Dwight Hutchison

Article

Matthew's Magi Never Visually Followed a Star Anywhere, But …

Dwight Hutchison

As we move forward into new discoveries in the heavens, it is also important for Christians involved in science to seek clarity about our ancient scripture texts. Matthew's account of the Magi and the star has been misinterpreted for generations. The star resists attempts to be discovered. One can find dozens of interpretations and speculations. Have we understood Matthew's account in its proper context? Recent archeological discoveries concerning Babylonian astronomy may help us to reimagine the Magi and their famous star.

The ancients marveled concerning the skies. Astronomical studies were done over many centuries by the Babylonians, Greeks, Chinese, Mayans, and others. While the Hubble and Kepler telescopes have been exploring deep space now, archaeologists, mathematicians, and archaeoastronomers have been exploring the world's ancient astronomical history. Some of their research in recent decades may have a bearing on our understanding of several biblical texts.

At the present time, using astronomical software, it is possible to immediately know the present, past, and future positions, brightness, and periods of visibility of a myriad of heavenly objects. However, this knowledge has roots in the ancient world. Mesopotamian astronomers made a detailed observation of the heavens for at least a few thousand years. Originally, their efforts were connected with trying to understand messages from the gods, but as time progressed, the Babylonian astronomers went well beyond that which was necessary simply to "read" omens in the heavens.

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Matthew's account of the Star of Bethlehem largely remains an enigma. Several atheists and agnostics recently have pointed out problems with both modern and traditional explanations of the star.[1] In 2014, at least eighteen of the twenty-two academic papers presented at an international academic colloquium were either formally opposed to Matthew's account of the Magi's star or largely called it into question. Indeed, there are significant problems. Looking at some of the proposals concerning the famous luminous object, one can be sorely tempted to join ranks with the skeptics.

Recent Christian Scholarship concerning the Magi's Star

In 2015, Colin Nicholl published a book entitled *The Great Christ Comet: Revealing the True Star of Bethlehem.*[2] Nicholl has taught at Cambridge University, and he was a professor of New Testament at Gordon-Conwell Theological Seminary. His book was a technical marvel, describing a completely hypothetical comet/star. After an amazing spectacle, the comet/star supposedly was positioned toward the Judean horizon so that it pointed to a certain house in Bethlehem. A huge amount of work went into the book. No

fewer than seventeen Christian academics and other persons solicited by the publisher gave the theory positive reviews on the Amazon page dedicated to the book.

A significant portion of Nicholl's theory relied on a questionable interpretation of the woman in Revelation chapter 12. The text from Revelation should be read with Joseph's dreams in Genesis 37 in mind, not with astrological theories about Virgo. It is regrettable that Nicholl did not even mention the background text from Genesis in his theorizing. If he had done so, he might have developed his ideas in a different manner.

In addition, one of the most important failures of Nicholl's scenario was purely astronomical. This is surprising considering the help that he received from professional astronomers. The author did not seem to realize that a comet that would have appeared to be pointing toward a certain house in Bethlehem could not "guide" anyone. The comet/star would have been pointing to another house or houses if an observer had moved ten meters to the left or right. Any observer approaching Bethlehem would have seen the comet/star pointing toward possibly dozens of homes all along the road. How would one even have had the idea that the comet/star was pointing toward a certain house as the Messiah's location, either on the way to Bethlehem or in the town? How would the men have known on which door to knock?

Much more can be said, but Nicholl should be congratulated for his extensive efforts. He did try to give a viable answer concerning the star enigma. However, Nicholl would have probably done better to insist that the star was only a sign concerning the Messiah, rather than a visual guide pointing to the King.

Questions and Problems concerning the Magi's Star

1. The traditional view of the star involves a mysterious, miraculous star that visually goes ahead of the wise men from the East all the way to Jerusalem and on to Bethlehem. However, ancient astronomers were never known to visually follow stars at any moment. Modern astronomers still adhere to the wisdom of their forebears and never venture out at night to follow any luminous planet, comet, actual star, or the moon. Over the centuries, Matthew's account of the star has most likely been misread.

2. A major weakness of the supernatural theory of the star is found in its lack of an explanation for the eastern manifestation of the star. If the Magi saw a supernatural star above the Messiah's head when they arrived in Bethlehem, what was the star that they saw while they were in their homeland? Was it also supernatural? If it was supernatural, how did the men come to connect it with the Jewish Messiah? Did their knowledge of the heavens count for anything at all in the story?

3. One can ask other questions: How would these men have known that they were supposed to "follow" any star anywhere? The Israelites in the wilderness of Sinai had instructions to follow the "pillar of fire and cloud." Did the wise men receive instructions to follow the star? How did this happen? Many commentators speculate that only the wise men could see the supernatural star. This is also an assumption not spelled out in the text.

Did the Magi travel to Bethlehem from Jerusalem during the night? Greek-speaking John Chrysostom, in the late fourth century, conceived of the star as a brilliant angel that was brighter than the sun.[3] He thought that the wise men visually followed the "star/angel" in broad daylight from the East all the way to Jerusalem and then later on to Bethlehem. He also believed that only the wise men could see the star. Apparently, Chrysostom realized that people generally did not travel at night. Matthew's text does not indicate that the wise men went to Judea or Bethlehem at night, nor does it specifically say they traveled during the daytime. As is evident above, there are a number of unspoken and perhaps unprovable assumptions which underpin the several versions of the traditional miraculous view of the star.

4. Although it is widely acclaimed as a key text concerning the Star of Bethlehem, Balaam's prophecy in Numbers 24:15–19 says nothing about either a natural or a supernatural star over Bethlehem. The text refers to a bright shining leader, a star, who would "come out of Jacob" and "bash through the forehead of Moab." In the gospel account, we read nothing about the Magi's star or Jesus hitting Moab or anyone else. Despite what numerous commentators say

concerning Numbers 24:17, it tells us nothing about either a star seen by men in the East or one over Bethlehem. The best candidate for Balaam's star is King David, who did wage war on Moab, Edom, and other sons of Seth. David's exploits, recounted in 2 Samuel 8:1–15, are a clear fulfillment of Balaam's prophecy. There would have been no scriptural reason for Jews or magi (Babylonian, Persian, Median, or other) to be expecting a star to appear signaling the appearance of the Messiah. One has to find other reasons concerning why the Magi came to associate a star with the Jewish Messiah. Simon ben Koziba, who led the Jewish revolt in the AD 130s, became known as Simon bar Kokhba. Simon, "the son of the star," was associated with King David, not with Moses, Jonah, Ezekiel, or anyone else.

5. The God who is revealed in the Bible does not make his bed with pagan deities. It should be understood that formal or made-up pseudo-astrological explanations concerning the star should probably be excluded from a Christian understanding of the events. The Magi who went to Bethlehem did not receive revelation through occult means. The God of Abraham has never been known to act in such a way.

