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# The Astronomical Design of Karakush, a Royal Burial Site in Ancient Commagene: An Hypothesis<sup>1</sup>

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**Abstract.** The explicit astronomical content of the great monument of Antiochus I of Commagene on the summit of Nemrud Dagħ warrants the search for astronomical significance in the design of other monuments of this ancient Near Eastern kingdom of the first century BCE. The article advances the hypothesis that the nearby monument of Karakush, built by Antiochus' son, Mithradates II, as a burial site for the royal women, was astronomically oriented, its three sets of peripheral columns being so positioned that during June Leo would be observed setting behind the lion columns after sunset, Aquila culminating over the eagle columns around midnight, and Taurus rising behind the bull columns before dawn. It is suggested, furthermore, that the astronomical occasion for the foundation of this second monument was a recurrence of significant planetary conjunctions in Leo. The 'lion horoscope' of Nemrud Dagħ records the conjunctions of 62 BCE; the Karakush site may be related to the conjunctions of 27-26 BCE.

Some time in the late 30s or 20s BCE, King Mithradates II of Commagene, a small but prosperous buffer state lying between the empires of Rome and Parthia, constructed a burial site and monument for four of his female relatives, his mother Isias, his sisters Laodike and Antiochis, and the latter's daughter Aka; more precisely, a tomb for his mother, one of his sisters (Antiochis), and his niece, and a cenotaph for his other sister (Laodike). The monument, known now as Karakush, is simple in design, though large in scale. It consists of a pile of rubble heaped to a height of some twenty metres over a burial chamber and surrounded by three sets of columns in a roughly equilateral triangle. Almost certainly, each group of columns was originally a trio, although they are shown as pairs in the plan (fig. 1), a point to which I return below. Each trio was set in a straight line at right angles to the line from the mound's centre. So one may think of the design as a hexagon with the lines of columns as its three short sides (about 10.5 m. each) and the intervals between those lines as the three long sides (about 120 m. each).

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What survives is the tumulus, less a huge gouge on its southern flank, two columns on the NE side, and one column each on the S and NW. On one of the surviving NE columns stands the statue of an ox, on the S column an eagle, and fallen to the N of the NW column a lion. On top of the NW column there still rests a relief showing two figures, one male, the other female, grasping hands; these ‘dexiosis’ reliefs, as we shall see, are typical of Commagenian monumental art. To give a further idea of the ample scale of the monument, the columns are all more than seven metres in height, and the eagle on top of the S column is approximately two and a half metres tall. Drawings of the four surviving columns are shown in fig. 2.<sup>2</sup>

The plan shown here as fig. 1 is part of the documentation of F. K. Dörner’s investigation of the site in 1967,<sup>3</sup> but no argument was made for pairs of columns rather than trios as in previous studies (e.g., Humann’s reconstruction of the NW columns drawn with the tumulus in the background and reproduced here as fig. 3);<sup>4</sup> subsequently, Dörner himself returned to speaking of trios.<sup>5</sup> That there was a trio to the NE is certain from the fallen drums of a third column, and another massive stone there suggests that there was a second bull atop. Likely, then, the concept exemplified in fig. 3, creatures symmetrically flanking a dexiosis relief or some such, reflects the arrangement on all three sides. The foundations of the missing columns have not yet been found, and while the locations of the NE and NW columns are virtually certain, there is some uncertainty as to whether the surviving S column (with its eagle) was the easternmost or westernmost of its trio.<sup>6</sup> Further exploration (excavation?) is needed to confirm the locations, and indeed the original number, of the columns.

Our information about the deceased commemorated at Karakush and the monument’s builder comes from two inscriptions. One has long been known: it is inscribed on the external face of the top two drums of the central column of the NE trio. Skipping a couple of phrases where the restoration is doubtful, it reads:<sup>7</sup>

This is the *hierotherasion* [sacred site or foundation] of Isias, whom the great King Mithradates (she being his own mother) ... deemed worthy of this final honour. And ... Antiochis lies herein, the king’s sister by the same mother, the most beautiful of women, whose life was short, but her honours long-enduring. Both of these, as you see, preside

## 12 The Astronomical Design of Karakush.

here, and with them a daughter's daughter, the daughter of Antiochis, Aka. A memorial of life with each other and of the king's honour.

The second inscription, on the capital of the NW column beneath the dexiosis relief, is so weathered that its presence was not even noticed until 1938. At a height of more than seven metres, a serious ladder is required. World War II intervened, and it was actually only in 1979 that the inscription was recorded.<sup>8</sup> It reads:

The great King Mithradates, the son of the great king Antiochus and queen Isias, dedicated this image to the unfading memory of queen Laodike, the king's sister and wife of Orodes, the king of kings, and to her own honour.

The inscription confirms, through the reference to Orodes II of Parthia, that our Mithradates is indeed Mithradates II,<sup>9</sup> and not, as had been suggested earlier, Mithradates I Kallinikos, the grandfather of Mithradates II. It is now thought that Laodike perished with her husband Orodes and her children in a parricidal and fratricidal massacre perpetrated by Phraates IV to whom Orodes had rashly handed over his kingdom following the death of his eldest son Pacorus in battle in 38 BCE.<sup>10</sup> The language of the inscription suggests a cenotaph, and the identities of the figures in the dexiosis relief are now clear: King Mithradates himself saying farewell to his sister Laodike — though that, I shall suggest in due course, is not quite the end of the story.

In 1967, an unusual and bold exploration of the site was undertaken by F. K. Dörner.<sup>11</sup> A drilling rig was used to bore for the burial chamber. The chamber was located, approximately in the centre. It proved empty; or rather, silted up with sand and soil. Likely culprits are to hand, sappers of the XVI legion, in the reign of Septimius Severus, excavating for building material for a bridge nearby (which is still standing) — plus a little profit from grave robbery on the side. All in all, Karakush is an interesting dynastic monument with an interesting history. Why, though, would one want to drag astronomy into the picture, and what warrants doing so? The answer lies some distance away in the much grander 'hierothesion' that Mithradates' father, Antiochus I, built for himself and his royal cult on the summit of Nemrud Dagh (Mt. Nimrod).

