

The Magi's Star from the Perspective of Ancient Astrological Practices

Michael R. Molnar

Rutgers University, Department of Physics and Astronomy, Piscataway, NJ 08855, USA

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SUMMARY

The Magi's star is proposed to have been a pair of auspicious lunar occultations of Jupiter that signified to ancient astrologers the birth of a king. These events occurred in the zodiacal sign of Aries that symbolized Herod's kingdom during this era. The birth of Christ probably corresponded to the first lunar occultation on 6 BC March 20, that exhibited astrological attributes found in imperial horoscopes. One month later, a second lunar occultation of Jupiter in Aries coincided with the heliacal rising of Jupiter. This time the occultation took place in the general direction of Bethlehem with respect from Jerusalem which agrees with the Biblical account that the star "in the east" (heliacal rising) reoccurred and "stood over where the young child was".

1. A CHALDAEAN LEGACY

While many cultures practised interpreting omens, the Chaldaean form of astral divination was truly alluring because its application of mathematics provided a cloak of scientific respectability. Chaldaean astrology not only predicted celestial positions; what is more important, it purported to forecast omens which led people to believe that they could control their fate (1). Furthermore, its message of sidereal determinism partnered well with the fatalism of Stoic philosophy that enjoyed wide acceptance throughout much of the Roman world.

Augustus Caesar had publicized that his horoscope predicted a fate to rule the world (2). After he had defeated the last of his major opponents, Antony and Cleopatra, at Actium in 31 BC, Roman society was convinced of the predictive powers of astrology. For the next two centuries people's horoscopes would be scrutinized for imperial aspects which would either advance their lives or lead to their demise (3). The intrigue created by astrological prognostications concerning regal births would have far-reaching consequences throughout the Roman world, especially for Judaea.

Much has been written about the 'star' that coincided with the birth of Jesus Christ. According to the *Book of Matthew*, Magi, who were respected savants, came to tell King Herod of Judaea that there was an astral sign that portended the birth of a king in Judaea. Herod "was troubled, and all Jerusalem with him" by this news (4). The likely reason why no one around Herod understood the celestial event is that Chaldaean astrology was not practised among devout Jews (5). Further evidence that the Magi were referring to an astrological event rather than a visible astronomical one, is that Herod and his people did not know that a special star had existed. This

had to be an obscure, subtle event that was discernible only to those who were knowledgeable about astrology.

Although there are indications of a growing acceptance that the Magi's star was an astrological event (6), there has been up to now little progress to understanding what astrologers of Herod's time would have ordained as a sign of a regal birth in Judaea. The highly convoluted nature of astrological prognostications presents a formidable barrier to scholarly scrutiny. The reluctance, if not disdain, to study this pseudo-science as it was practised in ancient times has produced theories that are rationalized from the notions of a modern mindset. Although there have been some theories that extrapolated Renaissance astrology back to the time of Christ, the evidence is overwhelming that astrology since its inception in Babylon has changed over the centuries (7). Contemporaneous documents and records show that astrological events were nothing more than geometrical alignments that were usually invisible at their auspicious moment. Today, we find such celestial aspects uninteresting and dull; thus, we have conjured up visible celestial events that meet our modern expectations. However, we forget that from the perspective of the superstitious, ancient mindset, the mundane astral alignments were truly spectacular and awesome (8).

This research is unique in that it was serendipitous. The work focused on numismatic studies of astrological iconography on Roman coinage, and was not in pursuit of an explanation of the Magi's star. Nevertheless, the studies lead to two significant findings. The first is that the astrological symbol of Judaea was the zodiacal sign of Aries. This is where the Magi would watch for their star. The second finding is that lunar occultations were consequential. Once it was realized that these coins provided a key to the famous star, an astrological model was made that could be tested. This logical methodology avoided force-fitting an interesting astronomical explanation that would have to be justified *post facto* for its astrological and cultural relevance.

Since these findings were first announced, there has been even stronger corroborative evidence. The central star in this astrological theory, namely a lunar occultation of Jupiter, is now realized to have coincided with a heliacal rising that relates to the perplexing phrase, *in the east*. To strengthen this case, we will examine analyses of the astrological charts of contemporaneous Roman emperors who were known to possess imperial horoscopes. Also, we will discuss significant contemporaneous astrological commentaries concerning regal or imperial horoscopes. Because the numismatic research led to this work on the Magi's star, let us start with the coins.

2 THE COINS OF ANTIOCH

An examination of astrological iconography on colonial Roman coinage led to an interesting group from Antioch that depicts the zodiacal sign of Aries, the leaping ram looking backwards (9). The Romans struck these after deposing Herod's son, Archelaus, in AD 6, and incorporated his realm of Judaea, Idumaea, and Samaria into an enlarged province of Roman Syria. The obverse on these bronze coins shows the bust of the god, Jupiter. The reverse, shown in Fig. 1, displays a star over the ram which is interpreted as



FIG. 1. The reverse side of a bronze coin issued in AD 13/14 by Silanus, legate of Syria AD 11–17. The letters, ΔM , stand for 44 years after the battle of Actium. The obverse, not shown, is a bust of Jupiter.

commemorating an extremely close conjunction of Jupiter and Mercury in Aries on AD 7 April 18 (10). This conjunction coincided with the heliacal rising of Jupiter that was a truly auspicious event for ancient astrologers. After developing some ancient concepts, the significance of this astrological coincidence will be re-examined.

The date of the conjunction is near to when the Roman legate, P. Sulpicius Quirinius, was organizing the new provincial government with Antioch as its capital. Quirinius is believed to have issued the first of the Antiochene coins that depict Aries (11). It became evident that Aries symbolized, not Syria which was sometimes represented by Scorpius on coins, but rather, the lands relinquished by Archelaus. For Romans who exploited coinage for its propagandistic value, the conjunction and heliacal rising were most likely seen as a celestial manifestation predicting good fortune for Antioch and the annexation of Judaea (12).

The connection between Aries and Herod's realm is discussed in the *Tetrabiblos* of Claudius Ptolemy of Alexandria (c. AD 100–178). Astrologers had compiled lists of countries that were said to be controlled by certain zodiacal signs. According to Ptolemy, Aries ruled “Coelê Syria, Palestine, Idumaea, and Judaea” which comprised Herod's kingdom (13). He also asserted that Syria, which was separate and distinct from its southern neighbour, Coelê Syria, was controlled by Scorpius.

Although such astrological lists of ethnography changed over time, there is excellent evidence that Ptolemy's ethnographic list was contemporaneous with Christ's birth. The *Tetrabiblos* was written in c. AD 150; however, there are many indications that major portions of this work are based upon the writings of Posidonius (14) (c. 135–51 BC) who is largely responsible for



FIG. 2. The reverse side of a bronze coin issued in AD 128/9. The Greek letters E[T] ZOP are for the Caesarean Era, 177. The obverse, not shown, depicts Tyche (Fortuna). For 20 years Antioch issued no coinage until Hadrian visited in AD 129.

spreading astrology throughout the Roman world. The countries given in the *Tetrabiblos* agree very well with a list that is distinctive of Posidonius (15); thus, the list in the *Tetrabiblos* has origins in the first century BC.

