A Reevaluation of the Death of Vincent van Gogh

Suicide or Murder? The Need for a Definitive Autopsy

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Abstract: Vincent van Gogh died on July 29, 1890, from an apparent gunshot wound to the belly sustained approximately 30 hours earlier on July 27. Although little is known how Vincent sustained his mortal wound, art historians have long believed that the death was the result of a suicide, a widely accepted "truth" for the mysterious death of the then unknown and now iconic artist. The basis and validity of this suicide narrative is still very hotly debated among van Gogh scholars to this day. We dug deeper into all the circumstantial evidence and testimonies to arrive at a comprehensive overview of the probability that it was likely impossible for Vincent to self-inflict his mortal wound.

We used all the available circumstantial evidence related to the day Vincent van Gogh was wounded to present the information and conclusions as if we were before a judge as expert witnesses to answer the question: suicide or murder? If Vincent did not shoot himself in the belly (a red flag in and of itself), whoever inflicted that penetrating wound into his abdomen murdered him. In our study, results from firing the same model revolver that allegedly killed Vincent from various ranges (direct contact, intermediate, and distant) demonstrated within a reasonable degree of medical probability (greater than 50%) that it was not probable for Vincent van Gogh to shoot himself without a described powder burn.

With little forensic evidence to rely on 130 years after the suspicious event, many have suggested a respectful exhumation and graveside autopsy utilizing 21st century techniques to bring resolve to this 19th century cold case. This crime, whether suicide or murder, has generated renewed interest and numerous questions surrounding the suspicious death of the most iconic artist of the 19th century. These missing forensic facts will remain buried with all the secrets Vincent took with him to his grave, unless a definitive autopsy is performed. What an autopsy could add to our forensic fact basis and understanding of this intriguing cold case is enormous and further delineated as the next step to answer these difficult, otherwise unanswerable questions and allow us to finally sign off on his death certificate with certainty.

It is clearly impossible to definitively prove suicide or murder, but it is also impossible to disprove murder given the data and arguments offered in this analysis. A physician's opinion is based on the material available to him, and in this case, "our opinion as to the cause and manner of death is based on the limited amount of forensic information available. It is, therefore, our opinion, based on that limited information that in all medical probability, the cause of death is not a self-inflicted wound by Vincent van Gogh, and, thus, in all medical probability, a homicide."

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THE DEATH OF VINCENT VAN GOGH

Although little is known about how Vincent van Gogh sustained his mortal wound, art historians have long believed that the death was the result of a suicide. The basis of this suicide narrative is hotly debated among van Gogh scholars to this day and comes from a letter written by Emile Bernard, a friend of Vincent and fellow painter, to Albert Aurier 3 days after Vincent's death, on August 3, 1890. In the letter, Bernard said, "I think that you will have already guessed the fact that he [Vincent van Gogh] killed himself." He validates his version of events to Aurier by saying, "The innkeeper [Arthur Gustave Ravoux] told us all [everyone in attendance at the funeral] the speculative details of the accident."

The innkeeper was given this version of Vincent's death by Dr. Paul Gachet, a friend and doctor to van Gogh, who was looking after Vincent following his discharge from the Asylum at Saint Remy, "cured." However, there is another witness, Anton Hirschig, a fellow artist at the Ravoux Inn, who was staying in a room adjacent to Vincent's. Hirschig said he heard Vincent scream, "Is not someone going to cut on my belly?" Quite a contradictory statement in relation to Bernard's letter suggesting Vincent wanted to die. The only other surviving eye and ear witness to Vincent's last 30 hours was Adeline Ravoux, the innkeeper's daughter. She was willing to go on record about details from the moment Vincent arrived at the Ravoux Inn injured until after he was buried. Her testimony was not recorded until 63 years after his death. She effectively disputed much of the longstanding undocumented suicide narrative mostly generated by Dr. Paul-Ferdinand Gachet and his son, Paul Jr., both persons of interest in this homicide cold case.

So what and who are we to believe? Was van Gogh a madman who killed himself deliberately as spread by Dr. Gachet? Van Gogh could have been easily transported to war-trained surgeons 20 miles away in Paris to get medical attention, and possibly save his life. Why did this not happen? Why did Dr. Gachet refuse to move Vincent to Paris? Why had Dr. Gachet avoided contacting Vincent's brother for over 12 hours? Why instead did he let him just lie in bed for the 30 hours without any medical treatment, dying in agony? The worst possible outcome of moving Vincent was no worse than the obvious expected outcome.

The historical record of Vincent van Gogh and what happened to him is completely unreliable and based primarily on hearsay. Bernard heard the story from Gustave Ravoux who heard it from Dr. Gachet, who in fact, as Vincent's doctor, told the story he wanted to be remembered, including to the local newspaper.