In basic form, Karakush replicates Nemrud Dagh: both monuments are huge cones of rubble. But whereas Karakush stands some twenty metres

high, at Nemrud Dagh Antiochus added fifty metres to the summit. He also constructed terraces on the E and W flanks with gigantic statues of his gods enthroned and reliefs of himself in dexiosis with them. The gods, who are carefully identified in the foundation text, are a conflation of the Iranian and the Greek.<sup>12</sup>

Among the reliefs, there is one markedly different in content from all other sculptures on the site or, indeed, from anywhere else in the realm. It bears the single massive figure of a lion studded with stars and with a crescent moon on its chest. The legends beside the three prominent stars above the lion's back reveal that they represent (from left to right) the planets Mars, Mercury, and Jupiter. So the relief is an astrological document of sorts, and scholars are now generally in agreement that it represents the foundation horoscope of this site on Mt. Nemrud which Antiochus established as the principal centre for his royal cult and as his eventual burial place. As a horoscope it provides the technical data that at the defined moment the planets Mars, Mercury and Jupiter, together with the moon, were in the constellation and/or the sign of Leo the Lion, and by implication that the other planets were not. The data are sufficient to compute the defined moment; again, there is general agreement, following Neugebauer and Van Hoesen, that it was 7 July 62 BCE.<sup>13</sup> Fig. 4 shows the configuration of the planets in Leo on that date, as reconstructed by the Voyager II program for the Macintosh.<sup>14</sup> The lion monument of Nemrud Dagh is familiar to students of ancient astrology since it is the first, and thus the first chronologically, in Neugebauer and Van Hoesen's great collection of Greek horoscopes.<sup>15</sup>

The lion horoscope, however, is more than a rather exotic way of memorializing the date of the hierothesion's inauguration.<sup>16</sup> Scholars are now generally agreed that the lion horoscope should be viewed in relation to the dexiosis reliefs among which it was set. The gods of the reliefs are the same as the planets of the horoscope, a set of equations which the foundation text obligingly spells out. The lion relief and the dexiosis reliefs thus commemorate different aspects of essentially the same event — or sequence of events. Anthropomorphically, Antiochus greets and is greeted by his gods in dexiosis. Astro-morphically (if I may be allowed the coinage), these same planetary gods come into conjunction with the king's celestial surrogate, Regulus, the so-called 'royal star in the heart of the Lion',<sup>17</sup> which is privileged on the relief in that it is shown cradled in the crescent moon on the lion's chest.

We owe these insights to Heinrich Dörrie,<sup>18</sup> and essentially, I believe, they are correct. However, they are not problem-free. First, Dörrie was mistaken about the actual dates of the planetary conjunctions with Regulus (see table 1). Secondly, and more seriously, his description of events overlooked other planetary conjunctions, i.e., those of the Sun and Venus (also shown in table 1), which occurred within the same time span and which complicate the tidy equations of the planets of the horoscope with the gods of the dexiosis relief. These are problems on which I am currently working.<sup>19</sup> They have not been noticed by others, as far as I know, perhaps because once the dating of the horoscope was determined the historians of astrology retired from the scene, there being nothing further of strictly 'scientific' interest (actually, that is not so), leaving the field to the historians of religion, who discovered what the former could not, i.e., the intent of the various reliefs (the horoscope included), but were not fully in control of the specifics of the underlying astronomy. It is, in fact, a problem of 'cultural astronomy' that calls out for precisely the type of investigation which this journal promotes. However, a full and proper inquiry into the astrology of Nemrud Dagh is for another day.

It is the astronomical/astrological elements of the Nemrud Dagh hierothesion, however broadly or narrowly one construes them, that warrant an attempt at an astronomical/astrological interpretation of the later hierothesion at Karakush, the possibilities of which seem to have escaped scholars to date. We know for a fact that the dynasty continued to be interested in astrology. Zodiacal signs were the main motif of its coinage, which featured, in particular, reverse types of Scorpius and Capricorn.<sup>20</sup> In the following century, the dynasty contracted a marriage with the family of one of the Roman empire's great astrologer-politicians, Tiberius Claudius Balbillus.<sup>21</sup> Demonstrably, the astronomy of Nemrud Dagh was no passing fashion among Commagenian royalty.

We might start an astronomical exploration of Karakush with the three creatures perched on their columns around the base of the mound. Each creature has of course its counterpart in the heavens. There is a celestial lion, the constellation of Leo; a celestial ox, the constellation of Taurus; and a celestial eagle, the constellation of Aquila. These three constellations, moreover, are disposed around the heavens in roughly the same triangular relationship as are the corresponding columns around the tumulus. On a first and very superficial interpretation, then, the monument might be supposed to represent *grosso modo* a celestial

hemisphere with the north pole at the vertex and three prominent constellations on the periphery.

But this is not all. From the latitude of Karakush the three constellations cannot be seen together in the night sky. They can, however, be seen sequentially on the same night — but only during a limited season corresponding in antiquity roughly to the month of June. If one were to make those observations, standing at the summit and centre of the tumulus, one would see something more interesting and precise. For that month or so in mid summer, one could observe on a single night, first Leo the Lion setting to the NW behind the lion columns some time after sunset; then in the middle of the night Aquila the Eagle culminating to the south above the eagle columns; and finally Taurus the Bull rising behind the ox columns in the NE an hour or so before sunrise. These can scarcely be unintended epiphenomena. One must conclude, then, that Karakush was designed and built to realize precisely these effects. The columns, in other words, are astronomically aligned with respect to the centre of the site: the lion and ox columns to the sectors of the horizon where, respectively, Leo sets and Taurus rises; the eagle column (roughly) on the meridian.

The season of the year when the three events (the setting of Leo, the culmination of Aquila, and the rising of Taurus) may be observed on the same night needs to be defined more clearly. Essentially, it is the period from the heliacal (morning) rising of Taurus to the heliacal (evening) setting of Leo, i.e., the time between the first appearance of Taurus rising in the morning and the last appearance of Leo setting in the evening. Great precision is neither necessary nor achievable, since constellations, unlike individual stars, do not accomplish their ‘phases’ on a single date. We might take as the start date the heliacal rising of the Pleiades on about May 22 and as the end date the heliacal setting of Regulus on about July 10.<sup>22</sup> This, then, is what we might call the privileged season at Karakush, the time of year when the monument ‘works’, i.e., when its celestial alignments are all actualized on a single night. (I use the present tense, since the monument works as well for the modern observer as for the ancient. However, the dates given are those contemporary with the building of the monument, so the season will have altered somewhat over the past two millennia, advancing from June to July. Likewise, there will have been some displacement of the rising and setting points of the stars on the horizon (the setting point of Regulus moving 9° southwards and the rising point of the Pleiades 11° northwards), but the broad effects of

Leo setting behind the lion columns and Taurus rising behind the ox columns remain.)

The three effects are shown in figs. 5, 6 and 7. A summer night was selected during the reign of Mithradates II, 11-12 June 26 BCE. The choice of year was arbitrary although, as we shall see later, serendipitously fortunate. The day and month, as we shall also see, follow from that serendipity. However, for our immediate purposes any June night for many years thereabouts would serve. Fig. 5 shows Leo setting behind the lion columns, marked by a spike in the horizon at the appropriate point (azimuth  $290^\circ$ ), at 9 p.m. LMT, an hour and fifty minutes after sunset. Fig. 6 shows Aquila culminating (Altair is precisely on the meridian) over the eagle columns, likewise marked on the horizon at  $185^\circ$ , at 1 a.m. Fig. 7 shows Taurus rising behind the ox columns, at  $68^\circ$  on the horizon, at 2:30 a.m., two hours before sunrise; the Pleiades are already  $9^\circ$  above the horizon, Aldebaran still  $5^\circ$  below.

