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Don't Listen to the Sceptics: Li Chunfeng (602–670) on Why Solar Eclipses Are Still Omens

Daniel Patrick Morgan (墨子涵)*

Abstract From at least the time of Sima Qian (c. 145–c. 86 BCE), Chinese sources have consistently divided the astral sciences into *tianwen* ‘heavenly patterns’ and *li* ‘calculation’. In short, the former is devoted to interpreting ‘anomalies’, the latter to modelling ‘regularities’, and though no one in his day could predict them with any accuracy, Astronomer Royal Sima Qian makes a forceful argument that solar eclipses are nevertheless perfectly ‘regular’ and, thus, not to be read as omens. Seven centuries later, when experts were able to calculate their exact time, place, ‘starting corner’ and magnitude with relative ease, we then hear Astronomer Royal Li Chunfeng (602–670) argue the opposite: that, regardless the protestations of sceptics, eclipses are nevertheless ‘catastrophes’ linked to political dysfunction. In this chapter, I will discuss Li Chunfeng’s curious position, presented in the omen compendium *Yisi zhan*, then turn to his other works and activities in ‘heavenly patterns’ omenology to explore how he may have put theory into practice. With an idea of what he personally did about solar eclipses, I will then take a broader look at the practice of their interpretation to his day to hypothesise about what was at stake in declassifying them as ‘anomalies’.

Key words Solar eclipses, Omenology, Li Chunfeng (602–670), *Yisi zhan*, Ritual

Introduction

In China, solar eclipses occupy a curious grey area between what an Assyriologist would call omenology and mathematical astronomy – between the sister sciences, in emic terms, of *tianwen* 天文 (‘heavenly patterns’) and *li* 曆 (‘calculation’). As our sources themselves describe them, *tianwen* is devoted to interpreting ‘anomalies’ (*yi* 異), and *li* to modelling and predicting ‘regularities’ (*chang* 常).¹ Where solar eclipses fall between the cracks is that, as one of the most spectacular phenomena the sky has to offer, they began as momentous ‘anomalies’, but over the course of the early imperial period (221 BCE–750 CE), experts learned that they were in fact ‘regular’ and developed models to successfully predict them. This leads to a curious dilemma first identified by Nakayama Shigeru:

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* Due to the interdisciplinary aims of this volume, I have chosen to prioritise translations and Western-language scholarship and keep Chinese characters to a minimum. For any sinologist who would like to verify my translations and statistics, see the supplementary data available at <https://halshs.archives-ouvertes.fr/halshs-02116057>.

¹ Or, as Yixing 一行 (673/683–727) tells us in *Xin Tangshu*, 27B.633, ‘mathematicians (*suanzhe*) are ignorant of signs (*xiang*), and omen-readers (*zhanzhe*) are confused by numbers’. For a discussion of the terminology, taxonomy, juxtaposition, literary genres, division of labour and historical evolution of *tianwen* and *li*, see Morgan (2017: 10–25). For important recent studies on *tianwen* omenology, see Cullen (2011), Chapman (2015) and Pankenier (2013).

[I]t is [thus] only natural to expect that the astrological importance of eclipses of the sun should have been lost. On the contrary, it was maintained to modern times. It is true that observation of solar eclipses provided an excellent method for checking the accuracy of the calendar (DPM: predictive astronomical models), but they kept their astrological significance for quite other reasons.

First, the periodicity of lunar eclipses had been discovered before the court ritual had attained a fixed pattern, whereas the periodicity of solar eclipses was not accepted until after they had come to acquire a definite ritual significance. Thus, as a matter of conventional inertia, the custom of closing offices on the day of a solar eclipse was observed even during and after the T'ang period. Second, the prediction of solar eclipses requires considerably more sophisticated techniques than that of lunar eclipses. For this reason early attempts at prediction could not have attained a high rate of confirmation. Inaccuracies were attributed not necessarily to imperfections in scientific technique, but often to the indeterminacy of celestial motions – or, to put it more accurately, to their susceptibility to at least some control by human desires operating through ritual and magic (Nakayama 1966: 445–446).

Nakayama offers this tantalising assertion in passing, with no supporting evidence, and there has been little since by way of follow-up with the exception of Shi and Xing (2006), who detail the state of eclipse prediction and the theoretical debate in omenology under the Han Empire (206 BCE–220 CE). In this chapter, I would like to extend the latter's discussion down to the seventh century CE and readdress the matter of ritual as raised by Nakayama.²

Specifically, after an overview of the theoretical debate and its underlying mechanics, we will examine how things played out in the omenological records from the following centuries and in the next substantial contribution to said debate by Li Chunfeng 李淳風 (602–670), the Tang astronomer royal in 648–662 and 670. Known in both 'heavenly patterns' and 'calculation', contemporary practice and historiography, Li Chunfeng has left us, among other things, with the ten-fascicle omen compendium *Yisi zhan* 乙巳占, histories of our sister sciences in the *History of the Jin* and the *History of the Sui*, a biography, and a slew of historical anecdotes.³ Curiously, we will see that the *Yisi zhan* makes a bold, innovative defence of eclipses omens in the face of scepticism wrought by 'scientific progress', for lack of a better word,⁴ but that it is one that leaves little discernible trace in Li Chunfeng's other writings or known activities. Left wondering what is at stake in this defence, we then explore the history of government responses to eclipse omens, asking if, as Eberhard (1957) has argued, they might represent a tool of political leverage that Li Chunfeng is unwilling to retire. What we find leads me to believe that it is, but that its form and function are entirely different to what Eberhard describes.

² On 'heavenly patterns' and ritual as explored through poetic journeys and the ritual of divination itself, see Chapman (2015: 210–286).

³ On Li Chunfeng and his authorship of said monographs, see Goodman (2019). For Li Chunfeng's collected works, see *Li Chunfeng ji*. Note that I use 'monograph' as a stand-in for the *zhi* 志 devoted to technical subjects and the history thereof within the framework of the 'annals-biography-monograph' genre of state history.

⁴ On the idea of the historical 'accumulation' (*ji* 積, *lei* 累) of human knowledge for the better in early imperial astronomy and in Li Chunfeng's writings specifically, see Morgan (2017: 177–212) and the works cited therein.

1 Solar eclipses in early omen theory

To summarise from Shi and Xing (2006), the first evidence for the prediction of solar eclipses in China appears only in the late second century CE. Admittedly, two astronomical procedure texts from the first century CE do include a method for predicting the ‘coincidence’ (*hui* 會) of the necessary conditions for there to be an eclipse using a period of $5^{20/23}$ months (23 eclipses:135 months). However, they specify that this applies to ‘calculating lunar eclipses’,⁵ and there is no evidence that this model was or could have been effectively applied to the sun.

Naturally, this led early, semi-legendary experts like Shi Shen 石申 (fourth century BCE) and Gan De 甘德 (third century BCE) to treat solar eclipses as omens to be interpreted (*zhan* 占). Oft cited, their original works are now lost, but the *Kaiyuan Omen Classic* of 729 CE offers the following by way potentially spurious fragments:

Mr Gan says: ‘[If/when] passing through a state without the Way (*dao*), the sun and moon are dimmed and eclipsed. [The state] is attacked by armies, and state and family are lost; there is further/furthermore cause for mourning.’ Mr Gan says: ‘The sun is the brilliant glory of the essence of Yang. The moon dark treasures its *qi*, which spreads virtue wherever it [shines]; it is the root of life on earth, and we call it virtue (*de*). Virtue is of the *lei* 類 (**category**) of life, and [if] virtue is compromised then [it/all] is lost. Therefore, [if/when] the sun is eclipsed there is necessarily a national disaster, and [if] the sun is eclipsed then (*ze*) the state that has lost its virtue will perish. [In case of] solar eclipse, cultivate virtue.’⁶

One notes that ‘passing through a state’ is a second-order criterion of interpretation referring to ‘field allocation’ – schemes by which the sky was divided into regions corresponding to ancient or contemporary political/administrative divisions.⁷ Shi Shen, by contrast to Gan De, is principally cited as concerns such second- and third-order criteria. Here is an example from further down in the *Kaiyuan Omen Classic*:

Mr Shi says: ‘[If/when] the sun is completely eclipsed, a/the great man of the [corresponding] state perishes; [if/when] incomplete, a/the minister leaves.’⁸

Coming to the Han Empire (206 BCE–220 CE), when our sources begin to pick up, it is safe to say that no one in Sima Qian’s 司馬遷 (c.145–c.86 BCE) day knew how to predict a solar eclipse either. Nevertheless, as the director of the astronomical bureau, Sima Qian makes a forceful argument in his ‘Book of Heavenly Offices’ that solar eclipses, in and of themselves, are not to be read as omens:

In the old Gan [De] and Shi [Shen] methods... the dimming and eclipse of sun and moon were all taken as ***zhan* (omens to be interpreted)**.

