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Articles

Studia Iuridica Lublinensia vol. XXX, 4, 2021
DOI: 10.17951/sil.2021.30.4.315-331

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Forensics as a Science and Practice

Kryminalistyka jako nauka i praktyka

ABSTRACT

Modern forensics is a science that has been dynamically developing in recent years, which is related both to the general development of science and technology and to the needs of the judiciary and law enforcement agencies. The main feature of forensics is its interdisciplinarity. All the facts presented cause that the identity of modern forensics is changing. It is, in a way, a natural process. However, it poses a great danger of disintegrating this science. The article presents a discussion on the constantly changing paradigm of forensics, its goals and tasks. Such important theoretical issues have a large impact on forensic practice, primarily on expert opinions, teaching forensics and knowledge of forensics by lawyers.

Keywords: forensics; interdisciplinarity; forensic practice; expert opinions; teaching forensics

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Data: 27/11/2026 15:55:29

INTRODUCTION

Modern forensics is a science that has been dynamically developing in recent years, which is related both to the general development of science and technology and to the needs of the judiciary and law enforcement agencies. The development of forensics thus provokes a lively discussion about the paradigm of this science.[1] By the paradigm of science, we most often understand its essence (basis), what distinguishes a given science from other sciences. Sometimes the paradigm is understood as the identity of science. Within this identity, we can distinguish the scope of a given science, its goals and tasks, subject of interest, structure and methodological issues.[2] The main feature of forensics is its interdisciplinarity. It does not fall within the traditional division of sciences into *a priori* and *a posteriori* sciences.[3] On the one hand, in forensics, the methods of logic and mathematics are used, and thus the methods of *a priori* sciences – these methods occur in the problems of the theory of forensics, including in the theory of ideas and opinions, a number of investigative conclusions are also of this nature, On the other hand, the methods of *a posteriori* sciences are widely used – natural and technical sciences (broadly understood) and humanities. Forensics to a large extent uses the specific achievements of other sciences, creatively adapting them, at the same time, maybe apart from physics, no science has so many general laws in its output.[4]

The issues raised may be considered commonly known and the question may arise as to why we are returning to them now, why it is worth discussing them. Connections of forensics with the current social development (and with the pathology accompanying this development, which is a modern crime), with the unprecedented in the history of mankind development of communication methods (especially information exchange methods), the development of science and technology mean that forensics must develop as quickly. Forensics is purposeful science, legal science, science primarily aimed at the implementation of the norms of procedural criminal law, and thus at the implementation of the norms of substantive criminal law.[5] If

[1] J. Kasprzak, *Problem tożsamości współczesnej kryminalistyki*, [in:] *Współczesna kryminalistyka. Wyzwania i zagrożenia*, eds. V. Kwiatkowska-Wójcikiewicz, M. Zubańska, Szczytno 2015, p. 7.

[2] Cf. *Podstawy filozofii*, eds. S. Opara, A. Kucnera, B. Zielewska-Rudnicka, Olsztyn 2009, p. 162 ff.; R. Wójcicki, *Wykłady z metodologii nauk*, Warszawa 1982, p. 9 ff.; S. Pabis, *Metodologia i metody nauk empirycznych*, Warszawa 1985, pp. 12–13; A. Grobler, *Metodologia nauk*, Kraków 2006, p. 251.

[3] *Podstawy filozofii…*, p. 163.

[4] B. Hołyst, *Kryminalistyka*, Warszawa 2010, p. 43. Cf. *Kryminalistyka*, ed. J. Widacki, Warszawa 2008, p. 3 ff.; E. Gruza, M. Goc, J. Moszczyński, *Kryminalistyka, czyli rzecz o metodach śledczych*, Warszawa 2008, p. 20 ff.; iidem, *Kryminalistyka, czyli o współczesnych metodach dowodzenia przestępstw*, Warszawa 2020.

[5] J. Kasprzak, B. Młodziejowski, W. Brzęk, J. Moszczyński*, Kryminalistyka*, Warszawa 2006, pp. 37–38.

