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The Star of Bethlehem

article by **Bill Warren**

WARNING: This article contains material of a religious nature. If, for whatever reason, that bothers you, stop reading right now and find something better to occupy your time.

Preface. Don't expect any definitive answers here. Your guess is as good as mine or anybody else's as to the identity of the Star of Bethlehem. My goal was simply to investigate the problem and suggest what that star might have been. It is, after all, a mystery that still intrigues people 2,000 years after **Jesus'** birth.

While I don't intend to impose my religious views on anyone, I began writing this article with certain assumptions, e.g., that the biblical accounts of Jesus' birth are true and accurate to the extent that the Gospel writers were capable of describing them. For example, I assumed (like most of you) that there actually *was* a Star of Bethlehem.

I also assumed – again, like most of you, and like countless historians and astronomers over the last two millennia who have tried to figure out what that star might have been – that its appearance was the result of natural processes at work, regardless of its religious significance or timing. (I'm not suggesting or implying that God did not ordain the appearance and timing of the Star of Bethlehem to lead the wise men to the site where Jesus was born; I'm merely saying that the only way for us to identify candidates for that star is to assume that He used a natural process that we can understand. Without that assumption, any investigation of the Star of Bethlehem is a complete waste of time.)

At any rate, I've narrowed down my own personal list of candidates for the Star of Bethlehem to two – one in 5 b.c. and the other in 2 b.c. They are not the only two candidates, of course -- and they may not even be the right two -- but they work for me. And that fact, combined with about \$5, will get you a cup of coffee at Starbucks.

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Above: Venus-Jupiter conjunction (June 30, 2015)

Introduction. On the evening of June 30th, 2015, **Venus** and **Jupiter** were nearly as bright as they ever get in our view. More important, though, on that night they were nestled together in the NW sky, a scant 1/4° apart – a distance equal to half of the **Full Moon's** naked-eye width. They weren't close enough to merge into a single "star", but they

fit easily into any low-power telescopic field of view and formed the brightest “double star” in the sky until 2023 when they are again that close.

Their proximity on June 30th brought fresh speculation as to whether such a conjunction by two – or maybe even three -- planets might have been the “star in the East” that the three wise men followed to reach the stable where Jesus was born. It’s not a new question: people have wondered what star led the wise men to Bethlehem ever since Gospel writers **Matthew** and **Luke** wrote about Jesus’s birth in the New Testament.

The Magi. *Matthew* 2:1-12 tells of three wise men, or *magi* (pronounced: MADGE-eye), who came to Jerusalem from Persia (Babylonia) seeking the whereabouts of the newborn messiah, or King of the Jews, whose birth had been predicted hundreds of years earlier by Jewish prophets.

Due to a large Jewish population in Persia, the magi – they were early astronomers -- were familiar with Jewish history and religion. They were aware that, according to ancient Jewish prophesy, the messiah’s birth would be heralded by an unmistakable sign from the heavens. They had been searching for such a sign for many years, and when a bright new star appeared in the East, they believed that the prophesy was being fulfilled. The magi followed the star to Jerusalem and asked **Herod**, the Judean king, where the child might be found. Herod didn’t know, of course, so he asked his chief priests. They told him that the prophet **Micah** had foretold that the child who would become the King of the Jews would be born in Bethlehem, the birthplace of **King David** (who wrote *Psalms*). Herod told the magi to search for the baby in Bethlehem and let him know if they found Him so that he – Herod – could go and worship Him, too. (That was a lie, of course: if such a royal birth had indeed occurred, Herod wanted to eliminate the future king.)

The magi continued their journey and found the baby Jesus in Bethlehem, as foretold by Micah. After paying homage to the newborn king, and not trusting Herod – they were, after all, wise men – they avoided Jerusalem on their return to Persia.

Enraged at having been deceived by the wise men – they hadn’t told him where the child could be found – Herod ordered all children age 2 or younger in the Bethlehem area to be put to death. But **Joseph**, **Mary** and Jesus escaped to Egypt, where

they remained until they received word that Herod had died.

The Slippery Slope of Dating Jesus’s Birth.

Truth is, no one knows the exact date of Jesus’ birth. The New Testament doesn’t give a precise date, but in what is now the year 525 a.d., a monk in Rome named **Dionysius Exiguus** (Latin for **Dennis the Little**) devised a new way to number the years in recorded history. Using Jesus’ birth as the starting point, he divided history into two parts, **b.c.** (before Christ) and **a.d.** (*anno domini*, “in the year of our Lord”). That system, combined with the previous calendar that had been in use since the reign of **Julius Caesar**, became the one that we use today.