[However], I have contemplated/observed the historical records (*shiji*) and examined past events, and [I can say that] in one hundred years... the dimming and eclipse

⁵ Liu Xin 劉歆 (c.50 BCE–23 CE), *Santong li* 三統曆 (1 BCE/5 CE), translated in Cullen (2017: 99–100); Bian Xin 編訢 and Li Fan 李梵, *Sifen li* 四分曆 (85 CE), translated in Cullen (2017: 180).

⁶ *Kaiyuan zhanjing*, 9.8a.

⁷ On ‘field allocation’ (*fenye* 分野), see Pankenier (1999; 2005).

⁸ *Kaiyuan zhanjing*, 9.14b.

of the sun and moon and their travels north and south (of the celestial equator) all have their [appropriate] times. These are their general **du 度 (measures/norms)**. ...

Faced with a solar disturbance, one practices virtue; faced with a lunar disturbance, one reduces punishments, ... For any celestial disturbance, [however], one only resorts to **zhan (omen interpretation)** if their **du (measures/norms)** are exceeded.

[If] the lord of the state is strong and great, the virtuous prosper, and the weak and small, fawning and false, [will] perish. The ultimate superior practices virtue, the next [person down] practices statecraft, the next practices relief [efforts], the next cultivates expiation, and [those at] the very bottom have no [responsibility] in the matter.⁹

Some two centuries later, after experts had begun successfully predicting when one might expect a lunar eclipse, Ban Zhao 班昭 (44/49–118/121) comes back to this in her ‘Heavenly Patterns Monograph’ in the *History of the Han*, playing on a double entendre between *zhengxing* 正行 as ‘proper motion’ and/as ‘proper conduct’¹⁰:

Li (mathematical astronomy) is concerned with proper motion/conduct. The ancients had a saying that: ‘When Great Peace reigns all under heaven, the five [planets] obey their **du (measures/norms)**... neither is the sun eclipsed at new moon, nor the moon eclipsed at full moon’. Mr Xia’s *Solar and Lunar Tradition* states that: ‘When a solar or lunar eclipse is complete, it [relates to] the position of ruler; when incomplete, it [relates to] the position of subject’. [Lastly], the *Star Tradition* states that: ‘The sun is virtue, and the moon is punishment, thus it is said that faced with a solar eclipse, one is to practice virtue, and faced with a lunar eclipse, one is to practice punishment. Even so, the tenants of *li* (mathematical astronomy) [allow us to] predict lunar eclipses along with the retrogradation of [Mars and Venus], [so] there is nothing **yi (anomalous)** [about these phenomena].’

[Mars] governs internal strife, [Venus] governs soldiers, and the moon governs punishment. [Now], ever since the decline of the house of Zhou (after 771 BCE), rebellious servants and the sons of traitors have led armies in numerous uprisings, and the punishments and penalties (i.e., the law) have missed the mark. And even when there were no [such political] disturbances, domestic officers were still unruly, the barbarians of the four quarters were still insubordinate, and the punishments and penalties were still unemployed. It is because of this (*wei zhi 为之*), one reasons (*gu*), that [Mars, Venus] and the moon violated their **du (measures/norms)**, and that the three disturbances were **chang (regularly)** seen; it was only when there were armies of rebellious servants and the sons of traitors, sprawling corpses and flowing blood, that the *big disturbances* would occur.

Gan [De] and Shi [Shen] saw that this was **chang (regularly)** the case and, therefore, took these phenomena as cyclic, *but none of this is proper motion/conduct*. The [*Classic of Odes*] says, ‘The moon eclipsed was what full **chang (oft)** takes place; the sun’s eclipse portends a sadder case’.¹¹ [However], the *Odes Tradition* [commentary] states that, ‘Lunar eclipses are by no means **chang (normal)** [as such], but they are

⁹ *Shiji*, 27.1349–1351; translation modified from Pankenier (2013: 509–510).

¹⁰ Various attributed to Ban Gu 班固 (32–92 CE) and Ma Xu 馬續 (fl. 111–141 CE), Ban Zhao’s biography tells us that, ‘Her elder brother [Ban] Gu wrote the *History of the Han*, but he died before he could finish its eight tables and “Heavenly Patterns Monograph,” so Emperor He (r. 89–105 CE) ordered her to render herself to the stacks of the Eastern Observatory so as to follow in his footsteps and bring it to completion’ (*Hou Hanshu*, 84.2784–2785). On Ban Zhao, see Swann (1968).

¹¹ Citing ‘Shiyue zhi jiao’ 十月之交, *Mao shi zhushu*, 19.33a; translation modified from Legge (1876: 321).

relatively *chang* (normal) by comparison to solar eclipses, [and that is precisely why] “the sun’s eclipse portends a sadder case”.’ To call this a ‘small disturbance’ is fine, but to call it ‘proper motion/conduct’ is wrong.

Thus it is that [Mars] necessarily wanders off and does as it pleases [only] after travelling sixteen lodges and placing itself at a distance from the sun (i.e., in retrograde, around opposition). [Thus it is that] Venus only retrogrades after having emerged from the west, advanced right up to the sun, and flourished its *qi* (in defiance?). [And thus it is too], coming to the moon, [that] it is necessarily eclipsed at full moon, when executions also flourish.¹²

Sima Qian and Ban Zhao may fundamentally disagree about the status of solar eclipses, but they are both writing in the same traditional paradigm of Chinese omenology as Shi Shen and Gan De. Namely, heaven and earth are mirrors of one another, the sky being populated with ‘signs’ or ‘simulacra’ (*xiang* 象) of the ‘myriad things’ (*wanwu* 萬物) on earth. By the law of ‘stimulus and response’ (*ganying* 感應), any disturbance of the moral order on earth is reflected *in kind* (*lei*) by a commensurate disturbance of the cosmic order in heaven. And given that the sun is the heavenly doppelgänger (*xiang*) of the earthly ruler, any true ‘solar disturbance’ (*ribian* 日變) is thus necessarily a response (*ying*) to the stimulus (*gan*) of his earthly misdeeds.¹³

How does this work? Be it ‘sympathy’, ‘organism’ or ‘correlation’, modern scholars tend to qualify the relationship between celestial and terrestrial disturbances as distinct from that of causation.¹⁴ It may not come through in translation, but one notes that the language of our sources is so elliptical that it certainly lends to this impression. There is no tense, gender or conjugation in Classical Chinese; you can omit everything but the verb from what qualifies as a complete sentence, and most verbs can be read as transitive, intransitive, causative, active or passive, potentially obscuring their subject, object, direction and temporal sequence. In omenology, more specifically, interpretative formulae (*zhan*) typically omit such particles as ‘when’ (*shi* 時), ‘if’ (*ruo* 若/*ru* 如) and ‘then’ (*ze* 則/*er* 而) connecting protasis and apodosis, and theoretical discussions tend to speak in vague terms of ‘mutual’ action (*xiāng* 相).

Far more telling than the language, however, are the metaphors around which the language turns. Chief among these is acoustic resonance, on which we might turn to the founder of ‘stimulus and response’ physics, Dong Zhongshu 董仲舒 (c.198–c.107 BCE):

When the note *do* is struck forth from a lute or zither, other *do* [strings] (nearby) spontaneously sound in **response** (*ying*). This is a case of how things are set into motion by **kind** (*lei*). They are activated by a sound which has no visible form, and when men can see no form to [account for] their movement, they describe it as ‘spontaneous sounding’. And wherever there is mutual action (*xiāng dong* 相動) without visible form [to account for it], by contrast, they describe it as ‘spontaneously so’ (*ziran* 自然).

In reality, it is not spontaneously so: there is something that causes (*shi* 使) it to be so. Things are definitely caused (*shi*) [to do what they do] by some concrete reality,

¹² *Hanshu*, 26.1290–1291.

¹³ Nowhere are these concepts more clearly or beautifully treated than in Schafer (1977: esp. 42–119).

¹⁴ See for example Granet (1934), Needham (1956: 216–345, esp. 281), Cheng (1976), Schafer (1977: 55–56) and, skipping forward, Chapman (2015:11–16) and Nylan (2019: 182).

invisible though this may be. According to the *Great Commentary to the Classic of Documents*, when the Zhou [dynasty] was about to arise (and overthrow the Shang King in 1045 BCE), some big red crows holding seed [heads] of grain in their bills gathered on the roof of the king's house. [The future] King Wu was elated, and all the great officers too. The Duke of Zhou said, 'Make greater effort! Make greater effort! Heaven reveals this to exhort us.' Faithfully we heed this.¹⁵

Whatever you call it, and to whatever divine intelligence or cosmic order you ascribe it, it is clear that 'stimulus and response' is predicated on cause and effect – on one thing 'making/causing' (*shi*), and another thing 'be[coming] so' (*ran*). As with acoustic resonance, however, the forces involved are unseen, and there is some 'mutual' back and forth: the rise of the Zhou provokes an omen, the omen hastens their rise, and their victory, not surprisingly, provokes yet further omens.

