

RESEARCH
ARTICLE

Deciphering the Zodiac Killer: A Killer Betrayed by his own Words

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HIGHLIGHTS

A new analysis of the Zodiac killer case argues that Donald Lee Cheney, not Arthur Leigh Allen, is the stronger suspect—based on a structured evidentiary principle rather than speculation.

ABSTRACT

Between December 1968 and October 1969, an unknown man terrorized the San Francisco Bay Area of California, murdering five people and wounding two others. The murderer adopted the moniker Zodiac and proceeded to mail taunting letters, cards, and cryptograms to law enforcement and newspapers, possibly leading to clues to his identity. For 55 years, countless investigators, professional and amateur, have been fascinated by the unsolved Zodiac killer murders, and dozens of authors have put forward dozens of men as possible Zodiac suspects, but their arguments supporting one Zodiac person of interest over others have often been based on vague reasoning without solid supporting evidence. This paper attempts to address this fault by using a well-defined principle of evidentiary analysis to analyze facts and competing hypotheses. Specifically, this paper will use the surprise principle to examine some important characteristics of two of the major players in the Zodiac killer mystery: Arthur Leigh Allen (the most discussed suspect) and Donald Lee Cheney (the man who brought Allen to law enforcement's attention), concluding that Cheney is the better of the two suspects.

SUBMITTED June 6, 2023
ACCEPTED December 7, 2024
PUBLISHED October 15, 2025

<https://doi.org/10.31275/20253043>

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KEYWORDS

Zodiac killer, serial killer, Don Cheney, Arthur Leigh Allen, surprise principle.

THE SURPRISE PRINCIPLE APPLIED TO THE ZODIAC KILLER CASE

It is undisputed that serial killings are the rarest form of homicide (Ellerbrok, 2011). With the rise in interest over the past few years in what is simply known as “True Crime,” the public’s fascination with serial killings is at an all-time high, resulting in numerous T.V. documentaries, videos, podcasts, and books on serial killers, such as Jeffery

Dahmer, Ted Bundy, and Gary Ridgway (a.k.a. the Green River Killer). The explosion of content examining these killers and their monstrous crimes has produced a unique opportunity to learn what inspired these individuals to act upon their murderous impulses, what mistakes led to their apprehension, and what, if anything, can be found in their backgrounds that contributed to their behaviors. A deeper study of serial killers allows even casual true crime



researchers to challenge the way that evidence is gathered and interpreted, particularly considering the advancements in DNA technology.

The unsolved case of the Zodiac killer, steeped in mystery, has garnered the fascination of amateur sleuths and has significantly shaped the public's perception of serial killings. Examining this case presents an opportunity to show how we determine which facts are relevant, how we reason from our chosen facts, and how confirmation bias may subconsciously influence our conclusions.

Fifty years ago, a brutal murderer terrorized the San Francisco Bay Area. Calling himself the Zodiac, the killer used the media to taunt the police and terrify the public. In the words of a contemporary law enforcement official from the Napa Sheriff's Department, "We have reason to believe he is a maniac; however, he is a cunning man. He knows exactly what moves he's going to make" (Frederick & Lindsey 2019, 13:50).

The Zodiac was cunning enough or lucky enough to escape capture, and the identity of the Zodiac killer remains one of America's greatest mysteries. Over the past 50 years, dozens of authors have put forward dozens of men as possible Zodiac suspects, but their arguments supporting one Zodiac person of interest over others have largely rested on imprecise methods of reasoning without regard for what comprises good, reliable evidence. In order to properly analyze facts and competing hypotheses, investigators need to use well-defined principles of evidential support. One such principle is the Surprise Principle. As Elliot Sober writes in *Core Questions in Philosophy*, "The Surprise Principle describes when an observation O strongly favors one hypothesis (H_1) over another (H_2)." (Sober, 34) This principle says that an observation O strongly supports hypothesis H_1 over Hypothesis H_2 if both the following conditions are satisfied, but not otherwise: (1) if H_1 were true, O is to be expected; and (2) if H_2 were true, O would have been unexpected (Sober, 2021).

This principle (even if not identified as such) is widely used across disciplines, including criminal investigations and legal cases. The best explanation will be the hypothesis that leads us to expect the data better than alternative hypotheses do. The surprise principle does not tell how probable the target hypothesis is. Instead, it is used to ascertain which of two or more competing hypotheses are supported by the facts. It tells us when facts strongly support one hypothesis over another. Normally, H predicting O means that H at least makes O more probable than not (i.e., greater than $\frac{1}{2}$). The surprise principle covers these cases, but it also covers cases in which neither hypothesis predicts the data, but rather, H_1

makes O more probable than does H_2 , and where neither H_1 nor H_2 makes O more probable than not.

This is important in forensic science. For example, the genetic data that show that two persons are related as siblings usually involve huge improbabilities. It is just that the sibling hypothesis makes the genetic data less improbable than the alternative hypothesis. But also, in criminal cases, there is often data that is less surprising/improbable given the defendant's guilt, although the defendant's guilt does not lead us to expect the data. For example, a Raleigh cigarette is found at the crime scene, and the defendant smokes that brand. It is not that the guilt of the defendant leads us to expect that a Raleigh cigarette would be found, but that fact may be more probable given that the defendant smokes Raleighs than if some other person committed the crime.

In short, we are speaking of H_1 better fitting data than H_2 , where the better fit involves H_1 conferring a greater probability on a datum even if the datum is still improbable given H_1 . It does this by focusing on which hypothesis makes the observational datum more probable (and so less surprising) than does an alternative hypothesis. In this way, the surprise principle identifies observations that discriminate between two hypotheses, and thereby evidentially favors one over the other.

The surprise principle will be used in an examination of some characteristics of two of the major players in the Zodiac killer mystery: Arthur Leigh Allen and Donald Lee Cheney. Arthur Leigh Allen, the best known and, to many, the most likely Zodiac killer suspect, was brought to police attention in this case by his friend Donald Lee Cheney, who in July of 1971, informed the Manhattan Beach, California Police Department that Allen, before the Zodiac crimes occurred, had spoken to him of his desire to commit Zodiac-type murders at one of the actual murder scenes. There is much evidence, to be discussed later, pointing to Allen as the killer, and environmental criminologist D. Kim Rossmo, Ph.D., writing in "Geographic Profile: Zodiac Serial Murders," indicates that Vallejo, California (where Allen lived) is within the geographic boundaries where the Zodiac killer most likely had his residence (Rossmo, 1999).

