Petra G. Schmidl

Al-Ašraf ʿUmar's 'Tabṣira', Chapter XXXV

Forecasting Weather and Predicting Prices

Abstract Al-Ašraf ʿUmar (d. 695/1296), author of more than ten scholarly treatises and later in his life ruler over Yemen, merges two prognostic practices—weather forecasting and price prediction—in Chapter XXXV of his 'Book of Enlightenment in the Science of the Stars' ('Kitāb al-Tabṣira fī ʿilm al-nuǧūm'). This article investigates the tradition strands of both prognostic practices in the Islamicate sources and discusses commonalities of their underlying techniques. With this background knowledge, Chapter XXXV of the 'Tabṣira' is discussed and assessed.

Keywords Al-Ašraf ʿUmar; Islamicate Traditions; Meteorology; Price Prediction; Weather Forecasting

> Māšāʾallāh wrote this book [on prices] on account of one of his friends who was a merchant, and they both made a partnership for profit, and they earned a lot of money the very first time. Pay attention, therefore, to what I will say […].[1]

> The only function of economic forecasting is to make astrology look respectable.[2]

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1 Māšāʾallāh: Dykes 2013, p. 253.

2 According to Ratcliffe 2018, the quote is by the Burmese-born American economist Ezra Solomon (1920–2002) and often wrongly attributed to J. K. Galbraith.

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1 Weather Forecasting and Price Prediction as Prognostic Practices

In the headline of Chapter XXXV in his 'Book of Enlightenment in the Science of the Stars' ('Kitāb al-Tabṣira fī ʿilm al-nuǧūm'), al-Ašraf ʿUmar, author of at least eleven scholarly treatises who later in his life became the third Rasūlid sultan and ruled over Yemen until his death in 695/1296,[3] announces two topics that are, even today, of keen interest in everyday life when it comes to discerning the future, weather forecasting, and predicting price trends.[4]

However, the methods and techniques that permit learning how the weather will be and how prices will develop differ widely between pre- and early modern times and today. The direct relation between these two spheres of everyday life, meteorology and economics, has today often sunk into oblivion, while in former times their practical dependencies were more immediately obvious.[5] Weather forecasting and predicting prices were, however, also linked theoretically in pre- and early modern times. Both can be classified as prognostic practices—leaving out of consideration that meteorology also consists of a theoretical part mainly based on Aristotle's 'Meteorologica'.[6] In turn, they can be characterised as methods and techniques drawing on signs or indications and interpreting them,[7] independently of how they are associated, e.g. by cause and effect, by empirical values, analogies, or other methods.[8] In one way or another, they all deduce from visible to invisible data.

By taking into account the prevalent pre- and early modern *Weltbild* that assumes the Earth in its centre and that distinguishes between a sublunar region inside the orbit of the Moon, where all changes take place, and an unchanging

3 This article belongs to a series by this author, all dealing with different aspects of the 'Tabṣira' and its author, al-Ašraf ʿUmar. They provide the basis of an edition, English translation, and study of the whole text; preprints of single chapters and further material informing on the contents and context of the treatise and its author are already published online via tabsira.hypotheses.org and will eventually be compiled into a printed volume.

4 For a critical view, see in particular Niederwieser 2020, pp. 292 f.; also ibid., pp. 245–278 and Niederwieser 2016, pp. 166–181.

5 Burnett 2021a, p. 689; al-Kindī (Bos/Burnett) 2000, p. 1.

6 See the contributions by Borroni, Hullmeine, and la Martire in this volume; for Aristotle's 'Meteorologica' in the pre-modern Islamicate sources, see Lettinck 1999; also Daiber 1975 and the overview in Lewin 1960; modern research sometimes distinguishes meteorological theory and practice into two sub-disciplines, 'meteorology' and 'weather forecasting' (Burnett 2008, p. 219 with an overview of the state of research; also Mandosio 2013, p. 168); also al-Kindī (Bos/Burnett) 2000, p. 10; Daiber 2013, pp. 154–156; Telelis 2021, p. 665.

