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CRIMINALISTICS AND CRIMINOLOGY – EQUALITIES, FUNCTIONS, DIFFERENCES, METHODOLOGIES

Kryminalistyka i kryminologia – podobieństwa, funkcje, różnice, metodologie

Introduction

Along with the increase of the availability of open source information, especially through information networks which have been frequently and intensively controlled, the development and production of new or known dangerous, controlled and prohibited substances and compounds has also extended. This mostly concern the Internet sector, which allows access to tremendous amounts of information on explosives, narcotics, psychotropic and addictive substances and their precursors. The consequences of this global trend is also reflected in Slovakia. Some analyses show, it is also true in the context of terrorism. The aim of the state and its institutions is to timely respond to this situation and to resolve it, or at least to minimize its effects. Legal tools alone do not allow to reach such goal, and it is necessary to involve tools based on practical sciences which may help predict, detect, and prevent criminal activity. Based on the results of research activities undertaken at the end of the last century and taking into account current state of public security in the Slovak Republic, the need to establish a specialized university studies in the fields of criminalistics and criminology is apparent. In order to achieve this, it is necessary to define the interrelation of these sciences, and thus help build the new study program: Criminalistics and Criminology in the security services.

Basis for connectivity and disconectivity

Although criminology has the longest tradition of scientific research in the field of criminal justice, its history has had little to say about the place of scientific methods in criminal investigations. Studies devoted to the use of scientific method in criminal investigations have not originated in the discipline of criminology. The history of criminology has not analysed neither the details of the scientific basis of investigative techniques nor whether they have actually worked. Such research has always come from the "sister" discipline, the criminalistics, which can be defined as the science dealing with the recognition, collection, identification, and interpretation of physical evidence, and the application of the natural sciences to law-science matters. There is a mutual relationship between criminology and criminalistics in regards to the questions such as "why is crime committed" and "how was the crime committed?". The answer for the first of the aforementioned questions is given on the grounds of criminological research. However, the answer to the second question is given by the research done in the field of criminalistics. Criminal investigation is a procedure very closely related to criminalistics; its purpose is the apprehension, trial, prosecution, and sentencing of criminals. The goal of this paper is to demonstrate that the knowledge applied in criminal investigations come from the discipline of criminalistics rather than criminology. In order to quickly apprehend the offender and to protect public safety, it is necessary to use the tools designed within criminalistics. In practice the answer to the question "how was the crime committed?" becomes more important than identifying the reasons why an offender might commit a particular criminal act. Criminological explanation of an offender's behaviour does not assist investigators in the recognition, collection, identification, and interpretation of physical evidence. It only supports the general and particular understanding of crime as a social phenomenon.

Methodology

The purpose of this paper is to present a revision of different methods and techniques that are applied in the process of police activities in Slovakia. In Slovakia, the key sources of theoretical knowledge about how the police should apply scientific solutions in criminal investigations are the academics conducting their research and teaching at the Academy of Police Forces in Bratislava.

In order to better understand methods and techniques used within the Slovak law enforcement system, one must be familiar with the criminology/criminalistics dichotomy. In Slovakia criminalistics officially belongs to

the broad discipline of legal science, and in that way it differentiates itself from its real nature as a practical, non-legal forensic science. Criminal investigation theories are described by the criminalistic tactics sub-discipline, therefore the science of criminalistics is the main topic of this paper. The research method used is a combination of literature review of scientific articles, journals, books, and textbooks that were published between the years of 1993 and 2014, as well as investigative reports from real crime cases investigated by the law enforcement departments in Bratislava territory (especially the Bratislava II district), and observational research in natural settings. The literature review has been conducted in the library of the Academy of Police Forces in Bratislava. As a result of not being able to conduct Internet searches on the topic or to retrieve articles from the Internet, all the information was retrieved manually from library books and afterwards photocopied and summarized. Observation was performed at the Department of Compressed Investigation in the second district of Bratislava. Direct observation was employed for the purposes of this paper, and involved a continuous observation of two police officers at their work while manually recording their performance[1]. Observational variables were descriptive, requiring no inference (i.e., all activity was merely observed and written down).

Basis for analysis

Criminal investigations based on scientific methods started a new era of criminal justice at the beginning of the 19th century. For criminal investigation, personal identification would no longer be based on empirical standards of recognition (e.g. testimonials), but on a precise correspondence between the physical peculiarities of an individual, his natural identity, his civic identity, or personal data.

By popular stories, Sherlock Holmes was the pioneer of scientific crime detection methods. Later on, Agatha Christie's Hercule Poirot added brainpower by using "the little grey cells". He was a conventional, clue-based detective who greatly depended on logic and psychology of the suspect's behaviour. Columbo's interrogation technique, on the other hand, was to conduct a seemingly innocent interview, politely conclude it, and exit the scene only to stop in the doorway or return moments later and ask "Just one more thing...". The "one

[1] S. Fabian, *Criminalistics Tactics: Methods and Techniques of Criminal Investigation in Slovakia*, British Columbia Institute of Technology, Centre for Forensics & Security Technology Studies, Crime & Intelligence Analysis 2009.

more thing" was always a jarring question regarding an inconsistency in either the crime scene or the suspect's alibi.

The era of the classical sleuth was replaced by the tough, hard-boiled cop with his tendency to use violence to get the job done and bring the offender to justice. The 1990s were characterized by the shift from action-cop hero to forensic science such as those portrayed in the television series "CSI". This type of detectives often employed observation, forensic science, and profiling to solve cases. With the emphasis on intelligence rather than muscularity and reliance on weapons, new kinds of detective-heroes have emerged. While these archetypes of criminal investigators are fictional, the movie industry has successfully mirrored the real life investigation methods and techniques employed by the law enforcement officers. Regardless of the specific type of the investigative methods used by a detective (fictional or real), the issue is of use of criminalistics (or forensic science, as it is defined in North America and the UK).

Although the term "criminalistics" is often used interchangeably with the term "forensic science", in fact, as the American Academy of Forensic Sciences acknowledges, it is a distinct discipline that operates along with other disciplines under the umbrella of forensic science. The American Board of Criminalistics adopted Osterburg's[2] definition of criminalistics as "profession and scientific discipline directed to the recognition, identification, individualization, and evaluation of physical evidence by application of the natural sciences in law-sciences matters." Merriam-Webster's online dictionary identifies criminalistics as an "application of scientific techniques in collecting and analyzing physical evidence in criminal cases"[3]. Krajnik[4] adds to this definition by stating that "European" criminalistics also investigates memory evidence as a part of our material environment.

