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MODERN TYPES OF EXPERTISE USED IN THE INVESTIGATION OF CRIMINAL CASES

ANNOTATION

Expertise holds immense importance in the investigation of crimes, serving as a crucial component in both forensic examinations and courtroom proceedings. Specialized knowledge is essential for conducting examinations during investigation and verification processes, such as analyzing fingerprints, determining weapon-related injuries, and verifying the authenticity of documentary evidence. This paper examines the legal principles surrounding expertise in criminal investigations, emphasizing its role in determining significant circumstances and providing evidence in judicial proceedings. The involvement of experts, their rights, obligations, and the process of forensic examination are outlined, highlighting the diverse expertise types employed, including DNA analysis, behavioral analysis, and cybercrime investigation. Moreover, advancements in forensic examination methodologies and technologies are discussed, underscoring the evolving landscape of expertise in crime investigation.

Keywords: expertise, criminal Investigations, forensic examination, legal principles, judicial proceedings, DNA Analysis, behavioral analysis, cybercrime investigation, forensic anthropology, ballistics

The importance and legal principles of expertise in the investigation of crimes

Expertise plays a significant role in the process of solving crimes that require forensic examination, as well as during its examination in court proceedings. Moreover, special knowledge, i.e., expertise, is necessary when conducting examination during investigation and verification time. For example, in cases where fingerprints found at the scene of the incident need to be examined to determine who left them, or in determining how a certain type of weapon caused injuries, or in cases where the authenticity of documentary evidence needs to be verified, such as signatures written by certain individuals. Such examinations are conducted by individuals with specialized knowledge. According to Article 172 of the Criminal Code of the Republic of Uzbekistan, "When it is necessary to obtain information about significant circumstances for work from a specialist in the field of science, technology, art, or craft, the examination is appointed."

The process of judicial expertise, based on procedural law, is carried out by a specialist appointed by investigative or judicial authorities, and its result is officially recorded as an expert opinion. This opinion serves as evidence in criminal (civil, economic, administrative) cases and is evaluated along with other evidence.

Specialists with expertise, craftsmen, artists, agricultural workers, builders examine various complexes, including projects implemented, the adequacy of scientific and technical solutions, identifying engineering errors, assessing the ability of workers and employees to work, identifying negligence, and solving other wide-ranging issues.

Employees of judicial and investigative bodies must have specialized knowledge to carry out the examination, as the process of determining the guilt or innocence of a person depends on it. Their rights and obligations are defined in Article 68 of the Criminal Procedure Code of the Republic of Uzbekistan.

An expert in the field (science, art, technology, craft) who has legal and procedural competence is responsible. Their rights and obligations are determined by Articles 68 and 69 of the Criminal Procedure Code. The specialist must be fully involved in the process of solving crimes, ensuring its completeness.

The role of a specialist in forensic matters includes collecting, analyzing, reinforcing, and using scientific and technical means, providing recommendations in certain situations. For example, in solving murder cases, determining the time and cause of death, assessing the method of committing the crime, ensuring that the evidence conforms to criminal law, determining the distance and direction of the gunshot from which the bullet was fired, identifying the means and methods used by the perpetrators, and other issues within the competence of a forensic specialist.

The process of involvement of a specialist in forensic matters is regulated by procedural law. This provision also applies to forensic experts. Experts and specialists who participate in investigative and judicial processes must be involved in determining the facts independently and objectively, with each having their own procedural status and functions.

All expert participants are specialists in their field and carry out their duties in accordance with the tasks assigned to them, whether it be participating in investigative actions or providing assistance in court proceedings, acting as advisors, assistants, or consultants during the forensic process.

The involvement of a specialist in investigative activities and court proceedings is stipulated in the regulations, and their advice and explanations, independent evidence, and explanations do not constitute independent evidence.

Entry into forensic examination

Forensic examination is a collection of scientific methods and technologies used to investigate crimes. It encompasses ballistic analysis, DNA analysis, digital examination, toxicology, and various other methods. These methods are employed to identify and analyze evidence that aids in the prosecution of criminals and the determination of suspects' guilt.

- DNA analysis in prosecuting criminals

DNA analysis is one of the most powerful methods used in forensic examination. This method allows for the establishment of a connection between genetic material and physical evidence or suspects. DNA analysis can be utilized to identify suspects, determine paternity, detect genetic diseases, and more.

- The role of forensic anthropology in identifying human remains

When it comes to identifying human remains, forensic anthropology plays a crucial role. Forensic anthropologists utilize their knowledge of skeletal anatomy to determine age, sex, and ethnicity and ascertain the cause of death. These specialists can also utilize evidence found at the scene to assist in identifying the individual.