So which comes first, the chicken or the egg? Read alone, there appears to be some room for ambiguity in a formula like Gan De's '[if] the sun is eclipsed **then** (*ze*) the state that has lost its virtue will perish'. However, since Gan De specifies earlier on that the sun is only eclipsed '[if/when] passing through a state without the Way', one must conclude that the loss of the Way and its virtue is the *cause*, and that the association of protasis (eclipse) and apodosis (perishing) is one of *correlation*, as symptom and end-stage, respectively, of a common disease.

Sima Qian and Ban Zhao's expositions both agree with this. Importantly, they also affirm that omen reading (*zhan*) is to be reserved for the truly anomalous (*yi*), which excludes all that is observed and/or mathematically proven to 'regularly' (*chang*) reoccur. Where they disagree, rather, can be summarised as follows. Gan De did not know that solar eclipses could be predicted and, so, treated them as symptoms of terrestrial disorder. Sima Qian could not predict them either, but a century of data gathering suggested to him that they were nevertheless predictable and, thus, insignificant (within bounds). Lastly, Ban Zhao placed ancient authority over contemporary experience, dreaming of a past and a potential future where such predictive models fail: a time when the sun and moon are no longer eclipsed, and the planets stop going backwards, because humanity commits itself to 'proper conduct'.¹⁶

2 Later developments

Several decades after Ban Zhao finished her 'Heavenly Patterns Monograph', Liu Hong 劉洪 (fl. 167–206) would revolutionise lunar theory, introducing models for calculating the moon's speed, latitude and nodal 'crossing' (*jiao* 交) – models that his predecessors would immediately apply to eclipse prediction and gradually improve.¹⁷ This is where Shi and Xing (2006) leave off, and for good reason: logically,

¹⁵ *Chunqiu fanlu yizheng*, 13.361; translation modified from Queen and Major (2016: 440). On Dong Zhongshu and his philosophy, see Loewe (2011).

¹⁶ One gets an idea of the sort of 'proper conduct' that this would require of her half of the population in Ban Zhao's *Lessons for Women* (*Nüjie* 女誡), translated in Baldwin (1988) and Indracoilo (2011).

¹⁷ On the application of these models to eclipse prediction in Yang Wei's 楊偉 *Jingchu li* 景初曆 of 237 CE, see Guan Yuzhen (2015). On third- to seventh-century eclipse prediction more generally, see Qu Anjing (2008: 390–531) and Tang Quan (2011).

the conflict would seem to have been resolved, and its effects are not immediately apparent in the centuries that follow the collapse of the Han Empire.

In terms of sources, the state histories of the Eastern Han (23–220), Jin (220/265–420), Tuoba-Wei (386–556), Liu-Song (420–479), Southern Qi (479–502) and ‘Five Dynasties’ (502–618) all possess a ‘Heavenly Patterns Monograph’ loosely modelled upon those of Sima Qian and Ban Zhao.¹⁸ Few enter into the theory or formulae of ‘heavenly patterns’ omenology, and those that do are silent on the aforementioned issues. This is odd considering the apparent explosion of literary output over this period: according to the relevant bibliographical monographs, the Han imperial library *circa* 5 BCE held 22 titles in 419 volumes in the section ‘Heavenly Patterns’; that of the Sui (581–618) held 98 titles in 677 volumes, almost none of which overlaps.¹⁹ Unfortunately, none of the great omen compendia from this period like Yu Jicai’s 庾季才 (d. 603) *Secret Garden of the Observatory* in 115 volumes survive intact, and those of which fragments come down to us in citation are not cited in relation to this debate.²⁰

What these monographs do contain, importantly, is an unbroken record of the observations and interpretations made at various imperial observatories over this period. Preserved in annals form, the individual reports are highly formulaic, comprising a date, observation and, often, an omen reading and/or correspondent political event. These reports clearly underwent some process of *a posteriori* selection, analysis and redaction, but there is reason to believe that the dates, observations and some of the more formulaic omen readings originated from the records kept at the Astronomical Bureau.²¹ Consider how the historian Wei Shou 魏收 (506–572) describes his process in the ‘Heavenly Signs Monograph’ of the *History of the [Tuoba]-Wei*:

[I] have placed all the various anomalies in heaven here under ‘Heavenly Signs’. Those whose [divined] responses (*ying*) match with [historical] evidence (*zheng*) are recorded following the entry, and those without manifest verification (*yan*) have been excised.²²

¹⁸ Note that the ‘Five Dynasties’ monograph is now contained in the *History of the Sui*. On the genre, authorship, contents and usages of the ‘Heavenly Patterns Monograph’ up to the seventh century CE, see Mansvelt Beck (1990: 111–130) and Morgan (2019a). Of those listed here, the Jin monograph is translated in Ho (1966). Note also that the *History of the Han*, *History of Later Han* and *History of the [Liu]-Song* offload eclipses and other typical ‘heavenly patterns’ phenomena to the ‘Monograph on Five-Agents [Omenology]’, for which reason I sometimes refer to ‘the omenology monograph/s’. On the ‘Monograph on Five-Agents [Omenology]’ and ‘Monograph on Auspicious Signs’, see Nylan (2019) and Lippiello (2001), respectively.

¹⁹ *Hanshu*, 30.1763–1765; *Suishu*, 34.1018–1022.

²⁰ Indeed, Yu Jicai’s *Secret Garden of the Observatory* (*Lingtai miyuan* 靈台秘苑) is the only ‘heavenly patterns’ omenology title recorded in the Sui imperial holdings that remains ‘extant’, but we know it to have undergone significant redaction in the Northern Song (960–1127), when it was reduced from 115 to 15 volumes; see *Lingtai miyuan*, ‘Tiyao’ 提要. Fragments of other second- to seventh-century omen compendia are gathered in the *Kaiyuan Omen Classic*.

²¹ Morgan (2019b; 2019a: 163–171). For examples of outright fabrication, see Huang (1990). On the matter of selection, historical hindsight and *a posteriori* interpretation, see Kern (2000). On early, more flagrant examples of the use of omens in the construction of historical and mythological narratives, see Kalinowski (1999) and Chapman (2015: 84–122). On the function and history of the Astronomical Bureau, see Deane (1989).

²² *Weishu*, 105A.2333.

As to how these annals reflect upon the neat picture of theory presented above, one notes that in the few cases where they explicitly discuss ‘stimulus’ and ‘response’, they ignore what our theorists identify as underlying causes and play fast and loose with their identification and temporal sequence. Let us consider two examples later incorporated into Li Chunfeng’s ‘Heavenly Patterns Monograph’ for the *History of the Jin*. The first comes from He Fasheng’s 何法盛 fifth-century *History of the Jin Revival*:

On Grand Harmony year 3 month III day *dingsi*_{54/60} (4 Apr 368) the sun was eclipsed, and on year 5 month VII day *guiyou*_{10/60} (8 Aug 370) the sun was eclipsed [again]. All of this was a response (*ying*) to [the Duke of] Haixi’s deposition (on 6 Jan 372).²³

The second comes from Shen Yue’s 沈約 (441–513 CE) *History of the [Liu]-Song*:

In the Wu ruler Sun Quan’s Red Crow year 13 month V, when the sun was at its northern extremity (i.e., at summer solstice, 23 Jun 250), Mars entered the Southern Dipper (Sgr) travelling in retrograde. In month VII (15 Aug–14 Sep), it trespassed upon the second star of the cup (τ Sgr) and [went] east. ... [I the historian note that], according to omen interpretation (*zhan*), [if/when] Mars enters the Southern Dipper, in three months/the third month, the king of Wu is dead. Another states that, ‘[if/when] Mars is in retrograde, the [corresponding] land has a dead lord’. In Grand Origin year 2 (252), [King Sun] Quan died – this was the response (*ying*).²⁴

In the first example, the phenomenon is identified as a ‘response’, *two years earlier*, to the ruler’s eventual fate. In the second example, ‘stimulus’ proceeds ‘response’, as we might expect, but it is the ruler’s fate that is identified as the ‘response’ (i.e., Mars killed the emperor). Neither address what these rulers may have done to deserve this, and the question of ‘stimulus and response’ would seem to me to be one of free association – the product of a later mind combing the observational and historical record for matches via the protasis and apodosis of an attested formula.²⁵

Far more striking, however, is that despite the near constant state of war and internal upheaval from 189 to 618 CE, eclipse omens actually all but disappear from records of professional omen reading at court.

²³ *Jin zhongxing shu* 晉中興書, cited in *Kaiyuan zhanjing*, 9.6b comm.; cf. *Jinshu*, 12.341. As concerns the dates, ‘Grand Harmony’ is the political era, and ‘*dingsi*_{54/60}’ is day 54 of the sexagenary cycle.

²⁴ *Songshu*, 23.688; cf. *Jinshu*, 13.364. Note that Liu Ciyuan (2015: 87) corrects ‘month VII’ to ‘month VI’ as concerns the date of ‘trespass’.