Criminal investigation represents a knowledge-intensive and time-critical environment. Investigation, either simple or complex, is best accomplished in a systematic and methodical way where investigative objectives should be determined. The fundamental objective in criminal investigation is to seek the truth. During the course of truth-seeking, investigators gather evidence to prove the "facts in issue" along with the identity of the offender(s) involved. A significant factor in understanding crime is to understand society. One of the extensive challenges faced by contemporary societies is the increase of criminal

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2 J.W. Osterburg, *Police science: What problem must criminalistics solve*, „The Journal of Criminal Law, Criminology and Police Science" 1968, no 59(3), p. 427.

3 http://www.merriam-webster.com/dictionary/criminalistics, access: 21.11.2017.

4 V. Krajnik et al., *Kriminalistika*, Akadémia PZ v Bratislave, Bratislava 2005.

offences and the ways in which the criminal justice system is dealing with it. In North American and European countries, the criminal investigation model is closely connected with forensic science. This discipline involves judgment, acquisition, identification and evaluation of material traces using scientific techniques in order to answer questions of legal importance.

Forensic science benefits from many disciplines including psychology, psychiatry, anthropology, odontology, osteology, pathology, botany, toxicology, biology, biochemistry, molecular biology, radiology, polygraph, firearm and tool mark examination, digital imaging enhancement, forensic data recovery, and accounting[5]. Typically, a criminal investigation begins at the crime scene. As the criminal investigation is a dynamic process, it requires the cooperation of patrol officers and detectives who work together toward the mutual goals of solving the case while seeking the truth[6].

The crime scene is a very active and quickly changing environment where the evidence of the crime is (or was) located. The role of the first officers to arrive on the crime scene (usually patrol officers) is crucial because, as the success of the criminal investigation depends on their actions. The fundamental task of the first officers is to prevent the destruction of potential evidence by protecting and preserving the crime scene exactly as it was[7]. The crime scene does not only provide proof that a crime has been committed, but it is also a place where physical evidence which may help to connect the perpetrator(s) to the crime may be found[8]. Physical evidence has the potential to play a critical role in the overall investigation and resolution of a suspected criminal act; therefore, activities performed at the beginning of an investigation at a crime scene can have a significant impact on this process. Investigators use "the burning bridges theory" to explain the importance of securing the crime scene: "Every time anything is done at a crime scene, it represents another "bridge" burned. Whatever has been changed can never be restored to its original condition"[9].

Fisher[10] indicates seven main objectives of a crime scene investigation: "to reconstruct the incident, ascertain the sequence of events, determine the mode of operation, uncover a motive, discover what property was stolen, find out all

5 B. Van Allen, *Criminal Investigation: In Search of the Truth*, Pearson Education Canada, Toronto 2007.

6 V.J. Geberth, *Practical Homicide Investigation: Tactics, Procedures, and Forensic Techniques*, 4th ed., CRC Press, Boca Raton 2006.

7 B.A.J. Fisher, *Techniques of Crime Scene Investigation*, 7th ed., CRC Press, Boca Raton 2004.

8 V.J. Geberth, op. cit.

9 B. Van Allen, op. cit.

10 B.A.J. Fisher, op. cit.

that the criminal may have done and recover physical evidence of the crime". No two crime scenes are alike. After arriving at the crime scene, detectives assess the scene. Depending upon the apparent type of criminal act, they decide what forensic specialists are needed to be called in to process the crime scene[11]. The use of forensic science is one of the fundamental techniques in criminal investigation. A typical investigative technique that helps link the offender to the crime is the analysis of physical evidence, such as fingerprints or DNA. Another technique used in the criminal investigation is behavioural analysis, which "tries to identify the offender through the interpretation of psychological clues that are evident from the offender's behaviour both during and after the offence"[12]. It consists of psychological profiling, threat assessment, geographic profiling and violent crime linkage analysis system. Methods and techniques of criminal investigation or criminalistic tactics and techniques help the investigators answer the question "how was the crime committed?". Successful answer to this question often leads to the offender and, in consequence, to his/her apprehension, which is the main objective of law enforcement officers.

When trying to answer the question "why was the crime committed?" criminologists face a multitude of complex issues. Although they have numerous theories handy, it is difficult for any single theory to provide the exact answer due to uniqueness of each offender. When it comes to motivation, the nature/nurture dichotomy comes in to play. Human behaviour is shaped by the environment in which a person lives in combination with genes inherited from his/her ancestors. Until recently, no researcher could provide proof as to which factor affects human behaviour more; therefore a correct and complete answer to "why was the crime committed" is virtually impossible. However, knowing the right answer turns out to be irrelevant when quick apprehension of the offender becomes the key concern of public safety. In consequence, the practical knowledge useful in criminal investigations comes from the discipline of criminalistics rather than from criminology.

Object and purpose of criminology

Sacco & Kennedy[13] define criminology as an interdisciplinary science that "attempts to understand (a) the factors that prompt or fail to inhibit criminal motivation, (b) circumstances leading up to the act, and (c) the consequences of

[11] C.H. Wecht, *Crime Scene Investigation: Crack the Case with Real-life Experts*, The Reader's Digest Association, Pleasantville, New York 2004.

[12] B. Van Allen, op. cit.

[13] V.F. Sacco, L.W. Kennedy, *The Criminal Event: An Introduction to Criminology in Canada*, 3rd ed., Nelson Thomson Learning, Toronto 2002.

the act for the victim(s), for others in the community, and for society at large. Criminologists are also asked to suggest how we should respond to crime. Finally, criminologists monitor how changes in the laws and their interpretation affect how people behave in society and, in turn, how agents of social control respond to this behaviour".

The term "criminology" is derived from Latin word, "crimen" (crime) and the Greek word "logos" (science). In Europe, criminology was introduced by French anthropologist Topirand in 1879. Italian lawyer Raffael Garofalo used the term "criminology" for the title of his book *Criminologia* in 1885[14]. The creation of the scientific field of criminology was necessary to understand the process of crime and the problems connected with crime. The need for the scientific examination of crime became clear at the end of 19th and the beginning of 20th century when crime developed into a significant problem in central European society.

