/2024-55-1 (date accessed: 05.02.2025).

5 Коломойцев М. М. Сучасні виклики в захисті підозрюваного під час воєнного стану. *Вісник Луганського навчально-наукового інституту ім. Е. О. Дідоренка*. 2024. Вип. 3 (107). С. 97—105. DOI: 10.32782/2786-9156.107.3.97-105 (date accessed: 05.02.2025).

6 Inshyn M., Shchokin R., Semenets-Orlova I., Kravchenko O., Barsuk M. The Role of Attorney's Request as a Communication Instrument in Advocacy. *Journal of Forensic Science and Medicine*. 2024. No. 10 (1). Pp. 34—41. DOI: 10.4103/jfsm.jfsm_114_22 (date accessed: 05.02.2025).

7 Oliinyk O., Bilan Y., Mishchuk H., Akimov O., Vasa L. The Impact of Migration of Highly Skilled Workers on the Country's Competitiveness and Economic Growth. *Montenegrin Journal of Economics*. 2021. Vol. 17. No. 3. Pp. 7—19. URL: https://ep3.nuwm.edu.ua/20736/ (date accessed: 05.02.2025).

Research Methods

A set of general scientific methods (analysis and synthesis, generalization, logical-structural approach, etc.) was applied. This made possible to conceptually assess typical approaches to determining essence of legal assistance provided by a lawyer involved by a witness and the limits of his legal status. Systematization of scientific provisions within the framework of the studied issues, highlighted in the scientific literature recently, made possible to identify certain differences between approaches of scientists. The author formulated his own opinion on the determination of the legal status of a lawyer involved in providing legal assistance to a witness in criminal proceedings, outlined certain problematic issues of his practice (in particular, in terms of rights and powers).

Analysis of Essential Researches and Publications

Functions of the Bar, as well as the issues of correlation between such legal concepts as *legal aid* and *defense function*, were studied by I. Hloviuk [8], V. Merkulova [9], V. Tertyshnyk [10], etc.

The provision of legal aid as a type of advocacy became the subject of monographs by V. Karpenko [11], O. Martovytska [12], K. Stoyanov [13], et al.

Systematic analysis of the provisions of the criminal procedural legislation in the context of determining components of the legal status of a lawyer providing legal assistance to witness was carried out by V. Zaborovskyi [14], T. Korcheva [15],

8 Гловюк І. В. Кримінально-процесуальні функції: теоретико-методологічні засади і практика реалізації : автореф. дис. ... д-ра юрид. наук. Одеса, 2016. 42 с. URL: http://hdl.handle.net/11300/3320 (date accessed: 05.02.2025).

9 Меркулова В. О. Функції адвокатури та відновне правосуддя: проблеми співвідношення. *Південноукраїнський правничий часопис.* 2023. № 3. С. 96—101. DOI: 10.32850/sulj.2023.3.16 (date accessed: 05.02.2025).

10 Тертишник В. М. Правнича допомога та функція захисту в кримінальному процесі: гармонізація доктрини. *Правова позиція*. 2017. № 2 (19). С. 128—137. URL: http://nbuv.gov.ua/UJRN/vamsup_2017_2_18 (date accessed: 05.02.2025).

11 Карпенко В. М. Право свідка на професійну правничу допомогу у кримінальному провадженні : дис. ... д-ра філос. Київ, 2022. 263 с. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/8a7880e7-d70e-498e-8026-faea06ca934b/content (date accessed: 05.02.2025).

12 Мартовицька О. В., Юхно О. О. Проблеми професійної правничої допомоги : теорія і практика : монографія. 2-ге вид., перероб. і допов. Харків, 2024. 420 с. URL: https://dspace.univd.edu.ua/server/api/core/bitstreams/87e1cb06-f938-451b-bad4-03c57304399a/content (date accessed: 05.02.2025) ; Мартовицька О. В. Реалізація правової допомоги на стадії досудового розслідування : автореф. дис. ... канд. юрид. наук. Харків, 2014. 22 с. URL: https://dspace.univd.edu.ua/server/api/core/bitstreams/1c26417b-87d4-4f7e-8d05-0ddd1c0c7b4f/content (date accessed: 05.02.2025) ; Її ж. Повноваження захисника при наданні правничої допомоги іншим учасникам кримінального провадження. *Європейські перспективи*. 2020. № 3. С. 102—109. DOI: 10.32782/EP.2020.3.15 (date accessed: 05.02.2025).

13 Стоянов К. С. Захисник та представник як учасники кримінального провадження у досудовому розслідуванні : монографія. Одеса, 2024. 263 с.

14 Заборовський В. В. Правовий статус адвоката свідка. *Науковий вісник Ужгородського національного університету. Серія: Право.* 2016. Вип. 36. Т. 2. С. 169—173. URL: http://nbuv.gov.ua/UJRN/nvuzhpr_2016_36%282%29__43 (date accessed: 05.02.2025).

15 Корчева Т. В. Надання професійної правничої допомоги свідку у кримінальному провадженні як вид адвокатської діяльності. *Порівняльно-аналітичне право*. 2018. № 1. С. 316—320. URL: https://dspace.nlu.edu.ua/handle/123456789/15683 (date accessed: 05.02.2025).

O. Panchuk [16], S. Rokun [17], O. Skriabin [18], O. Chepel and A. Habrelian [19], et al.

S. Rokun proposed to resolve the issue of legal regulation of the status of lawyer involved as a witness representative by supplementing and amending certain provisions of criminal procedural legislation. T. Korcheva expanded this idea: she formulated proposals for improving the provisions of Criminal Procedural Code of Ukraine and the Law on Advocacy. One of these is the position on statement of clause 2, Part 1, Article 66 of the Criminal Procedural Code in the following wording: "Use during criminal proceedings the professional legal assistance of a lawyer; representative whose authority to participate in criminal proceedings is confirmed by the documents provided for in article 50 of this Code, if the witness representative is a person who has the right to be a defense attorney in criminal proceedings" [20].

Some procedural aspects of providing legal assistance to a witness are disclosed in the research papers by O. Kuchynska and Yu. Tsyhaniuk [21], O. Baik [22] et al.

Attention of scholars to the issues of providing legal aid to witness in criminal proceedings demonstrates their relevance. At the same time, the analysis of legal provisions demonstrates a certain controversy of certain provisions within this issue. We believe that these issues will remain a priority in scientific research, given development of international standards in the field of human rights protection, their implementation in the national practice of law enforcement agencies, as well as socio-political changes and dynamic development of society that emphasizes the relevance of the issues raised.

Main Content Presentation

The constitutional provisions guarantee the right of every person to defend themselves personally and, if necessary to seek professional legal assistance [23]. A person

16 Панчук О. В. Захист прав свідка у кримінальному процесі України. *Адвокат*. 2012. № 2. С. 46—48. URL: http://nbuv.gov.ua/UJRN/adv_2012_2_9 (date accessed: 05.02.2025).

17 Рокунь С. В. Проблеми визначення правового статусу особи, яка надає правову допомогу свідку в кримінальному провадженні. *Актуальні проблеми вітчизняної юриспруденції.* 2017. Вип. 5. С. 157—158. URL: http://apnl.dnu.in.ua/5_2017/38.pdf (date accessed: 05.02.2025).

18 Скрябін О. М. Захисник в кримінальному процесі: нормативно-правове дослідження : автореф. дис. ... д-ра юрид. наук. Запоріжжя, 2017. 39 с. URL: http://virtuni.education.zp.ua/info_cpu/sites/default/files/AREF_skryabin_0.pdf (date accessed: 05.02.2025).

19 Чепель О., Габрелян А. Адвокат свідка: проблематика правового статусу. *Collection of Scientific Papers «SCIENTIA»* (Helsinki, Finland; Jan 26, 2024). 2024. С. 131—136. URL: https://previous.scientia.report/index.php/archive/article/view/1530 (date accessed: 05.02.2025).

20 Корчева Т. В. Зазнач. твір. URL: https://dspace.nlu.edu.ua/handle/123456789/15683 (date accessed: 05.02.2025).

21 Кучинська О. П., Циганюк Ю. В. Проблемні питання правового регулювання участі адвоката у кримінальному провадженні для надання професійної правничої допомоги учасникам такого провадження. *Аналітично-порівняльне правознавство.* 2024. № 1. С. 598—603. DOI: 10.24144/2788-6018.2024.01.105 (date accessed: 05.02.2025).

22 Баїк О. І. Адвокат як процесуальний представник особи у кримінальному провадженні. *Наукові інновації та передові технології. Серія: Право.* 2024. № 3 (31). С. 506—516. DOI: 10.52058/2786-5274-2024-3(31)-506-516 (date accessed: 05.02.2025).

23 Конституція України ... . URL: https://zakon.rada.gov.ua/laws/show/254к/96-вр#Text (date accessed: 02.02.2025).

who has acquired the witness status in criminal proceedings is no exception to this rule. Witness is recognized as one of the participants in criminal proceedings, who can only be an individual who knows or may know the circumstances relating to a criminal offense and is subject to proof during investigation and who is summoned to testify [24]. It is immediately noticeable that the legislator has enshrined the possibility of acquiring the status of witness by a person summoned to testify, but in law enforcement practice, witnesses are involved not only in interrogations: witnesses participate in examinations, investigative experiments, identification and even sampling for examination.

The legislator chose the same approach with the restriction of the legal capacity of the witness while determining the rights and obligations of witness (Article 66 of the Criminal Procedural Code of Ukraine) [25], that in our opinion, negatively affects the determination of the legal boundaries of interaction of the prosecution with such a participant in criminal proceedings during the pre-trial investigation.

The legal guarantee of the possibility for a witness to engage a lawyer is provided for in clause 2 of part 1 of Article 66 of the Criminal Procedural Code of Ukraine, according to which a witness has the right to "use legal assistance of a lawyer whose powers are confirmed in accordance with the provisions of Article 50 of this Code" [26], i.e. whose information is entered by the regional bar council in the Unified Register of Advocates of Ukraine and whose activities have not been suspended or terminated by the bar council of the region to which he or she belongs. At the same time, at the time of involvement in a procedural action with his or her client, the advocate must provide a certificate of the right to practice law, warrant, an agreement with a defense counsel or a power of attorney from a body (institution) authorized by law to provide free legal aid.

Textual analysis of the content of Articles 65–67 of the Criminal Procedure Code that defines the boundaries of the legal status of a witness, makes possible to generalize that witness has the right to:

- know for which criminal proceedings he is involved and in connection with what;
- use legal assistance in all procedural actions in which he is invited to participate;
- for security in accordance with the Law of Ukraine: *On Ensuring Security of the Persons who Participate in Criminal Legal Proceedings*;
- get acquainted with the protocol of interrogation and file a request for amendments, additions and remarks to it, as well as personally make such additions and remarks;
- if necessary, use notes and documents;
- reimbursement of costs associated with the call for testimony [27].

The problem with current Criminal Procedural Code of Ukraine lies not only in limited interpretation of legal status of person involved as a witness in criminal proceedings, but in the lack of regulatory

24 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: 02.02.2025).

25 Там само.

26 Там само.

27 Там само.

consolidation of the legal status of lawyer whom the witness has engaged to provide legal assistance.

In scientific literature, some scholars propose to consider the witness's lawyer as an independent participant in criminal proceedings. V. Zaborovskyi justifies this thesis by saying that the interests of the witness are significantly different from the interests of the parties and other participants in criminal proceedings, who are represented or defended by lawyers, because the witness has no legal interest in the results of the case. The scholar defines a witness as a person who performs an auxiliary function, contributing to the implementation of full, comprehensive and fair justice in criminal proceedings. In the researcher's opinion, this contradicts the possibility of considering the witness's lawyer as his representative in criminal proceedings [28]. The author's position has some support in scientific community, but there are also diametrically opposed ones.

For example, I. Hloviuk believes that if witness is covertly criminally prosecuted (for example, before the moment of reporting suspicion, if person is questioned as a witness if there are grounds to believe that he or she can have committed a criminal offense, but the evidence for reporting suspicion is insufficient, or if investigator intentionally delays reporting suspicion), witness actually performs the function of protection from criminal prosecution. The scholar concludes that if witness has a personal interest in criminal proceedings, one can speak of contractual form of representation of his or her interests, when the witness's lawyer is his or her representative [29].

O. Shylo rightly focused not on the interest of the person in the criminal proceedings, but in availability of legitimate interests related to the conduct of proceedings. In particular, *"a witness who has fallen ill has an interest in being questioned at his place of residence; his legitimate interest is also manifested in the desire to ensure his own safety and the safety of close relatives in connection with participation in the proceedings. <…> The legitimate interest of persons in whose residence or other property an investigative action is being carried out is that their private life data should not be disclosed"* [30]. Therefore, it is inappropriate to rely exclusively on the interest of a person in the results of the criminal proceedings as the main characteristic that determines his request for legal assistance. A person engages a lawyer to protect his or her legitimate procedural interests, to prevent arbitrariness on the part of security forces representatives and to hold a knowingly innocent person accountable, prevent the violation of a person's right to freedom from self-incrimination, to prevent the use of prohibited methods of psychological pressure, falsification or fabrication of certain information, things and documents. Therefore, engaging a lawyer to provide legal assistance to a witness contributes to implementation of many tasks, but the basic function of his or her

28 Заборовський В. В. Зазнач. твір. С. 170–171. URL: http://nbuv.gov.ua/UJRN/nvuzhpr_2016_36%282%29__43 (date accessed: 05.02.2025).

29 Гловюк І. В. Зазнач. твір. С. 17. URL: http://hdl.handle.net/11300/3320 (date accessed: 05.02.2025).

30 Шило О. Г. Теоретико-прикладні основи реалізації конституційного права людини і громадянина на судовий захист у досудовому провадженні в кримінальному процесі України : монографія. Харків, 2011. С. 137–138. URI: https://dspace.nlu.edu.ua//jspui/handle/123456789/19837 (date accessed: 05.02.2025).

participation is to ensure the protection of witness's procedural interests and the exercise of his or her legal rights.

As for essence of the assistance provided by involved lawyer to a witness in criminal proceedings, not everything is clear either. In particular, R. Yemelianov notes that *"lawyer who provides legal assistance to a victim, civil plaintiff, civil defendant, witness, third party, in respect of whose property the issue of arrest is being resolved, is a representative who carries out representation, which is a different type of legal activity from defense and has no procedural relationship to ensuring the right to defense for the suspect. Just as a lawyer who protects a suspect, defense attorney should not have any relationship to providing legal assistance to a victim, civil plaintiff, civil defendant, witness. Lawyer is a natural person who carries out legal activities in accordance with the Law on the Bar, defense attorney and a representative are different subjects of criminal proceedings who by carrying out procedural activities and entering into procedural relations, provide legal assistance to other participants in criminal proceedings"*[31]. Therefore, the author to some extent identifies the witness with the victim, civil plaintiff and some other participants in criminal proceedings.

In our opinion, while resolving the issue of the essence of the services provided by the engaged lawyer to the witness, one should rely on provisions of the Law on the Bar, according to Article 1 of which the activity of a lawyer consists in the protection, representation and provision of other types of legal assistance to the client[32].

Protection is related to ensuring protection of the rights, freedoms and legitimate interests of a person: in criminal proceedings in the aspect of representing suspect interests, accused, defendant, convicted, acquitted person; in respect of whom the application of compulsory medical or educational measures is envisaged or the issue of their application is being resolved in criminal proceedings; person in respect of whom the issue of extradition to a foreign State is being considered; who is being held administratively liable during the case consideration of administrative offense.

Representation is a form of advocacy aimed at ensuring the realization of the rights and fulfillment of the obligations of the client in civil, commercial, administrative and constitutional proceedings, as well as in cooperation with state bodies, individuals and legal entities. It includes protection of rights and obligations of the victim during consideration of cases of administrative offenses, ensuring interests of the victim, civil plaintiff and civil defendant in criminal proceedings[33].

Therefore, the legislator did not mention the witness among the participants in criminal proceedings.

Other types of legal aid are provision of legal information, consultations and explanations on legal issues, legal support of the client's activities, as well as preparation of applications, complaints, procedural and other documents of a legal nature are aimed at ensuring implementation of the client's rights, freedoms and legitimate interests, preventing their

31 Ємельянов Р. О. Правове регулювання участі адвоката — представника потерпілого в кримінальному провадженні. *Європейські перспективи*. 2020. № 3. С. 128. DOI: 10.32782/EP.2020.3.18 (date accessed: 05.02.2025).

32 Про адвокатуру … . URL: https://zakon.rada.gov.ua/laws/show/5076-17#Text (date accessed: 05.02.2025).

33 Там само.

violation and facilitating their restoration in case of violation. Therefore, providing legal aid to a witness is another type of legal aid, which consists in ensuring the implementation of the client's rights, freedoms and legitimate interests, preventing their violation and facilitating their restoration in case of violation[34]. In addition, in subclause 4, clause 1, Article 19 of the Law on Advocacy, the type of legal activity is called *"providing legal aid to a witness in criminal proceedings"*[35]. Therefore, as in the Code of Criminal Procedure, in the aforementioned Law this type of activity is separated from defense and representation.

Another important aspect of the issue under study is the legal status of the lawyer involved by the witness to ensure his interests, prevent their violation and restore them (if necessary). While solving this issue, scientists are most often guided by the approach of legislator allowing the defender and the representative of the person in criminal proceedings to use the rights guaranteed to the suspect and the victim, respectively, thus, the principle of analogy. For example, V. Karpenko came to the conclusion that the procedural powers of a witness and a witness's lawyer can be classified into two following groups:

1) *witness rights that he exercises directly during interrogation or other procedural actions.* The rights of the witness's lawyer in this case are conditioned by guaranteeing the proper exercise of rights by the witness himself during the procedural action. This group includes those that ensure the proper conduct of investigative (search) and other procedural actions with witness participation among which:
   - right to be present during investigative (search) and other procedural actions with involvement of a person who is provided with legal assistance;
   - explain to the witness his right to refuse to testify about himself, close relatives and family members, as well as about information that is not subject to disclosure;
   - with the permission of investigator, detective or prosecutor to ask witness questions and make comments.

   These rights of a lawyer contribute to the proper exercise of the rights of a witness provided for by law, in particular the right to refuse to testify about himself, close relatives and family members, as well as the right to testify in his native or other language in which he freely operates[36];
2) *rights of witness which implementation can be entrusted to a lawyer* (these rights are exercised by a lawyer in the form of representation of the interests of a witness):
   - receive information about the reasons for summoning witness and the criminal proceedings in which the witness is being questioned;
   - object to illegal actions of the investigator, detective, inquirer or prosecutor and demand that objections be recorded in the relevant protocol;
   - get acquainted with protocols of investigative (search) and other pro-

34 Про адвокатуру … . URL: https://zakon.rada.gov.ua/laws/show/5076-17#Text (date accessed: 05.02.2025).

35 Там само.

36 Карпенко В. М. Зазнач. твір. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/8a7880e7-d70e-498e-8026-faea06ca934b/content (date accessed: 05.02.2025).

cedural actions carried out with witness participation, as well as submit a petition for amendments, additions and comments to;

- challenge interpreter involved in the witness interrogation;
- initiate application of security measures to the witness and submit other petitions provided for by law;
- make written statements, complaints, petitions and other legal documents on behalf of the witness;
- challenge decisions, actions or omissions of the investigator, detective, inquirer, prosecutor, investigating judge or court in the witness interests [37].

In our opinion, this approach is too overburdened with various powers, which are not even always derived from the status of a lawyer. In particular, the *obligation to explain to the witness his right to refuse to testify about himself, close relatives and family members, as well as regarding information that is not subject to disclosure*, current legislation completely imposes on the subject who conducts the interrogation or other verbal investigative (search) action. If we proceed from this position, it is more appropriate to mention provisions of the Law on the Bar that provide for lawyer rights.

O. Chepel and A. Habrelian propose to distinguish the following among the rights of the lawyer involved by the witness:

"1) Have a meeting with a witness before the first interrogation in compliance with the conditions that ensure confidentiality of communication;
2) provide brief consultations to the witness during interrogation and other procedural actions;
3) ask, with the permission of investigator, prosecutor, investigating judge, court, questions to the participants of procedural actions;
4) make written statements, complaints, petitions and other legal documents on behalf of the witness;
5) appeal procedural decisions, actions or omissions of the investigator, prosecutor, investigating judge, court;
6) make written comments on correctness and completeness of the records in the protocol of interrogation and other procedural actions;
7) get acquainted with the materials of criminal proceedings that directly relate to the rights and legitimate interests of the witness" [38].

Note that the list of persons who have the right to appeal procedural decisions, actions or omissions of the investigator, prosecutor, investigating judge, court is exceptional, as is the list of procedural decisions (actions, cases of inaction) that can be appealed. In particular, the definition of procedural decisions and actions (inaction) that can be appealed during the pre-trial investigation is contained in Art. 303 of Criminal Procedural Code of Ukraine [39]. Textual content analysis of this article makes it possible to generalize that none of its provisions applies to the witness, and even more so to the person who provides him/her with legal assistance. In our opinion, the rights

37 Карпенко В. М. Зазнач. твір. С. 143—144. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/8a7880e7-d70e-498e-8026-faea06ca934b/content (date accessed: 05.02.2025).

38 Чепель О., Габрелян А. Зазнач. твір. С. 135. URL: https://previous.scientia.report/index.php/archive/article/view/1530 (date accessed: 05.02.2025).

39 Кримінальний процесуальний … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 02.02.2025).

of lawyer in this case are due to nature of procedural action where he is involved together with the witness, as well as provisions of the Law on the Bar.

Normative uncertainty of the legal status of a lawyer involved in providing legal assistance to a witness in criminal proceedings has led to the emergence of a number of scientific approaches to solving this issue. Thus, I. Dubivka proposes to supplement the current Criminal Procedure Code Article 66-1: *Lawyer who provides legal assistance to a witness* with the following content:

"1. Lawyer who provides legal assistance to a witness is a person whose authority is confirmed in the manner prescribed by Article 50 of this Code. 2. The lawyer has the right to: 1) attend and participate in the conduct of investigative (search) and other procedural actions carried out with the participation of the witness; 2) get acquainted with the content of the protocols of investigative (search) actions carried out with the participation of the witness, make written comments; 3) draw up on behalf of the witness written statements, complaints, petitions and other documents of a legal nature; 4) file a petition for the application of security measures to the witness; 5) file complaints against the decisions, actions, inaction of the investigator, prosecutor concerning interests of the witness. 3. Lawyer may be invited by a witness or other persons at his request or in his interests" [40].

In our opinion, such a proposal is quite acceptable and deserves support, since the consolidation of these provisions will primarily determine the limits of the powers of the involved lawyer. This legislative novelty should fundamentally change existing procedural practice for the better, given that currently submission of applications and motions by attorneys-at-law at the stage of providing legal aid to a witness in criminal proceedings is often accompanied by actions that have no procedural basis, do not contribute to improving the quality of investigative (search) actions and do not have positive results in ensuring the interests of the client. Such procedural behavior leads to a delay in the course of investigative (detective) and procedural actions, exhaustion of the participants in the proceedings and the creation of a false impression of quality of legal services provided to the client. This can lead to the loss of an important witness for the resolution of the case and realization of tasks of criminal proceedings, create the risk of bringing the witness to criminal liability for misleading the court or other authorized body (Article 384 of the Criminal Code of Ukraine) [41], etc.

Other approaches arise and try to gain a foothold on this issue in scientific discourse. Thus, V. Karpenko proposes to supplement the current CPC Art. 67-2: *Legal Adviser to a Witness* that will contain a list of the rights and obligations of this person. Among the rights, the scientist defines the following:

"1) Be present during the investigative (search) and other procedural actions with witness participation;

2) explain to the witness his right to refuse to testify about himself, close relatives and family members, as well as about information that is not subject to disclosure;

3) with the permission of investigator, detective, inquirer or prosecutor, address questions and comments to the witness;

40 Дубівка І. В. Діяльність адвоката в стадії досудового розслідування : автореф. дис. … канд. юрид. наук. Київ, 2017. С. 13—14. URL: https://elar.navs.edu.ua/jspui/handle/123456789/1750 (date accessed: 05.02.2025).

41 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: 05.05.2025).

4) know in connection with what and in what criminal proceedings the witness was called;

5) object to illegal actions of the investigator, detective, inquirer or prosecutor and demand that objections be recorded in the relevant protocol;

6) get acquainted with the protocols of investigative (search) and other procedural actions carried out with witness participation, as well as submit a petition for amendments, additions and comments to;

7) challenge an interpreter who participates in the witness interrogation;

8) file a petition for application of security measures to a witness and submit other petitions provided for by this Code;

9) make written statements, complaints, petitions and other legal documents on behalf of the witness;

10) challenge decisions, actions or omissions of the investigator, detective, inquirer, prosecutor, investigating judge or court in the witness interests” [42].

While positively assessing the researcher's attempts, it should be noted that the implementation of such a proposal requires reforming not only the provisions of criminal procedure legislation, but the principles of the relevant Law on the Bar. It should be noted that this approach is based on V. Tertyshnyk's concept of introducing a legal counsel (procedural legal adviser) to the trial, person who provides professional legal assistance to a witness in criminal proceedings [43]. At the same time, a textual analysis of the provisions formulated by the scholar makes it possible to note that the interpretation of the figure of a party to the process providing legal assistance to a witness has been expanded and this expansion contradicts even a number of constitutional principles. Thus, author notes, in particular, that a legal aid attorney may be not only a lawyer, but also his/her assistant, as well as another legal professional for whom there are no statutory grounds for disqualification from participation in a case [44]. Thus, introduction of this concept requires fundamental changes that, in our opinion, will not justify the efforts expended on.

We believe that engaged counsel has rights that are based on the general principles of criminal proceedings and apply to all participants in such proceedings, to all parties thereto and guarantee compliance with the criminal procedural form. Such an advocate has guarantees that apply to him or her as a participant in the procedural action where he or she participates together with the witness. In particular, this concerns the right to be aware of the reasons for and in connection with the criminal proceedings in which the procedural action to which he or she is involved is being conducted, as well as the rights that he or she may exercise while participating in procedural actions: familiarize himself or herself with the protocols of investigative (search) and other procedural actions conducted with his or her participation, file motions for amendments, additions and comments to these protocols, and to challenge the interpreter. In addition, advocate has the powers guaranteed by the Law on the Bar, lawyer's professional rights (Article 20), including:

“1) submit advocate requests, including requests for copies of documents, to the State

42 Карпенко В. М. Зазнач. твір. С. 155—156. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/8a7880e7-d70e-498e-8026-faea06ca934b/content (date accessed: 05.02.2025).

43 Тертишник В. М. Зазнач. твір. С. 134. URL: http://nbuv.gov.ua/UJRN/vamsup_2017_2_18 (date accessed: 05.02.2025).

44 Там само. С. 134—135.

authorities, local self-government bodies, their officials and employees, enterprises, institutions, organizations, public associations, as well as to individuals (with the consent of such individuals);

<…>

4) prepare applications, complaints, petitions and other legal documents and submit them in accordance with the procedure established by law;

<…>

8) use technical means, including for copying case materials where the advocate provides defense, representation or other types of legal aid, to record procedural actions in which he or she participates, as well as the course of the court session in the manner prescribed by law" [45].

Conclusions

Legal status of a lawyer involved in providing legal assistance to a witness remains legally undefined, as well as the legal status of a lawyer and a representative of person in criminal proceedings. This causes some controversy in scientific literature and creates problems in practice. Scientists define differently both the type of advocacy that he implements in interaction with a witness and his powers.

Based on the analysis of regulatory provisions of the criminal procedure legislation and the Law on the Bar, it is determined that an attorney engaged to provide legal assistance to a witness does not provide either defense or representation, so this form of activity should be understood as another type of attorney's activity. This means that lawyer does not acquire a derivative procedural status from the witness, i.e. does not have the rights of the witness. At the same time, the lawyer prevents violations of the witness's rights, guarantees inadmissibility of arbitrariness or abuse of power by representatives of the security forces, ensures the realization of procedural interests of the witness, his or her right to freedom from self-incrimination, prevention of bringing knowingly innocent to justice and the use of methods of psychological pressure, falsification or fabrication of certain information, things and documents, etc. Thus, the lawyer involved contributes to realization of many tasks, but his basic function is to ensure the protection of procedural interests of the witness and exercise of his rights.

It is substantiated that involved lawyer has rights that are based on the general principles of criminal proceedings, and guarantees that apply to him as a participant in the procedural action, as well as the powers guaranteed to him by Law on the Bar. Despite the support of the position on normative consolidation of the legal status of the lawyer involved in the provision of legal assistance to the witness, expediency of introducing legal adviser to the witness (legal attorney / procedural counsel) into criminal proceedings has been refuted, as this is contrary to constitutional rights.

Надання правничої допомоги свідкові у кримінальному провадженні: особливості та проблемні питання

Микола Коломойцев

Мета статті — з'ясувати особливості визначення правового статусу адвоката, залученого для надання правничої допомоги свідкові у кримінальному провадженні, окреслити проблемні питання його практичної діяльності. Застосовано загальнонаукові методи (аналіз і синтез, системного аналізу, логіко-структур-

45 Про адвокатуру … . URL: https://zakon.rada.gov.ua/laws/show/5076-17#Text (date accessed: 05.02.2025).

ний, узагальнення, порівняльно-правовий тощо). З'ясовано, що правовий статус адвоката, залученого для надання правничої допомоги свідкові, до сьогодні залишається нормативно не визначеним, як і правовий статус захисника та представника особи у кримінальному провадженні, що створює підґрунтя для наукової полеміки, зокрема щодо проблеми окреслення повноважень адвоката під час здійснення практичної діяльності. З'ясовано, що науковці по-різному визначають таку діяльність і повноваження адвоката. За законодавством України адвокат, залучений для надання правничої допомоги свідкові, не здійснює ані захисту, ані представництва, тож таку форму діяльності слід розуміти як інший вид адвокатської діяльності: адвокат не набуває похідного процесуального статусу від свідка, тобто не має його прав. Водночас адвокат унеможливлює порушення прав свідка, є гарантом недопустимості свавілля або перевищення повноважень з боку представників сил безпеки, забезпечує реалізацію процесуальних інтересів свідка, його право на свободу від самовикриття, недопущення притягнення завідомо невинного до відповідальності й застосування методів психологічного тиску, фальсифікування або фабрикування окремих відомостей, речей і документів тощо. Отже, залучений адвокат сприяє реалізації багатьох завдань, але його базова функція полягає в забезпеченні захисту процесуальних інтересів свідка й реалізації його прав. Обґрунтовано, що залучений адвокат має права, які базуються на загальних засадах кримінального провадження, і гарантії, що поширюються на нього як на учасника процесуальної дії, а також повноваження, гарантовані йому Законом України «Про адвокатуру та адвокатську діяльність». Попри підтримку позиції щодо нормативного закріплення правового статусу адвоката, залученого для надання правничої допомоги свідкові, спростовано доцільність уведення до кримінального провадження такого суб'єкта, як правничий консультант свідка (правничий повірений / процесуальний юрисконсульт), оскільки це суперечить конституційним правам.

Ключові слова: *кримінальне провадження; адвокат; правнича допомога; свідок; право на захист; правовий статус.*

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Tertyshnyk, V. M. (2017). Pravnycha dopomoha ta funktsiia zakhystu v kryminalnomu protsesi: harmonizatsiia doktryny [Legal aid and the function of protection in criminal proceedings: harmonization of the doctrine]. *Pravova pozytsiia*. № 2 (19). URL: http://nbuv.gov.ua/UJRN/vamsup_2017_2_18 [in Ukrainian].

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Forms of Specific Expertise Application in the Investigation of Economic Criminal Offenses: Possibility of Identifying a Non-Procedural Form

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The Article Purpose is to justify the possibility and importance of non-procedural forms of specific expertise application in the pre-trial investigation of criminal offenses related to economic activity using several general scientific methods (analysis and synthesis, comparative-legal, logical and structural, generalization, systematic analysis, etc.). It has been observed that the underlying cause for classifying forms of specific expertise application in criminal proceedings is the level and form of their regulatory consolidation in the criminal procedural legislation. It is noted that only if the criminal procedure legislation provides these methods of collecting evidence, it is possible to use the results of implementing certain specific expertise forms in proof: this is why procedural forms of specific expertise application are identified, which are defined as directly provided by the criminal procedural legislation. By this criterion, such procedural forms as conducting forensic examinations, participation of specialists in investigative (search) actions are singled out. Concerning non-procedural forms, the author also substantiates that it is feasible to identify them, even in the absence of an algorithm for their implementation within the criminal procedural legislation. The article emphasizes that non-procedural forms of specific expertise are used in criminal proceedings to obtain information of an indicative nature, inspect and conduct a preliminary (pre-expert) examina-

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tion of objects, as well as verify them against forensic records, etc. The author proves that findings acquired through the implementation of non-procedural forms of specific expertise should not serve as the foundation for procedural forms, since this can be the basis for their recognition as inadmissible. It is worth noting that they can be of paramount importance only if they are applicable to certain tactical tasks of the investigation, verification of investigative versions, determining the feasibility of appointing forensic examinations, etc. The significance of advisory assistance from well-versed persons as a non-procedural form of specific expertise application at the pre-trial investigation stage has been pointed out. The research paper outlines certain debatable aspects of the specialist's conclusion in the course of proving the facts of criminal misconduct for subsequent perspective research.

***Keywords**: specific expertise; criminal offense; economic activity; forensic examination; specialist's participation; non-procedural form.*

Research Problem Formulation

For the sake of impartiality, justice, and professionalism of the judiciary, one should abide by legal rules and use various methods (especially cooperation with specialists in certain fields). One of the important components of administering proceedings is the use of specific professional expertise and skills by forensic experts and specialists.

Following tradition, such methods of specific expertise application as participation of specialists in investigative (search) actions and forensic examinations are identified in criminal proceedings. However, recent changes in the criminal procedural legislation indicate the need to revise these approaches and unify the terminology for their corresponding designation.

Another point that should be considered when studying the issue of specific expertise application is classification of forms in which it is used in criminal proceedings. We plan to answer this question in the context of developing the issue of specific expertise application while investigating criminal offenses in the field of economic activity and their trial. The aim of this research is to assess the feasibility of identifying non-procedural forms of the use of specific expertise in criminal proceedings in general and in the investigation of economic crime in particular. We believe that this area of research is relevant because this issue has not been sufficiently addressed in the scientific literature, despite the fact that economic crimes pose a high level of public danger, which contributes to the scaling up of not just individual problems, but also affects the interests of the state.

Article Purpose

Justify the possibility and importance of non-procedural forms of specific expertise application in the pre-trial investigation of criminal offenses within economic activity.

Research Methods

The methodological basis of the study encompasses general scientific and special methods of scientific cognition. The comparative legal method and system-structural analysis have contributed to the definition of grounds for classifying forms of specific expertise application, justifying the ability to define a non-procedural form despite its inadmissibility in the course of proving.

Analysis of law application practices has grounds for claiming that certain forms of specific expertise application cannot be used in proving, even though they are mentioned in the legislation.

Dialectical, system-structural and system-functional methods, as well as a number of methods of formal logic (analysis, synthesis, deduction, induction, analogy, modeling, etc.) have contributed to logical presentation of thoughts, their argumentation, and broader generalization formulated as conclusions.

Analysis of Essential Researches and Publications

V. Areshonkov [1], V. Halahan and O. Kozak [2], H. Bidniak [3], I. Petrova [4], I. Pyrih [5], E. Simakova-Yefremian [6], M. Shcherbakovskyi [7] et al. have played a crucial role in developing the doctrine of specific expertise application.

From a positive perspective, it should be noted that recently scientists have started to pay more attention to the use of specific expertise in the investigation of economic crimes. Multidisciplinary studies conducted within this topic are of particular interest. One of the first extensive monographs devoted to theoretical and practical aspects of specific expertise application in cases involving budgetary offenses is the research paper by V. Didenko [8]. Similarly to most re-

1 Арешонков В. В. Теоретичні, правові та праксеологічні засади техніко-криміналістичних досліджень у розслідуванні злочинів : дис. ... д-ра юрид. наук. Київ, 2021. 559 с. URI: https://elar.navs.edu.ua/jspui/handle/123456789/18807 (date accessed: 20.02.2025).

2 Галаган В. І., Козак О. В. Процесуальний порядок і тактика отримання зразків для експертизи у кримінальному провадженні України : монографія. 2-ге вид., перероб. і доп. Краматорськ, 2015. 224 с.

3 Бідняк Г. С. Теорія і практика використання спеціальних знань при розслідуванні шахрайств : монографія. Дніпро, 2019. 152 с. URI: https://er.dduvs.edu.ua/handle/123456789/3707 (date accessed: 20.02.2025).

4 Петрова І. А. Теоретико-правові та організаційно-методологічні засади регулювання судово-товарознавчих експертиз споживчих товарів : дис. ... д-ра юрид. наук. Харків, 2012. 541 с. URL: https://uacademic.info/ua/document/0512U000231 (date accessed: 20.02.2025).

5 Пиріг І. В. Теоретико-прикладні проблеми експертного забезпечення досудового розслідування : монографія. Дніпропетровськ, 2015. 432 с. URL: https://dduvs.edu.ua/wp-content/uploads/files/Structure/library/student/monogr.pdf (date accessed: 20.02.2025).

6 Сімакова-Єфремян Е. Б. Теоретико-правові та методологічні засади комплексних судово-експертних досліджень : дис. ... д-ра юрид. наук. Харків, 2017. 392 с. URL: https://uacademic.info/ua/document/0517U000760 (date accessed: 20.02.2025).

7 Щербаковський М. Г. Теоретико-методологічні та праксеологічні засади судових експертиз у кримінальному процесі : автореф. дис. ... д-ра юрид. наук. Харків, 2016. 42 с. URL: https://dspace.univd.edu.ua/items/b4980be5-39f4-4baf-acff-56e0e631825c (date accessed: 20.02.2025).

8 Діденко В. Л. Використання спеціальних знань при розслідуванні кримінальних правопорушень у бюджетній сфері : дис. ... канд. юрид. наук. Дніпро, 2024. 238 с. URL: https://dduvs.edu.ua/wp-content/uploads/files/Structure/science/rada/new_d0872702/2024/1/1/d.pdf (date accessed: 20.02.2025).

search papers discussing the problems of applying specific expertise at the stage of pre-trial investigation, this research deals with the study of the mechanisms of unlawful activities aimed at the illegal seizure of budgetary funds. The author has defined the concept of specific expertise, outlined typical forms of its application in the investigation of these criminal offenses, considered the peculiarities of specialists' involvement, as well as tactical aspects of appointing a forensic examination.

Research papers by A. Volobuiev [9], V. Kikinchuk and V. Husieva [10], S. Tiulieniev [11], S. Trach [12] at el. outline certain aspects of appointing forensic examinations and involving specialists in cases related to unlawful encroachment on assets and legitimate interests of economic entities.

The issue of classifying forms of specific expertise application was also the subject of research by A. Vuima [13], I. Kohutych [14], O. Kovalova [15], Ye. Luk'ianchykov [16], V. Revaka [17], H. Spitsyna and H. Bidniak [18],

9 Волобуєв А. Ф. Наукові основи комплексної методики розслідування корисливих злочинів у сфері підприємництва : дис. ... д-ра юрид. наук. Харків, 2001. 407 с. URL: https://uacademic.info/ua/document/0502U000216 (date accessed: 20.02.2025).

10 Кікінчук В. В., Гусєва В. О. Особливості розслідування кримінальних правопорушень, пов'язаних з протиправним поглинанням та захопленням підприємств, сільськогосподарських земель, порушенням прав їх законних власників (рейдерство) : наук.-метод. рек. Харків, 2020. 58 с. URL: http://dspace.univd.edu.ua/xmlui/handle/123456789/9813 (date accessed: 20.02.2025).

11 Тюлєнєв С. А. Можливості почеркознавчої експертизи у розслідуванні рейдерства. *Вісник Одеського науково-дослідного інституту судових експертиз Міністерства юстиції України.* 2023. Вип. 14. С. 29—41. DOI: 10.32782/2522-9656/2024-14-3 (date accessed: 02.02.2025) ; Його ж. Призначення судових експертиз під час розслідування кримінальних правопорушень, пов'язаних із рейдерством. *Право і безпека.* 2024. № 1 (92). С. 112—122. DOI: 10.32631/pb.2024.1.10 (date accessed: 02.02.2025).

12 Трач С. С. Криміналістична методика розслідування кримінальних правопорушень у сфері господарської діяльності в Україні : монографія. Одеса, 2023. 452 с.

13 Вуйма А. Г. Поняття, сутність та форми спеціальних знань, що використовуються під час розслідування вбивств. *Вісник Луганського державного університету внутрішніх справ ім. Е. О. Дідоренка.* 2020. Вип. 1 (89). С. 54—62. DOI: 10.33766/2524-0323.89.54-62 (date accessed: 20.02.2025).

14 Когутич І. І. Окремі питання сутності та форм використання спеціальних знань у кримінальному провадженні. *Вісник Академії адвокатури України.* 2015. Т. 12. № 2 (33). С. 112—123. URL: http://nbuv.gov.ua/UJRN/vaau_2015_12_2_16 (date accessed: 20.02.2025).

15 Ковальова О. В. Форми використання спеціальних знань в інформаційному забезпеченні досудового розслідування. *Право і суспільство.* 2022. № 2. С. 215—221. DOI: 10.32842/2078-3736/2022.2.32 (date accessed: 20.02.2025).

16 Лук'янчиков Є. Д. Форми використання спеціальних знань за новим КПК України. Київ, 2014. С. 206—207. URL: http://tdp.kpi.ua/wp-content/uploads/Лук'янчиков-Євген-Дмитрович.pdf (дата звернення 16.02.2025).

17 Ревака В. М. Форми використання спеціальних пізнань в досудовому провадженні : дис. ... канд. юрид. наук. Харків, 2006. 194 с. URL: https://uacademic.info/ua/document/0406U004351 (date accessed: 20.02.2025).

18 Спіцина Г. О., Бідняк Г. С. Форми використання спеціальних знань. *Теорія та практика судової експертизи і криміналістики.* 2018. Вип. 18. С. 240—248. DOI: 10.32353/khrife.2018.26 (date accessed: 20.02.2025).

A. Taranova [19], Yu. Chaplynska [20], V. Yaremchuk [21] at el. Researchers either develop classifications on the example of certain groups of criminal offences, or highlight various aspects of this issue (i.e., the issue of identifying a non-procedural form), or identify forms of specialists' participation in certain procedural actions, etc. Therefore, the issue of specific expertise application in the investigation of economic crimes (notwithstanding the substantial contribution of scholars) has not yet been adequately addressed and requires further research.

Main Content Presentation

The analysis of theoretical provisions shows that the majority of Ukrainian scientists understand the forms of specific expertise application as the external manifestation of the essence of specific expertise, which is determined by its content. In the course of criminal investigation, it is embodied in the activities of specialists and forensic experts [22].

Classification approaches of scientists differ considerably in the criteria by which they are grouped and in the varieties that are identified on the basis of the same criterion. Therefore, I. Kohutych points out that there is no single approach to solving this problem in the scientific literature to date [23]. From the scientist's perspective, in the investigation, specific expertise traditionally takes two main forms: procedural and non-procedural [24].

According to I. Kohutych, key procedural forms include:

- direct application of specific expertise by an investigator, prosecutor, criminalist, or court within the scope of their procedural powers related to the collection, analysis, and evaluation of evidence;
- involvement of specialists in investigative (search) actions;
- appointment and conduct of forensic examinations [25].

19 Таранова А. Форми використання спеціальних знань у розслідуванні неналежного виконання професійних обов'язків медичним або фармацевтичним працівником. *Підприємництво, господарство і право*. 2019. № 10. С. 198—203. DOI: 10.32849/2663-5313/2019.10.34 (date accessed: 20.02.2025).

20 Чаплинська Ю. А. Форми використання спеціальних знань. *Криминалистика и судебная экспертиза*. 2013. Вып. 58 (2). С. 89—91. URL: http://nbuv.gov.ua/UJRN/krise_2013_58(2)__19 (date accessed: 20.02.2025).

21 Яремчук В. О. Функції та форми участі спеціаліста під час проведення слідчих дій. *Теорія та практика судової експертизи і криміналістики.* 2010. Вип. 10. С. 123—130. URL: http://nbuv.gov.ua/UJRN/Tpsek_2010_10_22 (date accessed: 20.02.2025).

22 Романюк Б. В. Сучасні теоретичні та правові проблеми використання спеціальних знань у досудовому слідстві : автореф. дис. ... канд. юрид. наук. Київ, 2002. 20 с. URL: https://dspace.nlu.edu.ua/jspui/handle/123456789/13915 (date accessed: 20.02.2025) ; Шрамко О. М. Використання спеціальних знань під час розслідування корупційних кримінальних правопорушень : дис. ... д-ра філос. Київ, 2021. 272 с. URI: https://elar.navs.edu.ua/jspui/handle/123456789/19544 (date accessed: 20.02.2025) ; Гайдар О. В. Використання спеціальних знань під час розслідування таємного викрадення чужого майна : монографія / за заг. ред. д-ра юрид. наук, проф. В. О. Гусєвої. Харків, 2023. 202 с.

23 Когутич І. І. Зазнач. твір. URL: http://nbuv.gov.ua/UJRN/vaau_2015_12_2_16 (date accessed: 20.02.2025).

24 Там само.

25 Там само.

The scientist calls non-procedural forms of specific expertise application: 1) providing advice and information notes (both oral and written); 2) conducting audits and inspections; 3) participation in operational (search) actions; 4) preliminary analysis of physical objects; 5) use information obtained from forensic records as information notes [26].

As argued by I. Kohutych, in investigative (search) actions the application of specific expertise is possible only in procedural forms, as this procedure is clearly regulated by the criminal procedural legislation, which makes it impossible to use such knowledge in non-procedural forms. Furthermore, the author proposed an additional classification of forms of specific expertise application during investigative (search) actions: main and auxiliary, traditional and non-traditional [27]. Thus, the researcher has comprehensively summarized approaches to classifying forms of specific expertise application in criminal proceedings. The analysis of this approach allows us to conclude that I. Kohutych uses the legal regulation of how a particular form is implemented in the criminal procedural legislation as the classification criterion for all forms of specific expertise application. The scientist primarily refers to the following non-procedural form of specific expertise application: advisory assistance by a specialist [28].

I. Kohutych's approach embodies the idea of most scientists about classification, although individual aspects of such classification are still criticized by the scientific community.

One of the unresolved questions still being debated is the ability to identify a non-procedural form of specific expertise application in criminal proceedings. Scientists provide various arguments about the inadmissibility of implementing non-procedural forms of specific expertise application in criminal proceedings. Many scholars share the position that the lack of a legal basis for introducing these forms into legislation excludes their use in criminal proceedings, as it indicates their unlawfulness [29]. The inability to objectively evaluate grounds for applying specific expertise calls into question the probative value of the information obtained in this way and makes it illegally obtained [30]. As discussed by N. Tymofieieva, criticism is primarily associated with the *non-procedural form* term, which is understood as unlawful (inadmissible) actions not provided by the current criminal procedural law [31].

This approach is characterized by two fundamental peculiarities: 1) It declares as unlawful the conduct of a person who, while participating in criminal proceedings, intends to use such forms of specific expertise; 2) It determines the inadmissibility of using findings obtained on the basis of such a form in the course of

26 Когутич І. І. Зазнач. твір. URL: http://nbuv.gov.ua/UJRN/vaau_2015_12_2_16 (date accessed: 20.02.2025).

27 Там само.

28 Там само.

29 Романюк Б. В. Участь спеціаліста на стадії досудового слідства : навч. посіб. Київ, 2010. 304 с.

30 Спіцина Г. О., Бідняк Г. С. Зазнач. твір. DOI: 10.32353/khrife.2018.26 (date accessed: 20.02.2025).

31 Тимофєєва Н. В. Використання спеціальних знань при розслідування злочинів проти безпеки виробництва : дис. ... канд. юрид. наук. Київ, 2018. С. 52. URI: https://elar.navs.edu.ua/jspui/handle/123456789/7430 (date accessed: 20.02.2025).

proving. In evaluating these criteria, it should be noted that they are interrelated, since the evidence, facilitated by the qualified use of specific expertise, must be provided in accordance with the procedure laid down by law. Otherwise, failure to comply with the procedural form when collecting evidence is the basis for declaring evidence inadmissible. This position is justified for several reasons. This is mainly defined by Part 2 of Article 19 of the Constitution of Ukraine: "*Bodies of state power and bodies of local self-government and their officials are obliged to act only on the grounds, within the limits of authority, and in the manner envisaged by the Constitution and the laws of Ukraine*" [32]. In addition, *"the rules of criminal proceedings in the territory of Ukraine shall be defined exclusively by the criminal procedure legislation of Ukraine"* (Part 1 of Article 1 of the Criminal Procedure Code of Ukraine, hereinafter referred to as the CPC) [33], and *"the matter and manner of criminal proceedings shall conform to the fundamentals of criminal proceedings"* (para. 1 of P. 1 of Art. 7 of the CPC) [34]. Generally speaking, as a principle, the procedure for conducting criminal proceedings is regulatory defined, specifically in the sources of the criminal procedural legislation, and its content and form should not contradict overall principles of criminal proceedings.

With regard to the legal basis for the collection of evidence, *"the prosecution shall collect evidence by way of conducting investigatory (search) actions and covert investigatory (search) actions, by demanding and obtaining from government authorities, local governments, enterprises, institutions and organizations, officials and individuals, of objects, documents, information, expert findings, audit and inspection reports, by conducting other procedural actions specified by this Code"* (Part 2 of Art. 93 of the CPC) [35]. In turn, *"the defence, victim, and representative of the legal entity in whose respect proceedings are taken shall conduct collection of evidence by way of demanding and obtaining from government authorities, local government, enterprises, institutions, organisations, officials and individuals of objects, copies of documents, information, expert reports, audit and inspection reports; by initiating the conduct of investigatory (search) activities, covert investigatory (search) activities and other procedural actions, and also by way of conducting other activities capable of ensuring the production of relevant and admissible evidence in court"* (para. 1 of P. 3 of Art. 93 of the CPC) [36].

At the same time, Art. 84 of the CPC envisages:

"1. Evidence in criminal proceedings is factual data obtained in the manner prescribed by this Code, on the basis of which the investigator, public prosecutor, investigating judge and court establish the presence or absence of facts and circumstances relevant to criminal proceedings and subject to proof.

2. Procedural sources of evidence shall be testimonies, physical evidence, documents and expert findings" [37].

32 Конституція України : Закон України від 28.06.1996 р. № 254к/96-ВР (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 20.02.2025).

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: 20.02.2025).

34 Там само.

35 Там само.

36 Там само.

37 Там само.

Given the above, neither audit nor inspection reports, which, although recognized as the result of implementing specific expertise by well-versed persons, cannot be viewed as evidence under the legislator's approach. Specifically, the position of the Supreme Court (hereinafter referred to as the *SC*) as part of the judges of the Third Judicial Chamber of the Criminal Cassation Court in Case No. 335/2108/17 is crucial [38]. *In its decision, the SC referred to Part 2 of Art. 93 of the CPC* [39], which does not stipulate an unscheduled audit as a way of collecting evidence, so the results of such audits carried out in criminal proceedings are inadmissible evidence: inadmissible evidence shall not be used in adopting procedural decisions, it shall not be referred to by the court when adopting a court decision (Part 2 of Article 86 of the CPC [40]). As a point supporting this position, the court decision also cited subclause 12, clause 5, Section XII of *Final Provisions* of the Law of Ukraine *On the Prosecutor's Office* [41], which amended Article 87 of the Criminal Procedure Code with P. 3, para. 2 of which states that evidence obtained by pre-trial investigation or prosecution authorities through the exercise of powers not stipulated by the CPC is inadmissible in criminal proceedings [42]. Given that the inadmissible evidence in this case is an expert conclusion based on an audit report, this case is also illustrative. As for the prosecutor's arguments that the expert conclusion was inadmissible as evidence, the court stated that there was insufficient justification. As stated in Art. 86 of the CPC, evidence is considered admissible if it has been obtained in accordance with the procedure laid down in this Code; in particular, expert opinion shall mean a detailed description of the examination, grounded responses to the questions posed and be based on information obtained by the forensic expert directly or during the study of materials provided (Art. 101, 102 of the CPC) [43]. Perhaps, the forensic expert's conclusion was founded upon the previously cited audit report, which explains the absence of certain documents referred to in this opinion in the case files of the criminal proceedings. There is no other way to explain the reference to this data, since it is unlikely that the forensic expert collected any information independently, as this is strictly prohibited by the Instructions on the Appointment and Conduct of Forensic Examinations and Expert Studies (Section II, para. 4, cl. 2.3) [44].

Consequently, the application of specific expertise results in proving is possible only if these methods of collecting evidence are envisaged in the CPC. Based on this Provision, procedural forms of

38 Постанова ВС України від 27.04.2020 р., справа *№ 335/2108/17, провадж. № 51-6560км19 / ЄДРСР : офіц. сайт.* URL: https://reyestr.court.gov.ua/Review/89034958 (date accessed: 20.02.2025).

39 Кримінальний процесуальний … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 20.02.2025).

40 Там само.

41 Про прокуратуру : Закон України від 14.10.2014 р. № 1697-VII (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1697-18#Text (date accessed: 20.02.2025).

42 Кримінальний процесуальний … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 20.02.2025).

43 Там само.