In 2011, art historians Stephen Naifeh and Gregory White Smith co-authored a book, *Van Gogh; The Life*, arguing the improbability that van Gogh committed suicide. Their conclusion provoked much debate in the academic art community as to how Vincent's true fate came to be. To address this dilemma, Dr. Vincent

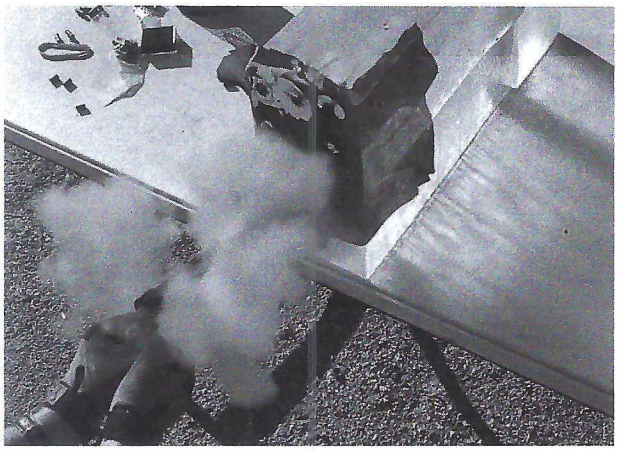

FIGURE 1. Test firing the same model Lefaucheux gun discovered in a wheat field. Fired at 6 in. The muzzle flash can burn the victim (target) like an acetylene torch. Note all the unburned black powder under pressure, surrounding the barrel (photo by Matt Sebesta).

J. M. Di Maio, an expert forensic pathologist, was brought into the argument in 2013 to have a more focused look at the suicide or murder issue, by applying modern forensic analysis to the old wound description. After examining all the limited available wound information, Dr. Di Maio concluded that it was not possible for Vincent to shoot himself in the abdomen. His findings were based on Vincent's wound description lacking a black powder burn resulting from a close contact discharge, as well as the difficulty of getting into any possible position to shoot himself in the belly while avoiding any evidence of burned or unburned black powder residue. In 2017, a movie, *Loving Vincent*, was released suggesting a similar theory, that van Gogh may have been the victim of foul play and was shot from several feet away.

To figure out what may have happened to Vincent, the *Killing Vincent Project* (2017) was created to approach this question from a more fact-based and scientific perspective. We treated Vincent's death as a cold case homicide and reenacted the events as they were written down to determine if the current narrative of suicide makes sense, or if foul play and a murder cover up are more likely. All of these different aspects and scenarios were diligently and extensively pursued in a research book, *Killing Vincent; The Man, The Myth, and The Murder* (Arenberg, I.K., 2019), which analyzed all aspects of the suspicious death and the key players involved.

In 1960, a farmer in Auver-sur-Oise, France found an old rusted and bent revolver in a wheatfield outside of town. It was commonly believed that Vincent was shot in a wheatfield outside of Auvers, so the farmer gave the gun to the current owner of the Ravoux Inn where Vincent died. Experts at The van Gogh Museum in Amsterdam considered this the likely gun involved in Vincent's suicide, despite only limited circumstantial evidence. The innkeeper left the rusted weapon on his mantle for over half-a-century, until it was eventually auctioned off in 2019 for US $183,000 (USD). Though there is no definitive proof that this is the revolver that shot Vincent, it is of the correct period and found in an area that matches the suicide narrative.

The Killing Vincent Project team decided to purchase the same model gun, a Lefaucheux 7-mm revolver with folding trigger, and simulate the exact trajectory, angle, and distance that would have been required to achieve the described wound results that Vincent sustained. Our goal in this study was to exonerate Vincent from the stigma of suicide. We used FBI grade ballistic gel to simulate Vincent van Gogh's body and we covered the ballistic gel with 100% cotton cloth to account for clothing of that period that Vincent was most likely wearing. We utilized the same model 7-mm gun and a supply of vintage black powder pinfire bullets to do basic ballistic studies to demonstrate several features of the presumed suicide, particularly the critical presence or absence of the signature black powder tattoo or unburned residue on Vincent or his clothing (Figs. 1 and 2).

Case Report

On July 29, 1890, iconic Dutch postimpressionist painter Vincent van Gogh succumbed to a fatal gunshot wound to his abdomen. He was a 37-year old, right-handed, white man, unemployed and an unknown artist, born in Holland and residing in Auvers-sur-Oise, France. More than 30 hours before the proximate time of his death, van Gogh left the inn where he was staying after his lunch on Sunday, July 27, presumably laden with his usual art supplies. He returned to the Ravoux Inn later that evening after the supper hour, his empty hands clamped over a single penetrating abdominal wound. The injury was in his left upper quadrant in the anterior axillary line. Despite this injury, he was able to climb the 17 stairs to his garret room, where he got into bed unassisted and lit his pipe. There were no witnesses to his wounding, and no one reported hearing a gunshot. No art supplies were noted to be with him when he arrived back at the inn (Fig. 3).