The object of criminological research can be specified from a broad or narrow point of view. A broad perspective identifies criminology as the science of the criminal act. A criminal act itself is not an isolated event; therefore, criminologists called for a wider understanding of this social phenomenon. There was also the need to expand the role of criminology to recognize issues of non-criminal, yet antisocial behaviours as well as crime prevention and victimology. According to Subert and Niksova, criminology is an independent science focusing on (a) the essence of crime as being a consequence of collective, dangerous social act, (b) the condition, structure, dynamics and tendencies of crime, (c) the circumstances and reasons for committing crime, (d) the personality of the offender, (e) the importance of the victim of crime and (f) target-oriented activities to prevent crime.

Criminology as an empirical science is oriented on general research known as theoretical criminology and applied criminology, where the knowledge from academic criminology is applied into the practice[15]. Kaiser identifies criminology as a methodological unit of empirical facts about crime, offenders, negative social visibility and the regulation of this kind of behaviour. Madliak defines criminology as a science about an offender's personality and the crime itself. According to him, criminology examines the structure, dynamics, conditions, sources and prognosis of the crime. According to Zapletal, criminology is

[14] M. Ondicová, *Úvod do kriminológie*, in: Kolektív autorov, *Kriminológia – všeobecná časť*, 1. diel, Akadémia Policajného Zboru v Bratislave, Bratislava 2003, pp. 6–29.

[15] Y. Turayova, P. Mikus, *Kriminológia, všeobecna časť'*, 1. diel, Akadémia Policajného Zboru v Bratislave, Bratislava 2003.

a science about crime, offenders, and their victims as well as about crime regulation and control. Although these definitions differ from one another, they do have a common denominator: they all recognize crimes and their consequences as real events that can be examined empirically, and thus precisely described and explained[16].

Criminology involves research into the negative social features defined in criminal law such as crime itself, offenders, victims, conditions and causes of crime, sanctions and punishments, as well as prognosis of crime progress. The definition and object of criminology consist of several concepts that should be thoroughly described and analyzed. A *crime* is understood as a complex of penal (criminal) acts committed within a particular time scope. However, this definition was adopted from law practitioners. Different groups of criminologists define crime as a complex of socially harmful acts, but this definition is vague. A *penal (criminal) act* is an act of human behaviour that is specified in criminal law. *Negative social features* are non-criminal, antisocial incidents that are not penalized by criminal code but deviate from social laws and norms accepted by contemporary society[17].

The key object of criminology is crime as a collective event. In pursuit of the exploration of origins of a particular social/antisocial feature or event we must observe and describe it first. This is the core mission of *criminological etiology*. On the other hand, *criminological phenomenology* deals with crime statistics. Its main task is to provide the big picture of the extent and type of criminal activity in a specific area and within a particular time range, along with the information about the type of offenders, including their age, gender, employment, recidivism rate, and material losses caused by committing crime (Ondicova, 2003). An *offender's personality* is another subject of criminology. Personality is understood as an organic entity consisting of biological and psychological attributes that interacts with the environment characterized by social features and social relationships. The consequences of an offender's behaviour are closely connected to his/her victim. Although *victimology* is a separate scientific discipline in foreign countries, in Slovakia it belongs to the field of criminology[18].

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16 M. Ondicová, op. cit., pp. 6–29.

17 Ibidem.

18 M. Ondicová, *Vzťahy biologickej, psychologickej a sociálnej podstaty človeka ako prvopáchateľa trestného činu.* Dizertačná práca vo vednom odbore: 92-65-9 Kriminológia, Kriminalistika, Akadémia Policajného Zboru v Bratislave, Bratislava 2008.

Modern criminology pays close attention to *crime control,* which is understood as the public effort to keep crime rates within acceptable boundaries or under reasonable constraint. Crime control is carried out by two means: *repressive* and *preventive*. Repressive crime control is achieved by the penal system stated in the criminal code. Preventive crime control consists of several strategies that are aimed at crime prevention. *Social prevention* is directed at social factors that are important in the process of socializing among humans. *Situational prevention* is focused on criminogenic situations, particularly on prohibiting opportunities to commit crime. Activities of *victimological prevention* intend to avoid possibilities of becoming a victim. The recipients of *primary prevention* are members of the society in general, including every citizen of a defined geographical or demographic category (such as "youth"). Recipients of *secondary prevention* are special risk groups of offenders or victims who are found in criminogenic situations. Activities of *tertiary prevention* are directed towards the offenders and victims of recidivism[19].

Bearing in mind its scientific foundation, criminology aims to fulfil three purposes. First, its *analytical function* serves to understand the condition, structure, dynamics and tendencies of crime, as well as the circumstances surrounding and reasons for committing the action, along with target-oriented activities to prevent crime. The *methodological function* assists to provide its own research results to other law enforcement subjects aimed at crime prevention. Finally, the *prognostic function* helps predict possible trends, forms and methods in crime development on a scientific basis[20].

History and development of criminalistics

In order to understand the development and features of criminalistics in Slovakia, it is useful to identify a few general characteristics. First of all, it has emerged from the discipline of criminal law through a growing acknowledgement of the social dimension of crime. In addition, its development has been influenced by the evolution of political and social systems. Sometimes its very existence was denied, and sometimes it was hijacked for ideological aims. Finally, it is receptive in terms of adapting theories and methods mainly from Austro-Hungarian monarchy and Bohemia, territory of which Slovakia used to belong to.

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[19] J. Metenko, M. Kloknerova, A. Kliment, *Prevencia criminality mladeze v policajnych cinnostiach 2002–2005.* Projekt vyskumu a zaverecna sprava, Akadémia PZ v Bratislave, Bratislava 2006, pp. 21–24.

[20] Y. Turayova, P. Mikus, op. cit.

