

# Criminal Investigation/Criminalistics in Europe: State of the Art and a Look to the Future

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Criminalistics/Criminal investigation is treated differently in European countries. In some countries, it has the status of an independent science, often connected with law (Germany, Russia, Serbia, Bosnia and Herzegovina, Poland), in others it is a »half« science usually incorporated formally to criminology (Slovenia, Austria, Croatia) or a sub-discipline of police sciences and criminology or recognized only as a forensic science (France, Italy, United Kingdom). The terminology used is different, especially between English and non-English speaking countries, and the connections between criminalistics and other disciplines such as forensic science, police science, investigative psychology, and criminology are not clear. Although there is a need for more and more specialized knowledge of criminal investigation and scientific evidence both for investigators and prosecutors and judges, these topics are not covered enough by research and scientific literature. It is important to develop criminalistics as a practical discipline in police academies and police vocational schools, however there is also a need to study and research it at the university level. It is important, however, that criminalistics obtains a status as an independent science and not just be a part of criminology or police science. Possibilities to gain a common ground between countries in Europe are not good because of a traditional view of this science.

More research and exchange of results should be encouraged among European countries. Language barriers make exchange of information and literature difficult, thus the analyses of textbooks have shown that most authors use only literature in their own language. The future of criminalistics/criminal investigation should be discussed and possible dangers to human rights predicted. The use of brain fingerprinting, visual recognition technology, information and communication technology, micro expressions, new psychological techniques of interrogation and interview, criminal intelligence models and proactive investigation methods can attribute to more effective detection and investigation of crime but can also pose threat to human rights.

**Keywords:** criminalistics, criminal investigation, forensic sciences, investigative psychology, crime science

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## 1 Introduction

Crime is increasing and changing, not only in Europe but also in other parts of the world as well. New forms of organized and economic crime, corruption and terrorism, cyber crime and ecological offences have all been (re)appearing. Furthermore, illegal migration, trafficking in human beings, drug offences, sexual exploitation of children and child pornography, have reached disturbing dimensions. Recent financial crises, stagnation of national economies and increased social differences and social problems, have also caused an increase in violence, property offenses and even terrorist attacks. In this regard then, the future looks not so optimistic.

On the other hand, it seems that the reaction of society to these new forms of crime is, despite many political appeals, sometimes slow and ineffective. Legislation changes slowly, reorganization of the police is not always effective, and there are financial problems and difficulties in international cooperation and in exchange of information and evidence between different institutions. While many serious criminal offenses in the field of economic and organized crime stay undetected, others stay un-cleared or the offenders are neither prosecuted nor found guilty by courts. Sometimes, judicial errors can also happen and innocent people are found guilty of crimes they did not commit.

There are several reasons for this, including: mistakes in the police investigation, use of illegal investigative methods, false confessions, bad prosecution and aggressive defense, problems with forensic evidence, exclusion of evidence, corruption, incompetence of police, prosecution and judges,

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prejudice and biases of forensic experts, among others. Last but not least, there is also the case of insufficient professional skill and knowledge of criminalistics/criminal investigation.

There is, therefore, a need for more effective and efficient detection, investigation and prosecution of criminal offences. A need for new methods and strategies of detection, investigation and prosecution of old and new forms of crime, and a need for innovation, research and development in science and technology that could be used for more effective investigation and prosecution.

Criminalistics/Criminal investigation deals with means and methods for efficient detection and investigation of criminal offences, the search for new scientific evidence, new discoveries of identification, classification and individualization of sources, new techniques of information gathering, etc. It also studies practical investigation, and mistakes and problems that happen in this work. It is, therefore, an important source of knowledge and experience for police officers, detectives, prosecutors and judges that can help them to efficiently conduct their work.

What is, then, the situation and status of criminalistics (especially in academic society) in Europe today? What is »the state of the art« and what can we expect from the future development? Is criminal investigation and detective work »art, craft or science«? (Repetto, 1978) Should it be studied and researched only in police academies and vocational schools or also at the university level? How is it treated in different countries in Europe? Is there enough exchange of research results among academics from different countries?

The purpose of this paper is: (1) to highlight the importance of criminalistics (both as a science and practical discipline); (2) to analyze its status and state of the art in different countries in Europe and its relationship to some other sciences (criminal law, forensic sciences, investigative psychology); and (3) to predict the future development and research in the field of criminalistics and criminal investigation and possible problems around it.

The main hypotheses are as follows:

1) It is important to study and research criminal investigation, including its means and methods also at the university level, in order for it to be effective, efficient and ethical in detection, investigation and prosecution of criminal offences;

2) criminalistics/criminal investigation is treated differently as a science or discipline in European countries, terminology used is different and there are no clear boundaries between other sciences; communication between countries is difficult and not very good;

3) the development of natural, technical and social sciences and trends of using them more often for crime control can lead to more efficient detection and investigation of crime but also to human rights violations.

