

Two New Theories Regarding the Zodiac Case

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Two New Theories Regarding the Zodiac Case. Version 1.2.

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Audience

This analysis of the Zodiac case is intended for people who are familiar with the facts of the case. There are a number of resources which are dedicated to the general facts of the Zodiac case¹. What follows focuses on new interpretations of existing evidence. I make little effort to explain or review general facts that are documented elsewhere.

1 Introduction

This analysis reinterprets existing evidence in the Zodiac case. The main claim of the Radian Theory is re-examined and determined to be correct in terms of the importance of the identified angle but incorrect with respect to detail. Two new theories regarding the methodologies used by the killer are proposed: the Zodiac Circle Theory and the Quadrants of Method Theory.

No attempt is made to prove or disprove the guilt of any particular suspect. The intent is solely objective analysis of the evidence.

2 Revisiting the Radian Theory

In 1980, Penn made what some people have considered to be a significant discovery in the Zodiac case: an angle of approximately 1 radian ($360/2\pi$ or $\sim 57.296^\circ$) connects the Blue-Rock Springs crime scene with the Stine murder scene when the vertex of the angle is placed on the peak of Mt. Diablo².

The evidence in the case strongly supports the conclusion that the angle in question is significant and that the crime scenes (or at least one of them) were chosen with the intent of forming the given angle. However, the evidence further suggests that the angle in question was not constructed as an approximation of one radian but rather an approximation of 60° .

2.1 A Context for Radians

¹ Two good resources are: <http://www.zodiackiller.com> and <http://members.aol.com/Jakewark>.

² Penn, Gareth. Times 17. I haven't actually read the book but I've seen it referenced several times.

Before delving into the relative merits of particular conclusions, it's appropriate to say a few words about radians themselves in order to insure the proper context exists for the discussion.

A radian is a unit of angular measure. Degrees and radians are equivalent, but not equal, units. Similar to feet and meters, anything that can be expressed in terms of degrees can also be expressed in terms of radians, and vice versa. There are 360 degrees in a circle. Similarly there are 2π radians in a circle. Therefore, one radian is equivalent to $360/2\pi$ degrees; one degree is equivalent to $2\pi/360$ radians.

2.2 Evidence Supporting the One-Radian Theory

Let's first examine the evidence that is offered in support of the one-radian conclusion. The Zodiac definitely wrote the following postscript:

"The Mt. Diablo code concerns radians + # inches along the radians."

Apparently, this postscript was misquoted for several years as roughly the following:

"You will find something interesting if you place a radian angle on Mt. Diablo."

Had the latter, inaccurate, quote been correct, it would have been compelling evidence that the angle in question is indeed 1 radian. However, the accurate quote provides weak support for the conclusion.

Since radians and degrees are equivalent units, one exercise that can provide insight into a given interpretation is to replace the word "radians" with the more familiar "degrees". If the concept makes sense for radians, it will likely make sense for degrees. Since most of us deal with degrees on a regular basis, we will likely have better intuition when considering the concept with respect to degrees. Making the substitution:

"The Mt. Diablo code concerns degrees + # inches along the degrees."

I sincerely doubt that many people would read this quote and conclude that the author is somehow referring to an angle of one degree. So why does it make sense to take the original quote and conclude it somehow refers to an angle of one radian? Admittedly, one radian is a more substantial angle than one degree. But this fact does not make the conclusion any more logical.

Apart from the above-mentioned single-sentence postscript, there is no additional direct evidence of which I am aware that supports the conclusion that the angle in question was intended to be an approximation of one radian. There is circumstantial evidence that exists in the form of people claiming the existence of one-radian angles with respect to other geographic details of the Zodiac case. However, without additional supporting evidence, I give little weight to these claims.

2.3 Some Final Thoughts on Radians`

As an engineer, I'm comfortable with radians. After reviewing the evidence and the context of the quote, it is my opinion that the killer's use of the term *radians* has no special meaning. In other words, it is merely intended to communicate the generalized notion of angular measure.

Another interesting point about radians that arguably strengthens this position is the following. The vast majority of the time one uses radians as a unit of measure, the angles involved are a fraction (possibly improper) of π , e.g. $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$, π , etc. Rarely does one encounter whole-number multiples of one radian.