Dionysius determined, by some unknown process, that Jesus was born 525 years previously, eight days before the year 1 a.d. began (i.e., on what is now celebrated as Christmas Day). But he probably was wrong by a few years.

In order to have heralded such a monumental crossroad in mankind’s history, the Star of Bethlehem must have been uncommonly bright or unusual. Modern analysis of events in the night sky in the years around Jesus’ traditional birth date offer numerous candidates for the Star – and none of them occurred in 1 b.c. or 1 a.d. (There was – and is -- no year 0; the Christian calendar went from 1 b.c. straight to 1 a.d.)

Most historians, Bible scholars and astronomers believe that Jesus was born sometime between 7 b.c. and 2 b.c.

To determine with any accuracy when Jesus was born, it is necessary to know (a) when the Star of Bethlehem appeared, and (b) what that “star” might have been, since no previously known star that reappeared every year could be a sign of such a momentous event.

What Kind of Object Was the Star of Bethlehem? There are several scientifically verifiable ways that a new and unusually bright “star” could have appeared in the night sky. Those ways include: *conjunctions*; *occultations*; *comets*; *novas*; and *supernovas*. By studying the occurrences of those events that were recorded by astronomers around the time when Jesus was born, we can get an idea of what the Star of Bethlehem might have been. But first it’s important to understand the problems involved in identifying that Star.

Problems of Interpretation. Numerous books and articles have been written over the years concerning various candidates for the Star of Bethlehem. All of them favor some events (usually one particular event) over all of the others, and the authors present creditable evidence to support their theories. Yet there are drawbacks in every case – problems associated with descriptions or interpretations of celestial events that occurred more than 2,000 years ago when both astronomy and recorded history were still in their infancy.

Ancient astronomers such as the Chinese and Babylonians kept detailed records of celestial events, but they were limited in their ability to understand or describe what they saw. They knew nothing about things like comets, novas or supernovas; all they knew was that sometimes celestial objects behaved in strange ways.

The same is true of the Gospel writers Matthew and Luke, who wrote the only recorded accounts of Jesus' birth. They were not historians or astronomers; they were simple, largely uneducated folk. (Matthew was an ex-tax collector, and Luke a fisherman.) For them, anything in the sky that was not a bird, the Sun or the Moon was a star. Thus, *Matthew 2:9* tells us that "The star which they had seen in the East went before them, till it came and stood over where the young Child was." (The key word here is *star*. Not "stars." Whatever it was, there was only one.)

Was the Star of Bethlehem a Conjunction? In the course of their orbits around the Sun, planets sometimes are closely aligned in the night sky. Such events are known as *conjunctions*, and the planets don't have to be exactly aligned, but merely close together in our view. They aren't everyday occurrences, but they are far from rare. **Roger Sinnott's** research for a 1968 *Sky & Telescope* article about the Star of Bethlehem uncovered more than 200 conjunctions involving Jupiter, Venus, **Saturn** and/or **Mars** between 12 b.c. and 7 a.d. So conjunctions were not particularly noteworthy -- *unless, that is, the planets were close enough to resemble a single star in the sky.*

***John Mosley** of Griffith Observatory in Los Angeles believes that the Star of Bethlehem was actually a conjunction of Venus and Jupiter in the constellation *Leo* on June 17th, 2 b.c.

Griffith: "The two planets had merged into one single gleaming object, one giant star in the sky, in the direction of Jerusalem, as seen from Persia." This may well have been the Star of Bethlehem, since research has shown that Venus did in fact pass partly across the face of Jupiter on that date. Venus would have been much larger and very much brighter than usual on that date.

*A triple conjunction of Jupiter, Saturn and Mars occurred on May 29th, 7 b.c. in the constellation *Pisces*, and many observatories use this date in identifying the Star of Bethlehem. But while the planets were closely aligned, according to modern researchers who are capable of reproducing the night sky as it appeared on any given date in the last 4,000 years, they did not form a single star. (Jupiter and Saturn were never closer than 1° – two Moon-widths -- apart on that occasion, and Mars was farther away. The three planets formed an 8° triangle.) Persian astronomers recorded that conjunction, but they didn't appear to give it any special significance.