The paper is based on the review and analyses of basic literature (textbooks, scientific articles) on criminalistics/criminal investigation in different European countries and on empirical and theoretical research in this field with special attention to university institutions. An overview of study courses at universities was used to identify the situation and problems regarding its relationship to other sciences. Development in the field of natural and social sciences, as well as information technology, was a basis for prediction of future development of criminalistics.

## 2 Criminalistics - a science of criminal investigation?

### 2.1 Terminology and concept problems

There is some confusion regarding the status of criminalistics in different legal systems and in different countries – both in Europe and in the world – but there are also problems regarding the terminology used: *criminalistics*, *criminal investigation*, *forensic sciences*, *police sciences* (English), *criminalistique*, *police scientifique* (French), and *polizia scientifica* (Italian) on one hand, and *kriminalistik* (German), and *kriminalistika*, *kryminalistika* (Slavic), on the other hand have different meanings in different languages and in different concepts.

In English-speaking countries, »criminalistics« is usually connected with forensic science. It is described as »the branch of forensic science concerned with the recording, scientific examination, and interpretation of the minute details to be found in physical evidence« (Osterburg & Ward, 2000: 30). It is therefore part of forensic science. Sometimes criminalistics is identified as forensic science (Bennett & Hess, 2001: 21), or considered as »a marriage of science, logic and philosophy« regarding physical evidence, or a term embracing »scientific forensic disciplines and crime scene investigation« (Shaler, 2012: 17, 20). The term criminalistics may relate to the work of crime scene technicians at the crime scene or to scientific forensic examination in crime labs (Chisum & Turvey, 2007). Last but not least, criminalistics may also be identified as criminology (or part of criminology) and (academic) criminalists as criminologists (Meško & Tičar, 2008: 288).

The same may be said for the meaning of the terms »criminalistique«, police technique, police scientifique, polizia sci-

entifica, etc., which are also expressions for forensic science and not synonymous with criminal investigation.<sup>2</sup>

In German and in most Slavic languages, the terms »kriminalistik«, »kriminalistika«, and »kryriminalistika« are used in their traditional sense that originated from Hans Gross's classic »Handbook for investigative judges as a system of criminalistics« (Gross, 1898).<sup>3</sup> Here, the expression is a synonym for the science of criminal investigation and includes both tactics and methodology of investigation, as well as technics<sup>4</sup> - forensic science. Since the term »forensics« and »forensic science« also became very popular in these countries, in some states they make a distinction between »kriminaltehnik or »kriminalistična taktika«, and »forensic science«. The first includes the work at the crime scene done by the police, while the second refers to the expert or scientific examination in forensic laboratory.

The traditional concept of »kriminalistik« has been accepted and followed by many central and eastern European countries – it is known as a criminological-criminalistic concept (Vodinić, 1985). It is not, however, accepted by some other west European countries (Italy, France, Spain) and especially not by English-speaking countries (UK, USA, Canada, Australia) which consider criminalistics only as utilizing natural and technical sciences for criminal investigation and evidence purposes.

There are, on one hand, terminological problems (what is criminal investigation, criminalistics, forensic science, police science?), and on the other hand, problems on how to treat the knowledge about detection and investigation of criminal offences (a science, discipline, sub discipline, art, craft), where to teach it and where to research it (police academies, university courses).

The analyzed textbooks show, however, that the authors have in mind more or less the same topics: criminal investigation that includes general topics (history of criminal investigation, general principles), personal information (interviews,

interrogation), material evidence (traces, identifications), tactics of investigation (in general and specific offenses), problems in investigation and criminal trial. Even in different systems, the topics of the textbooks on criminal investigation/criminalistics are similar. The treatment of the subject is, however, different – some as an independent science, others as a sub-discipline of other sciences (mostly criminal justice, law, criminology, police science, forensics).

## 2.2 Criminalistics in some European countries

It would be futile to present definitions, history and concepts of criminalistics in different countries in Europe in such a short paper. Therefore, we only briefly discuss some of the characteristics of authors and stress the most important issues. It would be very interesting, though, to make a larger empirical and theoretical research in this field and compare the views of academics and practitioners.

### 2.2.1 Germany

In Germany and Austria, the traditional concept of criminalistics that arose from the handbook of Hans Gross has been followed and additional theoretical parts of criminalistics as a science had been added. Especially in the former German Democratic Republic (DDR), criminalistics has been considered as a science and had been included in university lectures both at the undergraduate and graduate levels. At the Berlin Humboldt University, there had been department of criminalistics with a postgraduate course which, however, was unfortunately canceled in 1994 (Ackermann, 2007). There were several warnings by prominent academics that the situation with criminalistics in Germany was not going well (Ackermann, Koristka, Leonhard, Nisse, & Wirth, 2000). Research and teaching of criminalistics was mostly left to police academies and police vocational schools, and even there the courses are often integrated into general police tactics (Ackermann et al., 2000: 595). Since then, the situation has not improved much, but there are some Law Faculties that give students lectures on criminalistics (Ackermann, 2007). Still, in Germany, criminalistics is considered as an independent science. (Ackermann, Clages, & Roll, 2011). However, much of the (empirical and theoretical) research in criminalistics has been carried out by the Federal Bureau of Investigation (Bundeskriminalamt) as well as some high vocational police schools (like Deutschen Hochschule der Polizei in Munster).