²⁵ For an attempt to make theoretical sense of such records via the idea of ‘lozenge-shaped parallelism’ (and without reference to contemporary omen literature or ‘stimulus and response’ philosophers), see Eberhard (1957: 53–57). While I have specifically chosen to limit myself here to ‘professional omenology’ as practiced in the Astronomical Bureau (and transmitted to us through the relevant monographs by later historians), I believe that a more promising approach to understanding these contradictions would include a detailed study of the theoretical underpinnings of the omen-related memorials submitted over these years, as Chapman (2015: 146–209) has done for the Han.

As concerns lunar eclipses, the *History of the Han Continued* (23–220 CE) devotes a subheading to two ‘Lunars Eclipses on the Wrong Month’²⁶ – a category that subsequently disappears from the genre as predictive models improved. Thereafter, the *History of the [Tuoba]-Wei* (386–556 CE) and *History of the Southern Qi* (479–502 CE) are the only two histories to contain a systematic observational record of lunar eclipses, and of the 71 reported therein, 52 (73.2%) bear no interpretation whatsoever.²⁷ Here and there, one finds another five reported in the observational annals of the other histories, three of which likewise go without further comment. What this looks like is that historians and/or the observatory watchmen (*hou* 候) lost interest in the phenomenon as a subject of omen reading.

Solar eclipses, by contrast, remained a consistent focus of attention. In total, the six overlapping observational annals covering 23–618 CE contain 323 reports of 230 solar eclipses, some false, some corrupt and many of such small magnitude over that court’s territory that one wonders how they could possibly have been seen. Of these 323 reports, curiously, 203 (62.8%) are likewise left both uninterpreted and unassociated with historical events.

Why collect and transmit eclipse data if not for omen reading? One reason, as Xu Yue 徐岳 puts it in a court debate of *circa* 226, is that ‘of [all] the essentials of testing predictive astronomical systems (*li*) the [most] essential is the solar eclipse’.²⁸ Indeed, experts in mathematical astronomy (*li*) had begun treating eclipses as invaluable data points several centuries earlier, and the debate of *circa* 226 concerned a set of five gathered at the imperial observatory in 221–223 to assess a reform to the court’s predictive models. Turning to the transcript of this debate in the *History of the Jin* ‘Monograph on Tono-metrology and Mathematical Astronomy’, here is an example of how these eclipses were reported and employed:

On Yellow Inception year 2 month VI day 29, *wuchen*_{05/60} (5 Aug 221), at added hour *wei*_{B08} (14:00), the sun was eclipsed. The *Supernal Icon* procedures had the added hour at *shen*_{B09} and a strong half (17:10); with ‘ebb and flow’ this comes out to *wei*_{B08} (14:00); and the *Yellow Inception [Astronomy]* thought it at a strong *xin*_{S08} (19:10). The *Supernal Icon* was one and a strong half *chen* (190 minutes) behind heaven, which is close; the *Yellow Inception* was two and a half *chen* (240 minutes) [behind], which is far; the [*Supernal Icon* with] ‘ebb and flow’ was close[est] to heaven.²⁹

Compare this to a record of the same eclipse in the ‘Heavenly Patterns Monograph’:

²⁶ *Hou Hanshu*, *zhi* 18, 3374. Note that the technical monographs of the *History of the Han Continued* (*Xu Hanshu* 續漢書) were later incorporated into the *History of the Later Han* (*Hou Hanshu* 後漢書). On the history of these monographs, see Mansvelt Beck (1990).

²⁷ Confusingly, one notes that the term *yueshi* 月蝕 (lit. ‘moon eating’) is one that can take a direct object, thus an ambiguously phrased report like 月蝕井 (*Weishu*, 105B.2372) can be read either ‘the moon ate (occulted) [the lodge] Well’, or ‘the moon was eaten (eclipsed) [in] Well’. One can usually determine which is meant based on context such as the proximity to full moon and an historical eclipse, or the size of the second object in question. Here, I eliminate non-eclipse ‘eating’ phenomena from my tally.

²⁸ *Jinshu*, 17.500; passage translated in Morgan (2017: 155).

²⁹ *Jinshu*, 17.500. For a detailed account of this debate, the data and the specific time-keeping conventions used therein, see Morgan (2017: 140–176).

On Emperor Wen of Wei's Yellow Inception year 2 month Ⅴ new moon's eve, day *wuchen*_{05/60} (5 Aug 221), the sun was eclipsed. Officials petitioned the throne to relieve the defender-in-chief [of his duties]. [The emperor issued an] edict, stating: 'The appearance of disastrous anomalies (*yi*) is to reprimand the head (i.e., head of state), so how would passing the blame to one's right hand be what is meant by [the example of the legendary Sage Kings] Yu and Tang's having blamed themselves [and taken personal responsibility for heavenly omens]?!'³⁰ May it be hereby ordered that every official go sincerely about his own duties and that, be there any further heavenly or earthly catastrophes going forward, they shall desist from impeaching the Three Excellencies (i.e., the emperor's counsellor-in-chief, censor-in-chief and defender-in-chief).'³¹

One notes that this call for action comes from outside the Astronomical Bureau, that this is the same emperor that approved the Bureau's data-collection and deliberation, and that, while he may publically pronounce said eclipse an 'anomaly' (*yi*), he also refuses his officials' solution. One cannot say for certain what Emperor Wen of Wei (r. 220–226) *believed*, but it would seem that whether eclipses were data or disasters, 'regular' or 'anomalous', depended a great deal on the audience to which he was speaking.

All four of the previous records end up incorporated into Li Chunfeng's monographs in the *History of the Jin* (finished 648), painting a muddy picture of theory and practice that he does little to tidy *à la* Sima Qian and Ban Zhao. Indeed, the following is all his 'Heavenly Patterns Monograph' has to offer in terms of overarching principles by which to understand the phenomenon:

As the essence of Great Yang, the sun governs all life, sustenance, benevolence and virtue – the simulacra (*xiang*) of the lord of man. [If] the lord has any imperfections, [the sun] will necessarily reveal his wickedness to serve as warning. Thus it is that [if] the sun and moon passing through a state with the Way, then (*ze*) they are bright and lustrous; the lord is blessed and prosperous, and his people in peace and security. [If] the lord rules as king by [the power of] Earth, and his government is one of great peace, then (*ze*) none of the five colours will predominate (over yellow:Earth).³² [If/when] the sun changes colour... [If/when] the sun loses its colour... [If/when] the sun is dusky

³⁰ This appears to be a reference to an entry for 683 BCE (Zhuang 11) in the Classic *Zuo Tradition of the Spring and Autumn Annals*: 'In autumn, there were great floods in Song, and the duke sent a messenger with his condolences, saying, "Heaven has sent down excessive rains to the injury of the millet for sacrifice. I feel that I must condole with you." The answer was, "I am as an orphan, and must confess my want of reverence, for which Heaven has sent down this plague. And moreover I have caused *you* sorrow, and beg to acknowledge the condensation of your message." Zang Wenzhong said, "Song must be going to flourish. [The Sage Kings] Yu [the Great] and Tang [the accomplished] took the blame on themselves, and they prospered grandly. [The wicked kings] Jie and Tchou threw the blame on others, and their ruin came swiftly. Moreover when a State meets with calamity, it is the rule for the prince to call himself an orphan. With language showing anxious fear, and using the right name, Song cannot be far from prosperity"' (modified from Legge 1872: 88).

³¹ *Jinshu*, 12.337. The same record appears in *Songshu*, 34.1011, and *Sanguo zhi*, 2.78. On these official titles and their duties, see Hucker (1985).

³² Earth is the central, stable position within the cycle of the five agents (wood, fire, earth, metal and water), which is associated with the colour yellow. On five-agents metaphysics, see Graham (1986), Kalinowski (1991) and Nylan (2019).

by day, and pedestrians cast no shadow, and this persists until the evening... [If/when] the sun is dusky by day, and crowbirds gather and caw... [If/when] the crow appears in the middle of the sun... [If/when] there are black spots in the middle of the sun... [If/when] the sun is eclipsed, Yin encroaches upon Yang; this is the sign (*xiang*) of the servant occluding the lord, and state is lost.³³

He takes this paragraph word for word from his ‘Heavenly Patterns Monograph’ in the *History of the Sui* (finished 636), omitting a single line from the very end:

[If/when] the sun is eclipsed and the stars are seen, there is the killing of a lord and the world of heaven is cleaved asunder. The king cultivates virtue to exorcise it.³⁴

There is nothing new here, but Li Chunfeng tackles the debate between Sima Qian and Ban Zhao in spectacular fashion in his undated omen compendium, the *Yisi zhan*.³⁵ The *Yisi zhan* is not a particularly well studied text, and it is probably for that reason that what he has to contribute there on the subject of eclipses seems to have escaped scholarly attention.³⁶

In ‘[Chapter] VI, Solar Eclipse Omens’, Li Chunfeng begins with a simplified description of the sun’s behaviour and symbolic associations, appealing to the now familiar vocabulary of ‘measures’ and ‘regularity’:

The sun abides by *chang du* (**measures/norms of regularity**), and its eclipse is due to the moon coming in and concealing it, which is a sign (*xiang*) of the servant blocking the lord.³⁷

The text goes on to provide said *du* – the sun’s mean speed – and to describe how the moon effectively runs circles around the sun in the way that, if left unchecked, a lord’s servants can block and run circles around his authority. From there, Chapter VI then takes a strange turn:

Though eclipses abide by *chang du* (**measures/norms of regularity**), disaster nevertheless lies with the great ministers of the lord of state. Some people are sceptical of this, considering that every aspect of the eclipse of the sun and moon can be calculated via mathematical principles and known in advance of the new moon. [Between prediction and observation], the magnitude, time and direction are all like the left and right

³³ *Jinshu*, 12.317; cf. the translation in Ho (1966: 121).