A contemporary of Ptolemy, Vettius Valens of Antioch, also asserted that “Coelê Syria and its neighbours” are ruled by Aries (16). The boundaries of Coelê Syria varied, but definitely contained southern, interior modern Syria, east of modern Lebanon, down along the west bank of the Jordan River and included the Golan Heights and the Decapolis (17). Valens’ work on astrology, *Anthologies*, is believed to have been derived from Thrasyllus, Tiberius’ astrologer, but the structure of Valens’ ethnographic system is based apparently upon a work of Hipparchus (c. 150 BC) (18). Thus, we have an independent confirmation that during the centuries spanning Christ’s birth, astrologers claimed that Herod’s kingdom was symbolized by Aries. We conclude that Aries is the zodiacal sign that held the Magi’s star.

The second finding from the coins of Antioch is the significance of lunar occultations in Aries. While there is other numismatic evidence pointing to commemorations of near conjunctions and occultations that coincided with heliacal transitions (19), the coins from Antioch offer insight to important astrological events that are related specifically to Judaea. The first Antiochene coinage with Aries juxtaposed with a star was issued over a 4-year period that ended when Augustus Caesar died in 14 BC. During the reign of Nero, the use of Aries re-emerges for a 2-year period, but now the ram is looking at a crescent and star. This issue coincides with a glorious astrological event, a visible lunar occultation of Venus in Aries on AD 51 April 27. Almost 80 years later we find Aries again on the coins of Antioch with a star and crescent. This is shown in Fig. 2. During Hadrian’s reign there was a visible

lunar occultation of Jupiter in Aries on AD 125 October 27. At this time the imperial mint in Rome also issued silver denarii that depict a star held within the arms of a crescent Moon; below is Jupiter's celestial globe, the symbol of dominion. Hadrian was an astrologer and his issuance of imperial and provincial coinage indicates the astrological significance of the event that was similar to the occultations of Jupiter in Aries in 6 BC. Thus, we focus on the significance of a lunar occultation of Jupiter in Aries.

3 IMPERIAL HOROSCOPES

The astrology at the time of Christ's birth had its origins in Babylon; however, most scholars refer to it as Greek astrology (20). The conquests of Alexander the Great brought Greek and Babylonian sciences together. Before the use of Greek mathematics, Babylonian astrologers relied primarily on harmonic analysis that could only indicate that certain syzygies had a possibility of producing an eclipse. Now, as a result of the geometrical procedures of Hipparchus and others, astrologers had the capability to discern over a year in advance not only which of these would yield an eclipse, but also the magnitude and duration of the eclipse (21). With some Egyptian influence, the Greeks recast this Babylonian legacy in terms of their own culture. The planets and zodiacal signs were renamed and a new mythology was developed about them and the other constellations. It was this Hellenized form of astral divination that astrologers practised throughout the Roman empire where it was referred to as Chaldaean astrology. Astrologers were called Chaldaeans, mathematicians, or magi. By any name, their prognostications among a superstitious populace were formidable, especially in matters of regal births.

Although contemporaneous astrological sources are usually vague about regal horoscopes, there are discussions that reveal considerable information about this forbidden subject. Ptolemy briefly mentions the regal or imperial horoscope (22), and he is extremely cryptic. Valens reveals only a little more by noting a family of celestial aspects that have imperial qualities. At the end of the second century Antigonous of Nicaea discretely wrote a detailed commentary about the horoscope of an unnamed emperor who turned out to be Hadrian. This is perhaps the best primary source on the subject of the imperial horoscope. When we reach the fourth century there is a fairly open elucidation by Firmicus Maternus who describes imperial aspects at length.

The key to the Magi's star may very well lie in Firmicus' work, but such clues may lie buried beneath revisions and exceptions to ancient rules. By Firmicus' time, these changes were needed to justify the multitude of purported imperial horoscopes that Firmicus may have gleaned from the previous centuries. Nevertheless, we can find the key if we cautiously apply the discussions of Ptolemy, Valens, Antigonous and Firmicus to known imperial horoscopes that were close to the time of Christ. We will reconstruct the horoscopes of the emperors, Augustus Caesar (63 BC), Tiberius (42 BC), and Hadrian (AD 76).

This methodology presupposes that we can use only contemporaneous ancient practices because astrology had gradually changed over the centuries (23). The ancient astrological rules must not be reshaped to fit pre-conceived

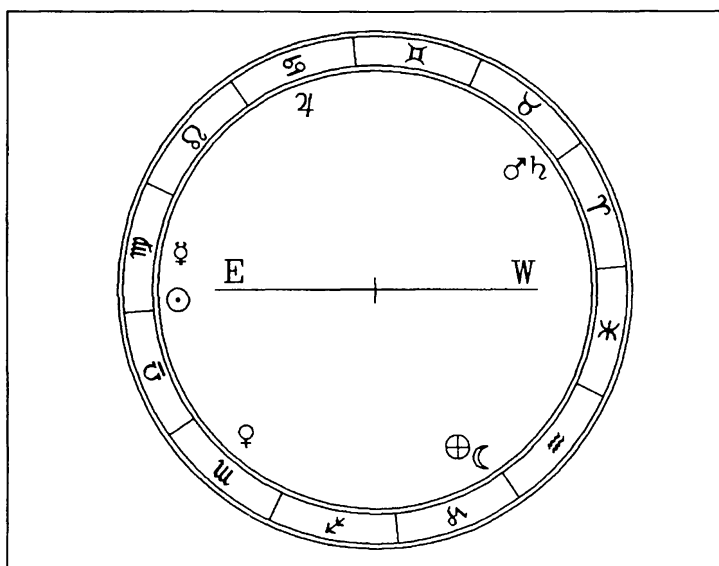


FIG. 3. In the horoscope for Augustus Caesar the Sun is immediately below the east (E) horizon which marks the ascendant. Jupiter is 'exalted' in Cancer, and the Moon is in conjunction with the Lot of Fortune in Capricorn which was Augustus' sign.

modern notions of what astrologers deemed as auspicious; thus, we reject 'rarity' and 'visible spectacles' as necessary conditions for astrological significance. Furthermore, we make the reasonable assumption that the Magi were practising the same form of Hellenized Chaldaean astrology as the rest of the Mediterranean world. Their regal star shares a common astrological denominator with the horoscopes of the Roman emperors.

