

# The Star of Bethlehem and the comet of AD 66

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The search for an explanation of the Star of Bethlehem is almost as old as the story itself. To date there is no generally accepted answer. This paper briefly reviews the possible explanations and concludes that it was almost certainly a fictional story perhaps inspired by the appearance of Comet Halley in AD 66.

## Introduction

This paper presents the results of a study to establish an explanation of what the Star of Bethlehem may have been.

It is important for any such study to establish the *a priori* assumptions. One of the most important is to take a stance on the subject of astrology. Over the centuries the Jewish and Christian hierarchies have taken a fairly ambivalent position on the question of the authenticity or otherwise of astrological predictions, and many previous studies concerning the star have also tended to fudge the issue.

Well before Christian times careful observation of the night sky led to the establishment of useful calendars. These allowed basic predictions to be made that aided agriculture and helped communities prepare for the likely weather and conditions ahead. One such prediction was that the heliacal rising of the star Sirius signalled the annual flooding of the Nile.<sup>1</sup>

It is a human weakness to try to extend this approach to other events where there is no causal relationship. This must have been particularly tempting for ancient non-scientifically based communities in which superstitions were rife. However, it is a fundamental assumption of this study that the configuration of the heavenly bodies can only affect happenings on Earth when there is a true causal reason. This rules out the validity of almost all astrology. Certain astrological predictions can of course become self-fulfilling prophecies such as the death of a king or the loss of a battle, or even the claimed birth of a Messiah.

Another starting assumption is that the appearance of the star was not a miracle. If it was then the story is not amenable to scientific analysis.

These basic assumptions in themselves rule out the story of the Magi and the star as a factual account, but they do not rule out the possibility of a star inspiring the story.

## The primary source

Any search for an explanation of the Star of Bethlehem must start with the *Gospel according to St Matthew*, as this is the sole source of the original story.

The full text as presented in the authorised King James Version of the Bible<sup>2</sup> is as follows:

### Chapter 2

- 1 Now when Jesus was born in Bethlehem of Judæa in the days of Herod the king, behold, there came wise men from the east to Jerusalem,
- 2 Saying, Where is he that is born king of the Jews? For we have seen his star in the east, and we have come to worship him.
- 3 When Herod the king had heard these things, he was troubled, and all Jerusalem with him.
- 4 And when he had gathered all the chief priests and scribes of the people together he demanded of them where Christ should be born.
- 5 And they said unto him, In Bethlehem of Judæa: for thus it is written by the prophet.
- 6 And thou Bethlehem in the land of Juda, art not the least among the princes of Juda: for out of thee shall come a Governor; that shall rule my people Israel.
- 7 Then Herod, when he had privily called the wise men, inquired of them diligently what time the star appeared.
- 8 And he sent them to Bethlehem, and said, Go and search diligently for the young child; and when ye have found him, bring me word again, that I may come and worship him also.
- 9 When they had heard the king, they departed; and, lo the star, which they saw in the east, went before them, till it came and stood over where the young child was.
- 10 When they saw the star, they rejoiced with exceeding great joy.
- 11 And when they were come into the house, they saw the young child with Mary his mother, and fell down, and worshipped him: and when they had opened their treasures, they presented unto him gifts; gold, and frankincense, and myrrh.
- 12 And being warned of God in a dream that they should not return to Herod, they departed into their own country another way.
- 13 And when they had departed, behold, the angel of the Lord appeareth to Joseph in a dream, saying, Arise, and take the young child and his mother, and flee into Egypt, and be thou there until I bring thee word: for Herod will seek the young child to destroy him.
- 14 When he arose, he took the young child and his mother by night, and departed into Egypt:
- 15 And was there until the death of Herod: that it might be fulfilled which was spoken of the Lord by the prophet, saying, Out of Egypt have I called my son.
- 16 Then Herod, when he saw that he was mocked of the wise men, was exceeding wroth, and sent forth, and slew all the children