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Data: 27/11/2026 15:55:29

the substantive criminal law, and to a lesser extent the procedural criminal law, can allow for certain inertia, delayed action, then forensics cannot allow such a situation in any case. However, there is dissonance. Technical research methods, investigative methods, applied practically, began to precede theoretical assumptions. In recent years, the boundaries of the scope of forensics have started to "blur", have become less clear. H. Kołecki draws attention to this phenomenon very accurately: "[…] after almost 45 years of dealing with university forensics, I see its subject and scope less and less clearly. As I read national forensic publications, it becomes more and more difficult for me to clearly determine what is and what is not forensics (the science of forensics)".[6] In this respect, Poland is not alone. The change in the identity of forensics and the change in its paradigm was influenced by political changes in Europe at the turn of the 20th and 21st centuries, generating also negative phenomena in the form of rapid development of crime (especially organized crime) after the collapse of many functions of the state in the former countries of the socialist camp, and the rapid development of science and techniques (especially information technology and global communication). Fundamental changes in forensics took place in Germany and other Western European countries,[7] in Russia – where in the 2001 Code of Criminal Procedure of the Russian Federation the principle of substantive truth was replaced by the principle of judicial truth.[8] On the other hand, the evaluation of evidence, especially scientific evidence in the form of an expert opinion in Poland, is increasingly influenced by the American principles resulting from the Daubert standard, discussion of American court judgements and views resulting from American scientific studies.[9]

All the facts presented cause that the identity of modern forensics is changing. It is, in a way, a natural process. However, it poses a great danger of disintegrating this science. For how attractive it seems for a scientist to create a "new branch of science", to challenge traditionally binding dogmas. Such an action is justified when the previous statements are replaced by new statements – tested and justified in accordance with the assumptions of falsification.[10] However, when there is a negation of the existing dogmas, without indicating new alternative solutions, on the basis of only "sticking the proverbial stick into the anthill", then such an action should be

[6] H. Kołecki, *Zakres i sposób uprawiania kryminalistyki w Polsce*, [in:] idem, *Kryminalistyka i nauki penalne wobec przestępczości*, Poznań 2008, p. 397.

[7] Cf. P. Girdwoyń, *Opinia biegłego w sprawach karnych w europejskim systemie prawnym. Perspektywy harmonizacji*, Warszawa 2011; B. Hołyst, "Kryminalistyka na Świecie" 2014, no. 1(4), pp. 41–42.

[8] D. Sołodow, *Ocena dowodów naukowych w systemie kryminalistyki rosyjskiej*, Olsztyn–Szczecin 2012, p. 84.

[9] *Ibidem*, p. 160 ff. Cf. J. Wójcikiewicz, *Temida nad mikroskopem. Judykatura wobec dowodu naukowego*, Toruń 2009; J. Konieczny, *Kryzys czy zmiana paradygmatu kryminalistyki?*, "Państwo i Prawo" 2012, no. 1.

[10] Cf. K.R. Popper, *Logika odkrycia naukowego*, Warszawa 2002, pp. 74–75.

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Data: 27/11/2026 15:55:29

assessed negatively, because it may undermine the trust among the litigants and the court in the commonly used and scientifically falsified methods of scientific evidence. After all, we are in a real fashion to "Americanize" our law and forensics. When we adopt institutions that work well in our legal system – for example, institutions of a crown witness, police provocation, new activities in the field of operational and reconnaissance work, research technology in some types of expertise – such activities should be assessed positively. However, when the issues of "unscientific" scientific methods used in Poland for a long time reach our ground, this "Americanization" becomes debatable.[11] These studies are often the result of judgements by US state and federal courts. The dissimilarity of the law, rules of evidence, complete detachment from the context of the realities and tradition of Polish and European forensics make these American solutions, perhaps interesting in terms of cognition, of little use in our practice. It should also be emphasized that European forensics (including Polish forensics) is completely unknown to American authors. The issues raised have been well researched, developed and put into practice in Europe for many years.[12]

FORMS OF UNDERSTANDING FORENSICS

Due to its complexity and multidimensionality, the identity of forensics (as well as the identity of science in general) can be considered in seven aspects (planes):[13]

1. Forensics as a species of knowledge – scientific knowledge.
2. Forensics as a practice aimed at the implementation of legal norms, especially in the field of procedural and substantive criminal law.
3. Forensics as a science that develops specific research methods concerning both science and practice, especially in the field of forensic tactics and techniques.
4. Forensics as a subject of didactics.
5. A team of scientific and research institutions dealing with forensics.
6. Forensics as a form of social awareness and the problem of knowledge of forensics among lawyers.
7. Forensics as an element of modern science in the system of productive forces of modern society.

[11] A. Feluś, *O tzw. nienaukowości ekspertyzy pisma ręcznego*, [in:] *Doctrina multiplex veritas una. Księga Jubileuszowa ofiarowana Profesorowi Mariuszowi Kulickiemu, Twórcy Katedry Kryminalistyki, z okazji 35-lecia powołania Katedry na Wydziale Prawa i Administracji UMK*, eds. A. Bulsiewicz, A. Marek, V. Kwiatkowska-Darul, Toruń 2004, p. 73; T. Widła, *Ekspertyza pismoznawcza jako dowód naukowy*, [in:] *Nauka wobec przestępczości*, eds. J. Błachut, M. Szewczyk, J. Wójcikiewicz, Kraków 2001, p. 99 ff.