Having said that, the choice of the term *radians* may possibly have been a carefully calculated move on the part of the Zodiac. Although it's not clear whether the Zodiac deserves credit, just look at the result of him having used the term radians instead of degrees. Since Penn's discovery in 1980, there has been a significant focus on the arguably unfamiliar unit. This clearly has diverted time, effort and focus away from other aspects of the case, including angles considered unrelated to radians. Numerous people have spent substantial amounts of time looking for one-radian angles throughout the geographic details of the case.

I believe the Zodiac killer intended to provide significant and meaningful clues regarding his methodologies and identity. I further believe he intended to obfuscate the meaning of his clues. Whether intentional or not, the use of the term *radians* was a significant contribution towards the end of obfuscation.

2.4 The Case for the Sixty-Degree Angle

The case for the sixty-degree angle is made by the multiple interpretations of the evidence that fit within the Zodiac Circle Theory. Additionally, it is bolstered implicitly by the degree to which the Quadrants of Method Theory appears to be valid. Both of these theories are detailed in the sections that follow.

3 Zodiac Circle Theory

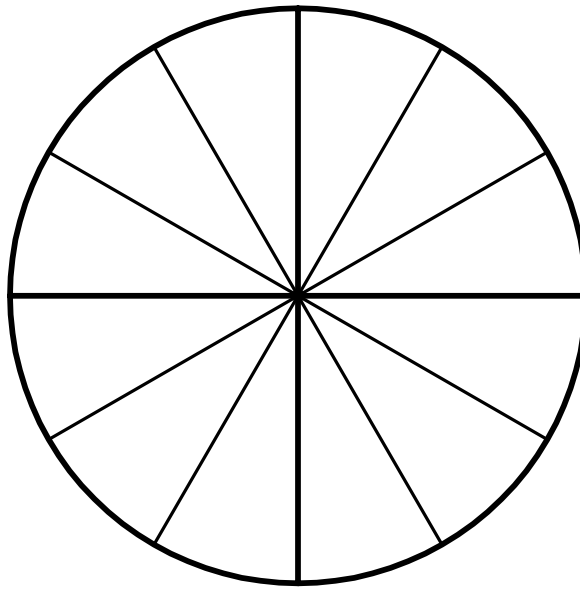
This theory asserts that the Zodiac killer used a zodiac circle, a circle segmented into 12 equal 30-degree slices, as part of his killing methodology. Numerous interpretations of the evidence are consistent with this assertion. Each interpretation will be discussed in turn.

3.1 The Map

On the Phillip's 66 map³ of the Bay Area that the Zodiac killer sent to the San Francisco Chronicle, the killer drew a crossed circle centered on the peak of Mt. Diablo with the axes numbered 0, 3, 6, & 9. The addition of the numbers to what is otherwise recognized

³ <http://www.zodiackiller.com/ZMap.html>

as the Zodiac symbol provides some clear implied meaning. The implication is that there are 8 vectors not shown in the figure. The total vector count is therefore 12 with the vectors being numbered 0 through 11⁴. Without a compelling reason to believe otherwise, it is reasonable to assume the vectors are to be spaced consistently, especially given the fact that the shown, numbered vectors are consistently spaced. The resulting figure is shown below. It consists of one vector every 30 degrees.



3.2 The Zodiac Circle

Those familiar with astrology⁵ will recognize that the above circle as a Zodiac circle. This type of circle is often used to represent the signs of the zodiac and their relative positioning. It consists of a circle divided into 12 equal segments, one for each of the signs of the zodiac.

3.3 The Name

Another aspect of the evidence that strengthens the case for the Zodiac-Circle Theory is the name: The Zodiac. Remember neither the police nor the media came up with the name. The killer himself chose it. He apparently felt that the name was somehow meaningful with respect to his identity as a killer. The killer could have chosen any word or phrase in the English language. He chose *The Zodiac*. This is something that should not be taken lightly.

⁴ The fact that the numbers range from 0-11 and not 1-12 suggests that the numbering was not intended to be a reference to a clock.

⁵ I am no expert on astrology. What little I've learned has been as a result of investigation into the Zodiac case.

An exercise that potentially provides insight into the significance of the name is simply to look up the word “Zodiac” in the dictionary. The following definition is taken from the Merriam-Webster online dictionary⁶:

"an imaginary band in the heavens centered on the ecliptic that encompasses the apparent paths of all the planets except Pluto and is divided into 12 constellations or signs each taken for astrological purposes to extend 30 degrees of longitude."

The described band itself is circular. Thus, the self-assigned name of the killer can be represented by a circle divided into 12, equal 30-degree segments.

