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Forensic aspects of the search for corpses

Summary

This article focuses on the topic of searching for human corpses. Such searches are conducted when murder, suicide or unexplained disappearance is suspected, with the circumstances of the case indicating that the person is probably dead. The following search methods are described: use of a specially trained dog, ground-penetrating radar method, phosphate method, sonar method, test excavation method, water search methods. The profiling of murder perpetrators is also discussed since the way the corpse is treated and the site at which it is concealed are valuable tips for the detection and collection of evidence. Presented are also aspects of interdisciplinary cooperation in unexplained cases in which murder is suspected but the corpse has not been discovered, such as cooperation with profiler and experts in different scientific disciplines.

Keywords corpse search, murder, police dog handler, ground-penetrating radar

No body, no crime?

It is generally believed that if the victim's body has not been found, felony cannot be confirmed due to the missing *corpus delicti*. However, this argument is not true. In Poland, ongoing are numerous investigations in which the site of concealment of a murder or other fatal offense victim's corpse is unknown, but law enforcement authorities are convinced that the victim was killed in a felony crime. Often in such cases, the person accused of murder will not indicate the site at which the corpse is concealed. This regards cases in which the victim is considered missing, but at the same time there is a reasonable suspicion that the missing person is dead, and the defendant is the direct perpetrator. The defendant can expect that as long as the corpse is not found, he will not incur any criminal liability. Such argument is raised frequently and the lack of the victim's corpse becomes the main line of defense. It should be noted, however, that Polish courts have sentenced defendants for murder in cases in which the corpse has never been found¹. In

such finally resolved cases, the defendant may claim innocence or even inform law enforcement authorities or criminal justice that the victim's corpse will never be found. This is certainly an uncomfortable situation from the perspective of criminal justice, and extremely traumatic for the victim's family.

The aim of this article is to indicate the options granted by the use of dogs and technical solutions in the search of human corpses. Using novel methods and technical solutions to determine the site of concealment of the corpse offers a chance for law enforcement and judicial authorities to eliminate doubts about events without the corpse revealed, convict the defendant and minimize the number of murders. Another chance in the search of the corpse may be cooperation with a profiler, i.e. a psychologist who will profile the perpetrator based on the way the victim's corpse was treated and concealed.

Dog specialized in searching for the scent of human corpses

The oldest method of searching for corpses involves the use of dogs. Dogs specialized in the "search and

1 E. Ornacka, *Tajemnice zbrodni*, Prószyński i S-ka, Warszawa 2011, p. 172.

localization of the scent of human corpses", also known as cadaver dogs, undergo special training in the police centers. In Poland, the center for training dogs in the search and localization of human corpses is the Department of Police Cynology in Sułkowice². The unit trains dogs in detecting the scent of human corpses, both in water and on land. Training a dog and its handler spans over 85 days³. Both the dog and its handler acquire the necessary skills and knowledge to work in the field. The dog needs to have an excellent sense of smell, hunting instinct, eagerness for autonomous work and subordination. Such dogs are particularly carefully selected and need to pass special tests. Noteworthy is the fact that there is an increasing number of cases in which the corpse is concealed in such a way that the dog is unable to find it.

It can be assumed that the perpetrators concealing the corpse know how to do it successfully⁴. Unfortunately, such information can be obtained by searching the Internet. There are technical solutions that can be used in cases in which the circumstances eliminate the use of a dog. Even corpses effectively hidden from dogs can and should be found.

Use of ground-penetrating radar

Ground-penetrating radar is used in geology and civil engineering⁵. It is also widely used in archeology. Archaeologists are concerned with "scene searching", since they need to know where an event happened in order to be able to draw conclusions on the event itself⁶. To this end, they use different search methods⁷.

The technique employed by ground-penetrating radar is a geophysical method of detection of subsurface objects using electromagnetic waves. It is an effective, easy-to-use and relatively low-cost method of mapping borders of subsurface materials with different dielectric constants. Generally, a ground-penetrating radar system comprises the control

unit X3M, antenna components (transmitter and receiver in a shielded housing) and a monitor or an external computer that converts the incoming signal and creates a graphical data representation. The transmitter sends recurring short-term electromagnetic signals toward the ground, while the antenna moves over the surface. Electromagnetic waves are reflected back to the receiver by the borders of materials with different dielectric properties. The characteristics of subsurface components of the ground that may cause such reflections are, for example:

- man-made objects, including utilities of all types of materials, such as plastic, spheroidal graphite iron, terracotta, concrete, underground tanks, building foundations, excavation boundaries, waste;
- natural geological conditions, such as changes in soil composition, support layers, ice, the water table, bedrock, boulders, sett, free space, etc.