[12] Cf. H. Tuthill, *Individualization: Principles and Procedures in Criminalistics*, Salem 1994.

[13] Cf. J. Such, M. Szcześniak, *Filozofia nauki*, Poznań 1999, p. 10.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

A detailed discussion of all the above-mentioned planes influencing the identity of forensics would require extensive elaboration and exceed the scope of this article. Also, many issues are so obvious that they do not cause discussion at all. For these reasons, reference will only be made to some issues, subjectively considered by the authors to be the most important or controversial.

FORENSICS AS A KIND OF KNOWLEDGE

Forensics is scientific knowledge. The year 1893 and the publication of the first edition of H. Gross' fundamental work are commonly regarded as the date of the founding of scientific forensics. Forensics is so science relatively young, its origins date back to the 19th century. Although the actions of law enforcement efforts to detect and apprehend the perpetrators of the crime and to prove his guilt, were taken from the period in which there was a crime as a social phenomenon, related to the state and existing there is a social system in it, but the modern organization and methodology of these activities could not be discussed until the 19th century. Earlier, in the entire world criminal trial, there was a far-reaching formalism, often based on irrational premises, for example, faith in the help of supernatural forces – in the "judgements of God". Most of the efforts of the law enforcement agencies were to obtain a confession of the suspect. Confessions, most often forced by torture. However, despite the primitive, as understood today, methods of investigation of that time, it can be stated that the origins of scientific evidence date back to antiquity. They concern knowledge in the field of forensics, construction and craftsmanship as well as examination of the authenticity of documents. The second half of the 18th century and the 19th century is the period of revolutionary changes in criminal law and the criminal trial. The inquisitive form of the trial was displaced by the mixed form, the legal theory of evidence by the principle of the free evaluation of evidence.[14]

The 18th and 19th centuries also saw the rapid development of the bourgeoisie and the growing wealth of this class, on the other hand, the impoverishment and ruin of the peasantry. It resulted in a great influx of people to the cities and an increase in numbers and the poor. Therefore, mainly, on the basis of socio-economic changes, we can look for the etiological premises of the increase in crime in this period. So a search for new forms of the criminal trial began. The need to establish an organized body to deal with the detection of offenders and their prosecution, i.e. a modern police force, was also realized.

[14] J. Kasprzak, B. Młodziejowski, W. Brzęk, J. Moszczyński, *op. cit.*, p. 18. Cf. B. Sygit, *Historia prawa kryminalnego*, Toruń 2007.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

The 19th century is also a century of rapid development of technology, medicine, biology and chemistry. All the latest achievements of these sciences were quickly implemented in the fight against crime. We should mention here the Bertillon methods, as well as a fingerprint identification method. During this period, theoretical works began to appear. This is the situation in which H. Gross' work appears. The 20th century is characterized by the further development of forensics. The achievements of many sciences are used in the fight criminal activities, but forensics is precisely the field of knowledge that does not mechanically follow research methods developed by other sciences, but creatively adapts them for its own purposes.[15] For example, we can mention the examination of invisible traces in ultraviolet or infrared rays, spectrography, X-ray, etc. Moreover, forensics develops its own methods (e.g. dactyloscopy, psychological principles of collecting and assessing personal evidence, etc.) and initiates research to use the results of various sciences to increase the efficiency of criminal prosecution.

The concept, subject and role of forensics have changed along with its development. Anyway, also today forensics is not clearly defined, which best proves the ongoing progress in this science and its complexity.

H. Gross assumed that forensics is an element of natural science in criminal law, and the subject of its research are the realities of criminal law in the broadest sense of the word. A similar position was taken by the co-founder of the criminal scientist E. Locard, according to whom forensics combines various sciences into the study of the techniques of crime.[16] This real evidence was to replace the extortion of confessions with the torture used so far. Therefore, in the initial stage of forensics development, its role was limited to examining the technical aspects of crime. This does not mean, however, that procedural activities such as interrogations of suspects and witnesses were abandoned, but the enthusiasm of the creators of forensics, resulting from the success of using technical means of evidence, meant that the role of personal evidence sources was diminished.[17]

This trend remained not long. Despite the continuous development of forensic science technique, in the second half of the 20th century, the views that forensics also included tactics, directed both at the perpetrator's and law enforcement's actions, began to prevail. P. Horoszowski – in his textbook *Criminalistics* published in 1958 – defined forensics as follows: "[…] this science examines the methods and means of committing crimes and develops methods for detecting a crime or for identifying and capturing the perpetrator of criminal act. […] certain procedures and specific technical measures are applied in the case of criminal activity, as well as in the detection of