The history of criminalistics is, in fact, a history of investigative methods. The first method used in criminalistics was most likely interrogation, whereas the first techniques used for identification were anthropometric method (detailed measure-based description of a person) and daktyloscopy (finger-print analysis). The first significant movement in criminalistics was the establishment of an organization called "Sûreté" (security) by Eugene Francois Vidocq (1775–1857) in France. Sûreté was a prototype of a law enforcement agency which applied investigative methods that were highly sophisticated for its time, and some of them have even survived until the present day. In 1879, French police officer Louis Alphonse Bertillon introduced anthropometry as an identification method based on measurements of human body parts. The introduction of the anthropometric method for the purpose of personal identification was a significant event in criminal investigation history which laid foundations for modern criminalistics. The founder of finger-print analysis is considered to be Czech scientist Jan Evangelista Purkyne. However, practical application of finger-print analysis was introduced by an Englishman Henry Faulds in 1880. This particular technique was expanded by Charles Darwin's cousin, Francis Galton, in his book *Finger Prints*, which was published in London and New York in 1892. The book provided grounds for the formation of personal identification databases and system in England in 1894. The system was a combination of anthropometry and finger-print analysis in which a person's body part measurements were officially registered in an appropriate database[21]. The work of Austrian criminal law professor and investigative judge Hans Gross and his first criminalistics textbook, *Handbuch fur Untersuchungsrichter als System der Kriminalistik* (1893), laid the foundations for teaching and understanding the nature of criminalistics in the Austro-Hungarian monarchy. Gross is believed to be the father of modern scientific criminalistics[22]. During his era, criminalistics was considered to be a supporting discipline of criminal law, known as "die straftrechtlichen Hilfswissenschaften"[23]. Criminalistics along with its sister disciplines such as criminal (forensic) anthropology, criminal psychology, and criminal sociology, assisted criminal law in its fight against crime. According to Gross, criminalistics consisted of two subjects: phenomenology of the offender and investigative science. The main role of criminalistics was to study the criminal act. The structure of criminology and criminalistics according to Gross was as follows:

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[21] J. Straus et al., *Uvod do kriminalistiky*, Vydavatelstvi a nakladatelstvi Ales Cenek, a. s., Plzeň 2004.

[22] V. Krajnik et al., op. cit.

[23] J. Metenko, J. Kubikova, *Pokroky v kriminalistike*, Akadémia Policajného Zboru v Bratislave, Bratislava 2005.

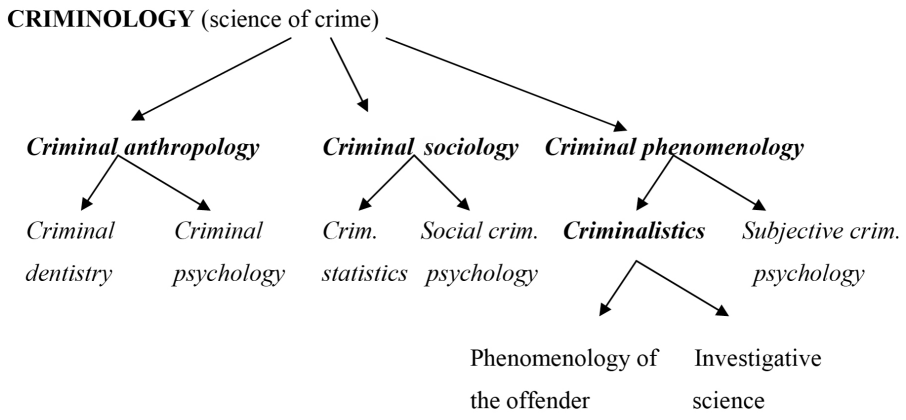

Figure 1.Source: J. Straus, *System Kriminalistiky*, „Policajná Téoria a Prax" 2005, no 3, R. XIII, pp. 5.

In Prague, the first finger-print analysis was introduced by Frantisek Protiwensky in 1891, and scientifically described in his book *The science of daktyloscopy and person description* in 1903. In 1901 the photographic laboratory became a part of the police department where photographs of the offenders were collected. In 1926, the Criminological Institute was established as a department at the faculty of law of the Charles University in Prague. The first central investigative police department was created in 1928. Between 1930 and 1950 several authors contributed to the growth of Czechoslovakian criminalistics. Frantisek Kocian, Jozef Vavrovsky, Vladimir Solnar, Josef Sejnoha, Josef Lebeda, Vitezslav Celansky Rudolf Kostak, Otta Fanta, and Ladislav Moravec were highly recognized for their contribution to the field.

The end of WW II caused a period of reorganization for the Czechoslovakian law enforcement system. Thus, on April 17th of 1945, *Agency of National Security* was created along with the Criminal Service of Czechoslovakia. The role of criminalistics was contingent upon the new political situation of the country. The first domestic academic textbook of criminalistics, *View to Criminalistics*, was published by the founder of the Institute of Criminalistics, Bohuslav Nemec in 1957[24]. The division of this book meant a slight shift from Gross' teaching to a new conception focusing on three fundamental elements of criminalistics: criminalistic tactics, criminalistic techniques, and supporting sciences[25]. Nemec was a significant figure in Czechoslovak criminalistics during the years between 1950 and 1960. Apart from textbooks, he published a number of criminalistics books and encyclopaedias. Czechoslovak criminalis-

[24] J. Straus et al., op. cit.
[25] J. Metenko, J. Kubikova, op. cit.

tics was further formed by the school of Soviet criminalistics largely via the work of A. Vinberg and R.S. Belkin, who together introduced a method of examination of mental (memory) evidence into criminal investigation. Belkin divided criminalistics into four essential subcategories: the general theory of criminalistics, criminalistic techniques, criminalistic tactics and the application of criminalistic methods[26]. The Soviet model was essentially developed by Jan Pjescak, who created the theoretical base for Czechoslovakian after-war criminalistics. According to Pjescak, the attention of criminalistics theory should be aimed at two key disciplines, criminalistic methodology in general and then specifically on the basis of individual crimes[27]. Pjescak's first significant work, *Introduction to Criminalistics*, was published in 1965. He issued the general theoretical principles of criminalistics in *Socialistic Criminalistics* published in 1979. Between 1982 and 1986, Pjescak published numerous criminalistics textbooks, some of them in cooperation with other Soviet authors. His work dramatically transformed Czechoslovak criminalistics and made Pjescak one of the most significant figures in the history of the Czechoslovak criminal justice system. Besides his publishing activities, Pjescak established and managed a number of criminalistics faculties and was a founder of the first forensic laboratory in Slovakia, which is now a part of the Academy of Police Forces in Bratislava. Until the split of Czechoslovakia on December 31, 1992, criminalistics was not an independent science; instead, it was a subcategory of criminal law taught and learned by lawyers at the Faculty of Law as a supporting discipline for the criminal law. After the creation of the new, democratic country, there was an enormous need to appropriately recognize the importance of criminalistics by defining its role, objects, and problems, in order to separate this discipline from legal science. There was also the additional need to distinguish between the objects of criminalistics, police science, and criminal law. Criminal acts as defined by Gross were no longer the subject of criminalistics; instead, its focus shifted to the examination of criminal evidence. With the alteration of the subject of criminalistics, there was a need to exclude some of the previous criminalistic methods such as searching for people[28] and holding people in custody[29] from this field of science.

