

ASTRONOMY AND THE STATE: TIME, SPACE AND POWER IN THE FOUNDATION OF BAGHDAD

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Abstract: This paper will consider the application of the heavens to the organisation of the 'human polity modelled on the assumption of a close relationship between society on the one hand, and planetary and stellar patterns on the other. I will examine accounts of the astrological foundation of Baghdad within the tradition of celestial town planning, consider contradictions in the data for the foundation, and argue that the city was designed to connect heaven to earth and ensure peace, stability and political success by harmonising time and space. It is therefore a prime example of the use of astronomy in the service of political power.

Keywords: *astronomy, power, cosmopolis, town planning, horoscope*

Introduction

The inauguration of the city of Baghdad in July 762 AD (145 AH) marked a seminal moment in the legitimisation of Abbasid power. The move of the capital city of the Islamic Empire from Damascus under Caliph al-Mansur was a huge undertaking, initiated in 758 AD and involving around 100,000 labourers and artisans (Wiet, 1971). It signified a break with the past and a new beginning which was conducted in conformity with appropriate astronomical alignments and the rules of astrological interpretation. It therefore provides a case study in the relationship between astronomy and political authority. My purpose is to analyse the horoscope, using literary sources, to establish whether the textual evidence adds to our understanding of the cultural application of astronomy in the eighth century.

The relationship between astronomy and power is often treated as one in which those people in positions of authority apply their astronomical knowledge in order to manipulate those whom they control. As Steve McCluskey (1993, 429) pointed out in relation to Mesoamerica, 'Astronomical observation and knowledge were...signs of sacred power and status'. Elaborating on this argument, and using the Pre-Columbian Mesoamerican application of the movements of Venus to regulate warfare, Clive Ruggles described the manner in which astronomical knowledge can function as 'a resource that can be brought to bear in support of the dominant ideology to reaffirm and reinforce the structures of a particular society' (Ruggles and Saunders 1993, 4). No doubt there is some truth in this perspective, and it resonates with Antonio Gramsci's (1971) theory of cultural hegemony, in which ideology rather than physical force serves as a tool of repression. In terms of the theory of space, Deyan Sudjic (2005) encompasses the hegemonic model (although he does not use the term) in his analysis of the phenomenon whereby powerful people construct monumental structures, including, of relevance to this paper, Saddam Hussein's reconstruction of Babylonian sites. Imposing architecture is used as an instrument of state power, to reinforce a cosmology in which the leader is interposed between the mass of the population and their ability to control their destinies.

The foundation of Baghdad is an archaeoastronomical issue, but Clive Ruggles has made an eloquent case for examining astrology in relation to archaeoastronomy. Speaking of academic interest in astrology, he argued, 'What interests these scientists [archaeologists and

anthropologists, whose interest is human behaviour] is the fact that people throughout the ages have drawn direct connections between the appearance of the sky and events on earth, and that this forms an integral part of their understanding of the way the world works' (Ruggles 2005, 24). Again, in relation to megalithic astronomy in particular, and all pre-modern astronomy in general, he wrote,

Why should the archaeologist, and in particular the student of Neolithic and Bronze Age Wessex, be interested in the perception of astronomical phenomena? A general answer is that in many, if not virtually all, non-Western world-views celestial phenomena are not separated from terrestrial ones, but form part of an integrated whole with complex interconnections. The association may often be viewed as closer in nature to modern astrology than modern astronomy (Ruggles 1997, 204).

For the astronomers of the eighth-century Near East, the use of astrology in the sense that Ruggles defines it was reinforced by Claudius Ptolemy's insistence that the astronomers work is divided into two phases. The first was the measurement of celestial positions, the second the measurement of their effects (Ptolemy 1940, I.1). To understand archaeoastronomy in the Islamic world, it is insufficient to consult Ptolemy's astronomical work, the *Almagest*; his astrological text, the *Tetrabiblos*, is the essential text. Ptolemy also developed the notion of cosmography, defined by Short as the use of geographical and celestial coordinates to map the harmonious relationship between sky and earth so that order might be maintained in terrestrial society (Short 2001, 28).

