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EDITORIAL

Introduction: "Moral Meteorology" as comparative framework from and beyond the history of East Asia[1]

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Abstract: The concept of "moral meteorology" has been first introduced into the study of Late Imperial China. With several examples, this introduction demonstrates its applicability to earlier periods of East Asian history and beyond across the ancient and medieval word before briefly referring to the contents of the special issue devoted to this topic.
Keywords: Climate History; East Asia; Medieval Europe; Historical Astronomy; Global History.

ES Introducción: "Meteorología Moral" como marco comparativo desde y más allá de la historia de Asia Oriental

Resumen: El concepto de "meteorología moral" se introdujo por primera vez en el estudio de la China imperial tardía. Con varios ejemplos, esta introducción demuestra su aplicabilidad a períodos anteriores de la historia de Asia Oriental y más allá a lo largo del mundo antiguo y medieval antes de hacer referencia brevemente al contenido del número especial dedicado a este tema.
Palabras clave: Historia del clima; Este de Asia; Europa medieval; astronomía histórica; historia global.

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On 25 May 788, a long drought was ended at the (then) Japanese capital of Nagaoka-kyō by imperial intervention:

It hadn't rained since last winter and it had been five months. Irrigation of the fields was now completely broken; officials and private individuals had given up all hope. Early that morning, after the bath, the emperor went out into the courtyard and prayed for rain himself. After a while the sky darkened, clouds gathered and the rain fell in torrents. In the crowd of dignitaries there was not one who did not dance for joy and burst out in cheers for the emperor. (...) All said: "It was the emperor's perfect virtue and highest honesty that caused the supplication."[2]

The idea that meteorological (and other celestial) phenomena and portents would correlate with the moral qualities of the emperor had gained currency in Japan in the century before, based on a combination of older assumptions on the divine legitimation of rulership and especially the "import" of concepts of imperial authority from China.

There, the notion of a "mandate of heaven" granted to the emperor was connected with the dynamics of weather and other omens already in the Early Han period (and before).[3] Dong Zhongshu (179-104 BCE) for instance stated: "When the ruler is righteous, the primordial forces (*yin* and *yang*) are in harmonious relationship with each other. Wind and rain come at the right time, auspicious stars appear, and the

1 The paper was finished within the framework of the Cluster of Excellence "EurAsian Transformations", funded by the Austrian Science Funds FWF (project number COE 8, https://www.fwf.ac.at/forschungsradar/10.55776/COE8)
2 *Rikkokushi: die amtlichen Reichsannalen Japans: die Regierungsannalen Kanmu-Tennô Shoku-Nihongi 36-40 und Nihon-Kôki 1-13 (780-806)*, transl. Bruno Lewin (Tokyo: Deutsche Gesellschaft für Natur- und Völkerkunde Ostasiens Tôkyô, 1962), 215.
3 On the "prehistory" of the mandate of heaven see David William Pankenier, *Astrology and Cosmology in Early China. Conforming Earth to Heaven* (Cambridge: Cambridge University Press, 2013).

Yellow Dragon descends."[4] Accordingly, calamitous weather events and less auspicious portents would indicate a lack of righteousness in the ruler and could even be interpreted as signs of a withdrawal of the divine mandate. Such ideas circulated in China until the time of the last imperial dynasty of the Qing (1644-1912), for whom Mark Elvin analysed them and coined the term of "moral meteorology":

> One view in Late Imperial China was that people were responsible for their weather. Rainfall and sunshine were thought to be seasonal or unseasonal, appropriate or excessive, according to whether human behavior was moral or immoral. The effects were statistical. Bad individuals in a community could benefit from the goodness of the majority; good individuals could suffer if the majority were evil. Some counted for more than others. The emperor's conduct was of preeminent importance; bureaucrats came in second place; and the common people ranked last. All or any of these could be decisive in a particular case. Further, since weather was mostly regional, there was a corresponding regionality of rewarded or sanctioned behavior; and the weather around the Capital was thought to have particular relevance to what Heaven thought of the emperor's conduct.[5]