During the last decades, at least two influential Christians aligned pseudo-astrology with the birth of the Messiah. Both Ernest L. Martin and Fredrick Larson have insisted that the fairly spectacular June 17, 2 BC, evening conjunction of Jupiter and Venus, joining them together as "one," constituted "The Star." For them, the conjunction was symbolic of a "father god" and a "mother goddess" coming together to have a child (the Messiah of Israel, no less!). Their argument should have been rejected, yet literally thousands of Christians bought Larson's DVD or consulted Martin's website (this author included).[4]

Babylonian astronomy was the most influential in the East at the time of the Messiah's birth. According to Babylonian thought, Dilbat, the star of Ishtar (Venus), was a female fertility goddess in the morning sky. In the evening sky, Dilbat (Venus) was thought to be a male war god. In the Babylonian omen catalog we read, "If Venus enters Jupiter, then the king of Akkad will die, the dynasty will change …"[5] Unless Babylonian astronomers had a good reason to think otherwise, the famous conjunction in the evening sky would have signaled a male war god striking the king (symbolized by the king planet MUL.BABBAR/ Jupiter) and overturning his rule. The Babylonians would certainly not have imagined "a father god and a mother goddess" coming together to make a baby on June 17, 2 BC.

A Star Proposal

All Bethlehem star theories involve presuppositions and spoken or unspoken assumptions. Here are important points for the star proposal presented in this article:

- The star was a herald of the Messiah: it was not a guiding light. The wise men witnessed a celestial announcement about a great king. They never visually followed anything, anywhere, at any moment. The star was given to inform, not to guide. Like normal travelers, the wise men probably traveled only during the daytime.
- The star was a natural celestial object. The heavenly signs surrounding the Messiah's coming seem to have been arranged since the time of creation.
- The star was not the brightest heavenly object. It never had a tail. The star was not overly spectacular while it was manifest to the wise men in the East or above Judea.
- The star was symbolically significant, but it did not indicate the specific day or time of Jesus's birth. The star announced the coming of a messianic king. Above Bethlehem, the star affirmed the Messiah's presence in the town.
- The star became symbolic in a context involving other stars, planets, and the sun and moon. It was involved in a series of celestial events centered on kingship.
- The wise men arrived in Judea about a year and a half after the first celestial signs. The young Messiah was probably about one year old. The wise men were not present with the shepherds at the time of Jesus's birth.
- The wise men went to Bethlehem during the daytime, and, over a short period of possibly several days, they made a careful search in order to find the Messiah's family. The men presented their gifts in the context of a private home. Matthew's mentioning of the "house" concerns the private nature of the meeting. The mention of the house is

not meant to localize the star. (See Matt. 13:36–43; 17:24–27, as well as Matt. 17:19–21 and the parallel passage in Mark 9:28–29.)

Babylonian Magi

Men such as Origen, Jerome, and Augustine thought of the wise men as Chaldeans and not as Zoroastrian Medes or Persians. In fact, very little is known about the astronomy and astrology of pre-Sassanian Iran (that is, before about AD 250). The reputation of the Persian astronomers arose from their activities following the third century AD.[6] The only usage of the word "magi" in the Greek Septuagint text of the Hebrew scriptures is in the book of Daniel.[7] The magi in Daniel's context were almost certainly Mesopotamians, not individuals from the Iranian plateau. The words "magi and magus" had come to be applied to many different people by the time the Septuagint was written. Luke uses the word for a Jewish false prophet in the book of Acts.[8] Using the Septuagint version of the scriptures, it would not have been difficult for Matthew to think of the Magi who eventually arrived in Bethlehem as Babylonians.[9] The distinguished Professor Edwin Yamauchi has voiced his judgment in the pages of *PSCF*, that the wise men were Babylonians.[10]

Looking to the Past

Based on the wealth of new archaeological information that has become available, especially in the last thirty years, one could possibly make a new attempt to get fact-based answers concerning the Messianic Star. Who were the Magi in Matthew's account? What were they like? What did they know? The next section of this article will briefly attempt to answer some of these questions.

Still existing, well-organized cuneiform Babylonian astronomical texts detail events in the heavens from about 700 BC to AD 75, but regular records were probably kept for many additional centuries. In recent decades, a series of books has been published containing about 3,000 pages of original Babylonian astronomical documents (one-half of the pages are cuneiform transliterations and the other half are translations).[11] Hundreds of pages of other technical astronomical documents and omen texts still exist as well. Even so, at the present time, there remains only a small portion of the vast corpus of Mesopotamian astronomical and astrological literature. From their observations, the Babylonians were able to understand the solar, lunar, and planetary cycles. They developed procedures and record-keeping systems that replicated the cycles and allowed them to make accurate predictions of future celestial events.

Babylonian astronomers developed detailed astronomical almanacs that gave them much of the basic information which one can now find using a simple computer application. About five hundred pages of transliterations and translations of original cuneiform almanacs have been published in recent years. The following is a typical example from a portion of a Babylonian "Normal Star Almanac" from ancient Uruk for a portion of the Seleucid Era year 150 (162/161 BC).[12] The Seleucid Era is a dating system that was associated with certain successors of Alexander the Great who reigned over Syria, Lebanon, Judaea, and Babylonia. This dating system was used by the Babylonians and others. The year 150 of the Seleucid Era is the equivalent of the year 162/161 BC. (Beginning in the spring, Babylonian and Jewish years straddle two of our years.) The text was predictive, calculated well in advance of the events. Question marks and gaps in the text indicate damaged or unreadable portions.

> Month I, the 1st of which will be identical with the 30th of the preceding month. The 13th?, the first moonset after sunrise. The 27th, the last visibility of the moon before sunrise.
>
> Night of the 5th, the first part of the night, Venus 2 cubits above Alpha Tauri (Aldebaran). The … Saturn stationary in Sagittarius. Night of the 12th?, the first part of the night, Venus 2? cubits below Zeta Tauri. Night of the 13th, the first part of the night, Mars 2½? cubits above Alpha Tauri (Aldebaran). Night of the 17th, the first part of the night, Venus 1 cubit above Tau Tauri. The 18th, Venus will reach Gemini. The 19th, first part of the night, Mercury's last appearance in the west in Taurus. The 21st, first part of the night, Mars' last appearance in the west in Taurus. Night of the 23rd, the first part of the night, Venus 1 cubit above Eta Geminorum. Night of the 25th, the first part of the night, Venus 1 cubit above Mu Geminorum. Night of the 27th, the first part of the night, Venus 4? cubits above Gamma Geminorum (Alhena).[13]

Comments about the Almanac and Babylonian Scholarship

The sample text shows the detailed nature of the Babylonian predictions, indicating the positions of the moon and several planets for many months in advance. There were some errors, but the Babylonian astronomers often succeeded in their predictions. From the fifth century BC onward, the Babylonians could calculate their lunar calendar for many decades in advance without additional observations. Documents exist which demonstrate the specifically measured and projected times for new moons, the full moon, and the last visible moon. Also, beginning in the fifth century BC, the Babylonians divided the path of the sun, moon, and planets into twelve equal parts containing 30 degrees each, forming an unchanging sidereal zodiac. This division of the sky facilitated their calculations.

The synodic cycles of the planets are very prominent in Babylonian observational and predictive documents. One finds first and last visibilities of the planets, their stationary points, and their acronychal risings. In the almanac text above, the reader will note that Mars disappeared into the solar glare in the west during the first month (last visibility/heliacal setting). However, if one looks at the whole document, Mars's calculated position was specifically indicated during months II, III, and IV as it would pass from one constellation of the zodiac to the next, while it was still invisible in the solar glare. Mars was then projected to enter Leo on the third day of month V. The planet was expected to become visible again (a heliacal rising) in the eastern sky the day after entering Leo (the morning of August 4, 162 BC). The days when other planets would pass from one constellation to the next were also forecast. In addition, the Babylonians very often calculated lunar and solar eclipses accurately. In the same almanac, at the end of month V, the astronomers predicted a solar eclipse in Virgo, which would not have been visible in Babylonia. It was to happen during the night of the 29th day of the fifth lunar month (August 28, 162 BC).