Cosmic Building

The evidence suggests that traditions of cosmic building appear to be as old as settled human life and, as Colin Renfrew said of Stonehenge, the practice seems to represent a 'deliberate attempt to align the human society in question with the cosmos' (Renfrew 2008, 183). Such concepts are evident in the ancient Near East. For example, in first-millennium BC Persia, Persepolis, the ceremonial capital of the Achaemenid Empire of c. 550-330 BC, was conceived of as what we might call a cosmic city, a cosmopolis in Greek. Paul Wheatley (1971, 439) described the city as follows:

With its acres of buildings, with a reception hall open on all sides to symbolize the diffusion of divine authority to the four quarters, and its triple wall, itself

symbolic but further strengthened by symbolic defensive signs and enormous supernatural figures standing guard before its gates, with its sacred groves in stone, its man-headed and lion-slaying bulls, sphinxes and paws uplifted in adoration before the Tree-of Life, throne room scenes, and all-pervading symbolic emblems, Persepolis constituted a magnificent demonstration of abundance, the contribution of the Persian people to the maintenance of harmony between the heavens and the earth.

To make better use of the heavens, key temples and palaces appear to have been aligned roughly to the north-east, facing the rays of the rising summer solstice sun. There are also accounts that Seleucia, capital of the Seleucid empire, one of the successor states to Alexander's empire, was founded on the basis of astrological advice. The story is possibly apocryphal but the second-century AD Alexandrian historian, Appian (II.9.58 in Cramer 1996, 11), emphasised the importance given to the correct foundation of cities by giving to the Babylonian astrologers of the time the following words: 'That which is fated, O king...neither man nor city can change, for there is a fate for cities, as well as for men!' Records of an astrological component in the consecration of Constantinople on 11 May 330 may also be apocryphal, as Pingree (1977) suggested, but also reinforce a prevailing idea that great cities should have great horoscopes.

The Astronomical Foundation of Baghdad

The best study of the foundation of Baghdad as a cosmopolis is Ibrahim Allawi's 'Some Evolutionary and Cosmological Aspects to Early Islamic Town Planning' (1988). Allawi drew attention to the astronomical and astrological features of Baghdad's foundation but, while he addressed the former, he did not possess the technical expertise to apply the latter.

Allawi's thesis was based on the following assumptions. First, townplanning in the Islamic world was, in important instances, cosmological, and in this respect based on pre-Islamic examples (of which the most notable is Mecca, the Ka'aba being aligned with the spring equinox) and which have antecedents which may be traced back to Sumerian culture in the 3rd millennium BC. Second, there were two principal models of Islamic *cosmopoleis*; one was the city of Kufa, which had replaced Medina as the Islamic capital under Caliph Ali in 656, and the second was Baghdad, founded as a replacement for Damascus in 762, under Caliph al-Mansur. When Al Mansur decided to create his new capital he intended it to be, as Allawi (1988, 62) put it, 'the centre of a world empire of power and commerce, and the navel of the whole cosmos'. Allawi identified various cosmological-numerological templates for urban planning, such as a quadruple system analogous to the cardinal points, and a hexagonal system which he identified with the many septenary systems in the ancient world, including the seven planets. He argued that the design of Kufa had been essentially open and aligned,

like Mecca, with the spring equinox. Baghdad, meanwhile, was essentially closed and, unusually, round, and envisaged as 'a grand cosmic astrolabe' (1988, 62). Allawi concluded that,

The design of the Round City of Baghdad is based on an astrological scheme. To attempt an explanation of its intricate conceptions would call for a technical treatment and some familiarity with Islamic astronomy and astrology, subjects still unfortunately unintelligible save to the initiated few and historians of science. Yet such a discussion is unavoidable if the discussion is to go beyond statement of hypothesis (1988, 62).