³⁴ *Suishu*, 20.555.

³⁵ Note that the use of a sexagenary binom in the title – *Yisi zhan* (*Yisi_{41/60} Omens*) – would seem to date the work to the one *yisi_{41/60}* year in Li Chunfeng’s lifetime, 645 CE, but it seems likely that this is a reference to the ancient astronomical zero-point he uses in the astronomical system he includes therein, the *Yisi_{41/60}-Origin Astronomy* (*Yisi yuan li* 乙巳元曆), composed in 629 CE. The latest date mentioned in the text itself is ‘Pure Contemplation year 13 month 1 day 3, noon’ (*Yisi zhan*, 8.12b), or 12:00 11 Feb 639, which provides us with a reliable *terminus post quem*.

³⁶ Indeed, the only scholarship on the *Yisi zhan* of which I am aware are the articles of Liu Jinyi (1987), Guan Zengjian (2002), Zeng and Cui (2009) and Harper (2010). I think it also important to note that my own attention was drawn to this work thanks to a text-reading seminar led by Marc Kalinowski at Université Paris Diderot on 2 April 2014.

³⁷ *Yisi zhan*, 1.27a.

halves of matching tallies, so how can this imply some celestial catastrophe? [As everyone knows, when] in heaven the moon is destroyed, in the springs the brains of fish [mysteriously] shrink – are we to believe that the moon destroys its form because of some disaster among the molluscs?³⁸

This last piece of stimulus-response folk-knowledge comes from the *Huainanzi* of 139 BCE,³⁹ and whether or not it makes sense to us, we can see the point that Li Chunfeng’s hypothetical sceptic is trying to make. Namely, if some celestial phenomenon occurs so regularly (*chang*) as to be perfectly predictable in advance, then how could it possibly be a *response* (*ying*) to the stimulus (*gan*) of some specific moral failing among men, let alone among fish and molluscs? Li goes on to explain, reminding us of the physics of stimulus and response:

These are simply due to the natural, spontaneous back-and-forth of stimulus and response between the *qi* of Yin and Yang. (Imagine you are eating dinner outside), the east wind comes, and a full [cup of] wine spills over. The east wind did not come with the express purpose of spilling wine, it is just that the wind brusquely arrived, and the wine spilled right over. Is this not an example of the stimulus and response between them?⁴⁰

Here comes the twist:

Granting this, [now consider a different] category of thing, that of grease (on your plate): the east wind comes, and the grease *does not* spill over, only the wine. This is like how, when a heavenly disaster appears, the virtuous lord cultivates his virtue and emerges unscathed, while the tyrannical king practices cruelty and invites disaster. Is this not the case? The *yangsui* (fire-starting mirror) absorbs [the] fire [of the sun], the *fangzhu* (dew-collecting mirror?) absorbs [the] water [of the moon], and both can be **zhan (omen-read)** according to the *xiang* (signs). [But] the *yangsui* and *fangshu* belong to the category of bronze clam-[shaped devices?], and the fact that you find nothing if you go looking in a normal mirror is because [normal mirrors] do not possess these *xiang* (signs) and [thus they] cannot be **zhan (omen-read)**.⁴¹

Li Chunfeng has reversed the traditional relationship of stimulus and response. It is no longer the ruinous behaviour of the king that stimulates (*gan*) an eclipse, it is rather the eclipse that stimulates ruinous behaviour in the king – in the category of king who, like wine, is easily moved to spill out of his constraints. A good king, like your average mirror, will not start fires when you point him at the sun.

‘[Chapter] VI, Solar Eclipse Omens’ goes on from there to list what I would divide into twenty multi-variant omen formulae. The omen formulae are fairly standard.

³⁸ *Yisi zhan*, 1.27b.

³⁹ *Huainan Honglie jijie*, 3.81: ‘Creatures with scales and shells make up the class of creeping and hiding things and are subject to yin. ... The moon is the fundament of yin. Therefore when the moon wanes, the brains of fish shrink; when the moon dies, wasps and crabs shrivel up’ (tr. Major 2010: 116).

⁴⁰ *Yisi zhan*, 1.27b.

⁴¹ *Yisi zhan*, 1.27b.

Some of are physically impossible, some reflect the schematic thinking of hemerology, to which large portions of this compendium are curiously dedicated,⁴² and one even pauses to contradict what he says in the introduction: ‘The sun is the *xiang* (doppelganger) of the ruler of men, thus (*gu*) [if] the king does not implement the Way and its virtue, then (*ze*) there will be a solar disturbance because of it (*wei zhi*).’⁴³ Li Chunfeng then ends on a note about the proper, classical apotropaic ritual:

Whenever the sun is eclipsed, [the emperor] is to don a red turban to aid [the forces of] Yang. The Son of Heaven wears the simple [white mourning] clothes, avoids the throne room, and remains stern and alert inside [the palace] and out [in the world]. The Observatory of the Astronomer Royal watches the sun, and [if/when] there is a disturbance, [they] immediately beat the drums; and once they first hear the sound of the drums, the officers in attendance all don red turbans and wear swords so as to aid [the forces of] Yang and follow along.⁴⁴

Whether or not he is consistent on this point, the most curious thing about chapter VI of the *Yisi zhan* is its reasoned inversion of stimulus and response as justification that an eclipse can be both predictable and an omen. In the following sections, I would like to explore the implications and the rationale of this gambit.

3 Practical implications

In arguing that it is the solar eclipse that is the stimulus (*gan*), and the failure of leadership the response (*ying*), Li Chunfeng effectively solves the dilemma posed by Sima Qian and Ban Zhao: in this configuration, regularity (*chang*) does not exclude omen reading (*zhan*), which allows us to both ‘save the phenomena’ and conserve the omenological tradition. In doing so, however, he also expands the latter’s potential range of application: theoretically, this would allow one to read omens that had yet to happen.

Let us consider one of the individual omen formulae that Li Chunfeng provides in chapter VI of the *Yisi zhan*:

The eclipse of the sun starts from the bottom: the female ruler acts capriciously; one’s servants below lose discipline in raising armies and mobilising the masses; the general will suffer it.⁴⁵

An eclipse’s ‘starting corner’ could be predicted in advance in Li Chunfeng’s day,⁴⁶ and if you could predict both the eclipse and the starting corner some months or years

⁴² On the *Yisi zhan*’s hemerological contents, see Harper (2010). On the relationship between hemerology and ‘heavenly patterns’ omenology, see Lu Yang (2007: 446) and Morgan (2016a; 2016b).

⁴³ *Yisi zhan*, 1.29b.

⁴⁴ *Yisi zhan*, 1.31a.

⁴⁵ *Yisi zhan*, 1.28b.

⁴⁶ Referred to as the ‘starting corner’ (*qijiao* 起角) or simply ‘whence it starts’ (*suoqi* 所起), see Sivin’s (2009: 106–110, 514–515) explanation of how this determined in the *Season Granting System* of 1280.

in advance, logically, you could also predict the empress' behaviour and the military defeat to follow.

This is the proposition that is at the centre of Jiang Xiaoyuan's famous argument that 'mathematical astronomy was in service of astral omens'⁴⁷:

At first glance, it seems that [omen literature] is all without exception in the form 'x celestial phenomenon is a portent of y event' and, as such, that all that omenologists need do was be diligent at observation, waiting until after they had seen a certain celestial phenomenon before interpreting it according to omenological theory. ... But the ideal to which ancient omenologists aspired involved something far more profound, the key to which lay in the foreknowledge of the laws and positions of celestial bodies (Jiang Xiaoyuan 1992: 173–174).

Jiang Xiaoyuan gives two examples of this ideal in action, and one of them happens to involve Li Chunfeng. According to the tenth-century encyclopaedia *Extensive Records of the Taiping Era*:

Under the Tang (619–907), Astronomer Royal Li Chunfeng was working on a new system of mathematical astronomy [when he realised that] the sun was due to be completely eclipsed at syzygy, and that it [would result in] an inauspicious omen reading (*zhan*). Displeased, Emperor Taizong (b. 598; r. 626–649) said, 'And if the sun is *not* eclipsed, how does my good minister plan to atone?' 'If it happens that it is not eclipsed,' [answered Li Chunfeng], 'Your servant requests to die for it.'