Van Gogh was reported to have had no shortness of breath, no major bleeding, no coughing up blood, nor any noted pulmonary complaints. He was described as calm, lucid, and, initially, not in any significant acute distress. Vincent van Gogh survived for over 30 hours after he was wounded without any notable medical treatment. He finally died in his brother's arms at about 1:30 AM on July 29, 1890, likely from overwhelming sepsis. There was no autopsy. The death was quickly accepted as a suicide after his doctor, Paul-Ferdinand Gachet, stated it as such. This narrative was easily supported in part by the victim's history of various mental and physical health issues. After all, he had only just been released "cured" from a year-long self-commitment in the asylum for epileptics and lunatics in Saint-Rémy-de-Provence.[1]

For these reasons, no serious investigations were undertaken into the unknown artist's otherwise suspicious death, and his shooting was just accepted as a suicide. The art supplies Vincent may have had with him in the morning were never recovered by the police. The crime scene was never confirmed, and the gun used in the crime remained missing. There was no exit wound described. The bullet is yet unretrieved as an autopsy was never performed. What is more, Vincent was only 1 hour away from war-trained surgeons in Paris who may have been able to save his life,

FIGURE 2. A 7-mm Lefaucheux black powder revolver with a folding trigger (photo by Edward Kobobel).

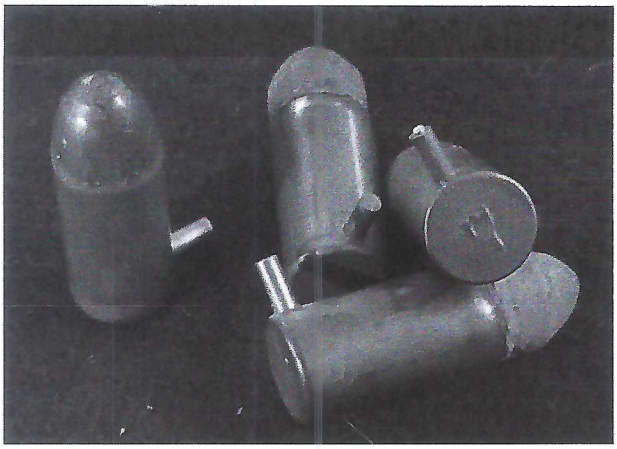

FIGURE 3. 7-mm pinfire cartridges, lead bullets loaded with black powder (photo by Edward Kobobel).

but he was never moved. The details, or lack thereof, surrounding this alleged suicide leave something to be desired. Could murder be a more fitting explanation for what happened to one of history's most influential painters? We explore that possibility in this study.

Historical Gunshot Wound Description and History

During a 1926 interview with Paul Gachet Jr., the attending physician's son, the entry wound in van Gogh's body was noted to be a "pea sized" hole with a dark red concentric margin, surrounded by a blueish-brown halo.[2] No black gunpowder was described. Paul Gachet Jr. reported that the alleged bullet entered "the wounded man at an angle, ricocheted off the fifth rib, and descended into a deep region around the midline." The location of the bullet, which failed to exit van Gogh, was stated to have stopped around the spinal cord and major blood vessels in the midline. This description was the basis for the excuse that van Gogh could not be moved from the inn to Paris, and no dangerous surgical intervention should be attempted.[3]

It is widely believed that a Lefaucheux 7-mm folding trigger revolver was the weapon that caused van Gogh's mortal wound, a speculation only supported by the discovery of a gun of that same model decades after Vincent's death. The gun was found all rusted and bent in a wheatfield that was one of the alleged scenes of the shooting. For this to be accepted as true, there are 2 critical pieces of evidence that must be present within or on the victim's remains. First, the missing bullet that can confirm the caliber of the gun. And second, a carbon black powder tattoo surrounding the entry wound, not to be confused with dried blood, that was suspiciously absent from Vincent's body and clothing, according to both of Paul Jr.'s vivid and colorful wound descriptions. In the presmokeless gunpowder era, when black powder ammunition was all that was available, powder burns were an essential feature of any close-range or direct contact gunshot wound.

With black powder weapons, these "powder burns" are almost impossible to avoid at close range, a fact that was well-known even by early criminologists. Thus, the absence of any described powder burns around the abdominal entry wound of Vincent van Gogh is critical to any investigation into a presumed suicide by a gunshot during this black powder era. Critical insofar as that fact ultimately determines the proximity of the muzzle to the body, absence of any powder burn on Vincent's body or clothing makes it extremely unlikely that he could have shot himself.[4]

The goal of this forensic study was to simulate the mortal wound Vincent received and to examine the characteristic impact of vintage black powder bullets which were discharged at a ballistic gel target from varying distances with an 1870s vintage pin-fire revolver. The study, as expected, showed that the farther away the muzzle is from the target, the less black powder would land and embed into the skin or catch the clothing on fire. From far enough away, there will be no black powder residue on the target at all and no burned cotton shirt (Figs. 4–6).[5]

In the era of van Gogh, studying black powder burns was a mainstay technique utilized by criminologists and law enforcement to determine the distance of the gun to the victim. Yet, in van Gogh's case, a powder burn was not mentioned in these explicitly detailed and otherwise colorful descriptions of the entry wound and surrounding skin (Fig. 7). Moreover, the policeman, Gendarme Rigaumon, examined Vincent's wound the next day and declared that he was shot from 1 to 2 ft. away. The only way he could have determined that was by the absence of any powder burn or residue on Vincent or his clothing. Rigaumon confronted van Gogh with his doubts as to his suicide, but Vincent was uncooperative and said, "Do not blame another, I did it to myself."