The azimuth bearings of the columns from the centre must be taken as approximate. In the first place, there is no preserved centre point at Karakush. I am assuming that it was a point at the centre of the site of the burial chamber and have measured accordingly. Secondly, while we can say with certainty which was the original central column of the NE and NW sets, the same is not true of the S set (see above). To limit maximum error, I have measured the bearing of the remaining eagle column, which was either the easternmost or westernmost. Thirdly, I am assuming a more or less level horizon. Finally, I am relying on the accuracy of the orientation of Dörner's site plan.<sup>23</sup> Fortunately, claims of the sort I make here (i.e. a particular constellation rising or setting behind a particular feature) have a very comfortable margin of error: after all, Taurus rising and Leo setting each covers an extensive sector of the horizon. Eventually, though, a new survey of the site should be undertaken, with the alignments of the columns particularly in mind, and a horizon profile drawn, noting particularly its altitude to ENE and WNW.

As mentioned, serendipity took me to the year 26 BCE (-25 being a 'nice round number' within the reign of Mithradates II for the setting of precession on the Voyager program). A glance at fig. 8 will show why that year was a fortunate choice and why, once chosen, the further selection of June 11-12 for the typical summer night was the best one. Fig. 8 is essentially fig. 5 with the planets reintroduced. To the primary constellation phenomena observable at Karakush summer after summer the planets are an irrelevance. But the spectacular conjunctions of the



planets Venus, Jupiter and Saturn in Leo in that year prompt one to consider whether the planets might not have been relevant to Karakush in its early years or even at its founding.

Although serendipity brought me there, there is another and more methodical route that I could, indeed should, have taken. I ought to have posed the following question: if planetary conjunctions with the star Regulus were ideologically important to the Commagenian dynasty, were there remarkable conjunctions of this sort during the reign of Mithradates II that might relate to the design of Karakush? In the idiom of the dynasty, were there more 'epiphanies of the great gods'?<sup>24</sup> Did the planetary gods return *en masse* to greet the king's stellar surrogate in the reign of Mithradates as in his father's? The answer, as fig. 8 reveals, is yes, in the year 26 BCE. Stated more prosaically (and cautiously), in 26 BCE there occurred astronomical events of the same type as in 62 BCE; given the known continuities in Commagene, the same ideological construction would likely have been placed on them as on the earlier occasion. It is probable, although ultimately unprovable in default of an explicit allusion, that a monument built by the dynasty at about the time of that second great cluster of conjunctions would in some way be related to the conjunctions in the intent of the designers. The argument, as with the alignment of the columns (and as so often in archaeoastronomy), rests essentially on the improbability of unintended coincidence. These probabilities might in due course be explored mathematically.

What one sees on 11-12 June of that year is but the culmination of a series of conjunctions beginning late in the summer of the preceding year and continuing through the winter and spring. All of these conjunctions, unlike those of 62 BCE when some would have been obscured by proximity to the sun, would have been observable. I have tabulated the series as a selective ephemeris in table 2.<sup>25</sup> However, one should think of these events not so much as happenings on particular nights. The actual moment of conjunction, defined as the time when the two bodies are at precisely the same celestial longitude, might well have been unobservable for any of several reasons: cloudy weather, both bodies below the horizon, the bodies moving too slowly relative to each other to tell without instrumentation when conjunction actually takes place. Rather, one should think of a succession of nights, some of them no doubt clear, over which the two bodies could be observed approaching each other, meeting, and then drawing apart. We are assuming, too, a competent observer, who would know from experience, from planetary

tables, and from observation on prior nights, exactly what was happening on cloudy nights, in daytime, or when the bodies were below the horizon. Commagene, after all, is up-river from Babylon, still one of the great professional centres of celestial observation and prediction.

I have excluded the moon's conjunctions with Regulus because they present an exception to what I have just described. The moon moves so rapidly that its observable proximity to another body would indeed be confined to a single night - or might occur during the daytime and/or when it was below the horizon and so be unobservable. But there were certainly some striking occasions in 27-26 BCE when the moon joined other planets in proximity to Regulus and which would have been observable, weather permitting, e.g., the configuration on 23 November at 3 a.m. reconstructed in fig. 9.

I emphasize that it is not the *individual* conjunctions of planets with Regulus that are remarkable. These happen at fairly regular intervals, from the moon's monthly encounters to Saturn's every twenty-nine and a half years. Rather, it is the *clustering* of conjunctions, both of the planets with Regulus and of the planets with each other in proximity to Regulus, that is remarkable. This clustering was even more notable in 27-26 BCE than in 62 BCE. In 27-26 BCE Saturn as well as Jupiter takes part in the Regulus conjunctions (only Mercury, the least visible of the planets, being absent). Indeed, the two senior planets effect their own conjunction with each other in close proximity to Regulus. Since these two are the slowest (stateliest, in anthropomorphic terms) of the planets, their conjunction is the least frequent, occurring only every twenty years or so. In 26 BCE the two planets are closest to each other on the night of June 26-27, just over one degree distant from Regulus, eleven days after Saturn's conjunction with the star and six days after Jupiter's.

As already mentioned, the series of celestial events and the various configurations were all observable (weather, etc., permitting), the earlier (August-September 27 BCE) in the pre-dawn eastern sky, those in the winter for most of the night (conspicuous when culminating to the south), and the later (spring 26) in the post-sunset western sky. This ready visibility was a result of the distance of the planets and Regulus from the sun. At mid winter, indeed, the sun was on the opposite side of the heavens. A further concomitant of solar opposition is that the three 'superior' planets (Mars, Jupiter, Saturn) are for a time in retrograde motion. They appear to cease their forward (eastward) motion relative to the stars and to retrace their steps westward, only to stop once more and

resume forward motion. The dates and longitudes at which in 27-26 BCE they stopped and changed direction (E and W 'station') are given in table 2. It will be noticed that Saturn passed Regulus on 25-26 September, reached E station  $3^\circ$  away on 14-15 November, passed Regulus again in retrograde motion on 9-10 January, reached W station on 27-28 March, and finally effected a third conjunction with Regulus on 15/16 June when once more in forward motion. Jupiter and Mars do not effect triple conjunctions with Regulus, since their E stations are to the west of the star. However, for both planets those stations are within a degree or two of Regulus, so the effect would have been equally impressive.