44 Інструкція про призначення та проведення судових експертиз та експертних досліджень : затв. наказ. 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: 20.02.2025).

specific expertise application, which are defined as directly provided by the criminal procedural legislation, are identified: performance of forensic examinations and participation of specialists in investigative (search) actions.

Notably, in criminal proceedings, the use of a specialist's specific expertise, which involves obtaining a specialist's conclusion, is now included in the procedural forms and sources of evidence in cases investigated through an inquiry. At the same time, this novel is still the subject of scientific discussions, since the criminal procedural legislation does not clearly determine the essence and content of the specialist's conclusion, criteria imposed on a person who may draft it, as well as the procedure for obtaining and implementing such a conclusion in criminal proceedings. Following the same criteria, some courts do not refer to specialists' conclusions in the reasoning of court decisions. Therefore, in view of the Supreme Court's conclusions cited above, the absence of a reference to the expert conclusion in the provisions of Part 2 of Article 93 of the CPC excludes the possibility of using the conclusion of a specialist as evidence. This is not consistent with the approach of the legislator enshrined in Part 1 of Art. 298-1 of the CPC, according to which *"procedural sources of evidence in criminal proceedings on criminal offences, in addition to those specified in Article 84 hereof, shall also be explanations of persons, results of medical examination, expert opinion, recordings by technical devices and technical means that have photo and filming functions, video recording, or photo and filming, video recording tools"* [45]. Thus, the use of a set of materials obtained as a result of specific expertise application by authorized subjects is characterized by a number of controversial aspects and is not without certain difficulties in resolving this issue, even in relation to those forms that have already acquired the status of procedural.

With regard to the non-procedural form of specific expertise application and the possibility of its implementation for proving, we find the position of O. Byshevets highly compelling. From the researcher's perspective, legislatively it is impossible to cover all cases of specific expertise application, and therefore the main thing is that they do not contradict the criminal procedural rules [46]. In addition, as the scientist objectively notes, use of non-procedural forms of specific expertise does not aim to achieve the same evidentiary value as procedural consolidation, but rather to establish the groundwork for the procedural integration of specific expertise into the investigative process [47].

To substantiate the researcher's viewpoint, we deem it appropriate to refer to such a non-procedural form of specific expertise application as conducting an interrogation using a polygraph. The Scientific and Methodological Guidelines on the Appointment and Conduct of Forensic Examinations and Expert Studies point out the following:

"6.8. To obtain indicative information, interrogations can be conducted with the help of a special technical tool: a computer polygraph.

45 Кримінальний процесуальний … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 20.02.2025).

46 Бишевець О. В. Використання спеціальних знань у доказуванні в кримінальних провадженнях. *Вісник кримінального судочинства.* 2015. № 2. С. 191—192. URL: https://vkslaw.knu.ua/images/verstka/2_2015_Bushevec.pdf (date accessed: 20.02.2025).

47 Там само. С. 192.

6.8.1. The subject of the interrogation with the use of a special technical tool (a computer polygraph) is to collect indicative information about:

the extent to which information provided by the interviewee is truthful;

accuracy of information provided by the interviewee;

sources of information received by the interviewee;

ideas of the interviewee about a certain event;

another indicative information required to construct versions of investigating certain events"[48].

The above provisions contain direct instruction to conduct similar interrogations in order to obtain indicative information, and therefore cannot be used a priori in the course of proving.

The same applies to the use of preliminary examinations results of objects in individual studies and on the basis of forensic records. We share V. Areshonkov's position that, for example, in the context of technical and forensic studies, it is advisable to identify the pre-expert type, including such subtypes of research as *"searching for objects of research in the course of investigative (search) action; inspection of an object; preliminary study in the course of an investigative (search) action; verification of an object against forensic records"*[49]. While investigating several criminal cases, defined forms of specific expertise, which are also to be considered as non-procedural forms, should be implemented.

Accordingly, we believe that it is entirely acceptable to use non-procedural forms of specific expertise application in criminal proceedings, specifically for obtaining information of an indicative nature, inspection and preliminary (pre-expert) examination of objects, their verification against forensic records, etc. Given the impossibility of referring to these materials in criminal proceedings, they should not be based on procedural forms of specific expertise application or other evidence, as this may be the basis for recognizing them as inadmissible. At the same time, the fundamental importance of these forms is to use them in order to carry out certain tactical investigative tasks, verify investigative versions, and determine the feasibility of appointing forensic examinations, etc.

Specific non-procedural forms of specific expertise application are also not uniform. A specialist's advisory assistance, sometimes called "reference and advisory work", leads to contradictions. Art. 360 of the CPC stipulates the procedure for examining evidence, granting the court the right to seek oral advice or written explanations from a specialist [50], while the procedure for obtaining advisory assistance from a specialist at the pre-trial investigation stage is not regulated to this day. For this reason, we believe that advisory assistance from a specialist in criminal proceedings, provided to the parties at the stage of pre-trial investigation, should be considered as a non-procedural form of specific expertise.

48 Науково-методичні рекомендації з питань підготовки та призначення судових експертиз та експертних досліджень : затв. наказ. 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: 20.02.2025).

49 Арешонков В. В. Зазнач. твір. С. 86. URI: https://elar.navs.edu.ua/jspui/handle/123456789/18807 (date accessed: 20.02.2025).

50 Кримінальний процесуальний ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 20.02.2025).

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With regard to crimes in economic activity, the most important non-procedural form of specific expertise application is advisory assistance from well-versed persons. For example, a person with specific expertise in economics and accounting, etc., can provide full information on the content of business transactions and their documentation. Especially if, in the course of investigating such crimes, the assets of business entities and related transactions are analyzed based on:

- interconnection between transactions in time and territory;
- logical consistency of transactions by their types;
- size of financial transactions;
- ties between founders, directors and beneficial owners of companies, their financial and social status;
- data compliance on the date, place of legal entities' registration, as well as their financial and economic activity;
- income level of individuals involved in transactions;
- inconsistencies in identification and other data from different sources;
- validity of agreements concluded which stipulate the transfer of property or other rights, legal and financial security of agreements;
- volume of assets and legal grounds for their acquisition, etc.

It is therefore important for the parties involved in criminal proceedings to interact with people with specific expertise who can provide advice.

Conclusions

The analysis of a number of legal principles that determine the form and content of criminal proceedings defines the procedure for the use of specific expertise in criminal proceedings and enables to substantiate a key position that is decisive for classifying these forms as procedural or non-procedural. Specifically, it is pointed out that the results of certain specific expertise forms can only be used in proving if these methods of collecting evidence are provided for by the criminal procedural legislation. Stemming from this provision, procedural forms of specific expertise application, which are defined as directly set forth in the criminal procedural legislation, are identified. For this reason, such procedural forms as forensic examinations and participation of specialists in investigative (search) actions are singled out. Regarding the non-procedural forms, it is also advisable to identify them, even though there is no algorithm for their implementation in provisions of the criminal procedural legislation.

It is noted that non-procedural forms of specific expertise are used in criminal proceedings to obtain information of an indicative nature, inspect and conduct a preliminary (pre-expert) examination of objects, as well as verify them against forensic records, etc. It has been stressed that findings derived from the implementation of outlined specific expertise forms cannot be limited to procedural ones, as this may be the reason for declaring them inadmissible. It is worth noting that they can be of paramount importance only if they are applicable to certain tactical tasks of investigation, verification of investigative versions, determining the feasibility of appointing forensic examinations, etc. The significance of advisory assistance from well-versed persons as a non-procedural form of specific expertise application at the pre-trial investigation stage has been pointed out. The research paper outlines certain debatable aspects of the specialist's conclusion in the course of proving the facts of criminal misconduct. They can be discussed during subsequent perspective research.

Форми застосування спеціальних знань у розслідуванні господарських кримінальних правопорушень: можливість виокремлення непроцесуальної форми

Віталій Усатий

Мета статті — обґрунтувати можливість і значення непроцесуальних форм застосування спеціальних знань у досудовому розслідуванні кримінальних правопорушень у сфері господарської діяльності за допомогою низки загальнонаукових методів (аналіз і синтез, порівняльно-правовий, логіко-структурний, узагальнення, системного аналізу та ін.). З'ясовано, що базовою підставою для класифікації форм застосування спеціальних знань у кримінальному провадженні є рівень і форма їх нормативного закріплення у кримінальному процесуальному законодавстві. Констатовано, що послуговуватися результатами реалізації окремих форм спеціальних знань у доказуванні можливо, лише якщо ці способи збирання доказів передбачено кримінальним процесуальним законодавством: саме на цій підставі виокремлюють процесуальні форми застосування спеціальних знань, які визначають як прямо передбачені кримінальним процесуальним законодавством. За цією ознакою виокремлено такі процесуальні форми, як проведення судових експертиз, участь спеціалістів у слідчих (розшукових) діях. Щодо непроцесуальних форм обґрунтовано, що їх також доцільно виокремлювати, навіть попри відсутність алгоритму їх реалізації у кримінальному процесуальному законодавстві. Наголошено, що непроцесуальними формами спеціальних знань у кримінальному провадженні послуговуються для отримання інформації орієнтувального характеру, огляду й попереднього (доекспертного) дослідження об'єктів, їх перевірки за криміналістичними обліками тощо. Визначено, що результати, отримані на підставі реалізації непроцесуальних форм застосування спеціальних знань, не слід покладати в основу процесуальних форм, оскільки це може стати підставою для визнання їх недопустимими. Зауважено, що їх вагоме значення полягає у застосуванні для виконання окремих тактичних завдань розслідування, перевірки слідчих версій, з'ясування доцільності призначення судових експертиз тощо. Акцентовано на важливості консультативної допомоги обізнаних осіб як непроцесуальної форми застосування спеціальних знань, на стадії досудового розслідування. Окреслено окремі дискусійні аспекти застосування висновку спеціаліста у процесі доказування фактів учинення кримінального проступку для подальших перспективних досліджень.

Ключові слова: *спеціальні знання; кримінальне правопорушення; господарська діяльність; експертиза; участь спеціаліста; непроцесуальна форма.*

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The author states that there is no conflict of interest relating to this topic.

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Forensic Classification of Criminal Offenses Related to Smuggling

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This article purpose is to develop a forensic classification of criminal offenses related to smuggling based on the most significant forensic signs. Methodological research basis are general scientific and special scientific methods. Separate group of criminal offenses that encroach on social relations in the field of ensuring economic activity is related to smuggling. This type of criminal offenses (despite availability of certain common signs) covers quite diverse types and forms of criminally illegal activity. This primarily concerns specifics of smuggling topic and the methods of committing criminal offenses. As a result of generalization of theoretical approaches to conducting forensic classification of criminal offenses, the need to apply an approach that, while studying legal phenomena, involves simultaneous consideration of both criminal-legal, which are basic and forensically significant, signs is substantiated. The main classification criteria for criminal offenses related to smuggling are: 1) method of implementing the criminal intent of smugglers; 2) topic characteristics of smuggling. According to the method of implementation, the following groups of criminal offenses can be distinguished: 1) those committed with concealment of contraband from customs control (using auxiliary tools and means); 2) those committed outside customs control. According to characteristics of smuggling topic, it is proposed to distinguish criminal offenses

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related to the illegal movement across the border of objects defined in Articles 201, 201-1, 201-3, 201-4 of the Criminal Code of Ukraine. According to possibility of the spread and free circulation of contraband items, criminal offenses under investigation can be divided into two independent groups: 1) criminal offenses whose subject matter is things not removed from free circulation by law; 2) criminal offenses whose subject matter is contraband goods, substances and means restricted or removed from civil circulation by law.

Keywords: *smuggling; forensic classification; criminal offense; crime; types and groups of criminal offenses; forensic methods.*

Research Problem Formulation

Smuggling is a rather trivial phenomenon, because with development of economic and customs relations, people were constantly looking for new ways to circumvent the law in order to avoid paying customs duties and transport goods beyond the control of state authorities. During development of the system of legal principles underlying the fight against smuggling, authorities introduced appropriate legal measures, including criminal law measures. In the current period of development of legal foundations of combating crime and scientific substantiation of this activity, issues of effective investigation of criminal offenses related to smuggling have repeatedly become the topic of researches. However, some of them are not fully consistent with current doctrines of criminal law and criminal procedure and some are limited to descriptive recommendations only. This indicates the need for thorough research, revision and scientific substantiation of individual researches which subject were recommendations on forensic support for the investigation of criminal offenses related to smuggling.

While developing recommendations for forensic support, groups of criminal offenses consistently refer to their forensic classification. Forensic classification of criminal offenses, determining the most common and typical characteristics of the phenomena under research, comparing them with similar ones and distinguishing them from the rest, allows a deeper study of the phenomenon itself, its impact on other processes and possible directions for further development. At the same time (for effective performance of this function), any classification has to be reliable in its internal content and properly structured externally. In other words, it should be based on the laws of dialectical and formal logic [1].

Forensic classification of crimes is their differentiation or systematization according to criteria that have forensic significance. It contributes to the formation of forensic characteristics of crimes and the development of specialized investigative methods [2]. As V. Tishchenko rightly notes, forensic classification of crimes makes possible to carry out comprehensive analysis of the identified categories of socially dangerous acts, generalize their forensically significant

1 Кривоченко Л. М. Класифікація злочинів за ступенем тяжкості у Кримінальному кодексі України : монографія. Київ, 2010. С. 15.

2 Шепітько В. Ю. Криміналістика : підручник. Київ, 2010. С. 324.

characteristics and form appropriate forensic characteristics. It also contributes to the development of investigative techniques of various levels: interspecific, species, group and non-specific ones that ensures their effective application in specific investigative situations [3].

Given the fairly recent amendments and additions [4] to the Criminal Code of Ukraine by Articles: 201, 201-1, 201-3, 201-4 [5], we consider appropriate to classify smuggling-related crimes. Since most scholars substantiate the possibility of formulating forensic recommendations in the form of forensic methods by outlining approaches to the technologies for building such methods [6], we consider forensic classification of criminal offenses to be an urgent research issue.

Article Purpose

Develop a forensic classification of criminal offenses related to smuggling on the basis of the most significant forensic signs.

Research Methods

The methodological basis of the research is general scientific and special scientific methods. Methods of analysis and synthesis, as well as dialectical, system-structural and system-functional ones, provided logical presentation of opinions, their argumentation and generalization in the form of conclusions. Data analyzed in this work is collected by studying provisions of legislative acts, theoretical scientific research and analyzed using a qualitative approach of judicial practice.

Analysis of Essential Researches and Publications

Problems of counteraction and investigation of smuggling, as well as application of specific expertise in this procedure were investigated by the following Ukrainian scientists: A. Buha, I. Hora, L. Kapitanchuk, O. Kofanova, O. Kuznetsova, R. Maliuha, A. Padalka, A. Poliakh, I. Rudnytskyi,

3 Тіщенко В. В. Теоретичні і практичні основи методики розслідування злочинів : монографія. Одеса, 2007. С. 44.

4 Про внесення змін до Кримінального та Кримінального процесуального кодексів України щодо криміналізації контрабанди товарів : Закон України від 09.12.2023 р. № 3513-IX. URL: https://zakon.rada.gov.ua/laws/show/3513-20#n6 (date accessed: 20.02.2025).

5 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: 20.02.2025).

6 Книженко С. Особливості розслідування злочинів проти правосуддя, що вчиняються свідками, потерпілими або іншими особами шляхом перешкоджання встановленню істини у справі. *Вісник Національної академії прокуратури України.* 2016. № 3 (45). С. 61—65. URL: http://nbuv.gov.ua/UJRN/Vnapu_2016_3_11 (date accessed: 20.02.2025) ; Мазур А. П. Побудова криміналістичних версій на початковому етапі розслідування окремих видів злочинів проти правосуддя. *Право і суспільство.* 2015. № 4. Ч. 2. С. 193—198. URL: http://www.pravoisuspilstvo.org.ua/archive/2015/4_2015/part_2/34.pdf (date accessed: 20.02.2025) ; Романаускас К. А. Основи методики розслідування надання завідомо неправдивих показань свідком і потерпілим : монографія / за заг. ред. д-ра юрид. наук, проф. В. О. Гусєвої. Харків, 2024. 203 с. ; Русанівська Д. Д. Розслідування втручання в діяльність захисника чи представника особи : дис. … д-ра філос. Київ, 2023. 260 с. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/87c654d4-47e0-4e7b-ae7c-8ecfdc784aaf/content (date accessed: 20.02.2025).

A. Svintsytskyi, V. Topchii, Ya. Furman, V. Shevchuk, et al.

V. Shevchuk, in order to facilitate development of methods for investigating smuggling, called it promising to generalize and systematize the methods of committing this crime, taking into account specific objects of illegal movement. As the scientist noted, it is advisable to distinguish the methods of smuggling goods, jewelry, precious metals, etc. It is important to classify the methods of illegal movement according to specific types of smuggling. For example, determine specifics of the smuggling of excisable goods, food and industrial goods, alcoholic beverages, tobacco products, alcohol, fuels and lubricants, cars, petroleum products, non-ferrous metals, energy carriers and other resources. The researcher notes: improving the system of collecting and generalizing information on the most common methods of smuggling in Ukraine will contribute to a more effective fight against this type of criminal activity [7].

Ya. Furman focused on the need to counteract criminal encroachments on cultural values, works of art and antiques of art experts, employees of museums and art galleries: he developed the basics of the methodology for investigating this type of criminal offense [8].

R. Maliuha conducted a thorough analysis of various aspects of proving the smuggling of narcotic drugs, psychotropic substances, their analogues and precursors, as well as counterfeit medicines at the stage of pre-trial investigation. The researcher explains low efficiency of investigating this type of smuggling not only by the fact that a significant part of such crimes are committed by organized criminal groups that act in a conspiratorial manner and have corrupt connections in customs, law enforcement and judicial bodies: he names as additional factors the ambiguous understanding by law enforcement officers of the essence, boundaries, subject, means and other elements of criminal procedural evidence, insufficient scientific development of relevant theoretical aspects, as well as the lack of practical recommendations for proving evidence at the stage of pre-trial investigation in such criminal proceedings [9].

A. Buha emphasized the importance of involving specialists in the investigation of criminal offenses related to the illegal circulation of medicines [10]. The researcher's classification of criminal offenses related to the illegal circulation, in particular, smuggling of medicines, should be positively noted. According to the scientist's

7 Шевчук В. М. Розділ VIII «Розслідування контрабанди» / Шепітько В. Ю., Коновалова В. О., Журавель В. А. та ін. Розслідування злочинів у сфері господарської діяльності: окремі криміналістичні методики : монографія ; за ред. проф. В. Ю. Шепітька. Харків, 2006. С. 481–537. URL: https://library.nlu.edu.ua/POLN_TEXT/KNIGI/PRAVO/Shepitko_Rozslid_2006.pdf (date accessed: 20.02.2025).

8 Фурман Я. В. Основи методики розслідування контрабанди культурних цінностей : автореф. дис. ... канд. юрид. наук. Київ, 2009. 22 с. URL: https://uacademic.info/ua/document/0410U001200 (date accessed: 20.02.2025).

9 Малюга Р. В. Кримінальне процесуальне доказування контрабанди наркотичних засобів, психотропних речовин, їх аналогів чи прекурсорів або фальсифікованих лікарських засобів у досудовому розслідуванні : дис. ... канд. юрид. наук. Київ, 2015. 273 с. URL: https://uacademic.info/ua/document/0415U005439 (date accessed: 20.02.2025).

10 Буга А. Ю. Методика розслідування злочинів, пов'язаних з незаконним обігом лікарських засобів : дис. ... д-ра філос. Одеса, 2020. 258 с. URL: https://uacademic.info/ua/document/0822U100024 (date accessed: 20.02.2025).

position, forensic classification should be understood as the process of realizing intellectual abilities of an authorized subject in the context of ordering and systematizing objects by dividing them using logical operations, i.e. the studied phenomena or objects are combined into a certain system in accordance with the prescribed forensically significant criteria. In other words, they are combined into groups depending on common characteristics and differences determined on the basis of previously agreed forensic signs [11].

General theoretical aspects of forensic classification of crimes have been studied by: S. Bondar, V. Husieva, V. Zhuravel, Yu. Komarynska, V. Korzh, S. Knyzhenko, M. Kryvonos, V. Maliarova, T. Matiushkova, O. Samoilenko, R. Stepaniuk, O. Pchelina, B. Shchur [12]. The scientists revealed essence and peculiarities of application of forensic classification, defined its importance and created the basis for further research in this area. They substantiated expediency of applying certain criteria for the classification of criminal offenses. Despite the significant contribution to development of this topic, some specific classifications of offenses remain insufficiently researched (in particular, crimes against justice).

Researchers periodically refer to classification of criminal offenses related to smuggling. At the same time, existing researches do not yet allow to comprehensively solve this problem and outline the prospects for building separate forensic investigation methods.

Main Content Presentation

Criminal offenses and their groups (as independent objects of cognition) can be thoroughly investigated in the case of applying the classification method, as well as induction and deduction methods. Their complex application in compliance with the rules of formal logic makes it possible to delve from the whole to the structural components, parts and vice versa. This approach ensures the identification of patterns between their parts and elements, the definition of the relationship between them, as well as the grounds and features of interaction within the system that has become the object of research [13]. Thus,

11 Буга А. Ю. Зазнач. твір. С. 50. URL: https://uacademic.info/ua/document/0822U100024 (date accessed: 20.02.2025).

12 Щур Б. В. Теоретичні основи формування та застосування криміналістичних методик : монографія Харків, 2010. 319 с. ; Гусєва В. О. Теоретичні основи методики розслідування злочинів проти авторитету органів державної влади у сфері правоохоронної діяльності : дис. … д-ра юрид. наук. Харків, 2021. 538 с. URL: https://core.ac.uk/download/pdf/442209993.pdf (date accessed: 20.02.2025) ; Книженко С. О. Криміналістична класифікація злочинів проти правосуддя. *Право і безпека.* 2013. № 1 (48). С. 113—118. URL: http://nbuv.gov.ua/UJRN/Pib_2013_1_26 (date accessed: 20.02.2025) ; Самойленко О. А. Криміналістична класифікація злочинів, вчинених із використанням обстановки кіберпростіру. *Науковий вісник Ужгородського національного університету. Серія: Право*. 2018. Вип. 49. Т. 2. С. 162—166. URL: https://dspace.onua.edu.ua/server/api/core/bitstreams/a3762107-fa9f-4672-8044-18c86f567c0a/content (date accessed: 20.02.2025) ; Степанюк Р. Л. Криміналістична класифікація злочинів, що вчиняються в бюджетній сфері України. *Вісник Харківського національного університету внутрішніх справ*. 2010. № 4 (51). Ч. 1. С. 175—180. URL: http://nbuv.gov.ua/UJRN/VKhnuvs_2010_4%281%29__24 (date accessed: 20.02.2025).

13 Тищенко В. В. Корыстно-насильственные преступления: криминалистический анализ : монография. Одесса, 2002. С. 18. URL: https://coollib.cc/b/425251-valeriy-vladimirovich-tischenko-koryistno-nasilstvennyie-prestupleniya-kriminalisticheskiy-analiz/read (date accessed: 26.02.2025).

the classification method creates the prerequisites for cognition of the essence of criminal law phenomena, develops recommendations for their cognition by scientists and in investigative activity.

It is worth agreeing with M. Kryvonos, who noted the advantages of this research method in the context of crimes related to drug trafficking. In his opinion, such a classification contributes to:

- developing schedule of actions of investigator during the pre-trial investigation;
- systematization of signs of criminal offense topic, formation of algorithms for its forensic research;
- improving information support of investigative activities, ensuring legal and organizational regulation of various areas of cognitive activity of prosecution;
- determining forms and tasks of interaction between the subjects of information and analytical activities during investigation of criminal offenses [14].

Thus, the forensic classification can be applied to crimes that have fairly clear forensically significant criteria. Since the topic of our research is a group of crimes united on the basis of the generic object of the conceptual components of the mechanism of criminal activity and methods of commission, we believe that task of developing a forensic classification of smuggling-related criminal offenses is quite reasonable.

Each classification of criminal offenses is based on certain signs or criteria. Generalization of theoretical approaches makes possible to assert that a certain pluralism of views on essence of classification criteria persists in scientific community.

For example, S. Cherniavskyi and R. Dovbash believe that crimes can be classified taking into account both criminal-legal characteristics and forensic criteria that makes possible to distinguish three main groups of crimes: basic related and associated ones [15].

Basic crimes are a key element of the mechanism of criminal activity. They reflect the main focus of unlawful actions of a person or group of persons and ensure the achievement of the criminal goal. *Related (auxiliary)* crimes are offenses that are a way or a necessary condition for the preparation, implementation or concealment of predicate crimes. They can help to disguise the traces of criminal activity or its individual episodes. *Related crimes* have certain common signs with predicate crimes, but differ in certain criminal law and forensic characteristics [16].

B. Lukianchykov investigating the types of forensic methods, noted that criteria for their classification may be the patterns clarified both during the commission of the crime and in the process of its cognition by the subject of criminal proceedings. The scientist stressed that for classification it is advisable to apply not only formal signs (for example, object of criminal attack), but meaningful criteria

14 Кривонос М. В. Криміналістична класифікація злочинів як наукова основа застосування спеціальних знань у розслідуванні злочинів у сфері обігу наркотичних засобів, психотропних речовин, їх аналогів або прекурсорів. *Вісник Академії митної служби України. Сер.: Право.* 2012. № 2. С. 134. URL: http://nbuv.gov.ua/UJRN/vamsup_2012_2_23 (date accessed: 20.02.2025).

15 Чернявський С. С., Довбаш Р. С. Протидія злочинам, пов’язаним з незаконним відшкодуванням податку на додану вартість : наук.-практ. посіб. Київ, 2009. С. 22—23.

16 Там само.

that are crucial for investigation and take into account specific forensic specifics of crimes [17].

Similar approach is shared by V. Tishchenko, who classified violent crimes by elements of forensic characteristics, distinguishing among them the following groups:

- according to offender person, take into account the number of participants in the crime, the level of organization, age, gender, affiliation, professional activity, hobbies, as well as the relationship between the offender and the victim;
- according to infringement object, take into account the identity of the victim and criminal infringement topic;
- according to crime circumstances, analyze the place, time and other circumstances that accompanied the crime;
- according to method, consider methods of preparation, direct commission and concealment of a crime;
- according to consequences, assess the result of the crime and its consequences [18].

This classification contributes to a more detailed analysis of violent crimes which in turn ensures development of effective methods for their investigation.

Regarding best practices of scientists in the review of the chosen subject of research, we should refer to classification of criminal offenses in the field of economic activity. S. Trach studies the latter comprehensively, determining the prospects for development of certain methods of investigating criminal offenses in the field of economic activity, scientist proposed to classify them according to the following criteria:

1) economic activity field (sectoral approach):
   - investigation of offenses related to violation of order of circulation of money, securities and other financial documents;
   - investigation of tax evasion offenses;
   - investigation of crimes in the field of budget regulation;
   - investigation of offenses related to illegal movement of goods across the customs border of Ukraine;
   - investigation of violations of business and other economic activities;
   - investigation of crimes against the rights and legitimate interests of creditors;
2) criminal law (species) characteristics:
   - investigation of basic criminal offenses (crimes provided for in Sec. VII of Criminal Code of Ukraine [19]);
   - investigation of subordinate criminal offenses (Articles 190, 191 of the Criminal Code [20]);

17 Бахін В., Лук’янчиков Б. Склад і призначення криміналістичної характеристики злочинів. *Правничий часопис Донецького університету*. 2000. № 1 (4). С. 39—43 ; Лук’янчиков Є. Д., Лук’янчиков Б. Є., Петряєв С. Ю. Криміналістична характеристика в структурі методики розслідування злочинів. *Криміналістика і судова експертиза*. 2021. Вип. 66. С. 178—190. DOI: 10.33994/kndise.2021.66.19 (date accessed: 26.02.2025) ; Лук’янчиков Б. Вневидові методики розслідування злочинів як напрямок удосконалення криміналістичної методики : дис. … канд. юрид. наук. Київ, 2001. 194 с.

18 Тіщенко В. В. Зазнач. твір. С. 44.

19 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 20.02.2025).

20 Там само.

- investigation of related criminal offenses (Articles 364, 366 of Criminal Code [21]);

3) other forensically significant criteria:
- depending on specifics of business transactions within which the offense was committed;
- in accordance with the method of committing crime;
- taking into account peculiarities of criminal offense topic, etc. [22]

The above classification makes possible to more effectively structure the methods of investigating criminal offenses in the field of economic activity and take into account their key specifics.

S. Tiulieniev investigating criminal offenses in the field of economic activity related to the illegal acquisition of assets of economic entities, proposed to classify them according to the following criteria:

- direct object of encroachment;
- topic subject of criminal offenses;
- type of economic activity that has been subjected to criminal influence;
- nature and form of detection of traces of criminal activity;
- nature of obtained criminal result;
- composition peculiarities of persons involved in the implementation of criminal intent;
- nature of the actions carried out by the raiders [23].

According to the approach of V. Usatyi, the main criteria for the classification of criminal offenses in the field of economic activity are as follows:

- type of economic interests that have suffered damage;
- status of entity in the field of economic legal relations, in which respect the crime was committed;
- type of tools and equipment used;
- type of economic activity and branch of production to which the affected business entity belongs;
- form of complicity of persons who committed a crime;
- outstanding characteristics of the person;
- method of offense committing;
- topic specifics of criminal infringement and social relations that have suffered damage;
- amount of damage caused;
- type of violence used (if any);
- legal regime within which the criminal offense occurred;
- type of consequences that have arisen as a result of the crime [24].

As additional criteria, the author considers:

- purpose and motives that guided the guilty person or group of persons in committing offense;
- existence of preparatory actions and other factors that influenced

21 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 20.02.2025).

22 Трач С. С. Концепція методики розслідування кримінальних правопорушень у сфері господарської діяльності. *Науковий вісник публічного та приватного права*. 2021. Вип. 2. Т. 2. С. 93, 99. DOI: 10.32844/2618-1258.2021.2.2.16 (date accessed: 20.02.2025).

23 Тюлєнєв С. А. Криміналістична класифікація злочинів і кримінальних проступків, пов’язаних із протиправними посяганнями на активи суб’єктів господарювання. *Вісник Харківського національного університету внутрішніх справ*. 2024. Т. 106. № 3. С. 235—246. DOI: 10.32631/v.2024.3.20 (date accessed: 20.02.2025).

24 Усатий В. О. Криміналістична класифікація кримінальних правопорушень у сфері господарської діяльності. *Вісник Харківського національного університету внутрішніх справ.* 2024. Т. 107. № 4. С. 220—230. DOI: 10.32631/v.2024.4.20 (date accessed: 20.02.2025).

implementation of the criminal project [25].

The forensic classification of crimes related to drug trafficking, as noted by A. Buha, can be developed on the basis of the following criteria:

- according to the method of committing crime (in particular, according to the form of criminal activity; according to the use of tools and means; according to the method of falsification of medicines; according to the method of distribution of illegal medicines);
- according to legality of infrastructure (illegal circulation through officially registered enterprises; crimes committed through illegal participants in pharmaceutical market, committed simultaneously in legal and illegal sectors of pharmaceutical activity; participation of officials of state institutions in a criminal scheme);
- according to the fact of concealment (crimes for which the traces of the offense are concealed and not concealed);
- according to the subject of a criminal infringement (falsified, poisonous or potent medicines; funds obtained from the illegal circulation of medicines; equipment for the illegal production of medicines; medicines for which the procedure for preclinical and clinical trials or state registration has been violated);
- according to the crime situation (localization; scale; international nature);
- according to the crime scene;
- according to the duration of illegal trafficking (short-term; long-term);
- according to the person of the offender (by social and professional status; by the number of participants; by availability of criminal experience; by gender; based on the motives of the crime);
- according to victims or aggrieved persons (according to the signs of the aggrieved party; according to nature of the caused damage) [26].

The above classification makes possible to comprehensively analyze the illicit trafficking in medicines, which contributes to improving efficiency of investigation and prevention of such crimes. At the same time, in the above positions, the authors proposed a number of classification criteria that can be used to group criminal offenses.

In view of the above, let us summarize: scientists base certain criteria on the most significant forensic grounds (signs, characteristics). In our opinion, they can be recognized as elements of the mechanism of criminal illegal activity, forensic characteristics of criminal offenses.

In the context of criminal offenses related to smuggling, the methods of committing a criminal offense are of great importance, including, in particular: 1) committed with concealment from customs control; 2) realized outside of customs control. Ya. Furman identified a number of ways of illegal transportation of cultural property across the border committed with the avoidance of customs control, such as: the use of caches and other methods that complicate the detection of contraband items during inspection;

25 Усатий В. О. Зазнач. твір. DOI: 10.32631/v.2024.4.20 (date accessed: 20.02.2025).

26 Буга А. Ю. Криміналістична класифікація злочинів, пов’язаних з незаконним обігом лікарських засобів. *Прикарпатський юридичний вісник*. 2019. Вип. 2 (27). Т. 2. С. 77—83. URL: http://nbuv.gov.ua/UJRN/Pjuv_2019_2%282%29__18 (date accessed: 20.02.2025).

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transportation in accompanied or unaccompanied cargo; by a person or animal; disguise by giving the items the appearance of other things [27]. Another common way to realize a criminal intent aimed at smuggling is to provide customs authorities with falsified documents forged, illegally obtained or containing false information. This list includes cases when documents required for the transportation of certain goods are used for the illegal transportation of others, as well as physical (material) forgery of accompanying documentation. Separately, the researcher identified the methods of smuggling carried out outside the control of the customs authorities: illegal movement outside the locations of customs points, crossing the border outside of working hours, the use of illegal mechanisms to exempt from customs control [28].

In scientific literature, the methods of smuggling by concealment from customs control are also classified as moving by: 1) use of caches; 2) use of various methods of *physical concealment*; 3) falsification of customs and other documents [29].

Thus, the method of committing a criminal offense is classification significant that leads to other specifics that should be taken into account when developing scientifically sound recommendations for investigating crimes. For example, use of forged documents in commission of a crime makes necessary to find, seize and expertly examine them. Subsequently, it is necessary to find out forger identity, tools and means used, etc. Such tasks are primarily determined by the circumstances to be established, which, in turn, are situationally dependent. These factors necessitate a whole range of investigative (detective) and other procedural actions. Thus, the method of committing criminal offenses can be used as the basis for forensic classification of the criminal offenses under research.

The very subject of encroachment has the same significant forensic significance as a method for criminal offenses related to smuggling. Currently, the legislator has criminalized smuggling:

- poisonous and potent substances, cultural values, weapons or ammunition (except for smooth-bore hunting weapons or ammunition for them), parts of rifled firearms, explosives, radioactive materials, special technical means for secretly obtaining information (Article 201 of the Criminal Code);
- timber and lumber of valuable and rare species of trees, raw timber, as well as other timber prohibited for export outside the customs territory of the State (Article 201-1 of the Criminal Code);
- goods (Article 201-3 of the Criminal Code);
- excisable goods, except for electricity (Article 201-4 of the Criminal Code) [30].

Therefore, criminal offenses related to smuggling can be classified on sepa-

27 Фурман Я. В. Зазнач. твір. С. 8. URL: https://uacademic.info/ua/document/0410U001200 (date accessed: 20.02.2025).

28 Фурман Я. В. Зазнач. твір. URL: https://uacademic.info/ua/document/0410U001200 (date accessed: 20.02.2025).

29 Шевчук В. М. Зазнач. твір. С. 489—493. URL: https://library.nlu.edu.ua/POLN_TEXT/KNIGI/PRAVO/Shepitko_Rozslid_2006.pdf (date accessed: 20.02.2025).

30 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 20.02.2025).

rate grounds of the subject of smuggling. Thus, if it is possible to distribute the topic of smuggling in free circulation, they can be combined into two independent groups: 1) criminal offenses, subject of smuggling of which are goods and other valuables in free circulation; 2) criminal offenses, subject of smuggling of which are goods, substances and means limited to free or withdrawn by law from civil circulation.

The following criteria can be used as additional grounds for classifying criminal offenses related to smuggling: time, situation and place of commission of criminal offenses; tools and means used; some characteristics of smuggler personality or group of smugglers, etc.

Conclusions

Significant level of public danger is characterized by a group of criminal offenses that encroach on public relations in the field of economic activity, in particular those related to smuggling. This type of criminal offenses (despite availability of certain common signs) covers quite diverse (by individual characteristics) types and forms of criminal activity. This primarily concerns specifics of smuggled goods and the methods of committing criminal offenses. Based on generalization of theoretical approaches to the forensic classification of criminal offenses, the author substantiates the need to apply an approach which while studying legal phenomena, provides for simultaneous consideration of both criminal law specifics which are basic and forensically significant.

The analysis of legislative and theoretical approaches makes possible to distinguish the main classification criteria for criminal offenses related to smuggling: 1) method of implementing the criminal intent of smugglers; 2) topic specifics of smuggling. According to the method of implementing the criminal intent of smugglers, the following groups of criminal offenses can be distinguished: 1) committed with concealment of smuggled goods from the control of customs officers (with the use of auxiliary tools and means); 2) implemented outside the customs control.

According to peculiarities of the subject of smuggling, it is proposed to single out criminal offenses related to the illegal movement across the border of the objects defined in Articles 201, 201-1, 201-3, 201-4 of Criminal Code. If it is possible to spread and stay in free circulation, the investigated criminal offenses can be combined into two independent groups, the topic of which were: 1) things not withdrawn by law from free circulation; 2) goods, substances and means limited to free or withdrawn by law from civil circulation.

Additional criteria for classifying criminal offenses related to smuggling can be: time, situation and place of commission of criminal offenses; tools and means used; some characteristics of smuggler personality or a group of smugglers, etc.

Криміналістична класифікація кримінальних правопорушень, пов'язаних із контрабандою

Юрій Ковальов

Мета статті — на підставі найбільш значущих криміналістичних ознак розробити криміналістичну класифікацію кримінальних правопорушень, пов'язаних із контрабандою. Методологічним підґрунтям дослідження є загальнонаукові та спеціальні наукові методи. Окрема група кримінальних правопорушень, що посягають на суспільні відносини у сфері забезпечення господарської *діяльності, пов'язана з контрабандою. Цей вид кримінальних правопорушень (попри наявність певних спільних ознак) охоплює доволі різноманітні види й форми кримінально протиправної діяльності. Це передусім стосується особливостей предмета контрабанди і способів учинення кримінальних правопорушень. На підставі узагальнення теоретичних підходів до проведення криміналістичної класифікації кримінальних правопорушень обґрунтовано необхідність застосування підходу, який під час дослідження правових явищ передбачає одночасне врахування ознак як кримінально-правових, що є базовими, так і криміналістично значущих. Основними класифікаційними критеріями кримінальних правопорушень, пов'язаних із контрабандою, ми вважаємо: 1) спосіб реалізації злочинного умислу контрабандистів; 2) особливості предмета контрабанди. За способом реалізації можна виокремити такі групи кримінальних правопорушень: 1) учинені із приховуванням предметів контрабанди від контролю митників (із застосуванням допоміжних знарядь і засобів); 2) реалізовані поза митним контролем. За особливостями предмета контрабанди запропоновано виокремлювати кримінальні правопорушення, пов'язані з незаконним переміщенням через кордон об'єктів, визначених у ст. 201, 201-1, 201-3, 201-4 Кримінального кодексу України. За можливістю поширення та перебування у вільному обігу предметів контрабанди досліджувані кримінальні правопорушення можна об'єднати у дві самостійні групи: 1) кримінальні правопорушення, предметом яких є речі, не вилучені законом із вільного обігу; 2) кримінальні правопорушення, предметом контрабанди яких є обмежені або вилучені законом із цивільного обігу товари, речовини й засоби.*

Ключові слова: *контрабанда; криміналістична класифікація; кримінальне правопорушення; злочин; види та групи кримінальних правопорушень; криміналістична методика.*

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Declaration of Competing Interest

Author declares no conflict of interest.

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Forensic Characterization Elements of Criminal Offenses Committed by Professional Participants in Justice

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This article purpose is to clarify of forensic characterization meaning of criminal offenses committed by professional participants in legal proceedings for determining substantive elements of its structure. The goal was achieved through application of a number of general and special methods of scientific knowledge. Based on consideration of the trends in development of forensic characterization doctrine, the analysis of theoretical approaches of scientists to resolving controversial aspects, it was determined that the forensic characterization is the information basis of individual forensic methods. As a generalization of forensically significant signs of elements of the mechanism of criminal and illegal activity, it ensures relevance of formulated recommendations and their compliance with requirements of law-making activity and therefore, their further practical significance. It is proved that the content of the forensic characterization has a dynamic structure, primarily determined by specifics of composition of criminal offense, their groups, as well as the peculiarities of the mechanism of criminal activity. It is argued that the forensic characteristics of criminal offenses committed by professional participants in justice are: 1) method of committing a criminal offense (method of preparation, method of committing, method of concealment); 2) circumstances of committing a criminal offense, time and place; 3) criminal identity; 4) tools and means

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of committing a criminal offense; 5) traces of a criminal offense; 6) victim identity; 7) offense topic. It was found that information about the identity of the victim and the subject of the offense are optional and are not always reflected in the structure of criminal and illegal activity. Identified components of these criminal offenses can be used to improve the methodology of their investigation, which will contribute to more effective detection, documentation and proof of the facts of illegal activity of professional participants in justice.

Keywords: *criminal proceedings; criminal offense; forensic methods; forensic characterization; professional participant in legal proceedings; crime against justice.*

Research Problem Formulation

Ensuring independent, objective and fair justice is one of the basic tasks of a modern legal and social state. Judiciary (together with other bodies and institutions involved in the administration of justice) is the last resort, ensuring the protection of the rights and freedoms of all participants in social relations, contributing to restoration of their legitimate interests and guaranteeing compliance with justice principles, rule of law and due legal procedure. Despite this, in practice there are cases of violation of current legislation by individuals including those who are involved in the process of administering justice and directly contributing to its implementation. This category of criminal offenses: offenses committed by professional participants in justice covers a number of unlawful acts, including: knowingly illegal detention, pretext, house arrest or detention; bringing a knowingly innocent person to criminal liability; coercion to give testimony; violation of the right to defense; illegal interference in the work of automated systems in bodies and institutions of the justice system; failure to take security measures for persons taken under protection and disclosure of information about such measures; disclosure by prosecutor, investigator, inquirer or employee of an operational-search agency of information from a pre-trial investigation or operational-search activity. In criminalistics, these offenses have not been comprehensively studied to date, therefore our goal is to study forensic characterization as integral element of the methodology for investigating these crimes and criminal offenses. Our attention is drawn to the issue of defining forensic characterization and its substantive components, since these aspects of the forensic discourse still cause controversy in the scientific community and the outlined group of criminal offenses has not been studied at all.

Scientific validity of recommendations for the investigation of criminal offenses is ensured by a proper information basis, systematic set of information about properties of the mechanism of criminal and illegal activities. The main form of application of this information basis is the forensic characteristic that currently many scientists call mandatory component of the structure of individual forensic techniques. Given the lack of significant scientific developments in the field of criminal offenses committed by professional participants in justice, issue of developing an appropriate forensic characterization becomes absolutely urgent.

Article Purpose

Find out the content of forensic characteristic of criminal offenses committed by professional participants in the proceedings, determine the essential elements of its structure.

Research Methods

Methodological apparatus is selected taking into account the set goal and is represented by general scientific and special methods of scientific knowledge. Methods of analysis and synthesis, comparative legal and system-structural analysis provided clarification of trends in the development of the doctrine of forensic characterization, made it possible to generalize approaches to determining its significance and essence. Methods of induction and deduction, as well as legal comparative studies, contributed to identification of the mechanism structure of criminal and illegal activities of professional participants in justice, the conclusions of which are the basis for determining the content of forensic characteristics of the investigated criminal offenses.

Analysis of Essential Researches and Publications

The issue of bringing a person to criminal liability for committing criminal offenses against justice has been comprehensively investigated in the research papers by N. Alekseeva [1], M. Bazhanov [2], G. Bershov [3], A. Vorontsov [4], S. Didyk [5], V. Kuznetsov and M. Siyploka [6], A. Martirosyan [7], L. Palyukh [8], V. Tiutiuhin with co-authors [9],

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6 Кузнецов В. В., Сийплокі М. В. Кримінальна відповідальність за притягнення як обвинуваченого завідомо невинуватої особи : монографія / за заг. ред. д-ра юрид. наук, проф. В. І. Шакуна ; передмова Г. О. Усатого. Ужгород, 2011. 284 с. URL: https://surl.li/rlqnny (date accessed: 03.03.2025).

7 Мартіросян А. Г. Кримінальна відповідальність за втручання в діяльність осіб, які здійснюють правосуддя : дис. ... канд. юрид. наук. Луцьк, 2011. 212 с.

8 Палюх Л. Класифікація злочинів проти правосуддя. *Підприємництво, господарство і право*. 2018. № 2. С. 176—181. URL: http://pgp-journal.kiev.ua/archive/2018/2/33.pdf (date accessed: 03.03.2025).

9 Тютюгін В. І., Борисов В. І. та ін. Злочини проти правосуддя : навч. посіб. / за заг. ред. проф. В. І. Борисова, В. І. Тютюгіна. Харків, 2011. 160 с. URL: https://library.nlu.edu.ua/POLN_TEXT/POSIBNIKI_2012/NMP_0017.pdf (date accessed: 03.03.2025).

M. Shepitko [10], et al. Despite the sufficient development of the criminal-legal characteristics of these criminal offenses, modern doctrine of criminology, unfortunately, does not yet have the proper level of scientific support in the aspect of investigating criminal offenses against justice in general and those committed by professional participants in the proceedings in particular: only in isolated research papers have some issues been revealed within the limits of the raised issues.

Among the latter, the achievements of S. Knizhenko should be mentioned. The author has long studied topical issues of investigation of criminal offenses against justice: these are the problems of forensic classification of criminal offenses against justice [11], and the structure of the methodology for their investigation [12], and practical aspects of pre-trial investigation in cases initiated on the grounds of these criminal offenses [13], etc.

M. Shepitko has taken a thorough approach to the development of the issues of detection and investigation of criminal offenses against justice. The scholar rightly notes that only a small proportion of criminal offenses against justice committed by professional participants in the judicial process are investigated by national investigative authorities. This is due to the professional and procedural status of such criminals, their legal awareness, work in the field of justice and performance of professional functions. In addition, the existing protection mechanisms and guarantees aimed at protecting their activities significantly complicate the process of detection and investigation of criminal offenses of this category [14]. The author's position supports the thesis that issue of combating criminal offenses committed by professional participants of justice is relevant and requires proper scientific support, which in turn will contribute to the realization of the praxeological function of criminalistics as a science.

Some issues of counteraction to criminal offenses committed by professional

10 Шепітько М. В. Теоретико-методологічні засади формування системи протидії злочинам у сфері правосуддя : автореф. дис. ... д-ра юрид. наук. Харків, 2018. 42 с. URL: https://uacademic.info/ua/document/0518U000802 (date accessed: 03.03.2025)

11 Книженко С. О. Криміналістична класифікація злочинів проти правосуддя. *Право і безпека.* 2013. № 1 (48). С. 113—118. URL: http://nbuv.gov.ua/UJRN/Pib_2013_1_26 (date accessed: 03.03.2025).

12 Її ж. Поняття та структурні елементи криміналістичної характеристики злочинів проти правосуддя. *Судова та слідча практика в Україні.* 2018. № 6. С. 111—115. URL: http://nbuv.gov.ua/UJRN/jipu_2018_6_21 (date accessed: 03.03.2025).

13 Її ж. Розслідування злочинів, що вчиняються службовими особами правоохоронних органів шляхом порушення порядку здійснення або забезпечення правосуддя. *Науковий вісник Міжнародного гуманітарного університету. Сер.: Юриспруденція.* 2017. № 30. Т. 2. С. 94—97. URL: https://dspace.univd.edu.ua/server/api/core/bitstreams/cef78ea4-4114-4e2d-83bc-dc65b426d7ff/content (date accessed: 03.03.2025) ; Її ж. Особливості розслідування злочинів проти правосуддя, що вчиняються шляхом порушення порядку відбування покарання або попереднього ув'язнення. *Форум права.* 2016. № 3. С. 121—125. URL: http://nbuv.gov.ua/UJRN/FP_index.htm_2016_3_24 (date accessed: 03.03.2025).

14 Шепітько М. В. Проблеми виявлення та розслідування злочинів проти правосуддя, що вчиняються професійними учасниками судочинства (провадження). *Теорія та практика судової експертизи і криміналістики.* 2019. № 19. С. 55. DOI: 10.32353/khrife.1.2019.04 (date accessed: 03.03.2025).

participants in justice were investigated by O. Vakulyk [15], A. Mazur [16], Yu. Hristova [17], etc. At the same time, the forensic characterization of these crimes has not yet become the subject of a thorough scientific study.

Main Content Presentation

One of the basic components of any separate forensic methods for investigation of criminal offenses is forensic characterization. Generalization of various methodological approaches to construction of forensic methods at one time allowed scientists to conclude that it is the forensic characteristic that is the information basis for the formation of most other structural components [18]. Improvement and development of new forensic methods, as V. Korzh rightly notes, is inextricably linked with the construction of forensic characteristics of certain types of crimes, their groups and subgroups [19].

Forensic characterization is defined as a theoretical category of forensic science, represented by a certain set of data on typical characteristics, general features of the type of criminal offenses. One of the important features of the forensic characterization is its dynamic nature, which indicates the dynamism of its components. Principal in this context is the position of V. Bakhin, who notes that elements of a criminalistic characteristic can be classified into two groups: 1) those that characterize and thereby distinguish a certain type of crime from a certain set of criminal offenses; 2) those that can be used in the disclosure and investigation of criminal offenses [20].

In addition to theoretical model, forensic characterization is understood as a model of criminal activity. S. Cherniavskyi correctly notes the following signs of forensic characterization of crimes as a scientific category:

1) it is represented by systematic information about characteristic fo-

15 Вакулик О. Насильство як спосіб вчинення злочинів проти правосуддя. *Підприємництво, господарство і право.* 2019. № 4. С. 274—278. URL: http://pgp-journal.kiev.ua/archive/2019/4/52.pdf (date accessed: 03.03.2025).

16 Мазур А. П. Побудова криміналістичних версій на початковому етапі розслідування окремих видів злочинів проти правосуддя. *Право і суспільство*. 2015. № 4 (2). С. 193—198. URL: http://www.pravoisuspilstvo.org.ua/archive/2015/4_2015/part_2/34.pdf (date accessed: 03.03.2025).

17 Христова Ю. Актуальні питання інформаційно-аналітичного забезпечення протидії кримінальним правопорушенням проти правосуддя в сучасних умовах. *Наукові інновації та передові технології. Серія «Право»*. 2024. № 10 (38). С. 317—329. DOI: 10.52058/2786-5274-2024-10(38)-317-329 (date accessed: 03.03.2025).

18 Щур Б. В. Теоретичні основи формування та застосування криміналістичних методик : дис. ... д-ра юрид. наук. Харків, 2011. С. 262. URL: https://uacademic.info/ua/document/0511U000327 (date accessed: 03.03.2025) ; Колесниченко А. Н., Коновалова В. Е. Криминалистическая характеристика преступлений : учеб. пособ. Харьков, 1985. С. 20.

19 Корж В. Криміналістична характеристика економічних злочинів, скоєних організованими групами з корупційними зв'язками. *Теорія та практика судової експертизи і криміналістики*. 2024. Вип. 2 (35). С. 45. DOI: 10.32353/khrife.2.2024.04 (date accessed: 03.03.2025).

20 Бахин В. П. Криминалистика. Проблемы и мнения (1962—2002) : монография. Киев, 2002. С. 183. URL: https://coollib.in/b/676021-v-p-bahin-kriminalistika-problemyi-i-mneniya-1962-2002/read (date accessed: 03.03.2025).

rensically significant specifics of crimes of a certain type or category;
2) it reveals certain patterns and relationships between these characteristics;
3) it contains possibility of practical application of the acquired knowledge for effective disclosure and investigation of criminal offenses.

In view of this, S. Cherniavskyi proposes to consider the forensic characterization as a structured system containing two main components:

1) theoretical one is a conceptual model, a system of concepts and interrelations, which makes it possible to describe the features of criminal activity. This model is the epistemological basis for the development of an investigation methods;
2) practical one involves collection and generalization of empirical data on specific signs of certain crimes that have forensic significance and can be used in investigative activities. This approach provides a comprehensive understanding of forensic characterization and its importance for effective criminal justice [21].

As B. Shchur emphasizes, forensic characterization performs a pragmatic function, is integral part of a separate forensic methodology, it is used in investigative activities as a tool for putting forward investigative versions [22].

Thus, in most of the research papers considered, scientists rightly note the importance of the criminalistic characteristics of criminal offenses, actualizing its two main aspects:

1) theoretical one is generalization of empirical data obtained from the materials of criminal proceedings, court decisions and expert opinions, which creates the basis for development of scientifically sound methodological recommendations for investigation;
2) practical one is creation of an information base that helps the prosecution to build investigative versions, determine the optimal investigative (search) actions and effectively collect evidence, while realizing the burden of proof, which is (as a general rule) assigned to the prosecution.