Contemporary criminalistics was greatly influenced by the creation and development of police sciences as well as other scientific disciplines. The ob-

[26] J. Straus, *System kriminalistiky*…, op. cit., pp. 5–15.
[27] J. Metenko, J. Kubikova, op. cit.
[28] J. Metenko, *Kriminalistická taktika*, 1. vyd., Akadémia PZ v Bratislave, Bratislava 2012.
[29] I. Simovcek, *Niektore teoreticke otazky kriminalistickej vedy*, in: *Kriminalisticke dni na Slovensku. Zbornik materialov z vedeckej konferencie konanej dna 20–21.5.1998*, pp. 5–13.

jectives of police sciences are consistent with those of the police services in general (policing), and their central role is to interconnect between secret/public and police/safety activities. Although the focus of both criminalistics and police sciences is mutually linked, it is necessary to distinguish between them on the basis of the methods within them. Criminalistics investigates trace evidence using solely criminalistic methods, (eg. methods of criminalistic examination/exploration). On the other hand, when criminalistics uses methods of other sciences, the application of these methods is performed in a way that is customized to the specificity of criminalistic research objects, rules, and needs. However, this is not accomplished by pure mechanical application of these methods; rather, transformation and actively adapting to the needs of criminalistic science is also a necessary factor. In contrast, police sciences employ methods of search/inquiry and proving/providing evidence[30].

The object and categories of criminalistics

The structure of criminalistics in Europe is not uniform. Western European countries took the British-American model which describes "criminalistics" as close to equal with "forensic science". According to this model, forensic science uses criminalistic techniques, employed for technical solution of judicial problems. Additionally, this model contains crime scene investigation techniques. Some of these techniques are used in central European models within the field of criminalistic tactics. For a number of central European law practitioners, criminalistics falls within the broad category of legal sciences[31]. Owing to the legal aspect of the criminalistics, forensic science and the science of criminalistics cannot be linked to each other. Not being identified in the Criminal Code, some of the forensic science techniques, such as electro-technical examination, examination of digital evidence, or metallographic examination, do not belong to legal methods, and therefore forensic science is viewed as a different discipline than criminalistics. The legal aspect plays a critical role in the differentiation between the two models[32]. Criminalistics is an independent science that "examines the manifestation of the event in form of physical and

[30] J. Metenko et al., *Kriminalisticke metody a moznosti kontroly sofistikovanej criminality*, 1. vyd., Katedra kriminalistiky a forenznych discipline, Akadémia PZ v Bratislave, Bratislava 2004.

[31] J. Metenko, I. Bačíková, M. Samek, *Kriminalistická taktika*, 1. vyd., Václav Klemm – vydavatelství a nakladatelství, Brno 2013.

[32] J. Metenko, *Vztah forenznych vied a kriminalistiky z hladiska niektorych metod*, in: *Zbornik z II. odborneho seminara Casta – Papiernicka 8.3.2006*, Kriminalisticky a expertizny ustav Policajného Zboru, Bratislava 2006.

memory characteristics"[33]. In criminalistics, this manifestation is called trace evidence. Trace evidence is the object of the science of criminalistics. Criminalistics differentiates two types of trace evidence: physical (material) and mental (memory). Naturally, criminal investigation based on material evidence provides a higher level of precision and certainty[34] (It is necessary to note that in criminalistics, we differentiate between evidence and trace evidence. *Evidence* is a term for proving something, and is basically regarded as a proof, whereas *trace evidence* is meant as an imprint used for identification). Contemporary criminalistics is broken down to two main groups, *criminalistic techniques* and *criminalistic tactics*. Criminalistic techniques focus on an examination of material (physical) trace evidence, while criminalistic tactics examine mainly memory trace evidence. Regardless of the different categories of evidence, criminalistics is focused on finding, seizing and examining the evidence[35]. Criminalistics distinguishes between three categories of achieving this goal: (a) modus operandi – method of committing a crime, (b) criminalistics trace evidence and (c) criminalistics identification.

Modus operandi/method of committing a crime

Considerable emphasis in criminal investigation is placed on a detailed description of the method of committing the crime, which is known as *modus operandi* (or *MO*). Three major components of MO play a role in criminal investigation, and they are listed as follows: The components pertaining to an action characterize the physical and psychological activity of the offender while committing a crime. Material components consist of tools and items necessary for committing the crime. Finally, multifaceted components are a complex group of activities and information required for committing the crime.

Human behaviour is determined by numerous factors. Similarly, the behaviour of the offender depends on the interaction between these factors. Criminalistics divides these factors on objective and subjective determinants. *Objective determinants* do not depend on offender's choice. In general, they are social/cultural conditions, victim(s)/target(s), the relationship between the offender and the victim/target, the crime scene, the time, the accessibility of tools (weapon, etc.), and the existence of co-offender(s). *Subjective determinants* depend on and are connected to the offender(s) specifically. They are the physical

[33] J. Metenko, *Skúmanie miesta činu a skúmanie na mieste činu*, in: *Pokroky v kriminalistike* 2011 EU SEC II/B, Akadémia Policajného Zboru, Bratislava 2011, pp. 19–18.

[34] V. Krajnik et al., op. cit.

[35] Z. Konrad, *Metodika vysetrovani jednotlivych druhu trestnych cinu – cast kriminalisticke vedy?*, in: *Zbornik vedeckych a odbornych prac z medzinarodneho teoreticko-praktickeho seminara zo dna 23.2.2007*, Akadémia PZ v Bratislave, Bratislava 2007, pp. 35–39.

(somatic) characteristics of the offender (ie. his/her strength, body build), psychological and motor characteristics of the offender (his/her level of intelligence, ease of mobility, hobbies, and sexual behaviour), age, gender, criminal experience and educational level (qualification, skills)[36]. Knowledge of the method of committing a crime offers additional important information. It enables investigators to create criminalistic versions, and provides data for criminal profiling[37].