These complex manoeuvres of the planets in relation to Regulus and to each other should be seen through the eyes and imaginations of the Commagenian royal astrologers. With the precedent of 62 BCE in mind, it would surely seem that the planetary gods were once more paying their respects to the "royal star" in an elaborate ritual of advancing, retiring, and advancing again to their encounters. This ceremonious behaviour on the part of planets came to be recognized in technical astrology, where the courtly metaphor of 'attendance' (*comitatus*; Greek *doryphoria*, literally 'spear-carrying') was used especially of the spatial relationships (aspects) of the other five planets to the two luminaries.<sup>26</sup>

What conclusion should we draw? The monument at Karakush must date to the reign of its dedicator Mithradates II, i.e., c. 36-20 BCE. During those years there occurred a far more spectacular mass conjunction of the planets with Regulus than that which had prompted Antiochus to found the primary site of his cult on Nemrud Dagh in 62. It is surely a reasonable conjecture that the conjunctions of 27-26 were the prompt for incorporating astronomical alignments into the design of Karakush.

Finally, we ought to take into account the fact that Karakush is the monument of the royal women. The climax of the celestial events 27-26 BCE is the conjunction of Venus with Saturn, Jupiter and the star Regulus on 11 June (fig. 8). At Nemrud Dagh the visual idiom for conjunction is the dexiosis relief, the king greeting and greeted by the planetary god. But the surviving dexiosis at Karakush - there may of course have been others, fallen from the central columns of the NE and S trios - is unique in that it appears to represent not the king greeting a planetary god but the king saying farewell to his sister Laodike. I wonder, though, if we ought not to read into this dexiosis too a planetary conjunction and to discern in the figure of Laodike also the planet Venus.

The relief is carried on the same pair of columns to the NW which carried the lion, and it is in this direction that one would have seen, on the evening of 11 July 26 BCE, Venus setting in conjunction with Regulus, Saturn and Jupiter. Of the four celestial bodies, Venus would be by far the brightest. And if one is concerned that the woman of the dexiosis relief is scarcely the Venus type, then we should recall that in the system of planetary nomenclature in use in Commagene at the time the planet Venus was not 'Venus' at all but 'Hera' (Latin Juno) the matronly queen of heaven.<sup>27</sup>

In the monuments of Karakush and Nemrud Dagh, celestial players and celestial encounters were conscripted into the service of an ideology of royalty and divinity. In conclusion, it is worth observing that the same players, and perhaps also the same sort of encounters, were recruited about a century and a half later into two very different Christian 'stories' as elements — albeit minor ones — in the definition of divine sovereignty. At the close of the first century CE or early in the second, John, the author of Revelation, saw in his vision of the heavens the throne of God circled by 'four living creatures', 'the first like a lion, the second like a young ox (*moschôî*), the third with a face like a man's, and the fourth like an eagle in flight (4:6-7). There is general agreement that these correspond to constellation figures.<sup>28</sup> Three of them are morphologically the same as the creatures/constellations which mark the periphery of Karakush and define the monument as an image of the heavens. Within the same time span as Revelation, the gospel of Matthew told in the birth narrative of Jesus the story of the 'star of Bethlehem' (2:1-12). On the question of the star's identity, I am not persuaded that there is necessarily an *astronomical* answer, a *theological* answer being sufficient to explain the story: the 'star', as an astrological construct, which may or may not have corresponded to an astronomical event, establishes, from the gospel perspective mediated through the Magi, the messiahship of Jesus, 'born to be king of the Jews' (2:1-2).<sup>29</sup> Nevertheless, if there was an actual astronomical counterpart, recalled non-technically in Matthew's story, it is worth remembering that a favoured candidate is the triple conjunction of Saturn and Jupiter in 7 BCE.<sup>30</sup> This was the next 'great conjunction' following that commemorated, on my hypothesis, at Karakush by the dynasty of Commagene. Another candidate for the 'star of Bethlehem' is a visually remarkable series of planetary conjunctions in Leo, including of course conjunctions of the planets with the star Regulus, in 3-2 BCE.<sup>31</sup> Again,

these were precisely the events explicitly commemorated at Nemrud Dagh and, as I have argued, also commemorated at Karakush.

One must not jump to hasty conclusions about an astrologers' cabal in the ancient Near East at the turn of the millennium orchestrating an ideology of kingship and divinity associated with planetary conjunctions in favoured signs and constellations. If there are coincidences here — and there may well not be — it is a matter of a shared astrological propensity to treat the celestial bodies and their encounters in a common way, to make, as it were, religious mileage from them in a similar fashion. Essentially, what is common to Nemrud Dagh and Karakush, on the one hand, and to Revelation's vision and the Matthean birth narrative, on the other, is the validation of sovereignty by appeal to the visible heavens. For Karakush, I have sought to demonstrate how a particular astrological idiom, certainly manifested at Nemrud Dagh and perhaps also in the two Christian narrative constructs, was employed to commemorate four women who, in their relationships to the kings of Commagene and of Parthia, as emphasized in the foundation texts, betokened sovereignty in their place and time.

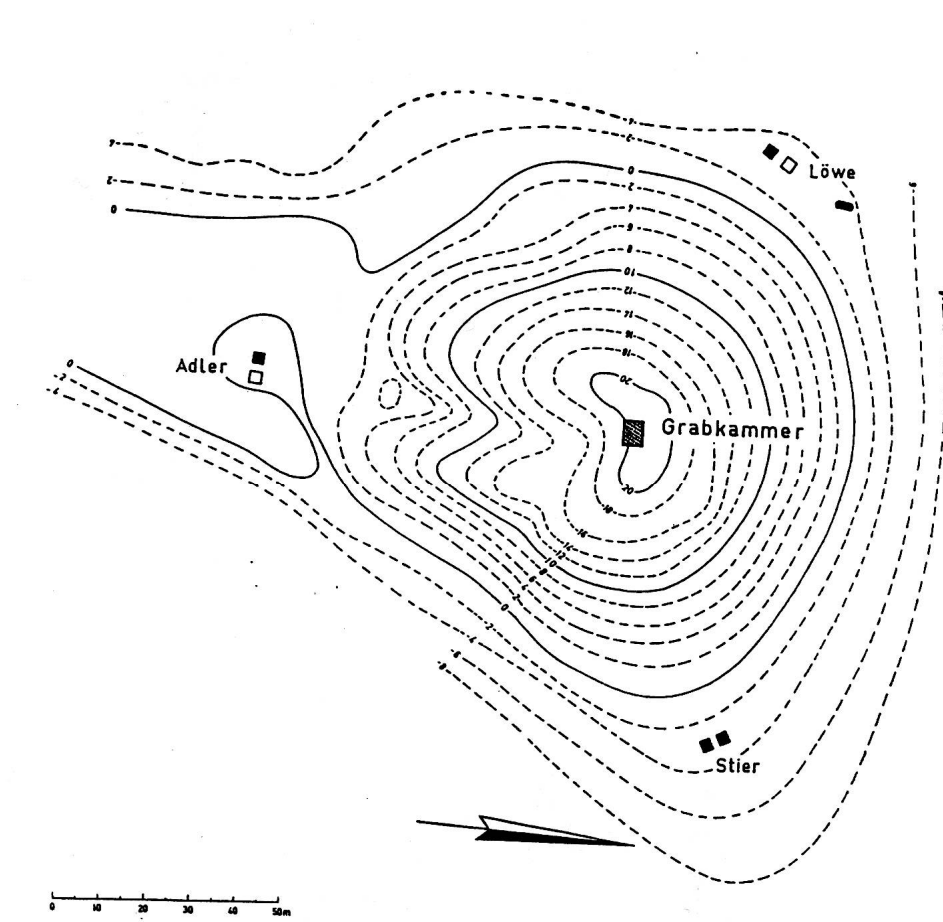
**Table 1: Conjunctions of selected planets with Regulus, June-August 62 BCE (time relative to Nemrud Dagh, Commagene, 38°E)**