Most often, when determining the essence of the forensic characterization of criminal offenses and its place in the structure of individual forensic methods, its correlation with the mechanism of criminal illegal activity, topic of proof or circumstances to be clarified during the investigation, etc. is analyzed. Personally, we are impressed by the approach of M. Shepitko, who notes while developing a forensic methodology, it is necessary to take into account the following aspects: characteristic specifics of the crime composition, characteristics of the person who committed it, retrospective nature of the investigation, influence of specific circumstances on its course, as well as the level of development of technical and

21 Чернявський С. С. Криміналістична характеристика злочинів: порівняльний аналіз наукових концепцій. *Науковий вісник Київського національного університету внутрішніх справ.* 2010. № 1. С. 142. URL: https://elar.navs.edu.ua/server/api/core/bitstreams/ea88d1af-dcc3-4609-b420-561991b458c2/content (date accessed: 03.03.2025).

22 Щур Б. В. Зазнач. твір. С. 136. URL: https://uacademic.info/ua/document/0511U000327 (date accessed: 03.03.2025).

tactical forensic means [23]. Certainly, these factors play a significant role in the structure of forensic characterization, which simply cannot but reflect the features of the crime and peculiarities of the criminal activity mechanism. Despite this, we consider it unjustified to identify the criminal and legal characterization with the forensic one.

According to M. Saltevskyi, the mechanism of illegal activity, its reflection, as well as the peculiarities of trace formation processes, which are the end result of criminal activity, are important for criminalistics [24]. In other words, the author focuses on criminal activity and its features that are decisive for investigative and scientific activities.

Peculiarities of the mechanism of criminal and illegal activity consisting in violation of the principles and principles of ensuring justice by its professional participants, can be represented by a number of key elements, among which:

1) *situation of committing a* criminal offense. This element covers not only the totality of spatio-temporal characteristics, but specific objective conditions in which it is committed;
2) *method of committing a* criminal offense. In the group of criminal offenses under study, the method usually consists either in the implementation of active forms of behavior associated with violation of specific legal norms (illegal prosecution, coercion to testify, etc.), or in passive forms consisting in non-compliance with legal principles and obligations imposed on a person by law (for example, failure to take security measures);
3) *suspect person* or a *person of a group of persons* who intentionally violated the principles and legal principles of the administration of justice. In the group of criminal offenses under consideration, such persons are special subjects: investigators, inquirers, prosecutors, employees of operational units, judges and other officials with a high level of legal awareness and professional training in the field of criminal procedure;
4) *trace picture* that reflects specifics of traces left in objective reality, which are the result of illegal activity. Typical traces of the investigated criminal offenses are various types of tangible and intangible objects that are important for the investigation and further judicial consideration of criminal proceedings.

Tangible traces in the form of documents are represented by materials reflecting procedural actions: protocols of investigative (search) actions, in which the course and results of investigative (search) and other procedural actions are recorded; protocols of court hearings containing information about the trial and positions of participants in the process; documents drawn up by defenders, which may contain evidence refuting the accusation or proving a violation of procedural rules.

23 Шепітько М. В. Проблеми формування методико-криміналістичних засобів у структурі протидії злочинам у сфері правосуддя. *Теорія та практика судової експертизи і криміналістики*. 2018. Вип. 18. С. 74. DOI: 10.32353/khrife.2018.08 (date accessed: 03.03.2025).

24 Салтевський М. В. Криміналістика (у сучасному вигляді) : підручник. Київ, 2005. С. 40–41. URL: https://surli.cc/xyracd (date accessed: 03.03.2025).

Virtual (digital) traces are represented by information stored on electronic media, in information systems or databases. This group of traces needs special attention when investigating unlawful interference with automated justice systems. In other categories of criminal offenses, such digital traces are records of telephone conversations, electronic correspondence, files confirming the commission of certain actions, or traces of deletion of information that can indicate evidence concealment.

Ideal traces are a reflection in the minds of people of information about an event recorded in their testimony. These testimonies may contain important information about the circumstances of the crime, the behavior of the participants in the event, the nature of their actions and possible motives. Peculiarity of such traces of criminal offenses is that they often remain in procedural documents. This necessitates a thorough analysis of each document, comparison of the content of different documents, identification of possible contradictions and compliance of the content of these documents with the actual circumstances of the case;

5) *used tools and equipment*. Such a component is not typical for all criminal offenses and is not decisive for the legal qualification of the act committed, but can have a significant forensic value during investigation in certain investigative situations;

6) *victim person* is one of the important elements of the mechanism of criminal activity, however, in the group of criminal offenses under study, it is optional, since their commission is not always associated with a violation of private interests.

Outlined components of the mechanism of criminal (criminal) activity should be reflected in the structure of the forensic characteristics of these criminal offenses.

Regarding the structure and content of the forensic characterization, different approaches are found in the forensic literature. Most often, scientists in their research distinguish from 4 to 12 elements of forensic characterization. For example, I. Kohutych proposes to consider as such generalized data on: 1) methods of committing crimes; 2) criminal offense topic; 3) the situation where the crime was committed; 4) motives and goals of the criminal act; 5) consequences caused by the crime; 6) properties of the victim's person; 7) properties of the offender's person [25].

Forensic characterization of crimes, according to B. Shchur, has its own characteristic structure including: 1) method of crime (method of preparation, method of commission, method of crime concealment); 2) criminal offense topic; 3) conditions for committing crime (time, place, situation); 4) tools and means of committing the crime; 5) offender identity; 6) victim identity; 7) traces of the crime [26].

V. Shevchuk proposes to distinguish the following six main elements in the structure of forensic characterization: 1) offense topic; 2) method of committing the crime; 3) typical crime traces;

25 Когутич І. І. Криміналістика : курс лекц. Київ, 2008. С. 544.

26 Щур Б. В. Зазнач. твір. С. 262. URL: https://uacademic.info/ua/document/0511U000327 (date accessed: 03.03.2025).

4) situation of the crime; 5) offender identity; 6) victim identity [27].

We are impressed by the outlined approaches, even though not all of the mentioned components are present in every criminal offense from the group we studied. In our opinion, this situation is quite acceptable precisely because the forensic characterization is not a set of generalized data on a specific crime, but a system of generalized data on a group of criminal offenses.

In our opinion, the issue of the object of the offense is somewhat controversial. First of all, we note that the mentioned scholars do not define the specifics of this component of the forensic methodology. Actually, the very concept of *criminal encroachment topic* is the property of criminal law, it is defined as a sign of the objective side of the criminal offense. In the essential aspect, it should be understood as material objects that embody social relations, encroachments on which are criminalized [28].

We believe that position on the need to distinguish forensic characteristics of the object of infringement in the structure is justified for those types and groups of criminal offenses for which the obligatory sign of the presence of the corpus delicti is the occurrence of consequences consisting in causing damage, that is, which mostly have a material composition. V. Pcholkin and O. Ivantsova while analyzing content of forensic characterization of crimes committed in economic field, note that topic of encroachment plays a key role in the structure of forensic characterization of crimes, since it is directly interrelated with its other elements. In particular, it determines the specifics of the ways of committing and concealing a crime, as well as facilitates the clarification of information about the offender's identity [29].

Most criminal offenses committed by professional participants in justice are not related to causing physical or property damage to a person. Most often, significant level of social danger of the investigated criminal offenses is due to encroachment on legally protected interests that do not have material nature.

Regarding criminal categorization of the subject of the crime in the context of the group of criminal offenses under consideration, it should be noted that such a subject is characteristic of the criminal offenses provided for in Articles 381 and 387 of the Criminal Code of Ukraine [30], that is, related to the disclosure of secrets protected by law. Thus, for Article 387 of the Criminal Code providing for liability for the disclosure of data of pre-trial in-

27 Шевчук В. М. Криміналістична характеристика злочинів: «криміналістичний пережиток» чи реально діюча категорія криміналістики. *Правничий часопис Донецького університету*. 2003. № 1 (9). С. 65. URL: https://dspace.nlu.edu.ua/bitstream/123456789/17704/1/Shevchuk_62-66.pdf (date accessed: 03.03.2025).

28 Отришко А. О. Предмет кримінально-протиправного посягання незаконного поводження зі зброєю, бойовими припасами або вибуховими речовинами. *Українська поліцеїстика: теорія, законодавство, практика*. 2023. Т. 5. № 1. С. 66—70. DOI: 10.32782/2709-9261-2022-1-5-12 (date accessed: 03.03.2025).

29 Пчолкін В. Д., Іванцова О. В. Криміналістична характеристика злочинів, що вчинюються у сфері економічної діяльності. *Вісник Харківського національного університету внутрішніх справ*. 2016. Т. 74. № 3. С. 155. URL: https://visnyk.univd.edu.ua/index.php/VNUAF/article/view/119 (date accessed: 03.03.2025).

30 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: 03.03.2025).

vestigation and operational investigative activities, such subject is exactly the following information: data of pre-trial investigation or inquiry that are not subject to disclosure [31].

Our position is consistent with the conclusions of O. Zaliska, who investigated the subject of crimes against justice. According to his conclusions, the subject of such crimes may be: 1) objects in the form of property (Articles 378 and 399 of the Criminal Code); 2) information in the form of information (Articles 376-1 and 387 of the Criminal Code) and documents, in particular information with a special legal status (Article 381 of the Criminal Code); 3) objects for which circulation special legal regime is provided (Article 388 of the Criminal Code) [32]. Thus, the topic of encroachment is characteristic only for those of the criminal offenses under study, the method of committing which is associated with the disclosure of information constituting a protected secret.

In view of the foregoing, we consider it necessary to name the following substantive elements of the criminalistic characteristics of criminal offenses committed by professional participants in justice: 1) the method of committing a criminal offense (method of preparation, method of committing, method of concealment); 2) situation of committing a criminal offense, including the time and place; 3) offender person; 4) tools and means of committing a criminal offense; 5) traces of a criminal offense; 6) victim person; 7) offense topic. And although the first five elements are basic and mandatory for all such offenses, and the last two are characteristic of only some of them, they are also to be distinguished in the structure of forensic characteristic under consideration.

Conclusions

Based on the trends in the development of the doctrine of forensic characterization and the analysis of various theoretical approaches to solving controversial aspects, it has been determined that forensic characterization is the information basis for certain forensic techniques. As a generalization of the forensically significant signs of mechanism elements of criminal and illegal activities, it ensures the relevance of the formulated recommendations and their compliance with the requirements of law enforcement activities, and, consequently, their further practical significance.

It is proved that the content of the criminalistic characterization has a dynamic structure, primarily due to the features of the criminal offense, their groups, and also the peculiarities of the mechanism of criminal activity. It is argued that the criminalistic characterization of criminal offenses committed by professional participants of justice includes: 1) method of committing a criminal offense (method of preparation, method of commission, method of concealment); 2) setting criminal offense, time and place; 3) offender identity; 4) tools and means of committing a criminal offense; 5) traces of a criminal

31 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (дата звернення: 03.03.2025) ; Борисов В. І., Тютюгін В. І. Зазнач. твір. URL: https://library.nlu.edu.ua/POLN_TEXT/POSIBNIKI_2012/NMP_0017.pdf (date accessed: 03.03.2025).

32 Заліско О. І. Предмет злочинів проти правосуддя. *Форум права*. 2015. № 3. С. 80—84. URL: http://nbuv.gov.ua/UJRN/FP_index.htm_2015_3_16 (date accessed: 03.03.2025) ; Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 03.03.2025).

offense; 6) victim identity (victim); 7) offense topic. It is found that information about victim's identity and the object of the offense is optional and is not always reflected in the structure of criminal activity. The identified components of these criminal offenses can be used to improve the methodology of their investigation, which will contribute to more effective detection, documentation and proof of the facts of illegal activities of professional participants of justice.

Prospects for further research on the issues raised by us are seen in the definition of correlations (interdependencies) between the elements of the forensic characterization of criminal offenses committed by professional participants in justice.

Елементи криміналістичної характеристики кримінальних правопорушень, учинених професійними учасниками правосуддя

Євген Суп

Мета статті — з'ясувати значення криміналістичної характеристики кримінальних правопорушень, учинених професійними учасниками судочинства, визначити змістовні елементи її структури. Поставлену мету реалізовано завдяки застосуванню низки загальних і спеціальних методів наукового пізнання. На підставі врахування тенденцій розвитку вчення про криміналістичну характеристику, аналізу теоретичних підходів учених до розв'язання дискусійних аспектів, визначено, що криміналістична характеристика є інформаційним підґрунтям окремих криміналістичних методик. Як узагальнення криміналістично значущих ознак елементів механізму кримінально-протиправної діяльності, вона забезпечує актуальність сформульованих рекомендацій і їхню відповідність запитам правозастовної діяльності, а отже, і їхню подальшу практичну значущість. Доведено, що зміст криміналістичної характеристики має динамічну структуру, передусім зумовлену ознаками складу кримінального правопорушення, їхніх груп, а також особливостями механізму злочинної діяльності. Аргументовано, що криміналістичну характеристику кримінальних правопорушень, учинених професійними учасниками правосуддя, становлять: 1) спосіб учинення кримінального правопорушення (спосіб приготування, спосіб учинення, спосіб приховування); 2) обстановка вчинення кримінального правопорушення, час і місце; 3) особа злочинця; 4) знаряддя та засоби вчинення кримінального правопорушення; 5) сліди кримінального правопорушення; 6) особа потерпілого (жертви); 7) предмет посягання. З'ясовано, що відомості про особу потерпілого та предмет посягання мають факультативний характер і не завжди відображені у структурі кримінально-протиправної діяльності. Визначені складові цих кримінальних правопорушень можна застосувати для вдосконалення методики їх розслідування, що сприятиме більш ефективному виявленню, документуванню й доказуванню фактів протиправної діяльності професійних учасників правосуддя.

Ключові слова: *кримінальне провадження; кримінальне правопорушення; криміналістична методика; криміналістична характеристика; професійний учасник судочинства; злочин проти правосуддя.*

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Research Papers

Countering Investigation as a Substantive Component of Topic of Criminalistics

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This article purpose is to determine the specifics and directions of cognition of such a phenomenon as countering investigation, in the context of formation of a separate forensic doctrine of such resistance and its neutralization (overcoming). Achievement of the set goal was facilitated by the use of a number of general scientific, special and philosophical methods (dialectical, modeling, system-structural analysis, comparative analysis, etc.). Understanding that criminalistics as a science studies regularities of the mechanism of committing criminal offenses, specifics of emergence and preservation of information about them in reality and digital space, as well as the methods of obtaining, analyzing, evaluating and applying this information while proving, made possible to substantiate the need to expand the system of its individual teachings and theories. Taking into account specifics of the topic of criminalistics, importance of post-criminal activity of subjects of criminal offenses as one of its important components is substantiated. It is emphasized that implementation of various forms of countering investigation by criminals has long actualized the need to single out the forensic doctrine of countering investigation and its neutralization. It is proven that (despite significant scientific achievements) a number of issues on

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the raised issues still do not have a single concept, and terminological apparatus remains contradictory and inconsistent. It is found that multiplicity of statements, conclusions and hypotheses within the limits of this topic requires systematic research. An approach to solving this issue is proposed by developing the fundamental principles of the forensic doctrine of countering investigation, however, final algorithm for its solution has not been formed. Prospects for further research are outlined that provide for development, improvement and verification of key provisions of the doctrine of countering investigation and its neutralization (taking into account requests and issues of law enforcement activities).

Keywords: *criminalistics; pre-trial investigation; forensic doctrine; theory; countering investigation; object and topic of criminalistics; investigative activity; post-criminal activity.*

Research Problem Formulation

Rapid increase in the crime level, its complication and improvement of methods of committing criminal offenses necessitate development of effective strategies for the security and defense sector, improvement of typical algorithms of work. This sets the task for lawyers and scientific community to modernize law enforcement activities, introduce new methods of combating crime and update forensic recommendations for investigation of criminal offenses.

One of leading aspects of modern criminal investigation practice is countering attempts by interested parties to influence the procedure of criminal proceedings. Effective neutralization of such actions is an important component of ensuring justice and upholding the rule of law. Solving any scientific or practical problem requires a thorough analysis of previous methods and their generalization. Such a methodological approach makes possible to determine optimal directions of further research and develop effective recommendations for improving activities of State bodies. Legal science, aimed at strengthening law enforcement practice, aims to develop effective mechanisms for protecting the rights and legitimate interests of citizens, as well as their restoration in the event of illegal actions by individuals, institutions or organizations. This is especially relevant, since according to the Constitution of Ukraine and a number of international legal treaties ensuring human rights and freedoms is one of the fundamental duties of the State.

Scholars have repeatedly attempted to comprehend and systematize typical forms of countering investigations, as well as to identify effective methods of neutralizing them. At the same time, the research conducted has not been systematized to date. Different theoretical approaches and practical issues find different, sometimes contradictory, proposals for their solution. There is no consensus on whether counteraction can be realized in the form of inaction; whether certain actions of the suspect should be recognized as counteraction or as the exercise of his right to defense; whether those actions that have signs of independent criminal offenses should be considered a form of counteraction; whether it is advisable to distinguish actions taken as a way to conceal a crime in the structure of counteraction to the investigation, etc. Thus, the outlined issues are complex, and therefore should acquire the status of an independent subject of research.

Article Purpose

Determine specifics and directions of knowledge of such a phenomenon as counteraction to the investigation, in the context of formation of a separate forensic doctrine on countering investigation and its neutralization (overcoming).

Research Methods

Implementation of the stated goal was ensured through the use of a complex of methods of scientific knowledge, that contributed to the systematic analysis of the regularities of committing criminal offenses, mechanisms of obtaining information about, as well as research on counteraction to investigation and its neutralization. The dialectical method made possible to consider criminalistics as a developing system of scientific knowledge, identify the regularities of formation, preservation and application of information about criminal offenses. With its help, relationship between the mechanism of criminal activity, post-criminal behavior of the subjects of offenses and the need to isolate an independent forensic doctrine about countering investigation was studied. The system-structural method provided the opportunity to consider criminalistics as a holistic system, which components are knowledge of the mechanism of committing criminal offenses, methods of obtaining and analyzing information, as well as means of its application in proving. This method made possible to substantiate that post-criminal activities of crime subjects are a separate important aspect of forensic researches.

Formal-logical method contributed to clarification of the terminological apparatus, identification of contradictions in terms and clarification of the need for their coordination within the boundaries of forensic science. Method of comparative analysis made possible to compare different approaches to defining the subject of forensic science, identifying its components, and evaluating existing hypotheses regarding the post-criminal activities of criminals. This justified the need for further concept development of countering investigation and determining its place in the forensic system. Modeling method contributed to construction of theoretical constructs regarding the mechanism of countering investigation and its neutralization. Thanks to this method, conceptual foundations of the future forensic science doctrine of countering investigation were proposed and the directions of its further development were determined.

Analysis of Essential Researches and Publications

Countering investigation involves creation of artificial obstacles to the legitimate activities of the bodies of pre-trial investigation, inquiry, judicial bodies, as well as other persons who contribute to administration of justice. Analysis of historical sources and scientific research devoted to development of legislation in the field of protection and ensuring the administration of justice, implementation of criminal law functions of and criminal procedure, indicates that some forms of such countering have existed for a long time. In particular, already in the days of the Ancient World, cases of concealment of crimes, pressure on witnesses and victims are mentioned that can be considered as early forms of interference in investigation procedure.

The scientific community began to make attempts to scientifically comprehend such a phenomenon as countering investigation in the second half of the twentieth century. At that time, fruitful work on this topic was carried out by V. Bakhin, V. Bernaz, V. Honcharenko, A. Ishchenko, N. Karpov, V. Konovalova, V. Korzh, V. Kuzmichov, V. Lysychenko, F. Sokyran, V. Tertyshnik, M. Shumylo, et al. Contribution of these scientists lies primarily in understanding essence of countering investigation, its typical forms and methods of neutralizing the countering.

In a number of monographic studies of the 2000s, achievements of scientists have become more systematic. One of the first thorough studies of independent Ukraine devoted to countering the investigation is the work of R. Shekhavtsov where the author considered typical forms and methods of countering the investigation of crimes and identified the means of overcoming them based on the analysis of materials of criminal cases of extortion committed by organized groups and criminal organizations [1].

In research by V. Vartsaba: *Investigation of crimes of organized criminal groups (tactical and psychological foundations)* the psychological aspects of the criminal activity of a group of individuals are considered, the internal relationships and features of the hierarchical structure of various criminal groups [2] are investigated. Further development of research in this area is associated with the work of O. Aleksandrenko, who thoroughly analyzed the forensic aspects of overcoming contraction of investigation, emphasizing feasibility of integrated approach and the use of the latest methods in neutralizing the countering investigation [3]. Another significant research in this area was the dissertation of B. Shchur, devoted to the regularities of tactical support of the work of law enforcement agencies in overcoming resistance from organized criminal groups [4].

A significant contribution to development of scientific approaches to overcoming counteraction to investigation was made by K. Hutnik. Her research highlights the provisions and recommendations for neutralizing resistance carried out in conditions of social tension and social protest by persons interested in destabilizing the situation [5]. V. Trepak's research paper examines the issue of overcoming

1 Шехавцов Р. М. Форми та способи протидії розслідуванню злочинів та засоби їх подолання (за матеріалами кримінальних справ про вимагання, вчинені організованими групами, злочинними організаціями) : дис. … канд. юрид. наук. Київ, 2003. 238 с. URL: https://uacademic.info/ua/document/0404U000411 (дата звернення: 10.02.2025).

2 Варцаба В. М. Розслідування злочинів організованих злочинних груп (тактико-психологічні основи) : дис. … канд. юрид. наук. Харків, 2003. 181 с. URL: https://uacademic.info/ua/document/0404U000656 (дата звернення: 10.02.2025).

3 Александренко О. В. Криміналістичні проблеми подолання протидії розслідуванню : автореф. дис. … канд. юрид. наук. Київ, 2004. 20 с. URL: https://dspace.nlu.edu.ua/jspui/handle/123456789/13980 (дата звернення: 10.02.2025).

4 Щур Б. В. Тактика усунення протидії розслідуванню злочинів, що вчиняються організованими злочинним групами : дис. … канд. юрид. наук. Харків, 2005. 195 с. URL: https://uacademic.info/ua/document/0405U000648 (дата звернення: 10.02.2025).

5 Гутнік К. В. Розслідування злочинів в умовах протидії, яка чиниться з використанням соціальної напруги : автореф. дис. … канд. юрид. наук . Харків, 2010. 20 с.

contraction by means of operational and investigative activities [6].

In 2014 (due to emergence of separatist movements and the growth of illegal arms trafficking), the proportion of crimes significantly increased. Accordingly, the counteraction to the detection and investigation of criminal offenses by criminal groups has significantly intensified and intensified. New challenges required improving methods for overcoming such opposition. Thus, research paper by O. Romtsiv examines specifics of overcoming counteraction during investigation of official crimes [7]. M. Chesakova's research is devoted to overcoming countering investigation at the stage of pre-trial investigation, which the scientist considers as a socially dangerous factor capable of changing the course of the investigation in favor of interested parties [8]. The issue of opposition to the judicial examination of criminal proceedings was thoroughly investigated by R. Mudretskyi: he emphasized that opposition to trial can manifest itself both in illegal actions or inaction of the participants in the trial and in deliberate creation of negative external circumstances that impede fair proceedings and adoption of a lawful decision [9].

V. Piddubnyi's dissertation research is devoted to countering investigation of economic crimes. He considers it not only as an element of criminal activity, but as an independent social phenomenon consisting in the use of active offensive actions aimed at complicating or disrupting investigation and trial [10].

V. Pletenets made an important contribution to systematic analysis of forensic support for overcoming counteraction to pre-trial investigation, who determined the legal and organizational principles of forensic support for overcoming the counteraction to the investigation, developed the concept of tactical and forensic support and outlined effective ways to overcome this phenomenon [11]. Consequently, scientific interest in the issue of countering investigation remains high, and modern research is aimed at developing effective methods for its detection and neutralization. At the same time, these best practices are mainly aimed at implementing the praxeological function of forensic science that has led to some descriptiveness in the definition of conceptual concepts and theories of forensic doctrine of countering investigation and its neutralization.

6 Трепак В. М. Розкриття та розслідування хабарництва, вчинюваного суддями, та подолання протидії засобами оперативно-розшукової діяльності : автореф. дис. ... канд. юрид. наук. Київ, 2011. 19 с.

7 Ромців О. І. Особливості подолання протидії під час розслідування злочинів у сфері службової діяльності : дис. ... канд. юрид. наук. Львів, 2016. 226 с. URL: https://lpnu.ua/sites/default/files/2020/dissertation/1817/disromtsivoi.pdf (дата звернення: 10.02.2025).

8 Чесакова М. С. Протидія розслідуванню злочинів та шляхи її подолання на стадії досудового розслідування : автореф. дис. ... канд. юрид. наук. Харків, 2019. 23 с. URL: https://uacademic.info/ua/document/0419U005608 (дата звернення: 10.02.2025).

9 Мудрецький Р. В. Подолання протидії судовому розгляду у кримінальних провадженнях : дис. ... канд. юрид. наук. Кривий Ріг, 2019. 263 с. URL: https://uacademic.info/ua/document/0420U100095 (дата звернення: 10.02.2025).

10 Піддубний В. В. Подолання протидії розслідуванню злочинів економічної спрямованості : дис. ... канд. юрид. наук. Харків, 2020. 260 с. URL: https://uacademic.info/ua/document/0420U100568 (дата звернення: 10.02.2025).

11 Плетенець В. М. Теоретичні та праксеологічні засади подолання протидії досудовому розслідуванню : монографія. Одеса, 2020. 424 с. URL: https://er.dduvs.edu.ua/handle/123456789/6404 (дата звернення: 10.02.2025).

Main Content Presentation

A number of above mentioned research papers indicate that there are reasonable grounds for formation of an independent forensic doctrine of countering investigation of crimes and its neutralization (overcoming). Various aspects of countering investigation have already been researched in the context of studying the methods of committing and concealing crimes, negative circumstances, investigative situations and search methods. At the same time, these works cover only certain aspects of this phenomenon. Despite existence of clearly defined subject areas, none of the existing theories comprehensively reflects the patterns of counteraction to investigations and mechanisms for its overcoming. They do not provide a unified theoretical basis for integrating and systematizing new knowledge in this area. As V. Lysychenko and R. Shekhavtsov rightly emphasize, the need to form a new separate forensic theory is closely related to the definition of its structure and content, the general scientific principles of systematization of substantiated provisions into a comprehensive system of knowledge about the phenomena of objective reality, methods of their obtaining [12].

In turn (according to V. Pletenets' approach), the development of concept of counteraction to pre-trial investigation not only expands the scientific understanding of this phenomenon, but creates real opportunities for its practical application. This direction of scientific research creates the need to continuously improve methods of neutralizing counteraction that makes possible to effectively counteract it with the use of modern measures of prevention, detection and neutralization. Therefore, as the scientist notes, the development of a theory of forensic support for overcoming counteraction to pre-trial investigation will be an important step in improving methods of crime investigation. Its implementation will help law enforcement agencies to effectively overcome criminal opposition at every stage of the investigation, which is critical in combating crime in general [13]. It is well known that a scientific theory is recognized as sound if its application contributes to the achievement of positive practical results. Given the number of cases of prosecution for interference with activities of law enforcement and judicial authorities, misleading the court and other law enforcement agencies in connection with concealment of a crime defined as separate forms of counteraction to the investigation, we can state that this theory contributes to the realization of the pragmatic goal of using forensic knowledge in criminal procedure.

Forensic science is a system of scientific provisions aimed at studying the patterns of the mechanism of committing criminal offenses, the process of occurrence and preservation of information about them, as well as ways of obtaining, analyzing, evaluating and applying this information. It develops effective methods,

12 Лисиченко В. К., Шехавцов Р. М. Проблеми теорії та практики подолання протидії розслідуванню окремих різновидів злочинів, вчинених організованими групами, злочинними організаціями : монографія. Вид. 2-ге, перероб. і допов. Луганськ, 2012. 342 с. URL: https://dspace.lvduvs.edu.ua/bitstream/1234567890/246/1/Shekhavtsov_monograf.pdf (дата звернення: 10.02.2025).

13 Плетенець В. М. Зазнач. твір. URL: https://er.dduvs.edu.ua/handle/123456789/6404 (дата звернення: 10.02.2025).

techniques and means aimed at organizing the search and analytical activities of authorized persons within the framework of proof in criminal proceedings [14].

The subject of forensic science is quite broad. In this regard, we consider V. Zhuravel's proposal to distinguish three levels of interrelated patterns in the structure of its subject to be appropriate:

1) mechanism of criminal and illegal activities;
2) formation of information about the mechanism of criminal and illegal activity and its reflection in relevant sources;
3) obtaining, researching, evaluating and applying information on the mechanism of criminal and illegal activity, its consequences for evidence [15].

As for the third level of regularities, among such regularities, the scientist distinguishes connections and dependencies between the nature of post-criminal behavior and the volume of evidence obtained. The researcher argues that relationship between nature of a person's behavior after committing a criminal offense and the volume of evidence is an important factor that determines the speed and effectiveness of subsequent pre-trial investigation. Actions taken by a person after the implementation of criminal intent can both facilitate investigation and significantly complicate it. If post-criminal behavior is neutral or even positive, this facilitates implementation of the tasks of criminal proceedings and establishment of the truth, or at least does not create additional obstacles to the investigation. On the other hand, the opposite behavior can distract the investigator, forcing him to perform a number of additional tactical tasks while performing the duties assigned to him by criminal procedural law. The greatest threat to ensuring the fulfillment of the tasks of criminal proceedings is negative post-criminal behavior consisting in conscious opposition to the investigation. Destruction of material evidence, tools and means of committing a criminal offense, unlawful influence on investigators, bribery or intimidation of victims and witnesses significantly complicate and sometimes even make impossible collecting evidentiary information and its objective assessment [16]. It is these patterns that should become the basis of the forensic doctrine of opposition to the investigation and its neutralization.

The basis of any science is theoretical concepts that form a holistic system of knowledge. A theory is an ordered set of ideas, inferences, and propositions aimed at explaining certain phenomena. It does not reflect reality directly, but is its generalized idealized model. Theory takes the form of an integrated system of knowledge, where separate concepts, hypotheses and laws are combined into a single conceptual structure.

The following requirements apply to new theories:

- compliance with real research object;
- possibility of replacing empirical research with theoretical conclusions;
- comprehensive coverage and full explanation of the phenomenon under research;

14 Журавель В. А. Закономірності, що вивчає криміналістика. *Вісник Національної академії правових наук України.* 2023. Т. 30. № 1. С. 227—249. DOI: 10.31359/1993-0909-2023-30-1-227 (дата звернення: 10.02.2025).

15 Там само.

16 Там само.

- disclosure of relationships between individual elements;
- internal logical consistency and confirmation by empirical data [17].

Currently, theoretical foundations of criminalistics are understood as a complex of scientific concepts, principles, methods and categories that determine the subject of this science. The main components of theoretical foundations of criminalistics are:

- introduction to general theory of criminalistics, key provisions on the subject, tasks, purpose, principles of development and place among the legal sciences;
- forensic doctrines about research methods.

Criminalistics is represented by general and special forensic theories. V. Markus among them proposes to distinguish:

- general theories (study patterns of mechanism of crime; peculiarities of the emergence, collection, research and evaluation of evidence; language of criminalistics and of research methods);
- special (separate) theories (methods of solving crimes; general and specific signs of crimes; forensic identification and diagnostics; mechanisms of committing and concealing crimes; planning and building forensic versions; research on trace formation processes; registration of forensic objects; search methods, detention, search and seizure, inspection of the scene of the crime, interrogation and specific expertise application) [18].

Scientific literature highlights other approaches to understanding forensic theories. According to V. Zhuravel, scientific teachings in the structure of criminalistics relate to scientific search, object, subject, nature, interscientific relations, system of science, language (conceptual and terminological apparatus) and methods. Among forensic teachings of the general scientific level, the researcher identifies the doctrine of the crime mechanism emergence, existence and disappearance of information about the mechanism of crime (forensic forensics), knowledge of the crime mechanism. At the same time, forensic teachings of a separate scientific level include the following theories: 1) forensic forecasting; 2) forensic diagnostics; 3) forensic prevention theory; 4) forensic classification of crimes; 5) forensic characterization of crimes; 6) situations in forensics, forensic situationology; 7) systems of investigative (detective) actions, tactical operations; 8) tactical decisions, mechanism for their solution; 9) recording of evidentiary information; 10) doctrine of formalization of investigative activities [19].

In our opinion, separate place in the system of forensic students of a separate scientific level should be occupied by the doctrine of counteraction to the investigation and its neutralization. We see the system of general theoretical provisions of this particular doctrine as follows:

17 Стефанюк Г. В. Теорія і методика наукових досліджень: опорні конспекти лекцій, глосарій, самостійна робота : навч.-метод. посіб. для студ. ден. і заоч. форм навч. спец. 014 «Середня освіта (Історія)». Івано-Франківськ, 2018. С. 20. URL: https://surl.li/dhfgmm (дата звернення: 10.02.2025).

18 Маркусь В. О. Криміналістика : навч. посіб. Київ, 2007. 558 с. URL: https://law.sspu.edu.ua/files/documents/books/library/17/markus.pdf (дата звернення: 10.02.2025).

19 Журавель В. А. Загальна теорія криміналістики: генеза та сучасний стан : монографія. Харків, 2021. 448 с.

- determination of its object and subject;
- analyzing the relationship of this concept with other forensic theories that have similar content are crucial;
- outline goals and objectives solved within this theory;
- defining the functions it performs in criminalistics;
- development of methodological framework that allows to investigate manifestations of countering investigation and ways to its neutralization [20].

It is important that some steps have already been taken in the scientific literature to promote the concept of expanding the system of separate forensic science doctrines. A significant contribution to this issue was made by V. Lysychenko and R. Shekhavtsov, who proposed a system of doctrine of countering investigation and ways to overcome it. In their opinion, it should be represented by the following four elements:

1) *theoretical foundations of the doctrine*. The object of the doctrine of countering investigation is the actual manifestations of counteraction, implemented in specific forms and methods of preventing clarification of the objective truth. Such actions may include manipulation of evidence, influence on participants in the trial, use of corruption mechanisms, etc. The process of overcoming this counteraction that involves interaction of investigative bodies with interested persons and the use of tactical methods of detecting, neutralizing and preventing illegal influence, is studied. The topic of the doctrine is counteraction regularities: forms and means of counteraction to the investigation; connection between material and other traces of criminal offenses, correlations between the method of counteraction and the traces it leaves; the influence of forensic methods of neutralizing counteraction to the investigation on the structure and development of counteraction methods, that in turn necessitates adaptation of investigation methods;
2) *system of concepts* explaining the phenomenon of counteraction to investigation and methods of its overcoming;
3) *classification of forms and methods* of counteraction to the pre-trial investigation, which will cover typical mechanisms for concealing criminal activity, traces of such counteraction and ways of their fixing;
4) *legal and forensic methods* of neutralization (overcoming) counteraction (including tactics for detecting, preventing and eliminating illegal influence on investigation procedure) [21].

Thus, mentioned scientists have proposed significant development within the scope of our research. The provisions developed by them once again indicate the need for a comprehensive study of countering investigation that should include the analysis of tactical techniques, mechanisms for concealing criminal activity and the development of effective measures to

20 Лисиченко В. К., Шехавцов Р. М. Зазнач. твір. URL: https://dspace.lvduvs.edu.ua/bitstream/1234567890/246/1/Shekhavtsov_monograf.pdf (дата звернення: 10.02.2025).

21 Там само. С. 266—268. URL: https://dspace.lvduvs.edu.ua/bitstream/1234567890/246/1/Shekhavtsov_monograf.pdf (дата звернення: 10.02.2025).

overcome them. At the same time, some aspects outlined by them require revision and improvement. At the current stage of development of the criminal justice system, it is necessary to analyze the problem of overcoming counteraction to the trial, systematize those theoretical provisions that relate to counteraction to the investigation of individual groups of criminal offenses, assess the practical significance of this doctrine, etc. Currently, scientists pay significant attention to determining the legal and organizational means of overcoming counteraction to the investigation of individual groups of criminal offenses [22], but a logical question arises: is there a need to study them in the context of individual groups of criminal offenses, because in essence they do not undergo significant changes?

In our opinion, the methodological apparatus remains imperfect. First of all, this applies to the concepts of *principles*, *forms of counteraction*, *methods of counteraction*, *methods of overcoming counteraction* and *means of overcoming counteraction*. Despite quite significant theoretical achievements, there is no unanimity of scientists in the understanding of conceptual aspects, among which: forms of counteraction; specifics of criminal legal assessment of such forms; essence of such a form as crime concealment, etc.

Conclusions

Criminalistics is a science, which system of provisions is represented by laws on the mechanism of committing criminal offenses, on peculiarities of occurrence and methods of obtaining, analyzing and evaluating information about these offenses, as well as on the fixation, preservation and application of information obtained while investigating and evidence.

Among regularities of obtaining, researching, evaluating and applying information about the mechanism of criminal and illegal activity, its consequences for proving, which are an independent level of regularities that personify the topic of criminalistics, an important place is occupied by the post-criminal activity of subjects of criminal offenses. The active forms of resistance carried out by them indicate the urgent need to single out resistance to the investigation and its neutralization as an independent forensic doctrine. Despite significant scientific achievements, a number of issues raised problem still do not have a single concept and terminological apparatus is contradictory and inconsistent. Plurality of statements, conclusions and hypotheses within the limits of this topic require systematic research. We emphasize only a certain approach to solving this problem, development of

22 Пчеліна О. В. Протидія розслідуванню злочинів у сфері службової діяльності та шляхи її подолання. *Молодий вчений*. 2016. № 4 (31). С. 628—632. URL: http://dspace.univd.edu.ua/xmlui/handle/123456789/1805 (дата звернення: 10.02.2025) ; Савчук Т. І. Щодо протидії розслідуванню корупційних злочинів. *Процесуальне та техніко-криміналістичне забезпечення досудового розслідування* : мат-ли наук.-практ. конф. (Харків, 28.11.2019). Харків, 2019. С. 147—150. URL: https://univd.edu.ua/general/publishing/konf/28_11_2019/pdf/52.pdf (дата звернення: 10.02.2025) ; Федосова О. В. Оперативно-розшукове забезпечення подолання протидії виявленню і розслідуванню злочинів, що вчиняються за участю неповнолітніх. *Держава та регіони. Серія: Право*. 2020. № 3 (69). Т. 3. С. 181—187. DOI: 10.32840/1813-338X-2020.3.3.30 (дата звернення: 10.02.2025) ; Богданюк Р. Правові засади та організаційні засоби подолання протидії під час розслідування кримінальних правопорушень у сфері господарської діяльності. *Архів кримінології та судових наук*. 2024. № 2 (10). С. 169—176. DOI: 10.32353/acfs.10.2024.14 (дата звернення: 10.02.2025).

fundamental principles of the aforementioned doctrine, while not proposing a final algorithm for its solution. We see prospects for further research in development, improvement and verification of a number of provisions, taking into account requests and issues of law enforcement activities.

Протидія розслідуванню як змістовний компонент предмета криміналістики

Олександр Таркан

Мета статті — визначити особливості й напрями пізнання такого явища, як протидія розслідуванню, у контексті формування окремого криміналістичного вчення про таку протидію та її нейтралізацію (подолання). Досягненню поставленої мети сприяло застосування низки загальнонаукових, спеціальних і філософських методів (діалектичного, моделювання, системно-структурного аналізу, порівняльного аналізу та ін.). Розуміння того, що криміналістика як наука вивчає закономірності механізму вчинення кримінальних правопорушень, особливості виникнення та збереження інформації про них у реальності й цифровому просторі, а також способи отримання, аналізу, оцінювання та застосування цієї інформації в процесі доказування, дало змогу обґрунтувати потребу в розширенні системи її окремих учень і теорій. З урахуванням особливостей предмета криміналістики обґрунтовано значення післякримінальної діяльності суб'єктів кримінальних правопорушень як одного з важливих її складових. Наголошено, що реалізація різноманітних форм протидії розслідуванню з боку злочинців уже давно актуалізувала потребу виокремити криміналістичне вчення про протидію розслідуванню та її нейтралізацію. Доведено, що (попри вагомий науковий доробок) низка питань за порушеною проблематикою до сьогодні не має єдиної концепції, а термінологічний апарат залишається суперечливим і неузгодженим. З'ясовано, що множинність тверджень, умовиводів і гіпотез у межах цієї теми потребує системного дослідження. Запропоновано підхід до розв'язання цієї проблеми шляхом розроблення фундаментальних засад криміналістичного вчення про протидію розслідуванню, проте не сформовано остаточного алгоритму її розв'язання. Окреслено перспективи подальших досліджень, які передбачають розроблення, удосконалення й верифікацію ключових положень учення про протидію розслідуванню та її нейтралізацію (із урахуванням запитів і проблем правозастосовної діяльності).

Ключові слова: *криміналістика; досудове розслідування; криміналістичне вчення; теорія; протидія розслідуванню; об'єкт і предмет криміналістики; слідча діяльність; післякримінальна діяльність.*

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Declaration of Competing Interest

Author declares no conflict of interest.

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Fundamental Principles of Forensic Expert Activity and Psychological Science in Service of Resolving Forensic Psychological Examination Tasks

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Legal regulations and literary sources on the issues of forensic expert activity and the science of psychology have been analyzed. The paper substantiates grounds for differentiating the principles of forensic expert activity and psychology and their influence on the performance of forensic psychological examination tasks. While preparing the article, the author used general, individual, and special methods of cognition. Since the Fundamental Law of Ukraine proclaims the recognition and operation of the rule of law principle in the State, it is proposed to supplement Article 3 of the Law of Ukraine "On Judicial Examination" with this principle. The author proves that the principle of legitimacy is enforced in various ways: the legislation envisages liability for both a forensic expert' offenses as well as for offenses against a forensic expert. Researchers have been supported on the need to amend the Criminal Code of Ukraine in the aspect of increasing liability for exerting unlawful pressure on a forensic expert. It is emphasized that the principle of independence is one of the key principles underpinning the effective execution of forensic expert activity. Moreover, guarantees ensuring the independence of forensic experts have been considered. The research paper discusses controversial issues of implementing the principles of objectivity and research completeness. The author analyzes the main groups of psychological science principles: derived from philosophy, general psychological and specific scientific (sectoral) principles.

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.

Emphasis is made on the fact that the principles of forensic expert activity along with the basic principles of psychology form a strong foundation for a forensic psychological examination (provided that scientifically sound and proven methods and techniques that have been certified and registered by the State and are essential for conducting forensic examinations in this field have been used).

Keywords: *forensic activity; forensic examination; basic principles of psychology; forensic psychological examination; principles of independence, legitimacy, objectivity; rule of law principle; completeness of research; reflection of connection between psyche and activity; principle of development; principle of systemic nature; principle of professional ethics.*

Research Problem Formulation

The practice of conducting forensic examinations overall and forensic psychological examinations specifically is closely linked to the theoretical justification for forensic examination subject and relevant tasks, objects, subjects, and methods of forensic psychological examination. Each of these concepts and their combination must comply with the principles of forensic expert activity (hereinafter referred to as FEA). Unfortunately, there are cases in expert practice where, from a forensic point of view, there are incorrect or insufficiently supported ideas about the above-mentioned cornerstone concepts that are pivotal for forensic examination. The Article Purpose is to attempt to formulate the principles of forensic psychological examination, which can be used to theoretically substantiate and develop theoretical, legal, and methodological foundations of various subject types of forensic psychological examination for their systematization and development.

Analysis of Essential Researches and Publications

The differentiated approach to formulating FEA principles is certainly not new not only to forensic science but also to the underlying sciences and the scientific and methodological underpinnings of different forensic examination types. We have already provided a general block diagram of the relationship between FEA principles [1] in previous research papers (*see Fig. 1*).

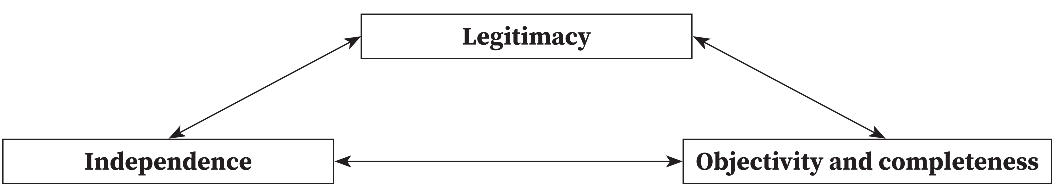

Fig. 1. The relationship between FEA principles

1 Євсюков О. Специфіка принципів судово-психологічної експертної діяльності. *Сучасні напрямки розвитку судової експертизи та криміналістики* : зб. Всеукр. наук.-практ. конф. (Одеса, 05.09.2024). Одеса, 2024. С. 170—173. URL: http://catalog.liha-pres.eu/index.php/liha-pres/catalog/view/320/9272/21031-1 (date accessed: 01.02.2025).

Specifically, we have noted that Art. 3 of the Law of Ukraine *On Judicial Examination* [2] (hereinafter referred to as the *Special Law*) sets forth such principles of FEA as "legitimacy", "independence", "objectivity" and "completeness" (although the essence of these concepts has not been revealed). Instead, researchers offer other principles to formulate FEA principles. For instance, M. Shcherbakovskyi mentions the following: a forensic expert's competence; the possibility for a person appointing a forensic examination to review the expert's conclusions; respect for a person's safety and rights during a forensic examination [3]. Other scholars [4] have also worked on identifying basic FEA principles in Ukraine. That is why we deem it essential to delve deeper into these concepts in terms of scientific and legal approaches to their interpretation.

Article Purpose

Undertake a theoretical and legal analysis of fundamental FEA principles in general, as well as a theoretical analysis of the science of psychology, and on this basis formulate specific principles of forensic expert activity in forensic psychological examination.

Research Methods

The author employs general, individual, and special methods of cognition. Based on the analysis of regulatory and legal, literary sources, expert practice, and the author's individual experience in scientific and practical endeavors, proposals for improving the theory and practice of forensic examination in general and forensic psychological examination in particular have been developed.

Main Content Presentation

Let's begin by discussing the concept of legitimacy. Unquestionably, this issue is not new in the legislative and scientific discourse: it is enshrined in the Constitution [5] and other laws of Ukraine, it has

2 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: 01.02.2025).

3 Щербаковський М. Г. Судебные экспертизы: назначение, производство, использование : учеб.-практ. пособ. Харьков, 2005. 544 с. URI: http://dspace.univd.edu.ua/xmlui/handle/123456789/12421 (date accessed: 01.02.2025).

4 Див., напр.: Жеребко О. І. Судово-експертна діяльність: сутність, принципи, організаційні основи : автореф. дис. ... канд. юрид. наук. Запоріжжя, 2010. 22 с. ; Казаров А. О. Принципи адміністративно-правового регулювання судово-експертної діяльності у справах про адміністративні правопорушення, пов'язані з дорожньо-транспортними пригодами. *Теорія та практика судової експертизи і криміналістики*. 2020. Вип. 22. С. 260—271. DOI: 10.32353/khrife.2.2020.20 (date accessed: 02.03.2025) ; Олійник О. О., Галунько В. В., Єщук О. М. Адміністративно-правове регулювання судово-експертної діяльності : монографія. Херсон, 2015. 224 с. ; Остропілець А. В. Принципи адміністративно-правового регулювання судово-експертної діяльності в Україні. *Прикарпатський юридичний вісник.* 2018. Вип. 1 (22). Т. 3. С. 197—202. URL: http://www.pjv.nuoua.od.ua/v1-3_2018/41.pdf (date accessed: 01.02.2025). ; Пиріг І. В., Шинкаренко І. Р. Принципи судової експертизи (*оглядова стаття*). *Теорія та практика судової експертизи і криміналістики.* 2018. Вип. 18. С. 221—230. DOI: 10.32353/khrife.2018.24 (date accessed: 02.03.2025) та ін.

5 Конституція України : Закон України від 28.06.1996 р. № 254к/96-ВР (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 01.02.2025).

been addressed by Ukrainian researchers both in the aspect of public administration [6] and in terms of analyzing constitutional and sectoral legislation [7].

According to Art. 8 of the Constitution, the principle of the rule of law [8] is recognized and effective in Ukraine. The Constitution has the highest legal force. Laws and other normative legal acts are adopted on the basis of the Constitution of Ukraine and shall conform to it. The norms of the Constitution of Ukraine are norms of direct effect. Appeals to the court in defense of the constitutional rights and freedoms of the individual and citizen directly on the grounds of the Constitution of Ukraine are guaranteed [9].

The rule of law and legitimacy are defined as general principles of criminal proceedings in the Criminal Procedure Code of Ukraine (hereinafter referred to as the CPC) [10]. At the same time, Art. 8 of the CPC sets forth that criminal proceedings shall be conducted in accordance with the principle of the rule of law, under which a human being, his/her rights and freedoms are the highest values which define content and priority areas of state activities, and Pt. 1 of Art. 9 of the CPC stipulates that in the course of criminal

6 Див., напр.: Мельник Р. Принцип законності vs. принцип правомірності: до питання про оновлення юридичних засад діяльності органів публічної влади. *Право України.* 2018. № 11. С. 14—31. DOI: 10.33498/louu-2018-11-014 (date accessed: 01.02.2025) ; Калєніченко С. І. Сутність законності в організації та діяльності Національної поліції України. *Правоохоронна функція держави: теоретико-методологічні та історико-правові проблеми* : тези доп. учасн. Міжнар. наук.-практ. конф. (Харків, 17.05.2019). Харків, 2019. С. 89—91. URL: https://univd.edu.ua/general/publishing/konf/17_05_2019/pdf/42.pdf (date accessed: 01.02.2025) ; Журавель М. В. Принцип законності в процесі розвитку державного управління в Україні. *Наукові праці Національного університету «Одеська юридична академія».* 2013. Т. 13. С. 220—227. URL: http://nbuv.gov.ua/UJRN/Nponyua_2013_13_24 (date accessed: 01.02.2025) та ін.

7 Див., напр.: Братасюк М., Росоляк О. Співвідношення принципу верховенства права та принципу законності. *Актуальні проблеми правознавства*. 2018. Вип. 1 (13). С. 11—17. URL: https://ccu.gov.ua/sites/default/files/bratasyuk_m._spivvidnoshennya_pryncypu_verhovenstva_prava_ta_pryncypu_zakonnosti.pdf (date accessed: 01.02.2025) ; Шевчук С. Конституційні засади правової системи України і проблеми її вдосконалення. *Право України*. 2010. № 12. С. 326—329. URL: https://pravoua.com.ua/storage/files/magazines/files/content-pravoukr-2010-12-pravoukr_2010_12-1.pdf (date accessed: 01.02.2025) ; Його ж. Доктрина верховенства права та конституціоналізму: історична ґенеза і співвідношення. *Там само*. № 3. С. 52—61. URL: https://pravoua.com.ua/storage/files/magazines/files/content-pravoukr-2010-3-pravoukr_2010_3-1.pdf (date accessed: 01.02.2025) ; Козюбра М. Принцип верховенства права та вітчизняна теорія і практика. *Українське право*. 2006. Вип. 1 (19). С. 15—24 ; Патей-Братасюк М. Г., Гвоздецький В. Д., Мурашин О. Г. та ін. Верховенство права: традиція доктрини і потенціал практики : монографія / за заг. ред. М. Г. Патей-Братасюк. Київ, 2010. 536 с. ; Матвєєва Ю. І. Тлумачення поняття «закон» як вимога принципу правової визначеності. *Наукові записки НаУКМА. Юридичні науки*. 2014. Т. 155. С. 18—20. URL: http://nbuv.gov.ua/UJRN/NaUKMAun_2014_155_6 (date accessed: 01.02.2025) та ін.

8 Конституція України ... . URL: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text (date accessed: 01.02.2025).

9 Там само.

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: 01.02.2025).

proceedings, a court, investigating judge, public prosecutor, chief officer of pre-trial investigation agency, investigator, other officials of government authorities shall fully comply with the requirements of the Constitution of Ukraine, this Code, and international treaties, ratified by the Verkhovna Rada of Ukraine, and requirements of other laws [11].

Art. 2 of the Civil Procedure Code of Ukraine (hereinafter referred to as the CivPC) defines the rule of law as one of the main principles of civil proceedings, and Pts. 1 and 2 of Art. 10 of this Code envisage that when considering a case, the court shall be guided by the principle of the rule of law, and the court shall consider cases in accordance with the Constitution of Ukraine, laws of Ukraine, international treaties that the Verkhovna Rada of Ukraine agrees are binding [12]. Similar norms are contained in Art. 2 of the Code of Commercial Procedure of Ukraine [13], and Art. 2 of the Code of Administrative Proceedings of Ukraine [14].

Therefore, as mentioned above, the Special Law lists legitimacy as one of the basic FEA principles but does not mention the rule of law. Since legitimacy is part of the rule of law, we do not see this as a significant disadvantage. We agree with the opinion of scholars M. Bratasiuk and O. Rosoliak, who argue that the rule of law as one of the guiding principles does not exclude the principle of legitimacy, and the correlation of these principles can be analyzed by means of the manifestation of the rule of law in the national legal system, specifically by the legislator's creation of laws and statutory regulations that are legal in content (acts of positive law that violate human rights and contradict the substantive characteristics of law cannot be considered lawful); implementation of law application activities based on the principles of law, which reflect the spirit of the law, widely accepted values, and meanings; these principles express equal requirements for all subjects of the legal system and determine the priority and position of the law within the system of legal acts of the state [15].

Simultaneously, since the Fundamental Law of Ukraine proclaims the recognition and operation of the rule of law principle in the state, we propose supplementing Article 3 of the Special Law with this principle. The main thing is that any type of FEA shall fully comply with the requirements of the Constitution of Ukraine, this Code, and international treaties, ratified by the Verkhovna Rada of Ukraine, and requirements of other laws.