No other descriptions of Vincent's mortal wound are known to exist, and we must rely on these minimal descriptions alone to put the death of Vincent van Gogh into 21st century perspective and to clarify if it was possible for Vincent van Gogh to self-inflict his mortal wound.

Putting the Pieces Together Today

Because no serious investigation into the artist's death was properly undertaken, we will try to fill in the information that a normal police or coroner's report should have contained. Vincent did not go out that morning to paint with his art supplies. Instead, we know he attended a meeting with the Gachet family, according to an interview[6] with Dr. Gachet's children, Paul Jr. and Marguerite,

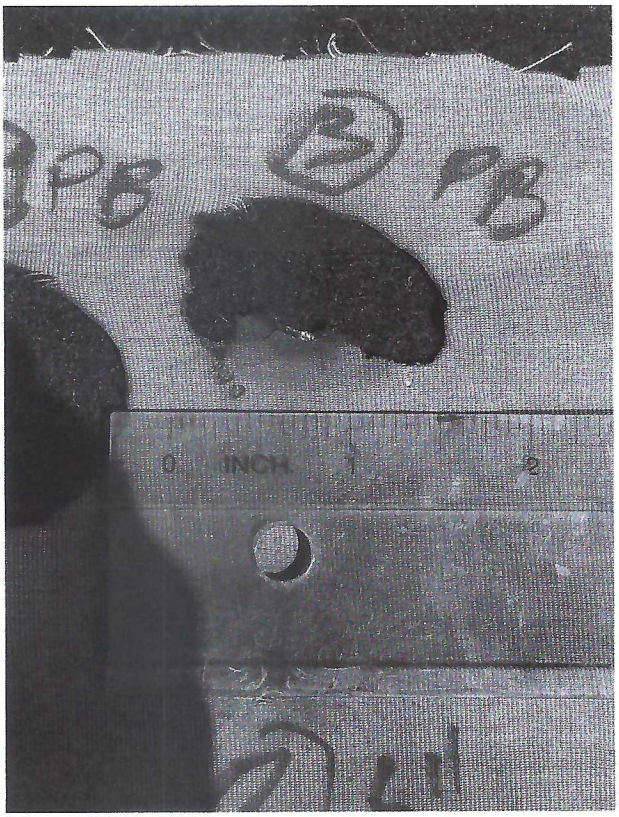

FIGURE 4. Cotton shirt over ballistic gel shot from point blank range (photo by Edward Kobobel).

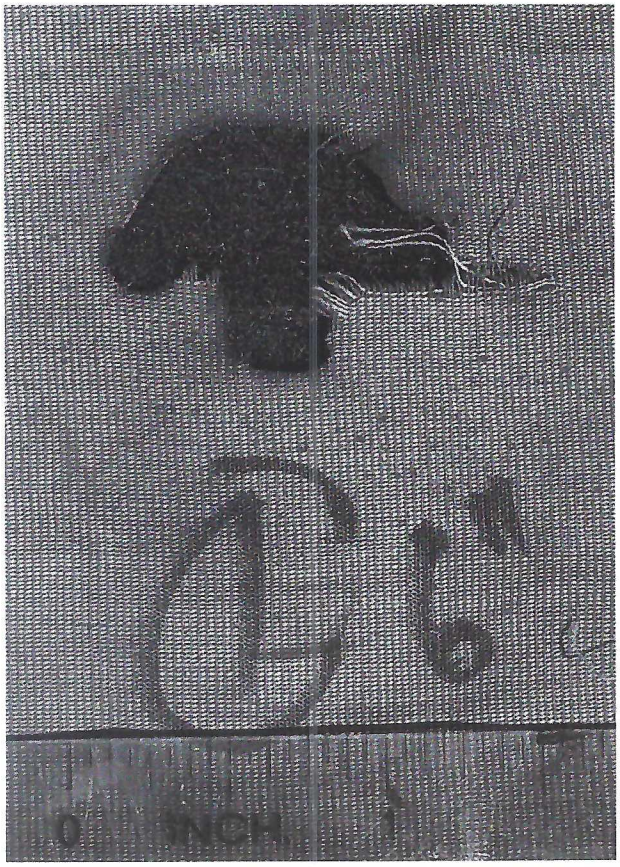

FIGURE 5. Cotton shirt over ballistic gel with obvious black burn radius around the impact of the bullet and brownish slow burn (photo by Edward Kobobel).

many years later. The art supplies were never missing as Vincent did not take them with him that morning to the Gachet home for that critical meeting. That is why there is no last painting by Vincent from the day he was shot.