[15] J. Kasprzak, B. Młodziejowski, W. Brzęk, J. Moszczyński, *op. cit.*, p. 20.
[16] *Ibidem*, p. 30.
[17] Cf. E. Locard, *Dochodzenie przestępstw według metod naukowych*, Łódź 1937, p. 13.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

crimes and the prosecution of perpetrators. Therefore, one can conceptually distinguish two, strictly indefinite areas of forensics: criminal tactics and techniques".[18]

The next step in extending the scope of forensics was to relate it not only to law enforcement but also to crime prevention. Such a position was presented, among others, by B. Hołyst, who wrote in 1973 that "forensics is the study of methods of establishing the fact of a crime, how it was committed, detecting perpetrators and preventing crimes".[19]

M. Kulicki perceives the scope of criminology very broadly, according to which "forensics is a science that enters the system of legal sciences, because it arises from the needs of law and serves its implementation. Forensics […] serves the implementation of the norms of substantive criminal law, mainly by establishing many aspects of the subject and the perpetrator. Forensics also fills many dispositions of procedural law norms with praxeological content […]. The principles of forensics should also be applied in a civil trial […], as well as in proceedings relating to misdemeanors. Forensics is a science that covers not only the pre-indictment proceedings, but also the jurisdictional stage of a trial. The subject of forensic research and concepts are both procedural (evidence) and extra-procedural (operational and reconnaissance) activities. The subject of forensic research are criminal tactics and techniques, as well as forensic tactics and techniques (reconnaissance, detection, evidence, preventive). Tactical and technical elements largely interpenetrate and pay off each other. […] The method of scientific research in forensics is the integrative application of the achievements of a number of other sciences […] and the development of one's own methods and means".[20]

Also Z. Czeczot and T. Tomaszewski define forensics as a science practical, efficient operation that develops the principle, the use of technical and laboratory research methods in order to prevent the commission of crimes and their detection and determination of the facts, relevant evidence in criminal proceedings (preparatory and judicial dimensions) or other (e.g. civil).[21]

In addition to tactics and techniques, T. Hanausek also distinguishes strategy, defining forensics as the science of tactical principles and methods as well as technical methods and means of identifying and detecting legally defined, negative social phenomena, in particular crimes and their perpetrators, and proving the existence or lack of a relationship between persons and events, as well as preventing crimes and other unfavorable but legally relevant phenomena. This science also deals with

[18] P. Horoszowski, *Kryminalistyka*, Warszawa 1958, pp. 13–14.
[19] B. Hołyst, *Kryminalistyka,* Warszawa 1973, p. 21.
[20] M. Kulicki, *Kryminalistyka. Zagadnienia wybrane*, Toruń 1990, pp. 46–47.
[21] Z. Czeczot, T. Tomaszewski, *Kryminalistyka ogólna*, Toruń 1996, p. 16.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

the strategy of predicting and future recognition and combating these phenomena, especially by preventing their occurrence and development.[22]

An interesting point of view on forensics is presented by J. Widacki, who writes that, in academic terms, forensics as one of the subjects of legal studies, and at the same time the subject of research activities of university employees or departments of forensics, covers the general theory of investigation science, criminal tactics (including both investigative and operational and reconnaissance activities), and all identification departments that were not included in other specialized and developed into separate scientific disciplines departments of knowledge, such as forensic medicine (now also a complex of disciplines), forensic toxicology, forensic chemistry, etc.[23]

Therefore, it can be concluded that forensics is a practical science, used in legal procedures, covering the technique, tactics and strategy of combating crime and other socially unfavorable phenomena. Forensics deals with learning the methods of committing crimes, detecting the fact of committing them and detecting perpetrators as well as methods of crime prevention.[24]

As can be seen from the above-mentioned definitions of forensics, this science is constantly expanding, its scope is expanding, which changes the identity and paradigm of this science.

FORENSICS AS A PRACTICE

Forensics as a practice aimed at the implementation of legal norms, especially in the field of procedural and substantive criminal law. In the preface to the third edition of his work, H. Gross wrote: "Forensics – in accordance with its nature – should enter where criminal law – also in accordance with its nature – can teach nothing more. […] Substantive criminal law defines crimes and penalties for them, procedural criminal law – rules to be followed when prosecuting crimes, and the questions: how are crimes committed, how is it investigated and established that the crime was committed […] cannot be answered by substantive criminal law or the provisions of criminal procedure".[25]

The links between forensics and criminal law, and in particular with procedural law, result from the fact that forensics is a factor necessary to achieve the objectives of criminal legislation. However, while in the criminal trial attention is paid to guaranteeing civil rights and ensuring the optimal degree of objectivity within the

[22] T. Hanausek, *Kryminalistyka. Zarys wykładu*, Kraków 1996, p. 14 ff.