We chose two books for our analyses, namely: the recently published 4th edition of *Handbook of criminalistics* (*Handbuch der Kriminalistik*, Ackermann et al., 2011) and the older *Criminalistics (Kriminalistik)* part 1 and part 2 (Kube, Störzer, & Timm, 1992, 1993).

<sup>2</sup> On the other hand, the concept of »forensic sciences« is also not accepted in France, since the term »sciences forensiques« is not used in official text instead of »police technique et scientifique« (Buquet, 2011: 21).

<sup>3</sup> In his *Handbuch für Untersuchungsrichter als system der kriminalistik* Gross actually used two spellings: »kriminalistik« and »kriminalistik«. It is interesting that the title of the book was translated to English as *Criminal Investigation, A practical Textbook for Magistrates, Police Officers, and Lawyers* (Gross in Chisum & Turvey, 2007: 17)

<sup>4</sup> The term »tehnika« or »tehnika« is difficult to translate in English, so we use term »technics« or »forensic science«

Ackermann gives the following definition of criminalistics (Kriminalistik): »Criminalistics is the science of detection, investigation and prevention of criminal offences and investigative relevant events« (Ackerman et al., 2011: 13). Its basis include principles of the origins of information (traces, evidence) about the criminal offense, and methods of their finding, securing and use for investigative and evidence purposes.

The basic structure and topics in these books is as follows: introduction to criminalistics, evidence, first response and preliminary investigation, hypothesis building, investigation of witnesses and suspects, alibi, eyewitness identification, house search, police interrogation, undercover investigation (Ackermann et al., 2011). Or – even more in detail – in the books *Kriminalistik 1* and *2* from Kube et al. (1992, 1993) topics include: theoretical criminalistics, organization of criminal investigation, investigative strategies, interrogation, crime scene investigation, traces, identification methods, forensic science methods, investigation of specific crimes (homicide, organized crime, drugs, economic crime, etc.).

We can conclude that German criminalistics includes all traditional branches of criminalistics, namely introduction with history, theory and methodology, tactics, technics (forensics), psychology of investigation, strategy of investigation and methodology of investigation of different criminal offences. The structure of criminalistics is as follows:

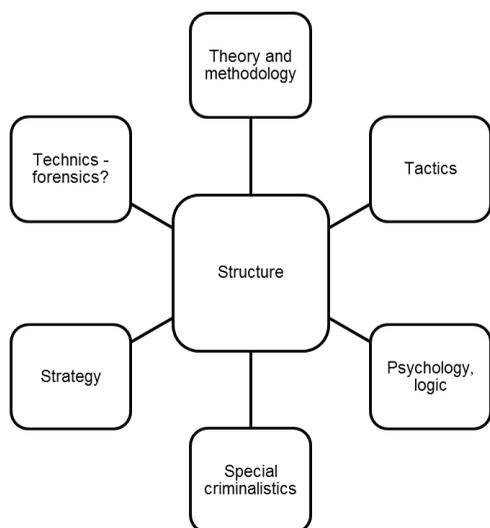


Figure 1: Structure of criminalistics in Germany

Handbook of Criminal Investigation (*Handbuch der Kriminalistik*) has 676 pages and the bibliography used includes more than 380 authors. Almost all texts are by German

authors and in German language. *Kriminalistik* (together part 1 and 2) has 2.000 pages and again, most of the literature is in German.

### 2.2.2 Russia (and the former Soviet Union)

In Russia (as well as in other states of former Soviet Union), criminalistics has been traditionally divided into criminal investigative tactics, technics and methodology (*kriminalističeskaja taktika, tehnika, metodika*). It has been considered a legal science and a great deal of attention has been paid to theoretical issues. Also, a lot of attention has been given both to empirical and theoretical research in criminal investigation. Unfortunately, until recently, literature from Russia had been difficult to obtain and understand (Cyrillic writing, Russian language). Today, books and reviews on criminalistics are easy available also in other European countries.

A Typical example of a Russian textbook on criminalistics is *Handbook for criminal investigators (Nastolnaja kniga sledovatelja*, Dudin, Korshunova, & Shadrin, 2008) and *Criminalistics: Full course (Kriminalistika: polny kurs)* by A. G. Filippov (Filippov, 2013), which includes an introduction to criminal investigation, legal bases of criminal investigation, criminal investigative technics, tactics and methodics.