<b>Planet</b>	<b>Conjunction with Regulus Dörrie's date (p. 205)</b>	<b>actual date</b>
Mars	'a few days before' (sc. before July 7)	June 25
Mercury	July 5 or 6	July 1
Moon	July 7	July 6
Sun	not given	July 28
Moon	not given	August 3
Venus	not given	August 6 (a.m.)
Jupiter	'a few days later' (sc. later than July 7)	August 6 (p.m.)

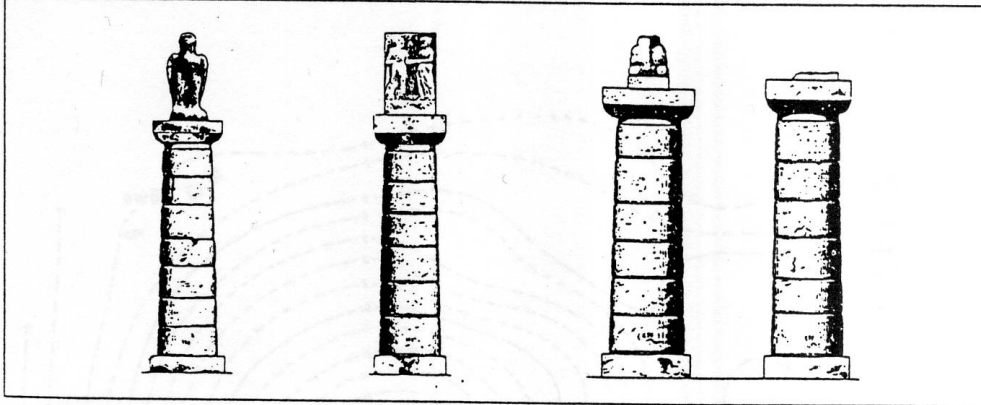
**Table 2: Ephemeris of selected planets relative to Regulus, 27-26 BCE, as observable from Karakush, Commagene**

<b>Night(s) (nearest°)</b>	<b>Conjunction(+)/station (Regulus 121.5°)</b>	<b>Longitude</b>
Aug. 18-19	Ven + Reg	
Sep. 25-26	Sat + Reg	
Nov. 14-15	Sat at E station	124
16-21	Jup at E station	121
Dec. 3-4	Mars at E station	120
Jan. 9-10	Sat (retrograde) + Reg	
Feb. 22-23	Mars at W station	101
Mar. 17-23	Jup at W station	111
27-28	Sat at W station	117
Apr. 10-11	Jup + Mars	112
24-25	Sat + Mars	118
May 2-3	Mars + Reg	
Jun. 8-9	Jup + Ven	119
10-11	Sat + Ven	121
	Ven + Reg	
15-16	Sat + Reg	
20-21	Jup + Reg	
26-27	Sat + Jup	123

Fig. 1. Site plan of Karakush (see n. 3).



**Fig. 2. Surviving columns at Karakush (see n. 2): (l. to r.) S, NW, NE (2).**



**Fig. 3. Reconstructed view of Karakush from NW (see n. 4).**

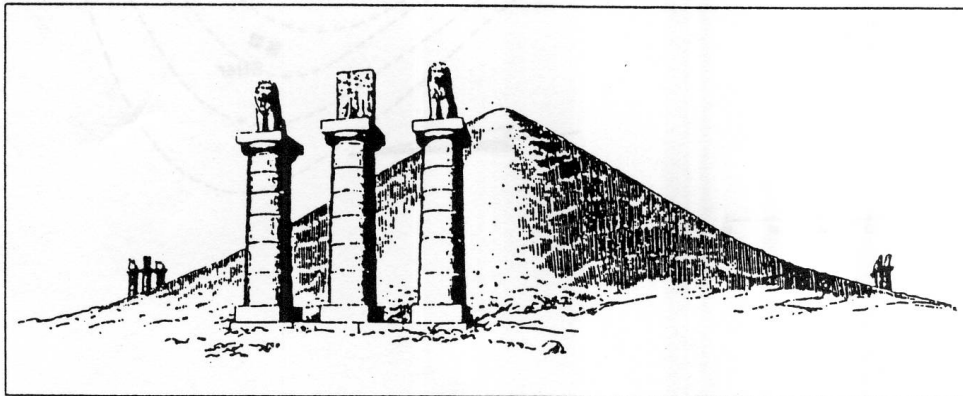
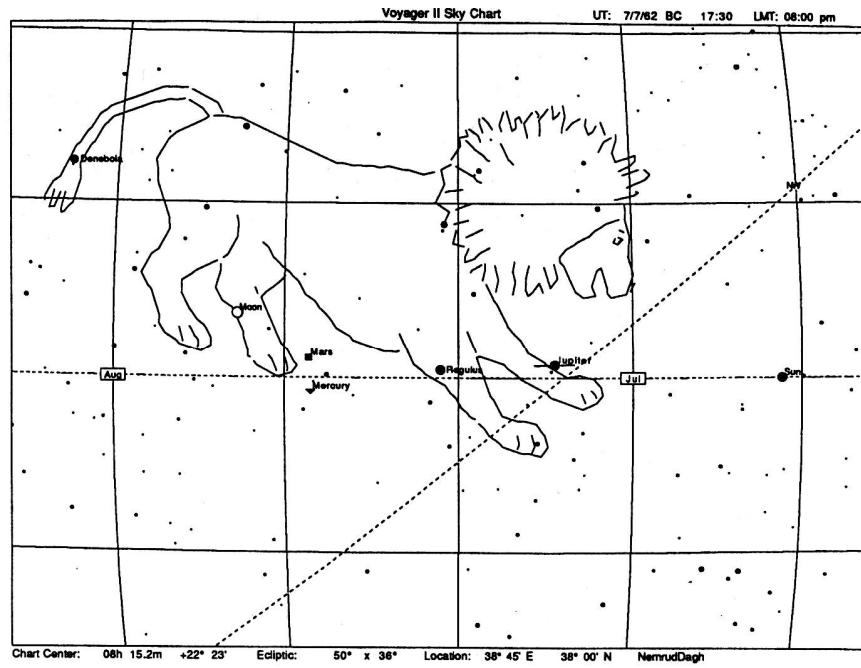
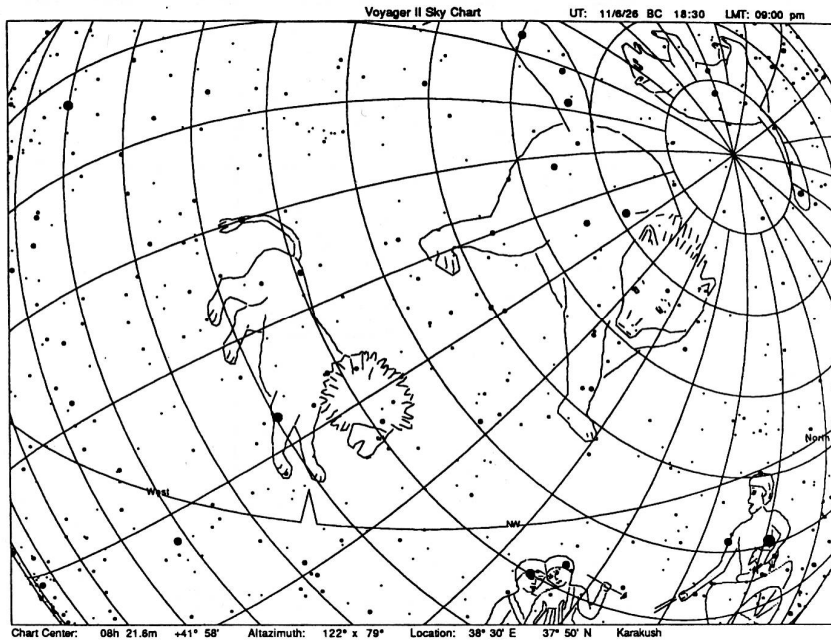