*that were in Bethlehem, and in all the coasts thereof, from two years old and under, according to the time which he had diligently inquired of the wise men.*

In the *New Revised Standard Version* of the Bible<sup>3</sup> that claims to be based on the translation of the best available manuscripts and recent advances in biblical, archeological and linguistic scholarship, ‘star in the east’ becomes ‘star at its rising’ and ‘went before them, till it came and stood over’ becomes ‘ahead of them went the star until it stopped over’. The phrase ‘star in the east’ is usually interpreted as ‘star at its heliacal rising’. The literal translation from the Greek is ‘star in the first rays of dawn’.

In the *New International Version*<sup>4</sup> ‘wise men’ becomes ‘Magi’ which is the Greek original. In the *New English Bible*<sup>5</sup> ‘wise men’ becomes ‘astrologers’ and in another version<sup>6</sup> ‘scholars who were students of the stars’. Elsewhere they have been described as scholarly envoys; magicians; sorcerers; dabblers in the black arts; fortune tellers; and priestly augurers, a caste who were adept at various forms of secret lore who could interpret dreams.<sup>7,8</sup>

According to a contemporary of Jesus, Philo of Alexandria, there existed astrologers who were the more scientific Magi, and other Magi who were charlatans and magicians – the ‘good and the bad’ Magi.<sup>7</sup> Matthew was probably referring to the former type. They were thought to be Babylonian Jews who were familiar with the beliefs of Zoroastrianism. They believed in good and evil, and that good would triumph, resurrecting the dead and creating paradise on earth. They lived in the expectation of the coming of the Messiah.

On the other hand Pliny was more familiar with the latter type of Magi and was very much against them. In his *Natural History* he states ‘I have often indeed refuted the fraudulent lies of the Magi.’<sup>9</sup> This negative view also seems to be the interpretation in other parts of the Bible where Magi feature.

The *Gospel according to St Luke* also tells the tale of the Nativity,<sup>10</sup> but Luke does not mention the star, the Magi or Herod and there was no slaughter of the innocents. Instead there were the swaddling clothes, the manger and the shepherds. In fact the star does not appear anywhere else in the New Testament. The New Testament is however made up of only a selection of the hundred or so books that were used by the early Church.<sup>11</sup> The star appears again in at least one of these – *The Protoevangelium of James*.<sup>11</sup> This text was not written until about 150 AD and has been described as ‘a pretty low-rated fictional account’.<sup>12</sup> The section relating to the star includes, ‘We saw how an indescribably greater star shone among these stars and dimmed them, so that they no longer shone’.

This version of the story has so many similarities to the events that are described in St Matthew’s Gospel that it appears to be simply a retelling and an embellishment of that story. Consequently it has to be rejected as an independent source of information, and the great size and brightness of the star therefore also has to be disregarded. In fact as the story was retold during the early days of the Church the star soon had attributed to it a great magnitude.<sup>13</sup> For example

Ignatius, the second Bishop of Antioch in Syria in about AD 107, wrote ‘a star shone forth in heaven above all the other stars, the light of which was inexpressible, while its novelty struck men with astonishment. And all the rest of the stars, with the Sun and Moon, formed a chorus to this star, and its light was exceedingly great above them all’.

Careful analysis of the text of St Matthew’s Gospel reveals a number of important points that are sometimes misquoted or misinterpreted. For example:

- It is not stated either explicitly or implicitly that the Magi followed the star to Jerusalem. Of course if they had followed the star and they came from the east the star would have had to have been in the west.
- The number of Magi is not specified.
- There is no reference to their being kings.
- The text does not say that Herod had not seen the star; it merely says he inquired when it first appeared.
- There is nothing that implies how bright the star was other than it was obviously a naked eye object.

## Important dates

### *Date of the Nativity*

Estimates for the date of Christ’s birth have ranged from at least 12 BC to AD 9.<sup>13</sup> Some estimates have a much sounder basis than others.