As Elvin´s paper demonstrated, the respective weight of responsibility for weather extremes or bad omens of either the ruler, the elite or the population at large was a matter of interpretation by various groups at the court, in the central or provincial bureaucracy or by individual dissident voices from outside the networks of power. This was already the case in the period of the Han dynasty, especially in the crisis-prone second century CE, when scholars such as Hsiang K'ai (in 166 CE) supported their criticism of imperial politics with various portents and calamities such as ominous signs in the stars, strange lights in the night sky, extreme cold in the last winter and of excessive frosts, hail and rain. These omens they interpreted as signs of cruel punishments and warnings to the ruler by the divine powers in order to argue for change of the emperor´s conduct and politics.[6] Rafe de Crespigny therefore argued that "indeed, we may take it as axiomatic that the portents recorded in the histories do not reflect the disorders of nature so well as they do the discontents and political disagreements of man. In a sense, the numbers of portents memorialised each year provide a graph of the popularity of the imperial government among the officials and scholars who controlled the responsible bureaus, and who generally reflected the political opinions and prejudices of their colleagues."[7] As the papers in the current special issue demonstrate, however, especially the increasing number of natural scientific data (from palaeoclimatology, vulcanology, astronomy) allows us to reconstruct an actual physical background to many of these phenomena; nevertheless, their perception, description and interpretation of course emerged in the cultural and political matrix of the respective society and period.

Accordingly, rulers and governments tried to maintain a monopoly of interpretation of such phenomena in order to prevent their use by opposition voices. Already in 267 CE, Jin Wudi, the founding emperor of the Western Jin Dynasty, forbade the private "study of divination by the stars and atmosphere".[8] Following Chinese dynasties repeated and tightened these regulations.[9] The Penal Code of the T´ang dynasty, created between 624 and 652, decreed in its article nr 268: "All cases of making magical inscriptions and magical incantations are punished by strangulation", specifying that "make means to oneself write or speak about good and bad fortune or words attributed to spirits. Or, to speak wildly about lucky or unlucky portents in a way that involves not being a proper subject of the emperor. (...) Such persons practice astrology and draw pictures on the earth, perversely speak about disasters and good omens, and wildly prognosticate good and evil. All of these cases involve not being a proper subject of the emperor and are punished by strangulation."[10] Furthermore, "those who propagate and distribute these inscriptions and incantations to confuse a group of people receive the same punishment."[11] The code´s article 377 decreed: "all cases of making false portents are punished by two years of penal servitude", specifying that "if a person falsely speaks about unicorns, phoenixes, tortoises, or dragons—things that cannot be verified—following the law on falsifying and not reporting the true circumstances in submitting documents to the emperor, the punishment is two years of penal servitude."[12]

The emperors of Japan adopted these regulations; the private possession of manuals on divination, prognostication books, maps of the heavens or astronomical instruments was forbidden. Anyone using such tools or fabricating "by oneself stories about auspicious and inauspicious events or spirits and ghosts" was punished for engaging "in reckless explanations involving good and bad omens that counter official authority".[13] At the same time, an office (the Yin-Yang Bureau/*Onmyōryō* or Bureau of Divination) was established in 675 at the Japanese court for observations and interpretations of celestial phenom-

4 Cited after Kai Vogelsang, *Geschichte Chinas* (Stuttgart: Reclam, 2012), 159. See also Rafe de Crespigny, *Portents of Protest in the Later Han Dynasty* (Canberra: Faculty of East Asian Studies, Australian National Univ., with Australian National Univ. Press, 1976)

5 Elvin, Mark, "Who Was Responsible for the Weather? Moral Meteorology in Late Imperial China". *Osiris 13, Beyond Joseph Needham: Science, Technology, and Medicine in East and Southeast Asia* (1998): 213-237, citation from 213.

6 de Crespigny, *Portents of Protest*, 5-7 and 21-27.

7 de Crespigny, *Portents of Protest*, 11 and 16. See also Elvin, "Who Was Responsible for the Weather", 214.

8 Whitfield, Susan, "Under the Censor's Eye: Printed Almanacs and Censorship in Ninth-Century China", *The British Library Journal* 24 (1998): 4-22, here 10. http://www.jstor.com/stable/42554486

9 Whitfield, "Under the Censor's Eye", 10-12.

10 *The T'ang Code Volume II, Specific Articles*, translated with an introduction by Wallace Johnson (Princeton, New Jersey: Princeton University Press, 1997), 274-275.

11 *The T'ang Code*, transl. Johnson, 276.

12 *The T'ang Code*, transl. Johnson, 444-445.