Adeline Ravoux, the innkeeper's daughter, was an eye and ear witness during the entire 30 hours of Vincent's death watch. For over 60 years after the funeral, she kept her silence. When Adeline Ravoux finally came forward as a friend of Vincent's at the time of MGM's location shootings of *Lust for Life*, it was because she was hearing false narrative about his last days on Radio France and in the newspapers. She disputed much of what had already been accepted as fact, but not verified, about the death of Vincent van Gogh from the father and son Gachets. Paul Jr. stated that his father had called in the second opinion of one Dr. Mazery. Adeline confirmed that no such doctor visited Vincent on his deathbed. Additionally, she described the apparent anger between Vincent and Dr. Gachet, as they glared at each other during a very brief visit from which the doctor abruptly departed.[7,8] The absence of a Dr. Mazery at Vincent's bedside eliminates Dr. Gachet's credibility, making him the sole decision maker to not move Vincent to Paris for additional medical assistance.

Moreover, Dr. Gachet's story was that he stayed the night with Vincent at his bedside. The truth, however, was that it was Adeline's father, Gustave Ravoux, who sat with Vincent on his deathbed that first night. There were many other flaws in the long standing Gachet narrative of what happened during those 30 hours. Her interviews and testimony disputed these and other long held beliefs about the day Vincent was wounded, further deepening the mystery. It was also Gachet's decision to wait 12 hours before notifying van Gogh's closest family member, his brother Theo, of Vincent's wounding. So, was this a narrative of the events on the day van Gogh was shot, really a cover up for a true crime? "Who Killed van Gogh?" "The doctor did it," in fact killing Vincent, at least by benign neglect.[9]

Furthermore, it is unknown what clothing he was wearing with certainty. It is reasonable to assume that on a hot muggy July day, he might have been wearing a light cotton garment as was customary for that time of year.

TEST FIRING THE REVOLVER

Materials and Methods

Reenactments and Simulations

This forensic study utilized the same model 7-mm Lefaucheux revolver suspected of creating the mortal wound in Vincent Van Gogh, with vintage 7 -mm pinfire black powder cartridges.

Bullets for this firearm would have been approximately 53.6 to 48.7 grains, low-powered rounds, and were all made of lead in either conical, ball, or shot configuration.[10]

Testing

The firearm was discharged into FBI-grade clear ballistic gel (Clear Ballistics LLC) covered in a 100% cotton shirt to simulate

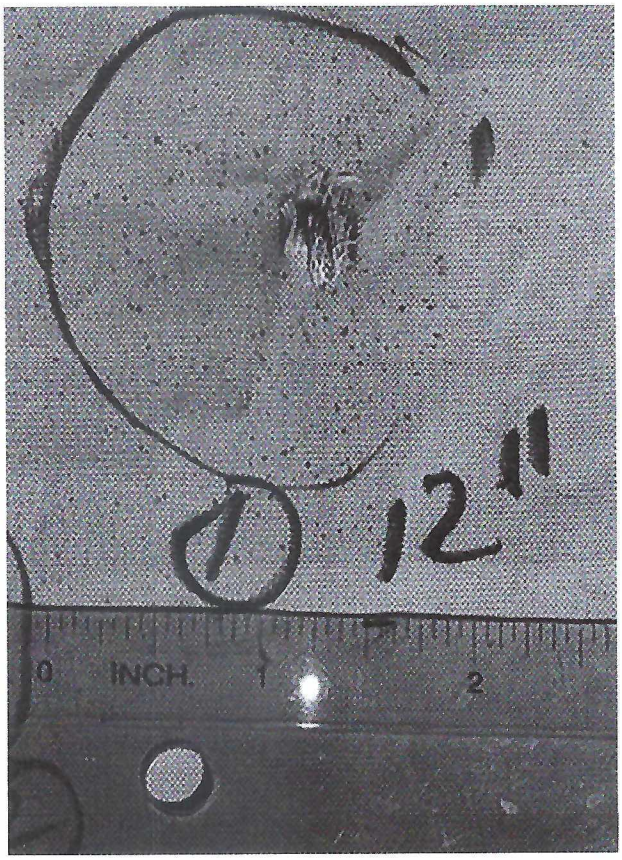

FIGURE 6. Entry wound in cotton shirt over ballistic gel surrounded by soot, spatter powder burn, and minimal brownish discoloration from the intense heat and slow burn. Another target shows the ballistic gel with a pea-sized bullet hole. Note there was no powder burn on the gel (photo by Edward Kobobel).

FIGURE 7. Entry wound with surrounding soot, but no evidence of burn on the striped cotton shirt (photo by Edward Kobobel).

how clothing might interact with the flame, unburned powder, and skin in a self-inflicted shooting at varying distances.

The test firing was conducted at the following distances: direct contact (point-blank), 6 inches, 12 in. (intermediate), 18 in., and 24 in. (distant). For each test distance, 3 shots were fired into the ballistic gel and digitally photographed. The burn patterns on the cotton shirt were observed and photographed, and the time of the burn was documented in videos (available on the website *www.killingvincent.com/forensics)*.

A 100% cotton shirt was placed over the FBI ballistic gelatin to simulate the type of garment that Vincent was most likely wearing that day. The shirt and gel/skin simulant were then assessed for the extent, spread, density, or absence of any unburned powder or stippling, on both the shirt and the ballistic gel, as well as examined for the burn and the effect of the flame (browning) on the cotton shirt covering the gel.