It is now accepted, but not by everyone,<sup>14</sup> that Christ was probably born between 7 and 5 BC.

### *Date of St Matthew’s Gospel*

Due to the dependence of St Matthew’s gospel on St Mark’s, it could not have been written before AD 70.<sup>15</sup> In addition as it was referred to by Ignatius of Antioch in his letters written at the start of the second century, it must have been written by AD 100.<sup>16</sup> It is also claimed that it was known to Clement of Rome before AD 96.<sup>13</sup>

The generally accepted view is that it was probably written between AD 80 and 100.<sup>17</sup> Some scholars support an earlier date,<sup>18</sup> however the consensus is very much for the period AD 80 to 100 and possibly within the more restricted timescale of AD 85 to 90.<sup>16</sup>

This date has a number of implications:

- The events of the Nativity were unlikely to be within living memory of the author(s). The author(s) may however have talked to people who had first hand knowledge of the times. These witnesses may have remembered a significant heavenly event that occurred at about the same time.
- It is improbable that the author was Matthew the disciple. However attributing the gospel to him helps to give it a certain apostolic authority. In this paper ‘Matthew’ is used to refer to whoever was the author or were the authors of St Matthew’s Gospel.
- The date is after the Jewish uprising of AD 66 and the destruction of the temple of Jerusalem in AD 70.<sup>17</sup>

## Possible explanations

There are five classes of possibilities:

- A miraculous event
- An astrological event
- An astronomical event
- An Unidentified Flying Object (UFO) of alien origin
- A fictional event

Note that a distinction is made in this paper between astrological and astronomical events even though many astrological events are also astronomical.

### *A miraculous event*

This possibility has been ruled out as one of the basic assumptions of this study. However, as it may be favoured by some, a few additional words are appropriate.

If the star was a miraculous event it does not lend itself to scientific analysis. For example as a miracle it could have been made visible to whoever the intended recipients were. It could have been a temporary phenomenon in the sky that did not obey the usual laws of physics. It could appear and shine today and be non-existent tomorrow.

The assumption that the star was not a miraculous event is made on the basis of what is known scientifically, i.e. miracles should not happen. This may be considered by some to be a narrow minded view and it has been claimed that ‘a presupposition that miracles are impossible is unscientific’.<sup>7</sup> Theologians have however also argued that excluding the idea of a miracle is perfectly acceptable and consistent with Christian belief.

### *An astrological event*

Strong astrological cases have been proposed for at least the following to be the star of Bethlehem:

- Triple conjunction of Saturn and Jupiter in 7 BC<sup>19</sup>
- A series of conjunctions involving planets and the star Regulus in 3 and 2 BC<sup>14</sup>
- The heliacal rising of Jupiter and its occultation by the Moon in 6 BC<sup>20</sup>
- Jupiter/Venus conjunction of 2 BC<sup>21</sup>

Each case is put forward with enthusiasm and conviction but the fact that strong cases can be made for such diverse possibilities throws doubt on the whole process. Also in each case there is no causal relationship between the phenomena described and the earthly happening. Of course this does not preclude one of these proposed solutions contributing to the story in retrospect.

In addition the currently popular triple conjunction theory is rejected, in one reference, on the basis that there is no contemporary evidence justifying calling such an occurrence a star or attaching any particular effect to it.<sup>7</sup> This problem can be avoided to a certain extent if it is one (or both if they merge to form a single entity) of the conjunction participating planets (e.g. Jupiter) that is considered to be the star.

Usually the proposed astrological solutions involve planetary stationary points, conjunctions, massings or occulta-

tions. It has also become popular to propose a series of events to help get over the problem of uniqueness.<sup>16,19,22,23</sup> For example one author suggests ‘Following the triple conjunction of 7 BC and the planetary massing in 6 BC, the Magi set out when they saw the comet of 5 BC and it was Jupiter at its stationary point that pointed out where the child was’.<sup>22</sup>

Though today the validity of such astrological predictions is rejected, the case for an astrological solution is often defended on the grounds that it doesn’t matter what we believe today, what is important is the beliefs of the time and particularly those of the Magi. The point that never seems to be made is that if there is no substance to a prediction then no matter how hard it is believed, it will never ever come true, except perhaps by coincidence. Consequently if the wise men saw such a sign in the sky, interpreted it and followed it, they would almost certainly not have found what they were looking for.