7 Schmidl 2021a, pp. 196–198; there is abundant discussion in the pre- and early modern sources concerning the question of whether what is interpreted is a mere sign or an efficient cause, e.g. by al-Baqqār (Guesmi/Samsó) 2018, pp. 33–36; also Daiber 2013, p. 152; Forcada 1995, p. 526b; Varisco 2021, p. 646.

8 Schmidl 2021a, p. 197.

supralunar world beyond it,[9] prognostic practices can be organised in parallel. While countless mantic arts interpret sublunar signs or omens, the interpretation of the movements of the celestial bodies, in particular the planets, belongs to the realm of astrology. Weather forecasting and price prediction are a special case insofar as both are not defined by the signs they interpret but by the issue they deal with, namely, learning more about tomorrow's weather and prices.[10] Despite these classificatory and methodological commonalities and the fact that al-Ašraf ʿUmar merges the two prognostic practices in Chapter XXXV of his 'Tabṣira', it appears advisable, given the state of research, to introduce them separately. Furthermore, although it is of secondary importance in this article, one should not lose track of the fact that weather phenomena, in particular rainbows, winds, thunder, and lightning, are also used as signs to be interpreted.[11]

1.1 Weather Forecasting in Pre-modern Islamicate Sources

When organising prognostic practices with regard to the signs they interpret, one can identify three tradition strands of what Arabic sources call "the science of the phenomena of the atmosphere" (*ʿilm aḥdāṯ al-ǧaww*) or sometimes simply "the science on rain(s)" (*ʿilm fī l-maṭar* [or: *fī l-amṭār*]), but also, and including meteorology, "the science of celestial effects" (*ʿilm al-āṯār al-ʿulwiyya*).[12] One tradition strand of weather forecasting in the pre- and early modern Islamicate sources considers sublunar signs comprising all kind of inanimate (but sometimes also animate, non-periodical, accidental, or unusual) phenomena as weather signs. They pertain to a stock of folk sayings,[13] common knowledge, and intergenerational experience that form a rather popular way of forecasting the weather and only require an alert mind, rather than any scholarly expertise, to apply them.[14] The signs either

9 For a general introduction, Hoppe 2017; for a concise summary, Ragep 2009; for a similar organisation of the Eastern Roman tradition, see Telelis 2021, p. 666; for a different organisation of the Latinate traditions, see Mandosio 2013, p. 167.

10 Schmidl 2021a, p. 212.

11 For an example in the Arabic sources, Fodor 1974, pp. 114–121 (English translation), 46–53 (Arabic text); for examples in the Latin sources, Berg 2020; Chiu and Juste 2013; for an overview of the Eastern Roman traditions, Grünbart 2021, pp. 811–813.

12 For the terminology, Burnett 2021b, p. 689; Burnett 2008, p. 220; Schmidl 2021a, p. 226; for a slightly different organisation of the tradition strands in the Islamicate sources, al-Kindī (Bos/Burnett) 2000, pp. 3–10; for an overview of weather forecasting practices in different traditions illustrating their entanglement, Burnett 2021b and Burnett 2004; Kocánová 2021; Mandosio 2013; Jenks 1983; Telelis 2021; Schwartz 2021.

13 Fahd, Heinrichs and Abdesselem 1995, p. 734a.

14 al-Kindī (Bos/Burnett) 2000, p. 5; also Abū Maʿšar (Burnett/Yamamoto) 2019, i. 6, pp. 150–153.

appear singularly or are embedded in comprehensive schemes, in particular when it comes to sublunar celestial, atmospheric, meteorological, and geological phenomena, such as eclipses, haloes around the Sun or Moon, thunder and lightning, rainbows, and earthquakes.[15] They indicate rain and breaks in the weather for a given list of moments in time, e.g. in the *malḥama* literature, prognostics attributed to the prophet Daniel,[16] where they occur together with other kinds of prognostications:

> If there is a halo around the Moon in the month of Nīsān this indicates a multitude of winds, earthquakes and clouds; but the fruits will be good.[17]