13 Ooms, Herman, *Imperial Politics and Symbolics in Ancient Japan: The Tenmu Dynasty, 650-800* (Honolulu: University of Hawaii Press, 2009), 92-93.

ena and other portents.[14] Among the phenomena recorded were "unusual phenomena relating to the sun and moon; unusual phenomena relating to the stars, constellations and planets, or comets; dragon conflagrations (i.e. thunderous sounds), demon conflagrations (i.e. plagues or epidemics), human conflagrations (i.e. unfavourable karmic conditions), forest conflagrations (i.e. forest fires due to drought) and fires in general; altered seasons; violent winds; excessive heat, i.e. drought, so that grains do not ripen; and rebels and armed conflict."[15] As Nathalie Phillips explains, the Bureau´s duty

> was to (...) report to the emperor if there were any strange events or deviations. The fundamental notion that sustained this type of correlative thought was the idea of cosmological resonance, which represented a mechanism through which various realms of reality or, categorically related, but spatially distant, phenomena could interact. (...) This notion of cosmic resonance was applied to the relations between humans and deities. If the deities did not receive proper ritual attention, the harmony of the entire system could be disrupted. (...) these cosmological notions constituted a moral discourse. Human behaviour was thought to resonate with the cosmic forces and thus was supposed to conform to the will of Heaven. Within this discourse the ruler occupied the pivotal position and was supposed to carry out the ritual acts that would maintain the harmony between heaven and earth. Natural calamities were perceived to be due to the emperor's moral failings (...).[16]

Within this framework, the emperor had to take responsibility for the occurrence of portents and calamities, but it was also up to him (and his Bureau of Divination) to interpret them and to implement adequate remedies. Thus, already shortly after his enthronement on 10 May 781, Emperor Kanmu issued an imperial decree that read: "Because of Our unworthiness, Yin and Yang are not yet in harmony. Months of drought lingered across the empire, the population wailed, and the nine realms harboured resentment. We, who are the father and mother of the people, are subject to this divine rebuke. However, although We do our best with utmost sincerity, we do not yet feel the blessing of the pouring rain. We direct Our thoughts to the prisoners and want to show them mercy specifically (...)."[17] The access to the Onmyōryō, however, laid not exclusively with the emperor; when Kanmu unduly extended the mourning period for his father Emperor Kōnin, the leading government officials consulted the Bureau of Divination and in September 782 addressed a petition to the throne of the wording:

> Recently natural disasters have occurred frequently and, moreover, ominous omens have become apparent. Therefore, tortoise and yarrow oracles were commanded to discover the reason by divination. [The Bureau of Divination] reported: "Although in constant worship of the gods by the state, offerings are made according to custom, but in mourning dress non-mourning and mourning have become confused in the realm. For this reason, a curse has come down from the Great Deity at Ise, as well as from all god shrines everywhere. If one does not stop grief and does not adhere to what brings salvation, there is a fear that His Majesty's body will be seized with disease. (...) Accordingly, the mourning clothes should be removed in order to correspond to the gods of heaven and earth.[18]

Faced with such a threatening prognosis regarding his own well-being, Emperor Kanmu conformed with his officials´ petition. The emperor's body "in particular was correlated with the state and the universe in general".[19] Yet, the moral responsibility for restoring the balance with the divine forces could equally be expended onto the body politic at large. When in August 796 the lake in the crater of the volcano Mount Aso on the island of Kyūshū dried up, the following imperial decree was issued by Kanmu:

> We fear that the order of the Five Elements may become confused. Recently, the administration of Tsukushi General Government reported that there is a pond on the mountain in Aso District, Higo Province. (...) Its water content has steadily decreased over the years. But now it has dried up by more than 20 jo for no reason. When the oracle was asked about it, it showed that this phenomenon indicates drought and plague. Since the people are not guilty of anything, they fear suffering such calamities. It is precisely there that we want to ban evil influences and help the people through the practice of virtue and the granting of favours. The widowers, widows, orphans and childless in the kingdom and who cannot survive on their own should receive aid. In addition, all temple monasteries are instructed to consecrate three days of purification, reading the sutras, and doing penance. The sentiments of compassion for all beings may affect the heavens above favourably, and the testimonies of divine reward may spread over the whole earth.[20]

Although the decree stated that the "the people are not guilty of anything", it nevertheless obliged the entire population to practice charity and other acts of virtue.[21]

Accordingly, the moral reading of portents and calamities could also be used by rulers to assign responsibility to officials at the court, in the provinces

14 Herman Ooms, Yin-Yang's Changing Clientele, 600-800, *Cahiers d'Extrême-Asie* 21 (2012) 21-41; Allan G. Grapard, "Religious practices", in *The Cambridge History of Japan, Vol. 2: Heian Japan*, ed. Donald H. Shively, and William H. McCullough (Cambridge: Cambridge University Press, 1999), 547-557; Phillips, Nathalie, *Conforming to Invisible Principles: The Significance of Meta-Physical Beliefs for the Heian-Period Episteme and their Articulation in Social and Political Relations* (Dissertation, The University of Edinburgh, 2019), 35-38.
15 Phillips, *Conforming to Invisible Principles*, 297-298.
16 Phillips, *Conforming to Invisible Principles*, 136-138.
17 *The Annals of Kanmu-Tennō*, transl. Lewin, 74.
18 *The Annals of Kanmu-Tennō*, transl. Lewin, 103-104.
19 Phillips, *Conforming to Invisible Principles*, 135.
20 *The Annals of Kanmu-Tennō*, transl. Lewin, 329.
21 See also Phillips, *Conforming to Invisible Principles*, 128.