Legitimacy is a multifaceted concept when it comes to the implementation of FEA. On the one hand, Ukrainian legislation envisages a forensic expert's accountability for misleading a court or other authorized body (person) by providing a knowingly false conclusion, failure to

11 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 01.02.2025)..

12 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: 01.02.2025).

13 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: 01.02.2025).

14 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: 01.02.2025).

15 Братасюк М., Росоляк О. Зазнач. твір. С. 14. URL: https://ccu.gov.ua/sites/default/files/bratasyuk_m._spivvidnoshennya_pryncypu_verhovenstva_prava_ta_pryncypu_zakonnosti.pdf (date accessed: 01.02.2025)

fulfill statutory obligations without valid reasons, disclosure of pre-trial investigation data (Arts. 384, 385, 387 of the Criminal Code of Ukraine, hereinafter referred to as the CC) [16], for showing disrespect toward the court or the Constitutional Court of Ukraine (malicious evasion of the court, or disobedience to the presiding officer's order, or violation of the order during a trial, as well as taking actions that testify to a clear disregard for court or the rules established in court), for malicious evasion of the expert's appearance before the investigating authorities or the prosecutor's failure to appear during the investigation (Arts. 185-3 and 185-4 of the Code of Ukraine on Administrative Offenses) [17].

Moreover, Art. 14 of the Special Law also stipulates the prosecution of a forensic expert for the following disciplinary misconduct:

"1) self-collection of materials to be researched, as well as independent selection of initial data for a forensic examination;

2) conducting a forensic examination by a forensic expert who is an employee of a state specialized institution without a written mandate from his/her head, in the event that a forensic examination is ordered to be conducted by a state specialized institution;

3) reassignment of forensic examination to another person in violation of the procedure established by law;

4) violation without valid reasons of the requirements of the law regarding the terms for conducting a forensic examination;

5) resolution of issues beyond the scope of a forensic expert's qualification in the relevant field of expertise, including issues of law;

6) failure of a forensic expert who is not an employee of a state specialized institution to comply with the legislative requirements for organizing a forensic expert's workplace;

7) evasion by a forensic expert who is not an employee of a state specialized institution from conducting a verification of his/her activities and/or his/her obstruction of such verification;

8) violation of the procedure for storage and handling of research objects, case (proceedings) materials, which has led or may lead to their loss or damage;

9) use of destructive research methods in violation of the legally established procedure;

10) failure to notify the holder of the State Register of Certified Forensic Experts, in accordance with the procedure established by law, of the occurrence of circumstances which, upon notification by a forensic expert, must be entered in such a register;

11) violation of the legislation requirements on drawing up a forensic expert's conclusion;

12) non-execution or improper execution of tasks assigned to a forensic expert without valid reasons, which became the basis for the court to issue a separate ruling raising the issue of disciplinary liability of a forensic expert" [18].

We deem it is appropriate to consider some of the disciplinary offenses men-

16 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: 02.02.2025).

17 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: 02.02.2025).

18 Про судову експертизу ... . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 01.02.2025).

tioned, but not explained in the Special Law. The first of them concerns the criteria for independent collection of materials and initial data by a forensic expert. From the perspective of V. Alieksieichuk [19], it is worth considering addressing this issue by clarifying the list of actions that do not fall under the concept of *independent collection of materials* in para. 5 of cl. 9 of Section VI of the Provision on the Central Expert Qualification Commission under the Ministry of Justice of Ukraine and the Certification of Forensic Experts: *"The use of samples from registers, registers, collections obtained in accordance with the legally established procedure, the use of information from information databases and other information sources, including for the purpose of determining the value of property, shall not be considered independent collection of materials"* [20]. At the same time, the scholar points out that these provisions do not completely resolve the situation of uncertainty, since, *firstly,* the norm of the Law cannot be narrowed by the norm of a lower-level legal regulation (by an order of a central executive authority); *secondly,* this clarification is unlikely to be considered by court that is guided by laws; *thirdly,* such a norm applies exclusively to forensic experts working in state specialized institutions of the Ministry of Justice of Ukraine and private forensic experts, as for other forensic experts, the issue of "independent collection of materials" is yet to be clarified in relevant departmental legal regulations [21]. In view of the above, the concepts of *independent collection of materials to be researched* and *independent selection of initial data for a forensic examination* should be revealed in the Special Law, specifically by drawing up a list of actions which do not fall within these concepts [22]. In this regard, we align with the opinion of V. Alieksieichuk and propose amending Art. 14 of the Special Law to include criteria for independent collection of materials and initial data for research by a forensic expert, as well as guidelines for the expert's actions to prevent such misconduct. Specifically, we suggest requiring the forensic expert to submit a motion if necessary initial data are not provided in the materials or are ambiguously reflected.

We also consider a disciplinary offense manifested as a forensic expert delegating the conduct of a forensic examination to another person to be unjustified, since a forensic expert is not entitled to delegate the conduct of a forensic examination to another person, and such a delegation is illogical.

The provision for failing to comply with the legislation requirements for drawing up a forensic report, as set out in the article analyzed, is somewhat unclear. What kind of violation of these requirements would be grounds for bringing

19 Алексейчук В. І. Запобігання самостійному збиранню судовим експертом матеріалів дослідження та вибору вихідних даних (за результатами аналізу практики дисциплінарних проваджень). *Криміналістика та судова експертиза у XXI столітті* : мат-ли всеукр. наук.-практ. семінару (Київ, 30.05.2024). Київ, 2024. С. 15—19. URL: http://ndekc.lviv.ua/pdf/18.06.2024.pdf (date accessed: 01.02.2025).

20 Положення про Центральну експертно-кваліфікаційну комісію при Міністерстві юстиції України та атестацію судових експертів : затв. наказ. 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: 01.02.2025).

21 Алексейчук В. І. Зазнач. твір. URL: http://ndekc.lviv.ua/pdf/18.06.2024.pdf (date accessed: 01.02.2025).

22 Там само.

a forensic expert to disciplinary liability? The Special Law does not contain answers to this question. So, let's consider the following example. Pt. 2 of Article 102 of the CPC sets forth that expert opinion shall necessarily state that he/she was *warned* [hereinafter emphasis added by the author] about liability for knowingly misleading opinion and for refusal to fulfil his/her expert duties without valid reasons. At the same time, both the prosecution and the defense counsel may engage a forensic expert. However, according to the law, only the prosecution or court can warn a forensic expert: the defense counsel does not have this right. The question therefore arises: On what basis will a forensic expert, when called upon by the defense counsel, state that he/she was warned about criminal liability in his/her opinion? Who warned him/her: the defense counsel or suspect? We believe that this legislation gap should be eliminated: after the words *"the expert's opinion must state that he/she has been warned"*, it is necessary to add *"(that he/she is aware)"* of liability for a knowingly false conclusion and refusal to fulfill his/her duties without valid reasons.

Let's continue to analyze the versatility of the *legitimacy* concept. It is worth pointing out that Ukrainian legislation envisages liability for offenses against expert support for justice (in particular, those directed against a forensic expert): obstructing the appearance of a forensic expert before a court, pre-trial investigation authorities, temporary investigators, and the special temporary investigative commission of the Verkhovna Rada of Ukraine; or coercion of the forensic expert to refuse to testify or give an opinion, and also give any knowingly false testimony or opinion, by threats of murder, violence, destruction of property of these persons or their close relatives, or disclosure of defamatory information about him/her, or tampering with a forensic expert for the same purposes, and also any threats to commit any such actions as a revenge for any previously presented testimony or opinion (Art. 386 of the CC) [23].

Since this article stipulates criminal liability for violation of the rights of not only a forensic expert, but also other participants in the proceedings (witnesses, victims, specialists), whose functions in the process are different in nature, we believe the opinion of E. Simakova-Yefremian regarding the need to increase liability for exerting unlawful pressure on a forensic expert, exclude him/her from the norms of Art. 386 of the Criminal Code, and supplement the Criminal Code with a new article that states:

"Article 386-1. Obstructing a forensic expert's appearance, forcing him/her to refuse to provide testimony or an opinion and to give knowingly false testimony or an opinion

Obstructing the appearance of a forensic expert before the court, pre-trial investigation authorities, temporary investigators, and the special temporary investigative commission of the Verkhovna Rada of Ukraine, forcing him/her to refuse to give testimony or an opinion, or coercion of the forensic expert to refuse to testify or give an opinion, or to provide knowingly false testimony or an opinion, by representatives of state authorities, local self-government, courts, criminal justice and pre-trial investigation authorities, or other individuals. This may involve threats of murder, violence, destruction of property, or disclosure of defamatory information about the forensic expert or his/her close relatives, or tampering with the forensic expert for

23 Кримінальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/2341-14#Text (date accessed: 02.02.2025).

the same purposes, and also any threats to commit any such actions as a revenge for any previously presented testimony or an opinion, —

shall be punishable by a fine of three hundred to five hundred tax-free minimum incomes, or correctional labor for a term of up to two years, or imprisonment for a term of up to three years” [24].

The next principle we propose discussing is the independence of a forensic expert. From the point of view of E. Simakova-Yefremian, ensuring FEA independence guaranteed by para. 2 of Pt. 1 of Art. 4 of the Special Law (prohibition of any person to interfere in the conduct of a forensic examination under the threat of liability envisaged by law) [25] is not always possible. The author was prompted to this opinion by empirical data obtained from a survey of forensic experts. Only one third of respondents answered the question in the affirmative: *“Have you ever been influenced to give a false expert opinion (refusal to perform your duties without valid reasons) in your practice?”* Proceeding with derivative questions: *“If so, from whom did such influence come?”,* and *“What was the nature of such influence?”* Two-thirds of respondents did not answer, suggesting that forensic experts experience a degree of anxiety in giving a positive answer, on the one hand, and the dissonance of answering “no”, on the other. Of the respondents who answered the question, 93% said “yes” and only 7% said “no”, indicating that exerting pressure on forensic experts is still a relevant issue. The situation with differentiation of persons who resorted to pressure (investigators: 9%, defense attorneys: 32%, prosecutors: 2%, judges: 5%, heads of forensic science institutions: 3%, victims: 3%, suspects: 11%, representatives of a party to the case: 8%, anonymous persons: 32%) and various ways of influence (failure to provide materials or samples for comparison or samples for comparative research or providing low-quality materials or samples for expert research: 41%, exerting psychological influence on an expert: 21%, disclosure of data on expert research: 3%, physical violence against a forensic expert in criminal proceedings: 2%) raises concerns [26]. Thereby, the above statistics point to the need to increase liability for the crime of exerting undue pressure on a forensic expert, as we have noted above.

One of the key principles in the conduct of forensic expert activity is its independence. The preamble of the Special Law contains a direct norm on the purpose of FEA: *“Ensuring justice in Ukraine through independent, qualified, and objective forensic examination focused on the maximum use of science and technology achievements”* [27]*, which means the independence of a forensic expert as a party to the process. In criminal proceedings, he/she does not represent the interests of either the prosecution or defense counsel, even if he/she prepares a conclusion at the request of one of the parties. The same applies to other types of court proceedings in cases where a forensic expert conducts a forensic examination at the request of a party to the case (plaintiff or defendant), since in*

24 Сімакова-Єфремян Е. Б. Теоретико-правові та методологічні засади комплексних судово-експертних досліджень : дис. … д-ра юрид. наук. Харків, 2017. С. 315—316. URL: https://uacademic.info/ua/document/0517U000760 (дата звернення: 02.02.2025).

25 Про судову експертизу … . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 01.02.2025).

26 Сімакова-Єфремян Е. Б. Зазнач. твір.

27 Про судову експертизу … . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 01.02.2025).

all types of court proceedings a forensic expert takes an oath as follows: "I, (last name, name, middle name), hereby swear to faithfully perform the duties of a forensic expert to the best of my ability". For this reason, the legislator has consolidated guarantees to ensure a forensic expert's independence (Art. 4 of the Special Law) [28].

The first guarantee of independence is the procedure for appointing a forensic expert specified by law. This norm means that a person with specific expertise can be involved in conducting a forensic examination in a particular type of proceedings only in the manner provided by Ukrainian legislation. Therefore, a forensic expert cannot be subjected to any action that is not provided for in the procedure for his/her appointment and violates his/her rights defined by the legislation. This is, of course, a guarantee of a forensic expert's independence.

The second independence guarantee is a prohibition, under the threat of legal liability, against anyone interfering with a forensic examination. Undoubtedly, this rule (as a reliable guarantee of a forensic expert's independence) is to some extent a preventive measure against exerting any pressure on a forensic expert. As mentioned above, we are in favor of increasing liability for putting pressure on the forensic expert. According to scientific sources, it is not an interference in a forensic examination if the head of a forensic science institution performs his/her organizational and managerial functions to control the quality of expert research established by statutory regulations [29], since as stated in cl. 1.10 of Sec. I of the Instructions on the Appointment and Conduct of Forensic Examinations and Expert Studies (hereinafter referred to as the *Instructions*): *"In the course of a forensic examination at the forensic institution, a forensic institution's head is responsible for the organizational, logistical support of its performance, control over its timely conduct, and compliance with laws and other statutory regulations on forensic examination"* [30]. In this case, it is highly important to distinguish between leadership's control over the quality of research and possible undue influence on the forensic expert during a forensic examination. The fact is that statutory regulations do not outline any signs or mechanisms that could be used to establish with certainty that a forensic expert has violated the methodology requirements for conducting a particular forensic examination, which the head of the forensic institution could identify at the stage of submitting an opinion. Moreover, according to the legislation, the choice of the method for conducting a forensic examination is the prerogative of a forensic expert, as he/she is personally responsible for an opinion he/she provides under the threat of criminal penalty. Thus, there is a dualism in the perception of legal norms on expert support for justice. On the one hand, the head of a specialized institution is vested by law with the functions of controlling the expert research quality, and on the other hand, the rule on the in-

28 Про судову експертизу ... . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 01.02.2025)..

29 Судові експертизи в процесуальному праві України : навч. посіб. / за заг. ред. О. Г. Рувіна. Київ, 2019. С. 43. URL: https://kndise.gov.ua/wp-content/uploads/2021/06/sudovi-ekspertyzy_posibnyk_druk.pdf (date accessed: 01.02.2025).

30 Інструкція про призначення та проведення судових експертиз та експертних досліджень : затв. наказ. 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: 01.02.2025).

admissibility of exerting pressure on a forensic expert, in particular, by the head of a forensic institution (his/her deputy or head of a structural unit) is quite justified. In such cases, we consider it appropriate to reinstate the following provision in the Instructions: *"If, upon reviewing the expert's opinion, it is found that the research was conducted in violation of or deviated from research methodology, a forensic institution's head may reassign a forensic examination to the expert committee, which shall include a forensic expert who has conducted previous research"* (it was once removed from the Instructions to uphold the principle of a forensic expert's independence) [31].

Another guarantee of a forensic expert's independence is associated with the independence of forensic institutions from the authorities conducting operational (search) actions, pre-trial investigation agencies, and court (forensic institutions of the Ministry of Justice and the Ministry of Health of Ukraine, private experts). Even when expert services operate under defense and law enforcement ministries and agencies (MIA, SSU), their functionality, structure, and place within the system of specialized forensic institutions do not involve subordination to inquiry or pre-trial investigation agencies. Thus, the possibility of pressure being exerted on forensic experts by the leadership of defense and law enforcement agencies (in the hypothetical scenario of needing to protect corporate reputation or maintain a biased, accusatory approach in applying specific expertise) is completely excluded.

The last and, in our view, the most important guarantee of a forensic expert's independence is the creation of necessary conditions for his/her activities, as well as his/her financial and social security. At this point, we must also note that the realities of martial law do not allow us to fully implement the norms of Article 18 of the Special Law, which states that motivation for preventing offenses in the field of FEA would be a high level of salary, salary and pension benefits for a forensic expert, and improvement of the norms of his/her social welfare. Unfortunately, the provision of Pt. 2 of Art. 18 of the Special Law, according to which the salaries of employees working at state specialized institutions and qualified as forensic experts should be at least 10 times the minimum subsistence income for able-bodied persons as of 1 January of the calendar year [32], has not yet been implemented: the budget legislation of Ukraine suspends this norm every year. We must acknowledge that at certain enterprises (especially in the private sector), the salary of an unskilled worker exceeds the salary of a forensic expert working at a specialized institution. At the same time, a forensic expert working at a specialized institution is under a heavy workload due to the unprecedented number of forensic examinations, which is constantly growing (especially under martial law), visits to inspect objects of study in frontline areas, posing an increased danger to his/her life and health, complications caused by corruption risks, and the specifics of his/her work, necessitating direct inspection of criminal elements or mass graves, murders, and other grave crimes, negatively affecting the emotional state of a forensic expert and, consequently, the results of

31 Про затвердження Змін до деяких нормативно-правових актів з питань судово-експертної діяльності : наказ Мін'юсту України від 20.01.2021 р. № 243/5. URL: https://zakon.rada.gov.ua/laws/show/z0089-21#Text (date accessed: 01.02.2025).

32 Про судову експертизу … . URL: https://zakon.rada.gov.ua/laws/show/4038-12#Text (date accessed: 01.02.2025).

his/her work. Therefore, the motivation for forensic experts to work (such as special remuneration and retirement benefits), which is enshrined in the legislation to guarantee his/her independence, needs to be implemented not only by proclamation but also by effective enforcement.

The principles of objectivity and completeness are also cornerstones of expert research based on specific expertise in the field of science, technology, art, etc. Let us dwell on the dualism of the objectivity principle. This is difficult because the sources of evidence, which also include the expert's opinion, are divided into direct and indirect, primary and secondary, indictment and acquittal, personal (subjective) and real (objective), etc. [33]. To put it differently, an expert's opinion is, on the one hand, a product created by the activity of a single forensic examination subject (a forensic expert) and drawn up according to his/her internal conviction — a personal (subjective) source of evidence. On the other hand (taking into account objectivity as a principle of FEA enshrined in the legislation), the expert's opinion has an objective basis: a forensic expert examines exclusively the objects provided to him/her for examination or at his/her request and is prohibited from collecting them independently (i.e., the choice of objects does not depend on him/her). Ultimately, a forensic expert uses specific expertise from a particular field of science, technology, art, etc., that is the objective knowledge of mankind accumulated over thousands of years, which has not been dependent on him/her. Therefore, when evaluating the principle of FEA objectivity, we should consider the factors mentioned earlier.

Let's elaborate on some grounds for evaluating the principle of research completeness, which is being debated in the theory and practice of forensic science. One of the rights of a forensic expert is the right to request the provision of necessary materials due to the lack of materials that would help in answering the question posed to him/her. There is a misconception that a forensic expert is not obliged to exercise this right and may refuse to answer questions or claim that it is impossible to answer a question, refusing to submit a motion for additional materials. In fact, a forensic expert is obliged to conduct full-fledged examination in person and prepare well-grounded

33 Див., напр.: Анохін А. М. Про допустимість ймовірного висновку при встановленні обставин предмета доказування у кримінальному провадженні про дорожньо-транспортні пригоди. *Митна справа*. 2013. № 1 (85). Ч. 2. Кн. 1. С. 121—126 ; Богдан О. Ю. Критерії оцінювання висновку експерта у кримінальному процесі. *Науковий вісник Національної академії внутрішніх справ*. 2011. Вип. 2. С. 247 ; Дячук В. І. Спеціальні знання у кримінально-процесуальній діяльності [Specific expertise in criminal procedural activity]. *Там само*. 2011. Вип. 4. С. 202 ; Марчак В. Я. «Консультації та роз'яснення спеціаліста» як новела в кримінальному процесуальному законодавстві України. *Митна справа*. 2013. № 2 (86). Ч. 2. Кн. 1. С. 100—105 ; Ревака В. Використання спеціальних знань у діяльності органів слідства та дізнання. *Вісник прокуратури*. 2010. № 3 (105). С. 34 ; Його ж. Правова експертиза в кримінальному судочинстві. *Там само*. 2008. № 10 (88). С. 88 ; Його ж. Правове регулювання використання спеціальних знань при здійсненні оперативно-розшукової діяльності. *Там само*. 2009. № 2 (92). С. 85 ; Рогатинська Н. З. Значення висновку експерта як джерела доказів у кримінальному процесі України. *Держава і право*. 2009. Вип. 46. С. 479—484. URI: http://dspace.nbuv.gov.ua/handle/123456789/9081 (date accessed: 01.02.2025) ; Ціркаль В. Перевірка та оцінка висновку експертизи на досудовому слідстві і у суді. *Право України*. 2005. № 8. С. 60.

and impartial written opinion in respect of questions asked, and where necessary, provide explanations thereon (cl. 1 of Pt. 5 of Article 69 of the CPC) [34].

Therefore, the FEA principles that we have analyzed are common to any type of forensic expert activities. We believe it is in this sense that they are theoretical and practical principles of a forensic expert's activities.

Cl. 1.2 of the Instructions lists the main types (subtypes) of forensic examinations [35]. We focus on forensic psychological examination. The Scientific and Methodological Guidelines on the Preparation and Appointment of Forensic Examinations and Expert Studies [36] determine their object, purpose, objectives, and an indicative list of questions addressed to a forensic expert. Given the specifics of expert research and specific questions posed to forensic psychological examination, it is appropriate to outline fundamental principles of psychological science.

O. Khokhlina points out that in psychology, three groups (levels) of principles are often identified: 1) derived from philosophy; 2) general psychological 3) specific scientific (sectoral) [37]. The principles that come from philosophy are primarily historicism, the principles of systemic nature, dialectical contradiction, unity of quality and quantity, dialectical negation, development, causality, etc. The researcher considers the following to be the cornerstone principles of psychology (general psychological principles): determinism, reflection, unity of psyche and activity, development, and systemic nature (according to O. Tkachenko) [38]. The researcher goes on to note that the list of specific scientific principles is conditioned by a certain branch of psychology, given the specifics of its subject [39].

Modern scientific psychology is a rather diverse system of disciplines and branches. Psychologists define three large groups according to the focus of activities in the process of transforming the psyche:

- theoretical;
- scientific and applied psychology;
- practical psychology.

Theoretical psychology consists of: general psychology, history of psychology, experimental, differential, psychophysiology, etc.

Scientific and applied psychology recognizes a number of branches characterized by researching and applying knowledge to optimize human behavior and activities according to the following criteria:

a) type of human activity and behavior:
   - occupational psychology;
   - engineering psychology;
   - psychology of creativity;
   - psychology of management and leadership;
   - psychology of sports, etc.;

34 Кримінальний процесуальний … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (date accessed: 01.02.2025).

35 Інструкція … . URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (date accessed: 01.02.2025).

36 Науково-методичні рекомендації з питань підготовки та призначення судових експертиз та експертних досліджень : затв. наказ. 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: 01.02.2025).

37 Хохліна О. П. Проблема методологічних принципів психології. *Юридична психологія*. 2015. № 2. С. 5—25. URL: http://nbuv.gov.ua/UJRN/urpp_2015_2_3 (date accessed: 01.02.2025).

38 Там само. С. 6.

39 Там само.

b) psychological issues of human development:
- age psychology;
- educational psychology;
- developmental psychology, etc.;

c) attitude toward normal psyche and mental illness:
- health psychology;
- medical psychology;

d) attitude to law: legal psychology [40].

Practical psychology is a major branch of psychology that focuses on applying its theories, methods, and tools to various practical areas of human behavior and psyche [41].

In view of the fundamental nature of general psychology, which belongs to the group of theoretical and legal psychology (which in turn is a component of scientific and applied psychology), it is recommended to apply an integrated approach to outline the principles of forensic psychological examination from the perspective of psychology as a science, which will further facilitate the synthesis of these principles into an integrated system in accordance with the purpose and objectives of forensic psychological examination and the methods and activities of a forensic psychologist.

O. Tkachenko, a renowned Ukrainian psychologist of the XX century, identified the following cornerstone principles of psychological science:

1) *the principle of determinism.* This principle explains the nature of the subject's psyche development and focuses primarily on causes determining the phenomenon under study. In the course of research, the development of individual consciousness is analyzed not only on the basis of what is acquired in the process of formation and cultivation of experience, but also as a result of inheritance of certain hereditary traits. The subject's psyche is shaped by the product of current and post-event interaction with an object, it is an important determinant of behavior and human activity. What is more, a product is a subjectivized (disobjectified) object and an objectified subject;
2) *the principle of reflection.* All mental functions are reflections of reality. Mental reflection serves a signaling function and can be used to comprehensively describe the formation of behavior. It is also active in nature, e.g., in rational (mental) cognition in the process of perception (individual level) and creation (personality level) of social and historical experience. It is this principle of psychological science that aims to cover and explain all levels of mental reflection, to reveal the general and specific of the phenomenon being analyzed;
3) *the principle of unity of psyche and activity.* The individual's way of being and development is to perceive and reproduce established patterns of social experience. The logic of the individual's development is understood by studying the logic of his/her actions and things he/she creates. This principle clarifies the principles of determinism and reflection and reveals the mechanism of mental reflection development;
4) *the principle of development.* Behavior formation, the connection be-

40 Євсюков О. Ф. Психологія : навч. посіб. Харків, 2020. 256 с.

41 Практична психологія / Простір психологів : вебсайт. 13.04.2023. URL: https://psyhology.space/psypedia-post/praktychna-psyhologiya/ (date accessed: 18.02.2025).

tween consciousness and activity is objectively manifested and realized in the course of psychic phenomena development. Each level of psychic evolution is characterized by a specific type of development: the organism (characterized by the general biological and biopsychic level of determination) develops in the process of maturation and formation of psychophysiological structures; the individual (characterized by the socio-psychic level of determination): in the process of learning, perception (mastery); the personality (also characterized by the socio-psychic level of determination): in the process of transformative, creative activity aimed at creating social and historical experience. Following the development principle requirements, the processes of human development as a personality should be linked to his/her creative activity. The logic of the relevant cycles of psychological categories should reflect the sequence of developmental stages of the object being studied;

5) *the principle of systemic nature.* It has broad heuristic possibilities in the study of personality, considering it as a special open system, and performs an important explanatory function. It contributes to the differentiation of essential aspects of the psyche's reality, outlines essential connections of the psyche with the reflected reality, reveals the structural organization of the psyche as a complex system of interconnected elements [42].

Agreeing with the renowned researcher, let us emphasize that the above sequence of psychological science principles is by no means a ranking by importance.

Today, there is an urgent need to exhaustively define fundamental principles of forensic psychological examination in accordance with the specific problematics and tasks facing a psychologist. From our standpoint, the FEA principles discussed earlier in conjunction with the basic psychology principles defined by O. Tkachenko will become a solid foundation for a forensic psychological examination (provided that scientifically sound and proven methods of cognition and techniques that have passed state certification and registration are used). We believe that a forensic psychologist's personality is pivotal in the forensic psychological expert activity. Therefore, we propose that the above principles be supplemented by the principle of professional ethics of a forensic psychologist. Supporters of certain positions see professional ethics as a system of norms and a code of rules that determine the behavior of a specialist in an official setting [43]. Others point out that professional ethics is a theory of professional morality shaping a person's attitude to his or her professional duties [44]. We will discuss the principle of professional ethics in further publications.

All of the above principles are dialectically interrelated; depending on a task

42 Ткаченко О. Принципи, категорії і методологічні проблеми психології. *Психологія і суспільство*. 2009. № 1 (35). Copyright © 1979. С. 45—134. URL: https://pis.wunu.edu.ua/index.php/uapis/article/view/390 (date accessed: 01.02.2025).

43 Бралатан В. П., Гуцаленко Л. В., Здирко Н. Г. Професійна етика : навч. посіб. Київ, 2011. 252 с. URL: http://elcat.pnpu.edu.ua/docs/Prof_etika.pdf (date accessed: 01.02.2025).

44 Професійна етика : лекції / Професійна етика : вебсайт. 2017. URL: http://pe.ptngu.com/01.html (date accessed: 18.02.2025).

and subject types of forensic psychological examination, some of them may prevail over others. Following the logic of forensic psychology, true representation of complex intrapsychic connections, and the place of the psychic in the overarching relationship of physical world phenomena, research should adhere to the unity of these principles and consider them as a fundamental system *(see Fig. 2)*.

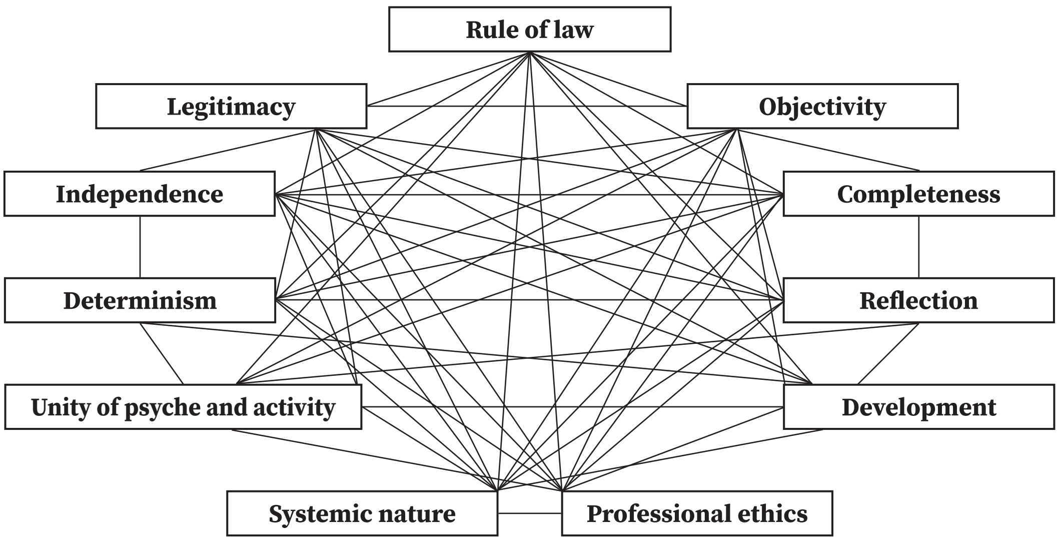

Fig. 2. System of forensic psychological examination principles

The proposed system of forensic psychological examination principles is based both on the requirements of Ukrainian legislation and on the specifics of psychological science.

Conclusions

Since the Fundamental Law of Ukraine proclaims the recognition and operation of the rule of law principle in the State, it is proposed to supplement Article 3 of the Law of Ukraine *On Judicial Examination* with this principle.

The legislation envisages liability for both a forensic expert's offenses as well as for offenses against expert support for justice (i.e., for offenses against the forensic expert): this forms the multidimensional nature of the principle of legitimacy.

The author supports researchers' suggestions on the need to strengthen liability for exerting unlawful pressure on a forensic expert: exclusion of the forensic expert from Art. 386 of the CC and supplementation of the Criminal Code with a new Art. 386-1 (punishment for obstructing a forensic expert's appearance, forcing him/her to refuse to provide testimony or an opinion and to give knowingly false testimony or an opinion).

The author emphasizes that the principle of FEA independence is one of the key principles underpinning the effective execution of forensic expert activity. Moreover, guarantees ensuring the independence of forensic experts have been considered. Specifically, it is stressed that the norm prohibiting anyone from interfering with a forensic examination under threat of legal liability is a reliable guarantee of a forensic expert's independence and, to a certain extent, prevents any pressure from being exerted on him/her. In this regard, the researcher considers functions of a forensic science institution's head, who, on the one hand, is vested by law with functions of controlling the expert research quality, and on the other hand, the rule on the inadmissibility of exerting pressure on a forensic expert, in particular, by the head of a forensic institution (his/her deputy or head of a structural unit) is quite justified. We consider it appropriate to reinstate in the Instructions the rule that the head of a forensic institution may reassign a forensic examination to the expert committee, which shall include a forensic expert who has conducted previous research (if, upon reviewing the expert's opinion, it is found that the research was conducted in violation of or deviated from the research methodology).

The author analyzes guarantees of a forensic expert's independence, which is closely related to the independence of forensic institutions from the authorities conducting operational (search) actions, pre-trial investigation agencies, and court (forensic institutions of the Ministry of Justice and the Ministry of Health of Ukraine, private experts). Even when expert services operate under defense and law enforcement ministries and agencies (MIA, SSU), their functionality, structure, and place within the system of specialized forensic institutions do not involve subordination to inquiry or pre-trial investigation agencies. This also excludes the possibility of exerting pressure on well-versed persons.

The author proves that the essential guarantee of a forensic expert's independence is creation of necessary conditions for his/her activities, as well as his/her financial and social security. Given the excessive workload of forensic experts, the unprecedented number and complexity of forensic examinations under martial law, visits to inspect objects of study in frontline areas, the need to examine dangerous criminals, inspect sites of mass graves, murders, and other grave crimes, motivation for forensic experts to work (such as special remuneration and retirement benefits), which is enshrined in law to guarantee his/her independence, needs to be implemented not only by proclamation but also by effective enforcement.

Emphasis is placed on the dualism of the objectivity principle: on the one hand, the expert's opinion is a personal (subjective) source of evidence, and on the other hand, the expert's opinion has an objective basis related to the study of submitted objects, prohibition to collect them independently, and the use of objective expertise from science and technology by a forensic expert. Therefore, when evaluating the principle of FEA objectivity, we should consider the factors mentioned earlier.

In light of the specifics of expert research and tasks involved in forensic psychological examination, the author has, for the first time, developed a system of principles for forensic psychological examination. This system incorporates both the general principles of FEA outlined in Ukrainian legislation and those from the field of psychology.

Основні принципи судово-експертної діяльності та психологічної науки на виконанні завдань судово-психологічних експертних досліджень

Олександр Євсюков

Проаналізовано нормативно-правові акти та літературні джерела з питань судово-експертної діяльності й науки психології.

Обґрунтовано підстави для диференціювання принципів судово-експертної діяльності й науки психології та їхній вплив на виконання завдань судово-психологічних експертних досліджень. Під час роботи над статтею застосовано загальні, окремі та спеціальні методи пізнання. Оскільки Основний Закон України проголошує визнання та дію в державі принципу верховенства права, запропоновано доповнити цим принципом статтю 3 Закону України «Про судову експертизу». Доведено різнобічність реалізації принципу законності: законодавством передбачено відповідальність як судового експерта за вчинені ним правопорушення, так і за правопорушення проти судового експерта. Підтримано пропозиції науковців щодо необхідності внесення змін до Кримінального кодексу України в аспекті посилення відповідальності за протиправний тиск на судового експерта. Наголошено на тому, що принцип незалежності судово-експертної діяльності є одним із провідних під час її здійснення, і розглянуто гарантії забезпечення незалежності судового експерта. Опрацьовано дискусійні питання реалізації принципів об'єктивності й повноти дослідження. Проаналізовано основні групи принципів психологічної науки: похідні із філософії, загально-психологічні та конкретно-наукові (галузеві). Увагу акцентовано на тому, що принципи судово-експертної діяльності у взаємозв'язку з основними принципами психології створюють надійні засади для проведення судово-психологічного експертного дослідження (за умови застосування науково-обґрунтованих і перевірених методів пізнання та методик, які пройшли державні атестацію й реєстрацію і є наріжними для виконання судових експертиз цього напряму).

Ключові слова: *судово-експертна діяльність; судова експертиза; основні принципи психології; судова психологічна експертиза; принципи незалежності, законності, об'єктивності; принцип верховенства права; повнота дослідження; відображення єдності психіки та діяльності; принцип розвитку; принцип системності; принцип професійної етики.*

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The author states that there is no conflict of interest relating to this topic.

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Yevsiukov, O. (2025). Fundamental Principles of Forensic Expert Activity and Psychological Science in Service of Resolving Forensic Psychological Examination Tasks. *Theory and Practice of Forensic Science and Criminalistics.* Issue 1 (38). P. 127—158. DOI: 10.32353/khrife.1.2025.10.

Overview Related to Exhumation of Animal Corpses: Theoretical, Legal and Organizational Principles

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The procedure for conducting and problematic aspects of examination associated with the exhumation of animal corpses as a procedural action in criminal proceedings is outlined. It is proposed to supplement the criminal procedural legislation of Ukraine with a new Article 239-1 "Examination associated with the exhumation of animal corpses". The definition of "exhumation of animal corpses" is formulated for the first time. It is stated that the objects of exhumation can be whole animal corpses regardless of species, age, sex, breed, including aborted fetuses, stillborn or live-born animals; remains of any degree of integrity (fragmentation), in particular, in a state of criminal destruction. It is noted that participants in the examination of an animal corpse associated with exhumation are a prosecutor, investigator or investigator, as well as a veterinary medicine specialist, specialists of the State Service for Food and Consumer Protection (in particular, laboratories of various levels of this State structure), at least two witnesses and technical staff. The content of examination stages (preparatory, main (exhumation and forensic veterinary examination), final) of the animal corpse(s) associated with exhumation is argued, each of which contains its own phases. It is emphasized that the procedure for examination associated with exhumation of animal corpse(s) set out in this research paper can become a component of methodological recommendations for law enforcement agencies and courts during pre-trial investi-

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gation or judicial investigation in criminal proceedings regarding crimes against health and life of animals. For achieving this goal, interrelated methods were used (analysis, synthesis, analogy; formal-logical one; logical-grammatical one; systemic-structural one; theoretical-legal modeling; comparative-legal one).

Keywords: *exhumation; examination; animal corpses; veterinary medicine specialist; criminal proceedings.*

Research Problem Formulation

Criminal Procedural Code of Ukraine provides that *"tasks of criminal proceedings are <...> to ensure a prompt, complete and impartial investigation and trial so that everyone who has committed a criminal offense is brought to justice to the extent of his or her guilt, no innocent person is accused or convicted, no person is subjected to unreasonable procedural coercion and due process is applied to each participant in criminal proceedings"* (part. 1 of Article 2)[1]. Thus, investigative actions in criminal proceedings are aimed at solving crimes (in particular, against the health and life of animals[2]). One of the means of solving such offenses is forensic veterinary examination[3], the which objects are most often exhumed animal corpses (putrefactive, skeletal, fragmented ones, etc.)[4]. A significant obstacle to the legal exhumation of animal corpses is the lack of procedures for its appointment and conduct in Ukrainian legislation, which may raise doubts about the admissibility of

1 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 (дата звернення: 10.01.2025).

2 Randour M. L., Smith-Blackmore M., Blaney N., DeSousa D., Guyony A.-A. Animal Abuse as a Type of Trauma: Lessons for Human and Animal Service Professionals. *Trauma, Violence, & Abuse.* 2021. Vol. 22. Is. 2. Pp. 277—288. DOI: 10.1177/1524838019843197 (дата звернення: 10.01.2025) ; Song T., Luo Z., Huang Yu., Li Y., Fang L., Chang J. A data set of the crackdown on cross-border wildlife crimes in China, 2014—2020. *Ecology: Ecological Society of America.* 2023. Vol. 104. Is. 6. Art. e4046. DOI: 10.1002/ecy.4046 (дата звернення: 10.01.2025) ; Wainwright Sh. H., Cunha C. W., Webb B., McGregor B., Drolet B., Welch J. B. Reemerging / Notifiable Diseases to Watch. *The Veterinary Clinics of North America. Food Animal Practice.* 2024. Vol. 40. Is. 2. Pp. 317—335. DOI: 10.1016/j.cvfa.2024.01.007 (дата звернення: 10.01.2025) ; Juszkiewicz M., Walczak M., Woźniakowski G., Podgórska K. African Swine Fever: Transmission, Spread, and Control through Biosecurity and Disinfection, Including Polish Trends. *Viruses.* 2023. Art. 15(11):2275. DOI: 10.3390/v15112275 (дата звернення: 10.01.2025).

3 Siqueira A. de, Campusano Cuevas S. E., Salvagni F. A., Maiorka P. C. Forensic Veterinary Pathology: Sharp Injuries in Animals. *Veterinary pathology.* 2016. Vol. 53. Is. 5. Pp. 979—987. DOI: 10.1177/0300985816655850 (дата звернення: 10.01.2025) ; Rebollada-Merino A., Barcena C., Mayoral-Alegre F. J., Garcia-Real I., Dominguez L., Rodriguez-Bertos A. Forensic cases of suspected dog and cat abuse in the Community of Madrid (Spain), 2014—2019. *Forensic science international.* 2020. Vol. 316. Art. 110522. DOI: 10.1016/j.forsciint.2020.110522 (дата звернення: 10.01.2025).

4 Geissenberger J., Ehrenfellner B., Monticelli F. C., Pittner S., Steinbacher P. Dismembered porcine limbs as a proxy for postmortem muscle protein degradation. *International Journal of Legal Medicine.* 2021. Vol. 135. Is. 4. Pp. 1627—1636. DOI: 10.1007/s00414-021-02571-6 (дата звернення: 10.01.2025).

evidence obtained during criminal proceedings. We consider it expedient to regulate the examination of animal corpse(s) related to exhumation in the system of investigative actions and to improve relevant provisions of national criminal procedure legislation.

Analysis of Essential Researches and Publications

The issue of examining the corpses of people after exhumation was considered both by Ukrainian scientists (O. Baulin [5], H. Hetman [6], O. Horlova and O. Zavorina [7], P. Denysiuk and M. Shevchuk [8], T. Dubovyk [9], O. Kovtun and G. Sukhina [10], Ya. Konyushenko [11], M. Patsula [12], V. Slivinsky and V. Rybalko [13], R. Khalilev and L. Legeza [14]) and foreign ones (W. Jilala with co-authors [15], D. A. Mansegosa with co-authors [16]). At the same time, the problems of legal, tactical, organizational and moral and ethical regulation of exhumation of corpses of animals are not suffi-

5 Баулін О. В. Огляд трупа, пов'язаний з ексгумацією, під час здійснення досудового розслідування. *Криміналістика і судова експертиза.* 2022. Вип. 67. С. 201—213. DOI: 10.33994/kndise.2022.67.22 (дата звернення: 10.01.2025).

6 Гетьман Г. М. Огляд трупа, пов'язаний з ексгумацією: порівняльно-правовий аспект. *Юридичний науковий електронний журнал.* 2022. № 11. С. 626—629. DOI: 10.32782/2524-0374/2022-11/151 (дата звернення: 10.01.2025).

7 Горлова О. В., Заворіна О. П. Деякі особливості огляду трупа, пов'язаного з ексгумацією. *Процесуальне та техніко-криміналістичне забезпечення досудового розслідування* : мат-ли наук.-практ. конф. (Харків, 28.11.2019). Харків, 2019. С. 209—212. URL: https://univd.edu.ua/general/publishing/konf/28_11_2019/pdf/75.pdf (дата звернення: 10.01.2025).

8 Денисюк П. Д., Шевчук М. М. Особливості ексгумації трупа в кримінальному провадженні. *Молодий вчений*. 2017. № 5.1 (45.1; спецвип.). С. 32—34.

9 Дубовик Т. С. Щодо питання отримання згоди родичів померлої особи на огляд трупа, пов'язаного з ексгумацією. *Південноукраїнський правничий часопис.* 2022. № 3. С. 66—70. DOI: 10.32850/sulj.2022.3.10 (дата звернення: 10.01.2025).

10 Ковтун О. О., Сухіна Г. Ю. Особливості огляду трупа, пов'язаного з ексгумацією як слідчої дії. *Юридичний науковий електронний журнал*. 2020. № 3. С. 384—386. DOI: 10.32782/2524-0374/2020-3/92 (дата звернення: 10.01.2025).

11 Конюшенко Я. Ю. Учасники проведення огляду трупа, пов'язаного з ексгумацією. *Науковий вісник Міжнародного гуманітарного університету. Серія: Юриспруденція*. 2020. № 47. Т. 2. С. 112—115. DOI: 10.32841/2307-1745.2020.47-2.23 (дата звернення: 10.01.2025).

12 Пацула М. П. Правові аспекти ексгумації трупа у кримінальному провадженні. *Вчені записки Таврійського національного університету імені В. І. Вернадського. Серія: Юридичні науки.* 2019. Т. 30 (69). № 1. С. 124—127. URL: http://nbuv.gov.ua/UJRN/UZTNU_law_2019_30%2869%29_1_23 (дата звернення: 10.01.2025).

13 Слівінський В. В., Рибалко В. В. Правові та морально-етичні проблеми проведення ексгумації трупа у кримінальному провадженні. *Юридичний науковий електронний журнал.* 2022. № 5. С. 600—602. DOI: 10.32782/2524-0374/2022-5/144 (дата звернення: 10.01.2025).

14 Халілєв Р. А., Легеза Л. А. Спірні питання процесуальної регламентації ексгумації трупа в кримінальному провадженні України. *Пропілеї права та безпеки*. 2022. № 1 (1). С. 46—51. DOI: 10.32620/pls.2022.1.06 (дата звернення: 10.01.2025).

15 Jilala W., Russa D., Ng'walali P., Balandya E., Lwoga N. Forensic exhumation and human remains identification: A gap between the Inquest Act 1980 and medico legal education in Tanzania. *Forensic Science International. Synergy.* 2022. Vol. 5. Art. 100276. DOI: 10.1016/j.fsisyn.2022.100276 (дата звернення: 10.01.2025).

16 Mansegosa D. A., Giannotti P. S., Marchiori J. I., Jofré F. N., Aballay F. H., Aisa C. F. The story of a homicide: The location, exhumation, and multidisciplinary analysis of a clandestine

ciently covered in the scientific legal and veterinary literature (C. S. Takenaka et al. [17], D. Shkundya and Ya. Serdyukov [18], I. Yatsenko and R. Kazantsev [19]).

Since the conceptual foundations of the examination of animal corpses associated with exhumation as a procedural action in criminal proceedings remain unexplored, we consider scientific research in this area to be timely.

Article Purpose

Outline the procedure and problematic aspects of examination related to the exhumation of animal corpses as a procedural action in criminal proceedings. Propose appropriate additions to the criminal procedural legislation of Ukraine.

Research Methods

In order to successfully perform research tasks, the following interdependent methods were used: analysis, synthesis, analogy, formal-logical, logical-grammatical, system-structural, theoretical-legal modeling, comparative-legal ones.

The empirical basis of the research is the materials of criminal proceedings of 2010—2024 regarding animal cruelty (Article 299 of the Criminal Code of Ukraine), illegal hunting (Article 248 of the Criminal Code), ecocide (Article 441 of the Criminal Code) [20].

Main Content Presentation

Let's consider the meaning of the concept of *examination of corpses of animals(s) associated with exhumation*. *Exhumation* (Latin *ex* — from, *humus* — earth) — removal of a corpse from the ground (from the place of its burial) for examination (forensic veterinary, forensic examination, pathoanatomical analysis, etc.). These aspects are interdependent: there is no point in conducting an exhumation without examining the corpse, nor is it possible to examine a buried corpse without exhuming. If the corpse of animal is removed from people homes: cellar, barn, basement, etc., such an investigative action is not an exhumation: it is carried out according to the rules of inspection (Article 237 of the Criminal Procedural Code of Ukraine),

burial. *Forensic Science International: Reports.* 2021. Vol. 3. Art. 100165. DOI: 10.1016/j.fsir.2020.100165 (дата звернення: 10.01.2025).

17 Takenaka C. S., Souza de C. N. A., Momo C. Case studies and technical aspects of the forensic necropsy of exhumed companion animals. *Forensic Science International.* 2023. Vol. 345. Art. 111624. DOI: 10.1016/j.forsciint.2023.111624 (дата звернення: 10.01.2025).

18 Шкундя Д. Ю., Сердюков Я. К. Методологія визначення давності настання смерті в м'ясоїдних свійських тварин біофізичними методами. *Біоморфологія XXI століття* : зб. тез доп. XIV Міжнар. наук. конф. присвяч. 100-річ. з часу заснув. каф. анат., гіст. і патоморф. тварин ім. акад. В. Г. Касьяненка (Київ, 23—24.09.2021). Київ, 2021. С. 78—79. URL: https://nubip.edu.ua/sites/default/files/u331/zbirnik_biomorfologiya_2021.pdf (дата звернення: 10.01.2025).

19 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 (дата звернення: 10.01.2025).

20 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 (дата звернення: 10.01.2025).

search (Article 234 of the Criminal Procedural Code of Ukraine) [21].

Objects of exhumation can be whole corpses of an animal, regardless of species, age, gender, breed, including aborted fetuses, dead or live-born animals; remains of a corpse of any degree of integrity (fragmentation), in particular in a state of criminal destruction. Fragmentation should be understood as the division of the corpse into parts, as well as lack of several parts due to its burning, catastrophe (man-made or natural), damage by people (intentional or negligent) or animals (carnivores, rodents, insects). Do not affect the exhumation of the cause of dismemberment, as well as its viability or postmortem.

Specifics of exhumation and examination of the animal corpse:

1) exhumation is not an independent investigative (search) action, exhumation by itself does not prove anything, it is only a technical prerequisite for examining the corpse or conducting a forensic veterinary examination, which will allow obtaining new factual data;
2) have an epistemological character;
3) corpse can be buried in the ground or another place (for example, columbaria, walled in the walls of buildings);
4) examination should be carried out in the presence and with the advice of a veterinary medicine specialist;
5) are carried out within the framework of criminal proceedings after entering information into the Unified Register of Pre-Trial Investigations (hereinafter referred to as the *Unified Register of Pre-Trial Investigation*) on the basis of the resolution of person conducting pre-trial investigation, or by the decision of examining magistrate (court).

In view of the above, we propose the following author's formulation: *"Exhumation of animal corpses is an investigative (search) action of an organizational and technical nature that consists in digging up and removing corpses from the burial site in the ground or another place for primary, repeated or additional forensic veterinary examination, as well as in examining objects found next to the corpses, within the limits of criminal proceedings to verify and clarify existing and identify new evidence or clarify other circumstances of criminal proceedings with subsequent burial"*.

Thus, exhumation of the corpse of an animal is a specific procedure, the grounds for which should be clearly outlined in the legislation. Exhumation of the corpse of an animal is not a basis for opening criminal proceedings, on the contrary: as a procedural action, it is possible only after entering data into the Unified Register of Pre-Trial Investigations and opening criminal proceedings.

Most scientists (O. Horlova and O. Zavorina [22], O. Kovtun and H. Sukhina [23], M. Patsula [24]) tend to consider the place of exhumation of a human corpse to be the place of official burial. Similarly, the place of exhumation of animal corpses should

21 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (дата звернення: 10.01.2025).

22 Горлова О. В., Заворіна О. П. Зазнач. твір. URL: https://univd.edu.ua/general/publishing/konf/28_11_2019/pdf/75.pdf (дата звернення: 10.01.2025).

23 Ковтун О. О., Сухіна Г. Ю. Зазнач. твір. DOI: 10.32782/2524-0374/2020-3/92 (дата звернення: 10.01.2025).

24 Пацула М. П. Зазнач. твір. URL: http://nbuv.gov.ua/UJRN/UZTNU_law_2019_30%2869%29_1_23 (дата звернення: 10.01.2025).

be within the boundaries of the site of official burial (animal cemetery). Discovery of animal corpses elsewhere (in buildings, in trenches (during military operations), on the surface, etc.) should be considered as examination of the animal corpses at the scene of the incident (at the discovery scene).

The normative (procedural), legal and factual grounds for examining the exhumed corpse of an animal are a set of certain circumstances. The current version of the Criminal Procedural Code of Ukraine does not contain a *normative (procedural) basis* (rule of law) that would regulate the procedure for examining the corpse of an animal related to exhumation. The *legal basis* can be considered the decision of the person conducting the investigation, or the decision of the investigating judge (court). The *factual basis* is the need to verify and clarify the available evidence in criminal proceedings; identify new evidence previously unknown to the investigator; clarify other circumstances of the case. We offer the following list of grounds for exhumation and examination of the animal corpse:

- the need for new researches to answer questions related to identification of new circumstances in criminal proceedings;
- suspicion of violent (sudden) death, if no forensic veterinary or pathological examination of the corpse was carried out before the burial;
- the need for initial, repeated or additional forensic examination or a comprehensive forensic examination based on integration of specific expertise, in particular veterinary one;
- too short, unclear description of injuries in the conclusion of primary forensic veterinary examination or autopsy protocol;
- incomplete primary examination of the corpse;
- verification of results of the initial examination of the corpse;
- lack of data on laboratory tests of biological objects removed from the corpse (for example, for suspected poisoning);
- inspection of objects found near the corpse;
- presentation of animal for identification of the corpse;
- obtaining samples of biological material (tissues, organs, fluids) for forensic examination;
- fundamental doubts about authenticity of the cause of death of animal determined before the burial due to new circumstances of criminal proceedings (due to defects in treatment (care, veterinary measures, etc.), concealment of the crime, etc.);
- clarification of differences in the content of several forensic examinations contained in the materials of criminal proceedings;
- principle of contradiction between the conclusion of forensic veterinarian and other materials of proceedings;
- elimination of doubts about the burial of the corpse of particular animal;
- the need to examine a corpse (its remains) buried with the aim of concealing a crime;
- knowledge of other circumstances of criminal proceedings by other means;
- clarification of other circumstances that are essential for criminal proceedings.

The outlined range of grounds for exhumation and examination of animal corpses is not exhaustive: it can vary depending on circumstances of criminal proceedings and other factors. The formulated grounds will be useful to persons conducting investigations when making procedural decisions, when the circumstances of criminal proceedings require.

Consequently, exhumation creates proper conditions for the examination of the corpses of animal(s), that makes possible to answer the above questions and provide the investigator with new factual data on the crime committed.