The birth of Augustus Caesar on 63 BC September 23 is perhaps the epitome of imperial horoscopes because of the extensive attention that it had been given in the historical accounts (24). The senator and astrologer, P.Nigidius Figulus, learning the time of birth from Augustus' father, dramatically proclaimed before the Senate that "the ruler of the world is now born" (25). Firmly believing in his fate to rule the world as foretold by his horoscope, Augustus struck several coins that depict his natal sign, Capricorn, who holds the implements of world rule (celestial sphere), control of human events (rudder), and good fortune (cornucopia) (26).

Although Augustus's horoscope has been lost, reconstructing it was possible (27). His astrological chart is shown in Fig. 3. From the viewpoint of an astronomer the planetary arrangement is unimpressive, but it was extremely providential for ancient astrologers because Jupiter was precisely at its *exaltation* in the fifteenth degree of Cancer (28). This location made Jupiter's astrological effects omnipotent, which in turn increased the magical power of other astral bodies that occupied the Chaldaean terms of Jupiter (29). The terms in ancient astrology were subdivisions within a sign, four to eight degrees wide (30), that a planet controlled and shared power through 'mutual reception'. Augustus' chart shows that the Sun, Moon, Venus, and the ascendant were in the terms of Jupiter which means that their magical powers were greatly enhanced (31).

Capricorn was Augustus' natal sign because it was occupied by the Moon (32, 33) but what is more important, it also held his Lot of Fortune, ⊕, that

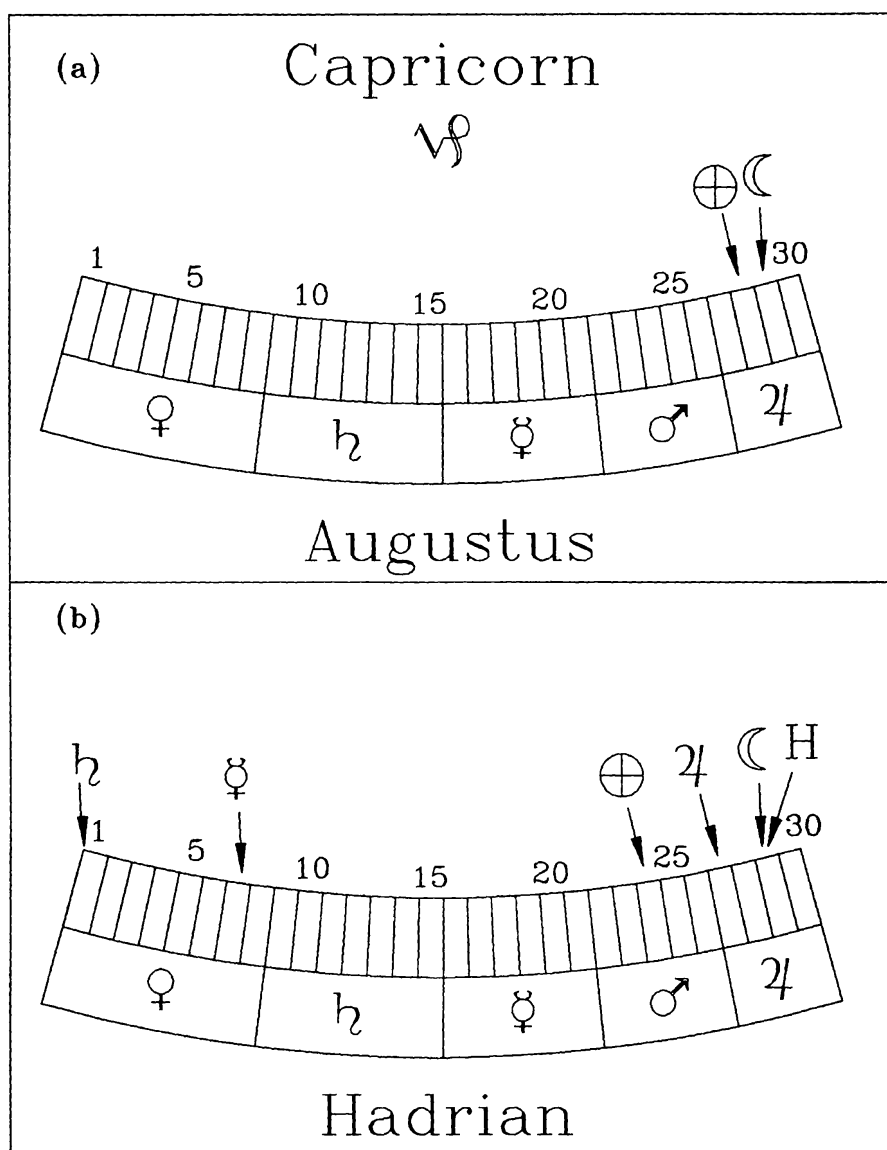


FIG. 4. The sign of Capricorn for Augustus (a) and Hadrian (b) showing the location and importance of the terms of Jupiter.

determined the “quality of life and length of life, material fortune, and inheritance” (34). The Lot of Fortune was a pure mathematical construct: take the longitude from the Sun to the Moon and measure the same angular direction from the ascendant to the Lot of Fortune (35). Ptolemy referred to this as a lunar ascendant and gave it importance that equalled the Sun, Moon, and ascendant (36). The mathematical definition varied slightly among astrologers, although Ptolemy’s method gives the same result for Augustus’ chart as other methods (37).

Together, the Moon and Lot of Fortune were in the terms of exalted Jupiter which made a horoscope even more auspicious according to Ptolemy and Firmicus (38). Figure 4a illustrates this astrological alignment for Augustus’ sign, Capricorn. There is a section in Firmicus’ *Mathesis* that refers to this rare astrological configuration and concludes that it makes

“emperors whose rule extends throughout the whole world and whose power is so great that it approaches that of the gods” (39). It is highly likely that Firmicus was referring specifically to the archetypal imperial horoscope of Augustus. Thus, we can appreciate why astrologers such as Theogenes of Apollonia prostrated themselves before Augustus (40). From this horoscope we can conclude that Jupiter, its exaltation and terms, the Moon, and the Lot of Fortune were the primary reasons for this auspicious horoscope.

Hadrian, born on AD 76 January 24 also had a significant chart that was first noticed by his great-uncle. This auspicious horoscope was confirmed by another astrologer when Hadrian went to Lower Moesia (41). The reconstruction of Hadrian’s horoscope revealed that Jupiter was not exalted as it was for Augustus; nevertheless, Jupiter was in its second best position that was within its own terms (42) and, perhaps by coincidence, in the sign of Capricorn. The Moon was in conjunction with Jupiter and in the terms of Jupiter within Capricorn. This zodiacal sign is illustrated in Fig. 4b and is strikingly similar to Augustus’ sign in Fig. 4a. Although Jupiter was not physically present in Capricorn for Augustus, Jupiter’s influence was present by way of its terms that were believed to be omnipotent because the planet was exalted.