[23] *Kryminalistyka*, ed. J. Widacki, p. 4.

[24] J. Kasprzak, B. Młodziejowski, W. Brzęk, J. Moszczyński, *op. cit.*, p. 32.

[25] H. Gross, *Rukowodstwo dlia sudiebnych sliedowatieliej kak sistiema kriminalistiki*, Petersburg 1908, p. VII. Cf. idem, *Podręcznik dla sędziego śledczego jako system kryminalistyki*, Warszawa 2021.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

established forms of evidence, forensics deals with the ways of achieving the general objectives of the Code of Criminal Procedure by obtaining evidence, securing it and presenting it in a manner prescribed by law.[26] The role of modern forensics does not end with investigative activities as part of preparatory proceedings. It blends into the whole of criminal proceedings – also at the jurisdictional stage.[27] It is often impossible to separate procedural issues from their actual implementation with the use of forensic knowledge. In the same area of social reality, dogmatic legal sciences – the subject of which is to formulate statements about applicable law, using its own, very specific method – meet with forensics belonging to applied sciences, and the methods of natural research are one of the distinguishing features of this discipline.[28] In the modern world, where crime, unfortunately, enters every area of social life, the constant development of forensics, adaptation of the achievements of other sciences and their adaptation for use in the criminal process is a necessity. Thus, forensics becomes a hybrid science, in a sense, uniting legal and empirical issues. Who, if not a lawyer, can better sense the need to engage the achievements of technical and natural sciences in the detection and judicial process?

Despite this location of forensics within the criminal process, there are still views that reduce it to the level of police knowledge only. The fact that forensics is only an auxiliary science to the criminal process and functions to a large extent within it does not in any way detract from its role and importance. On the other hand, in the field of forensics, new fields are developed, each year brings us new research opportunities. Sometimes they are debatable from the point of view of the criminal trial, on the verge of prohibitions in evidence. The development of various areas and their impact on the sphere of the criminal process, protection of basic superior values and protection of the rights of the individual in the trial, as well as the fear of violating the rule of law are factors that mean that any possibility of using a new technical measure or a new method must be examined each time in terms of its legal admissibility.[29]

FORENSIC AS A SCIENCE

Forensics as a science develops specific research methods concerning both science and practice, especially in the field of forensic tactics and techniques. This issue is extremely extensive and the framework of this study does not allow for

[26] B. Hołyst, *Kryminalistyka*, Warszawa 2010, p. 53.

[27] M. Kulicki, *Kryminalistyka. Wybrane zagadnienia teorii i praktyki śledczo-sądowej*, Toruń 1994, pp. 29–30.

[28] S. Waltoś, *O związku prawa karnego procesowego z kryminalistyką*, [in:] *Nauka wobec przestępczości*, eds. J. Błachut, M. Szewczyk, J. Wójcikiewicz, Kraków 2001, p. 178.

[29] Idem, *Proces karny. Zarys systemu*, Warszawa 2002, p. 15.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

a complete discussion of this issue. Let us consider only two issues selectively. The problem of applying the Daubert standard to assess the evidential value of the applied research method by an expert in Polish forensic practice and the problem of issuing categorical opinions.

One of the more complex and long-established criteria are the criteria of evidence in the American trial.[30] They stem from a fear of overly hasty introduction of modern scientific evidence that may not be fully validated, contain errors, and cause wrongful convictions. These criteria cover a very wide range of issues, ranging from the credibility of a given scientific principle and the test method based on it, through the test procedure and equipment used, to the qualification of an expert.[31] The admissibility of scientific evidence – evidence from an expert opinion as to its essence – is decided by the trial judge. In the United States, there are two admissibility tests: the older universal acceptance test from 1923 called the Frye test and the Daubert standard from 1993.[32] The Frye test is based on the assumption that acceptance of a given type of evidence requires the acceptance of the scientific community in a given field. In the Daubert standard, the proof should meet certain criteria:

1. Is the theory, method, technique proposed by the expert verifiable?
2. Has it been checked?
3. Has it been the subject of scientific evaluation and publication in professional literature?
4. Is the potential error rate known in the method or technique used?
5. Are there standards for the use of this technique?
6. Is the methodology used universally accepted?[33]

Unlike the Anglo-American system, based on common law and the system of evidence rules, in a continental criminal trial, the model of which is in force in Poland, the principle of free evaluation of evidence is common (Article 7 of the Code of Criminal Procedure). It is believed that the Code of Criminal Procedure should not be closed to scientific and technical progress, creating new evidence possibilities in the field of the so-called scientific evidence.[34] According to S. Waltoś, the use of new research means and techniques in a criminal trial requires great caution. There are two dangers: the use of a research agent or technique that has not yet been tested, and the violation of fundamental human rights by new achievements in science and technology.[35] Science must not be developed at the expense of the accused, a criminal trial is not a place to test scientific hypotheses.[36]