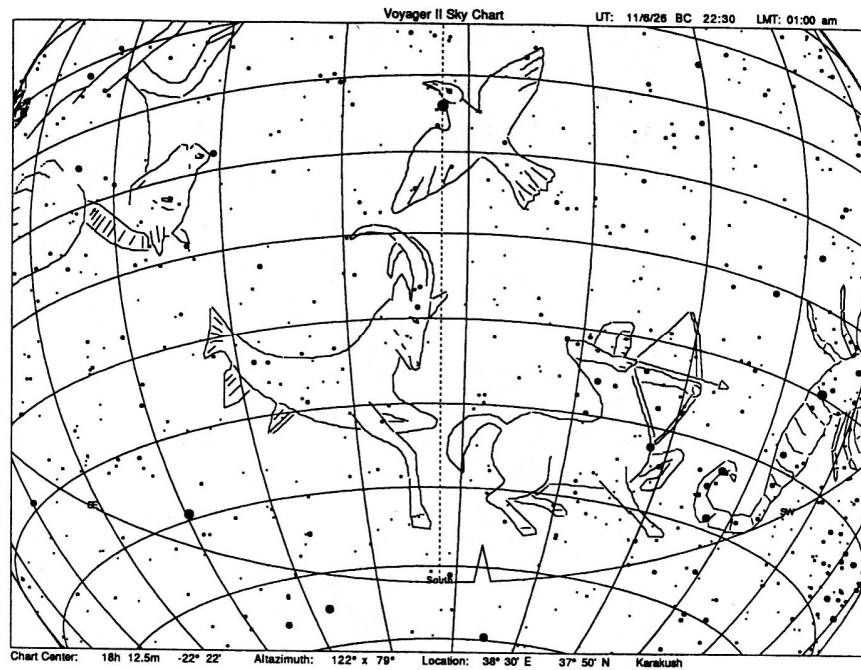
Fig. 4. Leo and the planets, 8:00 p.m. at Nemrud Dagh on 7 July 62 BCE.



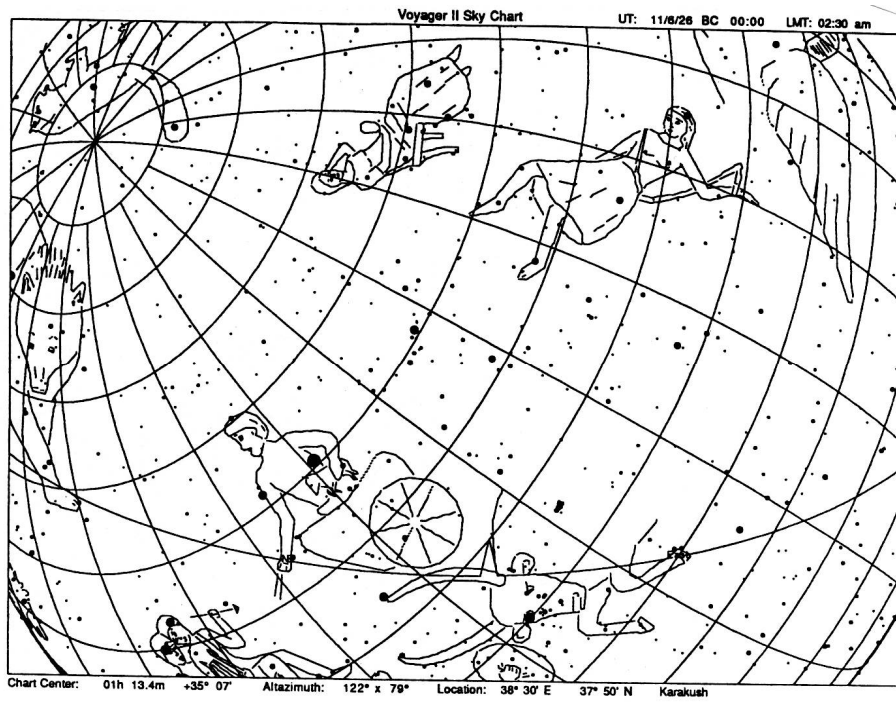
**Fig. 5. Leo setting behind the lion columns; post-sunset view to NW from Karakush on a June night, late first century BCE.**