Again, Allawi reiterated a few lines later that the design of Baghdad 'cannot be separated from astrology' (1988, 62). However, he restricts his discussion to a kind of general astronomy/astrology in which the round city is divided into twelve sections and related to the great circles of the universe, such as the tropics and the equator, as well as to the sun's apogee and perigee (1988, 66-9). As an example, the sun covers a longer distance when at its perigee (when furthest from the earth) than at its apogee (when closest to the earth) and the area of the city corresponding to the Sun's perigee therefore, he claimed, contained more streets.

However, for a full picture of the astronomical considerations behind Baghdad's foundation, the horoscope needs to be analysed. In order to ensure the best possible moment for his new capital's inauguration, al Mansur employed a committee of astrologers which, according to the chroniclers al-Yaqubi (d.897) and al-Biruni (973-1048), included Naubakht the Persian, of whom little is known, Masha'allah (c.740-c.815), whose work was to be influential both throughout the Islamic world and in medieval and Renaissance Europe, Umar ibn al-Farrukhan al-Tabari (known in Latin Europe as Omar of Tiberius), and al-Fazari, reputedly the first Arabic astrologer in the Islamic world (Pingree 1970, 104). Again, according to Allawi,

More relevant to our theme is the team of astronomers, astrologers and *muhandisun* to whom was entrusted the design of the city and the execution of the work. Translations of Ptolemy's *Almagest*, Indian astronomical treatises and Persian manuals were ordered by al Mansur (1988, 62).

The astrologers active in the region at the time were not necessarily Muslims (Pingree, 1997, 41-9), a significant point because they were unaffected by previous Islamic suspicion of non-Islamic learning. One, Kankah was Indian, Masha'allah was a Jew, while those who were Muslims, such as Abu Ma'shar, Omar of Tiberius, and Naubakht, tended to be Persians. Such astrologers formed part of an international community, exchanging information and texts between Greek, Syriac, Pahlavi and Sanskrit. The Greek texts which formed the basis for pre-Islamic Persian astrology included works by Dorotheus of Sidon, Vettius Valens and Hermes, dating to the first two centuries AD (Pingree 1997, 49). The last Greek

astrological author known to have been consulted by the Arabic-speaking Persian astrologers of the 8th century, was Rhetorius (late 6th to early 7th century), who summarised earlier astrological works including Claudius Ptolemy's second-century AD *Tetrabiblos*, which I shall refer to in the original (Pingree 1989, 232-3). The first major astrological author of Islamic Persia was a Greek, Theophilus of Edessa, (c.685-785), who concluded his career by working for Caliph al-Mahdi (775-85). I shall therefore consider texts from the Greek-speaking world, together with works in Arabic, which tend to be written immediately after the foundation of Baghdad, but which, as Pingree (1997) argued, are a summation of astrology prior to its foundation.

The Horoscope Data

The horoscope data was given by al-Yaqubi (Pingree 1970, 104) in the 9th century and al-Biruni (1879, 262) in the tenth-eleventh. However, there is a contradiction in the data. Al-Yaqubi listed the planetary positions on the basis of information from the astrologer al-Fazari. I recalculated the data using Solar Fire software, and the positions of the sun and moon indicate a time of 23.37 LMT on 30 July 762 and an ascendant (rising degree) of 20;45 Taurus (see Figure 1).

	1. Al-Fazari	2. Calc	3. Al-Biruni	4. Calc
Saturn	26;40 Ar. Ret.	1;10 Ta	26;40 Ar. Ret.	1;27 Taurus
Jupiter	Sag.	8;48 Sag	Sag.	8;47 Sag. Ret.
Mars	2;50 Ge.	6;31 Ge.	2;50 Ge.	6;55 Ge.
Sun	8;10 Leo	10;11 Leo	8;10 Leo	10;47 Leo
Venus	29;0 Ge.	2;01 Can.	29;0 Ge.	2;44 Can.
Mercury	25;7 Can.	26;59 Can. Ret.	25;7 Can.	26;54 Can. Ret.
Moon	19;10 Lib.	19;10 Lib.	19;10 Lib.	27;37 Lib.
North Node		28;48 Cap	25; Cap	28;47 Cap
Ascendant		20;45 Ta.	Sag	6;09 Sag

Figure 1. The horoscope of Baghdad.