### *An astronomical event*

Many candidates have been put forward for the astronomical event that could have been the required star. These include at least the following: nova, supernova, variable star, meteor(s), Cyrrillid type meteor stream, bolide or fireball, Sirius, Canopus, Mira, Venus, Jupiter, Uranus, comet, zodiacal light, ball lightning, aurora.

Most are too commonplace; others just don’t fit Matthew’s description.

Besides the appearance of a nova/comet in 5/4 BC (may have been the same object or different objects, each may have been a nova or a comet) there are no relevant astronomical events worthy of note during the period of interest. Halley’s Comet appeared in 12 BC but this was well before the birth of Christ and like the astrological possibilities, its only possible connection could be through contributing to the story that something happened in the sky at around the right time.

Astronomers have searched diligently for possible physical manifestations of the star but to date there is no generally accepted answer. This lack of an agreed interpretation in itself points to the conclusion that the Star of Bethlehem was not an actual astronomical event.

### *A UFO*

To date no form of life has been detected beyond the confines of the planet Earth and the question on whether or not life exists elsewhere is still open. Even if traces of life are found, intelligent life may still not exist elsewhere. In addition there is no scientific evidence that confirms the existence of alien spacecraft. The chances of the Star of Bethlehem being a UFO<sup>24</sup> must be very close to zero and this possibility is disregarded here.

### *A fictional event*

So was the Star of Bethlehem just a fictional story? The following support a positive response to this question:

- The failure of alternative possibilities to identify a phenomenon that is sufficiently convincing to become generally accepted as the correct interpretation.
- It would have been a pure coincidence or a self-fulfilling prophecy if the birth of the Messiah had been presaged by a signifi-

cant astrological event, as there is no causal relationship between the two. Furthermore there is no evidence that Jesus' destiny was influenced by any proclamation of his significance while still an infant. One can therefore safely reject the self-fulfilling prophecy idea.

- The story indicates that the Magi travelled a considerable distance to find the new King of the Jews. However once they had found him, honoured him, and presented their gifts they departed home and nothing else is heard of them! They do not seem to have offered any support, proclaimed the birth or taken any action whatsoever. This does not seem like the actions of wise men.
  - If the story is true then not only has one to find an event that could have persuaded the Magi to make their journey, but one also has to eliminate all other events that have taken place over the years from triggering them. There is no evidence of such a sufficiently unique event ever happening. Consequently, if the story were true, one would expect many references in the literature to failed Magi searches. This is patently not the case. However the belief that heavenly signs marked the births and deaths of great men was widely accepted at the time.<sup>7</sup>
  - It is also interesting to pose the question: Why is it that modern astronomers with all the resources available to them cannot decide on what the star was, whereas the Magi apparently could?
  - There is no historical evidence that Herod slaughtered the children of Bethlehem. For example Josephus, the first century Jewish historian, makes no reference to such a slaughter even though he covers many of Herod's other atrocities.<sup>17</sup> This part of the story may have been inspired by the 'slaughter of the innocents' referred to in Exodus that happened a long time before. There are not only many parallels with the story of Moses<sup>13</sup> but also between the story and a late Jewish midrash about the birth of Abraham.<sup>8,13</sup> The Abraham story contains a bright star that the Magi told Nimrod signalled the birth of a person who is destined to conquer this world and the next. There is also a plot to kill the child that involved the Magi.<sup>13</sup> This plot is frustrated by hiding him in a cave for three years.
  - Matthew wanted to convince a Jewish audience that Jesus was the Messiah, by showing that his birth had fulfilled the prophecies. The prophecies had said that there would be a star so there had to be a star. As one scholar put it, 'no star, no Messiah'.<sup>19</sup>
- The story of a star was compatible with the beliefs of the time. In addition the concept of a guiding star was also not unique: Virgil reported that a star guided Aeneas to the place where Rome was to be built.<sup>7</sup> The act of the Magi, notable people of the time, paying homage to Jesus also helped to support the case that Jesus was somebody very special.