Criminalistic trace evidence

In criminal investigation, trace evidence gives investigators a picture of the criminal act along with the indications about behaviour of the perpetrator and his/her victim(s) at the scene. The knowledge of the trace evidence mechanism and its creation lays the foundation for criminal investigation methods and techniques. The essence of trace evidence is the mutual association of two objects that provide information about criminal act. When two objects have an effect on one another, they create changes. These changes illustrate and reproduce characteristics of affected objects. Each change in a physical environment or a human mind that is influenced by a criminal act is considered to be trace evidence. As a result of this, criminalistics distinguishes between material (physical) trace evidence and memory trace evidence. Three major changes must come into effect in order to produce trace evidence: change that is generated by the criminal act, change that exists until the time of its seizing, and change that can be assessed by criminalistics methods and techniques[38]. Trace evidence is widely recognized as one of the subjects of scientific examination[39].

Material (physical) trace evidence is divided into five categories: Trace evidence that gives information about (a) the structure of outer surface of the objects, such as finger-prints or ballistics evidence, (b) the structure of the inner surface of the objects, such as biological, chemical or pyrotechnical evidence, (c) the functional and dynamic features of the objects, such as voice, posture while walking, or hand-writing, (d) characteristics of the objects that created

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[36] J. Hrasko, *K niektorym problemom o uplatnovani domovej prehliadky v policajnej praxi*, in: *Kriminalisticke dni na Slovensku. Zbornik materialov z vedeckej konferencie konanej dna 20–21.5.1998*, pp. 123–129.

[37] V. Porada et al., *Kriminalistika*, Vydavatelstvo pravnickej literatury IURA EDITION, s.r.o., Bratislava 2007.

[38] J. Musil et al., *Kriminalistika – vybrane problemy teorie a metodologie*, Policajni Akademie Ceske Republiky, Praha 2001.

[39] J. Metenko, J. Hejda, *Sytémové zmeny vo formách kriminalistickej dokumentácie*, in: M. Krajníková, S. Masnicová, J. Gýmerská (red.), *Pokroky v kriminalistike 2009. Zborník z medzinárodnej konferencie konanej v dňoch 9–10.11.2009*, Katedra kriminalistiky a forenzných disciplín, Akadémia PZ v Bratislave, Bratislava 2009.

the trace evidence, such as finger-prints created by blood, foot-prints that provide insight into walking patterns, and (e) features of the objects created by change, such as peripheral trace evidence, (moving an object from one place to another), slits or bruises[40]. Although memory trace evidence has physical features (like changes in brain cells) methods of their examination are quite complex. Memory trace evidence is formed by the five human senses (sight, hearing, touch, smell and taste), but it is very difficult to examine the exact way in which it is created. Additionally, it is influenced by the personality of the person who created it (the person's short and long term memory as well as his/her emotional state, etc.) and is not accessible immediately. Once the person dies or if he/she is not willing to share his/her memory, the trace evidence is lost. All memory trace evidence is formed as a reflection of the human mind, which is influenced by the organic or inorganic environment. The basic impulse that creates the memory trace evidence is a perception that is generated by the pressure of the environment on the human senses[41].

The examination of memory trace evidence is achievable merely by methods which allow a person to interpret his/her own experience through recollection of a specific event. This can be done using legal methods of psychological manipulation. As a result of this, memory trace evidence is examined using a combination of methods of criminalistic tactics, such as criminalistic versions, interrogation, confrontation, verification of the statement on the scene, recognition, and in some cases, criminalistic experiment and criminalistic reconstruction[42].

Criminalistic identification

Once trace evidence is formed during a criminal act, the investigators strive to find out who created the evidence and what object were used. Criminalistic identification includes examining objects (living and non-living) which may have contributed to the formation of trace evidence. During the process of criminalistic identification, the object is not only identified, but also individualized. Individualization of the object is the process by which investigators examine general and specific features of the object. Criminalistics identification is divided according to four categories. In relation to the *subject* (person who performed the identification), criminalistics distinguishes identification made by an *expert witness* or *recognition* by the witness (lay person). Identification

[40] S. Fabian, op. cit.
[41] V. Porada et al., op. cit.
[42] R. Bacik, *Kriminalisticke moznosti skumania pamatovych stop*. Rigorozna praca, Akadémia Policajného Zboru v Bratislave, Bratislava 2007.

made by *scientific methods of examination* consists of finger-print examination, ballistics, biological identification etc. In relation to the *identified objects* criminalistics differentiates between identification of *people* and identification of *non-living objects.* Identification of people is usually made on the base of anatomic and anthropological features of the human body, functional characteristics of motor signs, (human gesticulation, hand-writing), the human voice, biological traces, and track traces (foot-print, lip-print, teeth). Identification of non-living objects is conducted more often by ballistics, track traces, tool marks and microscopes. The last category distinguishes identification on the basis of results; for instance, whether the object was identified or not. *Individual* identification is achieved by confirmation (witnesses, DNA, etc). In the case of the process of *incomplete* identification, the identification is finished, but the object was not identified. Here, examiners conduct partial identification by grouping the object into a bigger category (type of vehicle). Identification according to *identifying features* is made on the basis of specific characteristics of the object, such as functional, dynamic, structural, etc. As a result of its capability to be scientifically examined, criminalistics identification belongs to both criminalistics sub-categories: criminalistic tactics and criminalistic techniques. Therefore, identification enables the examination of material and memory trace evidence[43].