Qualitative preparation and effective exhumation and examination of the corpse depend on the successful choice of tactics. In the procedural inspection algorithm related to the exhumation of animal corpses, we propose to distinguish 3 stages (*see Fig. 1*), each of which contains stages structured according to certain organizational, procedural and tactical-forensic aspects.

Preparatory → **Primary** → **Final**

Fig. 1: Stages of exhumation and examination of animal corpses

I. Phases of preparatory stage of exhumation and examination of animal corpses

1. Issuance by the person conducting investigation of an order to conduct an examination related to the exhumation of animal(s) corpses

Since the exhumation of corpses of animals is an investigative action, authorized person conducting the investigation issues a resolution for its conduct, and examining magistrate (court) issues a ruling stating:

- circumstances of criminal proceedings (briefly);
- newly discovered circumstances that prompted an examination (forensic veterinary examination) related to exhumation of corpses of animals;
- name of the veterinary specialist involved in the exhumation, examination and further forensic veterinary examination;
- range of questions to be answered [25];
- permission to use destructive methods and damage the objects of research (if it is necessary to remove biological samples and/or if there are reasonable grounds to argue that it is impossible to use other methods, in accordance with paragraph 2 of clause 4.11 of section IV of Instruction on appointment and conducting forensic examinations and researches [26]);
- notification of the owner (guardian) of the animal whose corpse will be exhumed, additionally indicating his right to refuse to conduct an exhumation and possibility of investigator's appeal to the court with a request for permission for this procedural action;
- date, time and address of the place of exhumation of the corpse(s) of animals.

2. Determining circle of persons who will participate in the exhumation and exami-

25 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 (дата звернення: 10.01.2025).

26 Інструкція про призначення та проведення судових експертиз та експертних досліджень : затв. наказ. Мін'юсту Укр. від 08.10.1998 р. № 53/5 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z0705-98#Text (дата звернення: 10.01.2025).

nation, specifying the burial site of the animal(s) corpse(s)

There is no such procedure for the corpses of Criminal Procedural Code of Ukraine animals(s). So let us turn to Parts 1 and 2 of Article 239 of Criminal Procedural Code of Ukraine, which regulates such actions against human corpses:

"1. Exhumation of the corpse is carried out by the decision of the prosecutor. Implementation of the resolution is entrusted to officials of local self-government bodies.

2. The corpse shall be removed from the burial site in the presence of forensic medical examiner <...>" [27].

Thus, the participants in exhumation of human corpse are the investigator, prosecutor, forensic expert and officials of local government bodies. According to Part 7 of Article 223 of Criminal Procedural Code of Ukraine, *"investigator, prosecutor is obliged to invite at least two disinterested persons (understood) to present a person, corpse, or thing for identification, examination of the corpse, including those related to the exhumation <...>"* [28].

Let us apply the principle of legal analogy to the circle of participants in exhumation and examination of the animal corpse: these are prosecutor, investigator (investigating officer), involved veterinary specialist (forensic veterinarian), officials of local self-government bodies, as well as at least two witnesses. Since the exhumation and examination of the corpse has a negative emotional coloring, the person conducting investigation should take this into account.

We consider Y. Konyushenko's opinion that if it is impossible to attract two witnesses, obligation to certify compliance of records in the protocol with the performed actions can be assigned to a veterinary medicine specialist [29].

In addition, optional exhumation participants should include the owner or guardian of the animal whose corpse is subject to this investigative action, as well as employees (administration) of the animal cemetery (They can provide information about the site and circumstances of burial of the animal, etc.).

If the exhumation of corpses of animals is associated with their death from infectious diseases, which pathogens are dangerous for humans, animals and the environment, then this procedure involves specialists from the State Service for Food Safety and Consumer Protection of the corresponding level. During the exhumation of corpses from such burials, it is necessary to carefully observe the rules of personal hygiene and sanitation.

Particular attention should be paid to the competence of a veterinary specialist: he should have a higher veterinary education of the educational level: *specialist* or *master*, theoretical knowledge and practical skills in the study of corpses of animals(s), in particular exhumed animals, provide advice, explanations, certificates and conclusions that require special veterinary knowledge and skills, impeccable reputation, be uninterested in the results of this procedural action, meet general procedural requirements; there should be no grounds for disqualification of such a specialist.

In addition to the above, if necessary, it is possible to invite such specialists as a criminalist, archaeologist, etc.

27 Кримінальний процесуальний кодекс ... . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (дата звернення: 10.01.2025).

28 Там само.

29 Конюшенко Я. Ю. Зазнач. твір. DOI: 10.32841/2307-1745.2020.47-2.23 (дата звернення: 10.01.2025).

For participating in the examination of animal corpse related to the exhumation, forensic expert (who performs the functions of a specialist during the examination) is involved by a letter of request to a forensic institution (currently, the only such institution in Ukraine is National Scientific Center "Hon. Prof. M. S. Bokarius Forensic Science Institute" of the Ministry of Justice of Ukraine) indicating the date, time and place of the exhumation (it is advisable to attach a copy of the resolution on the exhumation of the animal corpse). With a request to involve a veterinary medicine specialist in the exhumation of an animal corpse, investigator may, if necessary, contact other institutions or institutions (State Food and Consumer Protection Service of all levels, scientific and research institutions of veterinary medicine, faculties of veterinary medicine of higher education institutions) or certified forensic experts who do not work in State specialized forensic science institutions. The investigator should ensure the arrival of veterinary specialist, unhindered access to the object and proper working conditions.

3. Familiarization of veterinary medicine specialist with materials of criminal proceedings

In particular: with veterinary documents; resolution on appointment of an examination of the corpse of animal related to exhumation; protocols of interrogation of witnesses; conclusions of other forensic examinations than forensic veterinary (for example, forensic ballistic, forensic trace evidence); results of investigative experiments. At this stage of preparation for the exhumation of animal corpse, person conducting the investigation should receive advice from a veterinary specialist on:

- expediency of exhumation;
- possible informativeness of results of the examination of the corpse in the context of specific criminal proceedings;
- possible actions with the corpse of the animal after its exhumation, taking into account the specific circumstances of criminal proceedings, period of corpse burial, alleged mechanism of death, etc.

4. Preparation by the authorized person conducting investigation of an action plan for the exhumation and examination of animal(s) corpses

5. Sending a notice to the owner (guardian) of the animal(s) whose corpses are subject to exhumation, and handing him a copy of the resolution on commission of this procedural action

If the animal corpse is buried in an animal cemetery, then in order to carry out the exhumation, the person conducting the investigation should inform cemetery administration in writing, at the same time providing a copy of the order on the examination of animal's corpse related to exhumation.

At the same time, the owner (guardian) of animal whose corpse is to be exhumed is sent a notice and a copy of the resolution on commission of this procedural action. Such a notice states that the owner (guardian) of animal may be present during the exhumation, and also requests his written consent to conduct an examination related to the exhumation.

If the owner (guardian) of the animal objects to the exhumation and does not give written consent to its conducting, authorized person conducting the investigation shall apply to examining magistrate (court) for permission to perform this procedural action.

Since any actions at the burial site of an animal (for example, at an animal cemetery) without such permission are illegal, and evidence obtained in this way may be considered inadmissible in court, if the corpse of an animal whose owner (guardian) is unknown is subject to exhumation and examination, this investigative action is performed by a decision of examining magistrate (court). At the same time, the exhumation and examination of the corpse of homeless animal is performed without a court decision: by resolution of the person conducting the pre-trial investigation or by a court decision, if such a decision was made at the stage of judicial investigation.

6. Appeal to the examining magistrate(court) in case of objection of the owner (guardian) of the animal(s) against the exhumation with a petition for its conduct and judicial consideration of this petition

If the owner (guardian) of the animal(s) objects to the exhumation, authorized person conducting the investigation shall apply to the court with a justification that evidence within the criminal proceedings can be obtained exclusively as a result of the exhumation. The examining magistrate (court) may contact a forensic expert or veterinary specialist for clarification on this issue. Based on consideration results, examining magistrate (court) either satisfies the petition or issues a decision to refuse to conduct an exhumation.

Therefore, the more thoroughly the issue of exhuming an animal corpse is regulated, the less likely this procedural action will be challenged in court and the more effectively crimes against animals will be investigated.

7. Entry into force of the court decision

If none of the parties to criminal proceedings has appealed against.

8. Carrying out technical and organizational measures for the exhumation of corpses of animals

Resolution on the exhumation of animal corpse is mandatory for officials of local self-government bodies. If the person conducting the pre-trial investigation needs technical assistance during the exhumation, transportation of the animal's corpse, etc., he/she shall send a letter of notification and a copy of the resolution on the exhumation to the local self-government bodies with a request to provide such technical assistance. The witnesses are informed of their rights and obligations during the examination of animal corpse associated with the exhumation.

II. Stages of the main stage of exhumation and examination of animal corpse(s)

1. Technical removal of corpses of animals or remains from the burial site

First, the burial site is described: existence (lack), appearance and state of the earthen hill, gravestone (if any), fence, vegetation cover, inscriptions, etc. (*q.v. Fig. 2*).

Fig. 2. Pet cemetery in Babai village, Kharkiv region

By successively excavating the burial site, specifics of the soil (chernozem, sand, clay) and its physical properties (dry or wet, frozen, coarse or fine-grained) are described, and the depth of burial is determined (*q.v. Fig. 3*). Before opening the package in which the corpse is placed, its condition is described (nature and color of the material, its integrity: whole or fragmentarily damaged, nature of the damage). If the corpse is buried in a coffin, material of its manufacture (wood, metal), condition (without damage or with them, nature of the damage), the method of closing the lid (with nails, screws, nuts, bolts, sealing, etc.) and its condition (whole or damaged), condition of the corpse's bed in the coffin (color, impregnation with decomposition products, mold, etc.) are noted.

The corpse of the animal from the burial site is removed by the technical staff necessarily in the presence of a veterinary specialist (preferably a forensic expert) (*q.v. Fig. 3, a-c*). Procedural actions during the exhumation of the animal's corpse and its examination are recorded in the protocol or on the information carrier using technical means (Parts 1 and 2 of Art. 103 of Criminal Procedural Code of Ukraine [30]).

2. Examination of exhumed animal(s) at the exhumation site

The animal's corpse is released from packaging (the coffin is opened), where it was placed, and the animal is presented to the owner for identification. Veterinary specialist examines the corpse and describes in detail its morphological specifics (*q.v. Fig. 3d*), in particular:

- area where the animal's corpse is buried;

a **b** **c** **d**

Fig. 3. Phases of exhumation of the animal corpse: a) excavation of the burial site; b–c) removal of the corpse from the burial site; d) examination of the corpse at the burial site by a veterinary specialist

- identification marks (species, sex, age, breed, weight, posture, special features. For example: *"Corpse of an adult dog, male, fawn, approximately 4 years old, weighing approximately 15 kg. On the neck of the corpse is a textile collar and a ring for attaching to a leash"*);
- body structure (configuration (proportional or not, correct or not), external malformations; fatness category (above average, average, below average, thin). For example: *"Body of a cat has a correct body structure, proportional configuration, fatness is below average, external malformations and special signs are missing"*);
- cadaveric phenomena expressed externally (cadaveric drying, ca-

30 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (дата звернення: 10.01.2025).

daveric spots, cadaveric autolysis, cadaveric putrefaction, fat deposits, mummification, peat tanning and freezing. For example: *"Putrefactive biotransformation of the dog's corpse is moderately expressed, the color of the body areas with putrefactive changes is dirty-brown, cadaveric emphysema is pronounced, putrefactive venous network is clearly visible. The corpse emits a sharply pronounced repulsive odor of putrefaction"*);

- skin condition (smell, color, pigmentation, elasticity, moisture. For example: *"Skin of the corpse is contaminated with a black-gray substance, resembling soil in appearance; sagging; brown-green in abdominal area"*);
- condition of claw capsules (anatomical integrity, color, consistency);
- hair condition (color, density, skin adherence, malnutrition, shedding severity, presence of layers of the substance). Example: *"Hair unevenly covers the animal body, without shine, easily separates from the skin. On the hair, the substance is black and gray, looks like a soil that glued individual hairs into lumps"*);
- Eye condition (closed or open eye slits, anatomical integrity, color, moisture, hemorrhages, ulcers and the nature of other damage to the conjunctiva and cornea. For example: *"Eye slits (right and left) are open, conjunctiva is dull, eyeballs and auxiliary organs of the eye are in the state of initial cadaveric decomposition. The right eyeball is significantly deformed, there is a noticeable rupture of its fibrous membrane"*);
- condition of the right and left outer ears (condition of the development of the ears: correctly, with defects; anatomical integrity, condition of the inner and outer surfaces; patency of the external auditory canals and the presence of foreign objects, dirt, earwax, nature of injuries. For example: *"Auricles are anatomically intact, the inner surface is covered with particles of a black and gray substance that looks like sandy soil. External auditory canals contain earwax and layering of a substance of black and gray color, which looks like sandy soil"*);
- condition of the nose (condition of the skin around nostrils, their patency, anatomical integrity of the nose, relief of the nasal or nasolabial mirror. For example: *"Skin of the nasal mirror is in a state of cadaveric decomposition. In the lumen of the nostrils and the vestibule of the nasal cavity, there are masses of a dirty-dark brown color, which look like blood clots in a state of decomposition. The skin of dorsum of the nose is in a state of cadaveric decomposition, like the rest of the soft tissues of this area, easily separate from the bony base of the skull"*);
- condition of oral mucosa (color, consistency, stratification, ulcers. For example: *"Oral mucosa is unevenly colored, mainly dirty-dark brown, of a loose consistency, easily separated from the bony base of the skull. The mucous vestibule of the oral cavity, tongue, and partly the palate and pharynx are covered with smeary gray-dark brown masses that have the appearance of viscous, semi-liquid substrates of animal origin (possibly a mixture of mucus and blood) with admixtures of sandy soil"*);
- condition of oral cleft (distended, stooled, half-stooled);
- position of the tongue (protrudes or does not protrude beyond the oral

cavity; its apex is not clamped between the teeth);

- condition of the anus (closed, open, semi-open; the presence of foreign objects; the nature of the damage; the contamination of the hair around the opening with feces; the condition of the mucous membrane of the anus. For example: *"Anus is semi-open, the soft tissues that form it are gray-greenish in color, flabby in consistency, in a state of initial cadaveric decomposition; the skin around the anus is not contaminated with feces"*);
- condition of the external genitalia (in males: the foreskin, preputial opening, preputial cavity, color and consistency of the glans penis, integrity and color of the skin of the scrotum, the presence of testicles and their appendages in it; in females: the vulva; labia; degree of closure of the genital slit; in males and females: the nature of the discharge from the urogenital canal; availability of foreign objects; damage. For example: *"External genitalia are developed according to the age and sex of the animal; formed correctly according to the male type. The scrotum is of a very loose consistency in a state of cadaveric decomposition. The soft tissues that form the foreskin and penis are gray-brown in color, in a state of cadaveric decomposition"*; *"Labia are intact, the genital slit is slightly open. The mucous membrane of the vestibule of the vagina gray-green in color, whole, moderately folded. There are no foreign objects in the vestibule of the vagina and no damage"*);
- discharge from natural holes. For example: *"There are no discharge from the natural holes of the corpse"*;
- bone condition (availability of unnatural mobility). For example: *"No unnatural mobility of the bones of the skeleton was found"*;
- condition of the neck (proportionality of development, shape, availability or lack of strangulation groove, damage. For example: *"Neck is developed proportionally to the trunk, the strangulation groove is absent, without damage"*);
- condition of the chest (proportionality of development, shape, symmetry, presence of physical injuries. For example: *"The chest is flat-cylindrical in shape, symmetrical. Ribs and spine to the touch are safe"*);
- abdominal condition (configuration: tightened, sagging or enlarged; hungry pits are inflamed, filled; consistency; damage. For example: *"Abdomen is round, soft, without damage"*);
- condition of mammary glands (their development is appropriate for the animal's age, developmental defects, skin integrity, the condition of the nipples and nipple opening);
- condition of the limbs (position, articular angles, unnatural mobility in the bones or joints). For example: *"Thoracic limbs are bent in the elbow joints at an angle of 60^0. The lower part of the right thoracic limb is absent below the carpal joint. The left thoracic limb is anatomically intact. In the lower third of the left forearm, there is a superficial wound. The right and left pelvic limbs are anatomically intact, bent in the knee and metatarsal joints. Unnatural mobility in the right thigh"*);
- topography and nature of injuries or their consequences (skin scars, traumatic baldness, areas of pigmentation and depigmentation, traces of

blood, layering on the corpse. For example: *"On the right side of the head, in the cheek area, there is a lacerated injury — a deep wound that covers the skin, subcutaneous fascia of the head and the masticatory muscles. The edges of the wound are dirty-dark brown in color, soaked with blood, of a loose consistency. The soft tissues along the periphery of the wound are dark red in color, soaked with blood, dark gray, in the depths, red in color, of a loose consistency"*).

In order to determine the localization of bodily injuries found on an animal's corpse, a veterinary specialist should use a system of skeletal coordinates indicating the anatomical area of the body and the distance in centimeters from the injury to the protruding parts of the body. For a correct and understandable description of the shape of the identified bodily injuries, it is necessary to compare it with the shape of geometric shapes (slit-shaped, oval, round, triangular, star-shaped, angular) or letters (*П*-, *Г*-, *S*-shaped, etc.). The dimensions of the injuries are determined by two mutually perpendicular lines, measuring the greatest length, orienting the direction by the numbers on the clock face, and in *Г*-shaped and star-shaped injuries, the length of the rays is measured from the center.

The proposed list is not exhaustive: it depends on the condition of the corpse (fresh, with putrefactive changes, skeletonized, fragmented, etc.). Unnatural position of individual parts of the animal's corpse should be described especially carefully.

3. Removal of biological samples from animal carcass (es)

After the description, if necessary, samples of tissues and organs or part of the corpse can be removed from the corpse, as well as soil and things found next to the corpse that are necessary for conducting forensic researches (veterinary, chemical, histological, toxicological, biological, microbiological, molecular genetic ones) and are important for clarifying circumstances of a criminal offense.

If insects (larvae, beetles) are available on the corpse, the veterinary specialist notes the areas of greatest concentration. They are then removed, placed in test tubes, and sent for forensic biological examination.

If necessary, a sample of soil under a corpse weighing at least 500 g is taken for laboratory testing for poison detection.

It is extremely important to emphasize that during the exhumation of an animal's corpse, the *powers of a veterinary specialist* include:

- observation of excavation of burial site of the corpse;
- advising on proper removal of the corpse (its remains) from the burial site to the surface;
- nature indication and packaging material where the animal's corpse (its remains) was contained;
- determining the degree of integrity of the packaging where the corpse was located, and if it is destroyed, then indicating the factors that influenced this (insects, plants, microscopic fungi, decay processes, etc.);
- detailed description of external condition of the corpse;
- removal of samples from the corpse and, if necessary from packaging where it was kept and soil samples for laboratory testing;
- description and removal of cadaveric fauna for forensic biological research;

- advice on careful transportation of the exhumed corpse to the sectional hall of specialized forensic science institution for forensic examination;
- advising the investigator on the range of issues that may be posed to forensic veterinarian;
- participation in the preparation of the exhumation protocol for the animal corpse.

4. Drawing up an examination protocol related to the exhumation of animal corpses

Upon completion of the examination of the exhumed corpse, the person conducting the pre-trial investigation draws up a protocol (Articles 104, 106 of Criminal Procedural Code of Ukraine [31]), in which he or she notes everything found in the sequence in which it occurred and in the form in which it was observed. The report also contains a list of things and objects removed from the animal's corpse or burial site. The person who supervised the exhumation of the animal corpse shall, if necessary, attach appendices to the protocol (Article 105 of the Criminal Procedural Code of Ukraine) [32]: materials for measuring, weighing, photographing, sound and/or video recording; plans and diagrams; graphic images; photo tables; prints and casts (if available); written explanations of the veterinary specialist involved in this procedural action; electronic media and other materials explaining the content of the inspection protocol. Although the appendices to the protocol are optional, they should be properly packed to prevent their unauthorized opening and certified by the signatures of the participants in the procedural action (inquirer, investigator, prosecutor, veterinary specialist, etc.).

During exhumation, it is advisable to record general view of the burial site; grave markers, the moment of their dismantling; the beginning of excavation; packaging of the corpse (coffin) or the corpse itself (if it is buried without packaging) in the burial site (grave); the corpse in packaging (open coffin); objects found in the packaging (coffin); the moment of re-placement of the animal corpse after examination (forensic veterinary examination); the moment of covering with earth, final restoration of the burial site after exhumation. Photographs illustrating the examination report shall be drawn up as photo tables according to the rules of forensic photography and in the sequence in which it was recorded during exhumation of the corpse and its examination. Arrows, letters, numbers and other necessary marks can be applied to the photographs, and the content of the images and marks, numbers, arrows shall be indicated under each photograph.

Materials with video and audio recordings shall be attached to the inspection report in an envelope, fixing it on a piece of paper. The inscription on the envelope must correspond to the inspection report. All photographic illustrations, envelopes with disks, flash drives, etc. shall be sealed with a stamp and signature of the person conducting the exhumation of the animal corpse.

Examination protocol of the corpse related to the exhumation should contain the introductory, descriptive and final parts (Part 3 of Art. 104 of Criminal Procedural Code of Ukraine) [33]:

31 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (дата звернення: 10.01.2025).

32 Там само.

33 Там само.

1) introductory part:
- title of the document "Protocol of examination of the corpse of an animal associated with exhumation";
- place (name of the locality), date, time of the beginning and end of the inspection;
- surname, name and patronymic, position of the authorized person conducting procedural action, and the name of investigating authority;
- grounds for exhumation;
- information about witnesses (surname, name, patronymic, date of birth, place of residence; information on clarification of their rights and obligations in accordance with Articles 11, 13, 15 and 223 of the Criminal Procedural Code of Ukraine [34]);
- surname, name, patronymic, position of a forensic expert (veterinary doctor); explanation of his rights and obligations in accordance with Art. 69 of the Criminal Procedural Code of Ukraine [35];
- surname, name, patronymic of the technical staff involved in the exhumation;
- procedural document on appointment of exhumation (resolution of the prosecutor, investigator, investigating officer, decision of examining magistrate (court); position, surname and initials of these authorized persons; issuance date of the resolution or decision);
- reference to Art. 237 *Examination* of the Criminal Procedural Code of Ukraine, on the basis of which the exhumation is carried out [36];
- information on explaining to the persons present before the start of the inspection their right to be present during all actions that will be taken during examination, to make comments to be recorded in the protocol;
- method of recording exhumation of the animal corpse and the stages of its examination;
- information that persons participating in the examination related to the exhumation were informed in advance about the use of technical means of fixation;

2) *descriptive part* (sequence of actions during exhumation and inspection of the animal corpse):
- type, nickname or individual number, gender, owner (guardian);
- date and burial site;
- result of the examination (the state of the burial site, sequence of actions of the persons who carry out the exhumation and examination);
- list of tissue or organ samples seized from the animal corpse, their condition at the time of examination, and the method of their packaging and labeling;
- list of items seized from the burial site that are relevant to clarifying the circumstances of the criminal offense, the method of their packaging and labeling;
- name and address of forensic science institution where the corpse of the exhumed animal will be examined;

34 Кримінальний процесуальний кодекс … . URL: https://zakon.rada.gov.ua/laws/show/4651-17#Text (дата звернення: 10.01.2025).

35 Там само.

36 Там само.

3) *final part* (information about the things seized from the burial site, method of familiarizing the participants with the content of the protocol, comments and additions of the review participants to the protocol; surname, name, patronymic and signatures of all review participants; surname and initials, position of the person conducting the investigation, name of investigation body, signatures).

Refusal of any of participants in the examination of the corpse of the animal associated with the exhumation to sign the protocol is separately indicated in this protocol. Such a participant may explain in writing the reason for the refusal; this explanation is recorded in the protocol and certified by signatures of the witnesses.

5. Transportation of corpses or their remains to a specialized forensic science institution for forensic veterinary examination

For delivering exhumed corpse (remains) of the animal to the State forensic science institution, involved veterinary specialist packs the corpse (remains) in an impenetrable packaging (bag, polymer material, container, etc.). The person conducting investigation seals the packaging, attaches a sticker with an inscription and, together with the decision on the appointment of a forensic veterinary examination or a comprehensive forensic examination, directs the animal corpse to a State forensic science institution.

This procedure can be carried out in other institutions or facilities: for example, sectional halls of departments of higher education institutions, laboratories of the Veterinary Research Institute or the State Service of Ukraine for Food Safety and Consumer Protection, etc. As an exception, in agreement with the expert, it is allowed to conduct forensic examination of animal corpse (if necessary conditions are met) in the premises of veterinary medical institutions adapted for a sectional hall, as well as outdoors (only under favorable weather conditions and if the body (authorized person) that appointed the examination or engaged the expert provides the appropriate conditions for work). If the corpse was delivered from the place of exhumation, where the inspection report was drawn up, a copy of it should be sent together with the decision to appoint a forensic veterinary examination [37]. It is necessary to comply with veterinary, sanitary and hygienic requirements to prevent the spread of pathogens that the exhumed animal corpse can potentially contain.

6. Conducting forensic veterinary examination in a specialized forensic science institution

Most often, forensic veterinary examination of the corpse of an animal is performed in the sectional hall of the expert institution (*q.v. Fig. 4*) in accordance with the methodological recommendations *Rules of Forensic Veterinary Examination of Animal Corpses* [38], as well as *Methods of Forensic Veterinary Examination of Animal Corpses* [39].

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

38 Там само.

39 Їх же. Методика судово-ветеринарної експертизи трупів тварин. Харків, 2022. 336 с. Реєстр. код 18.1.02 / Реєстр методик проведення судових експертиз : офіц. сайт. URL: https://rmpse.minjust.gov.ua/search (дата звернення: 10.01.2025).

Fig. 4. General view of the dog's corpse in sectional hall

III. Phases of preparatory stage of exhumation and examination of animal corpses

1. Transportation of corpses or their remains for re-burial

The responsible person for this action *is* the authorized person conducting investigation.

2. Re-burial of corpse(s) or their remains

Repeatedly, the corpse (remains) of animal is buried in the same place from where it (them) was removed, and the burial site of the previous state is provided. The corpse (remains) of the animal can be cremated with the consent of the person conducting the pre-trial investigation. They hide the corpse (remains) of the animal after exhumation in the presence of the person conducting the pre-trial investigation. A protocol shall be drawn up on the repeated burial of the corpse (remains) in the same place where it (them) was initially buried, as well as on bringing the burial site to the previous state.

3. Reimbursement of expenses related to exhumation of corpses of animals

The costs associated with the exhumation, transportation to a specialized expert institution and subsequent burial of the animal corpse(s) shall be reimbursed in accordance with the procedure established by law. For participation in the examination of an animal corpse related to exhumation, a veterinary specialist involved in this procedural action shall have the right to receive remuneration in accordance with the law, if this is not his/her official duty.

We share the opinion of Y. Chornous and T. Sinoverska [40] about the need to take into account the specifics of a criminal offense against the health and life of animals and believe that the examination of the corpse of an animal should be regulated by a separate article of the Criminal Procedural Code of Ukraine. In this regard, and the above stages and stages of exhumation and examination of corpses of animals, we propose to supplement the Criminal Procedural Code of Ukraine with a new article with the following content:

"Article 239-1. Examination related to the exhumation of an animal's corpse

1. Exhumation of animal corpse(s) is an investigative (detective) action of an organizational and technical nature, which consists in digging and removing corpse(s) from the burial site in the ground or another place for primary, repeated or additional forensic veterinary examination, as well as in the examination of objects found near the corpse(s), within the framework of criminal proceedings to verify and clarify existing and identify new evidence or clarify other circumstances of criminal proceedings with subsequent burial.

40 Чорноус Ю., Синоверська Т. Криміналістична методика розслідування жорстокого поводження з тваринами : монографія. Київ, 2022. 248 с. URI: http://elar.naiau.kiev.ua/jspui/handle/123456789/23142 (дата звернення: 10.01.2025).

2. The grounds for examination of animal corpse related to exhumation are its sudden death and/or suspicion of violent death, if no forensic veterinary or pathological examination of the corpse was carried out before burial; the need to conduct primary, repeated or additional forensic veterinary examination or a comprehensive forensic examination based on the integration of specific expertise, including veterinary knowledge; presentation for identification; obtaining samples of biological material (tissues, organs, fluids) for forensic examination; doubts about the authenticity of the cause of death determined prior to burial due to newly discovered circumstances of criminal proceedings (defects in treatment, care, veterinary and sanitary measures, concealment of a crime, etc.); clarification of differences in the content of the examinations available in criminal proceedings; inconsistency of the forensic veterinary expert conclusion with other case (proceedings) materials; clarification of other circumstances that are essential to criminal proceedings.

3. Exhumation of the corpse of animal shall be carried out by the decision of the authorized person conducting the pre-trial investigation or by the decision of the investigating judge (court). If the owner (guardian) of the deceased animal objects to the exhumation, the decision on exhumation is issued by the examining magistrate (court) at the request of the person conducting the pre-trial investigation. All participants in the exhumation have the right to participate in the court session. Failure to appear of persons timely notified of the time and place of consideration of the petition is not an obstacle for consideration of the petition by the investigating judge (court). The decision on permission to conduct an exhumation or refusal to conduct it can be appealed.

4. The following persons take part in the exhumation of the corpse of the animal: a person conducting a pre-trial investigation (prosecutor, investigator, investigating officer), a veterinary medicine specialist, at least two witnesses, technical staff. If necessary, specialists of the State Food and Consumer Service are involved in this procedure. The resolution on exhumation is mandatory for officials of local self-government bodies.

5. Prior to the exhumation of the animal corpse, the person conducting pre-trial investigation shall present a resolution on the examination of the animal corpse related to exhumation and the written consent of the owner (guardian) of the animal whose corpse will be exhumed or a court decision to authorize the exhumation, explain to the participants of this procedural action their rights and obligations and make a record of this in the "Protocol of examination of the animal corpse related to exhumation".

6. Corpse of the animal shall be removed from the burial place in presence of involved veterinary specialist. Examination of the corpse is carried out in compliance with sanitary and hygienic safety measures.

7. After exhumation, examination, selection of the necessary samples for research and forensic veterinary examination, the animal corpse is either buried in the same place with the burial place restored to its previous state, or cremated in the presence of an authorized person conducting a pre-trial investigation. Protocol is drawn up on the repeated burial (cremation) of the corpse or its remains.

8. During exhumation, veterinary medicine specialist may remove tissue samples, organs or parts thereof from the corpse of an animal, as well as soil and things found next to the corpse that are necessary for conducting forensic veterinary research and are important for clarifying the circumstances of a criminal offense.

9. Exhumation procedure is recorded by photographing or video recording and described in detail in the protocol.

10. If necessary, the corpse of the animal (its remains) may be delivered to the state ex-

pert institution for forensic veterinary examination.

11. In accordance with Article 104 of this Code, on the exhumation of the corpse of animal, protocol is drawn up, where everything found is indicated in the sequence in which it occurred and in the form in which it was observed during the procedural (search) action. If during the exhumation, things and objects were removed for examination, then this should be noted in the protocol. Measurement materials, photographs, sound or video recordings, plans and diagrams, graphic images, prints and casts (if any) shall be added to the protocol.

12. The costs associated with the exhumation, transportation and reburial of the animal corpse shall be reimbursed in accordance with the procedure established by law".

Compliance with the above procedural requirements is the key to clarifying the actual circumstances of the case (proceedings) for further effective investigation.

Conclusions

Exhumation of animal corpse(s) is an investigative (detective) action of an organizational and technical nature, which consists in digging up and removing corpse(s) from the burial site in the ground or another place for primary, repeated or additional forensic veterinary examination, as well as in the examination of objects found near the corpse(s), within the framework of criminal proceedings to verify and clarify existing and identify new evidence or clarify other circumstances of criminal proceedings with subsequent burial.

The grounds for examination of animal corpse(s) related to exhumation are data of criminal proceedings and the adoption of relevant procedural decisions by the authorized person conducting investigation.

Participants in the examination of corpses of animals associated with exhumation are a prosecutor, investigator or investigating officer, veterinary medicine specialist (and/or specialists of the State Service of Ukraine on Food Safety and Consumer Protection), at least two witnesses, as well as technical staff.

Examination related to the exhumation of animal corpse(s) is a special procedural action within which we propose to distinguish 3 stages (preparatory, main (exhumation of the corpse and its examination) and final), each of which contains a certain number of stages.

Exhumation procedure of animal corpse(s), their examination and sampling for laboratory tests shall be recorded in the "Protocol of examination related to exhumation of animal corpse(s)".

Based on the results of theoretical research and developments of reputable scientists in the field of criminalistics, criminal procedure and forensic science, based on our own experience of forensic science activities during 2010—2024 and given the lack of rule in the Criminal Procedural Code of Ukraine that would regulate the examination of exhumed animal corpses, we propose to supplement the said Code with a new Article 239-1 "Examination related to the exhumation of animal corpse(s)".

The sequence of exhumation examinations we have outlined can be useful to law enforcement officers and judges during pre-trial investigations or court proceedings in criminal proceedings for crimes against animal health and life.

Огляд, пов'язаний з ексгумацією трупів тварин: теоретичні, правові й організаційні засади

Іван Яценко

Окреслено порядок проведення та проблемні аспекти огляду, пов'язаного з ексгумацією трупів тварин, як процесуальної дії у кримінальних провадженнях. Запропоновано *доповнити кримінальне процесуальне законодавство України новою ст. 239-1 «Огляд, пов'язаний з ексгумацією трупів(-а) тварин(-и)». Уперше сформульовано дефініцію «ексгумація трупів(-а) тварин(-и)». Стверджується, що об'єктами ексгумації можуть бути цілі трупи тварин незалежно від виду, віку, статі, породи, включно з абортованими плодами, мертво- або живонародженими(-ою) тваринами(-ою); рештками будь-якого ступеня цілісності (фрагментація), зокрема, у стані кримінального знищення. Зазначено, що учасниками огляду трупа тварини, пов'язаного з ексгумацією, є прокурор, слідчий або дізнавач, а також спеціаліст ветеринарної медицини, фахівці Держпродспоживслужби (зокрема, лабораторій різного рівня цієї держструктури), не менше двох понятих і технічний персонал. Аргументовано зміст етапів огляду (підготовчого, основного (ексгумація та судово-ветеринарна експертиза), завершального) трупів(-а) тварин(-и), пов'язаного з ексгумацією, кожен з яких містить свої стадії. Наголошено, що викладена в цій науковій праці процедура огляду, пов'язаного з ексгумацією трупів(-а) тварин(-и), може стати складовою методичних рекомендацій для правоохоронних органів і судів під час досудового розслідування або судового слідства у кримінальних провадженнях щодо злочинів проти здоров'я та життя тварин. Для досягнення мети застосовано взаємообумовлені методи (аналіз, синтез, аналогія; формально-логічний; логіко-граматичний; системно-структурний; теоретико-правового моделювання; порівняльно-правовий).*

Ключові слова: *ексгумація; огляд; трупи тварин; спеціаліст ветеринарної медицини; кримінальне провадження.*

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Comparative Analysis of Smart Lock Breaching Methods and Their Forensic Examination in Ukraine and the USA

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The development of technology has contributed to changes in methods of securing residential and commercial premises. Smart locks have become an integral part of the modern security market and have attracted the attention not only of property owners and security companies but also of criminals. The key methods of smart lock hacking used in Ukraine and the USA are examined, as well as the differences in forensic examination approaches to such crimes in these countries. A comparative analysis of physical, mechanical, and digital attacks has been conducted, outlining new challenges in the forensic examination of electronic locks and proposing recommendations for improving forensic research in this field. Modern security systems, including smart locks, combine mechanical and electronic technologies. At the same time, they are somewhat vulnerable, making them attractive to cybercriminals and traditional methods of physical hacking. The lack of a unified approach to forensic examination of such crimes in Ukraine and the USA creates difficulties in law enforcement activities. The purpose of this article is to explore the methods of smart lock hacking, compare the peculiarities of forensic examinations of such hacks in Ukraine and the USA, and propose measures to improve the investigation of such crimes. To achieve the stated goal, the method of comparative analysis, the traceological method of examining traces of hacking, the analysis of digital evidence, and vulnerability testing methods (fuzzing, reverse engineering of lock software) were applied.

Keywords: *smart locks; forensic examination; digital hacking; physical hacking; security; forensic analysis.*

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Research Problem Formulation

Modern security systems, including smart locks, combine mechanical and electronic technologies. At the same time, they are somewhat vulnerable, making them attractive to cybercriminals and traditional methods of physical hacking[1]. The lack of a unified approach to the forensic examination of such crimes in Ukraine and the USA creates difficulties in law enforcement activities, making the resolution of this issue relevant in the modern innovative world.

Article Purpose

To study the methods of smart lock hacking, compare the specifics of forensic examinations of such hacks in Ukraine and the USA, and propose measures to improve the investigation of such crimes.

Research Methods

The method of comparative analysis, the traceological method of examining traces of hacking, the analysis of digital evidence, and vulnerability testing methods (fuzzing, reverse engineering of lock software) were applied.

Analysis of Essential Researches and Publications

The features of expert research on the hacking of mechanical and smart locks have been studied by scientists from Ukraine (B. Yakymenko [2], H. Hrabovskyi with co-authors [3], R. Kuznetsov and P. Yevseiev [4], V. Kopcha with co-authors [5]), as well as researchers from other countries (D. Ollam [6], S. Dashevskyi and F. La Spina [7],

1 Smith S. W., Oorschot P. C. van. The Internet of Things: Security Challenges. *IEEE Security and Privacy Magazine*. 2019. Art. 17(5):7-9. DOI: 10.1109/MSEC.2019.2925918 (date accessed: 01.02.2025).

2 Якименко Р. В. Щодо важливості етапу порівняльного дослідження конформних слідів на деталях механічних сувальдних замків. *Криміналістика і судова експертиза.* 2018. Вип. 63. Ч. 1. С. 335—347. URL: https://digest.kndise.gov.ua/wp-content/uploads/2021/06/2018_1.pdf (date accessed: 01.02.2025).

3 Грабовський Г., Опарій А., Кузнєцов Р. Особливості експертного дослідження слідів знарядь злому. *Молодий вчений*. 2019. № 8 (72). С. 285—290. DOI: 10.32839/2304-5809/2019-8-72-61 (date accessed: 01.02.2025).

4 Кузнєцов Р. В., Євсєєв П. О. Особливості трасологічного дослідження динамічних слідів знарядь зламу. *Аналітично-порівняльне правознавство*. 2022. № 4. С. 337—341. DOI: 10.24144/2788-6018.2022.04.61 (date accessed: 01.02.2025).

5 Копча В. В., Фрідманський Р. М., Копча Н. В. Правове дослідження слідів на місці злочину: які сприяють ефективному розкриттю і попередженню злочинів. *Науковий вісник Ужгородського Національного Університету. Серія Право.* 2022. Вип. 72. Ч. 2. С. 211—218. DOI: 10.24144/2307-3322.2022.72.67 (date accessed: 01.02.2025).

6 Ollam D. Practical Lock Picking: A Physical Penetration Tester's Training Guide. Syngress, 2010. 236 p.

7 Dashevskyi S., La Spina F. Old Code Dies Hard: Finding New Vulnerabilities in Old Third-Party Software Components and the Importance of Having SBoM for IoT / OT Devices / Black Hat Europe 2023. 48 p. URL: https://i.blackhat.com/EU-23/Presentations/EU-23-Dashevskyi-Old_code_dies_hard.pdf (date accessed: 01.02.2025).

D. dos Santos with co-authors [8], Y. Osawa and S. Higuchi [9]).

Main Content Presentation

With the advancement of technology, the number of threats related to lock hacking, both conventional and high-tech (including smart locks), is increasing and their quality is improving.

In the USA, significant attention is paid to the digital forensics of smart lock hacking (e. g., at the National Forensic Science Technology Center, hereinafter referred to as NIST [10]), whereas in Ukraine, forensic examinations are still predominantly focused on the physical analysis of mechanical lock breaches.

Popular smart lock brands in the USA: August, Yale, Schlage, Kwikset, Wyze. More common brands in Ukraine: Chinese models such as Xiaomi, Aqara, and low-cost OEM-solutions.

Authentication methods in the USA: Biometrics, PIN codes, NFC, Bluetooth, Wi-Fi [11], authentication methods in Ukraine: RFID-cards, PIN codes, mechanical keys.

Main vulnerabilities of smart locks in the USA: wireless signal interception, code guessing, attacks via mobile applications [12]. Main threats in Ukraine: mechanical breaches, power outages, outdated software.

Thus, since the methods of hacking mechanical and smart locks in the USA and Ukraine differ to some extent, the specifics of forensic examinations of such breaches will also vary, which we will examine in detail further.

Methods of Lock Hacking and Their Forensic Examination in the USA

It is worth noting that smart locks leave unique traces of unauthorized access — evidence such as:

- Access logs — saved records of locking (unlocking) events may contain

8 Santos D. dos, Guiot S., Dashevskyi S., Amri A., Kerro O. Route to Bugs: Analyzing the Security of BGP Message Parsing / Black Hat USA 2023. 33 p. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-dosSantos-Route-to-Bugs-Analyzing-the-Security-of-BGP.pdf (date accessed: 01.02.2025).

9 Osawa Y., Higuchi S. A Manufacturer's Post-Shipment Approach to Fend-Off IoT Malware in Home Appliances / Black Hat USA 2023. 37 p. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-Osawa-Higuchi-A-Manufacturers-Post-Shipment-Approach.pdf (date accessed: 01.02.2025).

10 Kent K., Chevalier S., Grance T., Dang H. Guide to Integrating Forensic Techniques into Incident Response. Recommendations of the National Institute of Standards and Technology. SP 800-86. U. S. Department of Commerce ; Technology Administration ; NIST, Aug 2006. 121 p. URL: https://surl.gd/bfuxct (date accessed: 01.02.2025) ; Ayers R., Brothers S., Jansen W. NIST Special Publication 800-101. Rev. 1. Guidelines on Mobile Device Forensics. U. S. Department of Commerce ; NIST, May 2014. 85 p. DOI: 10.6028/NIST.SP.800-101r1 (date accessed: 01.02.2025) ; Cybersecurity Subteam Recommendations / National Institute of Standards and Technology : website. 2023-08-18. 5 p. URL: https://surl.li/fkkmcm (date accessed: 01.02.2025).

11 Berrios J., Mosher E., Benzo S., Grajeda C., Baggili I. Factorizing 2FA: Forensic analysis of two-factor authentication applications. *Forensic Science International: Digital Investigation.* 2023. Vol. 45. Suppl. Art. 301569. DOI: 10.1016/j.fsidi.2023.301569 (date accessed: 01.02.2025).

12 Caballero-Gil C., Álvarez R., Hernández-Goya C., Molina-Gil J. Research on smart-locks cybersecurity and vulnerabilities. *Wireless Networks.* 2024. Vol. 30. Pp. 5905—5917. DOI: 10.1007/s11276-023-03376-8 (date accessed: 01.02.2025).

information about the time of the breach or attempts to enter an incorrect code.

- Bluetooth or Wi-Fi connection data — can provide insights into hacking tools used for signal interception or code guessing.
- Forensic analysis of mobile applications — if the lock is controlled via a smartphone, it is possible to trace interactions with the app, even if the attacker attempted to delete it.

Smart locks have gained widespread popularity due to their convenience and integration with smart home systems [13].

According to a 2023 study, 12 % of smart lock owners in the USA experienced attempted breaches of their devices. Main threats:

- physical hacking (43%) — 3D-printed lock picks, bumping, magnetic manipulation;
- cyberattacks (37%) — hacking mobile applications, intercepting wireless signals via Bluetooth or Wi-Fi;
- attacks on the authentication system (20%) – password hacking or manipulation of NFC-cards [14].

In 2023, the FBI IC3 received 2,825 complaints about ransomware attacks, causing losses exceeding $59.6 million [15]. Such programs encrypt data on a device, making it inaccessible to users, while cybercriminals demand a ransom for the return of the stolen information. There have been recorded cases where attackers targeted smart locks, blocking access to premises and using this as a tool for extortion. For example, in the Austrian *Romantik Seehotel Jäegerwirt,* hackers compromised the electronic key system, locked guests in their rooms, and demanded a ransom to restore access. This demonstrates the vulnerability of IoT devices (*Internet of Things*), particularly electronic lock systems, which can become targets for attacks, compromising user security and causing financial losses. According to the *2024 Consumer Cyber Readiness Report,* 7 % of registered cyberattacks in 2024 were related to ransomware attacks on smart home devices, including smart locks [16]. Participants of the *Black Hat USA 2023* and *DEF CON* conferences have once again [17] explored new attack methods on smart locks (including the use of 3D-printed lock picks and magnetic manipulation), as well as detection, prevention, and forensic investigation techniques for such attacks.

With the advancement of technology, both hacking methods and forensic investigation techniques are evolving. Tra-

13 Adaramola O. O., Odigbo Ch. S., Elelegwu D., Chen L. Safeguarding Smart Homes: A Digital Security and Digital Forensics Approach / ResearchGate : website. Feb 2025. 14 p. DOI: 10.13140/RG.2.2.19403.30240 (date accessed: 01.02.2025) ; Hutchinson Sh., Yoon Y. H., Shantaram N., & Karabiyik U. Internet of Things Forensics in Smart Homes: Design, Implementation, and Analysis of Smart Home Laboratory. *2020 ASEE Virtual Annual Conference Content Access*. June 22—26. 2020. P. ID #29634. DOI: 10.18260/1-2--34868 (date accessed: 01.02.2025).

14 Federal Bureau of Investigation. Internet Crime Report 2023 / Internet Crime Complaint Center. Dec 12. 2023. Pp. 13—14. URL: https://www.ic3.gov/annualreport/reports/2023_ic3report.pdf (date accessed: 01.02.2025).

15 Ibid.

16 2024 Consumer Cyber Readiness Report / Aspen Digital : website. Oct 1. 2024. URL: https://www.aspendigital.org/report/2024-consumer-cyber-readiness-report/ (date accessed: 01.02.2025).

17 Black Hat USA 2023 (Aug 5—10, 2023; Mandalay Bay / Las Vegas + Virtual) / Black Hat : website. 2023. URL: https://www.blackhat.com/us-23/ (date accessed: 01.02.2025).

ditional mechanical locks leave physical traces of tampering, whereas smart locks may contain digital traces, the analysis of which requires specialized forensic examination.

Among the methods of smart lock hacking in the USA, digital attacks stand out the most, as they exploit vulnerabilities in software and network protocols [18]. The analysis of smart lock hacking in the USA is based on standardized digital forensics methodologies, which allow law enforcement agencies to accurately determine the circumstances of the breach, identify the method of unauthorized access, and trace the perpetrator.

For example, Bluetooth and Wi-Fi interception is used to decrypt transmitted data or clone authentication keys [19]. It has also been found that Bluetooth commands can be intercepted and replayed, granting unauthorized access to a lock without the need for a physical key. Most smart locks use *Bluetooth Low Energy (BLE)* or Wi-Fi to connect with the owner's smartphone. Attackers can exploit the following hacking methods:

- Bluetooth *connection interception* – hackers can record a communication session and attempt to replay it to gain access.
- Wi-Fi connection attacks – if the lock is connected to the internet, attackers can manipulate commands using Man-in-the-Middle (MITM) attacks.
- Brute-force attacks – cracking passwords or digital codes using automated scripts.

There are also other threats, such as:

- Software attacks (*API* vulnerabilities) – exploiting flaws in mobile applications that control smart locks [20]. Due to weak user authentication or with the use of specialized equipment, attackers can remotely intercept control signals between the mobile device and the lock.
- Unauthorized biometric data collection – a compromised smart lock modified by attackers can capture a user's fingerprints and transmit them via encrypted channels to a remote, controlled server without the owner's knowledge.
- Bypassing recognition algorithms – through "fingerprint replay" attacks, intercepted biometric data can be used to gain access to other devices owned by the victim.

This is why biometric data should be stored locally and protected using strong security mechanisms, such as *FIDO2* encryption (*Fast IDentity Online 2* – an open authentication standard designed to enhance user login procedures for improved security and trust in online services) [21].

18 Black Hat / DEF CON 2024: Latest Insights on Security and AI. ISMG Compendium Showcases More Than 50 Interviews on Threats, Emerging Solutions / Bank Info Security : website. Sept 13, 2024. URL: https://www.bankinfosecurity.com/black-hatdef-con-2024-latest-insights-on-security-ai-a-26283 (date accessed: 01.02.2025).

19 Winkelmann A. Unauthorized Smart Lock Access. Ethical Hacking of Smart Lock Systems. Stockholm, Sweden, 2022. 99 p. URL: https://kth.diva-portal.org/smash/get/diva2%3A1749555/FULLTEXT01.pdf (date accessed: 01.02.2025).

20 Ayers R., Brothers S., Jansen W. *Op. cit.* DOI: 10.6028/NIST.SP.800-101r1 (date accessed: 01.02.2025) ; Kent K., Chevalier S., Grance T., Dang H. *Op. cit.* URL: https://surl.gd/bfuxct (date accessed: 01.02.2025).

21 Kerrison S. IoT Droplocks: Wireless Fingerprint Theft Using Hacked Smart Locks. *ArXiv*. 2022. arXiv:2208.13343. DOI: 10.48550/arXiv.2208.13343 (date accessed: 01.02.2025).

Cases of physical tampering with the hybrid mechanisms of smart locks (such as 3D-printed lock picks and magnetic manipulation) are also common. In the USA, 3D-printed lock picks are widely used by physical security researchers and, unfortunately, also by malicious actors attempting to bypass traditional mechanical defenses [22]. Main methods of application:

- Key duplication – 3D-printing can create precise copies of keys based solely on their photographs or measurements.
- Lock core manipulation – printed lock picks can easily open cylinder mechanisms, which are widely used.
- Replacement of traditional lock picks – modern 3D-printing materials are strong enough to manipulate lock mechanisms.

At *the Black Hat USA 2019* conference, researchers demonstrated how 3D-printing can be used to create advanced lock-picking tools [23]. In particular*, L. Garland* and co-authors found that an analysis of artifacts generated during the 3D-printing process revealed digital traces at all studied stages [24]. These artifacts can be crucial for digital forensics, as they contain data related to the 3D-printer, slicing software, and G-code files. The study of digital traces in 3D-printing is particularly relevant in the context of security, especially when it comes to the illegal manufacturing of lock picking tools. As noted by *G. Hill* (2014), 3D-printed keys can be used to unlock complex locks within seconds, posing a serious security challenge [25].

Protection against 3D-printed lock picks is possible by using patented key profiles, which are harder to duplicate, and implementing multi-level pin systems, making unlocking with printed tools more difficult.

Security specialists have also observed magnetic interference with electromechanical locks and traditional models using magnetic keys. Attackers exploit powerful neodymium magnets to manipulate mechanical lock parts, bypass electronic lock components, and conduct reverse engineering of magnetic keys to create a functional duplicate without physical access to the original.

Strong magnets can bypass both electronic and mechanical locking mechanisms. At the Black Hat USA 2021, researchers confirmed that 54% of tested electronic locks were vulnerable to magnetic attacks, as they lacked proper shielding [26]. Protection methods: using non-magnetic alloys

22 Hill G. 3-D Printed Skeleton Key Can Open Almost Any Lock in Seconds / Security Today : website. Sep 03. 2014. URL: https://securitytoday.com/articles/2014/09/03/3d-printed-skeleton-key-can-open-almost-any-lock-in-seconds.aspx (date accessed: 01.02.2025) ; Four Ways 3D Printing May Threaten Security / RAND Corporation : website. May 8 2018. URL: https://www.rand.org/pubs/articles/2018/four-ways-3d-printing-may-threaten-security.html (date accessed: 01.02.2025).

23 Black Hat USA 2019 (Aug 3—8, 2019; Mandalay Bay / Las Vegas) / Black Hat : website. 2019. URL: https://www.blackhat.com/us-19/ (date accessed: 01.02.2025).

24 Garland L., Neyaz A., Varol C., & Shashidhar N. K. Investigating Digital Forensic Artifacts Generated from 3D Printing Slicing Software: Windows and Linux Analysis. *Electronics.* 2024. Vol. 13 (14). P. 2864. DOI: 10.3390/electronics13142864 (date accessed: 01.02.2025).

25 Hill G. Op. cit. URL: https://securitytoday.com/articles/2014/09/03/3d-printed-skeleton-key-can-open-almost-any-lock-in-seconds.aspx (date accessed: 01.02.2025).

26 Black Hat USA 2021 (Juli 31 — Aug 5, 2021; Mandalay Bay / Las Vegas + Virtual) / Black Hat : website. 2021. URL: https://www.blackhat.com/us-21/ (date accessed: 01.02.2025).

in critical lock components; implementing protective housings to shield against external magnetic influences; developing algorithms to detect unauthorized manipulations of electronic locks.

Thus, 3D-printed lock picks and magnetic manipulation are real threats to physical lock security in the USA. Forensic analysis of such crimes focuses on detecting residual traces of 3D-printed picks within lock mechanisms and analyzing the effects of magnetic interference.

Protection against lock hacking: combining electronic and mechanical security methods, using more complex key profiles, and employing magnet-resistant materials.

Methods of Lock Hacking and Their Forensic Analysis in Ukraine

In Ukraine, mechanical lock hacking remains the most common type of unauthorized access-related crime compared to digital breaches. The most widespread methods for mechanical locks include bumping, lock pick manipulation, drilling, and forced entry, all of which leave distinctive traces on lock components. As smart locks become increasingly popular, they are targeted by both physical and digital attacks, including wireless signal interception, exploitation of software vulnerabilities, and hacking of mobile applications.