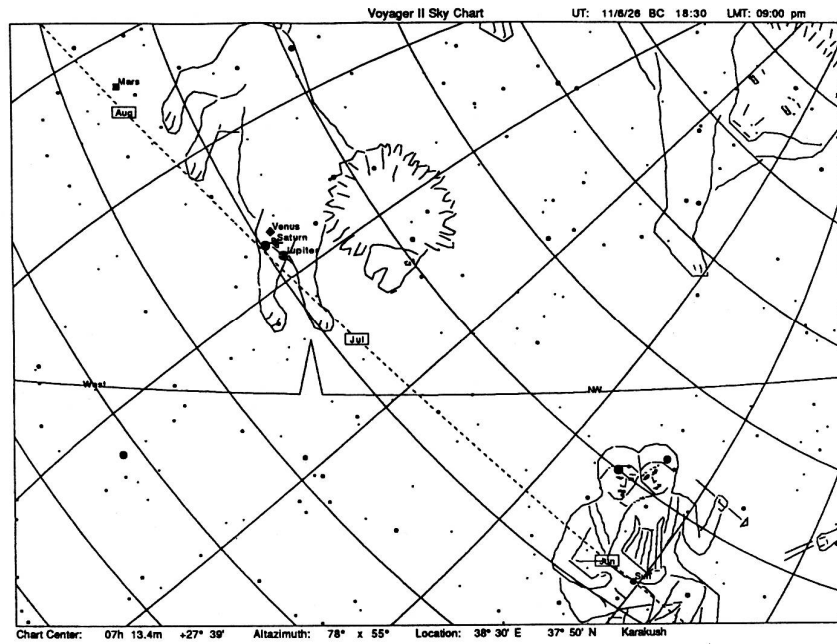
**Fig. 6. Aquila culminating above the eagle columns; view to S from Karakush in the middle of a June night, late first cent. BCE.**



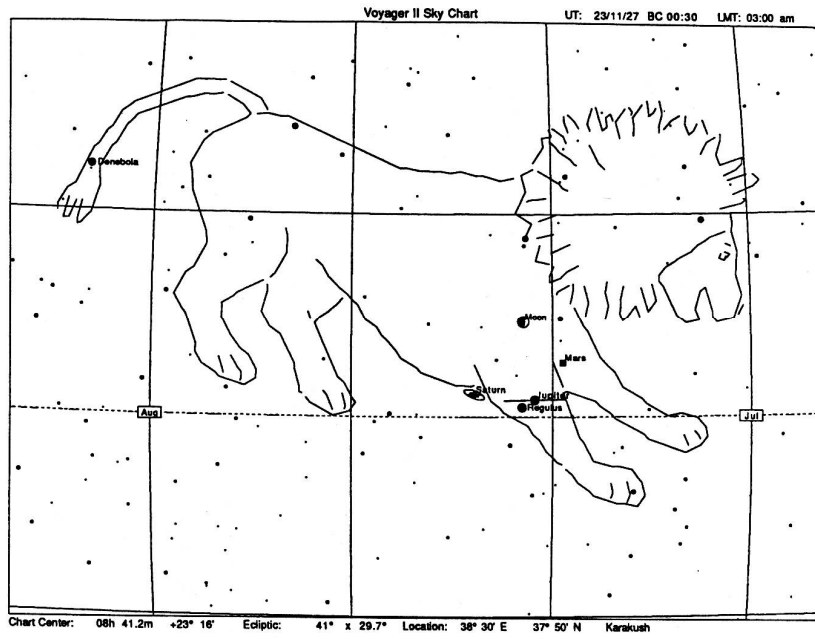
**Fig. 7. Taurus rising above the ox columns; pre-dawn view to NE from Karakush on a June night, late first cent. BCE.**



**Fig. 8. Leo and planets setting behind the Karakush lion columns, 9:00 p.m. on 11 June 26 BCE.**



**Fig. 9. Leo and the planets, 3:00 a.m. at Karakush on 23 November 27 BCE.**



## References

1. First presented as part of a lecture to the Calgary Society for Mediterranean Studies in the Discovery Dome of the Calgary Science Centre, October 1997. The Centre's Digistar planetarium was used (my thanks to Sid Lee for coordinating this). Also presented at the University of Toronto in lectures to the Division of Humanities, Erindale College (April 1998), and to the Department of Classics (October 1998).
2. From F. K. Dörner, *Der Thron der Götter auf dem Nemrud Dagh: Kommagene — das grosse archäologische Abenteuer in der östlichen Türkei* (2nd ed., Bergisch Gladbach, 1987) [hereafter Dörner 1987], p. 54, reproduced there from K. Humann and U. Puchstein, *Reisen in Klein-Asien und Nord Syrien* (Berlin, 1890) [hereafter Humann and Puchstein], figs 39-41.
3. F. K. Dörner, 'Kommagene: Forschungsarbeiten von 1967 bis 1969', *Istanbuler Mitteilungen* 19/20 (1969-70), 255-88 [hereafter Dörner 1969-70], at p. 269, Abb. 4.
4. Humann and Puchstein, p. 223, fig. 43, reproduced here from Dörner 1987, p. 53.
5. Dörner 1987, p. 53.
6. O. Hamdy Bey and Osgan Effendi, *Le tumulus de Nemroud-Dagh* (Constantinople, 1883) [hereafter Hamdy Bey and Osgan Effendi], p. 7; Humann and Puchstein, pp. 220-1.
7. Text in H. Waldmann, *Der kommagenische Mazdaismus (Istanbuler Mitteilungen, Beiheft 37, Tübingen, 1991)* [hereafter Waldmann 1991], pp. 200-1; my translation.
8. J. Wagner, 'Dynastie und Herrscherkult in Kommagene', *Istanbuler Mitteilungen* 33 (1983), 177-244 [hereafter Wagner 1983], at pp. 208-13, text p. 209 (also Waldman 1991, p. 201); my translation.
9. Wagner 1983, pp. 208-13.
10. Wagner 1983, *ibid.*
11. Dörner 1969-70, pp. 266-76, and 1987, pp. 53-9; also F. K. Dörner, 'Ein Drehbohrgerät löst das Problem der sepulkralen Kultanlage auf dem Karakush',

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in *Kommagene*, ed. F. K. Dörner (*Antike Welt* Sondernummer, 6. Jahrgang, 1975) [hereafter Dörner 1975], 60-3.