By using ground-penetrating radar, the presence of underground infrastructure, such as underground corridors and empty rooms, as well as areas in which the ground subsurface layer structure has been altered, may be detected. Based on this information, it can be concluded that the area should be subject to more accurate tests. At the site of corpse concealment, the perpetrator alters the structure of subsurface layers. Ground-penetrating radar allows determining the size and the structure of the excavation, and the presence of any objects inside it. Thanks to its broad spectrum of uses, it can be employed in searching not only for buried corpses, but also for those that were concreted or placed in special niches.

The use of a ground-penetrating radar allowed identification of, for example, the site of concealment of a corpse near a house in the locality of S. in 2012, along with barrels buried in a cellar, in which stolen objects, including ammunition for firearms, false documents, stamps and registration certificates, were concealed, probably by the alleged perpetrator of the murder and theft⁸.

The use of ground-penetrating radar allows finding corpses buried recently, a week or a month before, but also corpses of World War II victims, and even bodies buried much earlier, e.g. in the Viking times⁹. In 2014

2 <http://www.csp.edu.pl/csp/pion-dydaktyczny/10,Zaklad-Kynologii-Policyjnej.html> (access date: May 20th, 2014).

3 Official Journal of National Police Headquarters, Decision no. 400 of the Police Commander in Chief of 8 October, 2014, amending the decision on the program of the specialist training course for handlers of police dogs trained in detecting the scent of human corpses.

4 See the so-called copycat effect: I. Marsh, G. Melville, *Crime justice and the media*, Paperback, Abingdon 2009, p. 22–24; J. Stojer, *Efekt szkoleniowy seriali kryminalnych*, „Edukacja Prawnicza”, 2011, 1, p. 28–32.

5 J. Karczewski, Ł. Ortyl, M. Pasternak, *Zarys metody georadarowej*, Wydawnictwa AGH, Kraków 2011, p. 39.

6 P. Konczewski, *Archeologia sądowa w praktyce* [in:] *Archeologia sądowa w teorii i praktyce*, edited by M. Trzciński, J. Kawecki, Lex a Wolters Kluwer business, Warszawa 2013, p. 117.

7 P. Konczewski, op. cit., p. 118–158.

8 Events described in this article were anonymized in the interest of the ongoing criminal proceedings. References to specific cases involving search procedures with a ground-penetrating radar or a special dog pertain to cases investigated by Marek Lisowicz, a District Court judicial expert.

9 P. Konczewski, op. cit., p. 117. B.N. Damiata, J.M. Steinberg, D.J. Bolender, G. Zoëga, *Imaging skeletal remains with ground-penetrating radar: comparative results over two graves from Viking Age and Medieval churchyards on the Stóra-Seyla farm, northern Iceland*, "Journal of Archaeological Science", 2013, 40, p. 268–278.

in the locality of Kałuszyn, radar measurements were made and served to locate the site at which 26 corpses were buried during the march of Napoleon's troops to the war with Russia in 1812.

Using ground-penetrating radar can also permit determination of the site of concealment of a newborn, human fetus or small objects. Investigation of such events would also involve the use of ground-penetrating radar, which resulted in the discovery of the site at which the perpetrator buried a plastic bag with a human fetus, found on a premises in the locality of K. in 2014. In such cases, establishing whether the child was born alive or dead and determining the cause of death is a medico-juridical problem of key legal relevance¹⁰.

A spectacular example of the use of ground-penetrating radar was the discovery of the site at which corpses of a woman and two men were concealed. They were excavated 15 years after the death of the victims on private premises in Warsaw. No missing person was reported in that case, and the victims had links with armed organized crime groups. The corpses were found in a hole at a depth of approx. 1.7 m, covered with lime and submerged in concrete, which resulted in difficulties with identification due to their transformation into adipocere. The corpses were discovered in the locality of Sz. in 2014. Such cases demonstrate the existence of the dark figure of murder, and the number of such events may be higher than the number of reported disappearances.