The behaviour and occurrence of animals are also taken into considerations,[18] e.g. in the chapter on weather signs in 'The Nabatean Agriculture' ('al-Filāḥa al-nabaṭiyya') by Abū Bakr Aḥmad ibn Waḥšiyya (late 3rd/early 10th century [?]). He mentions that, among other things, cows turning their heads towards the south and ants carrying around their eggs indicate rain.[19]

The interpretation of such sublunar weather signs is already known from Ancient Mesopotamian times,[20] appears in the Greco-Roman traditions,[21] and continues to be used all over the pre- and early modern Afro-Eurasian *oikouménē*,[22] as documented, for example, in the Syriac treatise known as 'The Book of Medicines', allegedly copied in the 12th century,[23] and the Mandaic 'Book of the Zodiac' ('Sfar Malwašia'), probably originating in Sassanid times (3rd–7th century),[24]

15 For an example in Chapter XXXIV of the 'Tabṣira', Schmidl 2022a.

16 DiTommaso 2005, pp. 231–307; Fodor 1974.

17 Fodor 1974, pp. 112 (English translation), 39 (Arabic text).

18 Robertson 1930, pp. 387 f.

19 Ibn Waḥšiyya: al-Filāḥa al-Nabaṭiyya, p. 212; Hämeen-Anttila 2006, p. 82 (English translation).

20 For examples in the Akkadian series *iqqur īpuš* ("He tears down, he rebuilds") providing prognostications "for phenomena occurring or activities undertaken in the twelve months of the year" (Rochberg 2010, p. 230), see Un calendrier babylonien, esp. pp. 58–203; also Rochberg 2010, pp. 231 f.

21 Ptolemy: Tetrabiblos II, 13, pp. 212–219; also al-Kindī (Bos/Burnett) 2000, pp. 3–5, Telelis 2021, p. 669.

22 For the term Melvin-Koushki 2019, pp. 272 f. with n. 32; for examples from the Latinate societies, Heiduk 2021, who denotes such practices as "'do-it-yourself'-prognostication" (p. 125).

23 Budge 1913, vol. 1, p. XL; also Rudolf 2018 (including a German translation), here pp. 116 f.; Bhayro and Rudolf 2018, p. 116; for a prognostic practice using sublunar signs Budge 1913, vol. 2, p. 648; Rudolf 2018, p. 282.

24 The Book of the Zodiac, p. 2; for a prognostic practice using sublunar signs, pp. 143–146; also Rochberg 2010, p. 224.

both preserved only in late manuscripts (19th–20th century).[25] Their use is still popular today, as attested by the farmer's almanacs, annually published and sold, with their weather proverbs and sayings.[26]

A specific practice of weather forecasting by means of sublunar signs that uses mainly sheep shoulder blades for prognostication is described in some Arabic manuscripts on scapulimancy. They mark out a place on the scapula that indicates "abundant rain and its floods, and what happens in it of good and ill fortune".[27]

Two other tradition strands of weather forecasting in the pre-and early modern Islamicate sources interpret supralunar signs. They use two different concepts that might be distinguished along the disciplinary boundary between astronomy and astrology.[28] The former uses, seen from a geocentric point of view, the course of the Sun during the day and throughout the year, the phases of the Moon and its monthly movement through the zodiacal belt, and the rotation of the fixed stars for timekeeping, chronology, and calendrics. The latter interprets as signs not only actual, observable celestial objects, mainly the Sun, Moon, planets, and stars, but also notional, computed reference systems and points on the celestial sphere, e.g. the houses (basic for casting any horoscopes) or the lots, positions on the ecliptic, the apparent path of the Sun around the Earth and, most famous, the Lot of Fortune.[29]

In the first case, when considering supralunar signs, the Sun's position with reference to the zodiacal signs, or more precisely, its ecliptic longitude, acts as a time base. This parameter accounts for seasonal changes in the weather and lays the foundation for all solar calendars, e.g. when the Sun enters Aries on the northern hemisphere, days become longer, nights shorter, spring begins. Therefore, information related to the position of the Sun can be easily organised according to the date in a solar year and comprises data related to celestial phenomena, hygiene and medical treatment, rains and winds, planting and seeding, navigation and related topics.[30] Similar material is already found in the Greco-Roman tradition,[31] continuing in pre- and early modern times, not only in Arabic but also in Latin (as the entangled text history of the so-called 'Calendar of Cordoba' documents)[32] and in other languages.[33]

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25 Rudolf 2018, pp. 116–125; also Bhayro and Rudolf 2018, pp. 124–126; The Book of the Zodiac, p. 1; Rochberg 2010, pp. 223 f.