In the last three centuries before Christ, Babylonian astronomers developed an advanced mathematical astronomy. In early 2016, Mathieu Ossendrijver, a researcher at the Humboldt University in Berlin, published a paper in the journal *Science* which describes one recently translated calculation tablet concerning Jupiter's daily displacement.

> … Babylonian astronomers construed Jupiter's displacement along the ecliptic during the first 60 days after its first appearance as the area of a trapezoid in time-velocity space. … These computations predate the use of similar techniques by medieval European scholars by at least 14 centuries. The "Oxford calculators" of the 14th century CE, who were centered at Merton College, Oxford, are credited with formulating the "Mertonian mean speed theorem" for the distance traveled by a uniformly accelerating body, corresponding to the modern formula $s = t \bullet (v_0 + v_1)/2$, where v_0 and v_1 are the initial and final velocities.[14]

However, the above comments may give the reader a false impression. In Babylonian planetary astronomy, the synodic phenomena themselves were of keen interest, but not necessarily the daily motion of the planets.[15] Various algorithms are attested in still-surviving Babylonian cuneiform documents for calculating the synodic phenomena of the moon, and all the visible planets: Mercury, Venus, Mars, Jupiter, and Saturn.[16] As we shall see, the synodic phenomena of one planet may be a major key to understanding the star that eventually appeared over Bethlehem.

The ancient discoveries concerning the lunar, solar, and planetary cycles still have a practical role in our everyday lives. The Babylonian astronomers measured time through water clocks (clepsydra). Their basic unit of measure of time/degrees was called an "uš"[17] corresponding to four minutes of our normal time or one degree. Each day the sun, moon, and planets seem to move because the earth turns one degree every four minutes: 24 hours = 1440 minutes or 360° of angular distance (1440 ÷ 4 = 360).

The genius of later Babylonian astronomy is found in a statement made by N. M. Swerdlow, a retired professor of the University of Chicago:

> The very foundation of Babylonian mathematical astronomy is the measurement not of position, but of time, of intervals of months and days between phenomena drawn from records of calendar dates, and visibility times in uš measured with a water clock. The Scribes understood perfectly well that the measurement of location was far less precise than the measurement of time. … It seems clear, in any case, that the measurement of rising and

> setting times in uš lies at the very foundation of both lunar and planetary theory.[18]

One marvels at the ingenuity of ancient astronomers. Few people would dream that Matthew's wise men could have been technically capable of doing the things mentioned in the paragraphs above. Boxed in by what is assumed to be the only possible literal reading of the text, most traditional Christian presentations concerning the Magi and the star make little or no connection with the Magi's astronomy or their wisdom. Mystical church plays and Christmas card images have more or less dictated the church's understanding of Matthew's wise men. But there may be a way of reimagining the wise men, who eventually arrived in Bethlehem, as real scholars and astronomers.

Dating the Messiah's Coming

For various reasons, which go beyond the central focus of this article, many Bibles, commentaries, and godly preachers in the last four centuries have used a 4 BC date for the death of Herod the Great. This dating was first proposed by a Polish monk named Laurentius Suslyga in AD 1605. Suslyga's ideas were founded on a series of logical assumptions, but some of his dating proposals have been seriously called into question in recent decades.[19] These complicated matters have been explored in depth elsewhere.[20] The writings of Emil Schürer are often presented as being among the most authoritative on the dating subject, but most traditional Christians would hardly agree with his fundamental assumptions and arguments.[21] One has to accept the reality that our knowledge of the ancient past is imperfect, and it is often shaped by unprovable assumptions and even speculation.

In the early centuries of the Christian era, almost all of the church fathers believed that Jesus was born sometime during 3 or 2 BC, in the 41st or 42nd year of the reign of Augustus Caesar. A small minority of modern scholars believe that Jesus was born during 3 or 2 BC and that Herod the Great died in early 1 BC. This article adopts more or less the dates of the church fathers. In addition, the oldest church traditions indicate that Jesus was conceived at or near Passover and was born in December or January. The ancient "Feast of the Annunciation" (Gabriel's announcement to Mary) is still celebrated at Easter (Passover). Could anyone imagine a more Jewish date for a conception event than Passover? However, it may be that the skies themselves hold keys for establishing more reliable general dates both for Jesus's birth and Herod's death.

The Star in the East

Identifiable Celestial Kingship Events in 3/2 BC

A key element in the star story involves the star in the "east." It has become popular in recent decades to equate the phrase "saw the star in the east," with an early morning first visibility of a planet, star, or comet as it comes out of the solar glare (a heliacal rising). The "heliacal rising" interpretation of the passage was first suggested by various northern European scholars about one hundred years ago.[22] Franz Boll (1867–1924), a philologist, was once regarded as the world's foremost expert concerning ancient astrology. He rejected the "heliacal rising" translation. In reality, Matthew gives us a nontechnical message; he was not an astronomer. Even though a heliacal rising may have been important to the Magi, the famous phrase probably means that the men saw something while they were in the East.[23]

In Babylonian terms, there were two main royal "stars." The first royal star of importance was the king planet, the so-called "white star" MUL.BABBAR (Jupiter). MUL.BABBAR, the planet/star of Marduk, who was head of the Babylonian pantheon, was associated with messages concerning the king of Akkad in the omen texts used throughout Babylonian history.[24]

The second royal star was LUGAL, also called Sharru (both words mean "king"), which is Regulus in the constellation Leo. The constellation of the lion was also seen as being royal. Several constellations and planets are mentioned repeatedly in Assyrian royal correspondence with Mesopotamian astronomers in the seventh century BC. However, LUGAL (Regulus) was the only individual fixed star that seems to have had central importance to the astronomers who corresponded with the king.[25]

Parthian rulers, who dominated Mesopotamia in the first century BC, issued coins containing a star with the crescent moon (fig. 1).[26] The image on all the coins almost certainly stands for Regulus and the

moon.[27] It is probable that all of Matthew's Magi carried with them coins with the images of Phraates IV and/or his son Phrataaces.

Figure 1. Coins containing a star with the crescent moon issued by the Parthian rulers, who dominated Mesopotamia in the first century BC. Used by permission from www.cngcoins.com.

A monument, known as the Lion Horoscope, found in funeral statuary at Mount Nemrut in southeastern Turkey, is very similar to the coins (fig. 2). The monument portrays the constellation Leo with the crescent moon just beside Regulus. The royal house of Commagene, which commanded the monument, had historical links to all the major royal dynasties in the region. Culturally, the biblical Magi probably would have had the habit of directly associating LUGAL and the moon with kingship.

Figure 2. A monument, known as the Lion Horoscope portrays the constellation Leo with the crescent moon just beside Regulus. Image from "Lowenhoroshkop," an 1883 photo by Carl Humann.

The Danish expert in ancient Mesopotamian astrology, Ulla Koch-Westenholz, gives some indication of the meaning of the presence of Jupiter and Regulus in relation to the moon. This may explain why the Parthian rulers had placed Regulus with the crescent moon on their coins. The presence of Jupiter was also positive in an association of the moon with Regulus.

> In general Jupiter is a harbinger of plenty and peace, except in close connection with the moon (except when eclipsed) when it portends the death of a king and strife in the land, unless it is identified with Mul.LUGAL (Regulus) in which case it brings long days to the king (SAA 8 283).[28]

MUL.BABBAR and LUGAL in 3 and 2 BC

Were there any events involving the royal stars MUL.BABBAR (Jupiter) and LUGAL (Regulus) that might have impressed ancient astronomers in 3 and 2 BC? What happened at the key moments of MUL.BABBAR's 399-day synodic cycle?

