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CASE REPORT

ANTHROPOLOGY; PATHOLOGY/BIOLOGY

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So-called Spontaneous Human Combustion

ABSTRACT: A well-documented case of so-called Spontaneous Human Combustion is reported. Review of the literature shows that these strange observations have been reported since the 17th century, even in famous novels. There are several main features that may lead to help the diagnosis: the vicinity of the body is intact or nearly intact, some parts of the body are turned into ashes (usually the middle third of the body), whereas other parts are intact or nearly intact, burning of the body usually occurs postmortem, the cause of death is usually natural, there is often (but not always) high concentrations of blood alcohol, there is a source of heat near the body. It is indispensable to rule out a homicide by the examination of the body *in situ*, the autopsy, the toxicological and histopathological samples, the arson assessment, and a thorough police inquiry.

KEYWORDS: forensic science, forensic anthropology, spontaneous human combustion, physical anthropology, autopsy, burned remains, cremains, burned bones, arson, criminal behavior

So-called Spontaneous Human Combustion is not spontaneous, but needs a source of heat near the body. Typically, it affects elderly overweight alcoholic Caucasian (Western Europe and North America) women. Only parts of the body are reduced to ashes, including bones, whereas other parts are stunningly well or totally preserved. The immediate vicinity of the victim is nearly intact. The cause of death is nearly always natural, and burning of the body usually occurs after death. Frequently (but not always), there is a high blood alcohol concentration. There is no evidence of assault or foul play. The main forensic issue is to rule out a criminal behavior.

References to "Spontaneous Human Combustion" (SHC) are found in the religious and literary texts of the past 500 years. Famous examples include the deaths of Krook and Macquart attributed to spontaneous combustion by Charles Dickens (1–3) and Emile Zola (4), respectively. Dickens described the immaculate state of the victim's immediate vicinity contrasting with the dark greasy soot coating the walls and the ceiling of the house. Zola gave a stunning description of spontaneous human combustion. He related the case of a socially and geographically isolated chronic alcoholic pipe smoker, who was turned into ashes leaving no other trace of the fire in his immediate vicinity. Again, dark and greasy soot coated the walls and the ceiling, and additionally, a terrible stench permeated the air in the French novelist's description. Other authors have used SHC in their novels (e.g., Brown 1798, Irving 1809, Marryatt 1834, de Balzac 1847, DeQuincey 1856, Twain 1883, and others, quoted by Josephson, Perkins, and Jaume [5–7]). So far, the reality of this phenomenon has been greatly disputed by forensic pathologists and scientists, and its authenticity has been cast in doubt. For example, Casper (8) wrote, *"It is sad to think that, in an earnest scientific work, in the year of grace 1861, we must still treat of the fable of 'spontaneous combustion,' a thing that no one has ever seen or examined, the very proofs of whose existence rests upon the testimony of perfectly untrustworthy non-professionals...."* (p. 303). Old literature is difficult to analyze from a scientific point of view, because the cases reported are often poorly documented, and the analysis is often made from a religious or mystic point of view, with the intervention of God or the devil, and purification by means of fire.

Dupuytren (9), a famous French surgeon, wrote about "spontaneous combustion" and tried to find a rational explanation. Psychiatrists Guionnet and Gasnier (10) wrote about the appearance of SHC in the medical field at the end of the 17th century and its revocation by forensic medicine 150 years later.

SHC appears to be a very rare event in forensic practice. Nevertheless, some textbooks mention more or less documented cases. Randles and Hough (initially published in 1992, and re-edited several times until 2007 [11]) collected data concerning 111 cases from historical literature, newspapers, and private investigations dating from 1613 to 1990. Jaume (7) gathered 35 observations dating from 1725 to 1999. According to Christensen (12), there are about 200 reported cases worldwide since the 1600s (nearly exclusively from Western Europe and North America), and the number of cases in the last 50 years is nearly the same as the number of cases reported over the previous 350 years.