The greatest challenge in the investigations using ground-penetrating radar is live interpretation of radar images. The circumstances of operations usually do not allow an in-depth analysis of such material. This happens when an alleged perpetrator is present at the site of investigation, and a quick termination of the search before the discovery of the corpse may permit the perpetrator to move the corpse to another site. Thus the key problem is the far too short period available for searching a large area. Such complication occurred, e.g., in a case in which evidence was required for a temporary arrest of a woman who had probably buried a newborn's corpse in the garden. The limited time of arrest of that person left little time to search the garden. After four hours of verification activities in the locality of K. in 2014, the search led to the discovery of a dead fetus.

Disappearances

Searching for corpses is usually conducted in the event of disappearance when it is suspected that the person is dead, and the death was a result of

a murder, accident or suicide. Depending on the investigation hypothesis adopted to explain the event, different search methods are chosen. It also depends on whether there is a justified reason to suppose that a deliberate concealment of corpse occurred, or whether the event is not a crime leading to death and the victim of, e.g., a suicide, chose an unusual, difficult to discover place for his/her death¹¹. The authors propose to develop a methodology of searching for the corpse of the victim/perpetrator when suicide is suspected. A common mistake in relation to the rules of searching for corpses is using only one method instead of several methods concurrently¹².

The elapsing time should be considered as an ally of law enforcement authorities because the corpse can be discovered at any time, sooner or later. However, according to J. Gurgul, "preliminary investigation procedures are often crucial for the identification and conviction of the perpetrator"¹³, therefore they cannot be neglected. It has to be made clear that the described search procedures pertain to corpses, not living people. Even an unsuccessful search of a corpse is not considered as a failure, but brings law enforcement authorities closer to the resolution of the case. Negative search results obtained in a defined area allow exclusion of certain investigation hypotheses. No corpse found is a very important forensic trace.

Chemical methods

Another method used in searching for corpses is the phosphate method. It involves soil sampling and determining the content of organic phosphates, formed during the decomposition of, e.g., human body¹⁴. Soil samples are collected using a manual geological probe and treated with two chemical preparations at an appropriate time regime. By using this method, it can be determined, e.g., whether at the site of interest

10 A. Gałęska-Śliwka, *Dzieciobójstwo. Analiza karno-medyczna*, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika, Toruń 2012, p. 90.

11 See T. Jaśkiewicz-Obydzinska, *Ekspertyza psychologiczna*, [in:] *Ekspertyza sądowa*, edited by J. Wójcikiewicz, Lex a Wolters Kluwer business, Warszawa 2007, p. 406; J.K. Gierowski, E. Skupień, *Samobójstwo czy zabójstwo? Dylematy opiniowania kompleksowego*, „Z zagadnień nauk sądowych”, 2014, 97, p. 69.

12 See M. Całkiewicz, *Oględziny zwłok i miejsca ich znalezienia*, Wydawnictwo Poltext, Warszawa 2010, p. 140 and further to learn more on mistakes in scene survey.

13 J. Gurgul, *Uwagi o wykrywalności i czynnościach śledczych w sprawach zabójstw*, Prometeusz, Opole 2010, p. 27.

14 P. Wallin, I. Österholm, S. Österholm, R. Solsvik *Phosphates and bones: An analysis of the courtyard of marae Manunu, Huahine, Society Islands, French Polynesia*, "Islands of inquiry. Colonisation, seafaring and the archaeology of maritime landscapes. Terra Australis", 2008, p. 423–434.

organic matter breakdown (such as that of human body) occurred, in the case of transfer and another concealment of the corpse¹⁵.

In view of the fact that it is not possible to reliably determine whether the observed geophysical anomaly represents a human corpse, it is necessary to perform a test excavation and evaluate the nature of disturbance of the surface soil layers or the presence of foreign objects. Test excavations are made to a depth at which constant layers of uniform structure without foreign objects are present.

Sonar method

Another method used in search procedures is sonar. It is used to carry out searches in aquatic environment. Alternatively, a cadaver dog can be used for such searches. Sonar devices reproduce the surface of the bottom including deposited or floating objects. The devices can be used to search either shallow or deep water reservoirs. Using sonar allows searching large areas in a relatively short period of time.