Synodic Cycle Sign 1

MUL.BABBAR (Heliacal Rising)—Late July 3 BC

In the summer of 3 BC, when MUL.BABBAR first visibly rose out of the solar glare in the east, the sun was in its annual conjunction with LUGAL. Babylonian astronomers had ephemerides tables and procedure texts which could have indicated the position of the sun in relation to LUGAL (fig. 3).[29] The coincidence of the two events was unique. MUL.BABBAR was more or less in this exact position only every 83 years. Because of MUL.BABBAR's orbit, the mornings of July 28 or 29 in 3 BC were the optimum times in all of Babylonian astronomical history for the coincidence of MUL.BABBAR's rising and the solar conjunction with LUGAL (see statistics in the notes).[30]

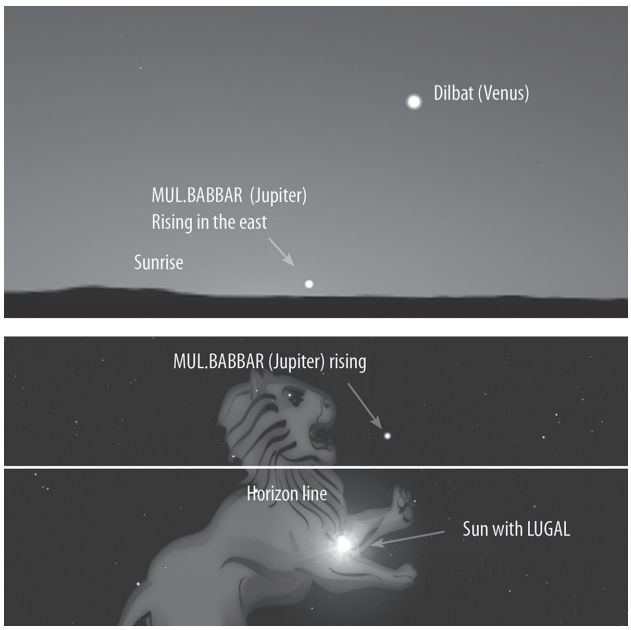

Figure 3. In the summer of 3 BC, when MUL.BABBAR (Jupiter) first visibly rose out of the solar glare in the east, the sun was in its annual conjunction with LUGAL (Regulus).

In Babylonian documents, the ideal rising time for MUL.BABBAR has been described. For example, on November 8, 142 BC, the astronomical diary entry reads: "The 22nd of the month, MUL.BABBAR's first appearance in Scorpius; it was small, the rising of MUL.BABBAR to sunrise: 11°30'" (11.5 uš = 46 minutes).[31] "Ideal first appearance on the 21st." (at 10.5 uš = 42 minutes).

On August 21, 109 BC, we read: "MUL.BABBAR's first appearance in Month V, Day 18, in Leo, rising of Jupiter to sunrise: 11 uš. Ideal first appearance on the 17th." (The previous day, it would appear that the ideal timing was about 10 uš.)[32]

The Almanac for the Seleucid Era year 150 in Month XII (see above) has MUL.BABBAR rising on March 24, 161 BC. From the sighting of the planet to sunrise there were about 10 uš.

The ideal rising in Leo seems to have been either 10 or 11 uš from the actual visual sighting of the planet to sunrise.[33] The planet would not normally have been visible for the first minutes after its rising above the horizon. However, a very bright planet like Jupiter certainly should have been visible within two lunar diameters or less from the horizon (within 1° of the horizon). See Babylonian historical statistics in the notes.[34] Below are the relevant facts for the 3 BC rising:

July 28, 3 BC, at Babylon[35]
Rising of MUL.BABBAR: 04:22:49 LMT (Local Mean Time)
Sunrise: 05:07:23 LMT[36]
Sun center from Regulus at sunrise: 0°31'

Rounding to the nearest minute, there were 44 minutes from MUL.BABBAR's rising above the horizon to sunrise. If one removes one degree to take into account MUL.BABBAR's invisibility toward the horizon, this leaves 40 minutes = 10 uš. On this day the sun was closer to Regulus than on the 29th.

July 29, 3 BC, at Babylon
Rising of MUL.BABBAR: 04:19:55 LMT
Sunrise: 05:08:06 LMT
Sun center from Regulus at sunrise: 0°40'

Rounding to the nearest minute, there were 48 minutes from MUL.BABBAR's rising above the horizon to sunrise. If one removes one degree to take into account MUL.BABBAR's invisibility toward the horizon, this leaves 44 minutes = 11 uš.

The two dates fall within the optimum dates for Jupiter's appearing according to Babylonian standards (statistics in the notes).[37] Ancient pagan astronomers in Babylonia would have understood that something symbolic had happened involving the king star and the king planet whether or not they had any other influences. The sun, known as Shamash in Babylonian thought, was associated with justice and truth. The sun appears to have been a positive celestial object except when eclipsed.

Synodic Cycle Sign 2

MUL.BABBAR's First Stationary Point—End of November 3 BC

On the day when MUL.BABBAR (Jupiter) had reached its first stationary point in Leo, the moon passed directly in front of LUGAL (Regulus) in an occultation (fig. 4). The royal symbolism is evident in that the moon was directly associated with the "king star" LUGAL at the same moment of the king planet's stationary point. Babylonian astronomers would have counted forward about four months from the heliacal rising to determine the date of the stationary point. They did not "eyeball" the station.[38] Counting about four months from July 28 or 29 one arrives in late November. The Babylonian dates were usually written with the first stationary point "around" a certain date in both their records and almanacs. The actual station was on the night of November 27/28.

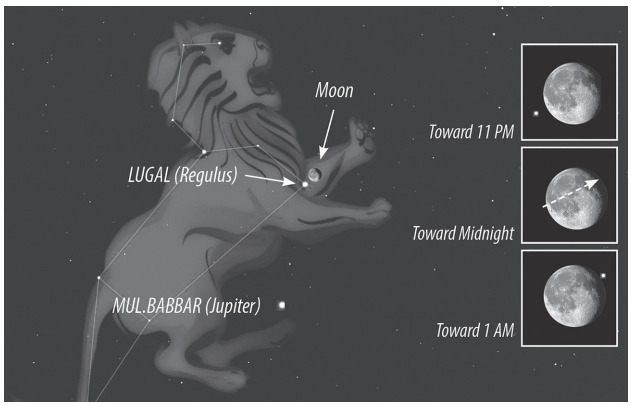

Figure 4. MUL.BABBAR's first station in Leo at the same moment as a lunar occultation of LUGAL.

According to one rough estimation, the coincidence of MUL.BABBAR's first station being in Leo at the same moment as a lunar occultation of LUGAL could

only happen about once in about 2,750 years.[39] Of course, this event brings to mind the Parthian coins and the lion monument. It was an obvious symbolic kingship event.

Synodic Cycle Sign 3

MUL.BABBAR's Acronychal Rising—January 2 BC

An acronychal rising of a planet or star is its last visible rising in the east just after sunset. Afterwards the object is already visible above the horizon in the eastern sky after sunset. The last visible acronychal rising was always several days before the true planetary opposition. It is impossible to actually see the planet rise above the horizon precisely at sunset.

