"The Star of Bethlehem"

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Preview: *For over two thousand years the Star of Bethlehem has been a powerful symbol of the Christian faith. Its unique story, told here by astronomer Craig Chester, was originally presented at Hillsdale College's Center for Constructive Alternatives Seminar, "Man and Creation: Perspectives on Science and Religion," in the fall of 1992.*

The Story of the Star in the East

Someone once observed, "The universe is composed of stories, not atoms." The Star of Bethlehem is certainly a story (as is most of the Bible, first and foremost). It is a mystery and a puzzle, involving not only theology and astronomy, but also history and even astrology.[1] It is an attempt of men to understand not the universe at large, but specific events, or "What I Saw"

What do we know about the Star of Bethlehem? The popular conception is summarized in the Christmas carol:

> We three kings of Orient are/Bearing gifts we traverse afar, Field and fountain, moor and mountain/Following yonder star.
>
> 0 star of wonder, star of night/Star with royal beauty bright, Westward leading, still proceeding/Guide us to thy perfect light.

We all know those lines as the story of the Star, which is fine—except for the fact that almost everything in it is wrong. The actual New Testament account of the Star of Bethlehem comes from the second chapter of the Gospel of Matthew (told here in the Revised English Bible translation):

> Jesus was born at Bethlehem in Judaea during the reign of Herod. After his birth astrologers [Magi] from the east arrived in Jerusalem, asking, "Where is the newborn king of the Jews? We observed the rising of his star, and we have come to pay him homage." King Herod was greatly perturbed when he heard this, and so was the whole of Jerusalem. He called together the chief priests and scribes of the Jews and asked them where the Messiah was to he born. "At Bethlehem in Judaea," they replied, "for this is what the prophet wrote: 'Bethlehem in the land of Judah, you are by no means least among the rulers of Judah; for out of you shall come a ruler to be the shepherd of my people Israel.' "
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> Then Herod summoned the astrologers to meet him secretly, and ascertained from them the exact time when the star had appeared. He sent them to Bethlehem, and said, "Go and make a careful search for the child, and when you have found him, bring me word, so that I may go myself and pay him homage."

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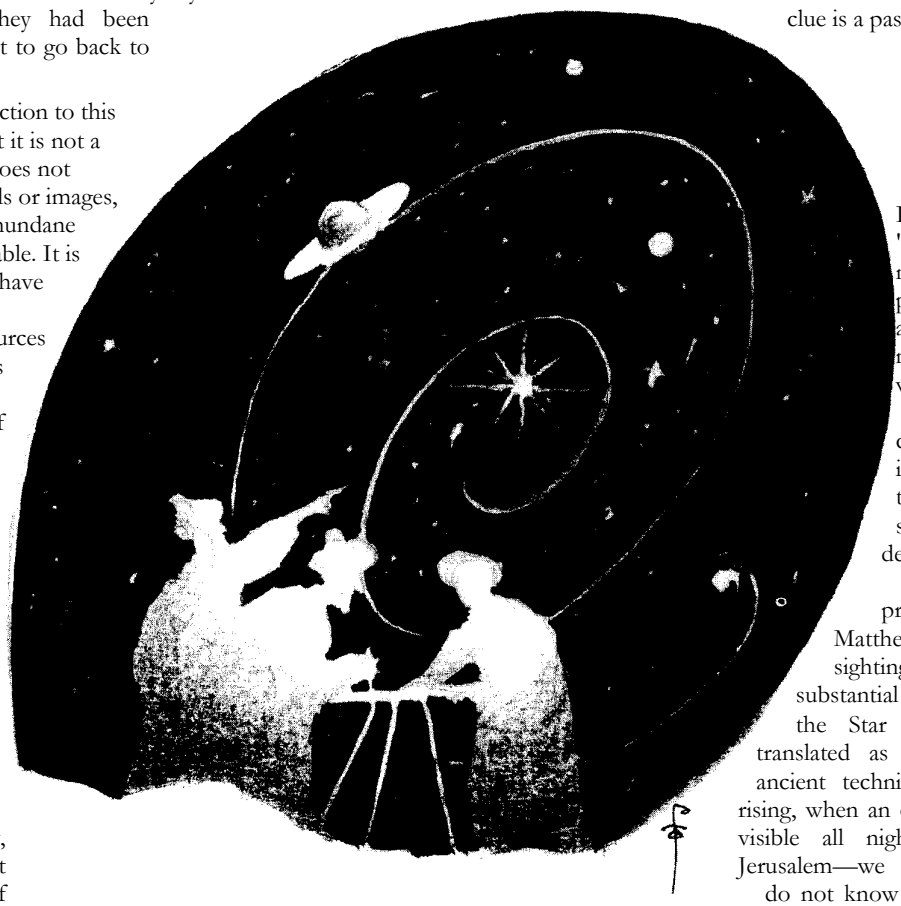
[1] My background is astronomy. I also took some fascinating courses in Biblical studies at Harvard Divinity School, but I do not pretend to be an expert of any sort. It also should be noted that I am not presenting any original research in this essay. Many scholars, including scientists, theologians, and historians, have studied the Star of Bethlehem.