3.4 X'ed Zodiac Signature

The Zodiac letter sent on November 9, 1969⁷ concluded with a large Zodiac symbol where X's had been placed at various locations along the circle.

If one looks closely at this drawing, tick marks easily can be seen on the circle. Anyone who has spent time graphing functions in a trigonometry or calculus class will recognize these ticks as an estimation of 30-degree intervals.

For simplicity of reference, I will refer to the 30-degree locations on the circle as positions 0, 1, 2, 3, etc. (analogous to the Phillips 66 map).

Many have theorized that at least a subset of the X's on the Zodiac signature correspond to geographic locations of crime scenes when the signature is placed on a sufficiently-scaled map of the Bay Area with the cross centered on Mt. Diablo. Any two X's on alternate ticks form an angle of 60 degrees which is approximately consistent with the positioning of the Blue-Rock Springs/Stine murder scenes. Such pairs exist at the following positions: 6/8, 8/10, 9/11. In the following, I will develop a theory that the X's in the 8, 10, & 11 positions correspond to the Stine, Vallejo, and Lake Berryessa murder scenes respectively.

3.4.1 Self Consistency

At this point it is worth noting that if one buys into the idea that two of the five X's on the X'ed Zodiac signature correspond to the Blue-Rock-Springs/Stine murder scenes, then the angle in question is quite likely not 1 radian. There are clearly 12 dividing points on the circle. There is no good way to get 1 radian between two of the dividing points without having inconsistent spacing for the remaining dividing points. For example, are we to conclude some of the divisions are 0.5 radians, some are slightly less than 0.5 radians and the rest are slightly more than 0.5 radians? Such a conclusion is illogical. The most logical conclusion is that the intervals are a consistent 30 degrees or $\pi/6$ radians and the angle separating the Blue-Rock-Springs/Stine murder scenes is 60 degrees.

⁶ <http://www.m-w.com/home.htm>

⁷ <http://www.zodiackiller.com/BombLetter6.html>

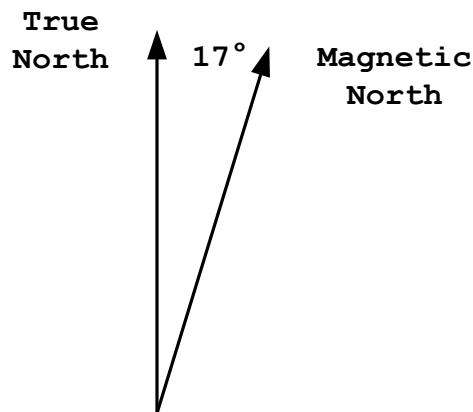
3.5 Magnetic North

The single instruction included on the Phillips 66 map was: "0 is to be set to Mag. N.". Clearly "Mag. N." is short for "Magnetic North". Interestingly, I've found relatively little discussion of this curious instruction

As many people know, magnetic north is the direction the "north" needle of a compass will point. The exact direction magnetic north represents is determined by the earth's magnetic fields. Furthermore, the direction changes over time and geographic location.

The angle between true north and magnetic north is known as "magnetic declination". Therefore, reconciling magnetic north and true north usually involves knowing the magnetic declination⁸. Fortunately, the internet provides all the resources needed to accurately estimate magnetic declination for the San Francisco Bay Area during the Zodiac era. Doing so⁹, we find that magnetic north is approximately 17° E of true north.

This means that the angle formed between true north and magnetic north is 17°, with the magnetic north vector projecting east of true north. Graphically, this looks like:



3.6 Putting Two and Two Together

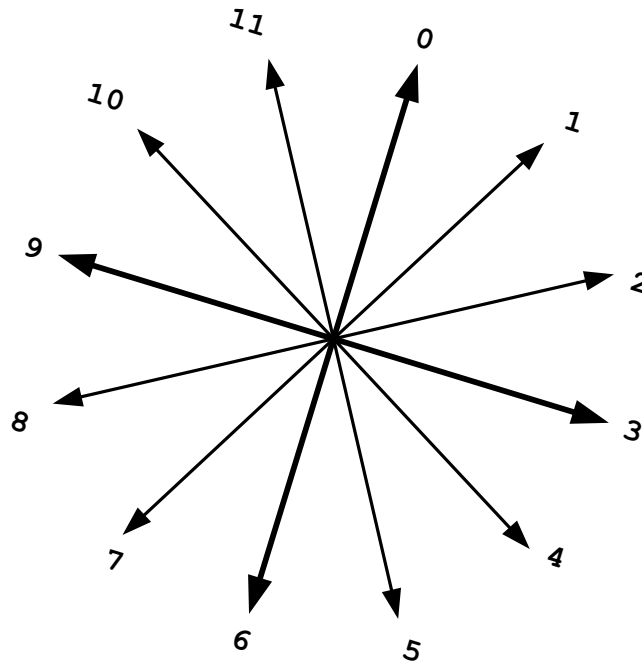
We now have enough information to perform the actions that I believe the Zodiac killer was attempting to communicate. First, we take a circle with a vector every 30 degrees. Next, we place the circle on a sufficiently scaled map of the Bay Area. The circle is centered on the peak of Mt. Diablo as shown on the Phillips 66 map. Initially, we align