In the aquatic environment, scuba divers can also be employed. The procedures can be performed in an alternating manner, by fields of operation or using a combination of both. It is presumed that at depths greater than 30 m, the safety of the scuba diver is compromised. For operations at great depths, an underwater camera or an underwater robot can be used. Metal detectors are used for searching for corpses as well. In the case of the search for corpses in silt or river sand, special detectors with frame coils mounted on buoys can be used. Such a set was used in the locality of S. in 2014 to search for a human corpse that was expected to be concealed in a suitcase deposited in the silt on the bottom of a water reservoir. Detectors with frame coils can detect metal objects at a depth up to several meters.

Documentation of procedures

Precise and accurate documentation is an indispensable part of performing search procedures. Particularly useful are GPS devices. They allow an accurate determination of operation sectors, recording the positions of discovered traces or coordination of the operations conducted by individual members of the investigation teams. Use of digital cameras and camcorders with built-in GPS modules allows later assignment of photos and videos to specific locations mapped on aerial or satellite images. When a camera with built-in GPS was used in 2014 by the prosecutors

from N. to reproduce the route the perpetrator took in order to conceal the corpse, the distance and speed of movement were precisely determined with photo shots taken at specific locations.

The best results are obtained in search procedures preceded by an analysis of the evidence and the so-called secondary site survey that involves selecting search methods and assessing the possibility of concealing the corpse in the area of interest. Thus, already at the initial stage of the search procedure, the expert can propose an optimal range of technical measures and the way they should be used. The investigation team does not necessarily have an extensive knowledge of the operation and potential uses of the latest technological facilities.

Psychological profiling

Cooperation with a profiler is very important. Psychological profiling is used as a tool for the identification of an unknown perpetrator of a murder¹⁶, while "the collected information about the scene plays an essential and the most significant role in developing a profile"¹⁷. Simultaneous appointment of a profiling expert is also important due to the possibility of using geoprofiling¹⁸ in the search of a corpse or corpses. Developing a psychological profile of the perpetrator requires every object found at the scene¹⁹. The events themselves can be very complicated. There are cases of extended suicide, i.e. the perpetrator first killed another person or persons, and then committed suicide, whereby these two events could occur at different sites²⁰.

Forensic profiling²¹, also known as psychological profiling, is an investigation tool intended to help the

15 H. Gundlach, *Tüpfelmethode auf Phosphat, angewandt in prähistorischer Forschung (als Feldmethode)*, „Mikrochimica Acta” 1961, 5, p. 735–737.

16 J.K. Gierowski, *Określenie sylwetki psychofizycznej nieznanego sprawcy zabójstwa – profilowanie*, [in:] *Zabójcy i ich ofiary*, edited by J.K. Gierowski, T. Jaśkiewicz-Obydzińska, Wyd. IES, Kraków 2002, p. 15.

17 B. Lach, *Profilowanie kryminalne*, Lex a Wolters Kluwer business, Warszawa 2014, p. 126.

18 J.K. Gierowski, op. cit., p. 26; K. Gradoń, *Zabójstwo wielokrotne. Profilowanie kryminalne*, Lex a Wolters Kluwer business, Warszawa 2010, p. 219.

19 B. Lach, op. cit., p. 129.

20 P. Kaliszczak, F. Bolechała, M. Strona, *Nowe spojrzenie na teoretyczne i praktyczne problemy określania zjawiska samobójstwa poagresyjnego*, [in:] *Samobójstwo. Stare problemy, nowe rozwiązania*, edited by J. Stojer-Polańska, A. Biederman-Zaręba, Wydawnictwo Jak, Kraków 2013, p. 62 and further.

21 J.K. Gierowski; E. Gruza, *Psychologia sądowa dla prawników*, Lex a Wolters Kluwer business, Warszawa 2012, p. 232; K. Gradoń, op. cit., p. 165; K. Bonda, B. Lach, *Zbrodnia niedoskonała*, Videograf II, Katowice 2009, p. 22.

police and/or the prosecutors to indicate the perpetrator of a crime. The profiler develops a characterization of a hypothetical perpetrator based primarily on psychology, but also on criminology, forensics, forensic medicine and sociology. Contemporary forensic profiling combines two ways of drawing conclusions—induction and deduction. The first way is based on data sets describing crimes from the past and uses the existing typology of perpetrators. The identified types often present very complex patterns of habitual behavior—from the selection of the victim, through the nature of the attack, and the methods of covering and concealing the evidence. The second way of drawing conclusions is deduction, which is based on the facts regarding that specific event. Inductive reasoning should be the starting point for preliminary hypotheses, which should then be verified by deduction²².