- Forensic odontology in prosecuting crimes

Forensic odontology, also known as forensic dentistry, involves the evaluation and examination of dental evidence in criminal investigations. Forensic dentists conduct post-mortem examinations and assessments to evaluate dental features, conduct necessary extractions, and compare dental records and impressions. Additionally, they may utilize X-rays to analyze dental anatomy and perform restorative dental procedures like fillings. They compile this information to aid in identification and collaborate with other professionals to determine the cause of death.

- **Ballistics in prosecuting crimes**

Ballistics involves the study of firearms and other projectiles' movements and behaviors. In the context of prosecuting crimes, ballistics helps determine the type of firearm used and the trajectory of projectiles, aiding in understanding the circumstances of the crime.

- **Digital examination and cybercrime prosecution**

Digital examination involves the use of computers and other electronic devices to collect and analyze evidence for prosecution purposes. This method can be employed in investigating cybercrimes such as hacking, identity theft, and fraud. Digital forensics experts analyze evidence from hard drives, phones, computers, and other electronic devices to aid in prosecuting criminals.

- **The significance of toxicology in forensic examination**

Toxicology involves the study of the effects of various chemical substances on the human body. In a forensic context, toxicology helps determine if a suspect was under the influence of drugs or alcohol at the time of the crime. If a perpetrator was poisoned, toxicology can assist in identifying the substance used and determining the cause of death.

- **Advancements in forensic examination**

Forensic examination continues to evolve with advancements in technology and methodologies to assist prosecutors and defense attorneys in identifying evidence and analyzing it effectively. Some recent developments include:

- Utilizing carbon nanoparticles to recover fingerprints: Researchers have discovered a method for using carbon nanoparticles to detect fingerprints, particularly useful in analyzing crime scenes. Fingerprints are crucial in many criminal investigations, but they can be challenging to obtain. This new technique enhances the visibility of fingerprints, even in difficult circumstances.

- Artificial intelligence (AI) applications: AI is increasingly being used in various fields, including forensic examination. AI algorithms can analyze large datasets, such as fingerprints, DNA samples, and surveillance footage, to identify patterns and assist in criminal investigations. AI technology has the potential to streamline and improve forensic analysis processes, making them more efficient and accurate.

- Luminescent carbon dot technology for fingerprint analysis: Researchers have developed a new method using luminescent carbon dots to enhance the visualization of fingerprints. These carbon dots emit light when exposed to ultraviolet radiation, making it easier to detect fingerprints on various surfaces. This technology improves the efficiency and accuracy of fingerprint analysis, aiding in criminal investigations.

- Psychological profiling: Psychological profiling, also known as offender profiling or criminal profiling, is another type of forensic examination used in prosecuting crimes. This method involves analyzing a perpetrator's behavior and characteristics to create a psychological profile. Psychological profilers examine crime scenes, witness statements, and other evidence to develop profiles that can help investigators understand the motivations and characteristics of criminals.

In conclusion, forensic examination encompasses a wide range of scientific methods and technologies used to investigate crimes and prosecute criminals effectively. Advances in technology and methodologies continue to improve forensic examination processes, making them more efficient and accurate. These advancements help ensure that justice is served and aid in the prosecution of criminals.

Foreign Country Temporal Expertise Centers and Types

Temporal expertise centers are facilities established for the analysis and empowerment of the most advanced experiences, innovations, and other new ideas and works in various fields to analyze and support the most advanced experiences. These centers provide assistance in scientific research, innovation, and the creation of new works in the field of expertise.

Temporal expertise centers are available in several countries around the world. For example, in the United States, there are famous temporal expertise centers such as the National Institute of Standards and Technology (NIST), the Massachusetts Institute of Technology (MIT), and the California Institute of Technology (Caltech).

Temporal expertise centers are also available in other countries. For example, in Europe, there are centers such as the Centre for European Policy Studies (CEPS) and the European Centre for International Political Economy (ECIPE). Each of these centers specializes in its own areas and conducts research in various directions.

Temporal expertise centers cover various fields, such as manufacturing, advanced technologies, automation, digital electronics, chemistry, biotechnology, medicine, legal expertise, and others.

There are several temporal expertise centers in China, and some of them can be mentioned as follows:

China Forensic Medical Center (CFMC): CFMC is a national-level forensic expertise center that provides laboratory analyses and forensic medical services. It has experienced forensic medical experts and has advanced laboratory facilities for DNA analysis, fingerprint analysis, and toxicology analysis. **National Center for Forensic Science (NCFS):** NCFS is a research institute under the Ministry of Public Security, responsible for national-level forensic work. It provides forensic expertise in forensic chemistry, forensic biology, forensic genetics, and forensic anthropology.