After hearing what the king had to say they set out; there before them was the star they had seen rising, and it went ahead of them until it stopped above the place where the child lay. They were overjoyed at the sight of it and, entering the house, they saw the child with Mary his mother and bowed low in homage to him; they opened their treasure chests and presented gifts to him: gold, frankincense, and myrrh. Then they returned to their own country by another route, for they had been warned in a dream not to go back to Herod.

What is your initial reaction to this story? It seems to me that it is not a fabulous tale. That is, it does not conjure up fantastic details or images, and it is told in a rather mundane fashion, not at all like a fable. It is also the only account we have of it in our Bible. Later, various non-canonical sources did elaborate on it. Books like the Protevangelium of James and an epistle of Ignatius say this star was the brightest star in the sky, brighter than all other stars combined, even including the sun and the moon, which bowed down before it. But Matthew is very matter-of-fact.'



The Historical Perspective

To understand this story, we must view it in the context of its time.

Who were these Magi? Where did they come from? Magi is the plural of Magus, the root of our word magic; "court astrologer" is probably the best translation. "Wise men" is also a good term, descriptive of the esteem in which they were widely held. The group of Magi in question (it is the Christmas carol, not Matthew, that refers to three of them) came "from the east." They might have been Zoroastrians, Medes, Persians, Arabs, or even Jews. They served as court advisors, making forecasts and predictions for their royal patrons based on their study of the stars, about which they were quite knowledgeable. Magi often wandered from court to court, and it was not unusual for them to cover great distances in order to attend the birth or crowning of a king, paying their respects and offering gifts. It is not surprising, therefore, that Matthew would mention them as validation of Jesus' kingship, or that Herod would regard their arrival as a very serious matter.

When might these Magi have appeared in Judaea? Obviously, determining the story's date is important if we are to look for astronomical connections. We might assume that it was around 1 B.C. or 1 A.D., since that is when, by conventional reckoning, Jesus was born. But the calendar on which these dates are based was set by the Roman monk Dionysius Exiguus in the year 525 A.D., long after the fact. Scholars writing in the first and second centuries A.D. asserted that Jesus was born between what we now call 4 B.C. and 1 B.C. They were living much closer to the event and had access to thousands of historical records in many excellent libraries, and their opinions probably should be given much more weight than has been common.

How about the time of the year? The best clue is a passage in the Book of Luke:

> And there were in the same country shepherds abiding in the fields, keeping watch over their flock by night.

If the reference to "fields" is accurate not pastures or holding pens—we might guess at a date in late summer or early fall, for it was customary for farmers to allow sheep and cattle to graze the stubble in the fields following the harvest. This clue is suggestive, but hardly definitive.