As of late, many investigators, including these authors, have begun to examine further Don Cheney's role in the Zodiac killer saga and have found evidence, which will be discussed later, indicating that Cheney was more than an informant – he was possibly the Zodiac killer himself. Comparing evidence for Don Cheney as the Zodiac killer to evidence for Arthur Leigh Allen as the Zodiac killer will be the

focus of this work, and the surprise principle will be utilized to show that there are important facts that strongly support the Cheney-as-Zodiac hypothesis over the Allen-as-Zodiac hypothesis. This analysis does not show that the Allen hypothesis is implausible, all things considered, but it does provide salient evidential considerations that potentially undermine arguments favorable to the Allen hypothesis. We will show that the Cheney hypothesis makes the data in the case less improbable (or more probable) than does the Allen hypothesis.

This comparison will demonstrate that Don Cheney's attributes/characteristics are a superior match to many of the facts that are known about the Zodiac persona, as listed below, and do not support prime suspect Arthur Leigh Allen as the perpetrator of the Zodiac crimes. We will also consider the Zodiac's physical characteristics as described by eyewitnesses, and in the same manner demonstrate that these physical characteristics more closely match those of Don Cheney than those of Arthur Leigh Allen.

The Zodiac Killer Persona:

1. An advanced knowledge of mathematics
2. Demonstrated sewing skills
3. An interest in comics
4. A big-game hunter
5. Proficiency with knives
6. Knowledge of celestial navigation
7. Drafting knowledge (ability to alter handwriting)
8. A shrewd and methodical planner
9. Profiled as an age-appropriate heterosexual male

Physical Characteristics of the Zodiac Killer (as described by eyewitnesses):

1. Height: six feet tall
2. Weight: 200-250 lbs.
3. Build: stocky and barrel-chested
4. Hair: brown/dark
5. Age: 35-40 years old
6. Wore eyeglasses

THE ZODIAC KILLER CRIMES

The First Attack: December 20, 1968

Five days before Christmas, on a typically cool night in Northern California, gunshots rang out, killing two high school students, Betty Lou Jensen and David Faraday (Zodiac Killer Facts, n.d.). They were on their first date, sitting in a car on a turnout, a local lovers' lane, on Lake Herman Road, which connects Benicia and Vallejo. Several months went

by with no arrest in the murders and no clues pointing to a motive ("Lake Herman Road," n.d.) (See Figure 1).

The Second Attack: July 4, 1969 (possibly early morning hours of July 5th)

The following summer, 22-year-old Darlene Ferrin and 19-year-old Michael Mageau were shot in the same manner as Jensen and Faraday - as they sat in Darlene's car in the parking lot of Blue Rock Springs Park in Vallejo, California, just four miles from the location where the first couple had been murdered (See Figure 2). One of the victims, Michael Mageau, survived the shooting and provided a description of the killer to the police. A pattern began to emerge - a killer was targeting couples in isolated areas (Zodiac Killer Facts, n.d.).



Figure 1. David Faraday and Betty Lou Jensen.

Note. From Zodiac Killer Facts (n.d.). This image is in the public domain.



Figure 2. Darlene Ferrin and Michael Mageau.

Note. From The True Crime Database (n.d.). This image is in the public domain.

Weeks later, three letters, postmarked July 31, claiming credit for the crimes and providing details of the attacks, were sent to three San Francisco Bay Area newspapers. Each of the letters contained part of a cipher, a message within a cryptic code. These were to be the first of four

ciphers sent by the killer that he claimed, if solved, would ultimately reveal his identity (See Figure 3).

A few days later, another letter, postmarked August 4, was received by the San Francisco Examiner (See Figure 4). It began with the words *Dear Editor, This is the Zodiac speaking.*

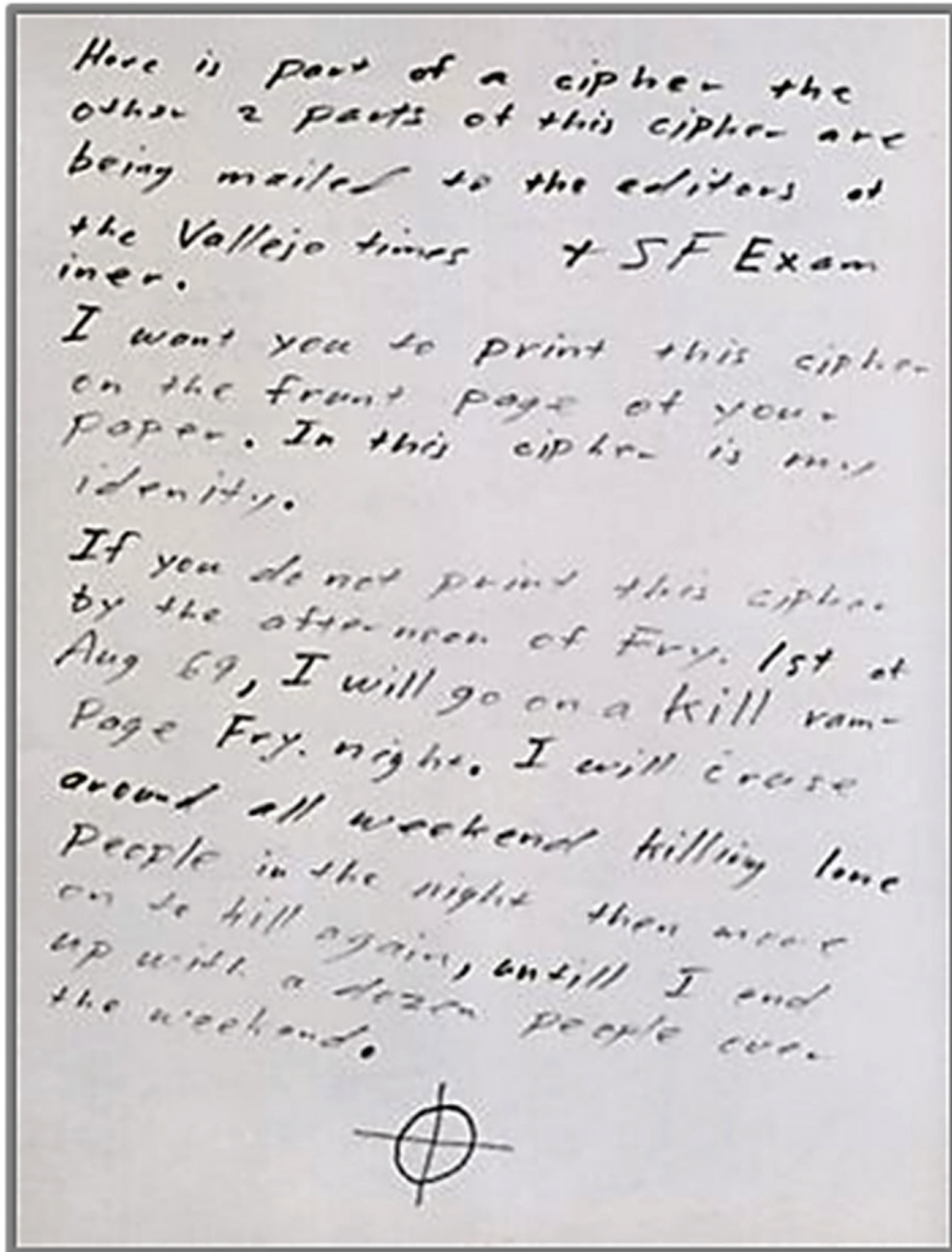


Figure 3. Zodiac letter, July 31, 1969.