Hadrian’s horoscope was described by a late second century astrologer, Antigonous of Nicaea (43). Neugebauer and Van Hoesen found that Antigonous’ celestial positions were slightly off (44). This small error masked the obvious similarity with Augustus’ chart. Nevertheless, Antigonous wrote unequivocally that the primary reason Hadrian received the ‘proskynesis’, the ceremonial prostration due to a king, was the influence of Jupiter. In particular, Antigonous emphasized that Jupiter was to have a heliacal rising in 7 days; the Moon was on the ascendant; the Moon and Jupiter were in conjunction; both were in the horoscopol sector (the first house); and that the Sun was ‘attended’ by them, i.e. nearby in an adjacent sign. Antigonous did not mention the Lot of Fortune, but as indicated in Fig. 4b, it was in Capricorn, and according to Ptolemy’s method, it yields a configuration for this zodiacal sign that is analogous to Augustus’ horoscope.

Antigonous stressed the importance of Jupiter’s heliacal rising. According to Firmicus, the heliacal transition of Jupiter from the evening to morning (west to east) sky was complete when its rising preceded the Sun by 12° (45). The *Tetrabiblos* also gives 12° as the astrological value, but in his astronomical treatise, *Almagest*, Ptolemy claimed it was precisely $12\frac{3}{4}^\circ$ (46). A star becomes visible at its heliacal rising, but this is not always the case for a planet whose first visibility depends largely on the inclination of the path of the rising Sun with respect to the horizon. The canonical value of 12° is approximately the minimum angle for Jupiter’s first visibility. This fixed angle was used by ancient astrologers as a convenient method to define heliacal rising regardless of the Sun’s inclination. For example, Antigonous said that Jupiter was to have a heliacal rising 7 days after the birth of Hadrian on January 24. Jupiter was close to 12° from the Sun on January 31 which corroborates 12° as the canonical heliacal angle for Jupiter. Nevertheless, Jupiter would not become visible in the morning skies until February 13, almost 2 weeks after its heliacal rising and 3 weeks after Hadrian’s birth (47).

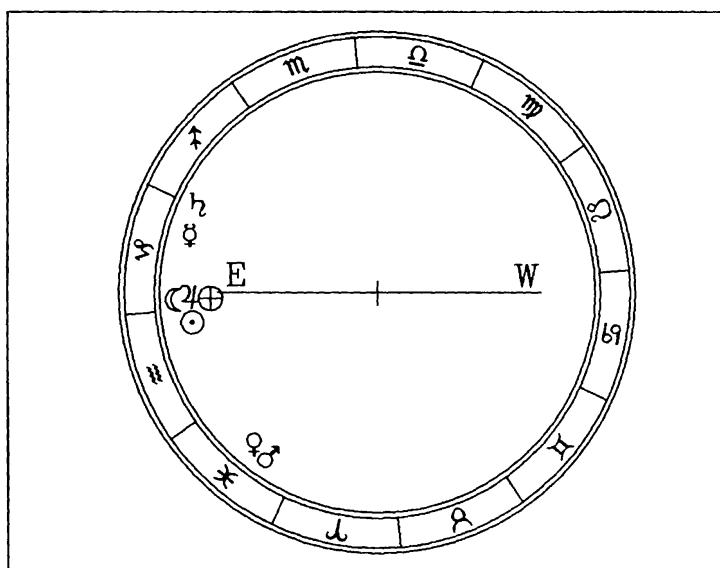


FIG. 5. The horoscope of Hadrian.

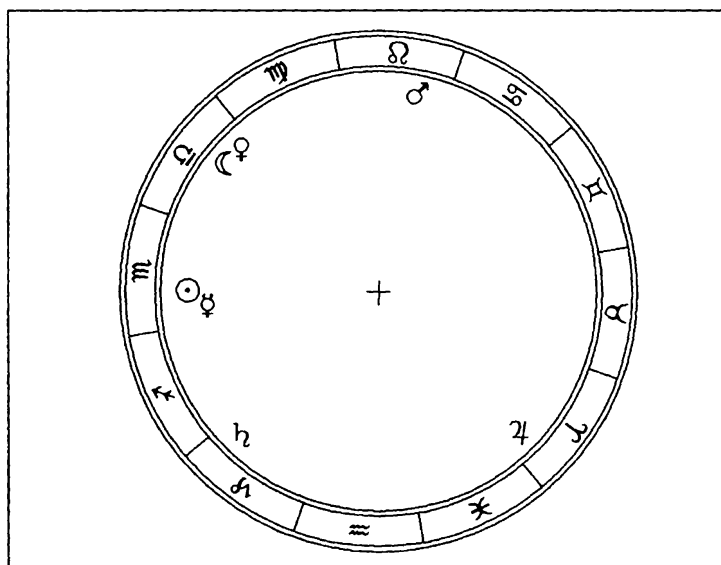


FIG. 6. The horoscope of Tiberius does not show the horizon because the time of birth is not known.

The importance of the heliacal rising was not the planet's astronomical visibility which followed, but rather its astrological effects in passing to the east sky. At its heliacal rising a planet was said to become matutine, morning rising or morning phase, which is when Jupiter was believed to be the most influential. This magical power was present regardless of whether the planet was visible: visibility was not a consideration in horoscopes. According to Antigonous, having Jupiter even *close* to its heliacal rising was important.

Antigonous also claimed that the Moon in conjunction with Jupiter was another extremely important aspect in Hadrian's horoscope (see Fig. 5). Valens noted that aspects between Jupiter and the Moon led to "masters of the world" (48). Firmicus, too, supported Antigonous' view that this

indicated “the greatest good fortune” and “infinite riches and ... prosperity” (49). He repeated the prognostication for being “fortunate, famous, and rich...master of great estates and wide possessions” (50). Perhaps, most significantly, Firmicus said that the waxing Moon moving towards conjunction with the Sun where Jupiter is “in aspect in any way” predicts “imperial power” (51). Thus, we can see the importance of the Moon’s relationship with Jupiter.

Another significant astrological configuration was the role of the cardinal points or first angles: ascendant, mid-heaven (*medium caelum*), descendant, and the lower mid-heaven (*imum caelum*). Astrological commentaries regularly made references to these points (52). Astrologers always examined how the luminaries and planets related to these locations directly and through the system of houses (53). For example, Antigonous noted several times that Hadrian had the Moon on the ascendant, and that the Moon and Jupiter were in the first house, the horoscopol sector. We will return to these astrological configurations.

The other imperial horoscope belongs to Tiberius, whose birth is established as 42 BC November 16. His mother, Livia, who was later to marry Augustus Caesar, was assured by the astrologer, Scribonius, that her son was destined for supreme powers, a refrain echoed later by Tiberius’ friend and astrologer, Thrasyllus (54). Because we do not have the time of birth, we cannot establish the positions of the cardinal points and Lot of Fortune. Only the locations of the celestial bodies in the zodiac can be examined; thus, this horoscope shown in Fig. 6 is less informative, but still useful.