In France, the first recorded observation occurred in Paris in 1663: Thomas Bartholin, a Danish anatomist (quoted by de Moulin and Bondeson [13,14]), described in 1663 the spontaneous combustion of an old French woman addicted to hard liquor. It was probably the first time that SHC was reported by a scientist. The first documented French case dates back to 1725 in Reims. Jean Millet, an innkeeper, was charged with having assassinated his wife and then cremated her in their chimney. Le Cât, a French doctor known for carrying out forensic examinations, concluded to spontaneous combustion. He suggested a divine origin to the fire, come to punish the wife for her overzealous consumption of alcohol (15,16).

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More recently, in 1977, Mrs. Kazmierczak was found in Uruffe, France (7), with lesions of strange selective carbonization. A thorough inquiry ruled out manslaughter and suggested SHC. Five modern cases from Western France were reported by Gromb et al. (17).

There are similar cases reported in other countries as early as 1731. In Verona, Italy, the Countess Cornelia di Bandi was discovered in a state of strange and advanced carbonization (13,18). The magistrate concluded to a ''mysterious fire'' as the cause of death. In this particular case, the woman was dining with a churchman a few hours before her death. She was known for her religious fervor and piety, and her morals were deemed irreproachable. She was not an alcoholic, and there were no suspects in the investigation. In the United States, the 1951 case of a St. Petersburg, Florida woman named Mary Reeser is famous (18).

Lair (19) collected 12 cases of obese elderly women (the first case dating back to 1692) and suggested a link between SHC and alcohol addiction. de Fontenelle (20) reported four cases (including those of Cornelia Bandi and of Millet), of which three involved severe chronic alcoholism. Guy (16) underlined that this phenomenon often occurred in elderly obese alcoholic women. Paris (21) wrote about the common elements of these cases: (i) the victims are chronic alcoholics; (ii) usually elderly women; (iii) the body has not burned spontaneously, but some lighted substance has come into contact with it; (iv) the hands and feet are usually spared; (v) the fire has caused very little damage to combustible materials in contact with the body; and (vi) the combustion of the body leaves a residue of greasy and fetid ashes.

In 1888, McKenzie Booth (22), an English forensic pathologist, illustrated a case of SHC with images.

Other observations are available in out of date medical or scientific literature (e.g., Parry [23]). Some old textbooks of forensic pathology already discussed this issue (e.g., Briand et al. [24]). Very recent well-documented cases have also been published (17,25–28). Today, it seems difficult to dispute the reality of the onset of this phenomenon.

In this work, we will present a contemporary forensic case of so-called SHC and will attempt to find a rational explanation or at least clues to understanding this phenomenon.

Case Report

In 2006, the mayor of the little village of the Centre of France had been without news of one of his villagers for 48 h. The 57-year-old divorced man was living off welfare. He was known for his alcohol and tobacco addictions, his violent temper, and his lack of social skills.

The House and the Vicinity of the Body

The police and the forensic pathologist on duty responded to the call. The door and the window to the house were closed, and the external walls were partly blackened. Some soot seemed to have escaped from inside the house through the single window. The door was locked from inside, with the keys still in the lock. The lock was impossible to open from the outside using another key, so the door had to be kicked down. Inside, a narrow hall led to a single room. All the walls were covered with soot, and the air smelled of smoke. The living conditions inside the house were squalid, with garbage, newspapers, and various objects lying about. The man's living conditions were already known to the police and mayor.

The body was found close to a pile of newspapers, a straw chair, and various other objects. The nearby wood stove had burned out. Some plastic bottles had melted a little, the newspaper had yellowed, and the objects in the vicinity were blackened, but not burnt. The straw chair was intact (Fig. 1).

The Body

The body was discovered in the middle of the room, in the prone position, partially carbonized (Fig. 1). The head, torso, and upper arms were nearly intact (Fig. 2). The hair was slightly involved. The inferior portion of the lower extremities was intact, as were the shoes (Fig. 3). The midsection was reduced to ashes, with no recognizable anatomical features (Fig. 4). Osteosynthetic hip material was visible. The brain temperature was the same as the room temperature. The medical history was difficult to reconstruct, but the victim seemed to suffer from coronary heart disease, hypertension, and chronic heart failure.