Note. From Zodiac Killer Facts (n.d.) This image is in the public domain.

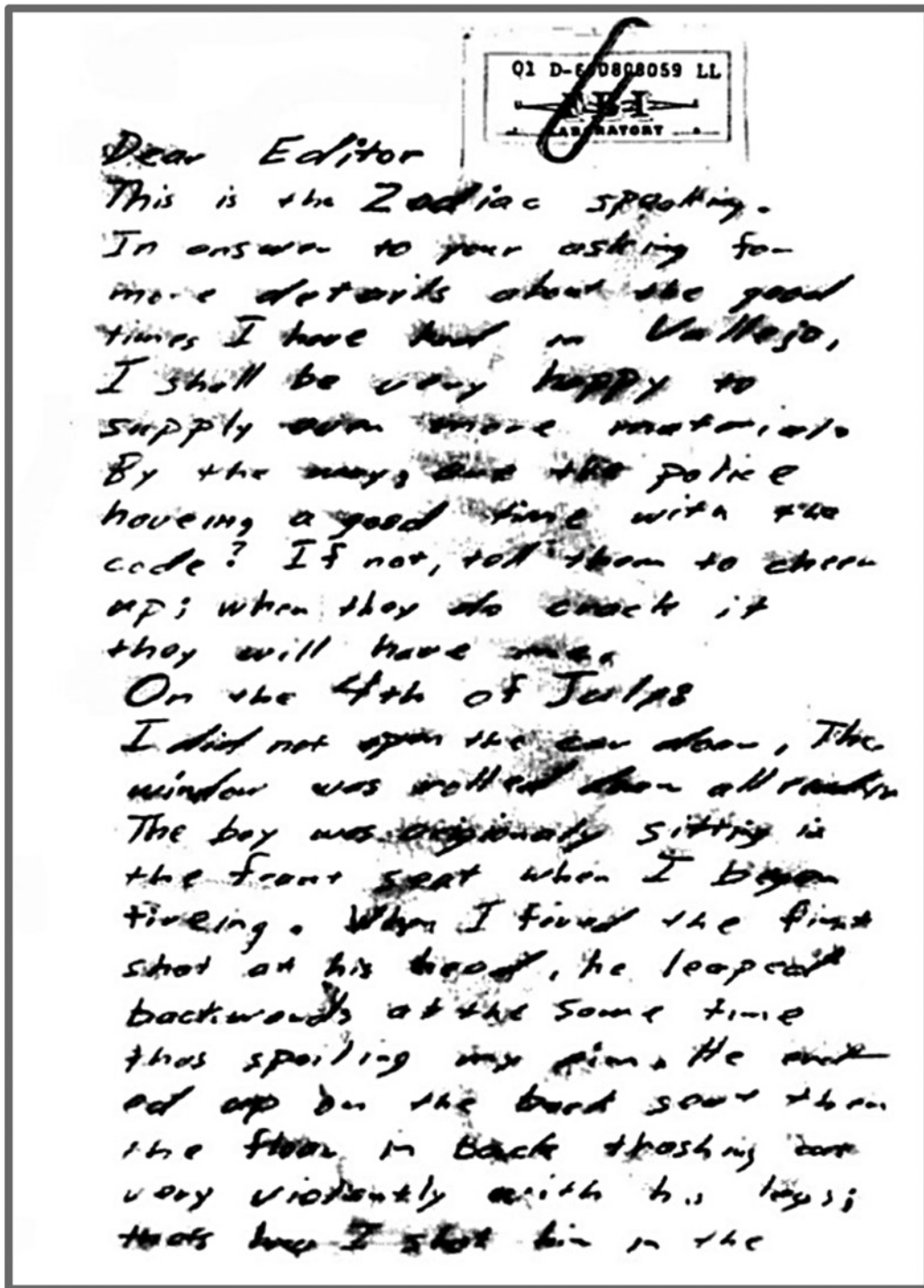


Figure 4. "This is the Zodiac speaking" letter.

Note. From Zodiac Killer Facts (n.d.). This image is in the public domain.

The Third Attack: September 7, 1969

While enjoying the afternoon at Lake Berryessa in Northern California, Bryan Hartnell and Cecelia Shepard were bound and stabbed repeatedly by a man who

had been hiding behind a tree (Zodiac Killer Facts, n.d.) (See Figure 5). Bryan survived the attack and later gave a detailed description of the perpetrator to the police, but Cecelia succumbed to her wounds and passed away two days later.



Figure 5. Cecelia Shepard and Bryan Hartnell.

Note. From Zodiac Killer Facts (n.d.). This image is in the public domain.



Figure 6. Drawing of Lake Berryessa attacker.

Note. From Zodiac Killer Facts (n.d.). This image is in the public domain.

One detail Bryan recalled was that the attacker wore a black executioner's hood covering his face. The hood came over the attacker's chest area and displayed the Zodiac cross-circle symbol (Narlow, n.d.) (See Figure 6).

The Fourth and Final Attack: October 11, 1969

In Presidio Heights, an upscale neighborhood in San Francisco, Paul Stine, a 29-year-old cab driver, was shot in the right side of the head by a passenger who fled the scene and was never identified.

Three teenagers, looking out of a second-story window, witnessed a man presumed to be a murderer get out of Stine's

cab, wipe down the outside of the vehicle, and calmly walk away. The famous Zodiac composite sketch is based on their descriptions of the killer. Initially, this crime appeared to be unrelated to the Zodiac killer attacks, but a few days after the murder, the San Francisco Chronicle received a letter, postmarked October 13, 1969, from the Zodiac in which he claimed to be the passenger responsible for Stine's murder. To prove his claim, the Zodiac included a piece of Paul Stine's bloody shirt in the letter (Zodiac Killer Facts, n.d.) (See Figures 7, 8 and 9).



Figure 7. Paul Stine.

Note. From Cole (2015). This image is in the public domain.



Figure 8. Sketch of the murderer of Paul Stine.

Note. From Roback (2023). This image is in the public domain.



Figure 9. Crime scene photo of the Paul Stine murder.

Note. From Zodiac Killer Facts. (n.d.). This image is in the public domain.

The last confirmed Zodiac killer attack occurred over 50 years ago, and despite the efforts of law enforcement and amateur investigators alike, the killer has yet to be identified. The public's fascination with the case reached its pinnacle with the 2007 release of the major motion picture *Zodiac* by acclaimed film director David Fincher. The movie, based on Robert Graysmith's nonfiction books *Zodiac*, published in 1986, and *Zodiac Unmasked*, published in 2007, focuses on a man named Arthur Leigh Allen, who had been the prime suspect in the case almost from the beginning.