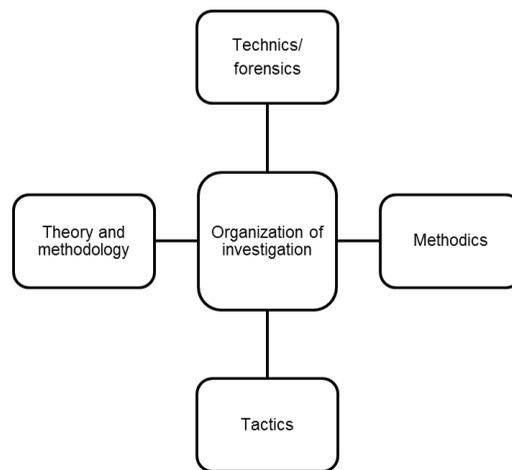


Figure 2: Structure of criminalistics in Russia

Filippov (as most Russian authors) defines criminalistics as »a science on principles of development of criminal act, information on the offence and the offenders, collection, investigation, evaluation and use of evidence and on them based on principles of special means and methods of criminal investigation ...« (Filippov, 2013: 16). After the introduction of the Bologna study programs, there were several changes in the

courses of criminalistics in Russia and – sadly – »the entire course of criminalistics has been reduced to practical exercises, not only in the police academies but also in law faculties of universities« (Yališev, 2011: 29–30). The country that had developed so many theoretical issues of criminal investigation and produced much empirical research has obviously moved one step back in this regard.

### 2.2.3 States of the former Yugoslavia (Slovenia, Serbia, Croatia and B&H)

Probably the most famous criminalist in the former Yugoslavia was Professor Vladimir Vodinelič, who published numerous textbooks and many scientific papers. He was both a former practitioner and an academic, and was following the traditional concept of criminalistics but added many theoretical and philosophical issues (under influence of Russian authors) as well. His textbook *Criminalistics (Kriminalistika, Vodinelič, 1984)* was the fifth addition of his original book and included an introduction and history of criminalistics, investigative tactics (both operative task of the police and formal investigative measures) and criminalistics technics (forensics). In his two books *Criminalistics: detection and investigation (Kriminalistika: otkrivanje i dokazivanje, Vodinelič, 1985)*, he collected numerous articles on criminalistics that he had published before, most of them theoretical. Students in Law faculties in Slovenia and in other states of former Yugoslavia used his textbook as the main study literature for criminalistics. He was also a mentor of many postgraduate students (masters and Ph.D.) who researched criminalistics. He defined criminalistics as »a science that searches develops and uses such scientific and in praxis developed means and methods that are the most appropriate to detect and investigate the criminal offense, to find the offender and to secure the evidence, as well as to prevent further planned criminal offences. This is a science on technics, tactics and methodic of operative, investigative and court employees« (Vodinelič, 1984: 3).

In Slovenia there are four recent books on criminalistics that are used by law students and students of faculty of criminal justice and security. The main textbook on criminalistics is *Criminalistics: introduction, tactics, technics (Kriminalistika: uvod, taktika, tehnika, Maver et al., 2004)*, which includes an introduction to criminalistics and criminal investigation, tactics of investigation and forensic science. The 600-page book includes citations from authors from different countries including Russia, Germany, Austria, Switzerland, UK, USA, republics of the former Yugoslavia, and others. Under the influence of Russian and German authors, Maver also published a book on epistemological and psychological questions of criminal investigation *Criminalistics as a truth finding process (Kriminalistični spoznavni process) (Maver, 1988)*. A Special

textbook on the methodology of investigation of different criminal offences was written by Anton Dvoršek (Dvoršek, 2003). His 406 page book *Criminal investigative methodology (Kriminalistična metodika)* deals with the specifics of investigation of homicides, sexual offences, property offences, arson and explosions, terrorism, drug offences and economic crime, includes citations of authors from different countries. Dvoršek also wrote a book on strategy of investigation (*Kriminalistična strategija*) (Dvoršek, 2001), while forensic psychology is covered in a special textbook of forensic psychologist Igor Areh. Some topics from the textbook *Forensic psychology (Forenzična psihologija)* are similar to those in Maver's handbook (eyewitness testimony, lie detection, interview and interrogation, etc.) but the literature used is only from English speaking sources (Areh, 2011).

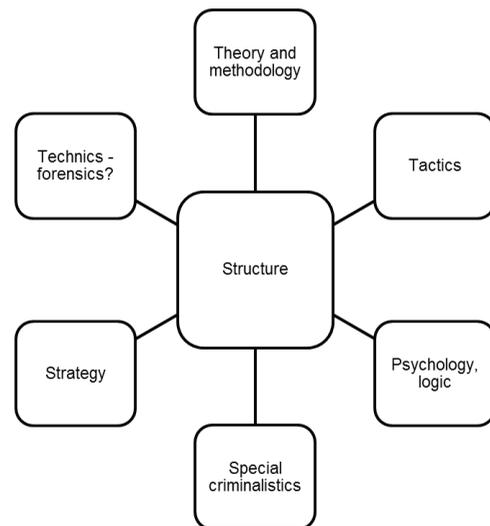


Figure 3: Structure of criminalistics in Slovenia

Similar is the situation in Croatia, Serbia, and Bosnia and Herzegovina. In Croatia, the main textbooks on criminal investigation are *Criminalistics (Kriminalistika)* (parts 1, 2 by Pavišić, Modly, and Veić, 2006, 2012). The first book covers the introduction to criminalistics and tactics of investigation, while the second deals with the methodology of investigation of different offences. The authors used literature from different countries. Pavišić also divides criminalistics into »heuristic« and »syllogistic« criminalistics; the first deals with operative police activities and the second with official investigative acts (Pavišić, et. al. 2006: 46).