⁸ To be completely accurate one would have to account for *map north*. However, since I don't need that degree of accuracy, I'm considering *map north* and *true north* to be one and the same.

⁹ http://www.bcca.org/misc/qiblih/latlong_us.html provides Latitude & Longitude values for major cities including San Francisco which is 37° 37' N, 122° 23' W. Once we have these values, the following web site can be used to estimate magnetic declination for a given year.

http://www.geolab.nrcan.gc.ca/geomag/mirp_e.shtml. The result for 1970 is 16° 51' E, or 16.85° E.

the 0 position with map north. Next we rotate the zodiac circle clockwise (east) 17 degrees. This aligns the 0 position with magnetic north. From here on, I will refer to such a positioned circle as a *Rotated Zodiac Circle* (an example is shown below). After performing these steps we find that the 60 degree angle formed by the 8 and 10 positions (both of which were X'ed on the X'ed Zodiac signature) align well with the Blue-Rock-Springs/Stine murder scenes.



3.7 The Importance of the Stine Murder Scene

Let's consider the aspects of the case over which the Zodiac killer had control. Clearly, the direction represented by magnetic north was outside of his control. The precise locations of the Lake Herman Road, Blue Rock Springs and Lake Berryessa crime scenes were likely at least a partial compromise in that the victims came to the respective crime scenes of their own accord. The Stine murder scene, however, was likely located precisely where the Zodiac killer intended. This is important because we can infer from this crime scene location precisely how the Zodiac killer chose to align his Rotated Zodiac Circle. In other words, the location of the crime scene allows us to *calibrate* or *zero* the rotation of the Zodiac Circle and in so doing determine the effective value of magnetic declination (magnetic north) used by the Zodiac killer.

By aligning the Rotated Zodiac Circle exactly with the Stine murder scene, I calculate the effective magnetic declination to be approximately 18.95° E. This is slightly more than the estimated 16.85° E that we arrived at above. However, considering the constraints involved, this is a completely reasonable value. For example, possible sources of inaccuracy in the magnetic declination include:

- Human error.
- Compass inaccuracy (in the case that magnetic declination was measured).
- Map imprecision.
- etc.

Additionally, the Zodiac had to reconcile two constraints over which he had absolutely no control: the exact value of magnetic declination and the geographic location of the lover's-lane areas where his preferred type of victims were known to frequent. It seems reasonable that the easiest way to reconcile these two constraints was to accept a small amount of inaccuracy with regard to the magnetic declination.

In my opinion, the very fact that the Zodiac provided a murder scene that arguably can be used to *calibrate* the Rotated Zodiac Circle may indicate that the killer was aware his effective value of magnetic declination was slightly inaccurate.

3.8 Zodiac-Circle Conclusions

In the previous sections we have followed instructions directly given by the Zodiac killer and in so doing convincingly interpreted other evidence also directly given by the killer. This is compelling evidence that the theory is valid and the angle formed by Blue Rock Springs/Stine murder scenes is 60° and not 1 radian.

3.9 Other Evidence

The following sections consider how some of the other evidence fits (or does not fit) within the context of the Zodiac Circle Theory.

3.9.1 Lake Berryessa

While the Lake Herman Road, Blue Rock Springs, and Stine murder scenes align relatively well along the vectors of the Rotated Zodiac Circle, the Lake Berryessa murder scene does not. The latter murder scene is slightly west of vector 11¹⁰.

Yet, the X'ed Zodiac Signature does have an X in the 11 position. I believe this X *does* represent the Lake Berryessa murder scene. Why this murder scene was not chosen to align more precisely is unclear. Below are some thoughts on possible reasons why this might be the case, but none of them are supported well enough to be considered compelling.