The primary feature that Tiberius’ chart has in common with the preceding horoscopes is that Jupiter was in its own terms, but within Aries. Tiberius’ chart shows that Jupiter in Aries formed one side of a triangle with Mars in Leo, which is a very good omen. Jupiter ‘in trine’ to Mars was held to indicate “high imperial position, highest government office” (55). Also, the Moon was in opposition to Jupiter, a potentially good aspect that depends on its relation to the cardinal points (56). Nevertheless, it is highly likely that astrologers such as Thrasyllus saw much more, but that will remain a mystery.

From three imperial charts we see that there is no canonical configuration for a regal birth. Rather, there is a family of aspects that emphasize Jupiter, its terms, its relationship to other bodies and the cardinal points, and its heliacal rising. This planet’s significant role in offering the royal purple should not be surprising in view of the high mythological importance that Jupiter held in the Greco-Roman pantheon (Marduk for the Babylonians). The other important celestial body is the Moon whose presence amplifies the astrological effects of Jupiter. In Augustus’ horoscope we find the Moon occupying the terms of exalted Jupiter (a ‘conjunction’ through mutual reception); Hadrian had Jupiter and the Moon in conjunction on the ascendant; and Tiberius had them in opposition. From these horoscopes we can conclude that the regal star would involve Jupiter in an important astrological aspect with the Moon.

4 THE MAGI'S STAR

We have seen that astrologers were most likely watching the zodiacal sign of Aries for portents related to Herod's kingdom. The Magi's star had to be Jupiter drawn within Aries in an event that was dramatic from the perspective of an ancient astrologer. The event would involve more than the presence of Jupiter in Aries that happened every dozen years. The Moon also played an important role in imperial horoscopes. A conjunction between Jupiter and the Moon was the most powerful aspect between these celestial bodies. Although conjunctions were held to be auspicious, there was one, in particular, that stood above all. This was a special and very rare case of the lunar conjunction, namely, the lunar occultation that is signified by a star and crescent. A lunar occultation was the consummate astrological event because the closeness of a conjunction determined the degree of importance (57).

Neugebauer noted that the historical records reflect a wide concern for occultations and near conjunctions (58). This fact is evident from another source, namely the record provided by ancient numismatics. The coinage of the Roman imperial and local provincial mints were exploited for purposes of political and moral propaganda. Interspersed among standard mythological themes are astrological motifs such as the zodiacal signs and astral symbols that include the crescent Moon with a star within its cusps, a symbol of an occultation (59). Although individual stars, crescents, and crescents with a star were used as mint marks, these also served as primary themes on coins issued under Augustus and especially Hadrian who was a practising astrologer. The numismatic record supports Neugebauer's observation that occultations were a focus of attention.

Before a search was made for plausible celestial events, the astrological aspects that would constitute the Magi's star were defined. Unlike many other explanations of the star that are spectacular astronomical phenomena such as close conjunctions, novae, comets, and so forth, the following astrological model was made:

- (1) A lunar occultation of Jupiter occurred in Aries which signified the birth of a king in Herod's kingdom;
- (2) Mars was present in Aries (not occulted by the Moon) because Ptolemy claimed that Mars ruled the countries under Aries (60). The other planets would play no significant role;
- (3) The occultation of Jupiter was difficult or impossible to see (an astrological event), and thus went unnoticed by Herod and the people of Jerusalem. The Magi as typical astrologers had perceived the event through their calculations (61); and
- (4) There was another lunar occultation of Jupiter in Aries because the Magi praised the star's reoccurrence.

The estimated time of Christ's birth has been developed adroitly by Hughes (62). To test this model, the period 10 to 1 BC was selected because it covers most estimates. The consensus is that 8 BC marks the tax enrolment of Augustus Caesar and 4 BC is the death of King Herod. The following was found.

On 6 BC March 20, (March 18 Gregorian Calendar) 1 min after sunset in Jerusalem the Moon occulted Jupiter while in Aries. Mars was also present in Aries about $7\frac{1}{2}^\circ$ above the Moon and Jupiter. The occultation ended half an hour later almost on the horizon. Although this significant astrological event was hidden by the bright sky, the evidence is that the astrologers had mathematical skills to indicate that there was an occultation; this will be discussed below. The top half of Fig. 7 illustrates the important astrological events in Aries. The first three requirements of the model were satisfied, as were the following significant astrological aspects gleaned from the imperial horoscopes.

- (1) Jupiter was in its own terms of Aries identically to Tiberius. Augustus and Hadrian also had Jupiter in its own terms, but in Cancer (where it was exalted) and in Capricorn, respectively.
- (2) The Lot of Fortune was in conjunction with the Moon similarly to Hadrian and in Jupiter's terms identically to Augustus. This fulfils Firmicus' prerequisite for a phenomenal regal chart: "power...of the gods".
- (3) The occultation, a magically powerful conjunction, occurred near one of the cardinal points, the descendant, which is analogous to Hadrian who had a conjunction on the ascendant.
- (4) The Sun was 'attended' by Jupiter and the Moon (nearby but in next sign) which Antigonous noted as very significant for Hadrian's horoscope. Ptolemy also noted this important aspect in regal horoscopes (63).

The fourth requirement was also met, but revealed some unanticipated results. The astrological event repeated after only one month. This is contrary to most theories that expect a long interval between occurrences to allow time for the Magi to travel to Jerusalem purportedly from Babylon even though there is no evidence for a long journey or origins in Babylon (64). On 6 BC April 17 the Moon, having swung around the sky, returned to Aries and repeated the occultation of Jupiter. This happened a little after local noon when Jupiter was in the southwest sky. Thus, the second occultation could only be detected through the mathematics of astrologers. The lower half of Fig. 7 shows the location of the celestial bodies during the second occultation which reveals another important event. A few hours earlier that morning, Jupiter underwent its heliacal rising; it was 12° from the Sun (65). However, there is the question whether astrologers could be aware of such invisible events.