or to larger sections of the population and thereby to support allegations of abuse of offices or of other forms of wrongdoing. During the Qing dynasty, Chinese emperors even established a causal link between the misdeeds of officials and the transformation of the dissatisfaction of the population in celestial portents and calamities; in 1679, an imperial decree was issued which read:

> This is all because the local officials have toadied to the higher officials, and imposed unauthorized levies on the common people. The governors-general, provincial governors, and intendants pass on [these pickings] in the form of presents to those in the Capital. The great officials thus transfer the limited material output to which Heaven can give birth, and the easily exhausted wealth of the people, into the private pockets of greedy bureaucrats. The aggrieved and resentful energy-vitality of the people of modest means reaches up to Heaven, thereby causing the summoning forth of such untoward events as floods, droughts, changes in the heavenly bodies, earthquakes, and the drying up of springs.[22]

In another text was stipulated that "the grieved and resentful energy-vitality (*qi*) of the humble folk rises up to Heaven, and thereby causes floods, in sun, moon, stars, and planets, and uncanny events such as earthquakes and springs running dry."[23] Based on this interpretation of signs and catastrophes, local officials were warned to perform their duties better. Through the public reading of these decrees, the anger of the suffering people was also directed against them – and distracted from the emperor.

In an edict of 1731, however, the guilt for bad omen and calamities was attributed to the population at large, since "Heaven Above has a loving heart-mind. It is in no way the case that there is some pattern- principle whereby It sends down disasters on humankind (undeservedly). The people of the empire bring floods, droughts, and famines on themselves."[24] It is unclear, to what extent such a wide-ranging distribution of responsibility beyond the imperial apparatus, with the emperor on top, found approval.[25]

We know, however, that attempts to monopolise the interpretation of portents at the imperial court were not successful. In T´ang China, information on weather signs, celestial phenomena and their possible meaning was collected in popular calendar almanacs, whose distribution became wide-spread with the use of book-printing in the 9th century – despite an official decree of 835 that stipulated that the private printing of such almanacs was forbidden.[26] As in earlier times, both in China as well as in Japan prominent individuals and opposing groups did not miss the opportunity to interpret disasters and omens in the spirit of their criticism of the ruler and his administration. Thereby, moral meteorology remained a dynamic element of political debate and historiographical interpretation of reigns throughout East Asian history.

Of course, we find comparable notions about the correlation between the interpretation of celestial phenomena and extreme events as portents and the moral qualification of the ruler, the elites or the population in other medieval societies. In 775 CE, the Anglo-Saxon cleric Cathwulf addressed a letter to a contemporary of Emperor Kanmu, the Frankish King Charles, in which he invoked "eight columns characteristic of a just king": truth in kingship, patience in negotiations, largesse in gift giving, verbal persuadability, correction of evils, elevation of goodness, modest taxes and equality of judgment between rich and poor.[27] And Cathwulf explained:

> So if you keep these eight pillars leaning, then you will be a king (...) and your kingdom will be blessed during your days, with your wife and children. And then the air and the weather will be calm (*erit aeris et tempestatum tranquillitas*), the land of the sea will be fruitful with everything that grows in them, and you will also rule many nations successfully and your enemies will fall before your face and the rest. On the other hand, as St. Patrick said: ‚Because of the king's injustice there will be unhappiness for himself, the dissension of his wife and children, the famine of the peoples, the pestilence, the barrenness of the land, and the fruits of different lands stricken by sea storms (*populorum fames, pestilentia, infecunditas terre, maris quoque tempestatibus fructus terrarum diversis percussis*), and he will be overcome by his enemies and expelled from the Kingdom.[28]

Interestingly, also Charlemagne shared this personal responsibility for good weather, the absence of ill omens and the wellbeing of the realm with larger parts of the elites and the population as Kanmu did in Japan around the same time (see above). When the (now) Emperor Charlemagne learned about unfavourable weather conditions, resulting harvest failures and the threat of famine and epidemics from individual parts of this empire (*singulis regni nostri partibus*) in 805/806, he ordered the richer members of the nobility and clergy to give alms, while all his subjects should undergo days of fasting, church services and prayers in order to appease God's wrath. With these weather events, God had pointed out moral grievances in society, therefore it was necessary for every person to repent of their own sins and strive for improvement.[29]

22 Elvin, "Who Was Responsible for the Weather", 216-217
23 Elvin, "Who Was Responsible for the Weather", 219-220.
24 Elvin, "Who Was Responsible for the Weather", 222.
25 Elvin, "Who Was Responsible for the Weather", 228.
26 Whitfield, "Under the Censor's Eye".