One difficulty in seeking a precise date is the fact that Matthew reports two separate sightings, possibly separated by a substantial time. First, the Magi saw the Star rising *en anatole,* best translated as "rising in the east," the ancient technical term for an acronical rising, when an object rises at sunset and is visible all night. After they come to Jerusalem—we do not know how long that took, and there is no indication that the Star was in any way involved with the journey—they see the Star again as they travel the few miles to Bethlehem:

> There before them was the star they had seen rising, and it went ahead of them until it stopped above the place where the child lay.

There was no need for a bright or supernatural guiding light to find Bethlehem from Jerusalem; it lies just five miles south

2 It has been suggested that this is a commentary by Matthew, always fond of referring to Old Testament prophecies, on Balaam's oracle in the Book of Numbers that "a star shall come forth out of Jacob and a scepter shall rise out of Israel." It would be uncharacteristic of Matthew to refrain from pointing out this prophecy explicitly, had he had it in mind.

The Hebrew prophet Daniel, himself a member of the Magi, foretold that a king of kings would come forth from Israel. On the strength of this prophecy, the Roman emperor Nero was even advised to move his capital to Jerusalem.

on the main road. There is a reference not to the "house" of an infant *(brephos* in the Greek) but of *a paidion,* or toddler, indicating that some months may have elapsed since the birth itself.

What are the astronomical possibilities? This question has been asked many times since the Christian apologist Origen first raised it around 250 A.D. It is safe to say that every astronomical event known to have occurred during, say, the decade of interest has at some point been proposed as the Star of Bethlehem.

The key point to answering this question is to note that it is not just *any* astronomical event that is of interest. We can restrict our inquiry to those appearances that would have had astrological significance to the Magi, who declared:

> "We observed the rising of *his* star, and we have come to pay him homage."

An astronomical event may not have been very obvious at all; certainly it was not obvious to Herod. Had it been an incomparably bright object, as later writers thought, there would be numerous written records of it. It is much more plausible that the Star of Bethlehem went unnoticed by all but a few experts such as the Magi.

The Death of Herod

A major key to the chronology is the date of the death of Herod, who figures prominently in our story. Herod was alive when the Star of Bethlehem appeared and the commonly quoted date for his death is 4 B.C.4 Thus dates of 7 B.C. through 4 B.C. are often given for the birth of Jesus. The political events of this period are best known from the writings of Josephus Flavius, the Jewish historian who lived from 37 A.D. to about 95 A.D. His testimony has always been considered vital in determining these dates. But the accounts of Josephus and the entire history of this period have been reassessed recently, with important new results, by Ernest Martin, whose book, *The Star that Astonished the World,* has become the authoritative source on the subject.'

According to Josephus, on the night of a lunar eclipse Herod executed two rabbis. They were accused of inciting some young men to climb up on the wall and tear down the golden eagle that the king had ordered placed on the gate to the Temple in Jerusalem. This eagle was, of course, an abomination to the Jews because it was a graven image. Soon Herod himself died and was buried. One of his sons inherited his throne, shortly after which Passover was celebrated. It was long believed that the lunar eclipse in question occurred on March 13 in 4 B.C. But this was only a partial eclipse (40 percent total) and fairly hard to detect. And it occurred only 29 days before Passover. Here is what would have had to happen in those 29 days:

Herod was sick at the time of the execution of the rabbis and his condition worsened almost immediately. He was treated for a time by his physicians, to no avail. Herod then decided to pack up the royal household and move to Jericho to take the baths. He tried the baths unsuccessfully for some days and then returned to Jerusalem. Believing that he soon would die, Herod came up with a diabolical plan to insure that all of Israel would mourn his death, in spite of his unpopularity. He commanded the leading men from around the country to come to Jerusalem; there he imprisoned them in the Hippodrome and ordered the army to execute them as soon as he was dead. Israel would indeed mourn. (Fortunately, the order was not carried out.)