RESULTS

We made 3 shots from each of the following distances and examples of the observed results can be viewed below.

Direct Contact (Point-Blank)

For close-range contact (point-blank and 6 in.), the flame from the gun burned a hole in the cotton shirt and could have likely left at least second degree burns on the ballistic gel "skin" as the garment caught fire from the flame. Note the size of the burn hole and the peripheral browning extent on the cotton shirt. On another target, the flame also melted ballistic gel with a black powder burn evident. There is also a slight browning effect on the ballistic gel itself. The duration of the burning shirt is documented in the video (www.killingvincent.com/forensics).

Six Inches

Cotton shirt over ballistic gel with obvious black burn radius around the impact of the bullet, and brownish slow burn noted circumferentially on the blue cotton material. On another target, the ballistic gel is seen with an evident white burn radius just above bullet impact and slight brownish surface slow burn. The duration of the burning shirt is documented in the video (www.killingvincent.com/forensics).

12 Inches (Intermediate)

In comparison, when the gun was fired from an intermediate distance of 12 to 18 in. away, the flame from the muzzle was less likely to burn a large hole in the cotton, leaving only a pea-sized bullet hole. From this distance, the bullet itself left little to no black powder, or singed clothing/skin.

Entry wound in cotton shirt over ballistic gel surrounded by soot, spatter powder burn, and minimal brownish discoloration from the intense heat and slow burn. Another target shows the ballistic gel with a pea-sized bullet hole. Note there was no powder burn on the gel (Fig. 8).

18 Inches

There was a simple entry wound with rare surrounding soot, but no evidence of burn on the cotton shirt or the ballistic gel.

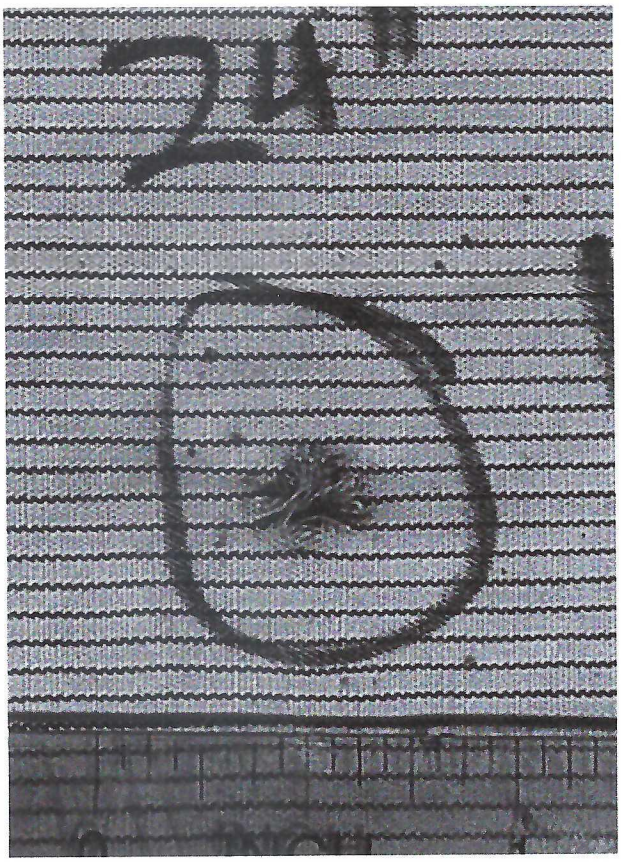

FIGURE 8. Slight stippling around impact point with minimal surrounding soot on the cotton shirt (photo by Edward Kobobel).

24 Inches (Distant)

The same was found in the case of a distant shooting, from 24 in. away. Therefore, the amount and distribution of gunpowder residue on the cotton clothing directly marks the proximity of the muzzle to the body. To determine how this pertains to Vincent's case, we would need a more definitive answer as to what he was wearing that day.

There was slight stippling around the impact point with minimal surrounding soot on the cotton shirt and the ballistic gel. Another target shows ballistic gel with a pea-sized bullet hole and no residual powder on the ballistic gel.

DISCUSSION

The Critical Questions to Answer in This Study

The Question of the Absent Powder Burn

The reliability of the wound description is, of course, in question, but it is the only historical information we have available to determine whether Vincent van Gogh could have actually shot himself in the belly on purpose. At both point blank range and 6 in. away, the powder burns on the ballistic gel and the shirt is most evident. As the muzzle gets farther away, the amount of powder burns and skin damage diminishes, as expected. Although slight powder or stippling is still evident out to 18 to 24 in., its presence has notably decreased. As noted above, none of the doctors, police, or visitors to Vincent's bedside observed or reported seeing powder burn or residue anywhere on Vincent's body, or his clothing. There was no unburned powder residue on his hands reported, which would be expected with a reverse grip. To miss seeing a powder burn anywhere, if present, is virtually impossible. To miss reporting it is even less likely, given their very detailed and specific descriptions of colorful, concentric rings around the pea-sized entry wound. The only reasonable explanation is that there was no powder burn to observe, which means the gun was likely fired from 18 to 24 in. away or greater. Gendarme Rigaumon is the only eyewitness more familiar with powder burn forensics to comment on the likely distance from which the gun was fired.