Methods of criminalistics

Criminalistic methods developed during the historical progress of criminalistics through its own scientific growth and through the adaptation and adjustment of methods developed in other sciences. However, criminalistic examination can be done by criminalistic methods only. These methods must meet four strict criteria. The methods must (a) not contravene lawful norms, (b) be scientifically based, (c) be verified by criminalistic practice and (d) be accepted by criminalistic practice. Satisfaction of the *lawful (legal) norm* is a central criterion for the application of criminalistic methods. Its importance lies in the outcome of the criminal investigation. If the evidence was gathered using an illegal method (for instance, the use of physical or psychological force during the interrogation), evidence usually becomes inadmissible in court. *Scientific base* criterion is determined by the current situation of the progress in the scientific world. When new knowledge is scientifically recognized, the method can be changed or altered and the old method is eventually discarded. *Verifica-*

[43] V. Krajnik, *Kriminalisticka identifikacia v kriminalistickej taktike*, in: *Kriminalisticke dni na Slovensku. Zbornik materialov z vedeckej konferencie konanej dna 20–21.5.1998*, pp. 61–63.

tion criterion is fulfilled when the scientific basis of the method is confirmed in an existing practical situation. *Recognition* criterion is linked to the verification principle, however, the time that elapses from the verification of a particular method to the complete application of this method into the practice is essentially longer[44]. Porada et al.[45] identify three groups of criminalisticc methods. The first group consists of *"methods of universal perception"*. These methods are generally employed by all examiners, such as observation, description, comparison, measurement and experiment. The second group involves *"methods taken from other sciences"*. These methods of examination were created by other sciences, such as physics, chemistry, and biology, and criminalistics includes them in its method of examination. The last group is composed of *"specific methods of criminalistics science"* and these are applied exclusively in the field of criminalistics, such as knowledge gathered from criminal investigation, law enforcement or judicial practice[46].

Criminalistic methods are divided into two major groups. The first, *methods of criminalistics techniques,* examines material (substantive) trace evidence (finger-print analysis, DNA, etc.), while the second, *methods of criminalistics tactics,* usually studies memory trace evidence (crime scene examination, interrogation, search, etc.)[47].

Methods of criminalistic techniques

The rapid development of scientific disciplines and the colossal growth of modern technologies has improved the methods and techniques of criminal investigation, along with the process of the identification of material trace evidence. Therefore, criminalistic techniques focus on the identification of people, items, and occasionally animals. With respect to the scientific procedure used for the examination of trace evidence, criminalistics techniques are divided into more categories.

The first, *methods that use procedures based on optical principles,* takes advantage of the miniature structure of trace evidence and the possibility of examining it without causing any further damage. Magnifying glasses and microscopes are tools widely used by forensic specialists. The application of microscopes (binocular, comparing, biological, metallographic, and electronic scan-

44 V. Krajnik et al., op. cit.
45 V. Porada et al., op. cit.
46 J. Metenko, I. Bačíková, M. Samek, op. cit.
47 V. Krajnik, et al., op. cit.

ning) is exclusively achievable at forensic laboratories. Magnifying glasses can be used both at the crime scene and forensic laboratory. The second category, *methods of criminalistics techniques that use procedures based on electromagnetic light,* employs X-rays, ultra-violet, infrared and nucleus light for further identification of material trace evidence. Lastly, *methods that use chemical and physical procedures,* are used in analyses of drugs, blood, toxins, fuels, emissions, plastics, etc. andare commonly applied[48]. The application of knowledge incorporated from various scientific disciplines into forensic science is the key factor that helps link the offender to the crime by means of material trace evidence. Forensic specialists employ numerous techniques appropriate to the characteristics of the crime. Frequently used techniques are finger-print analysis, (daktyloscopy), DNA analysis, forensic pathology, forensic biology, forensic anthropology, ballistics, forensic audio-expertise, firearm and tool mark examination, digital imaging enhancement, forensic data recovery, and accounting.

Methods of criminalistic tactics

The significance of criminalistic tactics as a method of collection, examination, exploration and application of evidence lies in its contribution to the process of criminal investigation. In the 1950s, Bohuslav Nemec defined criminalistic tactics as (a) a science about crime and criminal acts, (b) study about methods of offenders' activities, (c) generalization of criminalistic knowledge and its practical application, (d) active summary and statistics, (e) effective functioning of law enforcement, and (f) investigative process"[49]. Later on in the 60s, the objects of criminalistic tactics shifted to investigative methods and techniques of criminal investigation. Additionally, characteristics of the offender, methods of committing crimes, and their classification were added. During the 70s, academics agreed that criminalistic tactics should focus on the issues of examination and application of methods related to the investigation and prevention of dangerous activities. Criminalistic tactics assist in finding the facts in issue, and therefore they have to satisfy numerous requirements. A specific tactic must be legally approved, scientifically verifiable, appropriate, and accessible; finally, their application is required to be ethical.

At present, methods of criminalistics tactics focus on the examination of memory trace evidence. Each method examines evidence from a specific point of view. However, this type of evidence does not exist in a vacuum; memory is

[48] I. Simovcek, op. cit., pp. 5–13.
[49] S. Zavalidroga et al., *Kriminalisticka Taktika,* Akadémia PZ v Bratislave, Bratislava 1995.

frequently interconnected with material evidence and the material environment. Existing methods of criminalistic tactics include (a) *crime scene investigation*, (b) *criminalistic search*, (c) *criminalistic versions*, (d) *interrogation/interview*, (e) *confrontation*, (f) *verification of the statement on the scene*, (g) *recognition*, (h) *criminalistic experiment*, and (i) *criminalistic reconstruction.* In some cases, *criminalistic documentation*, *planning* and *management of criminalistics examination* are added to the methods of criminalistic tactics[50].

Crime scene investigation

The key role of the crime scene investigation (or CSI) is the comparison between an object's material condition and trace evidence obtained from this object, as well as their mutual relationship. The core of the CSI lies in direct observation of the scene and the object while searching for material changes in the object, which can become evidence. However, this process is not just mere observation. It is also empirical examination, continuous evaluation and documentation of a crime scene's physical condition and objects connected to it. Observation can be made by the senses or using electronic/technical equipment.

The goal of the CSI is to (a) find evidence, (b) discover relationships and associations, and (c) detect other circumstances, such as conditions, motives and hypotheses for the creation of criminalistics versions[51]. The significance of the CSI as one of criminalistic methods is remarkable. It enables investigators to understand the characteristics of the event that took place at the crime scene including plausible causes and conditions that gave rise to the criminal event, or to understand the offender who committed crime. Success of a criminal investigation often depends on the quality of the CSI, which is one criminalistic tactic that cannot be replaced by any other method. The level of its quality essentially influences the quality of the gathered evidence. Insufficient knowledge and skills or an irresponsible approach of law enforcement officers may lead to a lesser punishment or even acquittal of a true offender. CSI provides initial information about evidence and the event itself which took place at the crime scene. A shoe print might be an example, as it may lead to knowledge one's height. Facts derived from preliminary information about evidence depend considerably on experience and knowledge. The crime scene investigation is considered to be a team effort made by the police officers, investigators, and

[50] S. Svitok, *Vyznam previerky vypovede na mieste*, in: *Kriminalisticke dni na Slovensku. Zbornik materialov z vedeckej konferencie konanej dna 20–21.5.1998*, pp. 131–135.