In the meantime, word arrived from Rome that Herod had the Emperor's permission to execute his rebellious son Antipater, and he promptly complied. Five days later he died, but not before decreeing that his was to be the largest funeral ever held in the history of the world. His body was embalmed. The army was assembled to carry his body in the funeral procession to a burial site some 25 miles away. The soldiers walked in bare feet, as was required when in mourning, traveling one mile a day. A legate from Rome, where word of Herod's death had been received, arrived to protect the royal treasury. Finally, Herod's son Archelaus was crowned king and had time to issue a few decrees prior to the celebration of Passover.

The 29 days between the eclipse of 4 B.C. and the following Passover simply do not allow enough time for all of this to have happened. A minimum of ten weeks would have been required. But on January 10, 1 B.C., there was a total lunar eclipse visible in Palestine, and it occurred twelve and a half weeks before Passover. As Martin points out, there are other compelling reasons to regard 1 B.C. as the true date of Herod's death. For example, the War of Varus, known to have followed Herod's death, can be redated to 1 B.C., where it fits the other known facts perfectly.

If we conclude that Herod did die in the spring of 1 B.C., we are free to add the years 3 B.C. and 2 B.C. to our search for the Star of Bethlehem. What was happening then? The year 2 B.C. marked the 25th anniversary of Caesar Augustus's rule and the 750th anniversary of the founding of Rome. Huge celebrations were planned. The whole empire was at peace. The doors of the temple of Janus were closed for only the third time in Roman history. To honor their emperor, the people were to rise as one and name Augustus *pater patriae,* or "Father of the Country." Now, getting the people of an empire to do something "spontaneously" requires a great deal of organization. And so an enrollment, or census, was ordered:

> In those days, a decree went out from Caesar Augustus that all the world should be enrolled....And all went to be enrolled, each to his own city.

This enrollment, described in the Gospel of Luke, which brought Joseph and Mary to Bethlehem, always has been a mystery since no regular taxation census occurred at this time. But the *pater patriae* enrollment fits perfectly.

The Astronomical Perspective

What astronomical events, possibly in the years 3 or 2 B.C., might have been related to the Star of Bethlehem? Novae have been suggested, the unexpected, sudden brightening of a star from invisibility into a bright object for a period of days or weeks. There is no historical record of such a nova, nor is it clear what a nova's astrological significance would be. Comets are candidates, for they appear sporadically, move, and even seem to point down to the earth. (This was Origen's choice.) But the recorded comets around

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The reference is to Herod the Great. It was his son Herod Antipas who executed John the Baptist and who ruled at the time of the Crucifixion.

[5] Ernest Martin, *The Star that Astonished the World* (ASK Publications, 1991). See also John Mosley, *The Christmas Star* (Griffith Observatory, 1987).

this time, even Halley's Comet in 12 B.C., were not very impressive; astrologically, they were considered ominous. Meteors and fireballs are even less likely candidates.

Conjunctions of planets have long been considered good possibilities. A conjunction is a close apparent approach between two celestial objects. Technically speaking, a conjunction occurs at the moment when both objects have the same celestial longitude; one is due north of the other. The closer the objects, the more visually impressive is the event and the more significant astrologically. In 3 B.C. and 2 B.C., there was a series of close conjunctions involving Jupiter, the planet that represented kingship, coronations, and the birth of kings. In Hebrew, Jupiter was known as *Sedeq* or "Righteousness," a term also used for the Messiah.

In September of 3 B.C., Jupiter came into conjunction with Regulus, the star of kingship, the brightest star in the constellation of Leo. Leo was the constellation of kings, and it was associated with the Lion of Judah. The royal planet approached the royal star in the royal constellation representing Israel. Just a month earlier, Jupiter and Venus, the Mother planet, had almost seemed to touch each other in another Close conjunction, also in Leo. Then the conjunction between Jupiter and Regulus was repeated, not once but twice, in February and May of 2 B.C. Finally, in June of 2 B.C., Jupiter and Venus, the two brightest objects in the sky save the sun and the moon, experienced an even closer encounter when their disks appeared to touch; to the naked eye they became a single object above the setting sun. This exceptionally rare spectacle could not have been missed by the Magi.