At the appointed time, the emperor watched from the courtyard, and said to Chunfeng, 'I will release you to your wife and children to bid farewell.' [Li Chunfeng] responded, 'It's still early,' then drew a sun and pointed to [where] the shadow [would be] on its disk, and, at that, there was then an eclipse. The eclipse happened as he said, without a hair's breadth of a difference. (Commentary: Cited from *Alternate Compilations of the State Histories* and the *Chronicle of What I Have Heard*).⁴⁸

This is a great story, but it is clearly apocryphal: Li Chunfeng was made the astronomer royal in 648;⁴⁹ Taizong died on 10 July 649;⁵⁰ the only eclipse visible at Chang'an between these dates occurred while the emperor was away from the court at Yuhua, some 100 km north⁵¹; and, suspiciously, this anecdote only first appears in the *Alternate Compilations of the State Histories* some one century later.⁵² Jiang

⁴⁷ This argument is first made in Jiang Xiaoyuan (1991: 151–167) and expanded in Jiang Xiaoyuan (1992: 173–177).

⁴⁸ *Taiping guangji*, 76.6a–b; cited in Jiang Xiaoyuan (1991: 158).

⁴⁹ I.e., Zhenguan year 22; see *Jiu Tangshu*, 79.2718.

⁵⁰ I.e., Zhenguan year 23 month v day *jisi*_{06/60}; see *Jiu Tangshu*, 3.62.

⁵¹ I.e., the eclipse of 24 Aug 648 (obs. 0.838). According to the imperial annals in *Jiu Tangshu*, 3.60–61, the emperor left to Yuhua on 23 March (month II day *yihai*_{12/60}), the eclipse was seen on 24 August (month VIII day 1, *jiyou*_{46/60}), and the emperor only returned to Chang'an on 6 November (month x day *guihai*_{60/60}). Said eclipse is also reported in the 'Heavenly Patterns Monograph' in *Jiu Tangshu*, 36.1317, where it bears no interpretation, and in *Xin Tangshu*, 32.828, where the omen reading is 'drought'.

⁵² According to *Xin Tangshu*, 59.1541, the *Alternate Compilations of the State Histories* (*Guoshi yizuan* 國史異纂) was written by Liu Su 劉鋹 (fl. 742/756), and the *Chronicle of What I Have Heard* (*Jiwen* 紀聞) by Niu Su 牛肅 (fl. c.804). Add to this that the *Extensive*

Xiaoyuan provides one other example of omen forecasting, which is also apocryphal,⁵³ and while there may be more of which I am not aware, there is hardly evidence that omen forecasting was a trope, let alone a common practice in early imperial times.

What then did Li Chunfeng actually do with his new eclipse theory? Most of what we can say involves his work on interpreting historical eclipses in the ‘Heavenly Patterns Monograph’ of the *History of the Jin* and the *History of the Sui*, which include the observational annals of nine dynasties covering 220–419 CE and 502–617 CE.⁵⁴ Importantly, his eclipse records for 220–419 CE are taken nearly word for word from Shen Yue’s *History of the [Liu]-Song*,⁵⁵ so by comparing the two we can get a clear sense of Li Chunfeng’s editorial voice.

As to overlap, Shen Yue lists sixty-seven eclipses for 229–419 CE, while Li Chunfeng lists eighty-one. Quantitatively speaking, one might say that Li Chunfeng has subtracted two and added sixteen to Shen Yue’s list. Qualitatively speaking, most of this looks to be the product of confusion and textual corruption. Of the sixteen reports he adds, five of the dates are corrupt,⁵⁶ one is a lunar eclipse,⁵⁷ and at least four of the remaining ten are false reports.⁵⁸

If the question is how Li Chunfeng diverged from his sources in terms of historical omen reading, then we can eliminate the majority of these records from consideration. First, we need only consider those upon where Shen Yue and Li Chunfeng present some form of analysis (SY 17/67, LCF 28/81). Of these, we can eliminate those that simply report the government reaction and/or countermeasures taken at the time (SY 3/17, LCF 2/28). Lastly, of those reports that bear analysis, we can eliminate those that are copied more or less word for word (SY 4/14, LCF 4/26).⁵⁹

Records of the Taiping Era (Taiping guangji) follows this anecdote about Li Chunfeng with one that is even more fantastical, involving the transformation of the seven stars of the Northern Dipper (UMa) into alcoholic Buddhist monks.

⁵³ For his second example, Jiang Xiaoyuan (1992: 174) cites an anecdote from the *History of the [Tuoba]-Wei* that has Cui Hao 崔浩 (d. 450) interpret his prediction of the lodge in which Mars would reappear ‘in the year prior to [Latter Qin emperor] Yao Xing’s (r. 394–416) death’ as a sign of the latter’s impending death. In this anecdote, the situation of Mars’ sudden ‘disappearance’ (*shi* 失) is fantastical; Cui Hao’s method does not comport with those of mathematical astronomy (*li*), and Mars could not possibly have [re]appeared that year where reported; see Morgan (2017: 211n85).

⁵⁴ *Jinshu*, 12.337–345, translated in Ho (1966: 150–160), and *Suishu*, 21.593–615.

⁵⁵ *Songshu*, 25.739, 34.1011–1017.

⁵⁶ Liu Ciyuan (2015: 57–60, nos 15, 22, 24, 29). By ‘corrupt’ I mean that the sexagenary date (*jiazi*₀₁–*guihai*₆₀) either occurs more than two days before or after new moon or not at all in the given month of the given year.

⁵⁷ Liu Ciyuan (2015: 59, no 27). One notes that the occasional confusion of lunar and solar eclipse reports is due to the graphic similarity of the characters *ri* 日 (‘sun’) and *yue* 月 (‘moon’) and the general preference for/confidence in sexagenary over lunar dates (i.e., ‘new moon’, ‘day 2’, ‘day 3’).

⁵⁸ Liu Ciyuan (2015: 56–60, nos 9–11, 28).

⁵⁹ For the data and case-by-case determinations behind the numbers given here and in the following two paragraphs, see the supplementary data file available at <https://halshs.archives-ouvertes.fr/halshs-02116057>.

Of what remains, one notes that Li Chunfeng often expunges Shen Yue's analysis (SY 6/10, LCF 3/22) or simply moves or extends it to a neighbouring report (SY 3/4, LCF 5/19). In terms of what Li Chunfeng *adds*, he expands one of his predecessor's explanations (SY 1/1, LCF 1/14) and, striking out on his own, he draws connections on similar, traditional themes such as: the ruler's lack of virtue (×2), illness (×2) and ouster (×2); the death of the empress (×2); barbarian invasion (×2) and armed rebellion (×1); and the ouster of the regent (×1) and the heir apparent (×1). Curiously, none of what Li Chunfeng has to add matches the exact rules or language of his own omen formulae in the *Yisi zhan*.

As concerns the interpretation of historical eclipses, a line-by-line comparison of Shen Yue and Li Chunfeng's overlapping monographs does not paint the latter as particularly innovative, revolutionary or keen to reinvest the phenomenon with meaning. His monograph in the *History of the Sui* tells a similar story.⁶⁰ In quantitative terms, his two monographs only ascribe meaning to 30/96 (31.3%) solar eclipse reports – compared to 44/77 (57.1%) in the *History of the Han Continued* – and most of those ascriptions are simply copy-and-pasted from his predecessor.⁶¹

If Li Chunfeng does not seem to have applied his theory to eclipses in his future, nor in his historical past, that leaves the question of eclipses in his historical present. Admittedly, his writings, biography and contemporary anecdotes tell us nothing about how he may have practiced current-affairs eclipse reading in life, but there is an indirect route we might consider. Li Chunfeng served as astronomer royal in 648–662, and once again in 670, and it is in this position he would have been responsible for the submission and archival of such reports as would eventually make their way into the 'Heavenly Patterns Monograph' for the Tang (618–907). As such, though they too may have passed through other, later editorial hands, we might ask whether the eclipse records for these years in the *Old* and *New History of the Tang* reflect the application of Li Chunfeng's ideas in the *Yisi zhan*.

This does not give us much to work with. The two monographs record only four eclipses over these years, and none of the records in the *Old History of the Tang* (945 CE) bear any analysis.⁶² Two of those in the *New History of the Tang* (1060 CE) do, which raises other questions,⁶³ and one of those, miraculously, happens to correspond with one of Li Chunfeng's formulae in chapter VI of the *Yisi zhan*. The eclipse record is as follows:

⁶⁰ Likewise, the *History of the Sui* 'Heavenly Patterns Monograph' only comments on four of fifteen solar eclipse reports, and none of these comments would seem to relate to Li Chunfeng's thoughts on the phenomenon as elaborated in chapter VI of the *Yisi zhan*.