R. Yakymenko provided a detailed analysis of mechanical lock hacking through conformal traces on lock components [27]. Bumping is a method of opening pin-cylinder locks without the original key by using a special bump key, which is inserted into the keyway and subjected to slight impacts, causing the lock's pins to jump, allowing the cylinder to rotate and unlock the mechanism. The analysis of bumping focuses on identifying conformal traces – distinctive microscopic damage on internal lock components caused by bump key impacts. Key forensic indicators include microscopic dents or scratches on pins and spool pins, uneven wear, or deformations on the contact surfaces.

High-precision microscopes and other forensic tools are used to detect such traces, allowing for a thorough examination of the internal components of the lock. Identifying these indicators is critically important for confirming unauthorized access through bumping, as external damage is usually absent. Including this analysis in forensic investigations helps law enforcement agencies more effectively investigate cases of illegal entry and hold offenders accountable.

The use of lock picks and drilling for lock manipulation is discussed in the textbook *Forensics* edited by V. Shepitko [28]. Lock picks are a set of specialized tools used to manipulate the internal mechanisms of a lock without using the original key.

Based on their function, lock picks can be classified as follows:

- Manual picks (special hooks, rakes, tension tools) allow the operator to individually adjust the position of pins in a pin tumbler lock.
- Automated picks (electronic or impact tools) operate by quickly determining the correct combination without requiring precise manual manipulation.

27 Якименко Р. В. Зазнач. твір. URL: https://digest.kndise.gov.ua/wp-content/uploads/2021/06/2018_1.pdf (date accessed: 01.02.2025).

28 Шепітько В. Ю., Коновалова В. О., Журавель В. А. та ін. Криміналістика : підручник / за ред. В. Ю. Шепітька. 4-те вид., перероб. і допов. Харків, 2008. С. 60—62, 71—72. URL: https://law.sspu.edu.ua/files/documents/books/library/17/shepitko.pdf (date accessed: 01.02.2025).

Lock picks leave characteristic conformal traces on the internal components of a lock, including:

- scratches and wear marks on pins and levers caused by repeated manipulation;
- uneven wear of the mechanism, indicating unusual damage or displacement of the pins;
- changes in spring tension due to forceful manipulation techniques.

The aforementioned damage serves as evidence in criminal investigations, as it helps determine the method and tools used for the breach, as well as distinguish specialized burglary tools from standard lock wear and tear.

Drilling is one of the most destructive lock-breaking methods, involving the physical destruction of the lock's mechanism, allowing it to be opened without the original key.

The typical drilling points depend on the lock's design:

- drilling the cylinder – destroys the pin mechanism in pin tumbler locks;
- drilling near the bolt – used on lever locks and electromechanical locks to forcefully unlock the mechanism.

Forensic analysis of drilling:

- drill holes – their diameter, shape, and positioning can provide information about the tool used for the breach;
- metal shavings – indicate drilling patterns and direction, helping reconstruct the perpetrator's actions;
- thermal damage – caused by high-speed drills or tools with increased friction.

Criminals frequently use drilling to break into safes, electromechanical systems, and high-security locks, as it allows them to quickly bypass complex mechanisms without requiring advanced skills like lock picking.

Thus, mechanical lock breaches remain more relevant in Ukraine.

Analysis of Mechanical Break-In Traces

Mechanical break-in analysis is a key aspect of forensic criminology, as it allows experts to:

- determine the break-in method – whether lock picks or forceful methods like drilling were used;
- identify the criminal's tools – the type of damage can indicate a specific type of lock pick or drill, helping link it to suspects;
- assess the skill level of the perpetrators – professional burglaries often leave minimal damage, whereas amateur attempts cause more visible traces;
- confirm or refute unauthorized entry – a lack of break-in traces may indicate staged tampering.

The use of modern technologies, such as 3D-scanning of microscopic damage and spectral analysis of metal particles, allows for more precise forensic examinations. Experts consider the development of 3D-forensics essential for advancing crime investigation practices [29].

Thus, traceological analysis of break-in marks left by burglary tools remains a key stage in forensic investigations of lock-related crimes in Ukraine. Main types of traces that can be detected on a lock's body or internal mechanism:

29 Дуфенюк О. М. Майбутнє 3D криміналістики: інновації, які змінюють практику досудового розслідування. *Юридичний науковий електронний журнал*. 2024. № 3. С. 457—460. DOI: 10.32782/2524-0374/2024-3/110 (date accessed: 01.02.2025).

- deformation marks – dents, scratches, bends on the metal casing or cylinder;
- dynamic impact traces – friction or displacement caused by levers, screwdrivers, crowbars, or specialized lock-picking tools;
- micro-damage to the internal mechanism – possible evidence of manipulative break-in techniques, such as bumping or electronic attacks.

According to the study by H. Hrabovskyi and co-authors [30], traceological analysis of break-in marks is conducted using optical microscopes and digital tools to determine the mechanism of damage formation and the type of tool used for the break-in.

Regarding dynamic break-in traces, they contain crucial information for reconstructing the lock-breaking mechanism and identifying the type of tool applied. R. Kuznetsov and P. Yevseiev highlight the following key parameters for analysis:

- depth and shape of scratches – indicate the type of tool used (e.g., crowbar, screwdriver, hammer);
- angle and direction of movement – help determine how force was applied during the break-in;
- presence of metal residues – may indicate contact with specialized break-in tools [31].

Computer-based traceological modeling enables precise reconstruction of break-ins, allowing forensic experts to compare identified marks with known burglary tools commonly used in criminal activities.

Thus, the study of mechanical break-in traces on smart locks is crucial for identifying penetration methods and the tools involved. Combining traceological analysis, computer modeling, and legal support enhances forensic accuracy and improves investigation efficiency. However, unlike the USA, where demand for smart locks is rapidly growing, their adoption in Ukraine remains relatively low, and digital attacks on locks are still rarely recorded. Meanwhile, a lack of software updates and weak encryption standards in widely used Chinese smart lock models poses serious security risks.

Analysis of Digital Break-in Traces

The analysis of smart lock breaches in the USA is based on standardized digital forensic methodologies, allowing law enforcement to accurately determine the circumstances of the breach, identify unauthorized access methods, and trace the perpetrator.

Modern forensics in the USA treats digital traces as full-fledged evidence, equivalent to traditional physical traces such as fingerprints or tool marks.

Key principles of collecting and analyzing digital evidence:

- *integrity* – evidence must not be altered or damaged during collection;
- *authenticity* – it must be proven that the collected digital traces are directly related to the specific criminal incident;
- *reproducibility* – independent experts should be able to repeat the analysis and obtain the same results;

30 Грабовський Г., Опарій А., Кузнєцов Р. Зазнач. твір. DOI: 10.32839/2304-5809/2019-8-72-61 (date accessed: 01.02.2025).

31 Кузнєцов Р. В., Євсєєв П. О. Зазнач. твір. DOI: 10.24144/2788-6018.2022.04.61 (date accessed: 01.02.2025).

- *chain of custody* – a documented record must be kept of who accessed the digital evidence, when, and how.

During smart lock breach investigations in the USA, traditional forensic methods are combined with digital forensics techniques.

Modern smart lock event logs store information about:

- the date and time of each unlocking/locking event;
- attempts to enter an incorrect code or connect an unauthorized device;
- system reboots or password changes.

Law enforcement can retrieve this information directly from the lock or from the manufacturer's servers. In the USA, legal precedents allow authorities to access these records through court orders under the *Stored Communications Act (SCA, 1986)*, which governs access to electronic communications.

Methods of log analysis:

- *Forensic Imaging* – creating an exact copy of the event log for further analysis without modifying the original data;
- *Timeline Analysis* – examining the sequence of events to detect suspicious activity (e.g., login attempts at unusual times or from unknown devices);
- *Correlation with Other Sources* – comparing lock data with Wi-Fi router logs, surveillance footage, and mobile network records.

Most smart locks connect to the owner's smartphone via BLE (Bluetooth Low Energy) or Wi-Fi. In the event of a breach, the following forensic analysis methods are used:

- *Radio Frequency (RF) Traffic Analysis* – using specialized tools such as Wireshark or HackRF to intercept communication signals;
- *Router Forensics* – examining Wi-Fi connection logs to determine if an unauthorized device was used for the break-in;
- *Bluetooth Log Recovery* – using software such as BLE Sniffer to analyze past connections.

Smart locks are controlled via a mobile application, which may contain valuable information about device usage and potential breaches. In the USA, digital forensics tools are used to extract and analyze mobile device data, including: *Cellebrite UFED* – professional software for extracting data from smartphones. *Magnet AXIOM* – enables analysis of activity logs within the smart lock's mobile application.

Autopsy (The Sleuth Kit) is an open-source tool used for analyzing smartphone data in forensic investigations. Analysis methods:

- decoding mobile app log files – extracts information on login attempts, connection errors, password resets, etc.;
- checking cached data – even after the app is deleted, some data may remain in device memory;
- correlation with GPS data – helps determine whether the lock owner was physically near the location at the time of the breach or if the lock was hacked remotely.

Many smart locks synchronize their data with the manufacturer's server, allowing forensic investigators to retrieve additional digital evidence. User activity logs record all changes in the security system, while the firmware update history can reveal whether a known exploit was used in the breach. If the lock was hacked remotely, traces of the attack, such as the hacker's IP addresses, may remain on the server. Law enforcement agencies in the U.S. can request access to this data under the *Stored*

Communications Act by submitting an official request to the manufacturer. Methods for analyzing server data:

- access logs – reviewing login records and attempts to change settings;
- network request analysis – identifying unknown IP addresses or suspicious API requests to the lock;
- forensic analysis of SQL databases – recovering the lock's usage history.

Let's summarize the key points. In the United States, a comprehensive approach is used to analyze smart lock breaches, incorporating various digital forensic methods such as log analysis, connection tracking, mobile app forensics, and server data investigation. A well-established legal framework regulates the collection and use of digital evidence in criminal cases. Additionally, law enforcement agencies have access to advanced forensic tools, professional equipment, and specialized software for breach analysis. In contrast, Ukraine currently lacks a structured methodology, making it significantly more challenging to effectively investigate digital breaches. To combat digital lock hacking more effectively, Ukraine should adopt best practices from U.S. digital forensics and implement appropriate legal mechanisms at the legislative level.

Challenges in Analyzing Smart Lock Breaches in Ukraine Compared to the U.S.

Based on the aforementioned points, the key challenges in analyzing smart lock breaches in Ukraine compared to the U.S. include:

- *Limited specialization of experts.* In the U.S., smart lock breaches are analyzed not only by traditional forensic experts but also by cybersecurity specialists, ethical hackers, and IoT experts. In Ukraine, this field is still developing, and the number of experts capable of conducting a comprehensive analysis of digital traces remains limited.
- *Lack of standardized digital forensics methodologies.* The U.S. has standardized methodologies for analyzing digital evidence, such as NIST recommendations. While Ukraine adopts some international best practices, it still lacks a unified approach to cybercrime analysis, particularly regarding smart lock breach investigations.
- *Limited access to specialized equipment.* U.S. investigators have access to advanced digital forensic tools (logic analyzers, data extraction software, etc.) and specialized forensic laboratories. In Ukraine, such resources are significantly more limited, complicating the analysis of modern electronic lock breaches.
- *Insufficient legal framework for digital forensics.* In the U.S., digital forensic analysis is governed by established laws, allowing digital evidence to be used in court. Key regulations cover both hacking methods and legal liability for unauthorized access to IoT devices, including electronic locks.

Key U.S. regulations related to smart lock breach investigations:

- *Federal Rules of Evidence (1975)* establish that digital data, including smart lock access logs, network logs, and breach traces, are admissible as evidence in court proceedings.
- *Computer Fraud and Abuse Act (CFAA, 1986, updated 2023)* criminalizes unauthorized access to computer systems, including hacking attempts on IoT devices.

- *Electronic Communications Privacy Act (ECPA, 1986, updated 2018)* regulates law enforcement access to electronic communications and cloud storage where smart lock data may be stored.
- *Cybersecurity Information Sharing Act (CISA, 2015)* facilitates the exchange of cybersecurity threat information between government agencies and private companies, which can be applied to analyzing smart lock attacks.
- *Federal Trade Commission Act (FTC Act, 1914, updated 2021)* allows investigations into cases where smart lock manufacturers fail to provide adequate security, leading to breaches or data leaks.
- *California Consumer Privacy Act (CCPA, 2018)* governs the use and storage of personal data, including information collected by smart locks (biometric data, access logs, etc.).

The combination of these regulations forms a legal foundation for investigating smart lock breaches in the U.S.

In Ukraine, the legal aspects of using electronic evidence in criminal cases are still in their infancy, which often results in courts rejecting such evidence due to the lack of a clear procedure for its documentation and preservation. This makes the analysis of digital traces problematic due to several factors [32], including:

- The *Criminal Procedure Code of Ukraine* [33] does not provide a clear definition of electronic evidence in criminal proceedings. This creates legal uncertainty regarding the proper collection and use of digital evidence obtained from smart locks.
- Lack of standardized procedures for digital trace analysis. While the U.S. follows established NIST methodologies, Ukraine is still in the process of developing similar standards.
- Limited access to smart lock logs and data. If the smart lock manufacturer is based abroad (which is often the case), Ukrainian investigators face difficulties obtaining user access logs.
- Insufficient technical infrastructure. Only a few forensic laboratories in Ukraine have access to modern software for analyzing digital devices.
- Courts often reject digital evidence due to improper documentation or the lack of expert verification.

In our opinion, the implementation of the principles of the *Berkeley Protocol* [34] in Ukrainian practice could contribute to the standardization of processes for handling electronic evidence. This involves ensuring the authenticity and integrity of digital data, which is critically important in investigating cybercrimes, particularly smart lock breaches. However, for

32 Черемнова А. І., Бєлік Л. С. Цифрова інформація як об'єкт експертного дослідження в умовах діджиталізації: проблеми та перспективи розвитку. *Криміналістика і судова експертиза*. 2023. Вип. 68. С. 57—65. DOI: 10.33994/kndise.2023.68.06 (date accessed: 01.02.2025).

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: 06.01.2025).

34 Berkeley Protocol on Digital Open Source Investigations / Human Rights Center, Un. Nat. Human Rights Office of the High Commissioner. New York and Geneva, 2022. 102 p. URL: https://www.ohchr.org/sites/default/files/2024-01/OHCHR_BerkeleyProtocol.pdf (date accessed: 01.02.2025).

the effective implementation of these principles, it is necessary to introduce appropriate amendments to the Criminal Procedure Code of Ukraine, clearly defining the concept of "electronic evidence" and the procedures for its processing [35].

Unlike the United States, Ukraine has a significantly higher number of cases involving the use of cheap or illegally imported smart locks that lack necessary security protocols. This makes them more vulnerable to hacking while also complicating forensic examinations, as official documentation is unavailable and manufacturers do not cooperate with law enforcement agencies.

One of the key security risks for smart locks is the use of outdated third-party software components that may contain undiscovered vulnerabilities. According to research by S. Dashevskyi and F. La Spina, many IoT devices incorporate components that have not been updated for years, creating far greater opportunities for cybercriminal attacks [36].

A study of Sierra Wireless AirLink devices identified 21 new vulnerabilities, 15 of which were related to third-party software libraries. This underscores the necessity of regular software audits and maintaining an up-to-date Software Bill of Materials (SBoM) [37].

The analysis of smart lock hacking methods requires a comprehensive approach that considers forensic, cybersecurity, and legal aspects. In the United States, this process is well-established due to collaboration between law enforcement agencies, cybersecurity experts, and the security industry. In Ukraine, however, forensic examination of smart locks faces several challenges, including a lack of personnel, methodological standards, technical capabilities, and legal mechanisms. To improve the situation, it is necessary to enhance expert training, adapt international methodologies, and refine the regulatory framework for digital forensics.

For effective identification of vulnerabilities in *IoT* device software, including smart locks, researchers utilize fuzz testing. As noted by *D. dos Santos* and colleagues, this method allows for the detection of weaknesses in the implementation of hardware and network protocols, which can also be applied to smart lock security analysis [38].

Fuzz testing enables the automatic generation of thousands of incorrect requests, helping to identify critical vulnerabilities in smart lock software during the development stage.

Another approach to improving IoT device security is presented in the research by Y. Osawa and S. Higuchi, which describes the *ASTIRA* system (an intelligent platform) used for collecting and analyzing attacks on IoT devices, including smart locks [39].

Key measures to enhance smart lock security include:

- deploying honeypots – specially configured devices with vulnerabilities

35 Черемнова А. І., Бєлік Л. С. Зазнач. твір. С. 57, 59—60. DOI: 10.33994/kndise.2023.68.06 (date accessed: 01.02.2025).

36 Dashevskyi S., La Spina F. Op. cit. URL: https://i.blackhat.com/EU-23/Presentations/EU-23-Dashevskyi-Old_code_dies_hard.pdf (date accessed: 01.02.2025).

37 Ibid.

38 Santos D. dos, Guiot S., Dashevskyi S., Amri A., Kerro O. Op. cit. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-dosSantos-Route-to-Bugs-Analyzing-the-Security-of-BGP.pdf (date accessed: 01.02.2025).

39 Osawa Y., Higuchi S. Op. cit. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-Osawa-Higuchi-A-Manufacturers-Post-Shipment-Approach.pdf (date accessed: 01.02.2025).

that serve as decoys to collect information about attacks;
- automating malware analysis to detect new threats at early stages;
- establishing a centralized database of IoT device attacks, enabling manufacturers to respond more quickly to emerging threats.

According to researchers, over the past five years, more than 2.2 billion attacks on IoT devices have been recorded, highlighting the need for continuous smart lock security monitoring [40].

Based on the information provided above, several key recommendations can be highlighted to enhance smart lock security:
- conducting regular software audits to check all third-party components for vulnerabilities [41];
- implementing fuzz testing during smart lock development to identify potential weaknesses [42];
- utilizing IoT attack monitoring systems (such as ASTIRA) to detect and analyze emerging threats [43];
- ensuring SBoM (Software Bill of Materials) support by documenting all software components to enable quick updates of vulnerable libraries [44].

The analysis of software vulnerabilities in smart locks plays a crucial role in forensic investigations of crimes related to electronic access system breaches. Fuzz testing not only enables manufacturers to enhance device security but also allows forensic experts to reconstruct potential hacking scenarios and identify exploits used by criminals. Attack monitoring systems, such as *ASTIRA*, can detect intrusion attempts in real time, providing valuable evidence in criminal cases. Creating a centralized database of attacks on IoT devices helps experts recognize common hacking methods and connect separate crimes. Additionally, analyzing access logs and digital traces left by vulnerable smart locks serves as key evidence in court proceedings. Thus, implementing methods for detecting and mitigating vulnerabilities improves forensic examination efficiency and aids law enforcement in investigating digital security breaches.

In modern forensic science, technical prevention measures play a significant role in crime prevention and evidence collection. These measures include security surveillance systems, electronic access controllers, and chemical markers. Their implementation not only complicates criminal activities but also contributes to the creation of additional traces when criminals attempt to bypass these measures. This increases the amount of forensic evidence available for investigation. For example, when interacting with complex security systems, a perpetrator may leave traces at the crime scene that can help identify their identity or the tools

40 Osawa Y., Higuchi S. Op. cit. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-Osawa-Higuchi-A-Manufacturers-Post-Shipment-Approach.pdf (date accessed: 01.02.2025).

41 Dashevskyi S., La Spina F. Op. cit. URL: https://i.blackhat.com/EU-23/Presentations/EU-23-Dashevskyi-Old_code_dies_hard.pdf (date accessed: 01.02.2025).

42 Santos D. dos, Guiot S., Dashevskyi S., Amri A., Kerro O. Op. cit. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-dosSantos-Route-to-Bugs-Analyzing-the-Security-of-BGP.pdf (date accessed: 01.02.2025).

43 Osawa Y., Higuchi S. Op. cit. URL: https://i.blackhat.com/BH-US-23/Presentations/US-23-Osawa-Higuchi-A-Manufacturers-Post-Shipment-Approach.pdf (date accessed: 01.02.2025).

44 Dashevskyi S., La Spina F. Op. cit. URL: https://i.blackhat.com/EU-23/Presentations/EU-23-Dashevskyi-Old_code_dies_hard.pdf (date accessed: 01.02.2025).

used in the breach. Therefore, integrating modern technical prevention measures not only enhances security levels but also improves the effectiveness of forensic investigations [45].

Conclusions

The demand for smart locks in both the U.S. and Ukraine has been growing annually, along with the number of attempts to compromise them. Analysis of attack methods indicates that digital attacks are more common in the U.S., while physical manipulations dominate in Ukraine. Smart locks are vulnerable to both mechanical and digital breaches. Implementing fuzz testing and utilizing honeypots can enhance the security of smart locks. Their protection should combine both physical and digital security measures to minimize hacking risks and improve the effectiveness of criminal investigations. The analysis of smart lock attacks can also benefit from artificial intelligence, the creation of a unified database of smart lock connection logs, advancements in digital forensics, specialized training for experts, and the integration of U.S. forensic standards into national legislation.

Порівняльний аналіз методів зламу смартзамків і їхньої криміналістичної експертизи в Україні та США

Роман Піднебенний

Розвиток технологій сприяв зміні методів убезпечення житлових і комерційних приміщень. Смартзамки стали невід'ємною складовою сучасного ринку безпеки і привернули увагу не лише власників нерухомості та охоронних фірм, а й злочинців. Розглянуто ключові методи зламу смартзамків, застосовуваних в Україні та США, відмінності в підходах до криміналістичної експертизи таких злочинів у цих країнах. Проведено порівняльний аналіз фізичних, механічних і цифрових атак, окреслено нові виклики у сфері судової експертизи електронних замків та запропоновано рекомендації щодо вдосконалення криміналістичних досліджень у цій галузі. Сучасні системи безпеки, зокрема смартзамки, поєднують механічні й електронні технології. Водночас вони певною мірою вразливі, що робить їх привабливими для кіберзлочинців і традиційних методів фізичного зламу. Відсутність єдиного підходу до криміналістичної експертизи цих злочинів в Україні та США створює труднощі у правоохоронній діяльності. Мета статті — дослідити методи зламу смартзамків, порівняти особливості криміналістичних експертиз подібних зламів в Україні та США й запропонувати заходи для вдосконалення розслідування таких злочинів. Для досягнення поставленої мети застосовано метод порівняльного аналізу, трасологічний метод експертизи слідів зламу, аналіз цифрових доказів і методи тестування вразливості (фазинг, реверс-інжиніринг програмного забезпечення замків).

Ключові слова: *смартзамки; криміналістична експертиза; цифровий злам; фізичний злам; безпека; судова експертиза*

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Participants

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Case Notes

Electromagnetic Weapons: Forensic and Ballistic Examination of Railguns and Coilguns

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Electromagnetic gun has different ballistic dynamics and criminal traces as opposed to traditional firearms. Portable railgun and coilgun systems and similar weapons introduce new challenges in forensic investigations due to their portability and the possibility of being made at home. The ballistic effects of such weapons, physical traces they leave are studied during forensic medical examinations (research on caused fatal and non-fatal injuries). The technical features of railgun and coilgun systems are examined. The effects of ammunition fired using the Lorentz force, compared to those of firearms, are evaluated. The scope of forensic analyses regarding high speed and kinetic energy transfer in attacks using electromagnetic gun is being expanded. Other security risks include the silent operation of portable railgun and coilgun type electromagnetic gun and the reasons why they do not leave chemical waste. With the increasing use of electromagnetic railguns and coilguns, including those produced at home, new approaches and technical methods and examination methods need to be developed in forensic science investigations, as well as relevant international and national legislative rules to govern the proliferation of such weapons and unify research methods. The author *aims to examine technical and physical properties of electromagnetic guns, damage they cause, methods for researching them, and the need to amend relevant international and national regulations on proliferation and research of these and similar weapons. To achieve the set goal, the following scientific methods were used: analysis, synthesis, statistical analysis, generalization, etc.*

Keywords: *Electromagnetic Gun; Railgun; Coilgun; Forensic Investigation; Ballistic Effects; Forensic Medical Examination.*

Research Problem Formulation

Railguns and coilguns are Electromagnetic weapons (EMG) that use electrical energy to launch high-velocity projectiles through magnetic fields. These weapons do not leave the physical marks typical of firearms, but they can cause thermal damage or other deformations at the points of contact [1]. While railguns and coilguns are primarily designed for military and security research, they can be individually manufactured using a variety of materials and 3D printers, increasing the potential for criminal misuse. In terms of forensic science, the effects of EMG such as coilgun and railgun require a different approach compared to firearm or Directed Energy Weapons (DEW) ballistic traces. They can leave physical evidence as well as traces through electronic disruptions. New techniques and methods are needed to prevent the inadequacy of current forensic methodological examinations [2].

EMG systems have become an increasingly important field in modern ballistic engineering. Coilgun and railgun technologies require electrical energy, unlike gunpowder-based firearms. Today, the development of portable coilgun and railgun EMG models increases their accessibility in terms of individual production and criminal use [3]. Depending on many factors, coilgun and railgun models leave different ballistic traces at crime scenes and make it difficult to apply standardized ballistic analysis methods. Similarly, forensic medicine examinations and autopsy studies require different approaches and analyses in addition to technical methods. This study examines the risk factors related to the criminal use of coilgun and railgun models, which are EMG, in terms of forensic science and investigations, and the methodological methods of examination against security threats posed by these weapons in the future [4].

1 Du X. Y., Liu Sh. W., & Guan J. Design and Performance Analysis of an Electromagnetic Railgun. *Journal of Physics: Conference Series.* 2022. Vol. 2378. No. 1. P. 012008. DOI: 10.1088/1742-6596/2378/1/012008 (date accessed: 17.12.2024).

2 Yadav M., Ram R., & Thomas M. J. Comparative Analysis of the Muzzle Velocities of Projectiles in Horizontal and Inclined Configurations of the Coilgun / High Voltage — Energy Storage Capacitors and Their Applications ; A. Sharma (Ed.). Springer Nature Singapore, 2024. Pp. 49—57. DOI: 10.1007/978-981-97-0337-1_6 (date accessed: 25.12.2024).

3 Guo W., Zhang T., Mu Z., Zhu W., & Li M. A magnetic field constrained type of multi-barrel common-rail railgun. *Journal of Physics: Conference Series.* 2023. Vol. 2478. No. 9. P. 092018. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

4 Pei Ch., Liu X., & Zhou X. Design and simulation analysis of electromagnetic gun feeding and conveying device. *Ibid.* 2024. Vol. 2891. No. 10. P. 102006. DOI: 10.1088/1742-6596/2891/10/102006 (date accessed: 26.12.2024).

While the existing literature has covered a large portion of EMG, there is a significant lack of forensic analysis and evaluation, particularly for portable weapons such as the cailgun and railgun. For example, several studies have addressed the methodological limitations in detecting and analyzing railgun and coilgun ballistic effects and traces.

Article Purpose

The research aims to determine the technical and physical properties of weapons that can grow, such as railguns and coilguns, by examining forensic and ballistic examinations of these weapons, which are different from traditional firearms, and their fragmentation difficulties in criminal cases. EMG are not directly detected by firearm ballistic examination methods since they do not use chemical explosion-based propulsion systems. In this context, the study focuses on the analysis of what the capability, which is specific to technological weapons, may be. In addition, the ballistic performances of railgun and coilgun models, kinetic energy transfer unit and the results on the target are examined comparatively, and the structuring of penetrations on different features is evaluated. New methods such as electromagnetic signature, spectroscopic examinations and similar are discussed in forensic use, and the scientific methods for the treatment of the potential use of these weapons in criminal procedures are emphasized. The security and legal risks related to railgun and coilgun systems and the necessary national and international regulations related to these are emphasized.

Research Methods

To achieve the set goal, the following scientific methods were used: analysis, synthesis, statistical analysis, generalization, etc.

Analysis of Essential Researches and Publications

EMG, especially the railgun and coil gun studies have been discussed in various supporting and engineering publications. However, there is a significant part in the criminal investigations related to the use of these weapons for criminal purposes. Although the technical and ballistic summaries of the existing wide-ranging weapons have been analyzed in some way, the examinations in criminal investigations, especially with ballistic and other evidence that can be considered in forensic sciences, have not yet been sufficiently investigated. This research aims to provide a basic framework for these people to be considered and other detailed information.

Several scientific studies have examined the design, performance and applications of electromagnetic railguns and coilguns [5]. This study investigates the fundamental principles of coilgun electromagnetic weapons technology, including high-velocity projectile capabilities and energy efficiency [6]. Comparatively examines different railgun configurations by analyzing muzzle velocities and energy storage properties that are important for EMG forensic ballistic assessments [7]. It discusses developments in multiple-barrel railgun systems, emphasizing the effects of magnetic field constraints on projectile dynamics.

5 Du X. Y., Liu Sh. W., & Guan J. Op. cit. DOI: 10.1088/1742-6596/2378/1/012008 (date accessed: 17.12.2024).

6 Yadav M., Ram R., & Thomas M. J. Op. cit. Pp. 49—57. DOI: 10.1007/978-981-97-0337-1_6 (date accessed: 25.12.2024).

7 Guo W., Zhang T., Mu Z., Zhu W., & Li M. Op. cit. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

Despite the existence of these studies, there is a lack of forensic analysis regarding the potential criminal use of coilgun and railgun weapons, which are electromagnetic weapons. Existing forensic methodologies are primarily used on methods and techniques based on residues and ballistic signatures of firearms and non-fire (air) weapons. Railgun and coilgun electromagnetic weapons that are brought into portable form leave different traces and findings. New analyses, techniques and approaches are required due to many such deficiencies.

In this context, it will contribute to closing the gaps including spectroscopic analysis, magnetic field residue detection and impact signature evaluations and so on. The study serves as a basis for forensic methodologies by enabling all forensic investigators to develop an effective investigation approach for crimes related to railgun and coilgun electromagnetic weapons.

Main Content Presentation

Forensic and Security Implications of EMG: Coilgun and Railgun

The study includes evaluations on the traces left by the portable models of coilgun and railgun, which are EMG systems, in forensic ballistic examinations, technical difficulties that may be encountered in criminal investigations, and the potential risks and usage of these weapons. Within the scope of the study, the technical features of EMG are addressed with analytical methods in terms of kinetic energy transfer, ballistic effects and forensic trace detection. By integrating literature reviews, experimental data, spectral analysis, magnetic field measurements, and thermal imaging techniques applicable to crime scene investigations, an evaluation will be conducted on the findings related to EMG using new methodological approaches. In addition, in order to understand the effects of coilgun and railgun bullets on tissue, it is aimed to expand the scope of forensic analyses aimed at determining the effects in forensic medicine and autopsy examinations in comparison with the procedures in the current ballistic examination terminology. Magnetic field residues, thermal traces and spectral analysis results created by coilgun and railgun portable weapons are examined on the existing literature and experimental data.

Magnetic field residues, thermal signatures and spectral analysis of coilguns and railguns were examined in the light of literature and experimental data. Magnetic field measurements were evaluated with Hall effect sensors and gauss meter data, while thermal analyses were compared with experiments conducted with infrared thermal cameras [8]. Chemical changes and oxidation processes caused by EMG on bullet surfaces were discussed using X-ray fluorescence (XRF) and Fourier transform infrared (FTIR) data within the scope of spectral analysis [9].

Coilguns and railguns are EMG that accelerate projectiles using magnetic fields, but differ in their energy and speed. Coilguns use electromagnets to pull metal projectiles forward, requiring direct current to launch, but are effective at short ranges [10].

8 Moskovchenko A., Švantner M., & Honner M. Detection of gunshot residue by flash-pulse and long-pulse infrared thermography. *Infrared Physics & Technology*. 2024. Vol. 140. P. 105366. DOI: 10.1016/j.infrared.2024.105366 (date accessed: 27.12.2024).

9 Minzière V. R., Robyr O., & Weyermann C. Should inorganic or organic gunshot residues be analysed first? *Forensic Science International*. 2023. Vol. 348. P. 111600. DOI: 10.1016/j.forsciint.2023.111600 (date accessed: 28.12.2024).

10 Kakad Y. U., et al. Electromagnetic Projectile Launcher. *International Journal of Scientific Research in Engineering and Management*. 2024. Art. 8 (04):1-5. DOI: 10.55041/ijsrem30997 (date accessed:

In contrast, railguns can reach extreme speeds exceeding Mach 7 in military use, although they do not currently reach high speeds in portables by pushing the bullet with the Lorentz force by passing high current along parallel rails [11].

EMG, especially coilguns and railguns, are generally not considered in the Directed-Energy Weapons (DEW) category, but in the EMG class. These weapons use electromagnetic forces that can launch projectiles at very high speeds. Coilguns and railguns are two different types of weapon systems that launch projectiles rapidly using electromagnetic forces, and these two types of weapons differ fundamentally.

Compared to firearms or non-fire weapons, railguns and coilguns from EMG leave physically different and undetectable traces in evidence [12]. Due to these features, they pose various challenges in forensic analysis and criminal investigations. Railguns and coilguns can be used to damage targets by launching different types of projectors, bullets or torpedoes, especially to disrupt electronics, disable infrastructure and cause potential biological damage [13]. It is now possible to see personalized versions of such weapons and even receive them on special orders, and the fact that there is no legal obstacle in this regard also creates a different problem. This research is carried out in this context to touch upon the evidence that can be encountered and left in forensic investigations with the development of such railgun and coilgun EMG in an individually portable form, and to determine a holistic strategy for new methodological research [14].

Electromagnetic Gun (EMG) Portable Railgun and Coilgun

The TK-20 electromagnetic coilgun can fire at a speed of 136 m/s (446 fps) and the experimental and manufactured weapon, weighing 2.6 kg with a double-row magazine of 16 mm diameter and 15 rounds capacity, can fire 150 shots with a full battery. Projectiles with an energy of 56 J will cause serious injuries; compared to other types of weapons, air guns produce 15—30 J, 9 mm pistols 500 J, and pump-action rifles 1000 J. A projectile or bullet fired at a speed of 136 m/s will cause skin punctures, fractures and internal injuries where it hits; if

29.12.2024) ; Cheng B. The development of a novel coil gun with permanent magnet. *2023 IEEE / ASME International Conference on Advanced Intelligent Mechatronics (AIM)* (28—30 June; Seattle, WA, USA). 2023. Pp. 531—536. DOI: 10.1109/AIM46323.2023.10196246 (date accessed: 29.12.2024).

11 Ram R., & Thomas M. J. Performance of a Four-Stage Induction Coilgun That Uses a Solenoid Projectile. *2023 IEEE International Conference on Plasma Science (ICOPS)* (2023, May; Santa Fe, NM, USA). 2023. Pp. 1—1. DOI: 10.1109/ICOPS45740.2023.10481243 (date accessed: 30.12.2024) ; Raj R., Sesha Talpa Sai P. H. V., Gurudutta A. et al. Design and Numerical Analysis of Electromagnetic Rail Gun for Defense Applications / Intelligent Manufacturing and Energy Sustainability. 2023. Pp. 183—192. DOI: 10.1007/978-981-99-6774-2_17 (date accessed: 30.12.2024).

12 Jia L., Wang Y., Song Y., et al. The Detection Technology of High-Power Microwave: A Review. *IEEE Transactions on Instrumentation and Measurement.* 2024. Vol. 73. DOI: 10.1109/tim.2024.3472802 (date accessed: 02.01.2025).

13 Mykhaylenko O. V., Mishalov V. D., Kozlov S. V., & Varfolomeiev Y. A. Forensic characteristics of injuries from thermo-baric explosive device. *Reports of Morphology*. 2024. Vol. 30. № 2. Pp. 24—30. DOI: 10.31393/morphology-journal-2024-30(2)-03 (date accessed: 02.01.2025).

14 Cheng B. The Design and Simulation of a Novel Electromagnetic Launcher with Permanent Magnet. *7th International Conference on Mechanical Engineering and Robotics Research (ICMERR)*. 2022. Pp. 114—117. DOI: 10.1109/ICMERR56497.2022.10097818 (date accessed: 03.01.2025).

it hits the chest, head or neck area, it will have fatal results [15].

The 100+ pound railgun is a weapon that fires bullets at extremely high speeds, usually used for long-range precision shooting. Its use in competitions such as the 1000 yard (914 meter) Benchrest match shows that such weapons are accurate and powerful. The railgun with bullets used in a magnetic field that can reach Macg 5 and above can reach very high speeds, is more powerful than fire deities and can be deadly [16].

The 250 lb mobile railgun delivers 27,000 J of energy for heavy armor penetration and lethal impact. Its high energy ionizes the metal, creating a plasma explosion that increases both thermal and kinetic damage. In forensic ballistics, the TK-20 coil gun (56 J) causes limited damage, while the railgun's excessive speed and destructive impact make evidence analysis difficult [17].

The GR-1 "Anvil" is an EMG described as a portable shoulder-fired gauss rifle manufactured by Arcflash Labs. They are described as coilguns or linear accelerators, which can launch iron 1/2 diameter dowel pins (bullets) at a speed of 75 m/s (240 fps) by generating magnetic fields from a series of high-voltage coils with electrical energy between 4000 and 16000 amperes. Coilguns (gauss rifles) will launch metal bullets at high speeds, causing serious injuries or fatal consequences. Thanks to the accelerator, the bullet is powerful enough to penetrate armor and cause great damage to the human body [18]. ArcFlash Labs EMG-02 is an electromagnetic coilgun model. It can throw metal bullets weighing 5—10 grams at a speed of approximately 300 fps and above 100 m/s in full automatic mode and 20—30 J of energy, 30 and 50 meter. Although they are not lethal like firearms, they can cause the death of living beings at certain speeds, but they definitely have a serious wounding effect. A projectile with a force of 300 fps and above can cause fractures, holes and internal organ damage with human contact [19].

RARE CA-09 MAX POWER shotgun can fire 67/76 m/s notifications with 40 J energy to a disk or skug bullet. It can be fired at a speed of 1200 rpm and serious traumatic wounds can occur as a result of falling. Forensic investigation and ballistics, high firing speed and bullet structure will make it difficult to analyze different scar continuity [20].

NSSC CA-09 Coil Accelerator, which can shoot silently and without recoil with electromagnetic coils at a speed of 140 fps, with 16 J energy and a range of 12 meter, according to ballistic observations, other coilgun and railgun EMG do not leave gunpowder traces, making criminal investigations difficult [21].

15 Cheng B. Op. cit. DOI: 10.1109/ICMERR56497.2022.10097818 (date accessed: 03.01.2025).

16 Guo W., Zhang T., Mu Z., Zhu W., & Li M. Op. cit. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

17 Kakad Y. U., et al. Op. cit. DOI: 10.55041/ijsrem30997 (date accessed: 29.12.2024).

18 Abdo M. M. M., Fanni M., Miyashita T., & Ahmed S. M. The Effect of Coil Geometry and Winding Method on the Electromagnetic Launcher Performance. *IECON 2022 — 48th Annual Conference of the IEEE Industrial Electronics Society* (17—20.10.2022). 2022. Pp. 1—5. DOI: 10.1109/IECON49645.2022.9968763 (date accessed: 03.01.2025).

19 Korytkowski K., & Starzyński J. Coilgun Design by Simulation. *22nd International Conference on Computational Problems of Electrical Engineering (CPEE)* (15—17.09.2021; Hrádek u Sušice, Czech Republic). Pp. 1—5. DOI: 10.1109/CPEE54040.2021.9585193 (date accessed: 04.01.2025).

20 Nine S. Z., Hossain M. D., Hasan A. K., et al. Pellet Embolus in Ulnar artery — A rare vascular Injury. *Pulse*. 2018. Pp. 33—37. DOI: 10.3329/pulse.v11i1.62452 (date accessed: 04.01.2025).

21 Shornikov A., Champagne A. E., Walet R. C., & Mous D. J. W. High power DC and ns-pulsed 2 MV accelerator for light ions. *The Review of Scientific Instruments*. 2023. Art. 94(7):073303. DOI: 10.1063/5.0150982 (date accessed: 04.01.2025).

Forensic and Ballistic Comparison of Portable Coilgun and Railgun Systems

EMG	Energy (J)	Speed (m/s)	Range (meter)	Lethal Risk	Injury Risk
Coilgun	56	136	12	Moderate	Serious (skin puncture, fractures, internal injuries)
Railgun	27000	5000	914	High (armor-piercing, fatal)	Fatal (high-speed projectile)
Railgun	27000	5000	914	High (armor-piercing, fatal)	Fatal (high-speed projectile)
Railgun	30	75	50	Low to Moderate (penetrates soft targets, not lethal)	Serious (fractures, internal organ damage)
Coilgun	40	76	30	Moderate (can cause serious injury)	High (serious trauma, fractures, internal bleeding)
Coilgun	16	140	12	Low to Moderate (not lethal, but serious injury possible)	Moderate (soft tissue damage, fractures)

Forensic and Criminalistic Assessment of EMG: Railgun and Coilgun Analysis

EMG, especially the railgun and coilgun types, operate via different mechanisms than firearms. Wounding mechanisms, kinetic energy transfer, and target tissue properties determine the effects of these weapons [22]. The injuries and marks caused by these weapons depend on factors such as kinetic energy, bullet speed, target tissue characteristics and distance [23]. Kinetic energy and injury mechanisms; EMG railguns and coilguns launch bullets or projectiles at high speeds and cause damage to targets through kinetic energy transfer. Kinetic energy (KE) is directly related to bullet speed (v) and mass (m) and is calculated with the formula $KE = ½ mv^2$. Especially the high-energy model 250 lb railgun can directly cause fatal results. We understand that low-energy models such as the TK-20 coilgun can cause serious injuries [24].

Injuries to the skin and underlying soft tissue are caused by the sharp-edged contact of high-speed bullets (100 m/s and below). Bullets that are more similar to projectiles launched by other electromagnetic coilguns and railguns such as the NSSC CA-09 Coil Accelerator or TK-20 may evolve into cartridge-type bullets in the future, causing more serious injuries and deaths. While they may cause smaller diameters and less tissue fragmentation similar to traditional gunshot wounds, EMG at the Mach 5 effect will definitely cause deaths. Contusion (hematoma, ecchymosis) and abrasion are possible in the epidermis and dermis layers [25]. High-speed bullets will penetrate to the hypodermis and muscle tissue, causing skin tissue injuries such as laceration and avulsion. High-energy weapons such as railguns may also cause

22 Zhou Y., Zhang D., & Yan P. Modeling of Electromagnetic Rail Launcher System Based on Multifactor Effects. *IEEE Transactions on Plasma Science*. 2015. Vol. 43. Is. 5. Pp. 1516—1522. DOI: 10.1109/TPS.2015.2403264 (date accessed: 06.01.2025).

23 Ma M. Electromagnetic Railguns and Coil Guns: Comprehensive Analysis of Physical Principles and Applications and Experimental Improvements. *Theoretical and Natural Science*. 2025. Art. 87(1):15—25. DOI: 10.54254/2753-8818/2025.20319 (date accessed: 06.01.2025).

24 Kakad Y. U., et al. Op. cit. DOI: 10.55041/ijsrem30997 (date accessed: 29.12.2024).

25 Elsafty O., Berkey Ch. A., & Dauskardt R. H. Insights and mechanics-driven modeling of human cutaneous impact injuries. *Journal of the Mechanical Behavior of Biomedical Materials*. 2024. May. Art. 153:106456. DOI: 10.1016/j.jmbbm.2024.106456 (date accessed: 16.01.2025).

tissue fragmentation and necrosis due to hydrostatic shock [26].

EMG such as railguns and coilguns can also cause serious bone fractures. The type and severity of the fracture depend on the bullet's energy, speed, impact angle and bone density. When the bullet hits at a right angle, it can create a straight-line transverse fracture or the bone can shatter into multiple fracture fragments, i.e. communal fractures. However, in terms of forensic investigations, even low-energy bullets can cause fractures in individuals with low bone density and create pathological fractures. In particular, tibia and humerus as well as femur fractures carry the risk of massive hemorrhage or shock [27]. In terms of localization, skull fractures may cause brain damage or, in the case of pelvic fractures, they may be associated with internal organ injuries caused by railguns and coilguns. Bullets with a kinetic energy of 50 J and above can cause fractures in the skeletal system, and coilgun and railgun bullets with an energy of 100 J and above in particular will cause complete fractures in long bones. High-velocity bullets fired by EMG will cause severe cranial fractures and brain damage when they hit the skull, with fatal effects. Energy levels of 500 J and above can cause fatal head trauma [28].

Traumatic shock is possible to cause internal organ failure or damage. Perforation, bleeding and organ failure in internal organs due to coilgun and railgun projectiles hitting the chest or abdomen area are expected to occur especially at kinetic energy levels above 200 J. In the case of high energy bullets, shock waves can be created in the organs and secondary injuries can occur [29].

The findings of injuries caused by EMG are of critical importance during crime scene investigation and autopsy. It is characterized by small diameter, smooth edges and minimal tissue fragmentation, and carbonization and burn marks can be seen in wound hemorrhages due to thermal effects when the speed is as effective as Mach 5 [30]. If the bullet energy is high, the exit wound is likely to be more irregular and wider. However, for now, it is more appropriate for portable coilgun or railgun EMG to remain inside by moving through the internal tissue, as they cannot exceed a certain energy.

Railgun or coilgun high speed bullets connected to EMG or projectiles with penetrating power and speed can leave thermal or chemical traces. It is possible to detect coagulation necrosis and protein denaturation during histopathological

26 Jia Y., Wen Y., Dong F., Qin B., & Liu R. Retracted Artıcle: Human vulnerability assessment based on bullet motion and cavity expansion model with tissue identification. *Computer Methods in Biomechanics and Biomedical Engineering*. 2024. Jan. Art. 29:1—15. DOI: 10.1080/10255842.2023.2294263 (date accessed: 17.01.2025).

27 Chen S., Peng A., Chen A., & Liu T. Design and Characterization of High Efficiency Single-stage Electromagnetic Coil Guns. *ArXiv preprint*. 2024. arXiv:2410.07594. DOI: 10.48550/arxiv.2410.07594 (date accessed: 17.01.2025).

28 Yadav M., Ram R., & Thomas M. J. Op. cit. DOI: 10.1007/978-981-97-0337-1_6 (date accessed: 25.12.2024) ; Smith W., Schick S., Arthur R., Paul K., Elphingstone J., et al. Ballistic injuries of the humerus: A matched cohort analysis. *Trauma*. 2024. Vol. 26. Is. 4. Pp. 347—353. DOI: 10.1177/14604086231197053 (date accessed: 25.12.2024).

29 Nelson K. J., Daun M., Mourad T., Wahood W., & Ahmed O. Visceral and Solid Organ Trauma / IR Playbook: A Comprehensive Introduction to Interventional Radiology. 2024. Pp. 401—414. DOI: 10.1007/978-3-031-52546-9_33 (date accessed: 25.12.2024).

30 Guo W., Zhang T., Mu Z., Zhu W., & Li M. Op. cit. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

examinations [31]. Chemical compounds (e.g. metal ions and carbon particles) released as a result of the interaction between the bullet and the target tissue can be detected in toxicological analyses [32]. X-ray and CT scans can be used to detect bullet paths, fractures, and internal organ damage. Radiopaque particles can be seen if bullets or projectiles have fragmented in tissue. Railguns, in particular, can cause ionization or plasma formation during the launch of the bullet [33].

The technical features and energy values of EMG, coilgun and railgun EMG, differ in terms of the kinetic energy and bullet speeds they create in terms of the damage they can inflict on the body. Coilgun, which fires 16 mm diameter bullets-projectile and ½ metal dowel pins at speeds of 136 m/s and 75 m/s and produces approximately 56 J energy, can cause serious tissue injuries, traumatic shock, bone fractures, organ failure and even organ loss, as well as death when it reaches the carotid artery regions [34]. A coilgun, which fires a small metal disc or slug resembling a watch battery at a speed of 220—250 fps (64—76 m/s) and has an energy of 40 J, can easily break a vehicle window or seriously damage its metal surface, while hitting a human head can cause skull fractures and hematoma formation. Railguns and similar high-kinetic weapons that can produce 27,000 J of energy can easily penetrate heavy armor, and in crimes committed against humans or animals, they not only damage but also cause fragmentation [35].

Forensic analysis of EMG will present different problems due to the lack of gunshot ballistic traces such as gunpowder residue or cartridge cases. In forensic investigations, artificial intelligence system technical approaches should be applied in magnetic field analysis and thermal imaging techniques to detect the fine traces left by these weapons [36]. There are no limitations to such techniques and methods. For example, magnetic field analysis requires precise calibration and is sensitive to environmental factors, and thermal imaging is not always able to capture the transient heat signatures that occur during the launch of a projectile. To overcome or improve such challenges with the use of artificial intelligence, a multimodal approach combining magnetic, thermal and spectroscopic analysis is implemented [37].

Comparative Analysis of Ballistic Effects of Coilgun and Railgun

EMG can reach high speeds in terms of kinetic energy and firearms have higher kinetic energy with heavy bullets, but these change according to the conditions. Although coil-

31 Ma M. Op. cit. DOI: 10.54254/2753-8818/2025.20319 (date accessed: 06.01.2025).

32 Smith W., Schick S., Arthur R., Paul K., Elphingstone J., et al. Op. cit. DOI: 10.1177/14604086231197053 (date accessed: 25.12.2024).

33 Siemenn A. E., Deo Bh., Ng F., Zhou J., et al. A Railgun Secondary Propulsion System for High-Speed Hyperloop Transportation. *IEEE Transactions on Plasma Science*. 2023. Vol. 51. Is. 1. Pp. 243—248. DOI: 10.1109/TPS.2022.3232406 (date accessed: 06.01.2025).

34 Ma M. Op. cit. DOI: 10.54254/2753-8818/2025.20319 (date accessed: 06.01.2025) ; Yadav M., Ram R., & Thomas M. J. Op. cit. DOI: 10.1007/978-981-97-0337-1_6 (date accessed: 25.12.2024).

35 Kakad Y. U., et al. Op. cit. DOI: 10.55041/ijsrem30997 (date accessed: 29.12.2024).

36 Alnafrani R., & Wijesekera D. AIFIS: Artificial Intelligence (AI)-Based Forensic Investigative System. *10th International Symposium on Digital Forensics and Security (ISDFS)* (06—07.06.2022; Istanbul, Turkey). Pp. 1—6. DOI: 10.1109/ISDFS55398.2022.9800801 (date accessed: 22.01.2025).

37 Dudek A., Dąbek A., Zborowska I., & Lichosik J. Integrating artificial intelligence in forensic science. *E-methodology*. 2024. Art. 10(10):15-28. DOI: 10.15503/emet2023.15.28 (date accessed: 22.01.2025).

guns operate at lower energy levels, their projectiles can still cause penetration and fragmentation, depending on the target material and velocity [38].

In terms of comparing wound mechanisms, coilgun bullets are generally considered non-lethal due to their low energy and speed, but they can cause not only blunt trauma and superficial injuries but also other damage that will cause death. Railgun type EMG, on the other hand, cause great damage to human tissue due to their high kinetic energy, create bone fractures and can cause fatal forensic cases with hydrodynamic shock waves [39].

Criminalistic and Ballistic Evaluation of Railgun and Coilgun EMG

Railguns and coilguns, which are EMG, create new challenges in forensic investigations and examinations [40]. Injuries caused by these weapons exhibit different findings than standard firearms and should be detected with advanced analytical techniques. Spectroscopic examinations, thermal and magnetic analyses are especially in question, thus providing various evidences regarding the use of these railgun and coilgun type weapons. When we investigate what can be done about forensic injuries and deaths due to portable and continuously developing railgun and coilgun, it can be seen that it can have serious effects [41].

The risk of their potential use in crimes comes to the forefront due to their portability, not leaving chemical traces, not producing muzzle flames and low recoil properties in certain models. In this context, the following points are important for forensic investigations [42].

In bullet ballistics and evidence analysis, in attacks carried out with coilguns or railguns, bullet ballistic traces can be more irregular compared to firearms. In addition, excessive kinetic energy transfer can be observed at the point of contact due to high speed [43]. There are no traces of grooves or sets, no cartridge cases are found at the crime scenes, and instead of cores or projectile type air gun pellets or hand-made tools are used instead of bullets [44]. Surface deformations, thermal effects and magnetic field-induced changes caused by electromagnetic acceleration need to be investigated. Railgun and coilgun projectiles can be made of certain alloys or magnetic materials for electromagnetic acceleration. Therefore, spectroscopic analysis will be

38 Guo W., Zhang T., Mu Z., Zhu W., & Li M. Op. cit. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

39 Raj R., Sesha Talpa Sai P. H. V., Gurudutta A. et al. Op. cit. DOI: 10.1007/978-981-99-6774-2_17 (date accessed: 30.12.2024).

40 Guarnera L., Giudice O., Livatino S., Paratore A. B., et al. Assessing forensic ballistics three-dimensionally through graphical reconstruction and immersive VR observation. *Multimedia Tools and Applications*. 2023. Vol. 82. Is. 13. Pp. 20655—20681. DOI: 10.1007/s11042-022-14037-x (date accessed: 25.01.2025).

41 Hayda R. Ballistic, Blast, and Burn Injury: Science and Clinical Implications / Owens B., Belmont Ph. Combat Orthopedic Surgery: Lessons Learned in Iraq and Afghanistan. 2024. Pp. 53—63. DOI: 10.1201/9781003523222 (date accessed: 03.02.2025).