The Autopsy Findings

There were a few recent superficial bruises to the scalp and chin. The body also had widespread burn marks of decreasing intensity toward the extremities as to almost disappear on the hands. These were most noticeable close to the abdominal limit and more pronounced on the right side than the left. The hair was well preserved, but the tips were burnt. The left leg was more badly burnt than the right. No anatomical structure was recognizable under the first lumbar vertebra and above the distal third of the legs (Fig. 2). There were no other visible wounds that might indicate criminal behavior. The tongue was covered in soot but the opening of the trachea was clean.

Histopathology confirmed the absence of soot in the distal bronchi and bronchiole, and the absence of inflammatory process affecting the burned skin, the larynx, and the lungs. It also confirmed heart and coronary disease.

The toxicology report confirmed a blood alcohol concentration of 3.20 g/L (vitreous humor 3.0 g/L). No carbon monoxide and no cyanide were found in the blood sample. The body contained no other flammable materials and no other xenobiotics. Fragments of burnt cloth showed the presence of ethanol (3.2 g/kg) and a very low concentration of toluene (0.48 mg/kg), octane (0.25 mg/kg), benzene (0.90 mg/kg), and ethylbenzene (very low amount). Charred pieces of material under and in the immediate vicinity of the body also revealed the presence of ethanol (6.0 g/kg) and a very low

FIG. 1—*The body* in situ. *The immediate vicinity of the body is nearly intact. The chair and straw chair is intact. The arrow points to the head of the victim.*

FIG. 2—*The body at the morgue. The upper third of the body is nearly intact.*

FIG. 3—*The lower third of the body is relatively preserved. The feet and shoes are intact, including the laces.*

FIG. 4—*The middle third of the body (arrow) is nearly turned into ashes. No anatomical structure is recognizable, including the vertebrae.*

concentration of toluene (0.11 mg/kg), octane (0.26 mg/kg), benzene (0.30 mg/kg), and ethylbenzene (very low amount). The presence of these very low concentrations of hydrocarbures (benzene, toluene, ethylbenzene) and of an aliphatic alkane (octane) was attributed to coming from the burning of the environment. The presence of ethanol in burned residues of cloth and charred items under and in the immediate vicinity of the body suggested that alcohol had been poured by the victim, on himself and around him.

The autopsy concluded that burning had occurred in the postmortem period. It was impossible to determine the exact cause of death. The high blood alcohol concentration was probably not lethal given the subject's history of chronic alcohol dependency. Heart failure complicated by alcohol intake was suggested as a possible cause of death. The autopsy results did not suggest a homicide.

The Police Inquiry

The results of the police inquiry were inconclusive. There was no indication of burglary, and no motive for foul play was discovered. The arson expert found no suspicious sources of fuel in the house that might have served to start the fire. The wood stove was out, and the logs inside were uncharred. The ash drawer was full of ashes. Liquid fat of human origin was found near the body. The arson expert was surprised to find the objects surrounding the body, including paper, newspaper, wood, straw, and alcohol bottles to be undamaged.

Discussion

SHC seems to have been reported as early as the 17th century, usually linked to divine intervention in the form of an act of God or the devil. It was often interpreted as a means of punishing bad behavior, especially alcohol dependency in women. Modern records suggest that the phenomenon has some basis, but, to be sure, is not of supernatural origin.

In France, as soon as 1830, Dupuytren (9) gave his interpretation of possible SHC concerning a woman he had examined: "the clothes were ignited, the skin burned, the fat melted and poured on the floor, keeping the combustion process going. Over the course of a day, everything was consumed" (p. 386). This woman was a known alcoholic. Tardieu, a famous French forensic pathologist, was known for his experiments aimed at understanding the combustion properties of various body parts and ruled out the possibility of SHC (29). His main argument was that the human body contains about 75% water, which is incompatible with combustion. Christensen (12) pointed out that "*while humans do not spontaneously combust, they are surprisingly combustible*" (p. 470).