Neugebauer has shown that many astrological records from this time were not observations but calculations of daily events that were obscured by daylight or below the horizon (66). There is insufficient information about how far in advance astrologers made predictions, but it is evident that they did anticipate important events and tracked them close to their occurrence to ensure that they happened. Cicero wrote that eclipses were predicted "for many years in advance" by people using mathematical means (67). However, planetary motions were less predictable because of the Earth's motion that induced retrograde motion and wildly affected planetary positions. The occultations of 6 BC were not complicated by retrograde motion and, because they occurred near the heliacal setting and rising, it was possible to determine

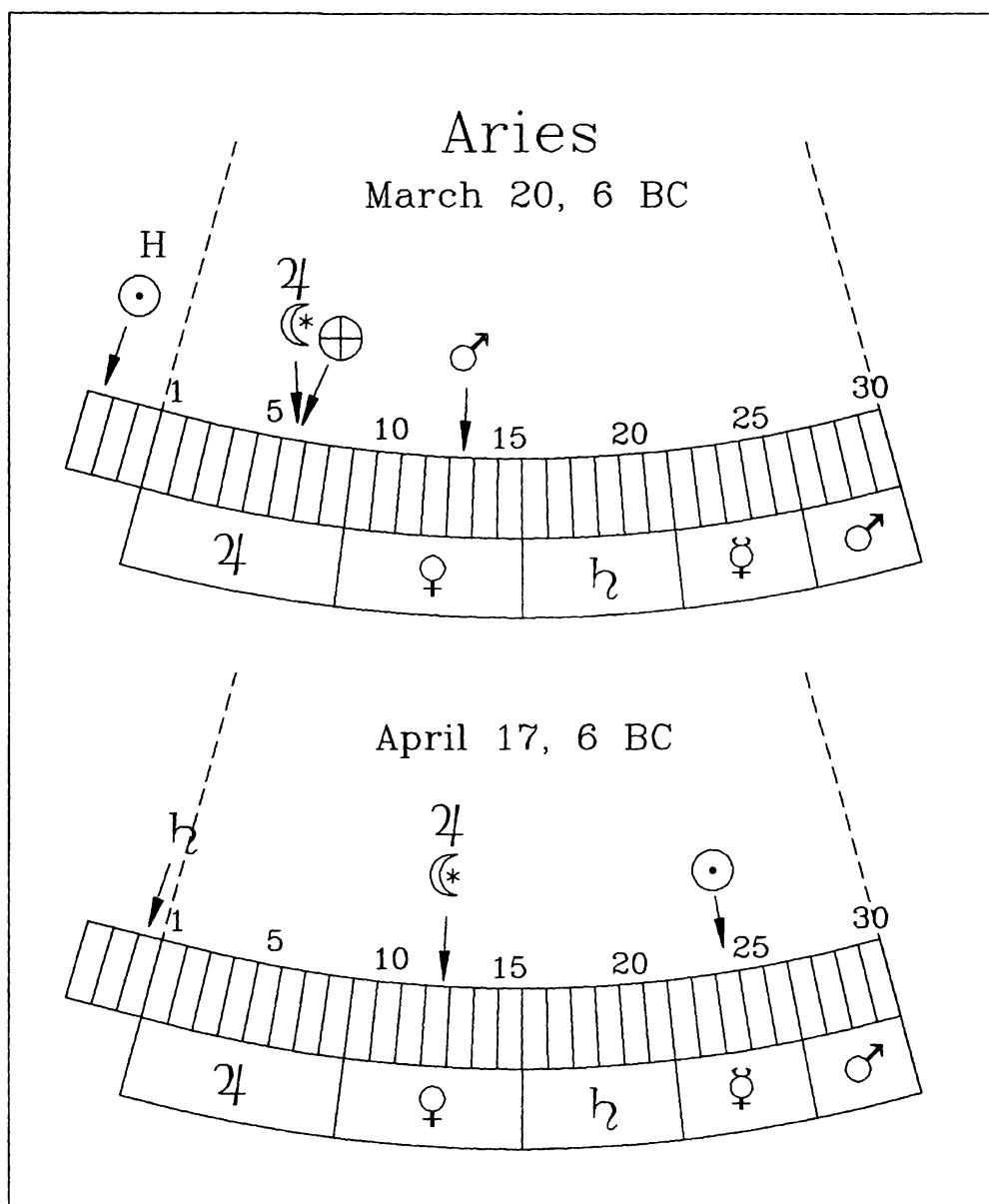


FIG. 7. The sign of Aries is shown for the pair of lunar occultations of Jupiter. The first most likely marks the birth of Christ while the second coincides with the Magi's visit to Herod.

with a good degree of certainty that they had occurred. The points where Jupiter heliacally set and rose were important and well-observed astronomical parameters that provided a base line to extrapolate future positions. These were designated as Ω (set) and Γ (rise) in the Greek models and the two occultations happened within a few degrees of them. From Neugebauer's work we can see how nearness to these benchmark positions ensured the best daily tracking of Jupiter because of its uniform longitudinal motion with hardly any latitudinal variation (68). Of the planets, Jupiter had the best ephemerides and even linear interpolation between the heliacal points gave sufficiently accurate information on Jupiter's daily progress near the Sun. As for the Moon, Neugebauer noted that the crude Babylonian harmonic

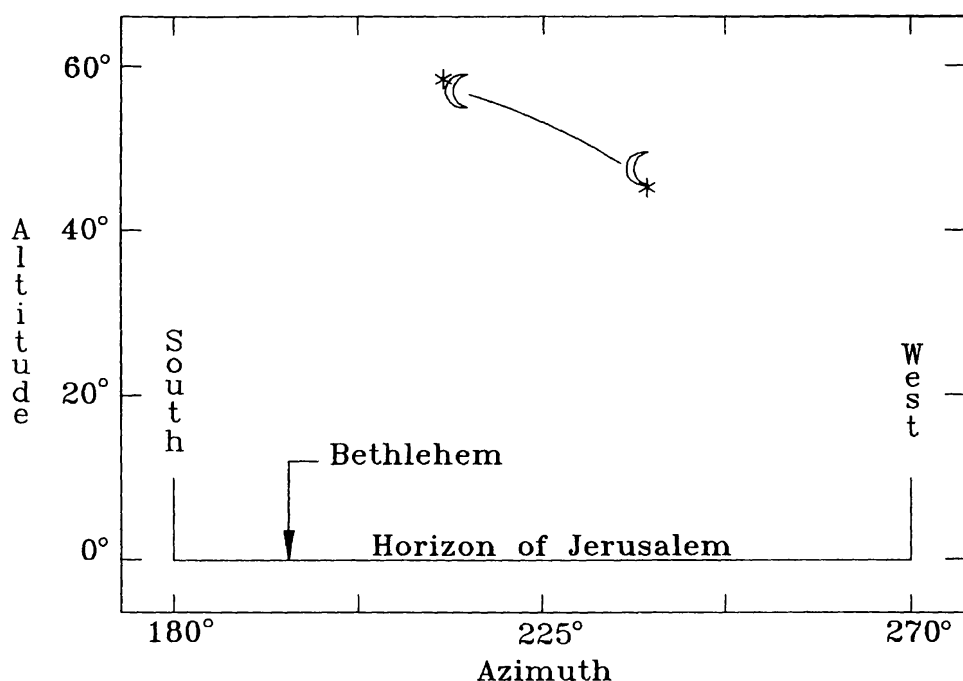


FIG. 8. The position of the second occultation is shown for its duration for the location of Jerusalem. The direction of Bethlehem is marked on the horizon.

analyses were now enhanced by Hellenistic geometrical models that greatly improved eclipse calculations (69). The accuracy of the Moon's path was linked to its proximity to the ascending lunar node which was monitored for astronomical and astrological purposes (70). For the occultations of 6 BC the node was present in Aries which led to a grazing solar eclipse the day after the second occultation. Thus, the conditions were correct for detecting the occultations.