In Serbia, one of the latest handbooks is *Criminalistics (Kriminalistika)* written by B. Simonović (Simonović, 2012), which is written in Cyrillic and includes topics such as tactics,

technics and methodology of investigation. In Bosnia, the latest handbook is *Investigation of criminal offences (Istraživanje krivičnih djela)* edited by Neđad Korajlić (Korajlić, 2012).

What is common and special in all the aforementioned textbooks is that they include traditional systems of criminalistics and that they use literature from different countries and in different languages.

#### 2.2.4 United Kingdom

From the United Kingdom, we analysed three recently published textbooks on criminal investigation: *Handbook of criminal investigation* (Newburn, Williamson, & Wright, 2007), *Handbook of forensic science* (Frazer & Williams, 2009) and *Understanding criminal investigation* (Tong, Bryant, & Horvath, 2009). The authors are well known and respected academics.

As in other English speaking countries, the term »criminalistics« is used as a synonym for »forensic science« which is an independent science, while »criminal investigation« is a sub-discipline of criminology. Newburn noted that »crime investigation has not generally been a subject of significant academic scrutiny« (Newburn et al., 2007: 1) and that »there has been little systematic research by sociologists, criminologists and social psychologists into how criminal investigations are conducted« (ibid.: 5). However, in criminology studies, students are now more often taking modules on criminal investigation as part of their studies (ibid.: 6).

It is evident that there are three separate sciences or disciplines which are connected to criminalistics, namely, i) criminal investigation; ii) forensic science; and iii) investigative or forensic psychology. On the other hand, we can see that authors of handbooks of criminal investigation often present all three topics together in one book. Newburn et al. (2007) include in their *Handbook of criminal investigation* chapters on history of criminal investigation, social context, legal aspects and organization of criminal investigation, investigative sources and processes (models of investigation, undercover investigation, investigative interviewing, and profiling) and governance of criminal investigation, as well as forensic techniques (in general) and investigative psychology.

Tong et al. (2009) also include parts of investigative or forensic psychology in their book on criminal investigation, which has chapters on the history of crime investigation, theories of criminal investigation, forms of reasoning, eyewitness evidence and also on offender profiling, investigating interviewing and eyewitness evidence. They do not, however, include chapters on physical evidence or forensic science.

*The handbook of forensic science* (Fraser & Williams, 2009) is dedicated only to forensic science, and covers topics such as human and material identification, crime reconstruction, evaluation of scientific evidence and general about the role of forensic science today and in the future. The book has 662 pages, with almost all literature used and citations from English – speaking authors.

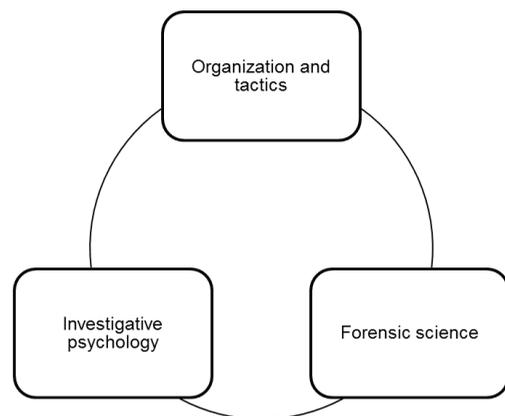


Figure 4: Structure of criminalistics in UK

#### 2.2.5 France, Italy, Spain, Portugal

Pioneers of French »criminalistique« are without a doubt Edmond Locard, who was a disciple of the famous Alexandre Lacassagne (Buquet, 2011), and Alphonse Bertillon (founder of anthropometry). Like them, many other criminalists from France are from the field of forensic medicine or other natural sciences, so criminalistics is traditionally treated as a part of criminology that uses scientific methods (Buquet, 2011). There are practically no academic works on criminal investigation in general.

Buquet's *Textbook on modern criminalistics (Manual de criminalistique modern)* includes forensic topics such as different identification methods (fingerprints, ballistics, signature and documents identification, traces), photography methods of analysis (chromatography, spectrometry, etc.) and new technologies and techniques (Buquet, 2011). The book has 436 pages, and the bibliography includes 122 units, almost all in French.

### 2.3 Criminalistics and other sciences

Criminalistics, forensic sciences, investigative psychology, criminology, police science often cover the same topic causing them to overlap.

Criminalistics usually covers topics such as: interview and interrogation, lie detection, crime scene investigation, crime reconstruction, search of houses and premises, eyewitness identification, undercover investigations, hypothesis building, clues and circumstantial evidence, psychological profiling, geographical profiling, crime classification, case analyses, operative and strategic analyses, etc.