1. Planetary positions from al-Fazari, recorded by al-Yaqubi
2. Planetary positions from al-Fazari recomputed for 23.37 LMT 30 July
3. Planetary positions from al-Biruni's horoscope given by Sachau
4. Planetary positions computed for the presumed ascendant of 6° Sagittarius.

Al-Biruni reproduced what Pingree assumed was Naubakht's horoscope for the city, giving it an ascendant in Sagittarius. This, though, is inconsistent with al-Yaqubi's data, for Sagittarius was rising on the afternoon of 31 July. The horoscope from al-Biruni's manuscript reproduced by Allawi appears to contain no degree positions for either planets or ascendant (Adams, 2011). The printed chart diagram created for Sachau's English translation of al-Biruni reproduced al-Yaqubi's degree positions for all the planets except Jupiter (for which al-Yaqubi records no position), but not for the ascendant (Figure 2). A tradition then arose, the origin of which I have not been able to trace, that the ascendant was 6° Sagittarius. Allawi assumed that this was correct, and it occurs elsewhere in the modern literature. James H. Holden uses this position and assumes a time and date of 14.40 LMT on 31 July 762, on the basis that, although 'No cuspal degrees are given... we can assume that the astrologers chose the time when Jupiter was in the ASC degree' (Holden, n.d.). The correct calculated time for an ascendant of 6° Sagittarius is 14.28 LMT. The result of this uncertainty is confusion even in the date of the city's inauguration; Pingree assumed 30 July, but Allawi and Holden assume 31 July. This makes it difficult to retrospectively reconstruct the intentions of al-Mansur's committee of astrologers with any certainty. However, I shall examine what the horoscopes may indicate, referring to the al-Fazari data as AF, and the al-Biruni data as AB.

Al-Biruni himself did not analyse the horoscope and gave only the following general commentary:

Winterly air on sea, winds (Philippus and Metrodorus); beginning of the blowing of the Etesian winds (Egyptians). On this day 'Abu Ja'far Almansur began to build Baghdad, that party which is called *Mansur's town*, on the western side of the Tigris in the present