Matthew rather strangely did not use a fulfilment phrase, such as that used in *Matthew* 2:15 ('that it might be fulfilled which was spoken of the Lord by the prophet'), when referring to the star. This is inconsistent with the rest of the gospel. There may be a number of reasons for this. First it was not clear that the prophecy in *Numbers* 24:17 actually referred to a sidereal phenomenon. Second, perhaps the phrase was omitted to avoid making an astrological claim that was directly against the beliefs of the Jewish religion (at the time astrology was forbidden) whilst still retaining the story to appeal to people's real beliefs and to appeal to non-Jewish readers.

Another interpretation of the meaning of Matthew introducing the Magi was to show good triumphing over evil. The sorcer-

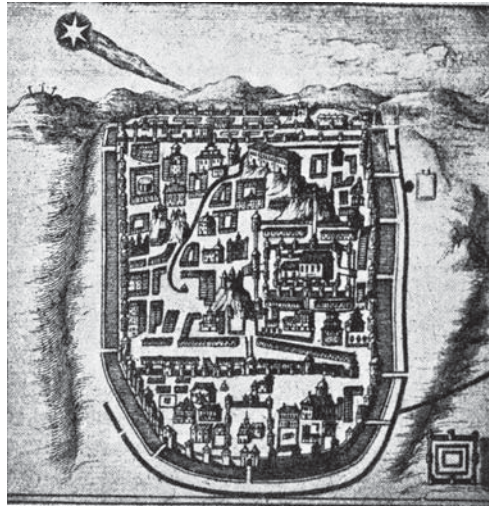


Figure 1. The comet 'hung over' Jerusalem in AD 66. From Stanislaw Lubieniecki, *Theatrum Cometicum*, 1681 edition.

ers (Magi) acknowledging that their ways depending on astrology, superstition and the magic arts was over. This seems to be how Ignatius of Antioch saw it in the first century AD: 'A star shone in the heavens beyond (the light of) all the stars ... and from that time all magic and all sorcery ceased'.<sup>8</sup>

- The Gospel was written in an age of oral history and myth and the story is not supported by any other primary source. St Luke takes up twice the space as Matthew on the early life of Jesus but does not mention the star, in spite of the fact that he mentions another astronomical portent later in his gospel – an eclipse during the crucifixion.

Overall it seems that the circumstantial evidence strongly suggests that the story was simply made up: a story carefully crafted by

Matthew to persuade predominately Jewish readers that Jesus was the long-awaited Messiah.

Matthew himself would have been offended by such an accusation. Following the traditions of Jewish midrash, he would rather see himself as writing down 'what must have been', telling the full story in a way that reconciles the old with the new and presenting a self-consistent view of the events, expanding on what he knew, filling in the gaps where necessary. The star of Bethlehem story is not the only example of midrash in Matthew and some see Matthew's Gospel as basically a midrashic expansion of Mark's.<sup>25</sup> Specific examples of midrashic expansion include as well as the infancy stories, the temptations, the details of Judas and the Sermon on the Mount. This midrashic theory, for the infancy narratives, is also supported by a statistical analysis of the words used.<sup>25</sup>

The conclusion that it was fiction should be as acceptable to believers as to non-believers. For if Jesus was not the Messiah then there is no reason for his birth to be heralded by a real astronomical event. On the other hand if Jesus was the Messiah, the only reason for a star is to prove that the birth was consistent with the mythology of the time. This can be considered by believers to be a requirement of men and not of God. The teachings of Jesus himself also point us away from imagining that his birth should have been heralded by a spectacular firework display.