The astronomical and astrological importance of the heliacal points sheds light on another part of the account of the Magi, namely that "we have seen his star *in the east*". Although the phrase, 'ἐν τῇ ἀνατολῇ', does translate into 'in the east', its meaning in astrological and astronomical discussions is more close to 'at the rising'. If we take Matthew's account as an astrological description, the star is unquestionably rising (71). Nevertheless, ἀνατολή has another ambiguity, namely the type of rising. Bouché-Leclercq (72) discusses how even the great authority, Ptolemy, incorrectly used this colloquial term, ἀνατολή, that means daily (diurnal) rising, when Ptolemy should have used, ἐπιτολή, for discussing a heliacal rising. Ancient purists pointed out this common abuse of astronomical terminology. Even Antigonous intermittently used ἀνατολή in discussing morning (heliacal) risings in Hadrian's horoscope. Thus, we conclude that the Magi's star was not just at the moment in the east, but rising heliacally which astrologers held as auspicious.

When Jupiter underwent its heliacal rising on April 17, there was a second lunar occultation which agrees with the Biblical account. The Magi left Herod and "the star which they saw *rising*, went before them, till it came and stood over where the young child was". This second occultation in Aries reinforced astrologers' belief that Herod's realm was the beneficiary of a regal birth; thus, this appears to explain the meaning of the star having

“stood over where the young child was”. That is, the glorious astrological occultation graced Aries; thus, the new born king resided under this sign in Judaea.

Figure 8 shows that the second lunar occultation offers a literal interpretation of the Biblical account. We see from this illustration that the astrological event indeed happened in the general direction of Bethlehem with respect from Jerusalem. The vagaries of meandering roads and of pointing to a village's compass direction during these times suggest a directional alignment. It is highly likely that the Magi realized this because astrological events were always watched for their relation to the cardinal points and system of houses that depended on the local horizon.

5 CONCLUSIONS

Let us review Matthew's account in the context of the astrological events. The first lunar occultation of Jupiter on 6 BC March 20 stirred astrologers into action. It was a truly auspicious event from their perspective. We do not know who the Magi were, their origins, their number, or how long they travelled to seek an audience with Herod. The occultation occurred in Aries; thus, they believed that a king of Judaea had been born and went to Herod to find the child. Herod and his people did not understand the Magi's claims because no one saw the star or understood astrology. The Magi reported to Herod that the astrologically important heliacal rising of Jupiter had taken place. Herod's advisers directed the Magi to Bethlehem where it was prophesied that a king would be born. Once the Magi realized that their travels would take them towards the direction of the second lunar occultation of Jupiter, they marvelled and drew attention to this auspicious omen. The second occultation happened in Aries and re-confirmed that Judaea was blessed by a regal birth. The coincidence of the heliacal rising and lunar occultation of Jupiter is strong evidence that the Magi visited Herod on April 17. Thus, Matthew's account is fully understandable from the perspective of ancient astrological practices.

Finally, the birthday, 6 BC March 20 indicates that Christ was 2 years old when Herod died in the spring of 4 BC. This lends support to the account about the slaughter of innocents, 2-year-old children who were perceived by Herod as recipients of a regal, star-blessed birth (73). It seems plausible that Herod issued this order very close to his death when he showed signs of growing dementia (74). There have been arguments that the slaughter never happened; however, from the perspective of parallel historical events, this was a common affair. Some beneficiaries of such auspicious horoscopes exploited their luck while many more lived in fear of their lives as kings and Roman emperors killed holders of regal horoscopes (75). Thus, the account of the family of Christ seeking refuge from Herod and later his son, Archelaus, was a typical situation of these times: a Chaldaean legacy.

NOTES & REFERENCES

- (1) Cramer, F.H., *Astrology in Roman Law and Politics* (American Philosophical Society, Philadelphia, 1954), p. 44–80. The term, Chaldaean astrology, was used during the time of Christ to describe horoscopic astrology.

- (2) Suetonius, *Augustus*, 94.
- (3) Cramer, F.H., *Astrology in Roman Law and Politics*, p. 144–146.
- (4) *Book of Matthew*, 2, 1.
- (5) That the Jews did not practise astrology is discussed in Mills, W.E. (Editor), *Mercer Dictionary of the Bible* (Mercer U. Press, Macon, 1990), p. 73. See also, *Book of Deuteronomy*, 4, 19; *Book of Isaiah*, 47, 13; “(The Jews) do not worry about the cyclic course of the Sun or the Moon... Neither do they practise the astrological predictions of the Chaldaeans”, *Sibylline Oracles*, 3, 218.
- (6) Bulmer-Thomas, Ivor, 1992. *Q. J. R. astr. Soc.*, **33**, 363.
- (7) Neugebauer, O., *The Exact Sciences in Antiquity* (Barnes & Noble, New York, 1993), p. 168–171.
- (8) Molnar, M.R., 1993. *The Celator*, 7 (11), 43.
- (9) Molnar, M.R., 1992. *Sky & Telescope*, **83**, 37.
- (10) Molnar, M.R., 1991. *The Celator*, 5 (12), 8.
- (11) MacDonald, G., 1904. *Numismatic Chronicle*, **IV**, Series 4, 1. The first Antiochene Aries coin is attributed to Quirinius. It is undated and probably corresponds with his census that he made after deposing Archelaus. The first dated Aries coin is AD 11/12.
- (12) After returning from the conquest of Dacia in AD 106, the emperor Trajan depicted on a gold coin a similar planetary conjunction between Jupiter and Mercury. See Molnar, M.R., 1993. *The Celator*, 7 (2), 38. This coincided with the heliacal setting of Jupiter which may explain the presence of the deceased emperor Vespasian on the obverse.
- (13) *Tetrabiblos*, II, 3.
- (14) Boll, F., *Studien Über Claudius Ptolemäus* (B.G. Teubner, Leipzig, 1894), p. 181–218.
- (15) *Ibid.*
- (16) Bara, Joëlle-Frédérique, *Vettius Valens d’Antioche, Anthologies, Livre I* (E.J. Brill, Leiden, 1989), p. 55.
- (17) Κοίλη or ‘hollow’ Syria is the opening subject of Josephus’ *Bellum Judaicum*. Herod eventually occupied this region that included eastern Palestine. Note that this land was not Syria. Valens removed Syria from Scorpius because he believed it to be an evil sign. He divided Syria among several zodiacal signs, none of which was Aries.
- (18) Bara, *op. cit.*, p. 55, f. 9.
- (19) See (12) for Trajan’s near conjunction. Probus in 281 AD celebrated a lunar occultation of Jupiter close to its heliacal rising. This was followed by a lunar occultation of Venus. M.Molnar (to be published).
- (20) Bouché-Leclercq, A., *L’Astrologie Grecque* (Culture et Civilisation, Bruxelles, 1899, rep. 1963), p. i–ix.
- (21) Neugebauer, O., 1972. *Proc. Amer. Philos. Soc.*, **116**, 243; also, 1963 *Proc. Amer. Philos. Soc.*, **107**, 528.
- (22) *Tetrabiblos*, IV, 3.
- (23) See (7) and Tester, J., *A History of Western Astrology* (Ballantine, New York, 1987), p. 11–29.
- (24) Cassius Dio, **45**, 1, 3–5.
- (25) Suetonius, *Augustus*, 94.
- (26) Sutherland, C.H.V., *The Roman Imperial Coinage I* (Spink, London, 1984), pp. 50, 53, 80, 85.
- (27) Molnar, M.R., 1994. *The Celator*, **8** (4), 6.
- (28) Bouché-Leclercq, A., *op. cit.*, p. 102–199.
- (29) *Ibid.*, p. 206–215; *Tetrabiblos*, I, 21.
- (30) Firmicus Maternus, *Matheseos Libri VIII*, Trans. by J.R. Bram (Noyes Press, Park Ridge, 1975), II, XXIX.18.
- (31) *Ibid.*, II, XX.7–8.
- (32) Goold, G.P., *Manilius-Astronomica* (Harvard University Press, Cambridge, 1977), 4.547. See discussion p. xii.
- (33) Smyly, J.G., 1912. *Hermathena*, p. 137.
- (34) Mathesis, IV, XVII.5.; also *Tetrabiblos*, IV, 2. Bouché-Leclercq, p. 288, f. 1 explains that the use of the symbol, \oplus , for the Lot of Fortune is derived from the ‘wheel’ of Fortune (Fortuna) or it may come from the hieroglyph for deified Time represented as a coiled snake. The Lot of Fortune is no longer in use and the symbol now represents the Earth. See also Tester, J., *A History of Western Astrology*, p. 27.
- (35) Bouché-Leclercq, *op. cit.*, p. 288.