26 For a German example, Bauernkalender 2023; for a short summary, Niederwieser 2020, pp. 96 f.

27 al-Kindī (Bos/Burnett) 2000, pp. 9 f.

28 Already Ptolemy: Tetrabiblos I, 1, pp. 2–5.

29 For a short explanation, Schmidl 2021b, pp. 540–542.

30 For examples, Varisco 1994; Pellat 1986.

31 For examples, Lehoux 2007, pp. 217–309; also al-Kindī (Bos/Burnett) 2000, pp. 5–7.

32 Arabic and Latin text with French translation in Pellat 1961; for a summary of the text history, Forcada 2011; also al-Kindī (Bos/Burnett) 2000, pp. 7 f.

33 Kocánová 2021, p. 658; Telelis 2021, pp. 667 f.

These practices that use the regular movement of the celestial bodies as a time base are, however, not strictly separated from astrological weather forecasting, as becomes clear, e.g. in 'The Great Introduction into Astrology' ('al-Mudḫal al-kabīr fī aḥkām al-nuǧūm') by Abū Maʿšar Ǧaʿfar ibn Muḥammad ibn ʿUmar al-Balḫī (d. 272/886),[34] a treatise fundamental for the development of astrology not only in the Islamicate societies but also elsewhere.[35] Its author stresses the role of the planets in explaining different weather conditions of a season in consecutive years: without them, they would remain always the same; no winter would be colder, no summer hotter than any other.[36]

Apart from the Sun, the concept of the *anwāʾ* (in the plural; *nawʾ* in the singular), which relies on pre-Islamic traditions and Arabic star lore, also acts as a time base in pre- and early modern Islamicate sources.[37] It comprises two different manifestations, which might explain their sometimes vague or even contradictory descriptions. On the one hand, *nawʾ* apparently denotes the rain falling when a star or a group of stars set at dusk, i.e. having its/their acronychal setting. On the other hand, *anwāʾ* describes a system of heliacal risings and acronychal settings of 28 different stars and asterisms positioned alongside the ecliptic,[38] which, in Islamic times, merged with the lunar mansions.[39] It subdivides the year into 28 intervals of usually 12, 13, or 14 days that run parallel to the seasons, providing a stellar calendar and can, therefore, be used for weather forecasting.[40] Sometimes, *nawʾ* only designates the setting, without the rising that marks the beginning of such an interval, as discussed in the sources. Furthermore, in such an interval, a shorter period of up to seven days might also be called *nawʾ*, apparently having its own weather characteristics.[41]

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34 Arabic text and English translation in Abū Maʿšar (Burnett/Yamamoto) 2019.

35 Documented, e.g. by the Latin translations of John of Seville and Herman of Carinthia (text in Abū Maʿšar: Kitāb al-Mudḫal al-kabīr ilā ʿilm aḥkām al-nuǧūm, vol. 4–7) and the early prints based on them, as well as by the Greek translation made around 1000 (text in Abū Maʿšar [Burnett/Yamamoto] 2019, vol. 2).

36 Abū Maʿšar (Burnett/Yamamoto) 2019, i. 2, pp. 58 f.

37 Varisco 1989, p. 145.

38 Ibid., p. 148.

39 Varisco 1991, p. 6; also Pellat 1960, p. 523a–b; a system classifying the lunar mansions into humid, dry, and sometimes apparently also moderate is recorded by Ibn Hibintā in his 'Muġnī' (Sezgin 1979, p. 332) and in a Latin treatise by John of Seville that is, in turn, relying on Arabic sources (Burnett 2008, pp. 235 f., pp. 249–253 [Latin text], 261–265 [English translation]). If and how the entangled history of the *Unwettersterne* (Kunitzsch 1972; also Kunitzsch 1967) is related to the concept of the *anwāʾ* requires further research.