This conclusion changes the search from trying to find a real or astrological event that constituted the actual star, to looking for an event that may have inspired Matthew.

## The comet of AD 66

In this new search the first point to note is that St Matthew's Gospel was written in the turbulent times following the Jewish uprising against the Romans in AD 66 and the destruction of the temple of Jerusalem in AD 70. These events would have been fresh in the mind of Matthew just as the Second World War was fresh in people's minds in the 1950s and '60s.

In addition during these times it is a historical fact that a deputation of Magi *did* come from the east to bring gifts and pay homage, and they *did* return home by another route. Also a bright comet with an impressive tail appeared over Jerusalem. These were both notable events of the time.

In AD 66 Tiridates, the King of Armenia, led a notable procession of Magi to pay homage to Nero.<sup>26</sup> After Nero had confirmed Tiridates as the King of Armenia ‘the King did not return by the route he had followed in coming’, but sailed back to Armenia by a different route. He came through Illyricum and north of the Ionian Sea and returned by sailing from Brundisium to Dyrrachium.<sup>27</sup> This event was of sufficient importance to be recorded in the works of Pliny, Dio Cassius and Suetonis. The procession may have passed close to the Greek speaking Jewish/Christian communities of northern and northeastern Syria where it is believed the gospel originated,<sup>13,15</sup> as Armenia lies to the north east of this area.

AD 66 was also the date of an apparition of Halley’s Comet which shone brightly over Jerusalem (Figure 1). It was said to have announced the destruction of Jerusalem in AD 70 and the widespread humiliation of the Jewish people. It appeared just before the Jewish uprising, and may even have helped to incite the first act of rebellion in the summer of AD 66 that led to the start of the Roman–Jewish war.<sup>28</sup>

Figure 1 was drawn about 1600 years after the apparition and is not technically correct. According to one translation, the Jewish historian Flavius Josephus wrote: ‘Amongst the warnings, a comet, of the kind called Xiphias, because their tails appear to represent the blade of a sword, was seen above the city’.<sup>29</sup>

According to Chinese records it was visible from February 20 until April 10.<sup>30</sup> At first sighting it had a tail of 12°. It reached first magnitude in March and the tail by then was probably enormously long due to the comet’s proximity.<sup>29</sup> The path of the comet against the star background is shown in Figure 2.

The estimated apparent magnitude of the comet during its period of visibility is given in Figure 3. The figure also shows the period each day, assuming a sufficiently cloudless sky, when the comet was visible from Jerusalem. To determine an



Figure 2. Path of Halley’s Comet in AD 66 (*SkyMap Pro*).

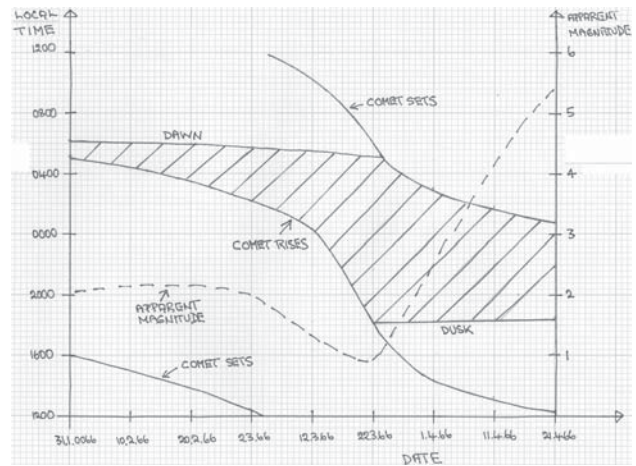


Figure 3. Visibility of Comet Halley from Jerusalem in AD 66 (Local time= UT+2).

overall picture of the spectacle it is noted that the comet was close to the Sun in late January and early February and consequently difficult to see. In addition the full Moon and the comet were in the same area of the sky for a few days towards the end of March, approaching to within about 15°.