Allen landed squarely on police radar as a person of interest in July 1971 after his close friend, Donald Lee Cheney, came forward with an explosive story just a few months after Paul Avery of the *San Francisco Chronicle* had received the infamous Zodiac Halloween card (See Figure 10). Allen had told him on New Year's Day 1968 that he was going to target and kill couples on lovers' lanes and call himself Zodiac (See Figures 11, 12, 13 and 14). Cheney explained that his memory of this event had been triggered by reading a newspaper article that included a quote from one of the Zodiac letters in which the Zodiac threatened to kill school children as they

came off a school bus. Cheney said he recalled that Allen had said this very thing.

In addition to Cheney's bombshell accusation, a mountain of evidence implicated Allen. One incriminating fact was Allen's possession of a Zodiac brand wristwatch, which his mother had given to him as a Christmas present in 1967. This particular watch featured a cross-circle logo, similar to both the symbol displayed by the Zodiac killer on his correspondence and the embellishment on the executioner's hood worn by the killer during the Lake Berryessa attack. Allen was also known for his reprehensible behavior. He lost his job as a schoolteacher in 1968 for inappropriately touching some of his students and was arrested for molesting an eight-year-old boy in 1974 (Zodiac Killer, n.d.).

The DVD version of the film *Zodiac*, released in 2008, came with a documentary called *His Name was Arthur Leigh Allen*. This documentary details the evidence against Allen. The film features interviews with many people who knew Arthur Leigh Allen, including Donald Lee Cheney; Allen's acquaintance, Santo "Sandy" Panzarella (also Cheney's friend and employer at the time of the Zodiac crimes); Allen's



Figure 10. Zodiac’s Halloween Card.

Note. From Grinnell (n.d.). This image is in the public domain.



Figure 11. Arthur Leigh Allen, 1960s.

Note. From Zodiac Killer. (n.d.). This image is in the public domain.

close friend, Norman Boudreau; and various law enforcement officers who had originally worked on the Zodiac case.



Figure 12. Donald Lee Cheney.

Note. From Find a Grave. (n.d.). This image is in the public domain.

Most notable among the law enforcement participants was Detective George Bawart, a Napa detective who inherited the Zodiac case in the early 1990s after all the original



Figure 13. Arthur Leigh Allen, 1970.

Note. From The True Crime Database (n.d.). This image is in the public domain.



Figure 14. Don Cheney, 1965.

Note. From Beeson (2019). This image is in the public domain.

investigators had retired or passed away. Bawart, the final lead investigator on the Zodiac case, was convinced that Allen was indeed the Zodiac killer (Bawart, n.d.). Bawart wanted to be the detective who finally solved the case. He was highly disappointed when a fellow police officer called him from

Allen's residence on August 26, 1992, telling him that Allen had been found dead. Arthur Leigh Allen had died of a heart attack.

The Graysmith book and the Fincher film did a fine job of raising suspicion of Arthur Leigh Allen by portraying him as a loner who was single due to his many odd behaviors, which included his propensity to be sexually attracted to school-age children. That served as the platter on which to place the seemingly overwhelming amount of evidence against Allen, including (a) the Zodiac watch that Allen wore with pride and (b) the fact that Allen was known to misspell words for comedic effect (e.g., *aigs*, meaning eggs, on his grocery list) in a manner similar to the Zodiac's in his letters (e.g., *clews* for the word clues and *Paradice* for the word Paradise).

His Name was Arthur Leigh Allen, and the book was made with the intent to explain why Arthur Leigh Allen had emerged as the prime suspect in one of the most notorious unsolved crimes in American history. This documentary did manage to achieve this goal, but it also had the unintended consequence of making Don Cheney look suspicious in his interviews. At one point in the film, Detective George Bawart is quoted as saying, "Yes, I believe Don Cheney's story [that Allen told Cheney that he wanted to be a killer called Zodiac]; I wonder sometimes if he's [Cheney's] not more involved in the case than he wants to let on" (Prior 2008, 20:33) Allen's close friend from his younger days, Norman Boudreau, also had his reservations about Cheney's character, stating in the documentary, "I met Don Cheney maybe two or three times. I really didn't get to know the guy. He made me feel uneasy, and I couldn't tell you why" (Prior 2008, 23:29).

In the documentary, Don Cheney states that the day Allen first told him that he wanted to become a killer named Zodiac was New Year's Day 1969; however, in the original San Francisco Police files, Cheney states that this conversation happened in late 1967 or in early 1968. Cheney reiterates the early 1968 date in a report prepared by Detective George Bawart in the early 1990s: "In January 1968, Allen had a conversation with Donald Cheney, a friend of his. Allen guised [sic] this conversation as though he was [sic] going to write a novel. Allen indicated to Cheney that he would call himself Zodiac and use the Zodiac watch as his symbol" (Bawart, n.d.).

On his ZodiacKiller.com website, long-time Zodiac researcher Tom Voigt stated that he interviewed Don Cheney in early 2000 and that Cheney had made many suspicious and contradictory statements during this interview. In one contradiction, Cheney stated that he was now sure that the date of Allen's "confession" was New Year's Day 1969. Cheney also told Voigt that he had never heard

of Blue Rock Springs Park, which contradicts his statement in *His Name was Arthur Lee Allen* that Allen had taken him to Blue Rock Springs Park on New Year's Day 1969 to show him where he wanted to kill a couple.

Also, in the *His Name was Arthur Leigh Allen* documentary, Cheney claimed that he would lick postage stamps for Allen (Prior, 2008). Could this be an attempt to cover himself in case his DNA was found on a postage stamp from one of the confirmed Zodiac mailed correspondences? After Don Cheney made the claim that he had licked Allen's stamps for him, he stated that he had given Allen his thumbprint in a ball of paraffin wax (Prior, 2008). San Francisco Police Department (SFPD) Detective George Bawart said that he did get Cheney's fingerprints compared to the Zodiac's, and they were not a match. When asked by the producer during the documentary if Cheney's DNA had been analyzed, Bawart responded, "I don't think so" (Prior 2008, 22:46).

Allen's DNA was tested against a DNA sample found on the top of a stamp from one of the Zodiac letters, but the results came back negative (Zodiac Killer Facts, n.d.). After Cheney mailed a letter to Zodiac killer researcher Tom Voigt in 2003, Voigt alerted authorities that the handwriting in Cheney's letter looked very similar to the handwriting in the Zodiac's letters. As a result, Cheney's DNA was reported to have been tested against a DNA sample held by the SFPD, and it was also not a match (Zodiac Killer Facts, n.d.). It remains unknown if a viable DNA sample from the Zodiac killer even exists.