40 For examples, Schmidl 2021c; Schmidl 2007, pp. 280–305, 326–341 (Arabic texts and German translations), pp. 602–614, 628–637 (studies).

41 Pellat 1960, p. 523a.

The *anwāʾ* are mainly discussed in a specific genre—in 'The Books on *anwāʾ* and Times' ('Kutub al-Anwāʾ wa-l-azmina')—that might not only include an explanation and tables with the dates of the risings and settings of the stars and information on winds and rains but also proverbs and poetry, e.g. in 'The Book of *anwāʾ*' ('Kitāb al-Anwāʾ') by Ibn Qutayba (d. c. 275/890).[42] To use the information on weather forecasting based on the concept of the *anwāʾ* requires a deeper astronomical knowledge than the information based on a solar calendar.[43] It involves a certain familiarity with the technical literature, e.g. for identifying the constellations.

In the second case, when taking supralunar signs into account, astrological concepts are employed for weather forecasting,[44] a tradition strand sometimes denoted as 'astrometeorology' in modern research.[45] Amongst the more general notions are the characteristics of the zodiacal signs, e.g. their belonging to the watery triplicity, those three zodiacal signs separated from each other by 120° and associated with the element water,[46] or the association of the planets with certain weather phenomena.[47] Several lots that are related to weather phenomena belong to the more specific concepts, e.g. Abū Rayḥān al-Bīrūnī (d. c. 440/1048) in 'The Book of Instruction in the Elements of the Art of Astrology' ('Kitāb al-Tafhīm li-awāʾil fī ṣināʿat al-tanǧīm') lists "the lot of air and wind" (*al-sahm al-hawwāʾ wa-l-riyāḥ*), "the lot of clouds" (*al-sahm al-ġuyūm*), and "the lot of rains" (*al-sahm al-amṭār*),[48] while Abū ʿAbd Allāh al-Baqqār (fl. early 9th/15th century) uses in 'The Book on Rains and Prices' ('Kitāb al-Amṭār wa-l-asʿār') "the lot of rain" (*al-sahm al-maṭar*), "the lot of the wind" (*al-sahm al-riyāḥ*), and "the lot of the days" (*al-sahm al-ayyām*),[49] both authors referring to Abū Maʿšar.[50] Although the sources clearly describe how these lots are determined, they remain rather silent with regard to their application.

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42 For the Arabic text, see Ibn Qutayba: Kitābuʾl-Anwāʾ; Pellat 1960, p. 523b.

43 Slightly different: al-Kindī (Bos/Burnett) 2000, p. 9.

44 See also the contribution by Hullmeine in this volume.

45 al-Kindī (Bos/Burnett) 2000, pp. 2 f. argues against this denotation; also the argumentation in Lawrence-Mathers 2020.

46 Kūšyār ibn Labbān (Yano) 1997, ii. 7, pp. 196 f.; also Burnett 2021b, p. 692; for a short explanation of the triplicities, Schmidl 2021b, p. 539.

47 Della Levi Vida 1934, pp. 271–279; also Burnett 2008, p. 255: "Venus indicates moisture, Mercury wind, Saturn clouds and cold […]".

48 al-Bīrūnī: The Book of Instruction, § 479, p. 291.

49 al-Baqqār (Guesmi/Samsó) 2018, pp. 98 f. (summary and commentary), 233 (Arabic text).

50 al-Bīrūnī: The Book of Instruction, § 476, p. 282; al-Baqqār (Guesmi/Samsó) 2018, pp. 98 f. (summary and commentary) and p. 233 (Arabic text); also the overview in Dykes 2013, pp. 29–31.