As seen from the Jerusalem area, and similarly for Babylon, the following is noted:

- When it first appeared it rose in the eastern sky just before dawn (Star in the east, seen at its rising).
- When it was at its brightest (about first magnitude<sup>29</sup>) it was visible throughout most of the hours of darkness.
- It moved in a westerly direction – each night it was further west with respect to the background stars (Indicates the direction towards Jerusalem for people in the east).
- Towards the end of its visibility period it was nearly stationary in right ascension – it stopped moving towards the west (Stopped and stood over). During this period it could be seen high in the southern sky in the evening (Direction of Bethlehem from Jerusalem). However it was now dimming rapidly (Magi had found the child).

The above is compatible with Matthew’s description as the notes in parentheses show. Matthew would have had the opportunity of a similar view as he was located about 500km (5°) to the north of Jerusalem. None of the other comets visible during the period 60–100 AD<sup>31</sup> can compare with the

credentials of this comet. In fact none of the reliably observed comets were ever visible in the eastern sky.

A comet is the phenomenon that best fits the description with respect to how it moved and ‘stood over’. Some have argued that a planet reaching its stationary point also fits this description.<sup>14</sup> However the phrases ‘stood over’ and ‘hung over’ when used in ancient literature have always referred to comets. For example Dio Cassius referring to the apparition of Comet Halley in 11 BC wrote: ‘The star called the comet hung for several days over the city [Rome].’<sup>32</sup> Consequently when Matthew used the phrase ‘stood over’ he was probably referring to a comet.<sup>33</sup>



**Figure 4.** *The Adoration of the Magi* by Giotto di Bondone (Scrovegni Chapel, Padua).

It is reputed, though this has been questioned,<sup>34</sup> that another apparition of Halley's Comet inspired Giotto di Bondone in 1301 to depict it as the Star of Bethlehem in his fresco 'The Adoration of the Magi'<sup>35</sup> (Figure 4). The comet should have been an even better spectacle to Matthew than to Giotto. For reference, the 1986 apparition in the northern hemisphere was the faintest<sup>36</sup> for over 2,000 years.

## The Star of Bethlehem

For almost two millennia people have speculated on what the 'Star of Bethlehem' might have been. Little new information has become available over the years other than that gleaned from computations of the appearance of the sky over the Middle East around the period of interest.

New information could become available in the future. New documents may be found, a comet could return, an examination of supernova or nova remnants traced back might yield interesting results. On a much more speculative basis, the Star may have been sighted and recorded

elsewhere, by other civilizations in other star systems. This suggestion is included here for completeness and without comment on the possibility of extraterrestrial intelligent life.

The first known speculation on the nature of the Star of Bethlehem was made by Origen around AD 248 and he concluded that it was a comet.

'We think that the star which appeared in the east was a new star and not like any of the ordinary ones, neither of those in the fixed sphere nor of those in the lower spheres, but it is to be classed with the comets which occasionally occur, or meteors, or bearded or jar-shaped stars, or any other such name of which the Greeks may like to describe their different forms.'<sup>37</sup>

This solution has 'always been one of the main contenders for the role of the messianic 'star'.<sup>34</sup> The fact that this solution has had its supporters through the centuries is witnessed by the number of paintings, woodcuts and other images entitled 'The Adoration of the Magi' that depict the star as a comet or comet-like object. These include among others works by Francesco d'Antonio, Giotto di Bondone, Antonio Busca, Gentile da Fabriano, Juan de Flandes, Bartolomeo di Giovanni, Pol de Limbourg, Stanislaw Lubieniecki, Jean de Saint-Igny and perhaps even Andrea Mantegna. Examples of such depictions are shown in Figure 5.