In fact, at this point, it is questionable that the evidence held by the SFPD is even useful in determining the Zodiac killer's identity. In the words of Harry Phillips, producer of a 2002 ABC News Primetime Thursday television show about the Zodiac killer, who had access to the SFPD evidence storage facility, "The evidence and the files were in an atrocious state. It was unbelievable, considering that we were dealing with multiple murders. And the case had so much mystique internally that the evidence had been stolen, rifled, and taken home by retired cops" (Russo, 2018). To make matters worse, in 2002, the *San Francisco Chronicle* reported that among American cities, the SFPD ranked dead last in solving violent crime (Derbeken, 2002).

After Joseph DeAngelo, the infamous Golden State Killer, was arrested based on DNA evidence, hope that DNA could identify the Zodiac killer arose anew. In early 2018, it was reported that the Vallejo Police Department

(VPD) was sending its Zodiac killer letters for DNA testing, using DNA obtained from the envelope flaps and stamps (Associated Press, 2018; Fagan, 2018). It has been over six years, and the VPD has yet to announce any test results. The contamination of the DNA found on the Zodiac letters, the improper storage of evidence, and the unprofessionalism of the SFPD have complicated what was already a confusing situation regarding the Zodiac killer's potential DNA.

Another confusing situation concerns the Zodiac's fingerprints. The Zodiac killer was meticulous in his efforts to leave no physical evidence at the crime scene or on his correspondence. In one of his letters, the Zodiac claimed that he wore transparent fingerprint guards made of airplane cement (Wark, n.d.).

Moments after the brutal murder of cab driver Paul Stine at the hands of the Zodiac killer in October 1969, three siblings named Robbins saw the killer wiping down the outside of the cab in which the murder had taken place. Law enforcement interpreted this action as an attempt to remove any fingerprints that may have been left on the cab. The FBI lifted approximately thirty latent fingerprints from Paul Stine's cab. It was later determined that two of the prints belonged to Paul Stine, one to an unidentified police officer, and one to a newspaper reporter (Wark, n.d.). It is not known if the fingerprints from any responding paramedics were taken and eliminated. Fingerprints taken from the Zodiac crime scenes have never matched those of any suspect, including Arthur Leigh Allen.

In addition to examining the crime scenes for fingerprints and other clues, law enforcement officials have examined the Zodiac letters, looking for clues to the writer's identity. In early 2002, Tom Voigt reported that he had received from Don Cheney a handwritten letter in which the word victim was misspelled in the same manner as the Zodiac killer had misspelled that word: victem.

As written by Tom Voigt on Zodiackiller.com: "In late 2002, I sent scans of the envelope and letter to the San Francisco Police Dept (See Figure 15). Apparently finding the handwriting to be highly suspicious, the department immediately requested that I send them the originals. Within a month or two, the department obtained a DNA sample from Cheney. It was not a match to the Zodiac."

DISCUSSION

In the 2007 documentary *His Name was Arthur Leigh Allen*, former Vallejo Police Detective George Bawart

Jan 4, 2002

Tom,

In reference to the dialysis death: Leigh injected Insulin into the Tubing connecting the victim to the dialysis machine. His syringe would not have been seen as a weapon.

Don

Figure 15. Letter from Don Cheney to Tom Voigt, 2002.

Note. From *Zodiac Killer Ciphers* (2019, January 9). This image is in the public domain.

speculated that Allen and Cheney could have been working together as a team in the Zodiac crimes. The documentary had a profound effect on the way the case is viewed and inspired one of these authors to write *Sighting In on the Zodiac Killer*. Research for this book involved learning as many things as possible about the people related to this case, and one thing stood out: Don Cheney's suspicious behavior in *His Name was Arthur Leigh Allen*. As a result of his "shifty" manner in the documentary, Don Cheney became a primary focus of the research for *Sighting In on the Zodiac Killer*, which addresses Cheney's potential involvement in the Zodiac crimes. The name of the book was based on what Don Cheney, who was an avid hunter and survivalist, called hunting: sighting in. It was also a play on the Zodiac killer's infamous cross-circle logo, which resembles a rifle scope sight.

The book lays out the basic facts of the case, establishes timelines for Cheney's claims against Allen, and examines the evidence for Don Cheney and Arthur Leigh Allen individually (and as a potential duo) taking part in the murders and in the letter-writing campaign. The book does not conclusively state that it was both men working in concert or that it was Cheney as a lone killer and letter writer. A careful, detailed analysis of this case indicates

that Cheney was the sole attacker, with Allen and Cheney both having input into the Zodiac letters. This research has also led to a high amount of confidence that Cheney was the primary creator of the Zodiac persona and that Allen was a lower-level participant, possibly kept in the dark as far as the actual murders were concerned, and only taking part in the Zodiac letter-writing campaign.

HYPOTHESIS

Although Don Cheney and Arthur Leigh Allen were of similar age, were friends, and shared some interests, the differences in their social standing, apparent character, criminal background (or in Cheney's case, the lack thereof) make Arthur Leigh Allen better than Donald Lee Cheney as a match to the Zodiac killer; however, when comparing their known respective skillsets, likeness to the witness descriptions, and specific evidence for each, Don Cheney is a better match with the Zodiac killer than is Arthur Leigh Allen. Also, using the surprise principle, the expectation would be that the accuser, Cheney, would make a superior suspect based on descriptions of the killer and what has been ascertained about the killer's possible background and skills from his many written correspondences. Three

categories, which will be the salient data subset to which the surprise principle will be applied, will be featured.

ANALYSIS

This analysis will be using the surprise principle, which (as stated previously) tells us when facts strongly support one hypothesis over another by focusing on which of two competing hypotheses confers a greater probability on the data. There are two categories of data that strongly support the Cheney hypothesis over the Allen hypothesis, since the data are much more consistent with the Cheney hypothesis than the Allen hypothesis. The first category compares Allen and Cheney with witness descriptions of the Zodiac killer.

The first feature of the Zodiac killer descriptions that favors Cheney over Allen is the fact that the Zodiac was described as having hair. More specifically, the teenagers who saw the Zodiac killer in the Presidio Heights neighborhood of San Francisco described a man with a short crew-cut hairstyle. Officer Donald Fouke, who believes that he saw the Zodiac killer in the Presidio Heights neighborhood, said that the man he saw had a widow’s peak, referencing a distinctive, V-shaped hairline that tends to be inherited (Prior, 2008).

As their photos show, Arthur Leigh Allen was almost completely bald by the time of the first Zodiac killer attack at Lake Herman Road in December 1968. Donald Cheney’s hair more closely matches the descriptions of the Zodiac’s hair than does Allen’s. Cheney had a distinctive widow’s peak and also had brown hair, matching the description of the hair that Bryan Hartnell saw coming through the eyelets of the killer’s executioner’s mask during the Lake Berryessa attack (Narlow, n.d.).