Of particular relevance is another method called "the opening of the doors" (*fatḥ al-abwāb*) that belongs also to the more specific notions.[51] It is, for example, explained and exemplified by al-Bīrūnī in his 'Tafhīm':

> When two planets whose natures are opposed conjoin, this is called opening the doors. So the conjunction of the sun or moon with Saturn indicates quiet rain, fine drizzle or snow-storms, that of Venus and Mars torrential rain, hail, thunder and lightning, and that of Mercury and Jupiter the opening of the doors of the winds.[52]

Al-Bīrūnī's contemporary, Kūšyār ibn Labbān (fl. 390/1000), in 'The Compendium of the Principles in Astrology' ('Muğmal al-uṣūl fī aḥkām al-nuğūm'), keeps the explanation of the opening of the doors more general and does not include the specification for each of the planets.[53] Kūšyār ibn Labbān draws on application and separation, a concept describing, as al-Bīrūnī simply puts it in his 'Tafhīm', the meeting of two planets in an aspect and their parting.[54]

> The separation of the Moon from a planet and its application to [another] planet whose house is in opposition to the house of the first planet: this is called 'the opening of the door'.[55]

Astrological weather forecasting, viewed from the technical side, either forms a branch of mundane, or general, astrology that keeps an eye on the big picture (not on individual odds and ends),[56] or belongs to interrogational astrology, another subfield, in which questions are asked and answered by astrological means.[57] Casting and interpreting a horoscope, the basis of both practices, requires advanced expertise in mathematics, astronomy, and astrology; the use of a technical terminology in these texts asks for specific linguistic skills. These requirements make weather forecasting in this tradition strand less suitable for non-experts than those based on sublunar signs and those using supralunar signs as a time base.

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51 For a definition and explanation of the opening of the doors, al-Baqqār (Guesmi/Samsó) 2018, pp. 16, 105 f.; Burnett 2021b, p. 693; also Dykes 2013, pp. 19–21.

52 al-Bīrūnī: Kitāb al-Tafhīm, § 517 (511) (Arabic text) and al-Bīrūnī: The Book of Instruction, § 511, p. 315 (facsimile and English translation).

53 Kūšyār ibn Labbān (Yano) 1997, pp. 86 f.

54 al-Bīrūnī: The Book of Instruction, § 489–490, pp. 303 f.; see also n. 133.

55 Kūšyār ibn Labbān (Yano) 1997, pp. 86 f.

56 Abū Maʿšar (Burnett/Yamamoto) 2000, viii. 1, pp. 478 f.; for a summary of mundane, or general, astrology, Burnett 2021a, pp. 488 f.; Schmidl 2021a, pp. 543 f.

57 For a summary of interrogational astrology, Burnett 2021a, pp. 489 f.; Schmidl 2021a, pp. 544 f.

Information on astrological weather forecasting is included in the pre- and early modern Islamicate sources in general treatises (either treated in specially tailored chapters or scattered throughout the text) or occurs in the technical literature dedicated to this topic—although one can always ask whether treatises were from the beginning independent texts or whether they were formerly part of a longer work and then outsourced.[58] To the former belong, e.g. introductory literature to astrology, such as Kūšyār ibn Labbān's 'Muǧmal', which deals in the second part, Chapters VI and VII, with "heat, coldness, and winds" and with "moisture and rains";[59] astrological compendia such as 'The Complete Book on Astrology' ('al-Kitāb al-Muġnī fī aḥkām al-nuǧūm') by Ibn Hibintā (fl. c. 340/950) and 'The Outstanding Book on Astrology' ('al-Kitāb al-Bāriʿ fī aḥkām al-nuǧūm') by Ibn Abī l-Riǧāl (d. after 429/1037–38);[60] treatises on mundane astrology such as Abū Maʿšar's 'On the Report of What Influences on Terrestrial Things the Celestial Bodies from among the Heavenly [Bodies] Indicate' ('Fī ḏikr mā tadullu ʿalayhi l-ašḫāṣ al-ʿulwiyya min al-samāʾiyya li-l-taʾṯīrāt fī l-ašyāʾ al-sufliyya'), whose Chapter II in Book III bears at least in one manuscript the heading "chapter on the determination of rains" (*bāb fī maʿrifat al-amṭār*);[61] and texts on interrogations such as 'The Book of Interrogations' ('Kitāb al-Masāʾil') by ʿUmar ibn Farruḫān al-Ṭabarī (d. c. 200/816).[62]