- Themes of research: criminalistics**

  - First response
  - Interview
  - Crime scene search
  - Interrogation of suspects and witnesses
  - Planning and hypothesis building
  - Reconstruction
  - Identification parade
  - House search
  - Undercover investigation
  - Polygraph examination
  - Strategies of investigation
  - Case analyses
  - Methodics of investigation
  - Criminal intelligence
  - Effectiveness of investigation
  - Mistakes in investigation
  - Knowledge and implementation
  - New methods and means
  - International cooperation
  - Standards of quality
  - Identification and individualisation
  - Traseology
  - Dactiloscopy
  - DNA and blood traces

*Figure 5: Topics of research in criminalistics*

Forensic sciences (without forensic psychology, forensic medicine, forensic psychiatry), usually deals with the same topics as criminalistics, places more emphasis on the natural sciences (chemistry, physic, biology etc.) as opposed to criminal investigation and criminal procedure. The views of forensic experts therefore differ from the views of academic criminalists, given that they are more scientific.

- Themes of research: forensic sciences**

  - Identification and individualization
  - DNA profiling and biological traces
  - Fingerprints
  - Shoeprints
  - Forensic anthropology
  - Microtraces
  - Forensic chemistry
  - Quality standards
  - Crime Reconstruction
  - Databases
  - Expert opinions
  - Judicial decisions
  - Organization and accreditation of forensic laboratories
  - Forensic statistics
  - Digital forensics

*Figure 6: Topics of research in forensic sciences*

Investigative or forensic psychology is also closely connected to criminalistics, especially to investigative tactics, and in academic courses topics often overlap. Yet, there are differences in their professional approach since forensic psychologists often have different educational backgrounds (psychology) than do criminalists (mostly lawyers). Therefore, their views about some topics can be different. It is interesting to also note that the pioneers of forensic (legal, investigative) psychology were mostly lawyers (from Hans Gross on to Ratinov, Magulski, Aćimović and others).

- Themes of research: investigative psychology**

  - General
  - Psychological profiling
  - Investigative thinking
  - Criminal psychology
  - Geographical profiling
  - Information gathering
  - Interview and interrogation
  - Polygraph
  - Psychological problems
  - Eyewitness identification
  - Expert testimony
  - Psychological help to investigators
  - New discoveries in psychology

*Figure 7: Topics of research in investigative psychology*

So we can thus far see that there is an overlap of sciences and academic courses that cover criminal investigation. Many topics are lectured and discussed in different courses, but generally from different points of view. This can in fact be considered a good thing, since the students get different information and different perspectives. It can, however, also mean that sometimes things will duplicate. In study programs these topics should be therefore emphasized and more clearly defined.

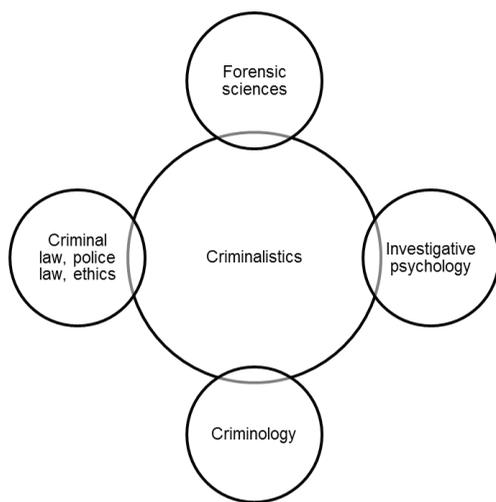


Figure 8: Overlap of sciences

## 2.4 Problems and dilemmas

There is not enough exchange of information and knowledge about criminalistics among the countries in Europe. There are, of course, meetings of EU institutions devoted to developing new strategies to fight crime (such as »The Stockholm Programme«) and conferences and meetings within Europol, Interpol, CEPOL, European Network of Forensic Science Institutes [ENFSI] and other professional police organizations that try to improve work in the field of criminal investigation, forensic science and investigative psychology (like ENFSI Research and Development Strategy project). Furthermore, there are also academic conferences in Europe about crime and criminal justice (Slovenia hosted some of them: e.g., the »9th Conference of European Society of Criminology« in 2009, or »The 9th Biannual International Conference Policing in Central and Eastern Europe« in 2012). These conferences, however, focus mostly on criminological and general criminal justice topics and only in small part on criminal investigation and criminalistics.

There were also some rare conferences on criminalistics, such as »The First and Second Conference on New Trends in Criminal Investigation and Evidence« in the Netherlands, »International conference on criminalistics and forensic examination« in Lithuania, and »Archibald Reiss Days« conference in Serbia. Most of the papers in these conferences, however, dealt mainly with general police and criminal justice problems. The 2011 »Criminalistics/Criminal Investigation in Europe« conference in Ljubljana, Slovenia, was one of the rare scientific meetings dedicated only to criminal investigation. We would need more such conferences in the future to get academics and practitioners together from different countries in Europe.

One of the problems in increasing the exchange of information and knowledge about research in criminalistics is also the language barrier. As we have stated before, in textbooks and articles authors mostly cited literature from their home country and in their own language. If the paper is also written in a different style, for example in Cyrillic, it is very difficult to share it with readers from other countries unfamiliar with it. What is not published in English language is rarely available.