In fact, we have seen here only the highlights of an impressive series of planetary motions and conjunctions fraught with a variety of astrological meanings, involving all the other known planets of the period, Mercury, Mars, and Saturn. The astrological significance of these impressive events must surely have been seen by the Magi as the announcement of the impending birth of a great king of Israel.

September 11, 3 B.C., is perhaps the most interesting date of all. Not only was Jupiter very close to Regulus in the first of their conjunctions, but the sun was in the constellation of Virgo (of obvious symbolism), together with the new moon, in a configuration that fits a plausible interpretation of a passage in the Book of Revelation describing the birth of a male child who is to be the ruler of the universe. Significantly, September 11, 3 B.C., also marked the beginning of the Jewish New Year, traditionally regarded as the anniversary of Noah's landing after the Great Flood.

But if the planet Jupiter was the Star of Bethlehem, or was a component of the events that triggered the visit by the Magi, how do we view the final appearance of the Star on their journey to Bethlehem? It would have been in the southern sky, though fairly high above the horizon. Could it have stopped over Bethlehem?

The answer is yes. The word "stop" was used for what we now call a planet's "stationary point." A planet normally moves eastward through the stars from night to night and month to month, but regularly exhibits a "retrograde loop." As it approaches the opposite point in the sky from the sun, it appears to slow, come to a full stop, and move backward (westward) through the sky for some weeks. Again it slows, stops, and resumes its eastward course. It seems plausible that the Magi were "overjoyed" at again seeing before them, as they traveled southward, *His* star, Jupiter, which at its stationary point was standing still over Bethlehem. We do know for certain that Jupiter performed a retrograde loop in 2 B.C. and that it was stationary on December 25, interestingly enough, during Hanukkah, the season for giving presents.

What Room for God?

Where has this search for the Star of Bethlehem taken us? There has been much discussion in recent years about the "God of the gaps"—finding God in the gaps between the portions of some subject that we feel we understand scientifically. It seems to me that this is a dangerous position, for science by definition cannot admit to such gaps and must search continually to fill them with its understanding, and it often will succeed in so doing. Here the situation is different. The question is: What *meaning,* what room for God, do we find in the events that we know to have occurred?

If we have correctly identified the Star of Bethlehem, the science is clear and simple. Keplerian orbits of planets' are predictable, so that we can deduce quite accurately what the sky looked like two thousand years ago. Even the ancient Magi understood apparent planetary motions quite well. Predictions of the conjunctions of 3 and 2 B.C. were made 400 years prior to the birth of Christ, and they were in error by only a few days. There is no need to invoke God or divine miracles to explain what happened in the heavens above Judaea. Natural laws are sufficient.

> *"What meaning,* what room for God, d we find in the events that we know to have occurred?"

But is this kind of sufficiency really enough for us? The significant question raised here is not what happened, but *why* it happened. What does it mean? Was Matthew right in seeing this event as divine confirmation of a central moment in God's plan for mankind? What room is left for God, not as an agent filling in the gaps between what we can understand as physical causes, but as the creator of purpose? And was God's purpose fulfilled by the great celestial dance that we call the Star of Bethlehem?

These questions are examples of the kind of decisions we are faced with daily. No theologian can say, in a way convincing to a scientist, that some event required an act of God outside natural law. Similarly, no scientist can say that some event was *merely (a* dangerous word) an act of natural law working itself out with no other meaning. That is, no one is forced to believe that what happened in the heavens two thousand years ago was a simple, natural event devoid of meaning. The Star of Bethlehem is an excellent example of an event that occurs right at the intersection of Christianity and science, in a world created by a God who chose to institute natural laws but who nevertheless continues to carry out His own purposes. **4**

[6] Johannes Kepler (1571-1630) was the German astronomer who discovered the physical laws describing planetary orbits.