In this last are included, e.g. 'The Book of Rains and Winds' ('Kitāb al-Amṭār wa-l-riyāḥ') by Māšāʾallāh (fl. c. 170/790),[63] whose works "are often echoed in Abū Maʿšar",[64] in this case in 'The Book of Rains and Winds and Changes in the Weather'

58 Also the translations of several treatises in Dykes 2013, pp. 32–240.

59 Kūšyār ibn Labbān (Yano) 1997, pp. 86–95.

60 For Ibn Hinbintā's 'Muġnī', see Sezgin 1979, pp. 331 f.; for a facsimile, see Ibn Hibintā: The Complete Book on Astrology, here pp. 203–216; for Ibn Abī l-Riǧāl's 'Bāriʿ', see Ullmann 1972, pp. 335–337; for its Old Castilian version by Yehudā b. Mošē for King Alfonso X (d. 1284), see ʿAlī ibn Abī l-Riǧāl (Hilty) 1954; for an English translation of extracts based on the Latin edition published in Venice in 1485 and two Arabic manuscripts, see Dykes 2013, pp. 158–162.

61 Abū Maʿšar (Burnett/Yamamoto) 2000, pp. xvi–xvii; Paris, Bibliothèque nationale de France, Arabe 2588.1, fol. 4b–29b, here fol. 12a; see also n. 82.

62 Ullmann 1972, p. 306; Burnett 2021b, p. 692; for an English translation of extracts included in Ibn Abī l-Riǧāl's Latin version Dykes 2013, pp. 129–140.

63 Māšāʾallāh's 'Kitāb al-Amṭār wa-l-riyāḥ' might be either identical to or include 'This chapter of the rains of the year (taken) from Māšāʾallāh' published by Della Levi Vida 1934, pp. 270–281 (cf. Pingree 1974, p. 161a); for an English translation of the Latin version, Dykes 2008, pp. 309–314 and also pp. 315–323 with an English translation of the Latin version of 'The letter of Māšāʾallāh on rains and winds' updated in Dykes 2013, pp. 149–157; see also n. 130.

64 Pingree 1974, p. 160a.

('Kitāb al-Amṭār wa-l-riyāḥ wa-taġayyur al-ahwiya'),[65] which both rank amongst the oldest Arabic texts of this type.[66] The treatises by Yaʿqūb ibn Isḥāq al-Kindī (d. c. 256/870) that merge the theoretical and the practical parts of weather forecasting became most influential.[67] The author's familiarity with Aristotle's 'Meteorologica', probably in the translation by Yaḥyā ibn al-Biṭrīq (fl. mid 3rd/9th century),[68] and the preservation of his texts only in Hebrew and Latin (the Arabic original is lost) draw a vivid image of the entanglement of pre-modern knowledge on weather forecasting.[69]

Distant relatives of astrological weather forecasting can already be found in the Ancient Mesopotamian sources.[70] The topic also occurs in the Ancient Greek traditions, being included in the 'Tetrabiblos' (or 'Αποτελεσματικὴ σύνταξις'; 'Kitāb al-Arbaʿa') by Ptolemy (fl. 2nd century), first translated into Arabic by Abū Yaḥyā al-Biṭrīq (fl. 2nd/8th century) and again by Ibrāhīm ibn al-Ṣalt (fl. 3rd/9th century),[71] a fundamental work not only for pre- and early modern Islamicate astrology. In Chapter II, Part 11, "the nature of the signs, part by part, and their effect upon the weather" is discussed.[72]

Similar to other prognostic practices, all three tradition strands of weather forecasting in the pre- and early modern Islamicate sources combine observations or calculations with interpretations. To link them, everyday experience stands side by side with scholarly knowledge.

1.2 Price Predictions in Pre-modern Islamicate Sources

As opposed to weather forecasting, the prediction of prices (*asʿār*, sg. *siʿr*) has been less systematically investigated by modern research, and proper overviews like those for weather forecasting have, so far, not been published.[73] The relevant literature

65 Pingree 1970, pp. 38b–39a, no. 34 argues that Abū Maʿšar's 'Kitāb al-Amṭār wa-l-riyāḥ wa-taġayyur al-ahwiya' is probably identical with his 'Kitāb al-Sirr', an assumption declined by Sezgin 1979, pp. 148, 328 f.; also Ullmann 1972, p. 323 and n. 79.