Beijing Forensic Science Institute (BFSI): BFSI is a provincial-level forensic center that provides expertise services to Beijing's police and judicial authorities. It has experts in forensic chemistry, forensic biology, fingerprint analysis, and forensic psychiatry.

Shanxi Forensic Science Institute (SFSI): SFSI is a provincial-level forensic expertise center serving Shanxi's police and judicial authorities. It has specialists in forensic pathology, forensic anthropology, and forensic dentistry.

These temporal expertise centers in China are equipped with the most advanced laboratory facilities and advanced forensic technologies. They play a crucial role in criminal investigations, providing important evidence for the judicial process and ensuring justice for suspects.

Several significant temporal forensic expertise centers provide various types of expertise in Germany. Some of the well-known expertise centers in Germany include:

Legal Medicine Institute of Frankfurt University: The Legal Medicine Institute of Frankfurt is one of Germany's largest and most advanced forensic expertise centers. It provides expertise services to courts, police, and other organizations in forensic pathology, forensic genetics, forensic toxicology, and forensic anthropology.

Münster Forensic Expertise Institute: The Münster city-based Forensic Expertise Institute is one of Germany's leading forensic expertise centers, providing services in forensic medicine and forensic pathology, forensic anthropology, forensic psychiatry, and forensic toxicology.

In addition, the forensic expertise centers of Leipzig, Cologne, and Hamburg universities are also famous in Germany. These centers offer expertise in forensic medicine, forensic toxicology, forensic genetics, and forensic anthropology. Additionally, they provide training on expertise types for students and other professionals.

These advanced forensic expertise centers in Germany are equipped with the most modern laboratory facilities and cutting-edge technologies. They provide important evidence in criminal proceedings and ensure the accuracy of judicial decisions.

Temporal Expertise Types Used in Criminal Investigations in Foreign Countries

In our research work, we explore several temporal expertise types used in criminal investigations, including new types of forensic expertise, behavioral analysis, and cybercrime, as well as DNA analysis and various toxicological expertise types.

DNA analysis expertise is a highly precise method used to determine information about individuals involved in the commission of a crime. For example, recently in the United States, forensic experts used DNA evidence to solve a 32-year-old murder case. Scientists extracted DNA from evidence found at the crime scene and compared it with the national DNA database. As a result, the perpetrator of the crime was identified, leading to his apprehension and prosecution.

Behavioral analysis is another type of temporal expertise used in criminal investigations. It involves creating a profile of the offender to understand their criminal behavior and psychology. Behavioral analysts analyze the behaviors and patterns of suspects to identify their motives and intentions. Moreover, they collaborate with law enforcement agencies to develop strategies for apprehending criminals based on behavioral insights. For instance, in the Unabomber case, the FBI utilized behavioral analysis to create a profile of the suspect, which ultimately helped in identifying and apprehending the Unabomber, responsible for several bombings and deaths.

The investigation of cybercrimes represents a relatively new frontier in temporal expertise used in criminal investigations. This involves the use of technology, such as hacking, phishing, and data theft, to commit crimes. Cybercrime investigators track digital traces and identify IP addresses to trace cybercriminals. For example, in a recent case in the United Kingdom, cybercriminals stole millions of dollars from banks worldwide, prompting law enforcement agencies to hunt down the cybercrime group by tracking their "cyber trails" on the internet and eventually bringing them to justice.

In conclusion, temporal expertise plays a crucial role in investigating criminal activities. The emergence of new types of forensic expertise, behavioral analysis, and cybercrime investigations reflects the evolving capabilities of law enforcement agencies to combat crime effectively. Understanding the nature and scope of forensic expertise, its functions, and especially its societal implications in the fight against crime requires further understanding and consideration.

CONCLUSION

In conclusion, the significance of expertise in crime investigation cannot be overstated. From analyzing material evidence to providing expert opinions on scientific and technical matters, experts play a vital role in ensuring the integrity and completeness of both investigative and judicial processes. The legal basis for expertise, as outlined in various articles of the Criminal Code and Criminal Procedure Code, underscores its importance in obtaining crucial information related to criminal cases.

Moreover, modern expertise centers, both domestically and internationally, contribute significantly to advancing forensic science and technology. These centers utilize state-of-the-art laboratory facilities and cutting-edge technologies to analyze evidence and support investigations. They cover a wide range of fields, including DNA analysis, psychological profiling, and cybercrime investigation, each contributing to enhancing crime detection and ensuring justice.

As we move forward, continuous research and collaboration among experts from different disciplines will further improve the effectiveness and efficiency of crime investigation processes. By leveraging the latest advancements in technology and expertise, we can better serve the interests of justice and ensure a safer society for all.

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