[51] J. Metenko, *Kriminalistická taktika...*, op. cit.

forensic specialists[52]. The first officers at the crime scene are the members of the "permanent access group". Additional participants of the CSI are witnesses, any victims or even the accused. It is crucial to use good judgement in deciding whether the attendance of such people is necessary or not because it might put the investigation at risk. A phone call made to 112 initiates four major tasks: (a) completion of initial, emergency activities, (b) preparation for crime scene examination, (c) completion of crime scene examination along with proper documentation of its results and (d) evaluation of accomplished results and their application[53].

Criminalistic documentation

The aim of criminalistic documentation is to secure trace evidence (verbally and acoustically) and to take control of the course and outcome of the criminal investigation. In criminalistic examination, (investigation), trace evidence and comparing material have the nature of *documented marks* and *seized objects*[54]. Documented marks are delivered in written form, (transcript), phonogram (audio recording), photographic form (photographs, hologram video, film, and digital recording), and topographic form (sketch, plan, and drawing). Standard criminalistic documentation comes in the form of a transcript. In other words, it describes a situation that was observed by its author. A transcript must consist of objectively true statement of facts – the subjective feelings of the author are not allowed. In addition to an oral description of the observed situation, investigators can choose the form of an audio (phonographic) recording. Furthermore, this form of documentation is frequently used at the interrogation/interview, where the statements made by the accused, witnesses or the victim are recorded. However, photographic form provides the most precise documentation. Written, phonographic and photographic forms are supplemented by topographic form, usually consisting of sketches, plans, and drawings. Seized objects are submitted in their natural form, and the exact location where they were found is documented along with all of the circumstances and conditions surrounding their discovery. Not only trace evidence but also any manipulation to it must be documented in order to protect the chain of evidence. Each and every piece of evidence, its manipulation and the circum-

[52] S. Zavalidroga et al., op. cit.

[53] J. Viktoryova, J. Zanovit, *Zamyslenie sa nad taktikou vykonania vysetrovacieho pokusu*, „Kriminalisticky Zbornik" 2007, r. 3, pp. 41–46.

[54] J. Metenko, *Nove trendy v kriminalistickej dokumentacji*, in: *Kriminalistika v prikladoch. Zbornik z I. odborneho seminara. Casta – Papiernicka 10.3.2005*, Bratislava 2005.

stances around it is important for a criminal investigation, therefore thorough documentation is crucial[55].

Conclusion

The any given activity in the investigative process should be performed in accordance with the scientifically described criminalistic methods. Methods of criminalistic tactics often have the same names as a methods of investigation, which is logical since the science of criminalistics has given grounds for the theory of the investigative process. Regardless of whether a separate discipline of police science is recognized or if it is considered a historical part of criminalistics (criminalistics methodics), all tactical and technical methods used and described in police science originate from criminalistics. For the purposes of criminological research, on the other hand, statistical analyses and other research methods specific for social sciences are more appropriate.

Given the potential scope of the study, we would like to address the issues associated with further analysis of the system of criminalistic methods in future studies. We hope we will be able to participate in the next continuation of the research "Centre of Excellence security research" (code ITMS: 26240120034 supported by the Research & Development Operational Programme funded by the ERDF) for which is this study partial output.

Summary

Although criminology is the discipline with the longest tradition in crime research, its history has had little to say about the place of scientific methods of crime evaluation, phenomenology and etiology. Criminalistics is oriented on evaluation and search of traces associated with a criminal act. Studies that have analyzed the history of scientific practices of criminal investigation have not come from the history of criminology. The history of criminology has analyzed neither the details of the scientific basis of the techniques nor whether they have actually worked. Such research has always come from the "sister" discipline: criminalistics, which can be defined as the science behind the recognition, collection, identification, and interpretation of traces and physical evidence, and the application of the natural sciences to legal science matters. This study is the partial result of the project implementation: "Centre of Excellence security

[55] J. Metenko, *Metódy a postupy práce na mieste činu – slovenská časť projektu: Projekt výskumnej úlohy*. Rieš. výsk. úl. Jozef Meteňko, 1. vyd., Akadémia PZ, Bratislava 2008, Výsk 139.

research" (code ITMS: 26240120034 supported by the Research & Development Operational Programme funded by the ERDF).

Keywords: criminology, criminalistics and forensic research, crime phenomenology and etiology, prevention, trace, techniques and tactics, identification, documentation, work on the crime scene

Streszczenie

Mimo że kryminologia jest dyscypliną o najdłuższej tradycji w dziedzinie badań przestępczości, jej historia miała niewiele do powiedzenia na temat naukowych metod oceny miejsca zbrodni, jej fenomenologii i etiologii. Kryminalistyka z kolei jest zorientowana na ocenę i wyszukiwanie wszelkich śladów popełnionego przestępstwa, które zostaną wykorzystane w prowadzonym dochodzeniu karnym. Analizowane badania z zakresu historii praktyk naukowych dochodzenia karnego nie pochodzą z historii kryminologii. Nie obejmuje ona bowiem ani szczegółów naukowych podstaw technik, ani sposobów faktycznego ich opracowania. Domeną tych badań jest zaś kryminalistyka, „siostra" omawianej dyscypliny, którą można zdefiniować jako naukę zajmującą się doborem, gromadzeniem, identyfikacją i interpretacją śladów lub dowodów fizycznych oraz zastosowaniem osiągnięć nauk przyrodniczych do spraw nauki prawa. Niniejsze studium prezentuje częściowe wyniki realizacji projektu: „Centrum doskonałości badawczych w dziedzinie bezpieczeństwa" (kod ITMS: 26240120034, wspieranego przez Program Operacyjny Research & Development finansowany ze środków EFRR).

Słowa kluczowe: kryminologia, kryminalistyka, nauki sądowe, fenomenologia i etiologia przestępczości, zapobieganie, ślad, techniki i taktyki, identyfikacja, dokumentacja, praca na miejscu zbrodni