***Was the Star of Bethlehem an Occultation?** Another form of conjunction – called an *occultation* – arises when the Moon passes between Earth and a planet, hiding that planet from view for a few hours. Such was the case when, on Mar. 17th, 6 b.c., the Moon occulted Jupiter. But the Moon could hardly have been mistaken for a star, and occulting a planet would not have made them any brighter except when the occultation began and when it ended. Anyway, the Moon occulted planets 170 times between 20 b.c. and 1 a.d.; it would not have been an important enough event in 6 b.c. to trigger such a response from the magi, regardless of which planet was occulted. So *No*, the Star was not an occultation.

Was the Star of Bethlehem a Comet? In 12 b.c., astronomers in China, Persia and Egypt, and Indians living in the American southwest, recorded a bright object that 17 centuries or more later was identified as an earlier visit of **Halley's Comet**. But that couldn't have been the Star of Bethlehem because, according to the Gospels, Jesus was "about thirty" years old when He was baptized by John the Baptist and began His ministry in the 15th year of the reign of **Tiberius Caesar** (i.e., 28 a.d.). So if Jesus was born in 12 b.c., He would have been forty years old – not thirty -- in 28 a.d. Jesus' ministry

lasted only three years before He died by crucifixion at age 33.

Beyond that, Halley's Comet is a periodic comet that returns every 76 years. It was first recorded by Chinese and Babylonian astronomers in 240 b.c., and although they didn't know it was the same object they recorded its reappearances in 164 b.c., 88 b.c. and 12 b.c.

The magi had been searching for hundreds of years for a sign from heaven that the Jewish messiah had been born, so the question arises: *If Halley's Comet was the Star of Bethlehem, why did they wait until its fourth appearance to look for the child?* The answer: They didn't. Halley's Comet, impressive as it might have been, was not the Star of Bethlehem.

*A more viable cometary candidate for the Star of Bethlehem might have been the one recorded by Chinese and Babylonians astronomers in 5 b.c. According to the Jewish historian **Josephus**, King Herod died shortly after a lunar eclipse in 4 b.c. -- so he was alive when the comet appeared a year earlier.

According to one source, Chinese astronomers described the object as a slow-moving star with a curving tail that "hung over" in what is now the constellation *Capricornus*. The comet first appeared sometime between Mar. 9th and Apr. 6th, and was visible in the night sky for 2-1/2 months. That would have given the magi plenty of time to follow the "star in the East," which was in fact where the comet was located in the pre-dawn hours.

*The Chinese also recorded a tailless comet in 4 b.c., but whether King Herod was still alive then makes this comet a possible but unlikely candidate for the Star of Bethlehem. It was not as spectacular as the one the previous year.

Was the Star of Bethlehem a Nova or a Supernova? *Novas* are stars that burst into sudden brilliance, and then gradually fade back to their former brightness. *Supernovas* are stars that explode in self-destructive blasts of such ferocity that their brilliance temporarily outshines the rest of the entire galaxy in which they are located. Because novas and supernovas are bright, single points of light that are stationary in the night sky from one evening to the next, such an event would be an ideal candidate for the Star of Bethlehem.

I'll come back to this topic in the next section.

Conclusion. The Star of Bethlehem might have been a conjunction of two planets – but conjunctions were fairly commonplace occurrences during the period in which Jesus was born. And perfect alignments of planets to form a single "star" are of short duration, lasting no more than one evening at most before they move apart to re-form separate points of light in the night sky.

However, if the Star of Bethlehem was a planetary conjunction, the best candidate appears to be the conjunction of Venus and Jupiter on June 17th, 2 b.c. For a brief period it would have been far brighter than any star or planet in the sky.

Or was the Star a comet? If so, its tail and coma (head) might have pointed directly toward the site sought by the magi. But comets are fast-moving objects when they are close enough to the Sun to be seen naked-eye. They move several degrees across the sky every night; it is difficult to imagine a comet that "came and stood over the place where the young child was." (Of course, devout Christians would counter that it is no more difficult to imagine a comet standing still in the sky than to imagine the virgin birth of the Son of God.)

If the Star of Bethlehem was a comet, the best candidate probably is the one that appeared between Mar. 9th and Apr. 6th, 5 b.c. and was visible for 70 nights. But that solution brings up another problem:

Colin J. Humphreys was the author whose description of that comet was cited earlier. But other sources claim that the comet of 5 b.c. had no tail. And if that was the case, that "comet" may have been a nova. (It was not a supernova, because there is no lingering radio source or supernova remnant located in that part of the sky.) A nova would explain why the "star" appeared suddenly, was uncommonly bright and did not move across the sky independently of the stars around it.

If in fact the object that appeared in 5 b.c. was a nova, it certainly would qualify as the best candidate of all for the Star of Bethlehem.

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