42 Molnar A. The Demonstration Model of an Electromagnetic Accelerator Gun. *Acta Universitatis Sapientiae, Electrical and Mechanical Engineering*. 2018. Ed. 10 (1). Pp. 77—89. DOI: 10.2478/AUSE-ME-2018-0005 (date accessed: 07.02.2025).

43 Reck B., Alouahabi F., Hassler Q., & Schneider M. Railgun Launch of Cylindrical and Conical Projectiles at Muzzle Velocities up to 2100 M/S. *16th Hypervelocity Impact Symposium.* 2022. Nov. P. V001T02A003. DOI: 10.1115/HVIS2022-42 (date accessed: 03.02.2025).

44 Ma M. Op. cit. DOI: 10.54254/2753-8818/2025.20319 (date accessed: 06.01.2025).

required on projectiles or projectiles [45]. In those reaching high speeds, there may be thermal changes in the face due to friction heat, and this can only be determined in forensic and criminalistic analyses [46].

The serial numbers, material composition and production traces of these components will provide information about the origin of the weapon. Electronic trace tracking is an important method for determining the use and origin of these weapons, but new difficulties will arise in this regard in cases where they are produced at home [47]. As energy sources, batteries or external power supply mechanisms may exhibit unique energy consumption patterns and provide data for forensic monitoring. Remaining end-use data, firing counts and energy output levels in circuits with microcontrollers or special control cards will provide important findings in matching suspicious devices found at the scene. Residues left on coils and conductor rails can be detected with high-speed imaging and thermal analysis techniques, providing information about when and how the weapon was used. Considering these factors, effective forensic reverse engineering interdisciplinary investigation is required in railgun and coilgun incidents [48].

In the investigation of electromagnetic railgun and coilgun weapons with criminalistic techniques, it is possible to detect chemical changes on the bullet and target surfaces using raman spectroscopy [49]. Analysis of metallic residues in bullets and tissue is performed by energy dispersive X-ray spectroscopy (EDS) [50]. Thermal imaging can map the thermal damage in the injury area, as well as detailing the bullet energy and interaction process. In magnetic field analysis, magnetic field residues left at the scene of the incident, including coilguns and railguns, can be detected due to the working principle of EMG, and findings about their use can be proven with evidence [51].

Techniques that can be used in Coilgun and Railgun Forensic Examination

Magnetic field analysis and electromagnetic signature detection coilgun and railgun accelerate bullets by electromagnetic fields created by the discharge of high-power capacitors. This process in-

45 Guo W., Zhang T., Mu Z., Zhu W., & Li M. Op. cit. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

46 Zhang Y., Lu J., Tan S., Li B., & Jiang Y. Dynamic Response of Interior Ballistic Process and Rail Stress in Electromagnetic Rail Launcher. *IEEE Transactions on Plasma Science*. 2019. Vol. 47. Is. 5. Pp. 2172—2178. DOI: 10.1109/TPS.2018.2887006 (date accessed: 11.02.2025).

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48 Ma M. Op. cit. DOI: 10.54254/2753-8818/2025.20319 (date accessed: 06.01.2025).

49 Li Sh., Cao R., Zhou Y., & Li J. Performance Analysis of Electromagnetic Railgun Launch System Based on Multiple Experimental Data. *IEEE Transactions on Plasma Science*. 2019. Vol. 47. Is. 1. Pp. 524—534. DOI: 10.1109/TPS.2018.2883285 (date accessed: 03.02.2025).

50 Serol M., Ahmad S. M., Quintas A., & Família C. Chemical Analysis of Gunpowder and Gunshot Residues. *Molecules*. 2023. Vol. 28. Is. 14. P. 5550. DOI: 10.3390/molecules28145550 (date accessed: 15.02.2025).

51 Wongpakdeea Th., Crenshaw K., Wong H. M. F., Nacapricha D., & McCord B. Advancements in Analytical Techniques for Rapid Identification of Gunshot Residue and Low Explosives through Electrochemical Detection and Surface-Enhanced Raman Spectroscopy. *Global Forensic and Justice Center Symposium Research*. 7. 2024. DOI: 10.25148/gfjcsr.2024.7 (date accessed: 15.02.2025).

volves magnetic field residues, permanent magnetization in the conductor, and traces of high-frequency electromagnetic radiation. Magnetic flux imaging (MFI) can be used to determine whether a coilgun or railgun was used by examining the residual magnetic fields (remanence) left at the scene or on the weapon. Magnetic field changes can be detected by using Hall effect sensors. Coilgun bullets can acquire temporary magnetization due to the strong magnetic field they are exposed to during launch, which can be detected by special sensors or laboratory analysis [52]. Railguns generate high current electrical discharges, magnetic field fluctuations and radio frequency (RF) signals during use. Spectrum analyzers and RF detection devices can be used to examine electromagnetic signatures in areas where these weapons are used [53].

Spectroscopic analysis and XRF in bullet composition examination, coilgun and railgun bullets contain nickel coating, ferromagnetic alloys (Fe, Co, Ni) or tungsten based metal compounds. XRF analysis can be used to determine the alloy composition of the fired bullets and to determine their source [54]. Chemical changes (oxidation or carbonization, etc.) on the surface of the bullets caused by the heat and current generated during the launch can be detected with FTIR. Energy dispersive EDS and Raman spectroscopy can be used in the examination of ionized chemical residues in metal particle examination.

In the analysis of thermal and plasma signatures, railgun systems accelerate the projectile with the Lorentz force, while high temperature and plasma formation occur during launch [55]. Thermal camera analysis will be able to detect heat-related damage or surface melting at the scene. Railgun and coilgun bullets emit ionized metal particles during launch and are detected by laser-induced plasma spectroscopy (LIBS) analysis. Scanning electron microscope (SEM) will be able to perform surface change examination for microscopic melting, deformation and carbon residue detection [56].

Conclusions

EMG, particularly railguns and coilguns, which are kinetic energy-based weapon systems, have been determined to have the potential to cause serious injuries and deaths. Future forensic research should focus on developing analytical techniques to detect EMG used in criminal cases. The analysis concludes that EMG, especially coilguns, which can be modified using readily available materials and parts, have the potential to cause serious incidents. This research has analyzed how the traces created by EMG such as coilgun and railgun can be examined with scientific tests

52 Guo W., Zhang T., Mu Z., Zhu W., & Li M. Op. cit. DOI: 10.1088/1742-6596/2478/9/092018 (date accessed: 25.12.2024).

53 Ma M. Op. cit. DOI: 10.54254/2753-8818/2025.20319 (date accessed: 06.01.2025).

54 Klisińska-Kopacz A. X-ray fluorescence spectroscopy / Non-Destructive Material Characterization Methods. Elsevier Inc., 2024. Pp. 487—523. DOI: 10.1016/B978-0-323-91150-4.00018-5 (date accessed: 21.02.2025).

55 Vijayan N., Tawale J. S., Kiran, & Joshi D. Characterization of Materials Using X-ray Fluorescence Spectrometry and Energy Dispersive X-Ray Spectroscopy / Characterization of Single Crystals ; Dr. M. S. Pandian & Dr. P. Ramasamy (Eds.). Royal Book Publishing, 2025. Pp. 69—83. DOI: 10.26524/225.4 (date accessed: 21.02.2025).

56 Rajput Sh., Kumar G., Swarup S., Nomula P., Pawar A., Joshi J. C., et al. Modeling and Simulation of High Energy Capacitor Bank based Electromagnetic Railgun / High Voltage … . Pp. 313—321. DOI: 10.1007/978-981-97-0337-1_31 (date accessed: 21.02.2025).

and how technical and methodological approaches can be used. The risks in terms of ballistics and security have been addressed and the necessities in preventing threats strategically have been emphasized. It has been concluded that the detection of criminal use of EMG will be standardized and facilitated by developing forensic examination techniques. Due to their high speed and penetrating power, these weapons can cause severe traumas in soft tissue and penetration marks on metal surfaces. For this reason, the traces created by EMG have been examined in detail in terms of ballistic examinations and it has been analyzed which techniques should be developed for detection in criminal cases.

More experimental and simulation-supported ballistic data collection is required on coilgun and railgun weapons and their bullets or projectors on different surfaces and ballistic gels similar to human tissue. EMG have been determined to have the potential to cause serious injuries and deaths, depending on the railgun and coilgun, which are kinetic energy-based weapon systems. It has been concluded that EMG, especially coilgun type, which can be created with modifications with the availability of individual materials and parts, can cause serious cases as a result of the analysis. In addition, new analysis methods should be developed to facilitate the detection of EMG in forensic examinations. To improve the detection and analysis of EMG in forensic investigations, standardization of techniques such as magnetic signature analysis, thermal imaging, and spectral analysis is vital. This can be achieved by developing universal protocols for data collection, analysis, and reporting, and ensuring consistency across forensic laboratories.

Railgun and coilgun EMG present new challenges in forensic and ballistic investigations. Unlike firearms, EMG do not leave chemical residue, which makes them technically inadequate for forensic detection methods. They create thermal signatures, magnetic residues, and various deformations on target surfaces.

Projectiles or bullets launched at high speeds can cause severe tissue damage or bone fractures. Techniques such as thermal imaging, XRF, and FTIR spectroscopy are being evaluated in forensic investigations to detect traces left by EMG. Additionally, Gauss meters and Hall effect sensors are important in detecting electromagnetic signatures at the scene.

The fact that these weapons are easily accessible increases the risks. It is possible to produce them personally with 3D printing and high-capacity capacitors. In forensic investigations, methods such as artificial intelligence-supported analysis and determination of electromagnetic signatures need to be developed.

Coilgun and railgun portable weapons create security and legal problems due to their low or silent operation, easy to manufacture and potential for abuse. The fact that they remain in the traditional firearms classification requires special regulatory measures. For example, they can be used in a terrorist attack because they are silent and effective, and the materials and ways they are put together can provide geographical information, and strategic approaches are provided in the detection of railguns and coilguns used in electromagnetic residue detection and spectral analysis. Forensic ballistics standards are open to the opposite idea that they do not provide full performance for EMG in the current situation.

Coilgun and railgun type EMG can be made in homes and therefore pose potential security risks for portable individual and criminal misuse. It is an open issue to develop a legal framework specifically for the production, possession and use of EMG in order to minimize these risks. Therefore, additional research that needs to be added to the literature should also focus on the development of protocols in forensic analysis of coilguns and railguns. Expanding research with coilguns and railguns, which are open to more ballistic tests, will be important not only in terms of ballistics but also in the functioning of justice in criminal investigations and is a strategic issue in preventing crimes before they start. With advanced analysis techniques, it will be more possible to determine the use of these weapons and to solve crimes.

Електромагнітна зброя: судово-медична й балістична експертизи рейкотрона та гармати Ґаусса

Ґоркем Ардакан Тан

Електромагнітна зброя має іншу балістичну динаміку та злочинні сліди, аніж традиційна вогнепальна зброя. Переносні металеві системи (рейкотронні й гармати Ґаусса) і подібна до них зброя створюють нові труднощі для їхнього криміналістичного дослідження через портативність і можливість виготовити їх у домашніх умовах. Під час судово-медичної експертизи (дослідження спричинених летальних і нелетальних травм) вивчають балістичні наслідки влучання такої зброї — фізичні сліди, які вони залишають. Розглянуто технічні характеристики рейкотронних систем і гармати Ґаусса. Оцінено шкоду від боєприпасів, випущених із силою Лоренца, порівняно зі шкодою, яку спричиняє звичайна вогнепальна зброя. Обсяг криміналістичного аналізу від застосування електромагнітної зброї через високу швидкість і передачу кінетичної енергії значно розширюється. Інші ризики безпеці полягають у безшумності портативної електромагнітної зброї та відсутності хімічних залишків (слідів) після їх спрацьовування. Зі збільшенням випадків застосування електромагнітних рейкотронів і гармат Ґаусса (зокрема, виготовлених у домашніх умовах) необхідно розробити нові підходи й методи експертизи для судово-медичних досліджень, а також відповідні міжнародні й національні законодавчі норми з регулювання поширення такої зброї та уніфікації методів її дослідження. Метою автора є розглянути технічні й фізичні властивості електромагнітної зброї, завдані нею ушкодження, методи її дослідження, а також потребу у змінах відповідних міжнародних і національних нормотворчих актів з питань поширення та дослідження цієї і подібної до неї зброї. Для досягнення поставленої мети застосовано такі наукові методи: аналіз, синтез, статистичний аналіз, узагальнення та ін.

Ключові слова: *електромагнітна зброя; рейкотрон; гармата Ґаусса; криміналістичне дослідження; балістичні ефекти; судово-медична експертиза.*

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Declaration of Competing Interest

Author declares no conflict of interest.

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Specifics of Occurrence and Research on Fires in Modern Vehicles

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This article purpose is to set out an algorithm for determining mechanism of fire occurrence, taking into account the tangible and materialized sources of information submitted for examination. For achieving this goal, the author uses both general scientific and specialized methods of scientific cognition, including systematic approach, comparative legal method, deduction and induction, as well as methods of interpretation, structural analysis and observation. The author analyzes existing fire hazards in various types of motor vehicles and provides relevant statistical data. Characteristic causes of fires for motor vehicles are investigated and their conditional differentiation is performed. Possible scenarios for the course of such fires are presented and the probable places of occurrence of fires are indicated. specifics of intentional and unintentional fires are ana-

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lyzed in detail. The main distinguishing signs of these groups of fires are given. The main causes of unintentional fires in motor vehicles are interaction of combustible substances in case of depressurization of fuel system with the potential thermal impulse of the exhaust gas exhaust system, as well as thermal manifestations of electrical energy, in particular, short circuits in electrical equipment of the vehicle. Vehicle manufacturers and/or their owners are proposed to equip vehicles with an automatic fire extinguishing system and fire extinguishers of appropriate type that provide for extinguishing precisely in order to minimize material losses and the impact of fire hazards on people and environment.

Keywords: *car; ignition source; combustion intensifier; fire hazard; cause of fire; vehicles.*

Research Problem Formulation

Vehicles are a source of increased danger. The materials from which vehicles are made are mostly combustible and capable of spreading flames. In addition, each vehicle contains explosive and fire hazardous substances, such as fuel permanently stored in a tank or cylinder as a design feature. Fires in vehicles occur under certain conditions – in the event of an interaction between a combustible substance and an ignition source that occurs as an unregulated process. A fire is a destructive event that combines a set of hazards that can cause injury and death, as well as significant material damage and environmental pollution. Even current advanced developments do not exclude possibility of fires. Since modern humanity cannot do without vehicles, special attention must be paid to preventing fires, and this requires investigating the causes of fires and minimizing their consequences. Thereby this topic is relevant and requires careful consideration.

Analysis of Essential Researches and Publications

In our opinion, the issues of fires in motor vehicles and determining the causes of their occurrence using specialized knowledge have not been given enough attention in the scientific works of Ukrainian researchers. For example, the fire hazard of vehicles was studied by A. Havryliuk [1], O. Bazhynov [2], and M. Kravtsov (who noted fire hazard of electric vehicles and hybrids) [3]. Vehicle systems and assemblies

1 Гаврилюк А. Ф. Пожежна небезпека колісних транспортних засобів : монографія. Львів, 2018. 80 с. URL: http://surl.li/xddyyp (date accessed: 01.01.2025).

2 Бажинов О. В., Кравцов М. М. Небезпека транспортних засобів : монографія. Харків, 2022. 160 с. URL: http://surl.li/arqlkp (date accessed: 01.01.2025).

3 Кравцов М. Н. Пожарная опасность электро, гибридов и автомобилей. *Автомобіль і електроніка. Сучасні технології.* 2017. № 12. С. 117–122. URL: http://nbuv.gov.ua/UJRN/veit_2017_12_23 (date accessed: 01.01.2025).

were analyzed by V. Hudym et al. [4] in terms of fire hazard. Fire protection of wheeled vehicles was considered by A. Havryliuk [5]. Research on external signs of the presence of flammable and combustible liquids found at the scene of the fire is devoted to the work of O. Matiiuk, I. Riabinin, R. Huseinov and I. Shebalkov [6]. At the level of textbook, the fires were studied by S. Vovk [7] et al. Thus, insufficient attention has not been paid to the study of the causes of fires in motor vehicles.

Article Purpose

Propose an algorithm for determining mechanism of fire in modern vehicles, taking into account the tangible and materialized sources of information provided for examination.

Research Methods

For conducting research, both general scientific and specialized methods of scientific knowledge were used including a systematic approach, comparative legal method, deduction and induction, as well as methods of interpretation, structural analysis and observation.

Main Content Presentation

In modern conditions, transport is one of the most important sectors of the economy designed to meet the needs of population and production and significantly influence economic development and is an integral part of everyday life. Modern vehicles are a number of technical devices that are the latest achievements of technical thought and production. One of the most important and at the same time difficult tasks in the design of cars is their protection against fires. Given the definitions contained in regulatory legal acts, the concept of *vehicles* can be considered in a broad and narrow sense. In a narrow sense, this concept is used when mentioning road transport. In a broad sense, it includes railway, water, road, aviation, and also urban electric transport [8].

Law of Ukraine *On Motor Vehicle Transport* defines a motor vehicle as *“a wheeled vehicle (bus, truck, car, trailer, semi-trailer) used for the transportation of passengers, cargo or special work functions”* [9].

4 Гудим В. І., Гаврилюк А. Ф. Аналіз систем та агрегатів автотранспортних засобів за рівнем пожежної небезпеки. *Пожежна безпека.* 2013. № 23. С. 58–63. URL: http://nbuv.gov.ua/UJRN/Pb_2013_23_10 (date accessed: 01.01.2025).

5 Гаврилюк А. Ф. Протипожежний захист колісних транспортних засобів та шляхи його підвищення. *Там само.* 2017. № 31. С. 11–16. URL: https://sci.ldubgd.edu.ua/jspui/handle/123456789/4671 (date accessed: 01.01.2025).

6 Матіюк О. О., Рябінін І. М., Гусейнов Р. Н., Шебалков І. Л. Дослідження зовнішніх (візуальних) ознак наявності легкозаймистих і горючих рідин, виявлених на місці пожежі. *Теорія та практика судової експертизи і криміналістики.* 2020. Вип. 21. С. 373–387. DOI: 10.32353/khrife.1.2020_26 (date accessed: 01.01.2025).

7 Вовк С., Харчук А., Сухай А., Шелюх Ю. Дослідження пожеж : навч. посіб. Львів, 2022. 528 с. URL: https://books.ldubgd.edu.ua/index.php/ed/catalog/view/196/147/637-1 (date accessed: 01.01.2025).

8 Баркова С. П. Щодо поняття «транспортні засоби». *Форум права.* 2013. № 2. С. 13–18. URL: http://nbuv.gov.ua/UJRN/FP_index.htm_2013_2_4 (date accessed: 30.09.2024).

9 Про автомобільний транспорт : Закон України від 05.04.2001 р. № 2344-III (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2344-14#Text (date accessed: 30.09.2024).

The need for transportation of goods and passengers by road in our country is growing from year to year due to the expansion of domestic and international trade and economic relations. The volume of road transportation is increasing every year and the number of traffic collisions and transport fires is growing accordingly. In current environment, important element of sustainable socio-economic development of the State is ensuring the required level of fire safety and minimizing losses from fires.

Fire is a thermal transformation of substances and materials, accompanied by the release of heat, light and combustion products.

According to ДСТУ 2272:2006, *"**fire** is an unregulated process of destruction or damage to property by fire that causes factors dangerous to living beings and the environment"* [10].

Fires on motor vehicles are not only dangerous (for both individuals and legal entities), but cause economic damage. Thus, understanding the causes of road fires is the first step towards road safety. By taking appropriate measures, vehicle owners can significantly reduce the risk of fires and protect themselves and the rest of the road users and if the vehicle is stationary, understand what malfunctions should be paid attention to. Fire in transport is dangerous because it begins most often in latent mode, and they learn about it when the smell of burning and smoke is already noticeable: spread of fire here is much faster than in buildings (2-3 minutes).

The population often buys used cars whose malfunctions cause them to operate in emergency mode, which in turn increases the number of traffic collisions and fires.

In accordance with clause 7 of the Procedure for accounting for fires and their consequences [11] (hereinafter referred to as the *Procedure*), *the document certifying the fact of a fire* is a fire report in appropriate form of this Procedure, which is drawn up at the place of fire by an authorized official of the State Emergency Service (no later than 24 hours from the moment of liquidation of the fire or submission of a written statement about the fire; in two copies having equal legal force). The act shall indicate the information data obtained from the inspection of the fire site and the survey of the owner (user) of the fire object or its representative, as well as persons who witness the destructive event.

By its Resolution dated 10.12.2019 in case № 559/1094/17, the Supreme Court concluded that the proof of force majeure (fire) is a duly executed fire report, not a certificate of such fact. Therefore, in case of compensation for damage by insurance organizations, the vehicle owner should pay attention to the following [12].

In 2023, there were 3,613 vehicle fires in Ukraine (3,389 fires in 2022; +6.6%), which is 5.3% of the total number of fires in Ukraine. These fires resulted in 41 deaths (in 2022 – 22 people; +86.36%)

10 ДСТУ 2272:2006 Пожежна безпека. Терміни та визначення основних понять [Чинний від 01.07.2007]. Київ, 2007. 32 с. URL: https://antifire.ua/dbn/19-DSTU_2272_2006.pdf (date accessed: 01.01.2025).

11 Порядок обліку пожеж та їх наслідків : затв. постан. КМУ від 26.12.2003 р. № 2030 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/2030-2003-%D0%BF#Text (date accessed: 07.01.2025).

12 Постанова Верховн. Суду від 10.12.2019 р. Справа № 559/1094/17. Адмін. провадж. № К/9901/35037/18. URL: https://iplex360.com.ua/sud.php?doc=86274775 (date accessed: 07.01.2025).

that is equal to 2.8% of the total number of deaths in Ukraine. These fires injured 127 people (68 people in 2022; +86.76%). Fires destroyed 2,970 pieces of equipment [13].

Analysis of statistical data indicates a trend towards an increase in the number of vehicle fires. Although these incidents are rare compared to the total number of vehicles, their consequences can be devastating. Therefore, research focused on identifying the causes of vehicle fires remains important for understanding the risks associated with. In addition, such research is crucial for exploring ways to potentially reduce the likelihood of fires and minimize their consequences.

The causes of fires caused by ignition sources can be divided into external and internal ones. These include: failure to comply with fire safety regulations, technical malfunctions, improper operation, structural faults and intentional arson.

It is worth noting that fires with a free development time of more than 5 s account for 39% of the total number of vehicle fires (22% of deaths), and 55% of fires with a free development time of more than 10 min caused 71% of deaths, which indicates the rapid development of vehicle fires and their dangerous impact. Vehicle fires occur and spread rapidly due to design and technological features, the presence of flammable and combustible liquids (fuel, lubricants, cooling and brake fluids) and components (artificial leather, plastics, foam rubber, synthetic substances, fabrics, etc.), poor and/or incomplete control over the technical condition, improper operating conditions, and long manufacturing time. Fire cause is a circumstance, action, or process that directly causes a fire. One of the most common causes of vehicle fires (according to statistics) is fire-hazardous modes of operation of the onboard electrical system (35%). As vehicle on-board systems diversify year after year to increase comfort and meet the needs of the driver, the electrical networks in these vehicles are also expanding and evolving, which consequently increases the risk of fire through electrical system.

At the same time, when electrical equipment fails and its emergency mode of operation causes a fire, the insulating material plays a major role in igniting and/or maintaining combustion. Most often, this material is combustible with medium flammability. More than 24% of vehicle fires are caused by the melting of hoses and pipes containing flammable substances under the influence of exhaust gases from a damaged exhaust manifold and subsequent interaction with the combustible system, fuel and other operational flammable liquids getting onto heated surfaces of the engine or turbocharger, leaks in fuel and hydraulic system valves; 11% are caused by arson; in approximately 32% of cases, the cause of the fire is not known.

The most dangerous for passengers are fires that occur during vehicle operation. If a fire breaks out in the engine compartment, combustion products can enter the vehicle and cause poisoning before the vehicle stops and passengers get out. If the brake system components are damaged by flames, they can malfunction, leading to traffic collision. It should be noted that 68% of fires occur in the engine compartment, and 13% in the passenger compartment or cab. Fires that occur during traffic collision are particularly dangerous because of the severe consequences (burns or death

13 Аналітична довідка про пожежі та їх наслідки в Україні за 12 місяців 2023 року. Київ, 2024. 39 с. URL: https://idundcz.dsns.gov.ua/upload/2/0/1/8/2/6/2/analitychna-dovidka-pro-pojeji-122023.pdf (date accessed: 30.09.2024).

of passengers). Injuries and blockage of people inside the vehicle, as well as deformation of the body as a result of accidents, complicate the process of extinguishing the fire and prompt evacuation of victims. In addition, damaged vehicle systems and components contribute to the rapid spread of flames. The main causes of vehicle fires in garages and parking lots are careless handling of fire, non-compliance with fire safety requirements when starting the engine, defects in the fuel system and sparks from electrical equipment.

In cars, components and systems are structurally combined, and their emergency modes can cause a fire. Modern vehicles have more powerful and technologically sophisticated branched electrical networks and power systems. Developed fuel lines, heating of engine components and systems can lead to extremely high thermal radiation, and at a certain critical value, a fire can occur there.

Fire hazard of vehicle compartments depends on the availability of flammable substances and potential sources of ignition [14]. Oxidizer is known to be present at all times that generally satisfies the concept of combustion.

Since oxidizers are present in almost every compartment and assembly of a vehicle, the fire hazard depends on what substances they contain and on the likelihood of an ignition source of sufficient power in that compartment or assembly, i.e., on manufacturability of the vehicle under research.

All other things being equal, compartments containing flammable liquids and combustible gases have a higher fire hazard than compartments containing only solid combustible materials [15].

Flammable or explosive substances have properties contributing to initiation and development of a fire or explosion.

Fire hazard is a cumulative property of materials and substances that characterize their ability to ignite and spread combustion.

All materials and substances are characterized by a flammability index in terms of fire.

Flammability is ability of materials and substances to ignite under the influence of an ignition source and continue to burn after it is removed.

The fire hazard of various combustibles depends on their aggregate state, physical and chemical properties and specific storage and use conditions.

According to the degree of fire hazard, substances and materials from which vehicles are made and that make up their components can be divided into the following groups:

1) flammable ones are substances (materials, mixtures) capable of igniting from a short-term action of an ignition source with low spark energy;
2) combustibles ones are substances capable of self-combustion after removal of ignition source;
3) highly combustible ones are substances that can burn only under the influence of an ignition source (for example, in case of fire) but are not capable of independent combustion;
4) non-combustible ones are substances that are not capable of burning.

14 ДСТУ 8828:2019 Пожежна безпека. Загальні положення [Чинний від 01.01.2020]. Київ, 2020. 87 с. URL: https://zakon.isu.net.ua/sites/default/files/normdocs/dstu_8828_2019.pdf (date accessed: 01.01.2025).

15 Бажинов О. В., Кравцов М. М. Небезпека транспортних засобів : монографія. Харків, 2022. 160 с. URL: http://surl.li/arqlkp (date accessed: 01.01.2025).

This division is conditional and depends on many circumstances.

Thus, fire hazard factors of motor vehicle compartments can generally be considered to be:

- use of combustible substances and materials;
- formation of fire hazardous environment in the compartment, inside systems and devices;
- appearance of an ignition source in a fire hazardous environment;
- emergence of conditions favorable for development of combustion and the spread of fire.

Fire load means the components and assemblies that make up a motor vehicle, all substances and materials of construction, as well as materials (substances) used in its systems that are capable of burning. The fire load is characterized by the mass, type and composition of combustible materials, as well as the amount of heat released during its combustion per unit surface area. The distribution of the fire load has a significant impact on the characteristics of fire development. The fire hazard of these materials is characterized by their ability to ignite, form flammable concentrations, explode and burn (from an ignition source, in case of interaction with other substances and oxidizers) [16].

Almost the entire combustible load is contained inside the vehicle (liquefied gas, fuels and lubricants, operating fluids, interior trim, seats, electrical insulation, polymeric containers for liquids) and in hybrid vehicles and electric vehicles, traction battery.

Combustible materials are component of wheels, decorative parts (made of polymers) and paint and varnish coating which quality depends on the state-of-the-art technology used.

The fire load containing various combinations of combustible materials of different nature is calculated according to the following formula, where its numerical value Q is expressed in megajoules:

$$G = \sum_{i=1}^{n} G_i Q_i,$$

where: n is number of combustible and flammable components in the machine;

Q_i is lower calorific value of the i-th material (MJ/kg);

G_i is the weight of the i-th material (kg).

For example, a modern truck on average contains 120—450 kg of rubber products, 120—200 kg of diesel fuel, 50—70 kg of motor and transmission oil, 4—6 kg of polyurethane foam, 1.8—2.9 kg of polyethylene, 2.6—3.8 kg of PVC, 2.5—3.4 kg of cardboard, and 9-10 kg of artificial leather. The calorific value of diesel fuel is 43.59 MJ/kg, engine and transmission oil: 41—42 MJ/kg, rubber products: 32—34 MJ/kg, polyurethane foam: 24.3 MJ/kg, polyethylene: 47.14 MJ/kg, PVC: 14.31 MJ/kg, cardboard: 13—14 MJ/kg, artificial leather: 17—18 MJ/kg. Thus, the fire load of a truck is in the range of 10,300—14,500 MJ. Modern vehicles have higher heat release rates during combustion compared to previously produced vehicles which is due to increased use of polymers.

In electrical systems, the fire load includes the insulation of conductive conductors of electrical wires, housings and radio components of electronic assemblies. Poly-

16 Пожежна безпека автомобіля / Навч.-метод. центр цивільн. захисту та безпеки життєдіяльн. Закарпат. обл. : офіц. сайт. 18.11.2021. URL: https://nmc.dsns.gov.ua/zk/news/ostanni-novini/494 (date accessed: 07.01.2025).

ethylene, polyvinyl chloride plastic and rubber are used for insulation. Electronic boards are usually made of paper-laminated plastic or fiberglass. Plastic masses, compounds, impregnated paper, paint and varnish coating and other similar materials are used in the construction of housings and some radio components.

In a fuel system, the combustible medium includes flexible fuel lines and the fuel itself, that can be diesel, gas, or gasoline.

Due to the fact that fuel system is isolated from the external environment, the occurrence of a fire hazardous environment in the engine compartment is possible only in the event of a leak. The analysis of the causes of fires in motor vehicles shows that the places of depressurization, mechanism of this process and its causes may vary and usually depend on the design characteristics of the vehicle, quality of manufacturing and installation of parts, operating conditions and the level of maintenance.

Fuel combustion occurs in the vapor or gas phase (e.g., diesel or gasoline/gas) and is characterized by concentration and temperature limits for flame spread. Fire hazardous concentrations can form in engine niches and vehicle compartments, mainly in the engine compartment.

In addition to fuel, other combustible liquids are used, including engine and transmission oils, coolants, brake fluids, etc.

The main combustible load in a vehicle cab is made up of interior parts, including the dashboard, seats, ceiling, floor, door, and other upholstery, and electrical wiring insulation. Most of these parts are made of combustible polymers.

In the engine compartment, the combustible load is made up of finishing materials, containers with a supply of operating fluids, engine oil, coolant. In or under the trunk, fuel tank, liquefied gas cylinder [17].

Determining the source of ignition and the cause of a vehicle fire is a complex task that requires a thorough understanding of the composition and characteristics of both the structural materials used to make the vehicle and the fuels and lubricants required for its operation. While determining the cause of a fire, it is necessary to take into account the ignition, flash and melting points of all materials used in the automotive industry. Fires in vehicles have significant differences from those in residential buildings. Flames in a car spread very quickly: usually within the first 15 minutes, a car suffers significant damage or complete destruction.

The main sources of ignition that cause car fires include thermal impulses of an electrical nature, in particular sparks (due to a short circuit or other emergency conditions in the internal electrical network); frictional sparks (caused by an accident, technical malfunction); friction of surfaces (braking system, clutch), surfaces of the exhaust system, heated above the ignition temperature of flammable vapors and flammable liquids and materials; open fire (due to repair work, arson, explosion, etc.).

Causes of fires at motor vehicles:

- during operation, malfunctions in the fuel and electrical systems. Less commonly, fire is caused by the ingress of combustible mixtures caused by depressurization of the fuel or hydraulic systems onto elements of the exhaust gas exhaust system or by an explosion of a gas cylinder;
- during repair work, careless handling of fire, non-compliance with

17 Гаврилюк А. Ф. Зазнач. твір. URL: http://surl.li/xddyyp (date accessed: 01.01.2025).

fire safety rules in technological procedures, as well as during welding. The situation is further complicated by the lack of knowledge of the vehicle design features by the persons performing the repair;

- in parking lots or garages, careless handling of fire, non-compliance with fire safety rules when starting the engine, as well as improper operation of heat-generating equipment or electrical devices;
- fires caused by deliberate arson constitute a separate category. In such cases, the open fire source is usually created through the use of flammable or combustible liquids. The characteristic signs of arson include finding a car in a parking lot with the engine turned off and electrical equipment disconnected, as well as the location of the fire inside the cab, in the engine compartment or outside the vehicle as a result of traffic collision or ammunition explosion.

They can be categorized into two main groups: intentional and unintentional.

Intentional fires are mostly related to insurance fraud, revenge, or other criminal intentions (deliberate introduction of an open fire source or use of special devices). Most often, such incidents occur at night (approximately between 02:30 and 04:00), when the number of potential witnesses is minimal and the first signs of fire are not immediately detected. This contributes to uncontrolled spread of flames leading to larger fires with more serious consequences.

If a car fire is extinguished as quickly as possible, there is a significant chance of determining the cause of the fire, as well as identifying residues of combustible or flammable substances or other materials used as ignition agents. This is especially true when fires occur in urban areas, where fires are usually detected and extinguished at an early stage, which helps preserve the evidence needed to determine the cause of the incident. Such fires are most often caused by third-party ignition sources. Vehicle arsons are also often committed to hide other crimes. Signs of arson: fire damage to the upper and lower parts of the radiator and heater pipes, as well as the fan drive belt, which usually indicates the use of combustion initiators. Additional evidence of intentional arson is the burning of the front rubber engine mounts. Based on our own expert practice, we have systematized the signs of arson with the use of accelerators and cases caused by technical malfunctions (*q.v. Table*).

Differential signs of arson with the use of combustible liquids / combustible materials or as a result of a technical malfunction associated with the leakage of combustible liquids / combustible materials

Sign	Arson with the use of combustible liquids	Technical malfunction (leakage of combustible liquids/ combustible materials)
Fire center outside the vehicle	+	–
Fire center outside the area of “regular” potential ignition sources	+	–
Fire center inside the cab	+	–

Table completion

Stratification of spills of the arson type	+	–
Stratification of spills of the not arson type	–	+
Localization of center signs in places of possible depressurization of gas distribution systems	–	+
Availability of remnants of ignition devices	+	–
Morphological characters of mechanical glass fracture	+	–
Morphological characters of arbitrary disconnection of pipelines with liquid and gas	–	+
Fire while driving or immediately after stopping (hot exhaust)	–	+
Discrepancy between the identification features of the detected fluid and the "standard" vehicle fluids	+	–

Expert practice indicates that use of combustible liquids and combustible materials at a fire scene leaves characteristic visual signs. This is due to the peculiarities of the combustion of such substances, which is homogeneous, diffuse and occurs in turbulent conditions. The vapor that is released from the surface of the combustible liquids and materials mixes with the surrounding gas environment through convective and molecular diffusion mechanisms, forming a vapor-air mixture known as a combustible system. The flame temperature in this case reaches 1200—1350 °C. These combustion specifics cause specific signs of thermal damage at the fire site.

The external signs of the use of combustible liquids and materials during fires at motor vehicles include characteristic traces in the form of burnt spots that resemble puddles of spilled liquid. Such spots can be found on plastic surfaces or on paint and varnish coating of metal elements. They usually have a blob-like shape with a clear boundary between the charred area and the unburned part of the material. Most often, these traces remain in places where the temperature during the fire did not affect the surface for long.

Rapidly evaporating combustible liquids and materials (gasoline, sulfuric ether, hexane, acetone, etc.) most often do not leave stains on surfaces without paint and varnish coatings (while combustion of combustible liquids and materials vaporing, surface temperature does not reach a level that causes noticeable thermal damage). In the case of heavier liquids (such as kerosene or diesel fuel), stains are bound to form. In addition, similar traces can remain after combustion of oils, bitumen, or molten polymers. Foamed polymers usually burn very intensely and sometimes do not leave any charred residues at all. However, most often the presence of such residues indicates that a polymer or other material, and not combustible liquids or combustible materials, burned in this place. For example, after the combustion of polyurethane foam, only a puddle of liquid products of its depolymerization remains. It is worth noting that thermoplastic polymers can melt and flow and their burnout areas usually have a blob-like shape, similar to that which occurs during ignition of combustible liquids and materials.

While analyzing thermal signs at a fire scene that indicate the use of flammable and combustible substances as combustion intensifiers, the following should be taken into account:

- characteristics of materials in the fire zone are evidence that ignition of substances and materials of the fire load may require the prolonged use of a powerful ignition source or flammable and combustible liquids. It can be evidence of the actual use of such liquids. This group of indicators includes the situation when the scale of the consequences of a fire is disproportionate to the small amount of fire load or low rate of heat transfer during combustion;
- place of origin, peculiarities of initial stage of the fire and the rapid dynamics of its development may indicate the use of flammable and combustible substances. This is the case when there are no powerful sources of ignition in the fire center and the rapid development of the fire would not have been possible without artificial initiation using such substances. Sudden flame spread that is not justified by other factors may also mean the use of combustion intensifiers. Especially when the fire is accompanied by "plops" (characteristic loud sounds similar to a weak explosion) and is intense from the very beginning, this is an obvious sign of the use of combustible liquids or combustible materials. At the same time, it should be remembered that availability of these substances at the fire site cannot be explained by technological conditions or fuel leakage;
- lack of focal signs in the traces of thermal effects on the fire object is observed when there are no clearly defined places of combustion. This situation most often occurs when a fire develops rapidly, which is typical for the use of combustible liquids and combustible materials as combustion enhancers. In particular, spillage of such substances over a large area often interferes with the formation of focal features. However, while analyzing this sign, it is important to remember that other factors can cause rapid fire development (intensive gas exchange caused by the constant flow of oxygen into the combustion zone; availability of powerful ignition source and the flammable properties of materials). In addition, smoothing or complete disappearance of focal signs is often observed in the case of a large-scale burning that is stopped without involvement of State Emergency Service units to extinguish the fire;
- availability of a characteristic odor felt at the scene of the fire by witnesses or employees of the State Emergency Service while extinguishing procedure.

When combustible liquids and materials are used to set fire to a vehicle, the liquid spreads over the entire area of the spill, resulting in a significant burning zone. Characteristic sign of use of combustible liquids and materials is surface burning on the vehicle body that is large and shaped accordingly. In the event of a rapid fire extinguishment, when paint and varnish coating does not have time to burn completely, characteristic traces of liquid spreading in the form of areas of coating burnout can remain on the front fenders. In the event of a spill of combustible liquids and materials on the hood of a vehicle, specific areas of local or uneven burnout of paint and varnish coating appear. The borders of such areas usually have a wavy shape. Spill marks can look like one large area or several smaller ones separated by fragments of unburned coating. The bulk of the spilled liquid drains through drainage channels, in particular onto the ground behind the front wheels of the vehicle. In these areas, characteristic thermal damage to the body is often observed. The most severe damage is usually localized in the area of the drainage channel, where more liquid has entered. By analyzing location and shape of the spots left by the liquid on the body surface, you can roughly determine the location of the initial spill. It is important to take into account the nature and intensity of burning in the areas of drainage holes, in the areas adjacent to, as well as where liquid may have accumulated. These features will help to clarify the circumstances and mechanism of motor vehicle arson.

Majority of unintentional fires occur in the engine compartment of motor vehicles (this applies to cars, trucks and other equipment).

Analysis of the causes of fires at the motor vehicles indicates their rapidity. This is due to the use of significant amount of flammable materials both during production and in the process of operation of vehicles. These include motor fuel (gasoline, diesel, liquefied gas), lubricants (various types of oils), rubber and technical materials (seals, tires, mats, etc.), as well as facing, upholstery and insulating materials (for example, organic glass, polystyrene, polyurethane foam, polyethylene, vinyl leather, paper-laminated plastic, etc.). A significant part of these materials is characterized by a high combustion temperature and rapid flame spread.

Taking into account the design features of cars, it is possible to predict the source of ignition, that is, determine the probable cause of ignition of engine oil, materials of construction and decoration.

The most common cause of fuel ignition is its overheating by heat coming from outside. Overheating can occur if fuel gets on engine parts, the heater, wires heated by overload currents or short-circuit currents. Fuel ignition and ignition of the vapor-air mixture from an open flame are possible if the rules for using the preheater are not followed, during welding work near the fuel tank or fuel lines.

Ignition of the vapor-gas mixture can occur due to a spark of static electricity during fuel transfer or refueling, especially from a fuel tank. Depressurization of the fuel system due to traffic collision can also lead to ignition of the fuel from sparks of mechanical origin that occur as a result of an impact. It is possible for the vapor-gas fuel mixture to ignite from an open source of fire, even a low-calorie one, for example, a match flame or an unextinguished cigarette.

For ignition of flammable structural and finishing materials used in the automotive industry, fairly high temperatures and thermal energy are required.

Sources of ignition can be electrical conductors that overheat due to overload or short-circuit currents, the thermal effect of an electric arc during short circuits, hot exhaust gases in the event of a leak in the exhaust system in the area of flammable materials, overheated heater elements or a source of open fire. The fuel system and electrical equipment of the motor vehicles are the main sources of increased fire danger. The highest temperature regime in the engine compartment is observed in the exhaust tract, from the collector to the exhaust pipe of the muffler. In an internal combustion engine, the temperature of the exhaust gases along the exhaust tract reaches 800–830 °C, while the temperature of the outer surfaces of the exhaust tract is slightly lower and is 710–770 °C. An additional factor that increases the risk of fire is the high saturation of motor vehicles with flammable materials. In addition, the absence of structural barriers between important parts of the car, for example, between the engine compartment and the interior or between it and the luggage compartment, contributes to the rapid spread of combustion. While analyzing the cause of the fire, it is worth considering that the ignition process can be significantly accelerated due to the instantaneous spread of the flame through a layer of spilled fuel. This can happen if the fuel system is damaged, that allows the fuel to quickly cover large areas of the car surface.

Many fires in cars and trucks are caused by antifreeze leaking onto hot engine surfaces, which is especially true for older cars. The scenario for such a fire is usually as follows: the driver notices an increase in engine temperature or steam coming out of the engine compartment. After the car stops, the engine starts to catch fire. The main cause of the fire is the composition and properties of antifreeze (a coolant – a mixture of ethylene glycol and water in a ratio of 50/50). Ethylene glycol has an autoignition temperature of 380 °C, and the ignition temperature of its vapors in air is 112 °C. The range of vapor concentrations at which flame propagation is possible is from 3.2 to 15.3%. It is known that the elements of a running engine (manifold in gasoline models or the turbocharger in diesel models) can heat up to temperatures significantly higher than the autoignition point of ethylene glycol. In the event of an antifreeze leak onto such surfaces, the water component evaporates, leaving pure ethylene glycol. This substance quickly heats up to its flash point (116 °C), creating conditions for ignition. The flash can occur due to a spark from the engine electrical components in a volume of space saturated with ethylene glycol vapor. If there is no spark, ignition is still possible if ethylene glycol comes into direct contact with a hot manifold or turbocharger. Such incidents most often occur while the engine is running.

Fires caused by fuel ignition most often occur due to various malfunctions in fuel equipment connections. The autoignition temperature of gasoline varies from 255 to 370 °C, while the temperature of an electric spark exceeds 2000 °C, which ensures instant ignition of gasoline vapors. When determining the causes of fires, it is important to pay attention to the detection of leaky areas in metal pipelines of the fuel system. While using highways made of polymer materials, it is more difficult to determine the location of the leak (due to the complete combustion of these elements). It should be noted separately that fuel getting on the hot parts of the engine or turbocharger can cause ignition. In the event of a fuel leak under the car and its ignition, serious damage to the rear of the car is characteristic, in particular, the rear tires burst into flames, as well as availability of traces of burning on the ground. Another reason for emergency mode of the fuel system is a violation of the rules for operating the vehicle, for example, using low-quality gasoline, deviations from technological standards and maintenance schedules, mechanical damage or unreliable connections. Fuel system malfunctions can be determined by indirect signs that precede the fire and are detected during an interview with the owner of the vehicle or witnesses to the incident (interruptions in engine operation: difficulty starting, unstable idling, reduced power, as well as sounds like “plops”). Other indicators include increased fuel consumption, the smell of gasoline in or near the car interior, and traces of fuel leaks indicating leak in the system.

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Fires occur by a similar mechanism when engine oil leaks and gets on the hot surface of the manifold. The oil ignites spontaneously at a temperature of 450 °C.

Determining the causes of fires caused by the conversion of electrical energy into heat is a difficult task, due to the large number of conductors grouped in harnesses. In such cases, the wires can fuse together or become brittle due to the significant impact of high temperatures. Conductors and elements of power electrical equipment that are not protected by fuses, in particular the generator, the power wires to it, the starter traction relay and the fuse block of the on-board power supply system, pose a particular fire hazard. A short circuit in the on-board network of motor vehicle often occurs due to damage to the insulation that leads to its friction against sharp parts of the structure due to vibration of the wires while the car is moving. One of the signs of a short circuit is a discharged battery: its absence on the car excludes possibility of ignition due to a short circuit. However, such a situation does not always indicate that the fire was caused by a short circuit. While inspecting car wiring, it is worth remembering that during short circuit, conductors melt, forming voluminous lumps of metal. At the same time, wires that have burned out from the effects of the flame have a characteristic sharpening. While determining the location of the short circuit to determine the causes of the fire, it is important to remember that the weak flame that occurs during such an event must be near a combustible material to ensure further spread of the fire. The external condition of the wires (including their insulation) can be used to roughly determine the maximum heating temperature during a fire, which will help to understand the mechanism of its development in more detail (*Fig. 1*).

Fig. 1. Appearance of copper stranded conductors with traces of thermal exposure at different temperatures

Recently, the most relevant causes of fire are explosions of ammunition as a result of hostilities of the Russian Federation. During the explosion, potential energy is converted into kinetic and thermal energy, which is transformed, in particular, into an open flame. In addition, the amount of heat released during such explosions ranges from 1 to 6 MJ, and the temperature of detonation combustion is several thousand degrees Celsius, which in turn significantly exceeds the minimum energy for igniting the available combustible materials in motor vehicle. During explosion of ammunition, thermal pulses of various ignition sources arise, which are capable of igniting the combustible material of the motor vehicle in the area of impact of ammunition or near it within the limits of the influence of dangerous explosion factors. Such groups of ignition sources, in particular, include heat received from a hotter or incandescent body, and an unusual ignition source (open flame).

In an electric vehicle (hybrid vehicle), a significant fire hazard is posed by a traction battery[18] equipped with lithium-ion cells, which have a certain susceptibility to risks: explosiveness, sensitivity to overdischarging and overcharging. Full discharge is extremely dangerous, as it can irreversibly damage the battery. Attempting to charge a fully discharged battery can cause an explosion. In addition, such batteries are very sensitive to mechanical damage, overheating and improper use of chargers. Overcharging that is actually overloading the battery with current, significantly increases the risks: decrease in capacity, damage to the battery or even its loss. Although when a full charge is reached, the generated reverse current usually compensates for the charging flow, inexpensive chargers can demonstrate a different picture. In practice, use of cheap Chinese or domestic chargers often leads to rapid battery wear. In addition, they can get very hot, which causes chemical reactions with the release of hydrogen, which can provoke an explosion. As for motor vehicle with a hybrid or electric power plant, the batteries are located closer to the bottom to increase the maneuverability of the car. However, in the event of a collision with large objects or sharp debris getting under the wheels, the battery can suffer significant damage, which often leads to an instant fire of the motor vehicle. Lithium batteries are occasionally prone to explosive spontaneous combustion. The burning intensity of these batteries can cause serious consequences. Characteristics of lithium (Li): flammable silver-white soft metal; atomic mass 6.94; density 534 kg/m^3; melting point 179 °C; boiling point 1372 °C; specific heat of combustion 43,221 kJ/kg; thermal conductivity coefficient 71.2 W/(m×K); ignites when heated in air; combustion temperature ≈1300 °C; autoignition temperature in air 180–200 °C; vigorously decomposes water; ignites in chlorine, bromine and iodine vapors; burns in carbon dioxide; reaction with nitrogen begins at room temperature, and in case of overheated reaction with nitrogen proceeds with ignition; melts and ignites in concentrated nitric acid; store in sealed containers with a neutral medium (argon), prevent contact with air and water; in the molten state causes destruction of welds, reacts intensively, with splashing, with building and thermal insulation materials (fiberglass, asbestos, concrete, etc.); extinguishing agents: special powders.

18 Lee E.-P. Analysis of Car Fire Cases Related to a Lithium Battery and Cause Investigation Technique. *Fire Science and Engineering*. 2019. Vol. 33. No. 2. Pp. 98–106. DOI: 10.7731/KIFSE.2019.33.2.098 (date accessed: 01.01.2025).

Dynamics of motor vehicles fire depends on its location, for example, the engine or luggage compartment, interior, fuel system, etc. According to available data, in the event of a fire in the engine compartment of a parked car, the flame penetrates the interior in 8–10 minutes. The interior is completely engulfed in fire in another 1–2 minutes. Then the fire engulfs the entire vehicle, breaking the tightness of the fuel system, which leads to the ignition of the leaking fuel. In the event of a fire in the interior with open windows, when the flame source is located in the back seat, the glass collapses within approximately 6 minutes. The complete combustion of the interior, together with the engine and luggage compartments, is completed in 30 minutes; 45 minutes later, only flameless smoldering of elements (seats, tires, and trim materials) is observed. Particularly dangerous is spontaneous combustion of a lithium battery that is practically impossible to extinguish by conventional methods. During thermal acceleration of a faulty or damaged battery, not only stored electrical energy is released: special chemical reactions produce additional energy for self-heating, oxygen and flammable gases. Due to this, the battery can burn without access to air making methods of isolation from oxygen ineffective. In addition, metallic lithium reacts actively with water, forming flammable hydrogen gas. Therefore, water for extinguishing is effective only if the mass of the lithium electrode is insignificant. In general, extinguishing lithium batteries is effective only to a certain extent. The main goal remains to reduce the temperature of the battery and prevent the spread of fire. Specifics of such a fire can completely destroy the motor vehicle in a few minutes. Extinguishing a lithium battery is effective with special fire extinguishers (*Fig. 2*) or argon.

Fig. 2. Special fire extinguishers for Li-Ion batteries

According to scientific data [19], occurrence of combustion requires the interaction of three material objects: an ignition source, a combustible medium (substance) and an oxidant. Under normal combustion conditions, the oxidant is oxygen in the air in a concentration characteristic of air. The answer to the question of the cause of the fire lies in determining the nature of the interaction of these three objects. For maintaining the combustion

19 Степаненко С. Г., Білкун Д. Г., Яник Я. М., Тимощук Ю. Т. Дослідження пожеж [Fire Research] : довідк.-метод. посіб. Київ, 1999. 224 с.

process, certain conditions should be met: the presence of a combustible substance with the appropriate characteristics (humidity, temperature), a sufficient amount of oxidant (oxygen or other chemicals that promote oxidation), as well as an ignition source with sufficient energy potential (a spark, flame or an object heated to a high temperature). In clarifying the causes of a fire, the primary goal is to determine its initial source.

ДСТУ 2272:2006 states: *"The primary source of fire is the place where the fire originated"* [20]. The primary source of fire is determined based on an analysis of the state of structural elements, assemblies, objects and materials after exposure to flame, taking into account the degree of their thermal damage. At the same time, the physical laws of the course of thermal processes in the combustion zone and possible paths of fire spread in specific conditions are taken into account. As a result of the action of high temperatures, the substances and materials from which the motor vehicle or technical component is made that have fallen into the fire zone undergo various changes. These changes are manifested in changes in the physical and mechanical properties of materials, deformations, partial destruction or complete burnout. The detected traces of thermal impact are stored on material information carriers: they are transferred for expert analysis; they remain directly at the case object that requires detailed study.

The source of fire is determined after inspecting research object [21]. Before conducting the inspection, it is necessary to find out whether the motor vehicle was in motion, parked, in the repair and maintenance area or garage at the time of the fire. The answers to these questions will allow us to further put forward versions of the possible cause of the fire. During the inspection, two zones are distinguished: the territory adjacent to the fire site and the burning zone. It is necessary to carefully inspect the area, pay attention to suspicious objects (canisters, bottles that could contain flammable and combustible liquids, other means of ignition), traces that could be left by persons involved in the fire and take measures to preserve, record and remove such traces (*Fig. 3 and 4*).

Fig. 3, 4. Image of burn marks and a glove with fragments of car glass

20 ДСТУ 2272:2006. URL: https://antifire.ua/dbn/19-DSTU_2272_2006.pdf (date accessed: 01.01.2025).

21 Пракшин Ю. К., Зернов С. И. Методика осмотра места пожара. Киев, 1988. 168 с.