3.9.1.1 Practicality

Murdering someone with a knife is a much more difficult task than murdering someone with a gun. It may be that this fact forced the Zodiac to be more *flexible* in choosing the

¹⁰ Perhaps $\sim 10^\circ$. I have not precisely measured this angle.

location of his attack. Also, his preferred type of victim, young couples, may have required some degree of flexibility.

3.9.1.2 Sufficient Data

At the time the Zodiac committed the Lake Berryessa attack, he already may have been planning what would later become the Stine murder (the latter attack happened only 14 days later). The Zodiac may have felt that the Blue Rock Springs/Stine murder scenes (the ones that align precisely along the 8 and 10 vectors) would be sufficient data for investigators to infer the Zodiac circle. Therefore, he may not have felt compelled to align the Lake Berryessa crime scene precisely. In fact, it's possible that the Lake Berryessa crime scene location was chosen to convey some other piece of information regarding the Zodiac's methodology (one such possibility is explored in the Quadrants of Method Theory).

3.9.1.3 A Mistake

It's always possible that the Zodiac killer simply made a mistake when choosing the Lake Berryessa crime scene. Of the four definite Zodiac murder scenes, Lake Berryessa was the furthest away from Mt. Diablo. Furthermore, Lake Berryessa does not even appear on the Phillips 66 map sent by the Zodiac. Of the various explanations, this one is the least satisfying. Nonetheless, it is a possibility.

3.9.1.4 Just Not Enough...

Whatever the reason actually was, the evidence surrounding the three murder scenes that are consistent with the Zodiac Circle theory is just too compelling to dismiss it on account of Lake Berryessa alone.

3.9.2 Kathleen Johns

Kathleen Johns was likely abducted by the Zodiac killer. Johns reported that the abduction started on Highway 132. Vector 3 of the Rotated Zodiac Circle passes through Highway 132 near Modesto. This fact appears to bolster both the case that Kathleen Johns was indeed abducted by the Zodiac killer and the case that the Zodiac Circle Theory is valid.

3.9.3 Cheri Jo Bates

Riverside, California, the location of the Cheri Jo Bates murder, aligns relatively well (given the distance) with vector 4 of the Rotated Zodiac Circle. This location is unaccounted for on the X'ed Zodiac signature. These facts support the following, relatively weak claim. If the Zodiac did murder Cheri Jo Bates, he appears to have done so prior to settling on the methodology he used as the Zodiac killer in the Bay Area.

3.9.4 Robert Domingos and Linda Edwards

The location of this couple's murder falls between vectors 4 and 5 of the Rotated Zodiac Circle. Again, both of these positions are unaccounted for on the X'ed Zodiac signature. Therefore, the same weak claim of the previous section is applicable in this instance.

3.9.5 What About the Other Two X's?

The four definite Zodiac attacks account for three of the five X's on the X'ed Zodiac signature. What about the other two? While one can conceive of a number of reasons why these two X's may have been added (actual murders, gamesmanship, bus-bomb location, etc.), I believe that the most probable reason is simply that their presence obfuscates correct alignment of the Zodiac Circle.

If the extra two X's, located in the 6 and 9 positions, are removed from the X'ed Zodiac signature, the alignment of the Zodiac Circle, when placed on Mt. Diablo, would be obvious because there would be exactly one pair of X's separated by 60 degrees (the angle I claim separates the precisely-aligned crime scenes). By adding the additional two X's, there are three different rotations of the Zodiac Circle that correctly position X's along these vectors.

3.9.6 Inches Along the Radians?

The Mt. Diablo postscript also refers to: "... # inches along the radians." While this must be significant, I have to date found no meaning involving linear distance and the known crime scenes. While I would not be surprised to learn there is some meaning that currently is being overlooked, it is also worth noting that the clue may not be inferable from the known data. That is, the as-of-yet-unbroken cryptogram may explicitly reference inches. For example, the code may say something like: "Three inches along vector 7" (this example is intended to describe possible conceptual content of the cryptogram; it is not intended to adhere to any other characteristics of the cryptogram).

4 Quadrants of Method Theory

The Quadrants of Method Theory proposes that the primary weapon used in the attacks committed by the Zodiac killer may have been chosen based on where the attack happened with respect to the Rotated Zodiac Circle. The theory is supported by the evidence in the Zodiac case, albeit less convincingly than the Zodiac Circle Theory.