The teenage witnesses at Presidio Heights and Officer Don Fouke all said that the man they saw the night of the Paul Stine attack wore eyeglasses. Don Cheney was known to regularly wear eyeglasses until the early 1970s, while Arthur Leigh Allen was never known to wear eyeglasses. Both men were six feet tall. Don Cheney’s weight was unknown in the late 1960s, but photographs of him from the mid-1960s and mid-1970s indicate that he was at least 25 to 30 pounds lighter than Allen. In addition, every eyewitness to the Zodiac killer said the person they saw was “stocky.” Officer Fouke used the term “barrel-chested” (Narlow, n.d.). This was a better description of Don Cheney, who was noticeably stocky and barrel-chested in all his photos and in the documentary, *His Name was Arthur*

Leigh Allen, than of Allen, who was not barrel-chested and at around 235 pounds, had a prominent stomach.

The second category considers the skills (from known profiles of the Zodiac killer, including those of Soren Korsgaard and Michael Cole) attributed to the Zodiac killer. These skills are sewing ability (based on the Zodiac’s executioner’s hood) and navigation skills (based on the Zodiac’s drawing of the compass rose over Mt. Diablo). Many skillsets and specialized knowledge have been attributed to the Zodiac killer based on the crimes and the Zodiac letters and ciphers. Zodiac appears to have been a drafter and/or engineer because he evidently used an alignment grid (possibly graph paper) underneath the paper upon which he drew his ciphers, positioning both papers on a drafter’s light table, the better to see the outline of the graph paper and make clean rows of cipher symbols. Note the image of the Zodiac’s 340 Cipher. A light table (or engineer’s table) is not something to which a layperson would generally have access (Cole, 2015) (See Figure 16).

As a mechanical engineer by trade, Don Cheney had manual drafting experience since computer software like AutoCAD was not yet in existence. Arthur Leigh Allen had no known drafting experience. So, here we have another



Figure 16. 340 Cipher.

Note. From *Zodiac Killer Facts* (n.d.). This image is in the public domain.

crucial fact that is more to be expected given the Cheney hypothesis than the Allen hypothesis.

The Zodiac killer most likely had more than a high school level of mathematical knowledge, or at least continued to use high school math into middle age. Cryptographers, including the Zodiac killer, use mathematics to hide data behind encryption. The Zodiac's 340 cipher was very complex. The 340 cipher had withstood over 50 years of attempts to break it until a group of three private citizens, including David Oranchak, a software developer in Virginia, Jarl Van Eycke, a Belgian computer programmer, and Sam Blake, an Australian mathematician, joined forces to break the code. Their solution was later confirmed as accurate by the FBI (Claburn, 2020). This is another important fact that is more expected with the Cheney hypothesis than with the Allen hypothesis.

Another skill connected to the Zodiac killer concerns sewing. Bryan Hartnell said that the hood that the Zodiac was wearing at Lake Berryessa was sewn together and that the logo on it also appeared to have been sewn with care (Prior, 2008). Don Cheney was highly skilled at making sewn leather items, such as leather sheaths for his hunting knives. Don Cheney even had a preference for high-carbon steel blades that he would sharpen himself for hunting trips. The autopsy report for Cecilia Shepard revealed that she was stabbed ten times with a very sharp knife with a foot-long blade. This is an additional fact that is more to be expected given the Cheney hypothesis than the Allen hypothesis.

One of the most compelling pieces of evidence for Arthur Leigh Allen is that he lived at the epicenter of Zodiac activity for the first and second canonical crimes. Allen's home at 32 Fresno Street in Vallejo was a short drive to both Lake Herman Road and Blue Rock Springs Park. During the Zodiac killer's phone calls to police immediately after both the Blue Rock Springs Park attack and the Lake Berryessa attack, Zodiac gave poor directions to each location, indicating that he had only a cursory knowledge of the area. Arthur Leigh Allen was a native of Vallejo and the general area; thus, he would have been able to give more precise directions to each crime scene. He was known to have gone skin diving at Lake Berryessa on several occasions (Arthur Lee Allen = Primed Suspect, n.d.; Zodiac Killer Facts, n.d.)

It should be noted here that Don Cheney moved to Southern California at some point after January 1969, just after the first canonical Zodiac attack at Lake Herman Road. Prior to relocating, Don Cheney lived in Concord, California, from 1968 to January 1969, where he would have had quick access to the Lake Herman Road site and have some knowledge of the location of Blue Rock Springs Park, the

site of the second canonical Zodiac attack. Furthermore, it is known that some serial killers can sometimes target areas close to their previous residences, as explained in D. Kim Rossmo, Ph.D.'s *Geographic Profile: Zodiac Serial Murder*, which was submitted to the San Francisco Police Department for law enforcement use.

Although Don Cheney did not live in the target zone as identified by Kim Rossmo and furthermore had relocated to southern California after the first canonical Zodiac crime at Lake Herman Road, he had familiarity with the Zodiac crime locations because he had previously lived close to where the crimes had taken place. From early 1965 until sometime in late 1965 or early 1966, Don Cheney lived on Day Street in the Noe Valley neighborhood in the city of San Francisco. Living at this location would have given Cheney some familiarity with the North Bay Area in general and with the nearby Presidio Heights neighborhood, the location of the Paul Stine murder in October 1969.

From early 1966 until he moved to Southern California in January (estimated) 1969, Don Cheney lived in Concord, California, on Halifax Way Street. Living in Concord would have given Don Cheney a familiarity with Mt. Diablo, which is visible from any area in Concord. The Zodiac infamously made Mt. Diablo the centerpiece of a Phillips 66 road map that he mailed along with a letter to the San Francisco Chronicle in June 1970. The map showed a section of the Bay Area with the Zodiac's cross-circle logo drawn over Mt. Diablo (Zodiac Killer Facts, n.d.) (See Figure 17). The letter featured a short 32-character code that the Zodiac explained could be used along with the map to determine the location of the bomb, which he claimed to have buried. Don Cheney's residence in Concord had easy access to Interstate 680, which can be taken north to the Zodiac killer's first attack site of Lake Herman Road, which was only a 13-mile drive from Cheney's home. The Zodiac killer's second attack location, Blue Rock Springs Park, was only seven miles away from Lake Herman Road.

Applying these geographic profiling techniques, Michael Sudduth, Ph.D., professor of philosophy at San Francisco State University and friend, compiled a list of the dates of three of the four canonical Zodiac crimes and a list of dates that each Zodiac letter was mailed or hand-delivered in 1969, the year of the bulk of Zodiac activity.

This list was of major importance for the Cheney-as-the-Zodiac-killer hypothesis because Don Cheney (per his amended timeline) had moved to his wife's hometown of Pomona, California, in early 1969, prior to three of the canonical Zodiac crimes. As Pomona is a six-and-a-half-hour drive



Figure 17. Zodiac Killer’s Phillips 66 Map.