⁶¹ Note that, in the case of 220–419 CE, Li Chunfeng might well have had other academic reasons for sticking so closely to Shen Yue's text, as discussed concerning their respective monographs in Morgan (2017, 188–202; 2019a). Also, as we do not know when the *Yisi zhan* was written, it could well be that the ideas behind it came to Li Chunfeng after he finished his historical monographs.

⁶² *Jiu Tangshu*, 36.1317; *Xin Tangshu*, 32.828 (Zhenguan 22, Xianqing 5, Longshuo 1 and Xianheng 1).

⁶³ E.g., whether the omen reading (*zhan*) might have been added in the eleventh-century *New History of the Tang* rather than omitted from its tenth-century predecessor.

On Pure Contemplation year 22 month VIII day *jiyou*_{46/60}, new moon (24 Aug 648), the sun was eclipsed; it was 5 *du* [into the lodge] Wings (Crt). The omen reading (*zhan*) stated: ‘Drought’.⁶⁴

Now compare this to chapter VI of Li Chunfeng’s *Yisi zhan*:

The sun is eclipsed in Wings: the king recalls the Minister of Rites and replaces him with an officer of the law; [if] there are virtuous ordinances, then (*zhe*) the eclipse will do no harm; there is a drought this year, and it is due for its part to the king’s negligence of the sacrifices and absence from the ancestral temple; admonition is directed at the officers responsible for carriages and driving.⁶⁵

This is the closest evidence I have found that Li Chunfeng ever put his own eclipse theory into practice, and it is a little underwhelming.

4 Political application

However Astronomer Royal Li Chunfeng may have actually interpreted solar eclipses in practice, Chapter VI of his *Yisi zhan* does at least provide the theoretical justification to continue treating them as omens – something that real-life sceptics like Sima Qian had opposed on principal for more than seven centuries. There is obviously something at stake in Li Chunfeng’s gambit, and if it not clear that it is its practical implications within the science itself, then we might think to look further afield. In Chinese history, that is usually code for ‘politics’.

Long ago, in his study of the relevant monographs for the Former Han (206 BCE–9 CE), Wolfram Eberhard argued that we are mistaken to study these materials through the optic of ‘science’, because the literature and practice of omenology are in fact ‘purely political’. More specifically, he argues that omenology provided a well-needed institutional check on the power of the Son of Heaven:

In most of the cases where an explanation of a phenomenon is given..., it is given in a subsequent proclamation of the ruler. This proclamation normally starts with the ruler’s self-accusation: ‘Recently Yin and Yang were disturbed, wind and rain did not come in time. This is [the result of] my lack of *te* [spiritual power (DPM: “virtue”)].’ The form of these ‘self-accusations’ suggests that they are a conventional formula and do not have to be taken at face value. They serve as an introduction for political actions, such as cancellation of debts of citizens (85 and 79 B.C.), reduction of luxury (71 B.C.), reduction of expenses in the central administration (83 B.C.), or any other actions which naturally infringed the vested rights of some persons (Eberhard 1957: 51).

However, citing logical inconsistencies in the application of omen reading, the implication of other political figures, and evidence of what he believed to be the contemporary ‘fabrication’ of eclipses, he hypothesises that...

... at least some of the persons who reported portents in memoranda, or who wrote them into the historical records, may not have believed in portents at all but may have used them merely as political weapons (Eberhard 1957: 56).

⁶⁴ *Xin Tangshu*, 32.828.

⁶⁵ *Yisi zhan*, 1.31a.

Having discerned statistical peaks in (transmitted) political criticism and categorised it by issue, Eberhard turns to omen-related petitions, 206 BCE–9 CE, contextualising these issues within the broad strokes of individual reigns and, the petitions, within biographical sketches of fifteen prominent omen-based petition-writers. To him, these sketches ‘show clearly that... most of them had outspoken political loyalties and utilized their “science” for the realization of their political aims’ (p. 62), thus substantiating ‘the fact that portents were used by some factions within the bureaucracy as a weapon against other factions in their struggle for power’ (p. 69).

Eberhard makes an important point, but it is one that must be shaken loose from his larger argument.⁶⁶ Let us do this here with a simple question: if officials hoped to hold an eclipse over the emperor to turn him against their enemies, then what, historically, could they expect the throne to do?

In terms of general precautions, we know that the throne maintained an Astronomical Bureau charged with the observation, interpretation, reporting and, eventually, prediction of the phenomenon. To Eberhard’s point, the omenological claims of officials, rebels, and religious movements can be somewhat empirically and interpretatively wild, and it would appear that the omenological wing of Astronomical Bureau was intended in part as a reasoned, professional and loyalist check on crackpots and subversives.⁶⁷

The throne also made ritual preparations such as Li Chunfeng emphasises in his conclusion to ‘[Chapter] VI, Solar Eclipse Omens’, above. In terms of precedent, the red turbans and drumming go back a discussion of the ritual appropriateness of the response to a solar eclipse on 21 August 525 BCE in the Confucian Classics.⁶⁸ The ritual appears in the monographs on imperial ceremonial in the various state histories up to Li Chunfeng’s day,⁶⁹ and one finds occasional discussion about its revision – all of which suggests that it was performed. Consider the following entry in the imperial annals of the southern empire of the Chen (557–589 CE):

On [Perpetual Fixity year 3] month v day [bing]chen.⁵³, new moon (21 Jun 559), the sun was eclipsed. Officials petitioned that, in the old ceremony, [the emperor] ruled from the antechamber, wearing a vermillion gauze cloak and the cap of heavenly communion. [The emperor issued an] edict, stating: ‘This is a vestige of the previous dynasty, and the intention is somewhat different. At syzygy [We] are to look up and aid the Great Yang, [so We] had better wear Our imperial robe and crown. From here forward, [let this] be the standard in perpetuity.’⁷⁰

⁶⁶ For more detailed criticism of Eberhard’s (1957) assumptions, methodology and conclusions, see Bielenstein (1984), Kern (2000), Pankenier (2012) and Morgan (2019b).

⁶⁷ Morgan (2019b: 69). One notes that of the fifteen critics from whose petitions Eberhard concludes that omenology served as a weapon in their internal politics, only one of them – Liu Xin – ever served in the Astronomical Bureau, and then only several decades after ‘his report in 32 B.C.’ (Eberhard 1957: 60). For examples and in-depth studies of omen-related petitions under the Han, see De Crespigny (1976) and Chapman (2015: 146–209).

⁶⁸ *Spring and Autumn Annals*, Duke Zhao, year 17; translated in Legge (1872: 667).

⁶⁹ E.g., *Hou Hanshu*, zhi 4, 3101; *Jin shu*, 19.594; *Songshu*, 14.351–353; *Suishu*, 8.169.

⁷⁰ *Chenshu*, 2.39.

Here is what the *History of the Sui* records of the ceremony as practiced in the North around the same time:

According to the stipulations of the Later (Northern) Qi (550–577), in case of solar eclipse, the Grand Culmen Hall is to be installed with [two] imperial thrones, one facing east from the West Wing, and the other facing west from the East Hall. The legion of officials are to be in uniform. When the water in the daytime clepsydra rises one notch (i.e., 1/100 day = 14m24s after dawn), all those inside and out are solemn. [On the sides] where there are three doors, the central door is shut; where there is a single door, it is covered. Three notches (43m12s) prior to the eclipse, the emperor dons his cap of heavenly communion and goes to his throne; the night guard remains as if everything was normal, and no matters are discussed. [If] there is an ‘incident’, and the sound of drumming is heard, then [the emperor] retreats from the throne room and goes to the East Hall, where he dons his white unlined [mourning] garments. His attendants all don the red turban and wear swords, mounting the hall in attendance. The various officials, each in their place, don the red turban and brandish swords, going out the doors to stand facing the sun. The officials each lead their subordinates to patrol the various doors and side-doors within the palace and garrison the Imperial Altar to the God of Soil. [Throughout the capital,] Ye, their subordinates are ordered to surround the altars to the God of Soil, guard the four city gates, and to wrap the altars three times around with ropes of vermillion silk. The spellmaster royal orders the pronouncement of words to castigate the soil altars, and the astronomer royal orders two men, galloping on horseback, to deliver status reports to the Imperial Secretariat, which the door officials hastily transmit to the emperor. It is further proclaimed that the governor of the Pure Metropolis sound the [city’s] drums as per [the observatory’s] solemn fashion. When the sun has returned to its glory, this stops, and the solemnities are lifted.⁷¹

As primarily recorded in the state histories’ imperial annals, the throne might take additional action in response to a given eclipse. This varies year to year, but if we look at every action taken in the name of or immediately following a solar eclipse, one discovers that there is a limited and thematically coherent repertoire common to every dynasty. As enumerated in Table 1, the emperors’ some 195 recurrent responses to solar eclipses in 23–618 CE fall within the themes of self-accusation, introspection, retreat from court, the reduction of state violence, the aid to those in need and the bolstering of the morale/morals of the nobility and civil service. Beyond this, there are 11 (5.3%) one-time actions including the cession of the throne, the firing of the Branch Department of State Affairs and the release of a dead emperor’s concubines from the palace to remarry, but, by and large, the political actions of the throne are every bit as predictable and virtue-driven as the ‘conventional formula[e]’ Eberhard tells us to dismiss in the accompanying edicts.