4.1 Lake Berryessa

After committing the Lake Berryessa stabbings, the Zodiac took the time to write the following on Bryan Hartnell's car door.

<zodiac symbol>
Vallejo

12-20-68
7-4-69
Sept 27-69-6:30
by knife

A major curiosity of mine is why the Zodiac would bother to write "by knife"? Any two sentence summary of the crime would include, either explicitly or implicitly, the type of weapon used in the assault. Why mention the obvious? What purpose did it serve? It seems highly probable that the Zodiac predetermined what he would write at the scene of the crime. Of all the things he could say, why include "by knife"? I think the answer is the following. The Zodiac was trying to draw attention to the type of murder weapon used. He was trying to point out that the method of attack was not only different in this case, but somehow meaningful. The meaning? My claim is that there was something in the Zodiac's methodology that indicated the assault should be committed "by knife".¹¹

4.2 The Halloween Card

If one examines the other evidence in the Zodiac case paying particular attention to weapons, one piece of evidence stands out: the Halloween card. This card¹² enumerates four different methods of murder: by knife, by gun, by fire, and by rope. The interesting thing about this card is the way in which the different methods are shown. Each is put into its own corner of the card. Each corner is separated by a part of a *cross* that is formed by the intersecting words Paradise and Slaves. The cross is a key component of the Zodiac symbol, which was described earlier as a subset of the Zodiac Circle. I claim that the intent of this card is to communicate that the Rotated Zodiac Circle is being divided into "quadrants" and that the Zodiac is intending to use a different method of attack in each quadrant.

4.2.1 Another Cross

Yet another interesting aspect of this Halloween card is that the Zodiac included the phrase "sorry no cypher" written twice, in the form of a *cross*, on the inside of the envelope (arguably rotated $\sim 15^\circ$ off center). This could be interpreted as yet another attempt to draw attention to the significance of the cross symbol.

In all, this single piece of correspondence includes two crosses and four explicit references to method of attack. It seems to me that the Zodiac, at the time he sent this card, was becoming increasingly desperate in terms of wanting to be understood.

4.3 Mapping Quadrants

¹¹ Parts of this argument are eerily similar to a thread that appeared on zodiackiller.com, "Ghia Door Writing: A New Twist?" initiated by William Baker. However, the arguments were developed independently. This fact suggests the general argument is logical and valid.

¹² <http://www.zodiackiller.com/HalloweenCard.html>.

We can map the given *quadrants* onto the Zodiac circle based on our knowledge of definite attacks perpetrated by the Zodiac. Given that the vectors of the circle occur every 30°, it takes three consecutive *vectors* to form a quadrant. Further given that the 8 and 10 vectors align precisely with crime scenes that were known to be committed with a gun, the quadrant that includes the vectors 8, 9, & 10 clearly maps to "by gun". Vector 11 corresponds to the Lake Berryessa murder which, of course, was explicitly labeled as "by knife". This means the 11-0-1 quadrant maps to "by knife".

4.3.1 Kathleen Johns

At this point, our list of definite Zodiac victims is exhausted. However, the Kathleen Johns incident provides some potential insight. Recall that the incident took place near the 4 vector. This vector corresponds to the 2-3-4 quadrant, for which we have not accounted.