Note. From Zodiac Killer Facts (n.d.). This image is in the public domain.

to the San Francisco Bay Area, it was vital that an analysis be done to show that it would have been possible for Cheney to have carried out the Zodiac crimes, given the round-trip travel time. Furthermore, the analysis done by Sudduth showed that it was possible for Cheney (or another suspect who lived far from the Bay Area) to have also mailed the San Francisco postmarked Zodiac killer letters.

He listed eight Zodiac events in 1969 with their corresponding date(s) as follows:

1. July 4th – Friday (Blue Rock Springs Park attack / Darlene Ferrin murder)
2. July 31st – Thursday (3 letters with 3 ciphers mailed)
3. August 4th – Monday – (letter) (may have been delivered August 3rd)
4. September 27th – Saturday (Lake Berryessa attack / Cecelia Shepherd murder)
5. October 11th – Saturday (Presidio Heights/Paul Stine murder)

6. October 13th – Monday (letter)
7. November 8th and 9th – Saturday and Sunday (letters)
8. December 20th – (letter)

Researching the exact date and day of each event allowed Sudduth to make three significant observations: The first was that apart from July 31, the remaining dates fell on a weekend or the beginning of the week. Even July 31 was part of a calendar week that runs into the weekend of August 2-3. Sudduth further noted that Zodiac letters that were postmarked on Monday could have been dropped off in a mailbox on Sunday, so the committing of murders and the delivery of the letters, at least in this block of time, are weekend actions. Secondly, it was found that four of the dates in the list of 1969 events were on or adjacent to a federal holiday: July 4 (Independence Day), October 13 (Columbus Day), November 11 (Veterans Day), and December 25 (Christmas Day). If the letter writer, presumably the

Zodiac killer, wanted to drive up to the Bay Area to deliver the letters, these dates would have been ideal for someone with a 9:00-to-5:00, Monday-to-Friday job, assuming they got these days off. Don Cheney was working a regular weekly job during this time period. The most significant observation made by compiling this data was that it would have taken only six trips to the Bay Area in a six-month period to accomplish the eight stated tasks.

As shown below, in examining the evidence for Arthur Leigh Allen, the surprise principle can be used to illustrate that the facts that appear to favor Allen are not as compelling as the facts that support the Cheney hypothesis.

Fact/Datum (D) Zodiac Killer characteristics	If Cheney were the Zodiac killer, then D would be	If Allen were the Zodiac killer, then D would be
Height: 6 feet tall	Unsurprising	Unsurprising
Weight: 200-215 lbs.	Unsurprising	Unsurprising: Allen weighed around 235 lbs., which is close to the eyewitness estimates.
Build: stocky and barrel-chested	Unsurprising	Surprising: He had a prominent stomach and was not barrel-chested.
Hair: brown/dark	Unsurprising	Surprising: Allen had blondish hair, and at the time of the murders, he was almost completely bald.
Age: 35-40 years old	Unsurprising	Unsurprising
Wore eyeglasses	Unsurprising	Surprising
Drafting/engineering ability	Unsurprising	Surprising
Higher math education	Unsurprising	Surprising
Sewing ability	Unsurprising	Surprising
Experience using fire-arms and knives	Unsurprising	Unsurprising
Familiar with the locations of the crimes	Unsurprising: Cheney had lived in the East Bay Area.	Unsurprising: Allen was a lifelong resident of Vallejo, the epicenter of the crimes.
Experience in celestial navigation	Unsurprising	Surprising

Of the 12 salient data points, none of them are surprising under the Cheney hypothesis, but seven are surprising under the Allen hypothesis, so the total set of evidence supports the Cheney hypothesis more than it does the Allen hypothesis.

Listed below are the strongest pieces of evidence in favor of Allen’s being the Zodiac – the characteristics of Allen that most closely match those of the Zodiac killer.

1. He owned and frequently wore a Zodiac wrist-watch that had the name “Zodiac” combined

with the cross-circle logo employed by the Zodiac killer.

2. He was known to misspell words for comedic effect, like the Zodiac killer did in his various correspondences.
3. Allen’s close friend Phil Tucker said that Allen claimed to like the book *The Most Dangerous Game*, a book which was referenced in the decoded Zodiac killer 408 Cipher (Bawart, n.d.) (Grinell, *The 408 Code is Cracked*, n.d.)

Comparing these pieces of evidence with Don Cheney produces a surprising result.

1. Don Cheney was an avid hunter of large game.
2. Don Cheney’s paternal grandfather had a first cousin named Mary Ingersoll Paradise. Paradise was a word often used by the Zodiac killer, as in his statement in what is known as the Little List Letter, “If you do not wear any type of buttons, I shall (on top of everything else) torture all 13 of my slaves that I have waiting for me in Paradise” (Grinell, *The Little List Letter*, n.d.). It is a surprise to find this uncommon surname with an unusual spelling connected to the man who brought forward the prime suspect in the case.
3. Don Cheney attended Bakersfield Junior College from the Fall of 1952 until the Spring of 1954. Paul Avery, a San Francisco Chronicle newspaper crime reporter, who made a name for himself by writing about the Zodiac killer at the time of his crimes and even received a threatening letter from the Zodiac, also attended Bakersfield Junior College from the Fall of 1952 until the Spring of 1953. Cheney and Avery’s freshman class consisted of approximately three hundred students. Avery ran for class president in 1952, wrote for the school newspaper, and was the Director of Student Assemblies during his tenure at Bakersfield Junior College. It is a surprise that two figures central to the Zodiac case were in such close proximity sixteen years prior to the first canonical Zodiac killer attack and almost three hundred miles away from the Bay Area.

CONCLUSION

By applying the surprise vs. no surprise principle and exercising a comparative and contrastive analysis of the



physical features, skillsets (attributes), and evidence between Don Cheney and Arthur Leigh Allen, Don Cheney is the superior suspect by comparison. It should be noted that the evidence for Arthur Leigh Allen can simply transfer to someone who knew him and wanted to implicate him in the crime.

Therefore, we submit the three most important items that favor a Cheney-alone hypothesis vs. an Arthur Leigh Allen-alone hypothesis.

1. As a mechanical engineer and drafter, Don Cheney would have been more capable of constructing the Zodiac ciphers and the bus bomb diagram than Allen, who was not known to have had a mathematical/engineering aptitude or background. This is to be expected if Cheney is the Zodiac killer – that the Zodiac would have engineering and drafting skills (See Figure 18).
2. Cheney matched the witnesses’ physical descriptions of the killer (stocky, barrel-chested, and

brown-haired with a widow’s peak) better than did Allen, who was obese and bald. If Cheney were the Zodiac killer, it would be expected that the Zodiac would have Cheney’s physical features.