27 Joanna Story, "Cathwulf, Kingship, and the Royal Abbey of Saint-Denis", *Speculum* 74 (1999): 1-21, esp. 8-10, https://doi.org/10.2307/2887268.
28 *Epistolae Karolini aevi*, Vol. 2, ed. Ernst Dümmler (MGH Epistolae 4) (Berlin: Weidmanns 1895), nr. 7, 503. See also Christian Jörg, "Die Besänftigung göttlichen Zorns in karolingischer Zeit. Kaiserliche Vorgaben zu Fasten, Gebet und Buße im Umfeld der Hungersnot von 805/06", *Das Mittelalter* 15 (2010): 38-51, esp. 49, https://doi.org/10.1524/mial.2010.0004.
29 Jörg, "Die Besänftigung göttlichen Zorns", 43-44. For the development of such notions in the Christian medieval West

The concept of "moral meteorology" thus provides a framework of comparison across geographical, religious or disciplinary boundaries, also far beyond the samples provided in the current issue which focuses on case studies from Central Europe and the Mediterranean across Eurasia to Japan.[30] Equally wide is the range of phenomena which could serve as portents and anchor points of various political and religious interpretations. Already the Greek philosopher Aristotle (384-322 BCE) in his *Meteorologica* defined *ta meteora* as "everything which happens naturally (*kata physin*), but with a regularity less (*aktoteran*) than that of the primary element of material things, and which occur in the region which borders most closely on the movements of the stars", that is the sub-lunar sphere.[31] This included not only phenomena we associate with "meteorology" today such as rain, snow, clouds, mist, frost, hail, winds, typhoons or thunder, but also comets, shooting stars, aurora borealis, the stars of the Milky Way, haloes and other atmospheric phenomena as well as earthquakes.[32] Between all these phenomena as well as other celestial bodies Aristotle assumed causal relationships; he explained for instance:

> an earthquake sometimes occurs at an eclipse of the moon. For when the interposition is approaching but the light and warmth from the sun, though already fading, have not entirely disappeared from the air, a calm falls when the wind runs back into the earth. And this causes the earthquake before the eclipse. For there are often winds also before eclipses, at nightfall before a midnight eclipse, at midnight before an eclipse at dawn. The reason for this is the failure of the heat from the moon when its course approaches the point at which the eclipse will take place. Thus when the cause which held it quiet ceases to operate the air is set in motion again and a wind rises, and the later the eclipse, the later this happens.[33]

Aristotle remained a scientific authority in the Christian and Islamic worlds up to the early modern period[34], and within such a framework moral meteorologists could establish manyfold connections between celestial and other phenomena as portents on the one hand and various extreme events on the other hand, with comets as particularly feared harbingers of disaster, for instance.[35] As Thomas Wozniak explains for ancient and medieval Europe:

> In ancient times, natural events were considered signs (*signum*) in the sense of omens (*prodigium*). Their symbolic character also played an outstanding role in the early and high Middle Ages, as, according to widespread belief, God commented on and punished people's sinful actions. In addition to the religious interpretation, there were also quasi "scientific" interpretations and observational representations. These two positions, on the one hand the religious, often eschatological interpretation of a natural event, and on the other hand the self-observed message from a curious contemporary who is fascinated or shocked by the event, are the two extreme poles between which the representation of natural events fluctuates. The third pole is the conscious instrumentalization of natural events. They are exploited as a sign of a change of ruler, a military invasion by strangers, and indicate the loss of peace or even the end of the world.[36]

Such a combination of scientific reasoning and religious-moralistic interpretation we find for instance, in the book on "On Celestial Signs" (*De Ostentis*), written by the high official John Lydus in Constantinople during the reign of Emperor Justinian (527-565 CE) and also cited in the later medieval Greek tradition:[37]

> These facts [on the physical causes for earthquakes, such as those provided by Aristotle], then, one would fancy when considering

on the basis of ancient Greek and Roman as well as Biblical examples see especially the monumental study of Thomas Wozniak, *Naturereignisse im frühen Mittelalter. Das Zeugnis der Geschichtsschreibung vom 6. bis 11. Jahrhundert* (Berlin: de Gruyter, 2020), 755-764.