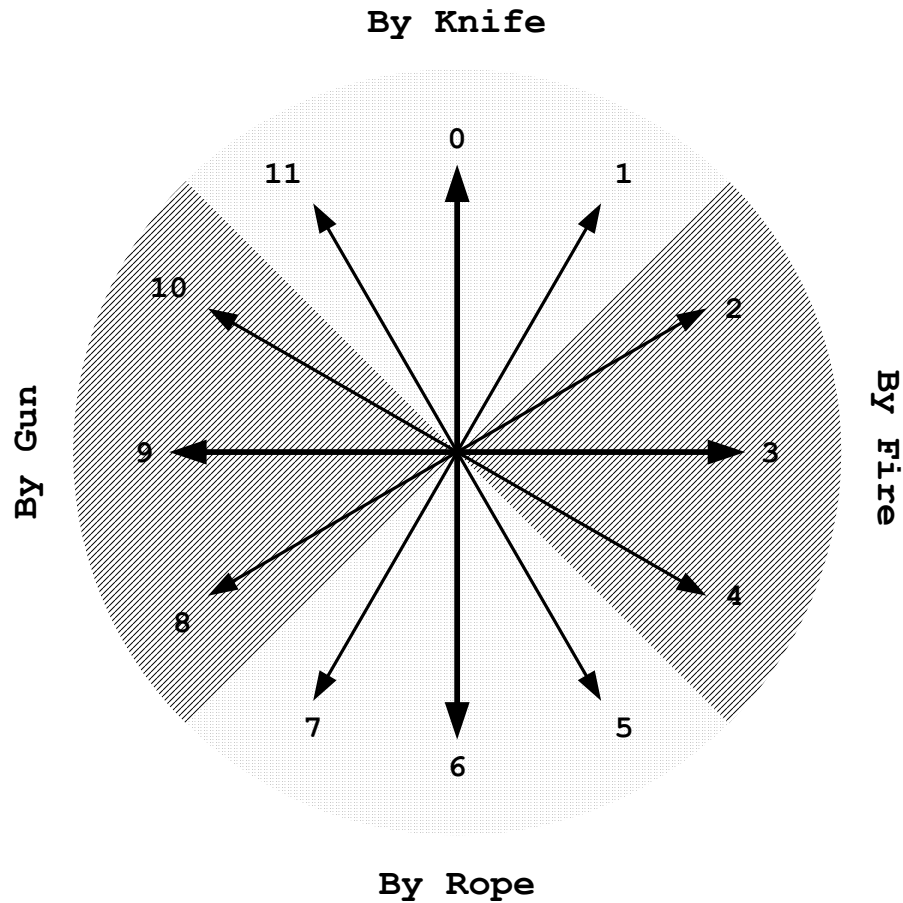
What we know about this incident is that the Zodiac ended up setting *fire* to Kathleen Johns' car (assuming the perpetrator was in fact the Zodiac). Furthermore, he made a point of explicitly telling police that he set fire to the car. While one could argue that he did this in an attempt to provide a detail that arguably was not well known outside of law enforcement, I believe there is a reasonable probability that the real intent was to provide another *data point* by explicitly providing the method of attack that should be associated with the geographic location of the crime scene.

Although I do not know it for a fact, I suspect that an accelerant, such as gasoline, was used when Kathleen Johns' car was torched. If this is true it would indicate a likely degree of premeditation and strengthen the case that the Zodiac was intending to use fire as his weapon of choice in this particular incident.

4.3.2 Completing the Quadrant Layout

Assuming one buys into the idea that the Kathleen Johns' incident represents a fire data point, by process of elimination the *rope* quadrant must correspond to the 5-6-7 quadrant. At this point, we have accounted for all vectors. Determining precisely where one quadrant transitions to the next is basically impossible given our limited data. However, the Lake Berryessa crime scene yields some insight. The crime scene falls between the 10 and 11 vectors. However, the Zodiac associates the location with the 11 vector. Therefore, the quadrant must transition from *gun* to *knife* somewhere between vector 10 and the vector that aligns with the Lake Berryessa crime scene. One could even argue that the Zodiac chose the Lake Berryessa crime scene location to provide information about the delineation of the quadrants (while logical, there's not much evidence to support this conclusion).

Pulling these ideas together, one possible layout of the quadrants is the following.



4.4 Shortcomings of the Quadrants of Method Theory

While there are a number of components that make the Quadrants of Method theory compelling; there are also pieces of evidence that, at the very least, leave questions to be answered.

4.4.1 The Halloween Card

The mapping of the quadrants to the Zodiac circle is not consistent with the layout on the Halloween card. This could be construed as a shortcoming of the Quadrants of Method theory. However, one could also argue that the Zodiac may have been trying to avoid being too obvious in his clues.

4.4.2 Why Such an Odd Mapping?

The above mapping is arguably regular; although it's not as satisfying as it would have been had it mapped exactly as given on the Halloween card and further aligned with the vertical and horizontal axes of the Zodiac Circle. However, there is a practical advantage to the mapping. Of the four described murder weapons, the gun is the safest to use. It is capable of inflicting fatal wounds quickly and enables the murder to keep a safe distance from his/her victims. Therefore, it is understandable that the Zodiac would have chosen the gun quadrant to align with the initial murder scenes near Lake Herman and the most populous section of the Zodiac circle, the one including San Francisco.

4.4.3 Bus Bomb?

For some time the Zodiac killer claimed to be contemplating using a bomb to blow up a school bus. Obviously, a bomb does not fit perfectly within the framework of the enumerated methods of murder. Arguably, *fire* would be a best fit.