In another segment of the zodiac away from Leo, the Babylonians added 58 days to the date of the first stationary point to get the acronychal rising date for MUL.BABBAR (fig. 5).[40] The planet's actual opposition was on January 26 in 2 BC. But January 24/25, 2 BC, was 58 days after November 27/28, 3 BC (First Station). The acronychal rising was often listed at about the time of true opposition (see the Late Babylonian Text—LBAT 1409).[41] However, according to Swerdlow, Babylonian procedural methods indicate acronychal risings at either 5°, 6° or 2° from true opposition, depending on the method which was employed.[42] The Babylonians usually listed the date of the acronychal rising as "around" a certain date. The Alcyone archaeoastronomy application, using an "arcus visionis" approach, gives the acronychal rising date as January 20, 2 BC.[43]

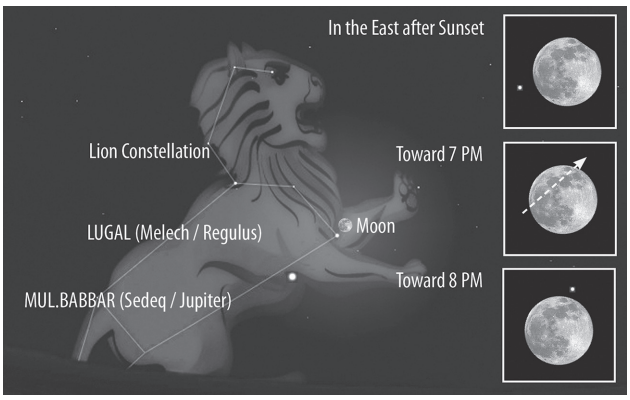

Figure 5. MUL.BABBAR's visible acronychal rising.

In the early evening on January 20, 2 BC, when seen from Babylon, the full moon passed in front of LUGAL again, making a second occultation in two months. January 20, 2 BC, could have been a possible candidate for MUL.BABBAR's visible acronychal rising.

Again, there was a clear connection to royalty through a simultaneous occultation and a possible acronychal rising. By this point, the men certainly could have been a bit puzzled about the meaning of the synodic cycle events.

Synodic Cycle Sign 4

MUL.BABBAR—Second Stationary Point—Late March 2 BC

MUL.BABBAR's second stationary phase was about four months after the first station. During its first and second stationary phase, the planet Jupiter is visually stationary for about two weeks. The Babylonians called the midpoint of that period the stationary point (fig. 6). Technically, Jupiter's second station was on March 29 in the spring of 2 BC. In their records and almanacs, the astronomers wrote the words "stationary around or about" a certain date. The station was calculated from the acronychal rising or the first station. In this case, the planet stopped its motion about 2.4 degrees west of Regulus.

Figure 6. The stationary point of MUL.BABBAR.

On March 31, MUL.BABBAR set in the west just moments before the moon rose in the east. Minutes later, Regulus set as the moon rose. Could this have been symbolically royal for Babylonian astronomers? Somewhat similar incidents involving simultaneous risings and settings of objects were occasionally mentioned in Babylonian astronomical records. They often spoke of "one god seeing another" when referring to similar incidents with the sun and moon. On March 31, 2 BC, the moon could feasibly have been associated with Jupiter's stationary phase.

Synodic Cycle Sign 5

MUL.BABBAR–Heliacal Setting—Late July, 2 BC

When MUL.BABBAR (Jupiter) finally made its heliacal setting in the west at the end of the planetary cycle, the sun was again in conjunction with LUGAL (Regulus) in the constellation Leo (fig. 7). This would have been about four months from the second station event. The optimum last visibility of MUL.BABBAR seems to have been about 10 or 11 uš after sunset (40 to 44 minutes after sunset).[44]

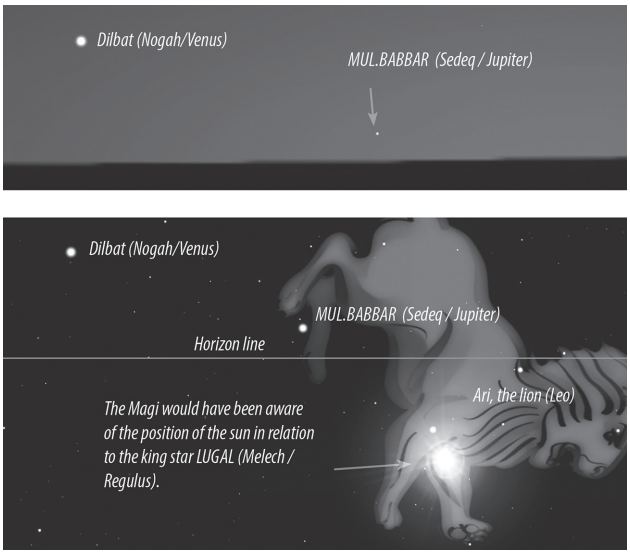

Figure 7. MUL.BABBAR made its heliacal setting in the west at the end of the planetary cycle, while the sun was in conjunction with LUGAL in the constellation Leo.

The events surrounding MUL.BABBAR's setting in 2 BC give almost a mirror image of the planet's rising one year earlier. The Alcyone archaeoastronomy application gives MUL.BABBAR's last visibility on July 28, if arcus visionis altitudes are the following: (MUL.BABBAR: +1° / Sun: -7°16').

July 28, 2 BC, at Babylon[45]
Sunset: 07:03:09 LMT[46]
Setting of MUL.BABBAR: 07:52:50 LMT
Sun center from Regulus at sunset: 0°21'
Sunset to MUL.BABBAR's setting = 50 minutes

If MUL.BABBAR was last visible at 1° above the horizon, it set six minutes later (50 – 6 = 44 minutes or 11 uš).

July 29, 2 BC, at Babylon[47]
Sunset: 07:02:33 LMT[48]
Setting of MUL.BABBAR: 07:49:34 LMT
Sun center from Regulus at sunset: 0°57'
Sunset to MUL.BABBAR's setting = 47 minutes

If MUL.BABBAR was last visible at 1° above the horizon, it set six minutes later (47 – 6 = 41 minutes or 10.25 uš).

Messianic Implications

All the above incidents involved the sun or moon as well as MUL.BABBAR and LUGAL. From a Babylonian perspective, there were royal implications to the extended series of unique celestial signs. These events could have been easily associated with the arrival of a truly great king. But such a series of events, all centered on MUL.BABBAR's synodic cycle, was unknown in their omen catalog. The men may have been surprised and questioning.

However, from a Jewish perspective, the incidents could have also called to mind the Messiah. It would not have been impossible for pagan Babylonians to become familiar with Jewish concepts. The Jewish community was large in Mesopotamia in the first century BC. Aramaic was the common language in the region. Also, scholars and many others would have spoken Greek. The Greek Septuagint text of the Hebrew scriptures would have been available for any who had questions about Jewish beliefs.

At some point in Jewish history, the planet Jupiter came to be called "Sedeq" (Tzedek) meaning "righteousness." The planet probably was commonly referred to by this name by about AD 200.[49] It would not be surprising that it carried the name in much earlier generations. The Jewish Messiah was spoken of as the "Righteous One" by early Christians (Acts 3:14; 7:52; and 22:14). This referred to the prophesied son of David, the righteous king of Jeremiah 23:5–6 and 33:14–17. Associating "Sedeq" with the king of the Jews would not have been difficult.