From expert practice, it is known that three main methods of arson are most often used. The *first method* involves breaking one of the windows with a heavy object and throwing a previously prepared container (approximately 0.5-5 liters in volume) filled with an accelerant inside, along with an ignition source (for example, a bunch of matches, a hunting match, or a lit cloth). In this case, the object used to break the glazing may remain inside the motor vehicle. The *second method* involves pouring a liquid: combustion intensifier on the external surfaces of the car, in particular the glass, body, and wheels. The most common target is the windshield, hood, and front wheels. Sometimes pieces of fabric soaked in combustion intensifier are used to cause a fire, which are placed under the wheels. The third method involves opening the fuel tank neck, inserting a cloth soaked in combustion intensifier. The rest of the fabric is left outside and set on fire. Such fires are characterized by the appearance of local zones of thermal damage. In particular, local burning of car tires and the hood paint and varnish coating can be observed (*Fig. 5 and 6*).

If flammable liquids are brought into the cabin, they settle either on the seat cushions or on the floor and rubber mats, where their remains can be found after a fire. External arson of motor vehicle is usually carried out by pouring a combustion accelerator onto the windshield. We have considered specifics of spread of the liquid and the visual signs of its availability earlier.


Fig. 5, 6. Display of local traces of surface liquid burnout

During inspection of burning area, probable source of the fire and the paths of fire spread are determined [22].

At this stage, traces of thermal impact are recorded on the external surfaces of the vehicle. Particular attention is paid to damage to the paint and varnish coating, glazing elements, bumpers, headlights, lights, wheels, etc. Next, they proceed to inspect the interior, in particular the wiring harnesses in the dashboard area. Wires with traces of melting are removed in compliance with all procedural standards. The exact location of the element

22 Кріса І. Я., Михайлов Ю. М., Бєлан С. В., Штангей Г. В., Єременко В. П. Методи визначення осередку пожежі : навч. посіб. / за заг. ред. П. Ф. Борисова. Харків, 2005. 215 с.

removal must be indicated on the packaging and an explanatory diagram should be attached to the inspection report. During the inspection of the luggage compartment, the degree of thermal impact on the objects located there is determined. During the inspection of the engine compartment, damage to components and assemblies in the under-hood space is recorded. Particular attention should be paid to such elements as carburetors, injectors, fuel pumps and fuel lines, exhaust gas exhaust system, electrical equipment and wiring harnesses. If necessary, these components are removed for further examination. In addition, it is necessary to record the presence of the battery and the "mass" switch (if available), as well as determine whether the electrical equipment of the motor vehicle was energized at the time of the thermal impact.

One of the key ways to determine the source of a fire is to analyze indirect signs of malfunctions in the motor vehicle fuel system (during witness interviews): malfunctions in the injection system, as well as defects in its other structural elements, including: reduced efficiency of the fuel pump (inability to create operating pressure); clogged fuel filter; blocked or deformed fuel drain line; system leak; mechanical damage.

During a fire, it is extremely important to consider the direction of the wind, as strong winds can significantly affect nature of the damage: if the wind is blowing from the rear of the vehicle, the front usually suffers more significant damage from the fire; if the wind is directed from the front, the main damage can be observed in the vehicle rear.

During inspection of freight vehicles, thermal damage to trailers (semi-trailers) and cargo is described. The inspection involves specifying the characteristics of the damage (quantity, type, method of placement and degree of thermal exposure). As with any other object, the first step in determining the cause of a fire is to determine its source, the place where it originated. In the motor vehicle, this process begins with identifying the area of the most severe thermal damage in the three main compartments: engine, passenger compartment (driver's cab) or trunk (platform or trailer). Although this is not always possible, in most cases, comparing the degree of damage in these areas helps to identify the place that suffered the most damage.

If the fire source is located in the passenger compartment of the vehicle, its interior suffers significant damage: the interior burns out almost completely, roof can deform, and the engine compartment and trunk are partially or completely burned and covered with soot. At the same time, these areas are usually preserved in better condition compared to the interior. If the fire was extinguished at an early stage, it is quite easy to determine its source, focusing on the degree of damage to the finishing materials. For example, the source of the fire in a truck that was parked was determined by the *center cone* formed by combustion products on the windshield and the burning of the dashboard: the cone downward-facing tip (*Fig. 7*) indicated that the fire had started in the dashboard and the degree of damage to the panel itself made it possible to more specifically identify the place where the fire had originally started next to the ashtray (*Fig. 8*).

During the dismantling of the dashboard, another sign was recorded, indicating the location of the fire center near the ashtray: traces of a change in the structure of the orange-colored metal were found on the metal frame (base for the panel),

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Fig. 7, 8. Center cone

while other parts of it were covered with traces of soot (therefore, it was in this area that the metal was exposed to the highest temperature). Thermal changes on metal elements can be caused by individual or combined actions of certain factors and processes. These changes manifest themselves as deformations, melting, transformations of the surface relief, structural changes of various nature and the formation of an oxide film of various shades on the metal surface. The intensity of such changes directly depends on the strength of the heating and duration of its effect. Some of them are irreversible, so they should be recorded during the inspection of the motor vehicle (in inspection report, by taking photographs):

- deformation of metal parts and elements of the motor vehicle is due to the thermal effect on them and, as a result, a change in the physicochemical and physical and mechanical properties; formation of oxides on the metal surface, at a temperature of 200–300 °C, an oxide film layer is formed on the steel surface, which causes the appearance of so-called colors of variability on the metal. It is necessary to distinguish between the colors of variability that form on the surface of steel after heating and cooling, and the color shades that occur when steel is exposed to high temperatures;
- melting and fusion of metal occur under the influence of temperatures exceeding the melting point of this material. In the event of a fire in the engine compartment, significant localized damage, burnout of rubber elements, gaskets and melting of silumin parts are usually observed. In motor vehicle with a front engine location, the front wheels usually burn out, while the rear ones suffer less damage. The flame can spread to the interior, causing it to burn out completely, while the trunk, especially in peripheral areas, is less affected. If the fire source is located in the trunk (platform or semi-trailer), it usually burns out, while the interior and engine compartment are only covered in soot. More noticeable damage, such as from melting, rarely occurs in these areas. At the same time, the mentioned signs are not always preserved: combustible materials of motor vehicle, especially in the case of prolonged

burning without extinguishing, can burn out completely. Therefore, it remains important to separate the three main areas of damage. Additional information about the location of the ignition can be obtained by inspecting the vehicle electrical wiring.

If, during inspection after the fire, damage to the electrical wiring by an electric arc is found in the area of the headlights or steering wheel, then it can be stated that the fire did not start in the engine compartment or the instrument panel. The proof here is built by the method of the opposite. If we assume the opposite, for example, the fire started in the engine compartment, then burning of the wires in the engine compartment should have led to the car being de-energized before the combustion goes beyond the engine compartment. Thus, when the flame front reaches the headlights or steering column, the wires there will clearly not be under voltage. If arcing is detected there, then the combustion began there earlier. Therefore, as with all other objects, in burned-out motor vehicles, the primary focus should be sought in the area of combustion that is furthest from the power source.

Let us give an example. During the inspection of a truck that caught fire while driving, a zone of maximum thermal damage was discovered (on the right in the lower part of the body, between the cab and the trailer). However, the exact location of the fire was not immediately determined. The electrical wiring in this zone had no visible defects or melting, and there were also no signs of emergency operation of other systems. Only an inspection of the space under the trailer clarified the situation. After dismantling the wooden floor covering of the trailer, not far from the zone of maximum damage, a burnt positive wire of the battery was found, which passed under the trailer. One end of this wire was tightly fused to the metal bracket of the gearbox, while the other remained connected to the generator in the engine compartment. A detailed examination of the section of the wire between the battery and the soldering point with the bracket revealed four zones of melting of the conductive cores. This area was removed for further investigation. The meltdown was analyzed using a metallographic method to determine the nature of the short circuit: primary or secondary. Research results of indicated that the meltdown furthest from the current source (at the point of contact with bracket) occurred due to a primary short circuit. This made possible to accurately determine the initial ignition location and determine the cause of the fire in the motor vehicle.

If arcing is detected during the inspection of a fire-damaged motor vehicle, it is advisable to find out which electrical circuit the wire with the arcing belongs to. Then the area with the arcing should be removed and sent for examination to determine the primary (secondary) nature of the short circuit. In the incident scene inspection report, it is necessary to record where this conductor was removed from. The rules for removing automobile wires are the same as for conventional electrical wiring.

There are known cases of fires in heavy-duty trucks, where the source of ignition was the thermal energy released during the friction of the tire on the floor covering of the semi-trailer platform. Thus, during a fire that broke out in the semi-trailer of a cargo truck while it was moving, center of the fire was found on the floor covering of the cargo platform (in the rear part) in the area ofthe left rear wheel of the last axle (*Fig. 9 and 10*).

Fig. 9, 10. Photo of fire center

In this area, a burn was found in the platform coating. The degree of carbonization of this coating on the wheel side was greater than on the cargo side. The platform floor coating on the wheel side had abrasions, located directly above the wheel tires and corresponding to their size. The above signs, as well as the absence of any elements of the fuel system and electrical system of the motor vehicle in the fire zone, gave reason to say that during the movement of the motor vehicle, the process of friction of the wheel tires on the floor coating of the cargo platform of the semi-trailer took place, which led to the fire. In the process of investigation, it was found that the semi-trailer was loaded with 81% of the permissible cargo mass. During the inspection of a semi-trailer identical to the burned one, the distances between the wheel tire and the floor covering were measured in normal operation (the semi-trailer is empty, the air suspension cushions are inflated) the distance was approximately 85 mm, and with the cushion deflated, approximately 25 mm. These and other data allowed us to conclude: during the movement of the motor vehicle, air suspension cushion of the left rear wheel of the last axle of the semi-trailer failed (deflated), as a result of which the wheel tires rubbed against the floor covering of the semi-trailer cargo platform, which led to their increased heating and subsequent ignition.

The main purpose of research on fires in motor vehicle is to identify the mechanism of their occurrence, as well as to identify this event as a key factor that led to the ignition. Analyzing the causes of motor vehicle fires is a difficult task due to the destruction or significant damage to the traces of combustion on the object. This is due to the compactness of the units and assemblies, the speed of fire development, as well as strong thermal and flame effects. As a result of the analysis, an information model is created that reflects the mechanism of fire occurrence and development. For determining the cause of the ignition, version analysis is used that is based on tracking mechanism of combustion from a potential ignition source. Taking into account the location of the primary fire source and the characteristics of the combustible load, expert assumptions are formed regarding the possible ignition source. If the proposed version does not correspond to the coordinates of the primary fire source or the power of the source is insufficient to ignite the material, it is rejected. The approved version serves as the basis for collecting, systematizing and analyzing information. It is a probabilistic logical construct: preliminary hypothesis that requires further clarification, verification and reasoned confirmation.

Verification of the proposed versions involves two points: refutation of versions that contradict the facts of objective reality and substantiation of the version that remains after eliminating the rest.

Conclusions

The main causes of fires on motor vehicles are considered. Most of the causes of such fires are classified. Intentional and unintentional fires are considered in detail. The main distinguishing signs of these groups of fires are given. The main causes of unintentional fires on motor vehicles are recognized as the interaction of a combustible substance in the event of depressurization of the fuel system with a potential thermal pulse of the exhaust gas system, as well as thermal manifestations of electrical energy, in particular, a short circuit of the motor vehicle electrical equipment. During a visual inspection of specific traces on motor vehicle, the expert is able to properly justify the use of a combustion intensifier in a fire. For fire protection, it is recommended to introduce a fire extinguishing system in the under-engine compartment (the most potentially dangerous place) as an additional option when assembling motor vehicle at the factory or in specialized services. In addition, electric vehicles and hybrid vehicles should be equipped with fire extinguishers of the appropriate type, designed to extinguish lithium, with corresponding changes to the standards for equipping vehicles with fire extinguishers.

Особливості виникнення та дослідження пожеж у сучасних транспортних засобах

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Метою статті є викладення алгоритму визначення механізму виникнення пожежі з урахуванням наданих на експертизу матеріальних і матеріалізованих джерел інформації. Для досягнення поставленої мети застосовано як загальнонаукові, так і спеціалізовані методи наукового пізнання, поміж яких системний підхід, порівняльно-правовий метод, дедукція й індукція, а також методи тлумачення, структурного аналізу та спостереження. Розглянуто наявну пожежну небезпеку в різних видах автотранспортних засобів і наведено відповідні статистичні відомості. Досліджено характерні причини пожеж для автотранспортних засобів та виконано їх умовну диференціацію. Наведено можливі сценарії перебігу таких пожеж, зазначено ймовірні місця виникнення загорянь. Докладно проаналізовано особливості навмисних і ненавмисних пожеж. Наведено основні відмінні ознаки цих груп пожеж. Основними причинами ненавмисних пожеж на автомобільному транспорті визнано взаємодію горючої речовини в разі розгерметизації паливної системи з потенційним тепловим імпульсом системи випуску відпрацьованих газів, а також теплові вияви електричної енергії, зокрема коротке замикання електричної апаратури автомобіля. Виробникам транспортних засобів і/або їхнім власникам запропоновано обладнувати транспортні засоби автоматичною системою пожежогасіння і вогнегасниками відповідного типу, що передбачають гасіння саме із метою мінімізувати матеріальні втрати та вплив небезпечних чинників пожежі на людей і довкілля.

Ключові слова: *автомобіль; джерело запалювання; інтенсифікатор горіння; пожежна*

небезпека; причина пожежі; транспортні засоби.

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The authors declare no conflict of interest.

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Improvised Incendiary Device Components

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The paper highlights the lack of definition for improvised incendiary device components in current foreign and domestic methodologies and reference literature used by specialists to conduct forensic fire and technical examinations. The purpose is to distinguish between basic and complementary components of improvised incendiary devices for subsequent use in forensic fire and technical examinations. To fulfil the goal, the method of system and structural analysis has been employed. The lack of methodologies and methods for studying improvised incendiary devices complicates the determination of a specific source of ignition that has resulted in the ignition of a certain material (substance) or has sufficient energy to ignite a corresponding combustible medium at the seat of a fire (in the context of forensic fire and technical examinations), leading to a probable rather than a categorical, expert conclusion, and sometimes to the impossibility of determining the cause of a fire at all. Stemming from the results of conducted studies (expert experiments), the author outlines the structure, interconnection, and principle of operation of individual improvised incendiary device components. The potential for combustible substances to ignite from ignition devices has been determined. Expert experiments have been visualized. The components of improvised incendiary devices are differentiated into basic and complementary. This contributes to the development of techniques and methods for researching improvised incendiary devices in the context of forensic fire and technical investigations.

Keywords: *fire; fire research; fire and technical examination; ignition source; improvised incendiary device; arson; fire investigation.*

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Research Problem Formulation

Amid martial law in Ukraine, the use of improvised incendiary devices to commit arson against the property of military servicemen, volunteers, and military units intended to confront the Russian occupiers has increased.

The analysis of current methods and reference literature that should be employed by specialists during forensic fire and technical examinations has revealed a lack of both methods for investigating improvised incendiary devices and a description of their components.

The description of the structure, interconnection, and principle of operation of both individual components of improvised incendiary devices and their overall operation will make it possible to begin work on methods of their research with further presentation in the corresponding methodology, which will subsequently help to identify specific sources of ignition, the mechanism of fire outbreaks, and, consequently, to solve crimes associated with arson.

Article Purpose

Identify basic and complementary components of improvised incendiary devices for further use in forensic fire and technical examinations.

In pursuit of this goal, it is essential to:

- analyze the presence of a definition for improvised incendiary device components with reference to the manuals for conducting forensic fire and technical examinations [1] and other publications [2] outlining the study of fires with signs of arson;
- analyze expert experiment results regarding the study of improvised incendiary devices;
- identify components of improvised incendiary devices;
- differentiate components of improvised incendiary devices into basic and complementary ones;
- systematize and visualize the division of improvised incendiary device components.

Research Methods

To fulfil the goal, the method of system and structural analysis has been applied.

Analysis of Essential Researches and Publications

The section of the Fire Research Reference Methodological Manual (hereinafter referred to as the *Manual–1999*), which includes the procedure for conducting research into the occurrence of combustion due to arson, only states that there are devices designed to ignite after some time. At that time the attacker can be in another place and provide himself/herself with an alibi (for example, unswitched heating devices and clock mechanisms) [3]. However, the description of improvised incendiary device components is not provided in the 1999 Manual.

The glossary of some general and special terms from Appendix 2 of the *Fire Investigations and Forensic Examinations*

1 Степаненко С. Г., Білкун Д Г., Яник Я. М., Тимощук Ю. Т. Дослідження пожеж : довідк.-метод. посіб. Київ, 1999. 224 с. ; Безвесільний В. Д., Дьяченко О. Ф. Розслідування та судові експертизи пожеж : довідк.-метод. посіб. Харків, 2007. 360 с.

2 Їх же. Дослідження пожеж з ознаками підпалу : монографія. Харків, 2006. 72 с.

3 Степаненко С. Г., Білкун Д Г., Яник Я. М., Тимощук Ю. Т. Зазнач. твір.

Reference Manual (hereinafter referred to as the *2007 Manual*) contains only the *means* concept (*"a tool, an aid, a device by which action is performed")* and a note that the offenders can use, for example, an ignition source, such as a heated coil of an electric stove, etc., to commit arson [4].

However, the 2007 Manual as well as the 1999 Manual lack the outline of improvised incendiary device components.

To identify means used to commit arson, the *Fire Investigations with Signs of Arson* Monograph (hereinafter referred to as the Monograph) recommends paying attention to patterns [5].

As evidenced by practice, the investigator and forensic expert can notice multiple signs of ignition sources resulting from the action of various tools and/or devices: from the simplest (match flame) to complex technical means (with electric heating elements and special chemical composition). When identifying them, it is important to examine the residues of chemicals, objects, and products found at the seat of a fire in order to characterize ignition sources used to start the fire (violation of operating or maintenance conditions within a facility; presence of a source of thermal energy generated by a special device or equipment that has resulted in the ignition of a combustible medium). Electrical ignition sources include, in particular, artificially manufactured electrical devices for starting fires.

Recently, criminals have increasingly used modern achievements of science and technology during the manufacture of specialized technical aids for committing arson [6]. Based on the response time, they are divided into the following means and devices:

- *instantaneous,* designed to ignite instantaneously and installed in such a way that they can be activated without having to enter a room;
- *delayed action,* intended to ignite after a certain period, allowing criminals to provide themselves with an alibi.

Depending on activation specifications, these are electrical, mechanical, firearms, explosives, chemical-reactive, complex-technical aids (devices), etc.

The analysis of cases investigating this category of fires has demonstrated that arson is most often committed using:

1) incendiary devices, components of which are capable of forming an ignition source object through interaction (fire, heated body, a spark, as well as heat accumulated by radiation or convection);
2) the simplest means widely used in everyday life (candles, matches, lighters, tobacco products, rags soaked in grease or impregnated with flammable or combustible liquids, etc.);
3) substances capable of spontaneous combustion and acceleration of the combustion reaction;
4) substances-intensifiers and related objects that promote the development of combustion during the occurrence or spread of a fire (residues of flammable liquid, combustible liquid).

Incendiary devices are primarily designed and used to ensure that ignition occurs with time delay, allowing the arsonist to flee the scene. For this purpose, many mechanical devices have been developed, primarily linked to basic combustion initi-

4 Степаненко С. Г., Білкун Д Г., Яник Я. М., Тимощук Ю. Т. Зазнач. твір.
5 Безвесільний В. Д., Дьяченко О. Ф. Дослідження пожеж ... .
6 Там само.

ators: lighters, matches, etc. Criminals employ devices that focus the sun's rays on the matches so that they ignite over some time. In the case of matches, a smoldering cigarette is also placed in the box to ensure the slow action of an incendiary device. Overall, matches are one of the most commonly used ignition devices since they contain phosphorus. The composition of the match head can be determined by chemical analysis.

Sometimes candles are used to start a fire. The burning time of a candle depends on its size. It helps to regulate the timing of a fire. Let us stress that molten wax or paraffin from a candle can get into the pores of wood and survive a fire even better than the wood itself: this will help to substantiate the arson version and identify the source.

Criminals frequently utilize devices with clockwork, electronic ignition, which ignite combustible substances using heated plates. In this case, the interval between switching on and ignition can be more than 12 hours. Various devices containing electric light bulbs, wires that heat up and come into contact with combustible material, etc., are also utilized. The ability to automatically turn on such devices enables to set the device's operating time and the period for igniting fire load materials in a wide range.

To facilitate the spread of combustion, paths made of spilled liquid on the floor, fibrous materials soaked in flammable liquid, etc., are commonly used.

At the same time, the Monograph [7] fails to provide a description of improvised incendiary device components, as do the 2007 and 1999–Manuals.

Moreover, foreign information sources presenting research findings on fires and arson also do not mention the components of improvised incendiary devices [8].

7 Безвесільний В. Д., Дьяченко О. Ф. Дослідження пожеж … .

8 Eroglu Y. Text Mining Approach for Trend Tracking in Scientific Kesearch: A Case Study on Forest Fire. *Fire*. 2023. 6(1):33. DOI: 10.3390/fire6010033 (дата звернення: 08.01.2025) ; Gales J., McNamee R. Fire research for timber structures. *Fire and Materials*. 2023. Vol. 47. Is. 4. Pp. 413—414. DOI: 10.1002/fam.3140 (дата звернення: 02.01.2025) ; Perry J. Innovative Fire Fighting Strategy / Advances in Forest Fire Research. Ed. D. X. Viegas, L. M. Ribeiro. Universidade de Coimbra, 2022. Pp. 1675—1681. DOI: 10.14195/978-989-26-2298-9_257 (дата звернення: 23.12.2024) ; Yang Y., Du H., Yao G. A Scientometric Research on Applications and Advances of Fire Safety Evacuation in Buildings. *Fire*. 2023. 6(3):83. DOI: 10.3390/fire6030083 (дата звернення: 25.12.2024) ; Lim O. K. Bibliometric Analysis of Research Topics on Fire Safety. *Fire Science and Engineering*. 2023. Vol. 37. Is. 1. Pp. 129—137. DOI: 10.7731/KIFSE.6a32f1fd (дата звернення: 31.12.2024) ; Christ S., Schwarz N., Sliuzas R. Measuring fire risk perception of residents before and after a fire / Advances in Forest … . Pp. 682—688. DOI: 10.14195/978-989-26-2298-9_104 (дата звернення: 09.12.2024) ; Scribner C. F. A Is for Arson: A History of Vandalism in American Education. Ithaca, NY : Cornell University Press, 2023. 240 p. DOI: 10.1515/9781501770739 (дата звернення: 12.12.2024) ; Arson, n.[1]. Arson, n.[2] / Oxford English Dictionary. 3rd ed. Oxford University Press, 2024. URL: https://www.oed.com/search/dictionary/?scope=Entries&q=arson (дата звернення: 25.11.2024) ; Woods R. Wildfire Arson Prevention Guide. 1st ed. CRC Press, 2023. 128 p. DOI: 10.4324/9781003353843 (дата звернення: 27.11.2024) ; Kwon H., Kim S., Seo J. The Typology of Korean Arson and Predictive Factor for Serial Arson. *Journal of The Korean Data Analysis Society*. 2020. Vol. 22. Is. 1. Pp. 387—401. DOI: 10.37727/jkdas.2020.22.1.387 (дата звернення: 19.11.2024) ; Noon R. K. Introduction to Forensic Engineering. 1st ed. CRC Press, 1992. 220 p. ; Horsley F. K. New Perspectives on Arson and Firesetting: The Human-Fire Relationship. Taylor & Francis Group, 2021. 132 p. DOI: 10.4324/9780367808648 (дата звернення: 02.01.2025) ; Stanley J. R. Preventing rural arson / Rural Crime Prevention. Theory, Tactics and Techniques ; Ed. by

Within forensic fire and technical examinations, it is hard to identify a specific ignition source that has resulted in the ignition of a particular material (substance) or has enough energy to ignite the corresponding combustible medium at the seat of a fire given the lack of methods and techniques for researching improvised incendiary devices. In turn, the fact that a specific ignition source cannot be identified leads to a probable, rather than a categorical, expert conclusion as to the actual cause of a fire, and sometimes proves that it is impossible to determine the cause of a fire at all.

Therefore, researching improvised incendiary devices is highly relevant. That is why the paper's purpose is to determine basic and complementary components of an improvised incendiary device for their subsequent use within forensic fire and technical examinations.

Main Content Presentation

All improvised incendiary devices are distinguished by a particular set of design elements. Certain parts of these elements (intact or remnant ones) may be found at the fire scene. What is more, a person who manufactured such a device must possess appropriate skills and specific expertise, as well as use certain components, parts, equipment, substances, etc., to create this device. Improvised incendiary devices or their remnants found at the scene of a fire should retain corresponding specifications. Identifying these specifications will enable to draw conclusions on their general structure, design elements, and principle of operation. Consequently, this will facilitate the comparison of improvised incendiary devices from a single source of origin during research.

In a previous study, we proposed the following definition: "***Improvised incendiary device*** *is a device in which at least one of the design elements is made in an improvised way or its non-industrial unregulated assembly is used, i.e., the structure of the device finally prepared for ignition of combustible substance or combustible medium is not determined by the relevant technical requirements for its manufacture, installation, use, etc."* [9]. This definition stems from the previously formulated and widely employed concept of *improvised explosive device* [10].

The analysis of current methodologies and reference literature that forensic experts should use when conducting forensic fire and technical examinations has revealed a lack of differentiation in the concept of *improvised incendiary device.* Therefore, there is a need to formulate the concept of *improvised incendiary device* using a system of signs and criteria that will help resolve the issue of whether any objects belong to this category.

From our perspective, the main signs determining whether objects under study

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9 Кузьменко М. Саморобний запа́льний прилад: визначення поняття. *Теорія та практика судової експертизи і криміналістики.* 2024. Вип. 4 (37). С. 206. DOI: 10.32353/khrife.4.2024.12 (дата звернення: 08.01.2025).

10 Прохоров-Лукін Г. В., Пащенко В. І., Биков В. І. та ін. Методика комплексного дослідження вибухових пристроїв, вибухових речовин і слідів вибуху. Київ, 2007. 218 с. : іл. URL: https://arm.naiau.kiev.ua/arm/arm_bmb_exp/idb/metod_wte.html (дата звернення: 08.01.2025).

belong to the category of improvised incendiary devices are as follows:

- presence of a combustible liquid or distinctive traces of its combustion, along with a device for triggering the ignition;
- ability to inflict damage;
- single use;
- use of thermal energy;
- special preparation of a device for ignition.

It should be borne in mind that the ability to cause damage, i.e., physical or thermal damage, is of paramount importance in determining whether an object is an improvised incendiary device (in addition to special preparation).

Special preparation of a device for ignition may be attributed to the fact that a certain action has not been fulfilled. For instance, a person who made an improvised incendiary device planned to use it in an arson attack, even though the attack may not have occurred (e.g., due to imperfect design, improper storage conditions, damage during transportation or installation, etc.). With regard to the ability to cause damage, it implies the necessary experimental verification of relevant damage parameters of an improvised incendiary device, which is a statement of fact, not of intent. Thus, such criteria for determining whether an object is an improvised incendiary device as special preparation for ignition and the ability to inflict damage need to be analyzed as a cohesive whole.

Single use refers to the idea that after use, an improvised incendiary device is destroyed and partially damaged because of thermal effects, the destructive action of design elements that are modified (destructed, deformed, etc.) during a fire, actions of fire and rescue units, etc., which hinder reuse of a device. Presence of a thermal damage factor is a criterion in determining whether an object is part of an improvised incendiary device.

Guided by the results of expert practice and research, we can single out the following components of improvised incendiary devices:

- combustible substance;
- ignition device;
- body;
- extra batteries;
- toggle switches, push button switches, target sensors, electronic units, etc.

Let us take a closer look at these components.

Combustible substances used by people who make improvised incendiary devices can be combined into two groups:

- *traditional* combustible substances (including various flammable and combustible liquids);
- *special* combustible substances containing flammable components.

By the method of ignition, combustible substances are split into two main classes:

- • forced ignition;
- • self-igniting.

Combustible substances of *forced ignition* include:

- flammable and combustible liquids;
- mixtures based on flammable and combustible liquids;
- pyrotechnic components;
- metallized mixtures derived from flammable and combustible liquids.

Self-igniting combustible substances comprise:

- chemically active substances;
- special pyrotechnic components.

The most common and accessible flammable and combustible liquids that are most commonly used as combustion intensifiers can be classified into the following groups:

- light oil products (gasoline, diesel fuel, kerosene, etc.);

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- varnish and paint solvents;
- other flammable and combustible liquids (perfumes, colognes, hairsprays, alcohols, ethers, glues based on organic solvents, fire starters, drying oil, antiseptics, some dry-cleaning products, etc.) [11].

Expert practice analysis has demonstrated that components of improvised incendiary devices consist of only combustibles of forced ignition while self-igniting combustible substances do not need the special components found in improvised incendiary devices. For example, attackers take advantage of the properties of acids by placing them in containers made of unstable materials, which, as a result of corrosion, cause these acids to come into contact with cellulose materials, which then ignite [12]. Moreover, studies have shown that arsonists most frequently use various brands of gasoline and diesel fuel (as combustibles) to force ignition, given their availability.

Ignition devices utilized to make improvised incendiary devices usually combine improvised and industrially manufactured products (the latter are modified and/or altered by perpetrators).

The most widely used design elements of ignition devices are:

- mechanical and electronic clockwork and countdown timers;
- industrially manufactured electric heating and lighting devices, etc., capable of causing the ignition of a combustible substance after a fixed period;
- radio-controlled devices.

Research practice reveals that the ignition of a combustible substance in improvised incendiary devices is most often initiated by electricity. This initiation is widely functional due to the possibility of using various methods of actuation (such as remote control, countdown timer, clock chime, target sensor, etc.). What is more, electrical initiation allows a person who installed (planted) the improvised explosive device to be far from the scene, in safety.

For instance, we can provide the example of the following improvised incendiary device: a mobile, to which speaker contacts the ends of the electrical wires from a broken light bulb of an electric garland were soldered, and the spiral of the light bulb was immersed in powdered sulfur from match heads; the sulfur was wrapped in adhesive tape and stuck to a plastic bottle of gasoline with the same tape; there were forty-eight tablets of dry fuel (urotropine) and seven more gasoline bottles next to the bottle; all of the above were placed in a plastic bag.

In the course of the expert experiment, it was found that after the mobile alarm went off, the sulfur ignited. Afterward, we could observe a steady flaming burning of a dry fuel tablet (urotropine; *see Figs. 1–3*).


Fig. 1

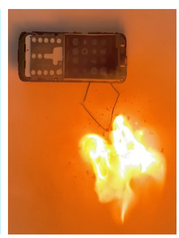
Fig. 2

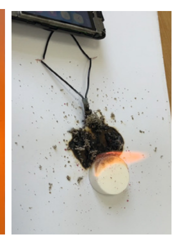
Fig. 3

As supported by reference literature, the flame temperature during dry fuel (urotropine) combustion is sufficient to ignite

11 Матіюк О. О., Сова С. А., Тимчук Р. Б. Виявлення та аналіз зовнішніх (візуальних) ознак застосування легкозаймистих і горючих рідин на місці (об'єкті) пожежі : інформ. лист. Київ, 2021. 48 с. : іл.

12 Степаненко С. Г., Білкун Д. Г., Яник Я. М., Тимощук Ю. Т. Зазнач. твір.

gasoline and melt plastic bottles containing it, which could cause gasoline to leak from them. Thus, the highest flame temperature for burning solids, not accompanied by smoldering, is 850–1050 °C[13]. Gasoline is a flammable, transparent liquid, a mixture of light hydrocarbons with an autoignition temperature ranging from 255 to 370 °C[14]. The maximum melting point of food-grade plastic is 170 °C[15].

Here is another example of an improvised incendiary device: a mobile, a battery, a switch, an electronic unit, a connecting element, electrical wires, and a coil assembled into a single construction (*see Fig. 4*).

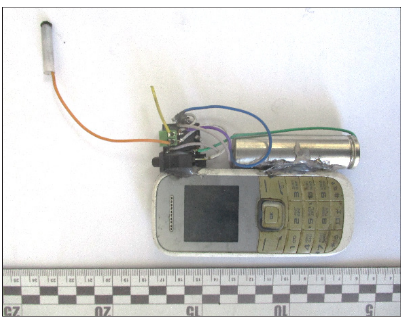

Fig. 4

Research has shown that sulfur can ignite from an ignition source such as a heated coil. Given the contact between the substances in the previous example, we know that sulfur can ignite dry fuel (urotropine), which in turn can ignite gasoline and/or melt plastic bottles containing it, causing gasoline to leak and then catch fire.

The coil was placed in a white polymer tube, fixed with a brown solid substance (sulfur). When this tube was dismantled, a black substance (gunpowder) was identified within it. The device was attached to a plastic gasoline bottle with rubber bands. The bottle was wrapped in paper which held the gunpowder in place.

To prepare for the expert experiment, a fragment of the brown substance (sulfur) was attached to the coil, a fragment of the black substance (gunpowder) and a small quantity of liquid (gasoline) from a plastic container were placed in a metal lid. Then the coil with the brown substance was pressed against the black substance (gunpowder; *see Figs. 5–7*).

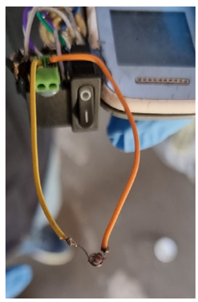

Fig. 5

Fig. 6

Fig. 7

The mobile alarm clock was set to vibrate (*see Figure 8*). After the alarm went off, the brown substance (sulfur) ignited first, followed by the black substance (gunpowder) and the liquid (gasoline; *see Fig. 9*).

Fig. 8

Fig. 9

13 Степаненко С. Г., Білкун Д. Г., Яник Я. М., Тимощук Ю. Т. Зазнач. твір.

14 Бензини автомобільні / НВФ Інтелект. URL: http://surl.li/eytltm (дата звернення: 08.01.2025).

15 Харчовий пластик: PP та HDPE / АДМІРЕЛЬ. 16.11.2020. URL: https://admirel.com.ua/ua/interesno-znat-2/13-stati-2/88-kharchovij-plastik-pp-ta-hdpe (дата звернення: 08.01.2025).

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Drawing upon the research findings, it has been concluded that the brown substance (sulfur) can be ignited by the action of an ignition source in the form of a heated coil provided for the study of the incendiary device. In view of the previously established contact between substances and liquids, it has been determined that the black substance (gunpowder) and the liquid (gasoline) are capable of being ignited by the flame during the burning of the brown substance (sulfur).

Regarding the body as a component of improvised incendiary devices: combustible substances are often placed inside it, although there are instances where the body may not be present.

Thus, basic components of improvised incendiary devices are a combustible substance and an ignition device, and complementary components are the body; additional batteries; toggle switches, push buttons, target sensors, electronic units, etc. (*see Diagram*).

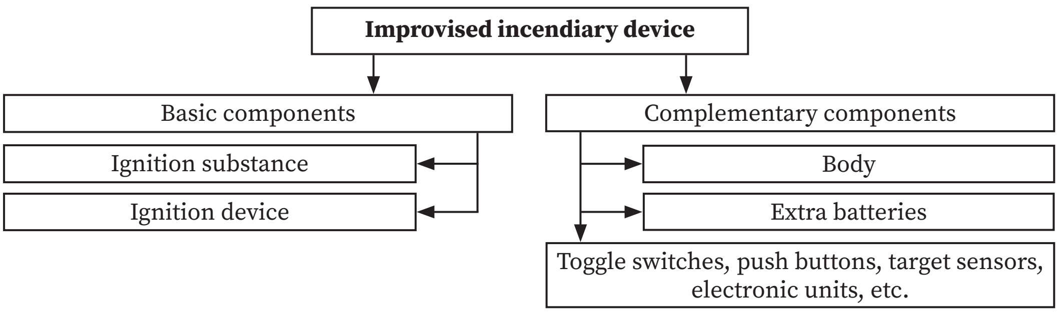

Diagram. Improvised incendiary device components

Conclusions

The article reveals that manuals for conducting forensic fire and technical examinations, as well as research papers researching arson signs, do not outline improvised incendiary device components. The author defines the problems caused by the lack of such information, along with the absence of procedures and methods for conducting research on improvised incendiary devices or their remnants found and seized at the scene of a fire or at facilities of vital human activity. It has been proven that today the development of methods for studying the overall structure, design elements, and operating principle of improvised incendiary devices is relevant for the successful conduct of forensic fire and technical examinations. Expert experiment results on the study of improvised incendiary devices have been analyzed. Improvised incendiary device components have been identified and differentiated. The author has provided a diagram for dividing components of improvised incendiary devices into basic and complementary.

Складові саморобного запа́льного приладу

Михайло Кузьменко

Зауважено відсутність визначення складових саморобного запа́льного приладу в чинних іноземних і вітчизняних методиках та довідковій літературі, якими фахівці послуговуються для проведення судових пожежно-технічних експертиз. Мета — визначити основні й додаткові складові саморобного за-

па́льного приладу для їх подальшого застосування в межах проведення судових пожежно-технічних експертиз. Для досягнення поставленої мети послуговувалися методом системно-структурного аналізу. Брак методик і методів дослідження саморобних запа́льних приладів дуже ускладнює визначення конкретного джерела запалювання, яке спричинило займання певного матеріалу (речовини) або має достатньо енергії для запалювання відповідного горючого середовища в осередку пожежі (у межах проведення судових пожежно-технічних досліджень), що своєю чергою призводить до складання ймовірного, а не категоричного висновку експерта, а інколи й до неможливості з'ясувати причину пожежі. За результатами проведених досліджень (експертних експериментів) визначено будову, взаємне поєднання та принцип дії окремих складових саморобних запа́льних приладів. З'ясовано можливість займання горючих речовин від приладів для запалення. Візуалізовано проведення експертних експериментів. Складові саморобних запа́льних приладів диференційовано як основні й додаткові, що сприятиме розробленню відповідних методик і методів дослідження саморобних запа́льних приладів у межах проведення судових пожежно-технічних експертиз.

Ключові слова: *пожежа; дослідження пожеж; пожежно-технічна експертиза; джерело запалювання; саморобний запа́льний прилад; підпал; розслідування пожеж.*

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Disclaimer

Founders had no role in the research design, data collection and analysis, decision to publish or manuscript preparation.

Participants

The author has contributed solely to intellectual discussion underlying this document, case law research, writing and editing, and assumes responsibility for its content and interpretation.

Declaration of Competing Interest

The author declares no conflict of interest.

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Workshop «Counterfeit Goods: Forensic Experts Say "STOP"»

Forensic Experts of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» and its Kyiv Branch ***Yulia Nosatenko*** and ***Hanna Buniachenko*** took part in the workshop «Counterfeit Goods: Forensic Experts Say "STOP"» organized by the National Association of Patent Attorneys of Ukraine on January 30, 2025. The workshop was held in Uzhhorod for leading forensic experts of Ukrainian and foreign institutions.

The participants considered the issues of illegal trade and illicit trafficking in tobacco products; analyzed the consequences of the presence of counterfeit and smuggled tobacco products on the EU market; possibility of detecting illegal products using a library of samples of packs of tobacco products. Speakers on these issues were representatives of the National Association of Patent Attorneys of Ukraine and the Swiss tobacco industry.

Experts also took part in the workshop "Trace Evidence analysis of tobacco packs", during which an international expert, the head of a leading laboratory in Germany, gave step-by-step methodological recommendations on this issue. In addition, the seminar participants took part in a panel discussion on possibility of using the library of samples of tobacco packs to form an evidence base in criminal and administrative proceedings, which resulted in the presentation of an action plan for the implementation of modern tools for determining illegal products in Ukraine.

All participants received certificates of participation in the workshop.

Information prepared
by Principal forensic expert of NSC FSI
Yulia Nosatenko

I International Scientific and Practical Conference: *Actual issues of development of Ukrainian space of forensic expert activity*

Serhii Tiulieniev, Director of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute»" (hereinafter referred to as NSC FSI) personally participated in the First International Scientific and Practical Conference: *Topical Issues of Development of the Ukrainian Forensic Expertise Space*, organized and held on January 31, 2025 in a mixed format by the Scientific Research Center of Independent Forensic of the Ministry of Justice of Ukraine of Ukraine (hereinafter referred to as SRCIF).

The participants of the scientific event were greeted by: ***Andrii Haichenko***, Deputy Minister of Justice of Ukraine for the Enforcement Service, ***Natalia Tkachenko***, Director of Forensic Science Support to Justice Department, ***Andrii Svintsitskyi***, Acting Director of SRCIF, ***Rolf Holmboe***, Head of EUAM Mission, ***Harsheth Virk***, Head of the UNODC Office, ***Iryna Zharonkina***, Head of Enforcement of Court Decisions and Protection of Property Rights component of the EU Pravo-Justice Project, ***Maksym Kyselov***, Director of Kyiv Scientific Research Institute of Forensic Expertise, ***Mariia Zelinska***, Director of Lviv Forensic Science Institute, ***Dmytro Kishko***, Director of Odessa Scientific Research Institute of Forensic Sciences, ***Anastasiia Kupriianova***, Director of Dnipropetrovsk Scientific Research Forensic Center of the Ministry of Internal Affairs of Ukraine (Dnipropetrovsk SRFC of the MIA of Ukraine), ***Mykhailo Mozhaiev***, Director of SRCFS of IT and Intellectual Property, Heads of Ukrainian and European specialized institutions, representatives of expert community, and honored guests.

In his welcoming speech, ***Serhii Tiulieniev*** stressed that under martial law, forensic expert activity is becoming increasingly important as an integral part of ensuring justice. In honor of the event, the Director of NSC FSI presented the organizers with an ultralight powerful drone *FOXEER RTF_AURA7* to help forensic experts of SRCIF in implementation of forensic activities.

Participants of the event: scientists, forensic experts, practitioners, stakeholders who are actively conducting research and contributing to development of the field of expert support of justice in Ukraine took part in panel discussions: *National and international experience of expert support of justice, Improving the regulatory and legal support of forensic activities in the context of European integration, Improving the efficiency of interaction between forensic entities and the security and defense sector of Ukraine, Building integrity in the field of expert support of justice* and made presentations on improving the regulatory and legal support of forensic activities in the context of European integration, increasing the efficiency of interaction between forensic entities and the security and defense sector of Ukraine. The speakers were not only forensic experts from Ukraine, but representatives of forensic science institutions and organizations from Latvia, Lithuania, Poland, Moldova and other countries.

During the conference, the participants were presented with a new scientific journal *Forensic Science*, which will be published by SRCIF and a postage stamp dedicated to the institution.

Scientific events of this level are a significant contribution to the implementation of European integration tasks to reform the field of expert support of justice in Ukraine, they make it possible to develop new approaches to forensic science and development of professional competencies of forensic experts and scientists through experience exchange.

Information prepared
by a researcher of NSC FSI ***Viktoriia Hrokhovska***

Workshop: ***Countering Illegal Handling of Firearms: Legislative and Practical Challenges***

The European Union Advisory Mission for Civilian Security Sector Reform (*EUAM Ukraine*) held a workshop: *Countering Illegal Handling of Firearms: Legislative and Practical Challenges* in Odessa on 05-06.02.2025 with participation of representatives of the Security Service, State Bureau of Investigation, State Border Guard Service, National Police, the Ministry of Justice and other interested ministries and departments of Ukraine.

From the Ministry of Justice, the event was attended by a leading researcher of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» (hereinafter referred to as *NSC FSI* ***Oleksandr Kolomiitsev***, PhD in Technology

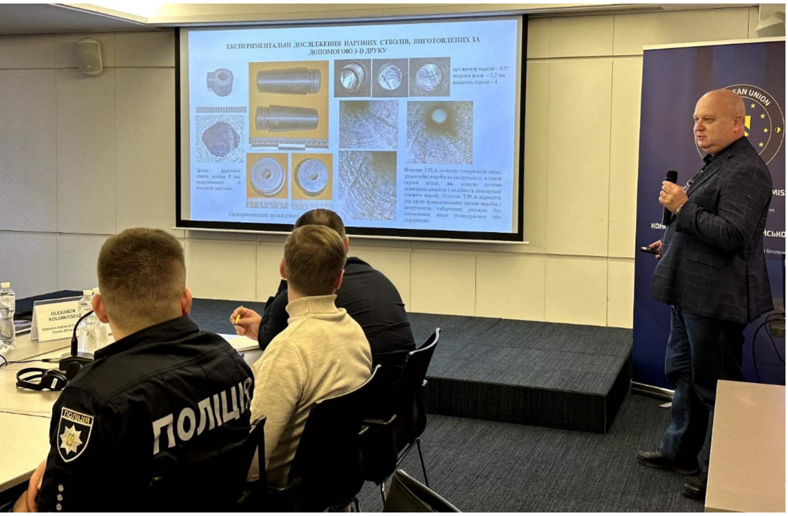
The participants paid special attention to the issues of coordinating the actions of law enforcement agencies to withdraw firearms, light weapons, ammunition and explosives from illegal circulation, as well as preventing their movement across the state border and entering the EU countries.

The meeting announced the launch of the Coordination Center for Combating Illicit Trafficking in Firearms, Their Parts and Components and Ammunition under the auspices of the Ministry of Internal Affairs of Ukraine.

Representatives of *EUAM Ukraine* stressed the need for international cooperation in the issues of lost, stolen and captured weapons, as well as the problematic aspects of the proliferation of dual-use technologies, which can be used by attackers for the illegal manufacture of weapons and ammunition.

The workshop was attended by employees of Odessa SRFC of the MIA of Ukraine, who acquainted the participants with the experience of experts in the use of the latest equipment and methods of investigating criminal offenses related to the seizure of firearms, their use and smuggling. Representatives of the weapons control unit of the licensing system of the Main Directorate of the Ministry of Internal Affairs in Odessa region briefed the workshop participants on innovations related to the register of weapons and registration of weapons by citizens.

Oleksandr Kolomiitsev made a presentation on the peculiarities of forensic identification of firearms made with a 3D printer. He spoke about experience of the staff of NSC FSI and the Kharkiv SRFC of the MIA of Ukraine in conducting identification studies of bullets fired from polymer barrels with rifling made using additive 3D printing technology.



Research results made possible to determine the resource of rifled polymer barrels, the ballistic characteristics of the shot bullets, their damaging properties, as well as the possibility of identifying the shot bullets. The research proved that (despite some specific conditions for the formation of traces from cuts on the surfaces of experimental bullets) it is possible to identify the signs, and identified coincidences of general and individual signs are sufficient to identify a specific sample of firearms, which barrel is made using *3D* printing.

Mr. Oleksandr presented a report on terminal (wound) ballistics and threats to society associated with the use of firearms. He emphasized that it is impossible to understand nature of the threat posed by a particular type of weapon without studying the consequences of its use, especially in case of harm to human health or in fatal cases. Using examples of experimental studies, he familiarized the audience with consequences of impact-contact interaction of high-speed projectiles and bullets of various calibers with a biological tissue simulator. Cooperation with Kharkiv SRFC of the MIA of Ukraine contributed to the enrichment of information on the peculiarities of the mechanism of formation of gunshot and shrapnel wounds, which became the basis for the creation of a computer model of viscoelastic environment, which can be used to predict the nature and extent of injuries caused to the human body in the event of a hit by high-speed kinetic projectiles (bullets, fragments, finished destructive elements), which is of priority importance for medicine and criminalistics.

The information was prepared
by the leading researcher of the NSC IFE
Oleksandr Kolomiitsev

Scientific event: *Women in Science*

On February 14, 2025, employees of National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» took part in the popular science event: *Women in Science*, organized and conducted by the Department for Family, Youth and Sports of the Kharkiv City Council on the occasion of the International Day of Women and Girls in Science and with the support of Kharkiv Mayor Ihor Terekhov, in order to popularize activities of women scientists and to attract young people to scientific activities of the city of Kharkiv.

In the area of presentation of humanitarian specialties, Head of the department of postgraduate and doctoral studies ***Daria Davydenko***, head of Laboratory of Handwriting Analysis, Forensic Linguistics, Forensic Psychology and Art Forensics ***Yevheniia Kovkina*** and leading researcher of laboratory of engineering and technical research ***Andrii Frolov*** presented certain areas of scientific activity of NSC FSI.

Higher educational institutions of the city and region also presented their activities at the scientific exhibition in a safe space. Guests of the exhibition had the opportunity to get acquainted with the developments of scientists of V. N. Karazin Kharkiv National University, Yaroslav Mudryi National Law University, Kharkiv National Medical University, Kharkiv National University of Internal Affairs, etc.

In honor of the holiday, Kharkiv Mayor Ihor Terekhov awarded female scientists, employees of the NSC ICE ***Daria Davydenko*** and ***Yevheniia Kovkina*** with gratitude for the conscientious performance of their duties and achievements that contribute to the development of the scientific potential of our city.

*Information prepared by **Daria Davydenko**,*
Head of Head of Graduate School of NSC FSI

Scientific and practical workshop *Peculiarities of appointment and conducting forensic examination of narcotic drugs, psychotropic substances and precursors*

Ukrainian Research Institute of Special Equipment and Forensic Science of the Security Service (hereinafter referred to as *ISEE SSU*) organized and held on February 27, 2025 in a mixed format (offline in Kyiv and online on the Zoom platform) scientific and practical workshop: *Specifics of the appointment and conduct of forensic examination of narcotic drugs, psychotropic substances and precursors*, which was attended by representatives of ISEE SSU, SSRFC of MIA, regional SRFC of MIA, Odessa Scientific Research Institute of Forensic Sciences and representatives of other institutions and organizations, in particular, from National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» (hereinafter referred to as NSC FSI), Head of laboratory of Forensic and Military Examinations ***Kateryna Rudnieva*** and Senior Forensic Expert of Department of Engineering and Technical Research of Kyiv Branch of NSC FSI ***Tetiana Filonenko***.

Employees of NSC FSI presented the report: *Specifics of the research of opium poppy within the framework of a comprehensive examination of objects of plant origin and the study of narcotic drugs, psychotropic substances, their analogues and precursors*.

Participants of the scientific event discussed the issues of expert support for the investigation of crimes related to the illegal manufacture of narcotic drugs, psychotropic substances and precursors; counteraction to the creation of drug laboratories; legalization of cannabis in Ukraine, its legal status, issues of analyzing cannabis and its products within the framework of forensic activities; research of objects containing Tetrahydrocannabinol and Buprenorphine and other relevant issues.

The speakers outlined the current issues of forensic examination of narcotic drugs, psychotropic substances and precursors, topical issues of research and regulatory regulation of the field of expert support of justice, methodology and techniques of forensic examination.

The participants paid special attention to the issues of terminology in accordance with the new version of the legislation on cannabis-derived drugs, considered other problems faced during the forensic examination of narcotic drugs and psychotropic substances and shared their experience.

Content of this scientific and practical event will be useful to scientists, judges, forensic experts, law enforcement officers, teachers and degree applicants of specialized institutions and organizations.

Information was prepared by ***Kateryna Rudnieva****,*
Head of Laboratory of Forensic
and Military Examinations of NSC FSI

Requirements for content

According to the Edition subject matter, content regarding coverage of criminalistic current issues, relevant issues of performing various types of forensic examinations and specific expertise application in legal proceedings is published on the pages of the Scientific Edition.

Based on research, presentational, evaluative and communicative functions of the Scientific Edition, **research papers** (where an author outlines main work outcomes); **research and methodological papers** (where an author analyses methods, processes, tools helping to achieve certain scientific results); **research and theoretical papers** (texts where an author presents results of theoretical ways for problem solution); **research and practical** (articles where an author describes his personal practical experience and performed scientific experiments), **review research papers** (dedicated to evaluation, conclusions, overview, analysis of earlier published information). The Editorial Board is also interested in **debatable articles, research ideas or short reports:** results of an experiment, personal experience, etc. Scientific style of the content presentation (accuracy, logic, conciseness, clarity, connectivity, integrity, completeness) and its high scientific level.

Article structural elements should include:

- Article Title;
- Abstract and Keywords. Abstract (summary) text should be not less than 1,800 characters (separately in article language and English). Abstract should include the following: outline of research problem, *purpose*, main research results, conclusions, keywords (7—10 words, should match the content of the article and display the publication topic). Titles of annotation structural parts other except the purpose should not be indicated;
- Formulation of research problem, its connection with scientific and practical interests (it is necessary to reveal essence and state of the scientific problem, theoretical and practical significance of a research, connection with scientific and practical tasks, substantiation of the research relevance);
- Article purpose (it is necessary to formulate the publication main thesis differing from previously considered research on the chosen topic in accordance with outlined problem and analysis of current researches);
- Research methods applied (are presented individually if they contain novelty and are notable, given the article subject matter);
- Analysis of essential researches and publications on the selected article topic, outlining the problematic field of the research that article is devoted; with obligatory reference to authors and their scientific papers;
- Main content presentation with obtained results (to reveal important theoretical positions and research results, analyze scientific facts, ideas, thoughts, regularities, concepts, as well as trends of further topic development, emphasizing personal contribution of the research author(s));
- Conclusions (main research results in a clear, consistent, logically presented form in compliance with set goal)*;*
- References (the list of used sources transliterated according to the Roman alphabet, for example, on the site of Vernadsky National Library of Ukraine: *http://nbuv.gov.ua/node/929*);
- Abstract in English, indicating the author(s) surname, article title and keywords.

Requirements for scope

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