The Question of the Discarded Gun

The assertion that a Lefaucheux 7-mm black powder revolver was the weapon that killed van Gogh remains little more than speculation. Our analysis of the alleged gun was limited to high resolution images available to us on the Internet. This old rusted and bent Lefaucheux 7 mm revolver found in a wheatfield in Auvers-sur-Oise, France in the 1950s was later turned into the Van Gogh museum in Amsterdam for assessment and verification. No detailed forensic evaluation of this gun or its functionality was performed when discovered or since to determine the likelihood that this gun was functioning normally on the day van Gogh was shot.

In addition to confirming the model of the gun, it would be helpful to confirm the caliber of the bullet. We cannot do so without retrieving the bullet from Vincent's remains. Finding the bullet could lead to finding and confirming the gun, which could point to its owner. Who was the owner of the murder weapon? And how would Vincent have possibly gained possession of this lethal weapon to use on himself? Did he "borrow" it? Steal it? Or was it placed in his way or handed to him? All intriguing questions that may be answered by finding the missing bullet at autopsy. However, whatever make, model, and caliber gun was used, it would be very difficult to argue that it was not a black powder bullet fired from that weapon.

The Question of van Gogh's Clothing

A shot fired at contact or close-range would certainly produce searing, powder tattooing, and/or soot deposition around the entry wound skin and the clothing covering it. Although we do not know exactly what van Gogh wore on that hot and muggy July afternoon, we used a flammable cotton shirt in our reenactments to cover the ballistic gel, as it was the most typical type of material worn during this time. We then recorded the extent of the unburned powder on the shirt, as well as the distribution, size, and duration to create the burn hole in the shirt. We also tested the distance one could test fire at the shirt-target without catching the shirt on fire. All these factors and observations are presented in the photos and videos in the Supplemental Digital Content (SDC) (www.killingvincent.com/forensics).

There is a possibility that van Gogh was wearing a painter's smock or jacket, though it has been determined that he was not painting the morning he was shot. Such a garment would be more likely to withstand gunpowder soot, and if Vincent was wearing layers (a vest, for instance), the additional material would have screened out a significant amount of powder particles, soot, and flame from tattooing or burning the skin.

The next set of forensic studies will use fresh pig skin over ballistic gel and various layers of clothing shot from various muzzle distances to the point of impact. This study would be most effective if done before or in conjunction with the recommended autopsy of van Gogh. A more definitive answer to the question of his clothing may be forthcoming based on actual discrete evidence, which could only be determined by exhuming the body and studying the clothes Vincent was shot and presumably buried in, if any clothing survived.

The varying results of unburned residue observed on the cotton shirts in relation to the distance of the muzzle from the point of impact are documented in the SDC. As one would expect, the amount of gunpowder residue (soot) on the cotton shirt decreases as distance from the target increases. It is the same for the shirt catching on fire. The findings of powder residue on the cotton shirt did not preclude the "powder burn" presence on the ballistic gel "skin" behind the shirt at close contact distance of 6 in. or less.

The Question of the Bullet's Trajectory and Internal Pathway

We are speculating on the trajectory of the bullet based solely on the information provided by Dr. Gachet's son Paul Gachet Jr. in 1926.[2]

The bullet pathway and resting place was presumably ascertained by unsterile digital or instrumental probing, as there was no exit wound described. The final resting place was reported with the description of the entry wound in 1926 and 1928. This final resting spot was used as an excuse as to why it was not possible to move Vincent quickly to a hospital in Paris 20 km away as the bullet was allegedly in the midline "near the great vessels and spine." Assuming the path of the bullet indeed turned from left to right and upward, suicide is still a viable theory. However, this direction is improbable based on the location of the wound and the presumed trajectory, as well as its internal pathway and final position of rest in the midline structures. The fact that lateral tracking in either direction can occur in self-inflicted wounds is well documented in the forensic medical literature and use of a nondominant hand to inflict a wound on oneself makes it even less likely. It is incredibly difficult to inflict such a wound without extensive extortion of the hand and forearm in a distant shot from 1 to 2 ft away.

Let us examine whether van Gogh could have somehow held a gun at the distance necessary to avoid obvious powder burns while creating the entry wound, the trajectory reported by Dr.

Gachet, and the rest point in the midline near the great vessels and the spine.

The expected path of the bullet, wherein the bullet creates the entry wound, follows the specified trajectory and comes to rest at the midline near the great vessels and spine as reported by Dr. Gachet. The study concludes it was virtually impossible for van Gogh to have shot himself right handed, at the entry wound site, having positioned himself and fired the gun in such a way that the bullet remained in his body in the midline, when it should have exited his left flank region, and left no trace of powder burns.

It is important to consider how Vincent might have shot himself with either hand as Vincent was known to be right-handed. Following basic laws of physics, with a right-handed shooter, the trajectory of this bullet should exit the left flank, not end up in the midline at a great angle off of the expected trajectory (Fig. 9).