Different study courses (universities, police academies, police vocational schools) also make research information more difficult to share and compare. Police educational institutions are more closed to the public and secret and so are the results of their research, while all research at the universities is open to media and public. Exchange of information is therefore difficult or even impossible.

Last, but not least, in the field of criminal investigation there are research problems that are for example different from research in criminology. It is difficult to get agreement for empirical research into police activities, given that there are ethical questions involved, as well as the issue of confidential data and secrecy. Police officials are also often not willing to allow research that may show negative results of their activities. Academic studies should be objective and therefore sometimes not welcome to police authorities.

## 3 The future of criminalistics and criminal investigation

Both in the field of criminalistics as a science or discipline, and in the field of criminal investigation as a practical police activity, what can we expect in the future? Can we predict further development in both areas? We will try to give some suggestions and warnings.

As was previously mentioned, the situation in Europe regarding criminalistics as an independent science does not

seem very promising. University study programs are rare and often abandoned even in some countries where they used to be available. The Bologna study courses are not in favor of including this science in the law faculty programs, so it is mostly left to rare faculties of criminal justice or to vocational police schools and police academies, which are crucial, as there will undoubtedly be further developments and research in forensic sciences, investigative psychology and criminology.

Criminalistics and other sciences (forensic sciences, investigative psychology, criminology, criminal law) must research work in the field of detection, investigation and evidence!

The programs in the field of education and research should be coordinated.

Because of different understanding of criminalistics in Europe, differences will continue to exist.

**Figure 9:** *Criminalistics or ...?*

There are, however, also possibilities for research in the field of criminalistics, both theoretical and empirical. Such topics for research include development of questions of criminal investigation, such as theory and methodology of criminalistics, its structure, and history. Furthermore, questions on how to find the truth about prior criminal acts, how to avoid wrongful convictions, or be more successful in detection and investigation of offenders and offences, what new methods and means could be developed and used in investigation, and what possible dangers could mean for their use for violation of human rights, are also both theoretical and empirical topics for research.

It would be interesting to study why investigative failures happen and how to avoid them. For this purpose, practical criminal cases should be analyzed to see where mistakes were made and suggestion given for the future. Effectiveness and efficiency of criminal investigation (in general and in specific investigative tasks such as crime scene examination, interrogation, interviewing, discovering deception, etc.) is another interesting topic for research. What can we realistically expect from the police in this regard? And what new tactical and methodological means and methods of investigation can we develop for better efficiency? No doubt the concept of proactive investigation and the use of criminal intelligence will become more and more important.

Phenomenology of criminal offences and »modus operandi« of offenders change over time and the police are usually »one step behind the criminals« in this regard. It would be wise to put more attention in studying these changes, as well as identifying new strategies of defense of criminals and to prepare counter strategies of investigators to these changes.

Most changes will, no doubt, come from the development of new technologies and discoveries in the field of natural sciences. Forensic sciences will, therefore, become more and more important for detection and investigation of crime, as well as for prosecution of criminal offenders.

There are several challenges that face introducing new means and methods (also) into criminal investigation. One of them is mistrust and aversion to new methods. This has been proven in criminalistics too (Bertillon, Vučetić, Fields, Herschel etc.). Also in Slovenia, my proposal to start an odontology identification in 1976 has had no result so far. People just do not trust new methods and their introduction in their working habits. Other obstacles include the credibility of new discoveries, and the legal requirements.

We can, therefore, expect new discoveries (especially in natural sciences) where there should be no special obstacles to use them in criminal investigation and forensic evidence (such as new methods in chemistry, biology, physics, nanotechnology, microfluidics, lab on a chip, remote sensing, etc.). There has been much improvement of analytical technology, however, which »has led to a situation in which forensic science laboratory can analyze smaller and smaller traces, yet it can be unclear how this improved analyses adds value to criminal investigation or prosecution« (European Network of Forensic Science Institutes [ENFSI], 2010: 3). ENFSI also suggests a transfer of forensic services to earlier stages of criminal investigation in the way that it »bring[s] the lab to the traces« instead of bringing »the traces to the lab« (ibid.: 6) and more cooperation between forensic laboratories and academia.

Then there are methods that are not scientifically approved and verified but still possible to use in operative police work. Also, some methods are useful but questionable from a legal point of view, yet others are too expensive to be used in police work (Maver et al., 2004: 59).

There are some interesting and challenging new methods such as 'brain-fingerprinting', use of drones for observation, new internet and computer technology, use of micro expressions and other psychological methods, observation, registration and identification technology, and also new discoveries in the field of quantum physics and parapsychology. They can have a great influence in the future understanding of episte-

mology problems regarding discovering and proving criminal offence as a past event.