12. On the Nemrud Dagh hierothesion, the royal cult, and the dynasty of Commagene: M. Boyce and F. Grenet, *A History of Zoroastrianism*, Vol. 3 (Leiden, 1991), at pp. 309-51; Dörner 1975 (lavishly illustrated); Dörner 1987; H. Dörrie, *Der Königskult des Antiochos von Kommagene im Lichte neuer Inschriften-Funde* (Göttingen, 1964) [hereafter Dörrie]; T. Goell, 'The excavation of the "hierothesion" of Antiochos I of Commagene on Nemrud Dagh (1953-56)', *Bulletin of the American Schools of Oriental Research* 147 (1957), 4-22; Hamdey Bey and Osgan Effendi; Humann and Puchstein; R. Merkelbach, *Mithras* (Königstein/Ts., 1984), at pp. 50-72; S. Sahin and J. Wagner, 'Das Grabmal von Antiochos I. von Kommagene auf dem Nemrud Dagh', *Antike Welt* 20.1 (1989), 55-8; R. D. Sullivan, 'The dynasty of Commagene', *Aufstieg und Niedergang der römischen Welt* II.8 (Berlin, 1977), 732-98; Wagner 1983; J. Wagner, *Kommagene: Heimat der Götter* (2nd ed., Dortmund, 1988); H. Waldmann, *Die kommagenischen Kultreformen* (Leiden, 1973); Waldmann 1991. For the foundation text, Waldmann 1973, pp. 62-77 ; English translation, F. C. Grant, *Hellenistic Religions* (Indianapolis, 1953), pp. 20-5.

13. O. Neugebauer and H. B. Van Hoesen, *Greek Horoscopes* (Philadelphia, 1959) [hereafter N&VH], pp. 14-16, no. 61. The monument is of course discussed in the works cited in the preceding note.

14. Carina Software, *Voyager II Dynamic Sky Simulator*, Version 2.0, for the Macintosh. All subsequent sky chart figures were also generated by this program.

15. See above, n. 13.

16. Incidentally, Neugebauer and Van Hoesen's conclusion that it marks an otherwise unattested and redundant re-coronation of Antiochos has quite rightly been dropped.

17. Pliny, *Natural History* 18.235, 271.

18. Dörrie, pp. 201-7.

19. The scope of a fuller inquiry into Commagenian astrology, covering both Nemrud Dagh and Karakush, is outlined in my recent 'The Mysteries of Mithras: A new account of their genesis', *Journal of Roman Studies* 88 (1998), 15-28 [hereafter Beck 1998], at p. 124, n. 52. There is a further problem to be addressed concerning Nemrud Dagh: as M. Crijns has pointed out to me (draft article communicated 1995), an astronomically valid - although, in my view, less



likely - alternative date for the lion horoscope, 14 or 15 July 109 BCE, was incorrectly excluded by N&VH. Another alternative, 4-5 February 55 BCE, proposed by V. S. Tuman, 'The tomb of Antiochus revisited: planetary alignments and the deification of the king', *Archaeoastronomy*, 7 (1984), 56-69, can scarcely be taken seriously (despite its sophistication and ingenuity), for it denies the basic intent and datum of the document, namely that the four identified planets were in Leo (however defined) and the other three were not.

20. O. A. Tasyürek, 'Die Münzprägung der Könige von Kommagene', in Dörner 1975, 42-3.

21. Beck 1998, at p. 121, n. 36, pp. 126-7 (numerous references there cited).

22. Rising and setting dates vary with geographic latitude and epoch. For the heliacal rising of Taurus I give Bickerman's date for 38°N in -100 (E. J. Bickerman, *Chronology of the Ancient World* (London, 1968), p. 143). For the heliacal setting of Regulus I cite an ancient source, the date in Ptolemy's *Phases* (ed. Heiberg, p. 59) for the latitude of Rhodes (the closest to that of Commagene). Much of Taurus will start to rise after the rising of the Pleiades and much of Leo to set after the setting of Regulus. However, the Pleiades seemed the appropriate body to select, given their importance in ancient calendrics (their rising marked the beginning of summer in some systems: see Geminus, ed. Aujac, p. 107); likewise Regulus, given its importance in Commagenian astrology (see above). For methods of determining the dates of stellar risings and settings in contexts where greater precision is required, see B.E. Schaefer, 'Predicting heliacal risings and settings', *Sky and Telescope* 70 (1985), 261-3; 'Heliacal rise phenomena', *Archaeoastronomy* 11 (1987), 19-33.

23. See above, n. 3. I am grateful to Dr. Engelbert Winter of the University of Münster for confirming for me from the records and from Dörner's colleagues that the orientation appears to be accurate.

24. The phrase is used (admittedly, not in direct reference to the 'appearances' of 62 BCE) in the Nemrud Dagh foundation text, lines 85-6 (Waldmann 1973, p. 65).

25. Generated from the Voyager program. For reasons explained below, the dates given are the nights when the celestial bodies could be seen, weather permitting, closest to each other or at station (Jupiter over several nights).

26. A. Bouché-Leclercq, *L'Astrologie grecque* (Paris, 1899, repr. Brussels, 1963), pp. 252-4.

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27. The three planets of the lion horoscope are so named (actually, with a double system of nomenclature, on which see F. Cumont, 'Les noms des planètes et l'astrolatrie chez les Grecs', *L'Antiquité Classique* 4 (1935), 5-43): Mars as the 'Fiery (star) of Heracles' (*Pyroeis Hêrakleous*), Mercury as the 'Glittering (star) of Apollo' (*Stilbôn Apollônos*), Jupiter as the 'Blazing (star) of Zeus' (*Phaëthôn Dios*: here, of course, the two systems of divine names coincide, since Greek Zeus and Latin Jupiter are the same god).

28. See (e.g.) B. J. Malina, *On the Genre and Message of Revelation: Star Visions and Sky Journeys* (Peabody, MA, 1995), pp. 97-100. There is disagreement about the constellation identities of the man-faced and eagle creatures. Ultimately the entire image is derived from Ezekiel 1:5-13.

29. For this (astronomically) sceptical point of view, see R. E. Brown, *The Birth of the Messiah* (revised ed., New York, 1993), 171-3, 610-13. I am grateful to my doctoral student Timothy Hegedus for input on this dilemma of the different approaches of biblical critics and astronomers to the subject.

30. E.g., R. K. Marshall, *The Star of Bethlehem* (Chapel Hill, 1949), who points out that this triple conjunction was first advanced, as a precursor of the 'real' star, by Kepler.

31. E. L. Martin, *The Birth of Christ Recalculated* (2nd ed., Pasadena, 1980). The principal objection to this identification, the fact that the celestial events postdate the generally accepted date of Herod's death, evaporates if one consigns to fiction the story of the magi's journey and with it their encounter with Herod. One is left then solely with the question: what celestial configurations (computed or remembered) might have been retrojected, as a quasi-horoscope, on to Jesus' nativity when the stories of his messiahship first came to be formulated? For the most up-to-date discussion of the Star of Bethlehem see Michael Molnar, *The Star of Bethlehem: The Legacy of the Magi*, (Rutgers University Press, 1999). I applaud Molnar's shift of the search for the 'star' from a visually impressive astronomical event to an astrologically significant configuration, and I find his solution (essentially, Jupiter rising heliacally in Aries on 17 April 6 BCE) both elegant and persuasive, though less credible than it might have been if he had been less concerned with salvaging the historicity of the story of the quest of the magi.