The composition of the human body is not homogeneous. Three main combustible constituents exist within a body and are not evenly distributed throughout (30): (i) soft tissues, especially skin and viscera, which are able to burn when dehydrated and exposed to a direct flame; (ii) bone, and more specifically bone marrow and fat; and (iii) above all fat. Dupuytren (9) suggested that after clothing ignited, body fat could melt and fuel the nearly complete combustion of the body. Gee (27) conceived of the wick effect theory as an alternative theory to spontaneous human combustion. According to the wick effect theory, the clothing of a subject can soak up human fat and act like the wick of a candle. This theory is supported by an experimental model in which a layer of human fat, a layer of skin, and several layers of light clothing are wrapped around a test tube and lighted at one end. The fat catches fire and leads to the slow combustion of the fat over the course of an hour, with no visible flame. This combustion produces a great deal of soot. In this experiment, an external source of heat is indispensable to ignite the flammable materials. The fat simply keeps the combustion process going. The ignition of human body fat requires a temperature of at least 250°C (27), but a low temperature (but at

least 24°C) is sufficient to keep the reaction going using a wick ([27]; usually a wick of clothes). Christensen (12) corroborated the candle effect by burning an amputated leg. He observed the destruction of the bone and the trend of the fire not to spread to the vicinity. He pointed out that osteoporotic bones were easier to destroy. These experiments highlight the fact that human combustion requires a source of heat but not necessarily a flame. The source of heat may disappear with the carbonization of the body, making it difficult to understand and accept. For example, in one of the five cases reported by Gromb et al. (17), it is said that the possible source of heat was a water heater, situated more than 6 m from the remains. In the current case, the potential source of heat was the wood stove, which had burned out when the body was discovered, but held a lot of ash in its drawer. Some victims reported in the literature were known smokers. A cigarette or cigar (28), a stove, the flame of a candle, or any source of heat might serve to light a wick of cloth or carpet, and the fat could serve as fuel. Human fat is liquid at 37°C and can burn very slowly over a long period of time, causing little damage to the surroundings, but releasing a large quantity of smoke.

The fact that several cases concern socially underprivileged subjects may be explained by the tardiness of emergency services in reaching these people, allowing for the slow process of human combustion to continue unchecked. Of the 12 victims identified by Lair (19), only one was not socially underprivileged. Palmiere et al. (28) described the case of a widow who lived alone. In the current case, the victim lived in total isolation.

Although cases of human combustion without alcohol intoxication have been reported (e.g., the cases reported by Gromb et al. [17]), alcohol dependency is often associated with these cases and is reported as far back as the 17th century. Even with high blood alcohol concentrations, the quantity of alcohol within the body is small and unlikely to contribute to the combustion process (31). It is more likely that alcohol is simply more frequent in socially isolated people and contributes to the process of self-combustion through the resulting altered state of consciousness. It is possible that the highly inebriated victims are unable to stop the combustion process once it is started or are unable to escape to call for assistance. In some cases, the conjunction of cigarette smoking and alcohol consumption could explain the ignition of clothes and the impossibility for the victim to light out the fire or to escape and call for assistance. The victim described by Palmiere et al. (28) was a heavy smoker.