When Matthew wrote the story of the Nativity the star referred to was very probably a comet. This conclusion is almost independent of anything else. It is also interesting to note that the Balaam prophecy in the *New English Bible*<sup>5</sup> refers to a comet: 'a star shall come forth out of Jacob, a comet arise from Israel'. (*Num* 24,17)

This astronomical event supported the case that Matthew was trying to prove and one that, at the time, was thought to signify a change in the world order. It was included to be in line with the beliefs of the time.

Matthew may have invented the star completely or it may have been based on oral stories of some manifestation in the heavens that occurred by chance at around the same time. The original stories, if such existed, could have been based on a different astronomical event or events. Such stories would have been based on something significant. This significance could either have been astronomical or astrological or both. The event didn't even necessarily have to be one based on a star. Consequently a conjunction that is



**Figure 5.** Examples of the Star of Bethlehem depicted as a comet in art. *Left to right:* from a painting in a side chapel in the Mezquita, Cordoba; from a 15th century illuminated manuscript by Martin of Aragon (*Bibliothèque Nationale de France*); a 19th century stained glass window in the parish church at Dunster, Somerset; from a 20th century Christmas card.



Figure 6. The heart of the Star of Bethlehem? (Photo: ESA)

astrologically significant is not ruled out as the basis of any such oral stories. What is ruled out is any causal relationship between such an event and the birth of Christ.

It might be the case that it was the appearance of Halley's Comet in 12 BC that was the inspiration for the stories. About two years after this apparition there was a procession of foreign ambassadors (Magi?) that came to visit Herod bearing gifts on the occasion of the completion of Caesarea Maritima.<sup>7</sup>

Why did Matthew very probably base the story on a comet? One can speculate that this was because the oral stories referred to an event Matthew thought was or might have been a comet, or because a comet fit his purpose or because of a recent event that he'd seen himself or a combination of these factors. Nobody can be sure which of these if any is correct.

Other aspects of the story, namely the visit of the Magi, indicate that the inspiration for the star could have been the comet that appeared in AD 66. Perhaps he'd observed this awesome portent which was believed to have resulted in the destruction of Jerusalem, and it inspired him to include a similar omen for the birth of Christ on the basis of an anticipated change to the established order. Perhaps his story was to show the importance of Jesus through parallels with the visit of the Magi to Nero, in particular with respect to the Magi, learned and powerful men of the time, bowing down to both of them.

The comet of AD 66 was Comet Halley, the most famous comet in history. If it was also the Star of Bethlehem this description would be more than justified.

## Conclusion

The conclusion that the Star of Bethlehem story was based on the apparition of Comet Halley in AD 66 is not entirely

new, as during the course of this study the author came across a reference to this possibility in the literature.<sup>38</sup> William Phipps, a professor of Religion and Philosophy at Davis and Elkins College, West Virginia, thought that Matthew could have been stimulated by the visit of the Magi to Nero and the appearance of Halley's Comet in 66 AD. He offers no proof except to point out parallels between the story and certain ancient events and traditions. The thrust of the story is that Jesus, who is worthy of a heavenly sign and earthly worship, is on a higher plane than a mere earthly ruler like Nero. This theory has some support in the literature.<sup>7,39</sup> Phipps did not consider alternatives. In this paper the alternatives have been reviewed and found wanting. In addition this paper has put forward the reasons why the story was probably fictional and why the comet of AD 66 is an interesting possibility.

The apparition of this same comet in 1301 probably inspired Giotto di Bondone to depict it as the Star of Bethlehem in his fresco 'The Adoration of the Magi'.<sup>35,40,41</sup> In the 1980s the European Space Agency named their Halley's Comet probe *Giotto*.<sup>42,43</sup> This probe recorded the first pictures of a cometary nucleus<sup>44</sup> (Figure 6). As it closed in on the comet on 1986 March 13 probably no-one realised that perhaps the probe was examining the very heart of the Star of Bethlehem.<sup>45</sup>

It can never be proved but it fits the facts and to be correct requires no act of faith or belief in astrology.

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