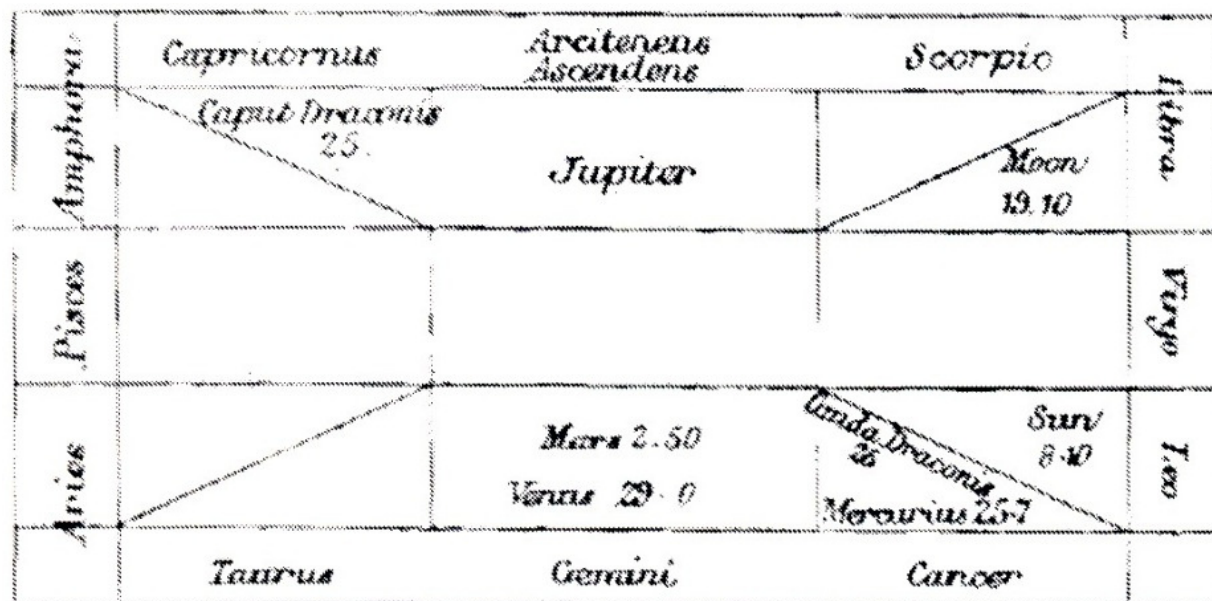


Figure 2. The printed horoscope chart from Sachau's 1879 English Translation of al-Biruni's Chronology of Ancient Nations.

Baghdad. This was A. Alexandri, 1074 [762 AD]. Astrologers are obliged to know dates like this, and must date from such an epoch by means of their knowledge of the Permutations, Terminations, Cycles, and Directions, until they find the horoscopes of those people who were born at those times. It was Naubakht who determined the time (for the commencement of building). The constellation which heaven showed at the time, and the stations of the planets which appeared on heaven, were such as are indicated in the following figure (1879, 262).

Note that he specified that a precise time for the inauguration was chosen, confirming that an ascending degree was specified, but that he records neither a time nor ascending degree.

Allawi's Analysis

In Allawi's view, the crucial determining fact for the horoscope for Baghdad was that the ascendant was set for 6⁰ Sagittarius. This is equivalent to 246⁰ of celestial longitude which Allawi believes was significant because it represents the terrestrial longitude of Baghdad if the mythical city of Kandakes, supposedly located in eastern China, is taken as 0⁰. I make no comment on this argument. Aside from this, Allawi writes that 'it is not easy to comprehend the astrological scheme underlying the horoscope at a glance' (1988, 62). However, the astrological scheme might be understood by consulting the astrological handbooks of the time.

Analysis of the Horoscope

There are abundant textual sources for eight-century astrology, but few indications of the specific rules that might have been implemented in the foundation of a city. The astrologer Sahl ibn Bishr al-Israili (c. 786-845?), did include a section in his work 'On Elections' titled 'If you wished to elect so that you might build a house...' (Sahl 2008, 199). He recommended taking the relevant factors in the following order of importance: the Moon, the planet ruling the sign containing the Moon, the ascendant, the planet ruling the sign containing the ascendant, the lot of fortune and Mercury. He then argued that Mars should be avoided with the qualification that, if he is present, then he should be under the sway of a strong Venus. He concluded with a string of increasingly minor and more intricate rules. However, given the uncertainty of the horoscope data, I need to start with the obvious common factor in both horoscopes, planetary locations in the zodiac signs rather than the houses (or 'domiciles' from the Greek, which are based on the diurnal cycle): except for the moon, the planets move only fractionally through the zodiac signs in one day but pass through all twelve houses. Thus their sign positions in the AF and AB charts are the same, but their house positions radically different.