30 For other regions of the medieval globe see for instance Ivan Šprajc, "Astronomy and its role in ancient Mesoamerica", *Proceedings of the International Astronomical Union* 5 (2009):87-95, https://doi.org/10.1017/S1743921311002171 (with further literature); David Pingree, *Jyotihśāstra: Astral and Mathematical Literature* (Wiesbaden: Otto Harrassowitz, 1981). For the medieval Islamic world see the relevant chapters in Matthias Heiduk, Klaus Herbers and Hans-Christian Lehner (eds.), *Prognostication in the Medieval World* (Berlin: de Gruyter, 2021).

31 Aristotle, *Meteorologica*, 1.1 (338b1-2) ed. with an English translation by H. D. P. Lee (Cambridge, Mass. – London: Harvard University Press), 1952, 4-5.

32 See also Michael Ian Beardmore, *Ancient Weather Signs: Texts, Science and Tradition* (PhD-Thesis University of St Andrews, 2013), 3-5.

33 Aristotle, *Meteorologica*, 2.8 (367b), ed. and transl. Lee, 214-215.

34 See for instance Anne Lawrence-Mathers, *Medieval Meteorology. Forecasting the Weather from Aristotle to the Almanac* (Cambridge: Cambridge University Press, 2019), also on the medieval Islamic tradition.

35 On this tradition see Wozniak, *Naturereignisse im frühen Mittelalter*; Andreas Bähr, *Der grausame Komet: Himmelszeichen und Weltgeschehen im Dreißigjährigen Krieg* (Hamburg: Rowohlt, 2017); Doris Gruber, *Frühneuzeitlicher Wissenswandel. Kometenerscheinungen in der Druckpublizistik des Heiligen Römischen Reiches* (Bremen: edition lumière, 2020); Piero Sicoli, Roberto Gorelli, María José Martínez and Francisco J. Marco, *Medieval Comets. European and Middle Eastern Perspective* (Valencia: Universitat Politecnica de Valencia, 2023).

36 Wozniak, *Naturereignisse im frühen Mittelalter*, 713. See also the various chapters in Heiduk, Herbers and Lehner, *Prognostication in the Medieval World*. For the ancient and Biblical traditions see for instance Ulla Koch-Westenholz, *Mesopotamian Astrology. An Introduction of Babylonian and Assyrian Celestial Divination*, (Copenhagen: Museum Tusculanum Press, 1995); Tzvi Abusch et al., *Texte aus der Umwelt des Alten Testaments, Neue Folge, Band 4: Omina, Orakel, Rituale und Beschwörungen* (Gütersloh: Gütersloher Verlagshaus, 2008); Susanne William Rasmussen, *Public Portents in Republican Rome* (Rome: «L'erma» di Bretschneider, 2003); David Engels, *Das römische Vorzeichenwesen (753 – 27 v. Chr.). Quellen, Terminologie, Kommentar, historische Entwicklung* (Stuttgart: Franz Steiner Verlag, 2007); Marie Therese Fögen, *Die Enteignung der Wahrsager. Studien zum kaiserlichen Wissensmonopol in der Spätantike* (Frankfurt am Main: Suhrkamp, 1997).

37 Anne-Laurence Caudano, "Astronomy and Astrology" in *A Companion to Byzantine Science*, ed. Stavros Lazaris, 202-230, here 208 (Leiden: Brill, 2020), https://doi.org/10.1163/9789004414617_008.

> concepts about nature, but, however, all realities are produced by Divine Providence and its supervision of judgment, not, indeed, at random, since this universe is put together by natural laws and is governed by God's Providence and reason beyond silence, hence earthquakes themselves in themselves not only harm those upon whom they happen, but, indeed, they become informers of no moderate ills also to others separated somewhere far off in both place and time.[38]

On the following pages, Martin Bauch explores medieval interpretations of the atmospheric and climatic phenomena in England and other parts of north-western Europe which modern research can connect with the impact of the massive eruption of the volcano Samalas on the island of Lombok (in modern-day Indonesia) in 1257. Maria Carolina Campone investigates the presence of meteorological and astronomical prophecies in the *Patria* of Constantinople, a collection of writings dedicated to the history, traditions, monuments and legends of the Byzantine capital. The cultural aspects of the building of houses within the framework of a landscape characterised by volcanic activity are explored by Saverio Carillo for the region of Mount Vesuvius. A historian –Koji Murata– and an astrophysicist –Hisashi Hayakawa– collaborate to re-investigate the question if the spectacular supernova of 1054 CE manifested itself in source evidence from western Eurasia (especially the Arab world and Byzantium). My own paper continues the discussion of the "moral meteorological" interpretation of climatic and astronomic phenomena in a comparison of 10th to 11th century Byzantium and Japan.