- (36) *Tetrabiblos*, III, 10.
- (37) When the sign holding the Sun was above the horizon, the chart was *diurnal*. Such horoscopes gave the same result for either method. In nocturnal charts, later astrologers reversed the angular direction which gives a different result. See (32) and Neugebauer, O. and Van Hoesen, H.B., *Greek Horoscopes* (American Philosophical Society, Philadelphia, 1959), p. 8.
- (38) *Tetrabiblos*, III, 4; *Mathesis*, III, XIV.1; IV, XVII.7.
- (39) *Mathesis*, IV, XVII.10.
- (40) Suetonius, *Augustus*, 94.
- (41) *Historia Augusta*, *Hadrian*, 2.3.
- (42) *Mathesis*, VIII, XXXII.2.
- (43) Cramer, F.H., *op. cit.*, p. 165.
- (44) Neugebauer, O. and Van Hoesen, H.B., *op. cit.*, p. 90.
- (45) *Mathesis*, II, IX.1.
- (46) *Tetrabiblos*, III, 10; *Almagest*, XIII, 7. Ptolemy's two values for heliacal risings reflect the different natures of the sources. The *Tetrabiblos* was compiled from older astrological manuscripts while the *Almagest* was a current scientific analysis. Note that 12° was not used by all astrologers although the evidence supports that it was the most popular value.
- (47) *Ibid.*
- (48) *Anthologies*, I, 21.
- (49) *Mathesis*, VI, XXIII.7.
- (50) *Ibid.*, IV, III.1.
- (51) *Ibid.*, III, XIV.7.
- (52) Neugebauer and Van Hoesen, *op. cit.*, p. 7.
- (53) Houses are twelve thirty degree-wide sectors that start at the east horizon, the ascendant. The first house lies below the east horizon while the last (twelfth) lies above it. The ancients called these 'places' (Latin *loci*, Greek τόποι).
- (54) Suetonius, *Tiberius*, 14.
- (55) *Mathesis*, VI, IV.1.
- (56) *Ibid.*, VI, XVI.7.
- (57) Bouché-Leclercq, *op. cit.*, p. 245; and *Tetrabiblos*, I, 24.
- (58) Neugebauer, O., *A History of Ancient Mathematical Astronomy* (Springer-Verlag, New York, 1975), p. 1038–1051.
- (59) Cramer, *op. cit.*, p. 12 and p. 29–44. For the discussion on the coins see Anson, L. 1916. *Numismatica Graeca*, 6, 1.
- (60) *Tetrabiblos*, II, 3.
- (61) Astrologers of the first century BC cast their horoscopes by using geometry and mathematics and not just by making visual sightings (65). Thus, the Magi had 'seen' their star through calculations. The Greek verb, εἶδω, *to see*, also means *to perceive*, or *to behold*. See Liddel, H.G., Scott, R., Jones, H.S., McKenzie, R., 1968. *A Greek-English Lexicon* (Clarendon Press, Oxford, 1968), p. 483.
- (62) Hughes, D., *The Star of Bethlehem: An Astronomer's Confirmation* (Walker and Co., New York, 1979), p. 46.
- (63) *Tetrabiblos*, IV, 3.
- (64) All we know is that the Magi were "from the East" which includes any number of cities, local and far.
- (65) The coincidence with the heliacal rising would be repeated by the very close conjunction of Mercury and Jupiter in 6 AD to which the first Antiochene coinage appears related.
- (66) Neugebauer, O., *The Exact Sciences in Antiquity* (Barnes & Noble, York, 1993, 2nd Ed.), p. 90. See also Neugebauer's warning that lists are usually calculations and not observations. Neugebauer, O., 1967. *Astron. J.*, 72, 964.
- (67) Neugebauer, O., *A History of Ancient Mathematical Astronomy* (Springer-Verlag, New York, 1975), p. 666.
- (68) *Ibid.*, p. 441, 830. See also Neugebauer, 1967 (66).
- (69) Neugebauer, O. *HAMA*, p. 808.
- (70) Neugebauer, O. and Van Hoesen, H.B., *op. cit.*, p. 165. The close proximity of the ascending lunar node was a likely signal for astrologers to watch for planetary occultations as the Moon moved closer to the ecliptic where Jupiter lies.
- (71) Modern English versions of the Bible such as the *New Revised Standard Version Bible* interpret ἀνατολή as rising.

- (72) Bouché-Leclercq, *op. cit.* p. 111, f. 3. Hughes, (*op. cit.*, p. 2) interprets ἀνατολή as meaning acronychal rising. However, Bouché-Leclercq points out that ἀκρόνυχος [ἀνατολή] means acronychal rising. See also the glossary of Neugebauer and Van Hoesen, *op. cit.*, p. 191.
- (73) Matthew, 2, 16.
- (74) Perowne, S., *Herod The Great* (Dorset, New York, 1991), p. 162.
- (75) Cramer, F.H. *op. cit.*, p. 168.