To begin with Sahl's criteria, the moon is in Libra, a location where, taking all factors into account, it is strong: in particular it is in the sign ruled by Venus, a fortunate planet (Ptolemy 1940, 1.5, 1.17). Ignoring the

ascendant, for the moment, as it is the cause of uncertainty, the lot of Fortune is not specified, so I will not consider it. Mercury, next in the list, is in Cancer, the sign ruled by the Moon and so, indirectly also, drawn under Venus' benevolent sway (Ptolemy 1940, 1.17). Mars, a destructive planet (Ptolemy 1940, 1.5), meanwhile is not avoided, as Sahl advised, but is in a close opposition to Jupiter, a difficult alignment (Ptolemy 1940, 1.13), a point to which I shall return. Mars is, though, in Gemini, a sign ruled by Mercury (Ptolemy 1940, 1.17) and so, via Mercury and the Moon, drawn under Venus. Venus itself is in Gemini, ruled by Mercury, so it does seem as if the astrologers may have been attempting to create a system of interlocking relationships between the planets. Saturn, being in Aries, a sign ruled by Mars (Ptolemy 1940, 1.17), is therefore also drawn into this scheme. The sequence of relationships could be considered a form of reception, a means of bringing the planets into mutually supportive relationships (Masha'allah 2008a, 439).

Only two planets are not part of this system: Jupiter is in Sagittarius, a sign which it rules, and the Sun is in Leo, which it rules (Ptolemy 1940, 1.17). Both planets therefore possess a kind of autonomy, and my suspicion is that these are the two most important factors in the chart. The Sun is in its own sign of Leo, which was characterised by Hephaistio of Thebes (1994, I.1) as 'kingly': hence we can assume it represents al-Mansur himself. The Sun itself was described by Vettius Valens (1993, I.1) in the following terms:

the all-seeing Sun, then, being truly fire-like and the light of the mind, the organ of perception of the soul, is significant at birth for a kingly office, hegemony, mind, practical wisdom, outward form, motion, height of fortune, public registration, action, popular leadership, judgment, father, mastership, friendship, persons of high repute, the honors of images, statues and crowns of office, arch-priests of the fatherland.

At 10⁰ Leo, the Sun had just entered the sign's second decan, for which Hephaistio of Thebes (1994, I.1) gave the following reading:

he who is brought forth upon the second decan will be a master, a king; he will be declared a plenipotentiary, and he will subject many and found cities, and many will pay tribute to him, and there will be knowledge of god in him, and the discovery of gold, and his mind will be inspired by him, and his honor equal to the gods.

There was a tradition in the classical world, expressed by Julius Firmicus Maternus in the 4th century, that the emperor was not subject to the stars (1975, II.XXX.4-5). However, if he is not subject to them, heaven at least indicates that al-Mansur's position was powerful.

Jupiter, meanwhile, was considered the most benevolent of the planets (Ptolemy 1940, 1.5) and its benign role was strengthened due to its rulership of Sagittarius (Ptolemy

1940, I.17), the sign containing it. In the Babylonian tradition, Jupiter appears to have been benevolent for kingship: if the planet was present in an eclipse then it signified, in one text, 'well being for the king' (Hunger 1992, 535). Another recorded that, if Jupiter was bright, the king would prevail (Hunger 1992, 489). Also significant was that the Sun and Jupiter are in a trine (separated by three zodiac signs), which brings them into a harmonious relationship (Ptolemy 1940, I.13,18). They are also both in their own signs within the fiery triangle (Aries-Leo-Sagittarius), which the Sun rules by day (which is relevant if the AB chart is correct) (Ptolemy 1940, I.17).

So far then, we have considered only general factors. The Sun was in Leo for an entire month and in a close angular relationship with Jupiter for a few days: we cannot say how close a relationship al-Mansur's astrologers required the planets to be in, but some quality about the days 30-31 July must have been significant.