The wide-ranging impacts of many of these phenomena require a "global" and comparative approach, but at the same time depend on detailed studies of their regional and culture-specific interpretation. This special issue is – hopefully – only a starting point for an even more comprehensive study of moral meteorologies across the Global Middle Ages.[39]

A few days after Professor Saverio Carillo submitted the final version of his article, we received the shocking news of his death. His paper is, therefore, also tragically a testimony to his profound erudition. We devote this special issue, which includes his contribution, to the memory of Saverio Carillo and his scholarship.

[38] John Lydus, *On Celestial Signs (De Ostentis)*, III, 28 ed and translated by Anastasius Bandy (Lewiston: Edwin Mellen Press, 2013), 224. On the interpretation of earthquakes see also Armin Bergmeier, "Natural Disasters and Time: Non-eschatological Perceptions of Earthquakes in Late Antique and Medieval Historiography". *Millennium. Jahrbuch zu Kultur und Geschichte des ersten Jahrtausends n. Chr. / Yearbook on the Culture and History of the First Millennium* C.E. 18 (2021): 155-174, https://doi.org/10.1515/mill-2021-0005.

[39] On this concept see among an increasing number of studies especially Peter Feldbauer and Angela Schottenhammer (eds.), *Globalgeschichte – die Welt 1000-1250* (Vienna: Mandelbaum Verlag, 2011); Catherine Holmes and Naomi Standen (eds.), *The Global Middle Ages*, Past & Present, Volume 238 (Oxford: Oxford University Press, 2018); Erik Hermans (ed.), *A Companion to the Global Early Middle Ages* (York: Arc Humanities Press, 2020); Geraldine Heng, *The Global Middle Ages: An Introduction* (Cambridge: Cambridge University Press, 2021); Michael Borgolte, *Die Welten des Mittelalters: Globalgeschichte eines Jahrtausends* (Munich: C. H. Beck, 2022); Michael Borgolte, *Globalgeschichte des Mittelalters* (Munich: C. H. Beck, 2023).

References

Primary sources

Aristotle, *Meteorologica*, ed. with an English translation by H. D. P. Lee. Cambridge, Mass. – London: Harvard University Press, 1952.

Epistolae Karolini aevi, Vol 2, ed. Ernst Dümmler (MGH Epistolae 4). Berlin: Weimanns 1895.

John Lydus, *On Celestial Signs (De Ostentis)*, ed. and translated by Anastasius Bandy. Lewiston: Edwin Mellen Press, 2013.

Rikkokushi: die amtlichen Reichsannalen Japans: die Regierungsannalen Kammu-Tennô Shoku-Nihongi 36 - 40 und Nihon-Kôki 1 - 13 (780 - 806), transl. Bruno Lewin, Tokyo: Deutsche Gesellschaft für Natur- und Völkerkunde Ostasiens Tôkyô, 1962

The T'ang Code Volume II, Specific Articles, translated with an introduction by Wallace Johnson. Princeton, New Jersey: Princeton University Press, 1997.

Bibliography

Abusch, Tzvi et al., *Texte aus der Umwelt des Alten Testaments, Neue Folge, Band 4: Omina, Orakel, Rituale und Beschwörungen*, Gütersloh: Gütersloher Verlagshaus, 2008.

Bähr, Andreas, *Der grausame Komet: Himmelszeichen und Weltgeschehen im Dreißigjährigen Krieg*. Hamburg: Rowohlt, 2017.

Beardmore, Michael Ian, *Ancient Weather Signs: Texts, Science and Tradition* (PhD-Thesis University of St Andrews), 2013.

Bergmeier, Armin, "Natural Disasters and Time: Non-eschatological Perceptions of Earthquakes in Late Antique and Medieval Historiography". *Millennium. Jahrbuch zu Kultur und Geschichte des ersten Jahrtausends n. Chr. / Yearbook on the Culture and History of the First Millennium* C.E. 18 (2021): 155-174. https://doi.org/10.1515/mill-2021-0005

Borgolte, Michael, *Die Welten des Mittelalters: Globalgeschichte eines Jahrtausends*. Munich: C. H. Beck, 2022.

Borgolte, Michael, *Globalgeschichte des Mittelalters*. Munich: C. H. Beck, 2023.

Caudano, Anne-Laurence, "Astronomy and Astrology" in *A Companion to Byzantine Science*, ed. Stavros Lazaris, 202-230. Leiden: Brill, 2020. https://doi.org/10.1163/9789004414617_008

de Crespigny, Rafe, *Portents of Protest in the Later Han Dynasty. The memorials of Hsiang K'ai to Emperor Huan*. Canberra: Faculty of East Asian Studies, 1976.