The Jewish equivalent of LUGAL was the word "Melech" meaning "king." One can see messianic implications by associating the two names Melech and Sedeq (the king of righteousness—Melchizedek). But in addition, LUGAL was in the lion constellation which evokes memories of Genesis 49:8–10 concerning the young lion of Judah and the rule of the Shiloh.

The messianic text of Psalm 89 also mentions the heavens several times. In the later part of the Psalm we read,

> … I will not lie to David. His descendants shall endure forever, and his throne as the sun before Me.

> It shall be established forever like the moon, and the witness in the sky is faithful. (Ps. 89:35–37)[50]

Here the enduring nature of the throne of David is associated directly with both the sun and the moon. Each of the five synodic events in 3 and 2 BC were associated with the sun and moon. In addition, remarkably, during two of the three conjunctions of MUL.BABBAR and LUGAL during this same cycle, the moon was positioned just beside the two "stars" on February 17, 2 BC, and May 9, 2 BC (fig. 8).

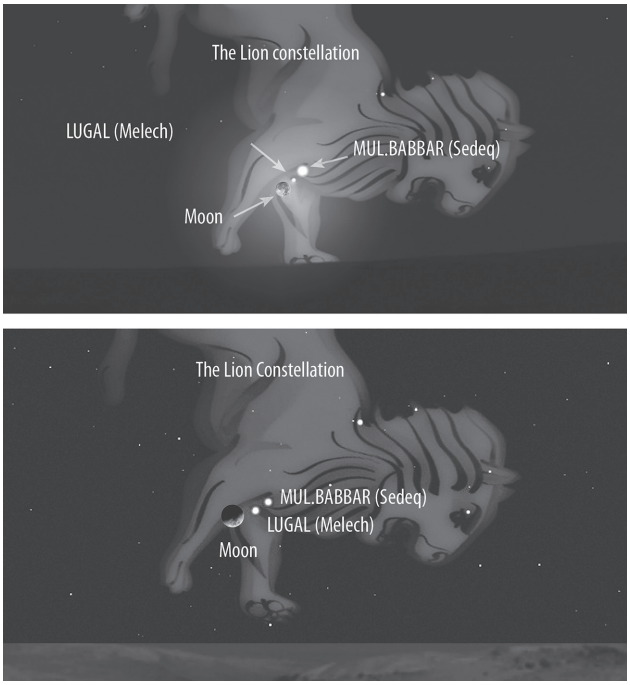

Figure 8. Moon positioned beside the two "stars." *Top:* February 17, 2 BC; *Bottom:* May 9, 2 BC.

In addition, during the relatively spectacular conjunction which visually united MUL.BABBAR (Sedeq/Jupiter) and Dilbat (Venus) on June 17, 2 BC, the full moon appeared in the east. The Jewish name of Dilbat is "Nogah," meaning "brightness." Sedeq and Nogah together evoke the "bright Righteous One" in the lion constellation beside the king star LUGAL (fig. 9).

By themselves the five signs connected to MUL. BABBAR's synodic cycle would have been enough to alert any Babylonian astronomer to the probability that something was happening concerning royalty. However, this series of events could have been supplemented by other celestial phenomena and symbolic associations. It may have been many

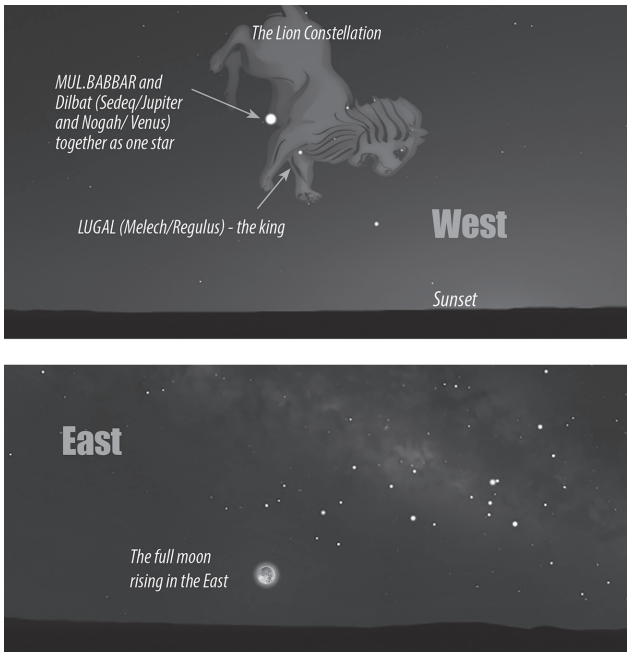

Figure 9. During the relatively spectacular conjunction which visually united MUL.BABBAR (Sedeq/Jupiter) and Dilbat (Venus) on June 17, 2 BC in the west, the full moon appeared in the east.

months before the astronomers came to the conclusion that the unfolding series of celestial events had something to do with the Jewish Messiah.

At the beginning, the Magi may have been complete pagans. However, the repeated and unique celestial signs, along with Jewish prophecy and royal symbolism, apparently convinced the men. A series of royal celestial signs all connected directly with the synodic cycle of MUL.BABBAR would have been completely unknown. Such a series is not found in the omen texts, but the royal nature of at least three or four of the synodic events is hardly disputable.

Based on this series of unique events, one could affirm that MUL.BABBAR (Sedeq/Jupiter), during this unique planetary cycle in 3 and 2 BC became the Messiah's Star.

The Star in the West—Rethinking the Key Text

Explanations of the Star of Bethlehem rise and fall based on the text of Matthew 2:9:

> When they heard the king, they departed; and behold, the star which they had seen in the East went before them, till it came and stood over where the young Child was. (NKJV)

In recent times, this passage has been interpreted to mean that the star went visually in front of the wise men from Jerusalem to Bethlehem. The eastern church fathers thought that the wise men had visually followed the star all the way from where they had been in the East to Judea and then on to Bethlehem. However, these ideas may not be what Matthew had in mind. In fact, the traditional interpretation of the text of the star as a visual guide may be profoundly in error. There may be an alternate literal reading of the text which can avoid the intellectual, scientific, and mystical puzzles of the traditional reading.

One way of understanding Matthew's text would be to look at other passages in Matthew, which use the same keywords. Matthew uses the Greek verb, προάγω (proago), with the specific meaning of "to precede" or "to go ahead of," in other passages in his gospel.[51]

In Matthew 14:22, we read: "[Jesus] made the disciples get into the boat and go ahead (προάγειν) of Him to the other side, while He sent the crowds away." Jesus then goes up on a mountain to pray and later meets the disciples on the sea. Jesus was not visually following the disciples at any moment, but he had simply sent them on ahead of him.

During the last supper, Jesus made the following statement: "But after I have been raised, I will go ahead of you (προάξω) to Galilee" (Matt. 26:32, see also Mark 14:28). After Jesus was raised from the dead, an angel appeared to some of his followers and said to them: "Go quickly and tell His disciples that He has risen from the dead; and behold, He is going ahead of you (προάγει) into Galilee, there you will see Him …" (Matt. 28:7, see also Mark 16:7).

It is clear that the disciples did not follow Jesus visually to Galilee after the resurrection in the same sense that one usually thinks about the wise men following the star. The disciples arrived chronologically in Galilee after Jesus already had arrived there. Jesus had "preceded" them there. In like manner, the star was waiting for the wise men upon their arrival in Bethlehem, just as Jesus later was waiting for the disciples. The star preceded the Magi to Bethlehem, but not as a visual guide. Matthew 2:9 simply sends the reader back to the East before describing the event in the West.