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[30] R. Tokarczyk, *Prawo amerykańskie*, Kraków 2000, p. 250 ff.
[31] T. Tomaszewski., *Proces amerykański. Problematyka śledcza*, Toruń 1996, pp. 224–225.
[32] C. Henderson, *Expert Witness*, [in:] *Encyclopedia of Forensic Science*, London 2000, p. 724.
[33] Cf. T. Tomaszewski, *op. cit.*, pp. 233–237.
[34] R. Kmiecik, E. Skrętowicz, *Proces karny – część ogólna*, Kraków 2002, p. 367.
[35] S. Waltoś, *Proces karny. Zarys systemu*, Warszawa 2009, pp. 347–348.
[36] *Ibidem*, p. 347.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

In the jurisprudence of the Polish Supreme Court, there are no general criteria for scientific evidence and its assessment, which does not mean that the Supreme Court did not deal with these problems. In numerous judgements we find indications that the expert opinion should be assessed in the light of the requirements of modern knowledge, it is necessary to establish whether the expertise is actually based on a uniform and commonly accepted research method. It is recommended that courts make use of the results of the latest scientific research, as long as these results are sufficiently certain and the new method is methodologically flawless.[37]

Pursuant to the principle of free evaluation of evidence, the adjudicating body may accept a given scientific evidence if, based on its knowledge and experience, it considers the test method presented by the expert to be reliable and admissible. If, on the basis of the Polish criminal process, the jurisprudence did not develop something like Daubert's standard, for obvious reasons dealing with the criteria and assessment of the admissibility of scientific evidence in a fragmentary manner, then it is necessary to consider whether these criteria and assessments do not result directly from the provisions of the Code of Criminal Procedure. The science of the criminal process distinguishes *a priori* assessment, consisting in the examination of the usefulness of evidence for proving a given issue, which is made in terms of the formal admissibility of evidence and the expected substantive importance for the case (cf. Article 170 and Article 193 § 1 of the the Code of Criminal Procedure) and *a posteriori* assessment, performed after taking evidence.[38]

The most controversial in the Daubert standard may arise from the principle that we need to know the error rate of a given method and determine its diagnostic value.[39] It is often practically impossible to calculate such a ratio. There are types of tests, especially identification ones, in such departments as dactyloscopy and other methods of human identification (cheiloscopy, otoscopy, odontoscopy), where these methods are considered reliable and if there are mistakes, it is a human error (resulting from carelessness, lack of sufficient training expert and inadequate experience). Is there a method error then? After all, the method is efficient and does not assume any margin of error. If we assume the efficiency of the method, then how to build the quotient of the correct results to the incorrect ones. In that case, the denominator would have to be zero – which makes the operation mathematically flawed. There is also no criterion for a court judgement. After all, when issuing a conviction, the court takes into account all the circumstances and evidence gathered in the case. The fact that there was a conviction is only information that the court admitted the evidence, but assessed it together with other evidence. However, in some expert

[37] *Ekspertyza sądowa. Zagadnienia wybrane*, ed. J. Wójcikiewicz, Warszawa 2007, p. 21.

[38] *Wykład prawa karnego procesowego*, ed. P. Kruszyński, Białystok 1998, p. 61; D. Sołodow, *op. cit.*, p. 164.

[39] Cf. *Kryminalistyka*, ed. J. Widacki, pp. 178–179.

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Data: 27/11/2026 15:55:29

opinions (e.g., printing expertise) and investigative activities (e.g., presentation), it is possible to use test studies and determine the potential error rate.

Another problem is the criticism of issuing categorical opinions in the opinions of experts, which is more and more often found in American literature and transferred to Poland.[40] Mistakes made by careless foreign experts can not depreciate recognized and thoroughly tested methods for years. Sometimes we are too fascinated by what is American. Often, after thoroughly studying the presented issues, we conclude that the level of research conducted in this field in Poland or in other European countries is much higher than the American level. The assessment of the given evidence by the trial authority and the judge is also subjective. It is the instance of court proceedings that is to protect the citizen against judicial mistakes.