One of the main principles of forensic profiling is the so-called projection paradigm. The committed crime is the perpetrator's projected conception on how the crime should look like and what would be the possible actions undertaken by law enforcement authorities in order to capture him/her. The two basic questions the profiler attempts to answer regard the determination of the type and the degree of relationship between the perpetrator and the victim, and the relationship between the perpetrator and the scene, which can be simplified as follows: "Did the perpetrator know the victim and the crime scene?"

Another question regards the degree to which the crime was planned. It should be assumed that perpetrators who plan the crime also take into account the need to cover the evidence, including concealing the principal evidence, *corpus delicti*, i.e. the victim's corpse. The method of hiding the corpse or providing false proof to suggest a different nature of the event depends on the knowledge and skills of the perpetrator, which are the sum of his/her intellectual abilities, personality and experience. Perpetrators of the second kind (statistically more numerous) do not plan the murder; it constitutes a combination of personal factors and circumstances. The need for covering and concealing the evidence occurs only as a response to the crime committed. Relevant factors, as in the first group, include the intellectual abilities, personality and skills of the perpetrators, but also the degree of controlling emotions (how quickly "cold blood" and the ability to think rationally are regained), intoxication, as well as circumstances, i.e. available means, time and disrupting factors, such as the proximity of other people, weather conditions, terrain, time of day, etc.

The corpse is the most important proof against the perpetrator, thus the effort put into concealing or destroying it is the greater, the closer seems to the perpetrator the relationship between himself and the victim. In other words, the perpetrator dumps or conceals the corpse more carefully when he/she believes that finding the corpse will attract the attention of the investigators to him/her. This is dependent on the relationship with the victim (acquaintance, blood relationship, etc.).

In the event of a murder, the profiler develops the perpetrator's profile on the basis of victimological analysis and analysis of forensic traces. Cases in which the victim's corpse was not found should be analyzed with particular attention. Usually, murder is suspected, often the victim is formally presumed dead, but also suicide is taken into account. In such cases, psychoforensic analysis has to cover all possible versions of the event. In victimological analysis, the degree of risk of becoming a victim of a crime is evaluated, along with the possibility of the so-called dissociative fugue, i.e. disappearance, escape due to mental disorders or dissociative mechanism (a defensive mechanism following stressful or traumatic experience). The risk of the so-called pre-suicidal syndrome is also evaluated. Establishing the suicidal potential allows hypothesizing on the method and place of the attack, which involves, e.g., assessment of expressiveness vs. intimacy, reference to the statistics (e.g., most men commit suicide by hanging), as well as consideration of individual tendencies of the evaluated person. If murder is hypothesized and a possible relationship between the perpetrator and the victim has been determined, along with the crime scene and the perpetrator's motivation, the possible method and site of concealment of the corpse can be proposed.

The perpetrators' *modus operandi* are very diverse and may involve burying, dismemberment, throwing into water reservoirs, septic tanks, latrine pits or swamp, leaving in boggy areas (often preceded by attaching weights and dismemberment), burning, dissolution in acid, cutting into pieces and dumping into the sewer, or even feeding animals (e.g., pigs or dogs) with the corpse.

In the branch of forensic science devoted to forensic profiling, assumptions referring to behavioral patterns of criminals, usually in the form of perpetrator typology, have been developed. Forensic profiling is historically related with the investigations of serial killings, and based on this experience, the "collectors vs. predators" model was developed. The first perpetrator type keeps the victim's corpse in his/her house or in its vicinity, usually fairly well concealed. Examples of this type of perpetrators include Jeffrey Dahmer, John Wayne Gacy and Bogdan Arnold. The second type is focused mainly on the act of killing and is no longer interested in the corpse afterwards, therefore abandons

22 J. Gołębiowski, *Profilowanie kryminalne. Wprowadzenie do sporządzania charakterystyki psychofizycznej nieznanymi sprawców przestępstwa*, Logos, Warszawa 2008, p. 94.

the corpse; examples include Ted Bundy or Paweł Tuchlin²³.