But for the bullet to end up in the midline without an exit wound, it would have to make a dramatic, if not magical turn to come to rest at the midline. This is an almost impossible turn of notable angles. Did the bullet deflect to the midline after a ricochet striking the fifth rib, as Paul Jr. suggested? How did it travel from the point of entry in the abdomen up to the fifth rib, and then deflect into the midline adjacent to the vital structures? Significant deflection of a bullet path is somewhat rare, particularly when dealing with a projectile of medium caliber or greater. However, the 7-mm black powder pinfire round was quite low power (even modern rimfire ammunition is more powerful), so a ricochet is not out of the question. Still, for the bullet to strike the fifth rib at the midchest level when the entry wound was below the twelfth rib in the left upper quadrant of the abdomen, and then deflect to the midline near the great vessels and spine would be quite a journey for a low to moderate energy projectile. Junior's story is not believable and just does not add up.

FIGURE 9. Van Gogh shooting himself with his right hand. Based on this angle, it seems impossible to shoot oneself and accomplish the necessary trajectory and come to rest in the midline (art by Darrell Anderson).

FIGURE 10. Sketch of Vincent van Gogh shooting himself with his left hand in the angle that matches the known trajectory of the bullet that killed Vincent van Gogh but without leaving the signature powder burn (art by Darrell Anderson).

It is possible for a suicide victim to hold a handgun in a reverse grip (hand around the grip with a thumb on the trigger), allowing much more latitude in directionality than with a standard grip. In this way, it is entirely possible for a person to hold a handgun some distance away from the body while firing a bullet along a wide variety of trajectories. We concluded that although this is technically true, van Gogh still would not have been able to hold the gun far enough away to inflict his fatal gunshot with no residual powder burn or catching his flammable cotton garments on fire while following the trajectory described. Absence of any one of these points would make this forensically not possible (Figs. 10 and 11).

CONCLUSIONS

There are no legal debates or liability issues in this 130-year-old homicide cold case. All we are trying to do is make a clinical

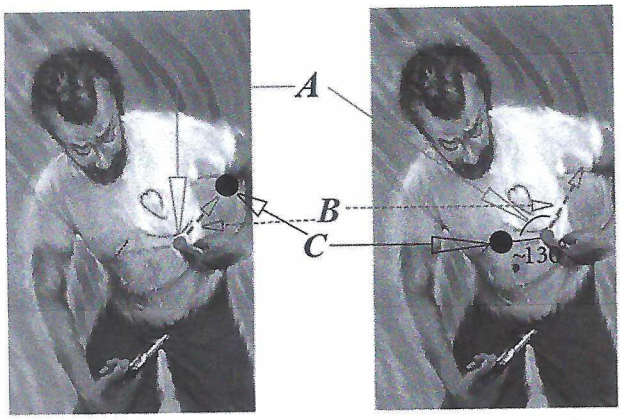

FIGURE 11. A sketch of the path of the bullet that killed Vincent van Gogh. The left side shows what should be the correct trajectory of the bullet if fired with the right (dominant) hand. The bullet should have exited the left flank under the axilla. The right side shows what appears to be an impossible trajectory, but is the correct trajectory based on the original 1926 report. The bullet starts at the entry wound (A), follows the trajectory (B), and comes to rest at the midline (C). This is virtually an impossible trajectory and end point for this bullet to have traversed (art by Darrell Anderson).

assessment as to whether Vincent van Gogh really shot himself, using all the available wound information, ballistics, later testimonies, our black powder reenactments, and an investigation of the alleged murder weapon.

It is certainly interesting and worthwhile from a historical perspective to speculate as to whether Vincent van Gogh committed suicide as commonly believed. No one disputes that Vincent died of some type of penetrating abdominal wound. The big forensic question facing us now is whether this was a self-inflicted gunshot wound or someone else shot Vincent accidentally or on purpose. This is the historical question we have been trying to answer with very little accepted facts and meaningful descriptions to rely on. All the forensic entry wound data we have available to any of us is secondhand from a person of interest and questionable source. Although the policeman believed Vincent was shot from a distance, there are no contemporaneous reports confirming that suspicion nor any documentation of any powder burn on Vincent's belly or on his clothes. Shooting oneself in the belly to commit suicide is very unlikely as Molina and Di Maio showed in their study of 797 suicides, in which only 1.3% of self-inflicted wounds were in the abdomen.[10] It is doubtful that the issue of suicide or murder can ever be conclusively proven one way or the other. We all concur that despite the 130-year hiatus, we do not know what secrets Vincent took to his grave unless we do a respectful exhumation and definitive graveside autopsy. We believe that the only certain benefit to an autopsy is to obtain the bullet and assess its caliber to see if it is consistent with a 7-mm bullet. The clothing and bones are likely simply ash at this point. However, if van Gogh's remains, ribs, and clothing have not fully deteriorated, any useful information they might contain, may shed some additional light on the questions surrounding this historically challenging cold case. However, it is likely that there may not be enough left of Vincent's remains to really provide us any answers we seek.

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