FORENSICS AS A SUBJECT OF DIDACTICS

Forensics as a subject of didactics and a group of scientific and research institutions dealing with forensics – these issues are self-evident and do not need to be discussed in detail. For the representatives of law enforcement agencies, forensics is a professional, compulsory subject, included in the programs of a number of schools and departmental universities. A modern lawyer comes into contact with forensics for the first time during his studies.[41] Although currently every law faculty, as well as university administration, has a department or forensics laboratory, the subject of "forensics" is not included in the basic subjects. Contemporary legal knowledge passed on to students is so extensive that forensics plays the role of a specialized, additional subject, i.e. usually optional. It may therefore happen that the future prosecutor, judge, attorney at university will not have any contact with forensics at all. Any attempts to discuss in various forums defining the curriculum of legal studies usually end up reducing forensics to the rank of police science, additional, not necessarily needed by the future lawyer. Unfortunately, such a situation causes the widening of the gap between the modern science of forensics, which responds to changes in contemporary crime, and the knowledge of a lawyer. This situation is not improved by subsequent training within the application, as the selection of forensic topics and the level of their conduct is debatable.

Another noteworthy issue is the establishment in Poland of a number of non-police research units that provide forensic expertise. This gives a chance for greater objectivity of experts, which is particularly important in the perspective of changes in the code aimed at increasing the adversarial nature of the criminal process (especially in the jurisdictional phase).

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[40] J. Konieczny, *op. cit.*, p. 11 ff.

[41] Cf. B. Hołyst, *Kryminalistyka jako przedmiot dydaktyki*, "Problemy Kryminalistyki" 1986, no. 174, p. 547 ff.

Pobrane z czasopisma Studia Iuridica Lublinensia **http://studiaiuridica.umcs.pl**
Data: 27/11/2026 15:55:29

FORENSICS AS A FORM OF SOCIAL AWARENESS

It might seem that today there is no need to convince anyone that forensics functions within the legal sciences[42] and is particularly closely related to criminal proceedings and substantive criminal law. B. Hołyst describes the problem very accurately, who claims that "one of the important factors determining the contemporary effectiveness of criminal prosecution and the effectiveness of fulfilling the tasks imposed on the judicial institutions is the dissemination of knowledge of forensics not only among employees of the police authorities, but also among prosecutors, judges and attorneys-at-law. The preparation of a lawyer in the field of forensics is fundamental to the protection of the rule of law. Undoubtedly, many court errors, discontinuation of proceedings, and acquittal (for lack of evidence, despite the fact that everyone knows that the accused is a dangerous criminal) could be avoided if prosecutors and judges knew exactly the scientific investigation methods. Unfortunately, the level of knowledge of even basic issues in the field of scientific investigation methods is still insufficient among lawyers, as evidenced by even surprising cases of ignorance".[43] It is understandable that judges, lawyers and even prosecutors cannot be required to know exactly the forensic technique. However, they should know on a general level the methods of securing evidence, be aware of the possibility of conducting individual expert opinions and their probative value, as well as know at what stage and what elements of material evidence should be secured.[44] A lawyer unfamiliar with forensics actually "capitulates" in front of an expert, often unable to properly assess the evidence significance of the tests performed, the value of the methods used and the expert's qualifications. The prosecutor or judge may not be able to carry out an expert opinion, but must be aware of the percentage of uncertainty in the research methods used by the expert. This uncertainty must be taken into account when assessing the entirety of the evidence.[45] Knowledge of forensics cannot be reduced only to knowledge in the field of forensic technology, although the participation of the prosecutor in the inspection of the scene (in the light of recent research and cases) leaves a lot to be

[42] Cf. J. Kasprzak, B. Młodziejowski, W. Brzęk, J. Moszczyński, *op. cit.*, p. 13; E. Gruza, M. Goc, J. Moszczyński, *Kryminalistyka, czyli o współczesnych metodach…*, p. 13.

[43] B. Hołyst, *Kryminalistyka*, Warszawa 2010, p. 43.

[44] J. Gurgul, *Sprzężenie: biegły – prokurator (policjant)*, "Problemy Kryminalistyki" 1997, no. 216, p. 30 ff.; idem, *Wybrane problemy w kontaktach organu procesowego z biegłym*, "Problemy Kryminalistyki" 2004, no. 244, p. 16 ff.

[45] B. Hołyst, *Kryminalistyka*, Warszawa 2010, p. 43; M. Całkiewicz, *Wykorzystanie opinii biegłego w polskim procesie karnym*, "Problemy Kryminalistyki" 2008, no. 259, p. 26 ff.; eadem, *Ocena dowodu z opinii biegłego przez organ procesowy w postępowaniu karnym*, "Problemy Kryminalistyki" 2008, no. 260, p. 55 ff.

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Data: 27/11/2026 15:55:29

desired.[46] A lawyer working in law enforcement or the judiciary also undertakes a number of tactical activities. It is the forensic knowledge that is necessary for the proper questioning of a witness, suspect, confrontation, presentation, search, trial experiment or, finally, many reconnaissance and operational activities.[47] It is difficult to clearly distinguish and list all activities where forensic knowledge is useful or even necessary. After all, you can also mention planning the proceeding, creating versions, and their checking and verification. In the light of the latest trends, when the law enforcement agency, in addition to the classic retroactive action (undertaken after the occurrence of a crime), will increasingly proactively (pre-emptively and prophylactically) be more and more important in the field of criminal intelligence, criminal analysis or profiling.[48] So is the problem of knowledge of forensics by lawyers a new problem? Well no! This problem has been raised since the times of H. Gross[49] and unfortunately is still a current problem.