#### 4 Conclusion

In conclusion, we shall try to provide answers to the hypotheses proposed in the introduction of this paper. It would take a much larger empirical and theoretical study to be complete in our answers, so we are aware of the shortcomings of our presentation and suggest that it is taken just as a brief overview of the problems in the area of criminalistics and stimulation for further research. The answers might offer some guidelines for those who will (hopefully) decide to continue research of this topic and help to further develop criminalistics/criminal investigation as a science and practical discipline and to exchange knowledge among countries in Europe. This paper is a broader international approach to scientific justification of this discipline which I started with my paper on origins, development and trends of criminalistics in Slovenia (Maver, 2009). Some of the proposals there may also apply to this occasion, so we will not repeat them here.

The answers to the proposed hypotheses are:

1) Yes, Criminalistics/Criminal investigation is important for efficient, effective and ethical criminal investigation and for successful criminal procedure in general, both as a science and a practical discipline. Together with forensic sciences, forensic psychology and criminology can contribute to better knowledge and experience of all who are responsible for detection, investigation and prosecution of crimes and offenders, higher conviction rates and less investigative failures and wrong convictions. Although it is important to develop criminalistics in police academies and police vocational schools, there is a need to study, research and lecture criminalistics at the university level as well. Lawyers (prosecutors, judges, defense lawyers) need such knowledge and scientific research can be conducted only at independent university institutions. Therefore, it is important that criminalistics gets a status of an independent science and not be just a part of criminology or police science. The situation and the trend for the future is, unfortunately, not very promising, even in those countries where criminalistics had traditionally been a part of university study programs.

2) Yes, Criminalistics is treated differently in European countries. In some, it has a status of independent science, often connected with law (Russia, Serbia, Bosnia and Herzegovina, Poland), while in others it is a »half« science usually incorporated formally to criminology (Slovenia, Austria,) or is considered only as a sub-discipline of police sciences or criminology (England). Also, the terminology used is different with

distinctions of English speaking and non-English speaking countries in regard to the term criminalistics, criminal investigation and forensic sciences, making communication sometimes difficult. There are no clear borders between sciences like criminal investigation, forensic sciences, investigative psychology and criminology. Therefore lectures and research sometimes overlap. However, since professional background of lecturers and researchers is different (lawyers, psychologists, natural science graduates, criminologists), the perspectives are also different, which can in fact give a more versatile approach to the topics.

3) Yes, the future will bring many new discoveries in the field of science and technology that might improve detection, investigation and prosecution of criminal offences, but at the same time also threats to human rights and privacy. We have to be careful regarding introduction of these methods in practical criminal justice. The current experiences are a good warning for possible future threats.

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## **Kriminalistika v Evropi: stanje in pogled v prihodnost**

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Kriminalistiko pojmujejo v Evropi zelo različno. V nekaterih državah je to samostojna znanost, pogosto povezana s pravom (Nemčija, Rusija, Srbija, Bosna in Hercegovina, Poljska), drugje je le »polovična« znanost, pogosto formalno vključena v kriminologijo (Slovenija, Avstrija, Hrvaška) ali poddisciplina policijskih znanosti oziroma priznana le kot forenzična znanost (Francija, Italija, Velika Britanija). Uporabljena terminologija se razlikuje, še zlasti med angleško in neangleško govorečimi državami, prav tako pa ni jasna razmejitev med kriminalistiko in nekaterimi drugimi vedami, kot so npr. forenzične znanosti, policijske vede, preiskovalna psihologija ali kriminologija. Čeprav je potrebnega vedno več specializiranega znanja na področju kriminalističnega preiskovanja in znanstvenih dokazov – tako za preiskovalce kot tožilce in sodnike – so te teme premalo pokrite z raziskovalno dejavnostjo in strokovno literaturo. Pomembno je razvijati kriminalistiko kot praktično vedo na policijskih akademijah in policijskih strokovnih šolah, prav tako pa je pomembno proučevanje in raziskovanje kriminalistike kot znanstvene discipline na univerzitetnem nivoju. Pomembno je, da kriminalistika ohrani samostojnost kot znanost in ne postane le del kriminologije ali policijskih ved. Možnosti za enotno obravnavanje kriminalistike med evropskimi državami so zaradi tradicionalnih pogledov na to vedo žal majhne.

Med državami v Evropi bi bilo potrebno več raziskovanja in izmenjave rezultatov. Jezikovne razlike otežujejo izmenjavo informacij in literature, saj pregledani učbeniki kažejo, da večina avtorjev uporablja le literaturo v svojem jeziku. Treba je razpravljati tudi o prihodnosti kriminalističnega preiskovanja in predvideti morebitne nevarnosti kršenja človekovih pravic. Uporaba različnih metod (npr. angl. *brain fingerprinting*, tehnologija za vizualno prepoznavo, informacijske in komunikacijske tehnologije, mikro izrazi na obrazih, nove psihološke metode zasliševanja in intervjuja, obveščevalna kriminalistična dejavnost, proaktivne preiskovalne metode) lahko prispeva k učinkovitejšemu odkrivanju in preiskovanju kriminalitete, vendar lahko predstavlja grožnjo človekovim pravicam.

**Ključne besede:** kriminalistika, kriminalistično preiskovanje, forenzične znanosti, preiskovalna psihologija, znanost o kriminaliteti

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