The cause of death in cases of self-combustion is not carbonization. In the cases where autopsies were performed, no soot was found inside the trachea (cases of Gromb et al., Palmiere et al. [17,28]; current case). Histopathology did not reveal any inflammatory process of the lungs, respiratory tract, and burn margin of the skin. And there is usually no carboxyhemoglobin or cyanide in the blood, as in the current case. The autopsy usually concludes to another cause of death (probably of cardiac origin in this case, complicated by the intake of alcohol), with the carbonization occurring separately. The cause of death is often very difficult to elucidate given the state of the body, but may be extrapolated from the medical history of the victim (e.g., heart attack, epilepsy). In some cases, in spite of extensive carbonization, signs of severe coronary disease can still be observed (27). In others cases, high blood alcohol concentrations are highly suggestive of coma. In rare cases, there is a significant concentration of carboxyhemoglobin in the blood, which suggests that the victim was still alive when the combustion process started. It is possible that the victim had lost consciousness following a heart attack, a stroke, or a significant intake of alcohol. Furthermore, it has been demonstrated that high blood cyanide levels are not indicative of premortem combustion. Indeed, postmortem diffusion can lead to high blood cyanide levels (32). To our knowledge, this phenomenon has not yet been observed with carbon monoxide. An extradural hematoma because of postmortem heat is possible at autopsy (28).

There are rarely multiple victims. A case dating back to 1779 reports of a couple discovered burnt "like a mass of charcoal" in their home with only a slightly damaged chair and table in the surroundings (case quoted by Randles and Hough [11]). A modern case reports on the death of a 55-year-old man from human combustion (carboxyhemoglobin 12%, cyanide 0.05 mg/L, alcohol 1.10 g/L in a blood sample from the intact portion of the legs) and his dog from carbon monoxide poisoning (carboxyhemoglobin 65%, cyanide 0.23 mg/L in a blood sample of the dog; [28]).

To summarize, cases of so-called SHC share a number of features (Table 1) and typically affect elderly overweight alcoholic Caucasian (Western Europe and North America) women (12). Six main features of SHC are worth noting. First of all, only parts of the body are reduced to ashes, including bones, whereas other parts are stunningly well or totally preserved. This is well illustrated by the current case, where the upper third and lower third were well preserved, whereas the midsection was totally reduced to ashes. Usually, the middle third of the body, between the thorax and knees, is most extensively damaged (Fig. 2), whereas the head (Figs 1 and 2) and lower legs (Fig. 3) are well preserved, as in the cases described by Gromb et al., Thurston, Palmiere et al. (17,26,28), and in the current case. The arms are usually well preserved ([17]; current case, Fig. 2). The genital area is usually totally destroyed ([17,28]; current case, Fig. 4). The extensively damaged body areas are those with the highest body fat composition (abdomen, buttocks and thighs). In one case, it was still possible to identify the thick layer of subcutaneous fat (17). The feet, down to the socks and footwear, are often intact (28). In the current case, the feet and shoes were completely intact (Fig. 3). This respect of hands, feet, and head contrasts with the lesions resulting

TABLE 1—*Some features to help diagnosis of the so-called spontaneous human combustion.*

Environment of the body	Intact or nearly intact
	Inflammable objects are not burned
	No fuel for explaining the burnings
	Source of heat in the vicinity (but may have disappeared)
The clothing	Some parts of the clothing totally destroyed
	Other parts intact, especially socks and shoes
The body	Some parts of the body totally destroyed (into ashes), usually the middle third
	Other parts intact or nearly intact, as head, upper arms, and distal legs
Autopsy findings	Burning occurred postmortem
	Cause of death: heart attack, stroke, alcohol coma …
	No assault
Toxicology	Usual absence of carbon monoxide, cyanide
	Often high level of alcohol in blood (sometimes taken from the intact legs)
Histopathology	No inflammatory reaction on burned skin, larynx, trachea, lungs …
	Other cause of death than burning
Arson assessment	Source of heat near the body (usually not a flame) or the victim is a smoker; often the source of external heat has disappeared (consumed in ensuing fire/combustion)
	No fuel for explaining the fire
	No tank containing fuel in the vicinity
Inquiry	Homicide has definitely to be discussed and ruled out

from usual fire injuries (28). Sometimes, the head and neck are concerned, like in one of the cases reported by Gromb et al. (17) and Thurston (26). In these cases, the victims were found with their heads in the hearth of a fireplace. Gee (27) suggested that the victim had fallen into the fireplace following an attack, and this had caused the head to catch fire.