In the 1970s, M. Kulicki already drew attention to the necessity of using forensics by judges, claiming that in court proceedings forensics has a wide range of activities, because personal and material evidence sources are examined, decisions are made on the usefulness and reality of the requested measure evidence, confrontations are made, inspections are made, experts are appointed and the scope of expert opinions is determined, experiments are carried out or the course of events is reconstructed. Actions taken by the court in the course of evidence proceedings must be properly documented, which also requires forensic preparation. Finally, at the stage of adjudication, how often the judge's ignorance of forensics makes the court elude the arguments resulting from painstaking examinations by experts or performed activities. Another situation is also possible, when the judge is guided only by the authority of the expert or the reputation of the institution conducting the research. In the proceedings before the court of second instance, the court checks, among other things, the correctness of factual findings and the correctness of assessments, and sometimes even supplements the evidence proceedings. And at this stage, the principles of forensics play a role and cannot be alien to the judge.[50]

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[46] Cf. M. Całkiewicz, *Oględziny zwłok i miejsca ich znalezienia*, Warszawa 2010. See also V. Kwiatkowska-Wójcikiewicz, *Oględziny miejsca. Teoria i praktyka*, Toruń 2011.

[47] Z. Czeczot, T. Tomaszewski, *op. cit.*, p. 24 ff.; *Kryminalistyka*, ed. J. Widacki, p. 5 ff.

[48] J. Konieczny, *op. cit.*, p. 5. Cf. P. Chlebowicz, W. Filipkowski, *Analiza kryminalna. Aspekty kryminalistyczne i prawnodowodowe*, Warszawa 2011; *Profilowanie kryminalne*, eds. J. Konieczny, M. Szostak, Warszawa 2011; J. Gołębiowski, *Profilowanie kryminalne*, Warszawa 2008.

[49] Cf. E. Locard, *op. cit.*, p. 18; J.J. Bossowski, *Wiadomości z nauk kryminologicznych*, Poznań 1946, p. 15; P. Horoszowski, *op. cit.*, p. 5.

[50] M. Kulicki, *Kryminalistyka (zarys wykładu)*, part 1, Toruń 1972, pp. 18–19. Cf. M. Kulicki, V. Kwiatkowska-Wójcikiewicz, L. Stępka, *Kryminalistyka. Wybrane zagadnienia teorii i praktyki śledczo-sądowej*, Toruń 2009.

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Data: 27/11/2026 15:55:29

CONCLUSIONS

From the presented discussion it should be assumed that we cannot talk about the "twilight" or the end of forensics. There is only a process of changing its identity and paradigms, and this is perhaps the most violent process in the history of this science.

To sum up, the directions of changes in the identity of modern forensics can be framed:

- dissemination of forensic knowledge among lawyers,
- extensive introduction of new information technologies supporting investigative and operational activities (criminal analysis, criminal intelligence, profiling, integrated databases),
- striving to obtain the appropriate status of an expert,
- developing new investigative methodologies, especially in the field of organized, terrorist and computer crime,
- development of research methods for virtual traces,
- continuing research on the possibilities of objectifying the expert's opinion.

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Data: 27/11/2026 15:55:29

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Data: 27/11/2026 15:55:29

ABSTRAKT

Współczesna kryminalistyka jest nauką dynamicznie rozwijającą się w ostatnich latach, co wiąże się zarówno z ogólnym rozwojem nauki i techniki, jak i z potrzebami wymiaru sprawiedliwości i organów ścigania. Podstawową cechą kryminalistyki jest jej interdyscyplinarność. Wszystkie przedstawione fakty sprawiają, że tożsamość współczesnej kryminalistyki ulega zmianom. Jest to poniekąd proces naturalny. Rodzi on jednak wielkie niebezpieczeństwo dezintegracji tej nauki. W artykule przedstawiono dyskusję na temat stale zmieniającego się paradygmatu kryminalistyki, jej celów i zadań. Tak ważne zagadnienia teoretyczne mają duży wpływ na praktykę kryminalistyczną, przede wszystkim na opiniowanie biegłych, nauczanie kryminalistyki i znajomość kryminalistyki przez prawników.

Słowa kluczowe: kryminalistyka; interdyscyplinarność; praktyka kryminalistyczna; opiniowanie biegłych; nauczanie kryminalistyki