Bethlehem: A Possible Scenario

While the wise men were in their homeland, the star MUL.BABBAR (Jupiter), in association with other celestial objects, gave several symbolic indications that a great king was certainly arising. The men took this as an announcement about the king's birth. After having received the star's message, the wise men went to Judea. At every moment during their expedition, the men journeyed during the daytime like normal travelers. The way to Judea was well known. They were not looking to the star for visual guidance because the star's purpose had been to give a message. The star was a sign concerning the Messiah. It was not a guide.

Over a period of months, MUL.BABBAR came to be positioned well above the men's heads during a good portion of each night. In the days before the Magi arrived in Bethlehem, the star was near to the zenith in the nighttime skies. The Magi thought that the star had delivered its royal message while the men had been in the East. They were not expecting any other sign in the West. But after their arrival in Bethlehem itself, the men suddenly realized that the star was again in a symbolically significant position "above the place where the child was" (fig. 10).

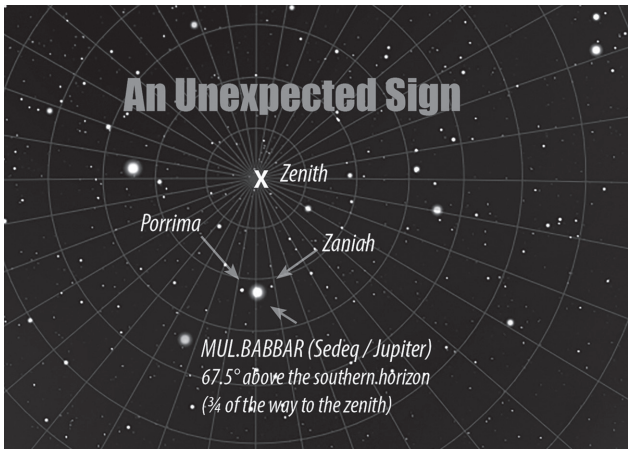

Figure 10. The star was in a symbolically significant position "above the place where the child was."

On the timeline presented here, the men would have unexpectedly arrived in Bethlehem in late December 2 BC. There would have been no reason that the men should have expected any other celestial signs. They never expected to arrive in Bethlehem. But considering their previous experience in the East, it would not be hard to imagine that Jupiter's stationary point on December 28, 2 BC, could have been symbolically meaningful to them.

Matthew's terminology about the star "standing over the place where the child was" is simply affirming that the star was present in the sky while the men were in the town, it having "preceded" them there. Matthew's terminology about MUL.BABBAR's "standing over" the town (and indeed all Judea in the latter part of the night) was not specifically an astronomical reference to the planet's first station.[52] However, in the context, MUL.BABBAR's first station could have been a symbolically significant celestial event for the Magi while the planet was located over Bethlehem.

While a relatively unspectacular planetary station is not at all impressive for modern skeptics or believers, symbolically it would have recalled the Magi's experience in the East. If MUL.BABBAR's first station was happening at the moment of their unexpected arrival in the town, the men certainly would have rejoiced, thinking that the planet's station was a heavenly sign.

Conclusion

The Messianic Star seems to have been connected to symbolic royal celestial events at the heart of Babylonian planetary science. The star was not discovered through the Babylonian omen catalog or their normal astrology. The star over Bethlehem was not spectacular. It was not necessary for the star to be overly luminous or visually remarkable. However, the star was symbolically significant. The wise men never followed the star anywhere visually, but the star was waiting for them upon their arrival in Bethlehem.

David's throne will indeed be established for ages to come, even as the sun and the moon have endured for ages past. The witness in the sky is faithful (Ps. 89:34–37). ☼

Notes

[1]Webpage https://buff.ly/2HNdDys provides an annotated bibliography of many star interpretations.

[2]Colin R. Nicholl, *The Great Christ Comet: Revealing the True Star of Bethlehem* (Wheaton, IL: Crossway, 2015).

[3]St. John Chrysostom, *Homilies on the Gospel of Matthew,* Homily 7: Matt. 2:4, 5, sections 3 and 4, http://www.documentacatholicaomnia.eu/03d/0345-0407,_Iohannes_Chrysostomus,_Homilies_on_The_Gospel_Of_Matthew,_EN.pdf, 89–92.

[4]Concerning the "father god and mother goddess" theme see Ernest L. Martin, *The Star That Astonished the World,* www.askelm.com/star/, chap. 4, paragraph six, "About the Real Star of Bethlehem"; F. A. Larson, *The Star of Bethlehem,* www.bethlehemstar.net/starry-dance/westward-leading/, first paragraph. I have no personal animus against either man. Martin has died; I wish Larson the best.

[5]Erica Reiner and David Pingree, *Babylonian Planetary Omens* (Groningen, Netherlands: Styx, 1998), 45. Akkad was a kingdom in the third millennium BC in Mesopotamia more or less equivalent to Babylonia.

[6]David Pingree, "Astronomy and Astrology in India and Iran," *Iris* 54, no. 2 (1963): 241.

[7]Daniel 1:20; 2:2, 10, 27; 4:7; 5:7, 11, 15.

[8]Acts 13:6: "… they came upon a certain magician, a Jewish false prophet named Bar-Jesus." ἄνδρα τινὰ μάγον ψευδοπροφήτην Ἰουδαῖον.

[9]It is almost certain that Matthew would not have been looking to Herodotus for any information about magi (Herodotus, *Histories* 1.101).

[10]Kenell J. Touryan, "Dating the Birth of Jesus from the Star of the Nativity," *PSCF* 65, no. 1 (2013): 71.

[11]Abraham Sachs and Hermann Hunger, eds., *Astronomical Diaries and Related Texts from Babylonia,* vols. 1, 2, 3, 5, 6, and 7 (Wien, Austria: Austrian Academy of Sciences Press, 1988–2014). One can access much of this material through: http://www.attalus.org/docs/diaries.html.

[12]Hermann Hunger, ed., and including materials by Abraham J. Sachs, *Astronomical Diaries and Related Texts from Babylonia, Vol. VII: Almanacs and Normal Star Almanacs* (Wien, Austria: Austrian Academy of Sciences Press, 2014), 61–63. The original published text has been somewhat modified for brevity and clarity. A cubit is a distance of about two degrees. Cubits were divided into 24 fingers. An astronomical finger was five minutes of arc in modern terms.

[13]For a limited time, the author is making a few pages of Sachs and Hunger's almanac for SE 150 (162/161 BC) available at https://buff.ly/2qiMf30. To translate the dates into Julian terms use the Babylonian calendar converter: www.staff.science.uu.nl/~gent0113/babylon/babycal.htm.

[14]Mathieu Ossendrijver et al., "Ancient Babylonian Astronomers Calculated Jupiter's Position from the Area under a Time-Velocity Graph," *Science* 351, no. 6272 (January 29, 2016): 482–84.

[15]N. M. Swerdlow, *The Babylonian Theory of the Planets* (Princeton, NJ: Princeton University Press, 1998), 35.

[16]Mathieu Ossendrijver, *Babylonian Mathematical Astronomy: Procedure Texts* (New York: Springer, 2012), 55–109, 207–333.

[17]uš is pronounced 'ush.'

[18]Swerdlow, *The Babylonian Theory of the Planets*, 52.

[19]Frederick M. Strickert, *Philip's City: From Bethsaida to Julias* (Collegeville, MN: Liturgical Press, 2011), chap. 12.