5 Conclusions

These two new theories, Zodiac Circle and Quadrants of Method, involve many aspects of the Zodiac case. The following are some of the conclusions that I draw from the theories.

5.1 With Respect To Suspects

Unlike most people doing non-trivial analysis of the Zodiac case, I have no suspect to put forth. What's clear, assuming the foregoing is valid, is that the Zodiac invested a large amount of time and effort into the process and methodology surrounding his murders and attacks. Each of the Zodiac's crimes appears to serve an ulterior purpose when considered against the backdrop of his methodology. This "depth of purpose" creates a dimension of the Zodiac that is noticeably lacking with most suspects.

For this reason, it is my belief the Zodiac is/was most likely someone other than one of the most commonly suggested suspects.

5.2 Just Enough Information

An interesting aspect of the evidence in the Zodiac case is that there is just enough information to infer the Quadrants of Method theory. Without the Kathleen Johns incident, we are unable to determine which vectors correspond to *by fire* and which correspond to *by rope*. If gun murders were not committed on vectors 60° apart and/or the Lake Berryessa crime was located elsewhere, there may have been ambiguity introduced into the mapping of the quadrants. If the Halloween card had not been sent, the association of the quadrants would have been unlikely.

I believe there is a reasonable probability that the Zodiac felt compelled to act until he had provided enough evidence for law enforcement (or whomever) to infer his quadrant mapping. Once the Kathleen Johns incident happened and the Zodiac explicitly made the

association of *fire* with the crime scene, his motivation to continue may have declined, especially in light of the fact that he had nearly been caught during the Stine murder.

5.3 Kathleen Johns and Cheri Jo Bates

Both theories appear to suggest that the Zodiac was indeed responsible for the Kathleen Johns incident. In turn, the similar modus operandi used in the Johns incident and Bates murder (intentional sabotage followed by a good- Samaritan ruse) increases the probability the Zodiac was Bates' murderer as well.

5.4 Timing of Theories

If the Zodiac did in fact employ the methodology described by the two theories, an interesting question to ask is: "When did he commit to this methodology?" There are two possibilities. The first is that the Zodiac conceived of his methodology from the first murder on Lake Herman Road. The second possibility is that the Zodiac committed some of the murders prior to conceiving of the framework in which he would claim to operate. If this were the case, he would have had to construct the methodology such that it could be retrofitted onto his earlier crimes. Either way it's clear that the methodology was in place by the time the Lake Berryessa attack was committed (as evidenced by the "by knife" statement).

My sense is that the entire methodology was in place from the beginning. Not only does this possibility explain the alignment of the Vallejo crime scenes, but it is also consistent with the initial letters sent by the Zodiac. Despite the fact the Zodiac did not refer to himself as "The Zodiac" in these letters, he signed the letters with the Zodiac symbol (the crossed circle). Since the Zodiac symbol is itself a representation of the method quadrants and a subset of the Zodiac circle, it seems highly probable that the methodology was in place.

6 Summary

This analysis of the Zodiac case has introduced two new theories. The Zodiac Circle theory asserts the Zodiac used a Zodiac circle, a circle divided into twelve equal segments, as part of his killing methodology. The theory further claims that the angle formed by the Blue Rock Springs/Stine murder scenes (with Mt. Diablo as a vertex) really was intended to be an approximation of 60° (a subset of the Zodiac circle), not 1 radian as others suggest.

The Quadrants of Method Theory claims the Zodiac chose his primary weapon based on the geographic location of the crime scene. Specifically, the Rotated Zodiac Circle was divided into quadrants and each quadrant was assigned one of the methods of attack enumerated on the Halloween card. The evidence in the Zodiac case provides sufficient data to infer the basic mapping of the quadrants. A possible mapping was suggested.

7 Version History

Version	Date	Version Notes
1.0	August 3, 2003	Initial version.
1.1	August 9, 2003	Fixed minor problem with radian quote. Changed “very near” to “near” when describing the location of the Johns incident with respect to vector 4. Modified copyright statement to include title and version.
1.2	August 10, 2003	Fixed quote: “Mag. North” to “Mag. N.”. Changed some of the discussion of the Rotated Zodiac Circle due to a problem I had with map north... Conclusions are still valid. Added a few words about the Santa Barbara murders. Added a conclusion about Kathleen Johns and Cheri Jo Bates.