3. Cheney had the following characteristics, which Allen did not: (1) the Paul Avery/ Bakersfield Junior College connection, (2) a relative named Paradice, (3) extensive big-game hunting experience, (4) a high proficiency with knives, (5) great skill as a seamster, and (6) handwriting that appears to be similar to that of the writer of the Zodiac letters. If Cheney were the Zodiac killer, it would be no surprise that the Zodiac had the characteristics listed above.

Although a careful analysis shows that Don Cheney makes a better Zodiac killer suspect than does Allen relative to the evidence here considered, this case remains unsolved. The characteristics analyzed in this examination

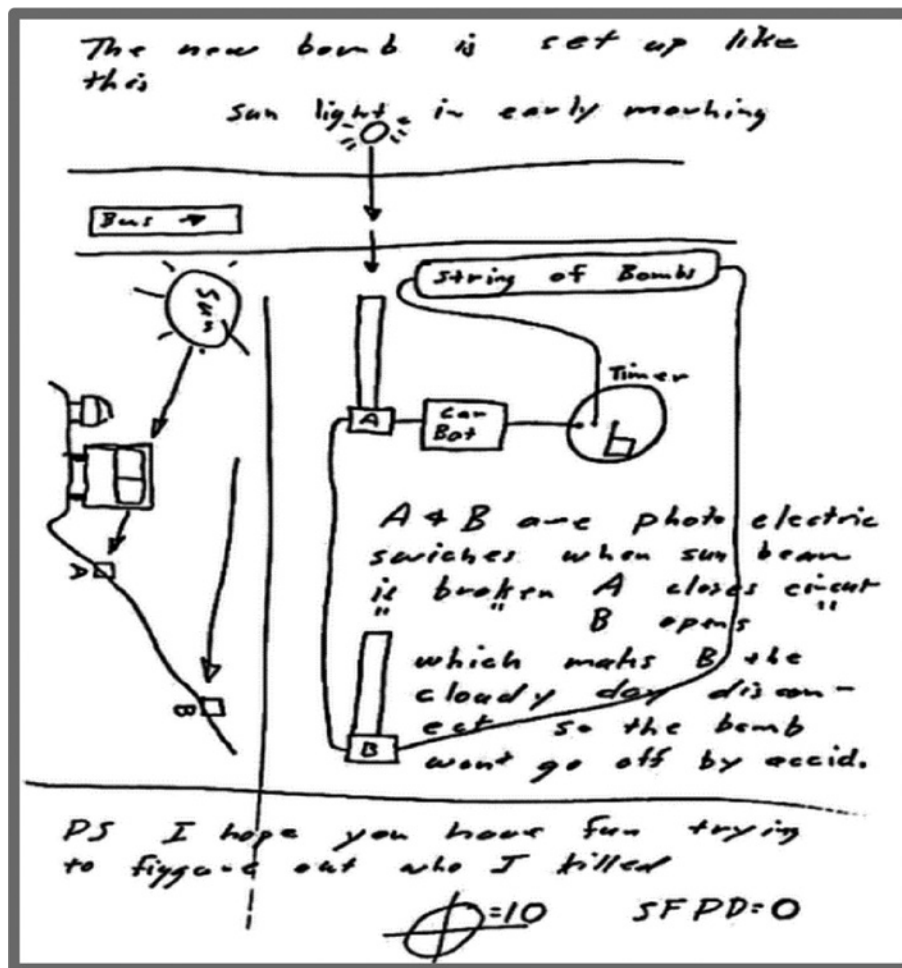


Figure 18. Zodiac’s Bus-Bomb Diagram.

Note. From Grinnell (n.d.). This image is in the public domain.

are pertinent to the Zodiac investigation, but this analysis does not offer conclusive proof of the Zodiac's identity. The technique, as utilized by laboratories such as Othram, Inc., of using new DNA technologies to amplify small and degraded DNA samples enough to make them usable for testing and then comparing these test results to genetic genealogy data to identify potential suspects, is making long cold cases now solvable. Of course, DNA evidence is circumstantial evidence, and even if a person of interest were identified through DNA testing of the Zodiac letters, that individual would still not be placed at any of the crime scenes.

Unfortunately, the case may never be solved unless some physical evidence, such as the killer's hood or one of his guns, turns up somehow and can be tied to an individual who was in or around the Bay Area in the late 1960s. The adage that the Zodiac killer case gets solved three times a year remains true. In May of 2023, a volunteer group called The Case Breakers (2021; n.d.), led by Thomas Colbert, a former media executive and current media consultant, sent out a press release, claiming that they had connected a man named Gary Francis Poste to the Zodiac case. They further claimed that "the felon has been secretly listed as the Zodiac suspect in Headquarters' computers since 2016 – with his partial DNA safely secured at the feds' Quantico, Virginia lab." (Griffin, 2023) The team also claimed that one of its members was told by an FBI whistleblower that the FBI has a partial sample of Poste's DNA in their database, but has failed to use it to identify Poste as the Zodiac.

The Case Breakers describe themselves as a forty-plus-member team of former law enforcement investigators. The team first made headlines in 2016 with a press conference announcing that the team had identified a former Vietnam veteran, Robert Rackstraw, as the infamous hijacker D.B. Cooper (Time-Line: How Sleuths Exposed D.B. Cooper and his FBI Cover-Up, 2021). This identification by the team led to a book called *The Last Master Outlaw* by Colbert and to a History Channel show, called *D.B. Cooper: Case Closed*, that aired in 2016. The show culminated in a scene during which Tina Mucklow, the flight attendant who had spent the most time with D.B. Cooper, looked at a table of photographs of Rackstraw and quickly concluded that he was not the hijacker ("D.B. Cooper: Case Closed?," 2016). Serious true crime researchers find it unfortunate that people with media contacts, like Thomas Colbert, without doing serious due diligence on the cases or on the various suspects they put forward, are able to get misleading headlines on websites like *Fox News* and the *Daily Mail*. The media outlets that accept these stories should have journalistic integrity and

check the veracity of these stories instead of creating misleading headlines.

Gary Poste was originally submitted as a suspect by the group in 2021, with their best piece of evidence being the fact that Poste had scars on his forehead that were similar to the "scars" shown in the Zodiac killer sketch (Sheets, 2021). Unfortunately for The Case Breakers, the lines shown on the forehead of the Zodiac sketch were age lines, not scars. Although The Case Breakers appear to have a direct line to big media outlets, their claims do not meet the Carl Sagan Standard that extraordinary claims require extraordinary evidence. The Case Breakers have also claimed that they will reveal the final fate of Teamster leader Jimmy Hoffa in the future (The Case Breakers, n.d.). Bold claims such as these have become the new normal for the Zodiac case, as it has only grown in popularity and has remained unsolved for over fifty years.

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