Elvin, Mark, "Who Was Responsible for the Weather? Moral Meteorology in Late Imperial China". *Osiris 13, Beyond Joseph Needham: Science, Technology, and Medicine in East and Southeast Asia* (1998): 213-237.

Engels, David, *Das römische Vorzeichenwesen (753 – 27 v. Chr.). Quellen, Terminologie, Kommentar, historische Entwicklung*, Stuttgart: Franz Steiner Verlag, 2007.

Feldbauer, Peter and Angela Schottenhammer (eds.), *Globalgeschichte – die Welt 1000-1250*. Vienna: Mandelbaum Verlag, 2011.

Fögen, Marie Therese, *Die Enteignung der Wahrsager. Studien zum kaiserlichen Wissensmonopol in der Spätantike*. Frankfurt am Main: Suhrkamp, 1997.

Grapard, Allan G., "Religious practices", in *The Cambridge History of Japan, Vol. 2: Heian Japan*, ed. Donald H. Shively, and William H. McCullough, 517-575. Cambridge: Cambridge University Press, 1999.

Gruber, Doris, *Frühneuzeitlicher Wissenswandel. Kometenerscheinungen in der Druckpublizistik des Heiligen Römischen Reiches*. Bremen: edition lumière, 2020.

Heiduk, Matthias, Klaus Herbers and Hans-Christian Lehner (eds.), *Prognostication in the Medieval World*. Berlin: de Gruyter, 2021.

Heng, Geraldine, *The Global Middle Ages: An Introduction*. Cambridge: Cambridge University Press, 2021.

Hermans, Erik (ed.), *A Companion to the Global Early Middle Ages*. York: Arc Humanities Press, 2020.

Holmes, Catherine, and Naomi Standen (eds.), *The Global Middle Ages*, Past & Present, Volume 238. Oxford: Oxford University Press, 2018.

Jörg, Christian, "Die Besänftigung göttlichen Zorns in karolingischer Zeit. Kaiserliche Vorgaben zu Fasten, Gebet und Buße im Umfeld der Hungersnot von 805/06", *Das Mittelalter* 15 (2010): 38-51. https://doi.org/10.1524/mial.2010.0004

Koch-Westenholz, Ulla, *Mesopotamian Astrology. An Introduction of Babylonian and Assyrian Celestial Divination*, Copenhagen: Museum Tusculanum Press, 1995.

Lawrence-Mathers, Anne, *Medieval Meteorology. Forecasting the Weather from Aristotle to the Almanac*. Cambridge: Cambridge University Press, 2019.

Ooms, Herman, *Imperial Politics and Symbolics in Ancient Japan: The Tenmu Dynasty, 650-800*, Honolulu: University of Hawaii Press, 2009.

Ooms, Herman, "Yin-Yang's Changing Clientele, 600-800". *Cahiers d'Extrême-Asie* 21 (2012): 21-41.

Pankenier, David William, *Astrology and Cosmology in Early China. Conforming Earth to Heaven*, Cambridge: Cambridge University Press, 2013.

Phillips, Nathalie, *Conforming to Invisible Principles: The Significance of Meta-Physical Beliefs for the Heian-Period Episteme and their Articulation in Social and Political Relations*, Dissertation, The University of Edinburgh, 2019.

Pingree, David, *Jyotiḥśāstra: Astral and Mathematical Literature*. Wiesbaden: Otto Harrassowitz, 1981.

Rasmussen, Susanne William, *Public Portents in Republican Rome*, Rome: «L'erma» di Bretschneider, 2003.

Sicoli, Piero, Roberto Gorelli, María José Martínez and Francisco J. Marco, *Medieval Comets. European and Middle Eastern Perspective*, Valencia: Universitat Politecnica de Valencia, 2023.

Šprajc, Ivan, "Astronomy and its role in ancient Mesoamerica", *Proceedings of the International Astronomical Union* 5 (2009):87-95. https://doi.org/10.1017/S1743921311002171

Story, Joanna, "Cathwulf, Kingship, and the Royal Abbey of Saint-Denis", *Speculum* 74 (1999): 1-21. https://doi.org/10.2307/2887268

Vogelsang, Kai, *Geschichte Chinas*. Stuttgart: Reclam, 2012.

Whitfield, Susan, "Under the Censor's Eye: Printed Almanacs and Censorship in Ninth-Century China", *The British Library Journal* 24 (1998): 4-22. http://www.jstor.com/stable/42554486

Wozniak, Thomas, *Naturereignisse im frühen Mittelalter. Das Zeugnis der Geschichtsschreibung vom 6. bis 11. Jahrhundert*, Berlin: de Gruyter, 2020.