We need to consider, though, the AB horoscope, with its Sagittarius ascendant (the ascendant came high on Sahl's list of criteria for choosing the time to erect a building), which, as I argued, is entirely inconsistent with the planetary (especially lunar) data given by al-Yaqubi. There is a clear problem. However, to place the ascendant in Sagittarius also places Jupiter, being in the same sign, close to the ascendant and in the first house. For Masha'allah, this could not be better: 'Jupiter, if he were in the Ascendant, signifies reverence and beauty and the honesty of faith and religion, of teaching also, and reason, and the end of those things in which is involved, will be towards salvation, and sovereignty will be handed to him in this' (Masha'allah 2008b, 507). From the classical literature, we find the following from the fourth-century astrologer Julius Firmicus Maternus:

if Jupiter is found exactly on the first angle, that is, on the ascendant, especially in those signs in which he rejoices or in his own house or terms or in his exaltation, he will make the native high-born, famous, always ruling great states, perhaps the first ten of the great states. He will also make him...virtuous, charming, benevolent, cheerful, rich, especially if Jupiter is in this house by day...' (1975, III.3.1).

Again, this is a powerfully benevolent indication for al-Mansur. Further, a Sagittarian ascendant would place the Sun in the ninth house which, in Masha'allah's view, signified 'divine culture faith and the fear of God the Highest, and the remembrance of angels' (2008b, p. 499). Going back to the classical tradition, Firmicus (1975, III.V.33) wrote that

Natives who have the Sun in the ninth house make images of the gods or worship divine images; or they decorate the gods, design their temples or write hymns and prizes of the gods. They make ostentatious display of holy songs and gain fame and honor from this activity.

He also wrote that 'If the Sun is on the ascendant by day, Jupiter on any angle...the native, although not a lord or king, will have power throughout the whole world' (1975, III.V.1). Now, the Sun was not on the ascendant, but Jupiter was on an angle (the ascendant), so his reading gives us something of the flavour of the pattern.

The AB chart, with its Sagittarian ascendant, is quite clearly so benevolent while being at odds with the data in the AF chart that it is clearly possible that it is rooted in a tradition which was already current when al-Biruni wrote. We may point to two solutions to the problem.

1.The AB horoscope might have been retrospectively rectified and attributed to Naubakht, that is, a new time and date assumed on the basis that Sagittarius 'should' have been ascending when Baghdad was inaugurated, moving the data from 30 July, as chosen by al-Mansur's committee, to 31 July.

2.There was never any intention that the ascendant and the planetary data in the AB horoscope should correspond. This may be a heretical suggestion, but it was already accepted that the ascendant, as the starting point of a twelve-house system, need not be astronomically correct. For example, it was possible to use the Lot of Fortune, calculated on the basis of the Sun, Moon and astronomically-correct ascendant, as the basis of a twelve house system known as the *athla* (Manilius 1977, 3.43-159), with the Lot of Fortune functioning as a derived ascendant. Thus Allawi may be correct that the ascendant was 6° Sagittarius. However, it may not have been the case that al-Mansur's astrologers chose a corresponding time of 14.28 LMT 31 July, but that a derived, rather than astronomically-correct, house system based on 6° Sagittarius, was imposed on plants calculated for 23.37 LMT on 31 July. This is indeed a complicated solution, but not an impossible one.

We should also bear in mind a third option; that the Sagittarius-ascendant horoscope presented by al-Biruni is genuinely that cast by Naubakht, but that the planetary positions, especially that of the Moon, were miscalculated in the original. In that case, though, we have even more reason to consider that benevolent Sun-Jupiter relationship as crucial. There is, though, one further problem with both the AB and AF charts: Mars, a naturally malefic planet (Ptolemy 1940, 1.5), was in a close and inauspicious opposition to Jupiter. Worse, in the AB chart Mars was on the descending angle (in the seventh house), strengthening its destructive power rather than, as Sahl was to recommend, minimising it. This is what Masha'allah had to say about Mars in the seventh house (2008b, 510): 'business dealing and contention and sexual intercourse with injustice, and harm on account of this, and disarray in every matter, and contention and horribly [so], and grief because of them'. Firmicus (1975, III.4.17) had considered that the same position 'indicates the greatest evils and enormous perils'. He also suggested that 'Jupiter and Mars in opposition indicate an unstable life and continual loss of possessions. Hostility of friends is stirred up, and there is the greatest danger from riots

and rash activities' (1975, VI.VXI.1). What seemed profoundly auspicious (Jupiter in Sagittarius in the first house trine Sun in Leo in the ninth house) now appears to carry equally profound dangers. A resolution to this conundrum has to be found.