A number of perpetrators keep or conceal the corpses at sites they know well, such as their house, premises or other familiar places, since staying in such location or its good knowledge provides them control over the place and gives a feeling of security. The second group of perpetrators dispose of the corpse, usually transporting it far from their place of residence (the so-called base, such as their home) or try to destroy it.

Having completed the evaluation of hypotheses and presumed murder, the profiler develops a profile of an unknown perpetrator and, assessing the degree to which the crime was planned and the potential control of emotions, takes into account the perpetrator's psychogeographic preferences, as well as experience and skills, often acquired in the course of his/her professional career. Psychogeographic preferences refer to the routes and means of transport that may be used by the hypothetical perpetrator. Careful analysis of maps is conducted to find these or identical sites in real geographic space.

Aspects related with profiling and *modus operandi* analysis are of key importance. Most murders in Poland occur between people who know each other and usually the perpetrator does not conceal the corpse, but leaves it at the scene²⁴. According to the authors, however, there is a significant dark figure of fatal events²⁵, including both suicides and murders. The perpetrator may present an unusual *modus operandi*, e.g., cuts the corpse into pieces, which complicates the search procedures. It should be noted that corpses are protected by criminal law²⁶.

Interdisciplinary cooperation

It should be pointed out that experts in forensic entomology may provide relevant information to the case as well. This type of knowledge will be very important with corpses discovered at particular sites, in order to determine the time of their concealment in that location, and to verify the hypothesis that the corpse was transported²⁷. Entomological methods are also used to determine the time of death of either "fresh"²⁸ or "aged" corpses²⁹.

It seems obvious that cooperation and exchange of information between experts performing site survey, investigation officers and forensic technicians, as well as the survey team leader—usually a prosecutor—are important. In the literature, the importance of correctly performed survey of the site at which the corpse was discovered is also emphasized³⁰.

The authors recognize the need to initiate meetings aimed at exchanging experiences in the form of seminars, workshops or expert conferences dealing with this kind of issues as an interdisciplinary problem. Technological advances enable inclusion of an increasing number of new methods of searching for corpses in the fight against crime. People involved in such searches should be trained in lifelong learning systems. There are also options to receive training abroad and exchange experiences outside of Poland. The cost of labor of experts appointed at the beginning of investigation, with disappearance involved, allows a reduction of the overall costs of investigation. The high cost of labor of experts is often a result of their late inclusion in the investigation. In order to reduce the dark figure of crime, particularly that referring to offenses against life, all available methods of searching for corpses should be used.

Translate Rafał Wierchośławski

23 To learn more about the history of serial killers, see K. Gradoń, A. Czerwiński, *Seryjni mordercy*, Muza, Warszawa 2001.

24 M. Całkiewicz, *Modus operandi sprawców zabójstw*, Poltext, Warszawa 2010, p. 139; K. Juszka, *Analiza wpływu oględzin kryminalistycznych na wykrywalność sprawców zabójstw*, WUJ, Kraków 2013, 38; R. Włodarczyk, *Działania kryminalistyczne, medyczne i organizacyjne w sytuacjach zdarzeń masowych ze szczególnym uwzględnieniem identyfikacji genetycznej zwłok i szczątków ludzkich z pogorzeliska*, Wydawnictwo Wyższej Szkoły Policji, Szczytno, 2010, p. 1134.

25 To learn more about the dark figure, see J. Błachut, A. Gaberle, K. Krajewski *Kryminologia*, Arche, Gdańsk 2001, p. 227.

26 B. Sygit, M. Romańczuk-Grącka, *Kryminalizacja zachowań przeciwko zmarłym*, [in:] B. Sygit, T. Kuczor, *Aktualne problemy kryminalizacyjne*, Wydawnictwo Adam Marszałek, Toruń 2013, p. 15.

27 E. Kaczorowska, A. Draber-Mońko, *Wprowadzenie do entomologii sądowej*, Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk 2014, p. 81.

28 Ibidem, p. 106.

29 Ibidem, p. 123.

30 M. Całkiewicz, *Oględziny...*, p. 23, M. Całkiewicz, *Modus operandi...*, p. 229; K. Witkowska, *Oględziny. Aspekty procesowe i kryminalistyczne*, Lex a Wolters Kluwer business, Warszawa 2013, p. 249.

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