[20]W. E. Filmer, "The Chronology of the Reign of Herod the Great," *The Journal of Theological Studies* 17, no. 2 (1966): 283–98; Jack Finegan, *Handbook of Biblical Chronology*, rev. ed. (Peabody, MA: Hendrickson Publishers, 2015), 279–369—the entire section contains relevant material; Dwight Hutchison, *The Lion Led the Way*, 3rd ed. and expanded (St. Paul-Trois-Chateaux, France: Association Signes Célestes, 2015), 78–104, 298–332; James A. Nollet, "Astronomical and Historical Evidence for Dating the Nativity in 2 BC," *PSCF* 64, no. 4 (2012): 211–19—I do not agree with all of Nollet's ideas concerning the dating of the Roman

governors; Andrew E. Steinmann, *From Abraham to Paul: A Biblical Chronology* (St. Louis, MO: Concordia Publishing House, 2011), 219–56; and ___, "When Did Herod the Great Reign?," *Novum Testamentum* 51, no. 1 (2009): 1–29.

[21]Emil Schürer, *A History of the Jewish People in the Time of Jesus Christ* (Charleston, SC: BiblioLife, 2017), 399–427.

[22]Aaron Adair, "The Star of Christ in the Light of Astronomy," *Zygon* 47, no. 1 (2012): 16.

[23]Ibid.; and Courtney Roberts, *The Star of the Magi: The Mystery That Heralded the Coming of Christ* (Franklin Lakes, NJ: The Career Press, 2007) 120–21. There is at least one clear example from the end of the first century AD of "in the east" (Greek dative, singular) as a geographical area, not a heliacal rising, in the book of 1 Clement 5:5–6.

[24]See the example from Reiner and Pingree, *Babylonian Planetary Omens*.

[25]Simo Parpola, *Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal, Part II: Commentary and Appendices* (University Park, PA: Eisenbrauns, 2007), 420–22.

[26]Mithradates III and Orodes II ruled about 50 years before the birth of Christ. But Phraates IV (38–2 BC) and his son Phrataaces (2 BC–AD 4) ruled at the time of Jesus's birth.

[27]See also the Coins section of the website www.parthia.com.

[28]Ulla Koch-Westenholz, *Mesopotamian Astrology: An Introduction to Babylonian and Assyrian Celestial Divination* (København, Denmark: Museum Tusculanum Press, 1995), 121.

[29]Otto Neugebauer, *The Exact Sciences in Antiquity* (Mineola, NY: Dover, 1969), 121; Ossendrijver, *Babylonian Mathematical Astronomy,* 145; and Michael R. Molnar, *The Star of Bethlehem: The Legacy of the Magi* (Piscataway, NJ: Rutgers University Press, 2013). It should be noted as well that Molnar's entire star theory is built on invisible incidents which took place in the solar glare.

[30]See a table which demonstrates the relative uniqueness of these heliacal rising dates at https://buff.ly/2tzHYd0.

[31]Abraham Sachs and Hermann Hunger, *Astronomical Diaries and Related Texts from Babylonia, Vol. III: Diaries from 164 BC to 61 BC: Texts and Plates* (Wien, Germany: Verlag der Österreichische Akademie der Wissenschaften, 1996), 127. The eighth time is as follows: Jupiter rises (JR): 5:37:21; Sun rises (SR): 6:26:48. Difference = 50 minutes. Sighting took place at 1 US (50 minutes – 46 minutes = 4 minutes = 1 US). 46 minutes = 11.5 US. The seventh JR: 5:40:13/SR: 6:25:51. Difference 46 minutes = 11.5 US. Ideal at 10.5 US or 42 minutes.

[32]Ibid., 359. There is an error in the text. The dates should be the seventeenth and eighteenth of the fifth month, not the seventh and eighth. Earlier Jupiter was invisible, being only about 3 degrees from the sun.

[33]This seems to vary according to the planet's position in the zodiac, the angle of the rising, etc.

[34]The sun and moon are typically about 30 minutes of arc in diameter. The planet could be seen at about 1 US above the horizon. One can download a table with several recorded and estimated ideal risings of Jupiter at the following address: https://buff.ly/2XjTxTk.

[35]The numbers in Babylonian "time/degrees" (uš) are for Al-Hillah, Iraq (near ancient Babylon).

[36]Sunrise is here defined as the lip of the sun crossing the horizon.

[37]See a table which demonstrates the relative uniqueness of these heliacal rising dates at https://buff.ly/2tzHYd0. The Alcyone archaeoastronomy program, using "arcus visionis" concepts, gives similar results although MUL.BABBAR (Jupiter) would probably be visible one day later (the 30th) if one allows exactly one degree of altitude before sighting (default variable setting). At 0.99° of altitude, the planet should have been visible on the 29th, but visibility was unlikely on the 28th (default variable setting).

[38]Ossendrijver, *Babylonian Mathematical Astronomy*, 251, 257. In one part of the zodiac, not including Leo, Jupiter's station was calculated as 123 days from the heliacal rising. We no longer have the exact formula for the station in Leo.

[39]This rough statistical result is the least common multiple of the synodic period of Jupiter (11.86 years) and the lunar nodal period (18.6 years) = 11,029.8. But, also, the moon passes the ecliptic twice near Regulus in 18.6 years. Two stationary phases of Jupiter should fall in Leo every 11.86 years.

[40]Ossendrijver, *Babylonian Mathematical Astronomy*, 257. In their procedure texts, the Babylonians calculated synodic events differently according to Jupiter's place in the zodiac.

[41]Swerdlow, *The Babylonian Theory of the Planets*, 200–201.

[42]N. M. Swerdlow, "Acronychal Risings in Babylonian Planetary Theory," *Archive for History of Exact Sciences* 54, no. 1 (1999): 61.

[43]Result of using the "default variable" settings assuming the planet was visible at 1° above the horizon. The planet was 4°18' below the horizon when the sun was completely set. It was one degree above the horizon 30 minutes after sunset.

[44]For example, MUL.BABBAR's settings in the cuneiform document LBAT 1409 in 147, 146, 144, and 143 BC indicate settings from about 9 uš or less to 11 uš (sunset to the setting of MUL.BABBAR). The setting dates are often much less precise than the rising dates. The word "about" a certain date is often used in Babylonian documents.

[45]The numbers in Babylonian "time/degrees" (uš) are for Al-Hillah, Iraq (near ancient Babylon).

[46]Sunset is here defined as the top lip of the sun crossing below the horizon (sun completely hidden).

[47]The numbers in Babylonian "time/degrees" (uš) are for Al-Hillah, Iraq (near ancient Babylon).

[48]Sunset is here defined as the top lip of the sun crossing below the horizon (sun completely hidden).

[49]Sedeq was the name used by Abba Arikka (AD 175–247), also called Rav or Rab. See "Babylonian Talmud, Tractate Shabbat," www.come-and-hear.com/shabbath/shabbath_156.html#PARTa. (The reader should see Folio 156a and Shabbath 156b.)

[50]All Bible references unless otherwise indicated are from the *New American Standard Bible* (La Habra, CA: Lockman Foundation, 1995).

[51]In judicial contexts, the verb προάγω (proago) can also mean "to lead" individuals before authorities. It is used repeatedly in this sense in the book of Acts (12:6; 16:30; and 25:26).

[52]Babylonian documents often mention planets "standing" in particular locations during lunar and solar eclipses, meaning that the planet was present, it was located, or positioned in the sky during the event.