One possible solution is suggested by the astrological allocation of Zoroastrian millennia to planets. According to Masha'allah, the tenth of the twelve onethousand year periods in the lifespan of the Persian world was ruled by Mars (Kennedy and Pingree 1971, 72-3). Pingree and Kennedy, noting that the births of both Christ and Mohammed occur in a Martian period, find this unsatisfactory and argue that the better option would have been the Sun (Kennedy and Pingree 1971, 74-5). However, there is no problem: all the evidence from medieval and Renaissance Europe, where Masha'allah's scheme was adopted with enthusiasm, indicates that the planets' rulerships of historical periods are not associated with their inherently benign or malign natures, which are disregarded for this purpose (Campion 1994, 354-9).

A good precedent was set by the emperor Augustus when he promoted the zodiac sign in which the Moon was located at his birth, Capricorn, for propaganda reasons. The Moon is weak in Capricorn—Masha'allah (2008c, 371) referred to the position as 'evil'—which is ruled by the planet Saturn, which was considered to be destructive (Ptolemy 1940, 1.5). It appears that the emperor was exploiting an alternate tradition in which Saturn, as the Greek Kronos, was ruler of the Golden Age (Campion 2009, 234). The strict rule which designated planets weak or strong depending on their zodiac sign was therefore trumped by a historical imperative. Thus, if we adopt a millenarian Zoroastrian scheme, rather than a horoscopic one, the threatening qualities of the Jupiter-Mars opposition may have been replaced by a neutral indication that the foundation of Baghdad conformed to a divine, historical plan. This, at any rate, is a suitable solution.

Conclusion

Clive Ruggles (2005, 23) wrote that,

From ancient Babylon to China, Mexico and Peru, from empire and city state to tribe, astronomical information was gathered and recorded and use by those interests lay as much in the spheres of status enforcement and political ideology as in predicting rainy seasons or planning agricultural schedules.

In the case of Baghdad we have a prime example of the encoding of astronomical data in space, through the structure of the city and through time in the moment chosen for its inauguration. That we have doubts over the data used for this moment does not change the principle. The city was intended to create a physical link between heaven and earth, to synchronise human actions with God's will as expressed in the unfolding of planetary patterns.

Although the horoscopic data for the foundation of Baghdad is inconsistent, and unresolved questions remain, a good argument can be made that it was designed to bring the power of the celestial spheres and of the divine plan of history to bear on the new city. The purpose may also have been to actively play a role in ensuring the city's success. As the pseudo-Ptolemaic *Centiloquium* (probably composed in eighth-century Persia) put it: 'One skilful in this Science may evade many effects of the Stars, when he knows their Natures, and diligently prepares himself to receive their effects' (Ptolemy 1679, 305). I would therefore like to suggest that we can identify different perspectives on the use of astronomy in relation to power: (1) to harmonise with the divine plan as expressed through celestial cycles, (2) to call down the blessing of God through such harmonisation, (3) to gain power through correct alignment with history and (4) to gain the knowledge necessary to actively manipulate fate through correct behaviour.

David Harvey (1989, 175) has drawn attention to the fundamental importance of time-space relations to social relations, but argues that, in conventional urban studies, time is prioritised. This is particularly clear in the case of Baghdad, in which its astronomical qualities were encoded in the time for its foundation. As Vincent Berdoulay (1989, 135) wrote, 'a place comes explicitly into being in the discourse of its inhabitants, and particularly in the rhetoric it promotes. Thus the geographers' discourse uses the same ways as the people who define their own place'. In these terms, astrology was the discourse used by the founders of Baghdad.

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