The second stunning feature concerning these cases is that the immediate vicinity of the victim is nearly intact. This feature attracts attention to SHC cases, which might otherwise have been classified as arson with secondary carbonization of the body. In every well-documented case, it is exclusively the body, and usually only part of it, that seems to have burned on its own. The extensive damage to some parts of the body contrasts with the minimal damage to the environment of the victim (e.g., [17,26–28]; current case, Fig. 1). This was also described in older cases and even reported in nonscientific literature (e.g., Charles Dickens, Emile Zola). Greasy residue, likely a by-product of human combustion, is often found coating the furniture, objects, and walls near the victim ([26,28]; current case). Thurston (26) described his case as having a "considerable amount of black residue and soot in the room" (p. 101). But the walls, furniture, and other objects are undamaged below the soot and grease. In one modern case, the chair near the body was found completely burnt, but the sofa, armchairs, wood furniture, and a small table close to the body were intact. The carpet surrounding the body was also intact. Only the carpet under the body was burned (28). In the current case, newspaper close to the body was yellowed but the chair and even the straw chair near the body were completely intact (Fig. 1). Clothing is well preserved in areas where the body is intact, up to an area quite close to the burn area but is severely damaged in those areas where the body is completely burnt. An overflow of liquefied body fat was also reported as early as 1830 by Dupuytren (9) and in several modern cases ([17,28]; current case).

The third feature is that self-combustion usually occurs postmortem. This conclusion is sustained by the usual absence of soot in the trachea and lungs and the absence of carboxyhemoglobin or cyanide in the blood. That is to say that the cause of death is not combustion but can be attributed to any number of causes of sudden death or loss of consciousness that would prevent the victim from putting out a fire or calling emergency services (e.g., heart attack, stroke, acute alcohol intoxication). All recent well-documented cases share this feature ([17,26,28]; current case). The cause of death is not always evident at autopsy, but may be suggested by the medical history of the victim (Palmiere et al. [28]; current case) or the autopsy findings (e.g., advanced lesions of the coronary arteries). In some cases, as in the case study reported by Gromb et al. (17), there is a significant concentration of blood carboxyhemoglobin, soot in the trachea, brain edema, lung edema, cherry red skin, which suggests that the subject survived a certain period of time after the combustion process had begun, but had lost consciousness or could not escape.

The fourth feature is a frequently (but not always) high blood alcohol concentration. This feature had already been highlighted in the nonmedical literature (e.g., Zola [4]) and was seen at the time as a sign of divine intervention. According to early SHC theories, alcohol was thought to saturate the drinker's tissues, rendering them flammable (3). But as early as 1838, some authors had ruled out the role of alcohol by experimenting on flesh soaked in alcohol during 5 months (20). Some victims were found with negative blood alcohol concentrations (e.g., three of the five cases of Gromb et al. [17]), suggesting that alcohol does not play a part in the self-carbonization process. Alcohol probably plays a dramatic part in the resulting loss of consciousness and/or inability to escape than as a fuel. Another element worth noting is that fat distribution is altered in chronic alcoholics, especially in women, leading to higher distribution around the midsection (abdomen, buttocks, and thighs), which is the area that is often completely turned to ashes.

The fifth feature is that self-combustion requires a source of heat near the body, with or without a flame, but no fuel that could explain the fire. In forensic practice, arson with secondary burning of victims or fuel thrown on a victim and then ignited results in a different pattern of lesions. The explanation for SHC is to be found elsewhere. The candle or wick theory, with a source of heat, a wick of clothes, and a built-in fuel source in the form of liquefied body fat, is supported by Gee (27). His experiment led to a slow combustion of body fat with significant release of smoke. The source of heat may disappear during the carbonization process that complicates the investigation. Some experiments (30,32) showed that pork fat can contribute to fueling a compartment fire. The source of external heat might be a cigarette, an open fireplace, a lamp, a candlestick, a stove, an electric heater (12). According to the wick theory, the source of heat has to last at least several minutes to char and split the skin and then release the melted subcutaneous fat (33).