Little in Table 1 suggests itself as an effective ‘political weapon’ for an official wishing to smite his foes. The one exception is perhaps the dismissal of the minister of works (×2), minister of education (×5) and defender-in-chief (×21), but one notes that, in most cases, they are simply transferred, and, often, they petition for their own impeachment/removal.⁷² As such, it makes more sense to think of these ‘conventional formula[e]’ too as *ritual*, and while they ‘do not have to be taken at face value’,

⁷¹ *Suishu*, 8.169–170.

⁷² In the biography of Duan Ying 段穎 (d. 179 CE), we read that: ‘In Glorious Harmony year 2 (179 CE), he once again replaced Qiao Xuan 橋玄 (109–183 CE) as defender in chief, [but] after [a little] more than a month at his post, he impeached himself on the occasion of a solar eclipse

The emperor issues a decree, declaring his lack of virtue to be the cause and promising to take corrective measures (×15).
As penance and for the sake of introspection, he avoids the throne room (×8), refuses audience for five days (×5) and/or invites open and, often, anonymous written criticism with the promise that ‘nothing is off limits’ (×20).
Humbling himself before a higher power, he offers cult (<i>ci</i>) to his ancestors (×4) and/or offers sacrifice (<i>si</i>) to the gods (×4; fourth century on).
To turn a page in his rule, he orders the recommendation of the ‘worthy and good’ to public office (×14), orders those already in office to do better (×6), declares a new political era of ‘Great Prosperity’, ‘Perpetual Peace’, etc. (×10) and/or dismisses the current minister of education (×5).
On the theme of crime and punishment, he orders a general amnesty (×30), a regional amnesty (×4; fifth century on), a blanket sentence reduction (×7), and/or a blanket audit for cases of wrongful imprisonment (×3; only in the Han).
On the theme of war (i.e. external crime and punishment), he orders a halt to military operations (×5) and/or the dismissal of the defender-in-chief (×21; only in the Han).
On the theme of public welfare, he orders emissaries to travel the empire inquiring about ‘hardships’ (×5; fifth century on), relief to widows, orphans and the aged (×8), a reduction in luxuries and government expenditures (×7), a reduction in taxes (×5), a reduction in corvée labour (×2) and/or the dismissal of the minister of works (×2).
To reward the nobility, he orders a blanket or targeted increase in noble title (×5).

Table 1 Typical actions taken by the throne in response to a solar eclipse, 23–618 CE. Sources: all standard histories, plus *Dongguan Hanji*, *Hou Hanji* and *Shiliuguo chungiu*. Methodology: Having gathered all mentions of *shi* 蝕 (‘eclipse’), *rishi* 日食 (‘solar eclipse’) and *ri you* 日有 (‘the sun was/had’) via database search, I identified imperial actions citing solar eclipse as the rational, e.g. in edicts and in sentences such as ‘[he] was relieved of duty because of the solar eclipse’ 以日食免. Where no direct reason is given, as in often the case in imperial annals, I include the actions immediately following the eclipse and prior to a second, unrelated natural or political event, making case-by-case exceptions for typical actions like amnesties that may come a month later and/or after another record. Of these, I include here only actions that occurred more than once. For the exact sources, see the supplementary data file available at <https://halshs.archives-ouvertes.fr/halshs-02116057>.

neither should we ignore what our sources cite *ad nauseam* as their purpose: ‘the cultivation of virtue’ (*xiu de* 修德). That, according to Confucian philosophy, is the very point of ritual (*li* 禮).⁷³

In other words, when treated as omens, solar eclipses provided a ritual occasion for the emperor to show humility, hear criticism, and if not *cultivate* then at least *make a show of virtuous conduct* – one so grand as to eclipse the eclipse. In defending the phenomenon’s status as an omen in the face of sceptics and scientific progress, it might be, as his emphasis on virtue and ritual suggest, that Li Chunfeng was defending the ritual. Indeed, one wonders what other ends could possibly be served by provoking the emperor with an omen formula like the following, from the *Yisi zhan*:

The sun is eclipsed at the [Eastern] Wall (Peg): Yang is eliminated and Yin is broken; many men and women hurt and defeat the Way of humanity; the king loses his piety and respect; his inferiors follow their teachers and friends; there is a deficiency of cultural examples, a forfeiture of virtue (*de*) training, and the study of the Rites (*li*) is abandoned.⁷⁴

5 Conclusion

Curiously, experts had challenged the omenological status of solar eclipses in China since well before they could be predicted, and once prediction began, from the third century CE on, the effect on theory and practice was ambiguous. The gatekeepers lost interest (25.9% of their interest, depending on how you count),⁷⁵ and whether they were ‘regularities’ or ‘anomalies’ might depend upon the audience to which one was speaking. In the *Yisi zhan* (639/670 CE), Li Chunfeng attempts to iron out the contradictions, and he does this by arguing that it is the eclipse that stimulates the monarch’s misdeeds rather than vice versa. Li Chunfeng is not consistent upon this point across his writing, nor even in said chapter of the *Yisi zhan*, and there is little evidence that he applied his theories to any eclipse past, present or future. It could be that the point was simply to solve scholastic problems, bending the theory to reconcile contemporary experience with ancient authority, but one suspects that his defence of the omenological tradition was also a defence of what the throne was expected to do about it: a solemn ritual followed by equally ritualistic acts of humility, introspection and benevolence.

(24 May). Officials reported him in petition, and [the emperor issued an] edict that his seal and ribbon (of office) be revoked and that [he] was to go to the chamberlain for law enforcement’ (*Hou Hanshu*, 65.2154). In the biography of Jia Chong 賈充 (217–282 CE), by contrast, we read that: ‘In Everything Quiet year 3, the sun was eclipsed on New Year’s Morning (20 Feb 277). [Jia] Chong requested to step down [as defender-in-chief], but his request was denied’ (*Jinshu*, 40.1169).

⁷³ On ritual (*li*) and virtue (*de*). See for example Slingerland (2011) and Ing (2012: esp. 57–58). On the role of virtue in the practice of ‘heavenly patterns’ and *Classic of Changes* (*I ching*) divination, see Chapman (2015: 63–70).

⁷⁴ *Yisi zhan*, 1.30b.

⁷⁵ As cited above, 25.9% is the difference between the percentage of solar eclipses commented upon in the *History of the Han Continued* (44/77, 57.1%) and in Li Chunfeng’s monographs in the *History of the Jin* and *History of the Sui* (30/96, 31.3%).

This ambiguous, contradictory picture of what early imperial astronomers did about the eclipse dilemma more or less confirms Nakayama's (1966) assertion and, more importantly, it brings us back to that made by omenologists since before the time of Sima Qian: that 'heavenly patterns' is foremost the science of virtue (*de*) and appropriate conduct (*li*). As a field, the first place we should have gone with these materials is to ritual, virtue ethics and their expression in political philosophy, but scholars largely managed to miss/disregard their subjects' explanations throughout the entirety of the twentieth century. Ethics, even today, are essential to the functioning and mission of scientific communities, and as I intended Table 1 to show, there is an insurmountable gulf between Eberhard's (1957) cynicism and what our sources, statistically, have to say in this regard. We may no longer believe in the omen formulae cited here, and while someone like Sima Qian did not either, it strikes me that there is infinitely more we can do as historians than simply linger on questions of whether our subjects are somehow cheating.

Among the questions we could be asking, I would like to highlight several that came to me in the process of writing and that, for want of time, I was unable to pursue. First, a careful reading of the observational/omenological annals reveals apparent contradictions in practice concerning the identification of 'stimulus' (*gan*) and 'response' (*ying*), which, in a way, offer precedence for Li Chunfeng's inversion of the relationship between eclipses and misdeeds. Is this a case of practice informing theory? And if so, might it be related to other divinatory practices, such as the matching of *zhan* 占 ('omen') and *yan* 驗 ('verification') we see in oracle bones? Second, Li Chunfeng was a Taoist, but the idea of the sun 'stimulating' behaviour is reminiscent of the planet's 'grasp' on human fate in Greco-Indo-Iranian astrology, which had already begun transmission into China via Buddhism by Li Chunfeng's day.⁷⁶ Is this a coincidence, a one-time exception, or might we once again look for foreign influences in 'heavenly patterns' omenology?⁷⁷

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⁷⁶ See Kotyk (2018).

⁷⁷ On the old question of Babylonian influence, raised by Bezold (1919), see Pankenier (2014).

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