The human body has three main combustible constituents: soft tissues, bone, and fat (30,34,35). Nevertheless, it is difficult to understand how the skin might ignite using a cigarette, which seems unable to burn the skin sufficiently to contribute to the wick effect. In 1863, Beck and Beck (15) had suggested that "inflammable products formed in the body by decomposition" (p. 525), explaining either the ease of ignition or the sustained combustion, but without any scientific proof. A 1991 emergency room case reported by Weed (36) also suggested that skin ignition was possible using a simple book of matches; but the lesion observed was only an erythema of the buttock.

The sixth feature is the absence of evidence of assault or foul play during the forensic investigation and the police inquiry. The absence of vital burning always suggests the possibility of homicide. The cause of death is nearly always natural, the victims usually being dead when the combustion occurs. In most cases, SHC is a postmortem phenomenon. In cases where there is evidence that the victim survived some time after the self-combustion process had started, it is assumed that the victim was in no condition to halt the ignition or call emergency services. No suicide has been described in a context of SHC. In self-immolation, death is quick, with usually no time for carbon monoxide or cyanide to accumulate in the blood, or an inflammatory reaction to become always visible at autopsy. But, in self-immolation, left-over fuel is observed on the clothing and the body, and the fuel container is found near the body. Furthermore, in our experience, high levels of accelerants are observed in cases of self-immolation (the concentrations of toluene, benzene, and ethylbenzene in clothing are 100–1000 times those encountered in the current case). Only one homicide was reported (34). The case had all the features of SHC, but the victim had been stabbed several times before burning. The inquiry concluded that the body was probably ignited using charcoal starter fluid, and the slow combustion of fatty tissue kept the combustion process going. It was established that the whole process lasted <5 h, the victim having been seen alive five hours before. Again, high clothing concentrations of accelerants are observed in homicides with hydrocarbures thrown onto the body (more than 300–500 times those encountered in the current case).

In our opinion, the main forensic problem is to rule out a criminal behavior. This issue was raised as early as 1847, in Darmstadt, Germany (quoted by Randles and Hough, Liebig [11,37]). The Countess of Goerlitz, a temperate woman, was found dead with her

upper body charred. SHC was suspected by physicians, but the servant, a known thief, was given a life sentence. He later admitted to having killed the Countess by a violent blow to the head and then burned her (11,37,38). Shaw (25) definitely claimed that SHC was a nonentity and raised the issue of proving that both the death and the combustion process are the result of manslaughter. Homicide must be kept in mind throughout the investigation. SHC deaths look very suspicious. In most published cases, the victim had no vital signs at the time of combustion (as attested by the lack of inflammatory reaction, the absence of deposit of soot in the trachea and bronchi, and the absence of carbon monoxide and cyanide in the blood), and the cause of death is to be found elsewhere. The cause of death is often suggested by the subject's history and sometimes by the autopsy findings, as in the current case where heart disease seemed most probable. In cases where the head is charred, it is difficult to rule out manslaughter, because wounds to the head cannot be excluded, and charring of the head is not a common feature of SHC. In any case, ruling out a homicide is very difficult, and the autopsy, toxicology, histopathology, and arson assessments and the police inquiry must be thoroughly carried out. Important details can be found on the scene, such the door locked from the inside in the current case or a door that is impossible or difficult to open from the outside as in the Palmiere et al. (28) case of 2009, and the fact that there are no signs of assault on the scene or on the body. Toxicology may reveal small amounts of hydrocarbures in clothing fragments or debris around the body, but always <1 mg/kg, which is very far away from those amounts encountered in self-immolation or homicide. Therefore, the presence of these very low concentrations can be attributed to coming from the burning of the environment (combustion products).

In conclusion, so-called spontaneous human combustion is a reality in forensic practice, but burning of the body is not spontaneous. To avoid any ambiguity, another name could be suggested for these cases, as ''isolated body combustion'' or ''isolated central body combustion.'' Again, the main forensic issue is to rule out a criminal behavior.

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