66 Burnett 2021b, p. 692.

67 Burnett 2004, pp. 205 f.

68 al-Kindī (Bos/Burnett) 2000, pp. 12 f.; for an edition of Yaḥyā ibn al-Biṭrīq's translation, Schoonheim 2000, pp. 1–174.

69 al-Kindī (Bos/Burnett) 2000, pp. 29 f.

70 Hunger 1976.

71 Löhr 2023 (bis); Sezgin 1979, pp. 42 f.; Ullmann 1972, pp. 282 f.

72 Ptolemy: Tetrabiblos II, 11, pp. 200–205 and also II, 12, pp. 206–213 with the title 'On the Investigation of Weather in Detail'; also Daiber 2013, pp. 153 f.

73 For introductions into the Islamicate traditions of weather forecasting, Burnett 2021b; Burnett 2004; for a summary of the Latin traditions of price prediction, Burnett 2021a, p. 489; Dykes 2013, pp. 241–247.

helps only in exposing isolated examples and allowing the location of sources dealing with the prediction of prices; most of them, however, have not been investigated in detail.[74] Nevertheless, some parallels between weather forecasting and price prediction have already become obvious.[75] Again, both practices can be organised according to the signs they interpret; the expertise required for their application differs accordingly. They are either found in general treatises, be it together with other prognostications or in chapters dedicated particularly to the topic, or in special texts—again raising the question of whether they were originally composed as standalones or belonged to longer works and become separated from them later.[76]

With regard to the sublunar world, similar signs to those for weather forecasting are taken into account. Celestial, atmospheric, meteorological, and geological phenomena are considered to predict price trends, e.g. in the *malḥama* literature. The weekday of the beginning of the month, haloes around the Sun and the Moon, and eclipses indicate the rising and lowering of prices; their predictions occur together with other prognostication, e.g. related to agriculture. The behaviour and occurrence of animals are also taken into consideration. They permit learning more about price trends, when, e.g. the death of rats indicates their reduction and abundance.[77]

When considering supralunar signs, the texts present astrological price prediction with many parallels to astrological weather forecasting.[78] Again, general astrological concepts are employed, e.g. the lord of the ascendant being in a stable position, namely, in one of the four cardines, indicates price stability as in 'The Book of the Secret' ('Kitāb al-Sirr') by Abū Maʿšar.[79] Price prediction also belongs to mundane astrology, as, e.g. the Iḫwān al-Ṣafāʾ ("Brethren of Purity"; fl. c. 370/980) explain in 'The Third Epistle on *astronomia*' ('al-Risāla al-ṯāliṯa fī l-asṭrunumiyā'),[80] one of the 50, 51, or 52 letters, depending on how one counts, forming the encyclopaedic corpus of this group of scholars.[81] Therefore, as before,

74 An exception forms Dykes 2013, pp. 248–309, with English translations of chapters and treatises related to price prediction attributed to Greek-, Arabic-, Hebrew-, and Latin-writing scholars.

75 Also Dykes 2013, p. 2.

76 See also n. 74.

77 Cf. Fahd 1966, p. 477: "Si la mort se répand chez les rats, il y aura baisse des prix et abondance", referring to "Ps.-Ǧāḥiẓ, *ʿIrāfa*, 9; Ibn Quṭayba, *ʿUyūn*, II, 151" and again p. 517.

78 Also Dykes 2013, p. 2.

79 Abū Maʿšar: Kitāb al-Sirr, p. 61 (copy kindly provided by the editor); see also n. 65; for a short explanation of the cardines Schmidl 2021b, p. 541.

80 Iḫwān al-Ṣafāʾ: On Astronomia, pp. 84 f. (English translation) and pp. 148 f. (Arabic text).

81 There is an ever-expanding literature on the 'Rasāʾil' of the Iḫwān al-Ṣafāʾ fuelled by the series of critical editions and annotated English translations published under the aegis of the Institute of Ismaili Studies (IIS) in London.

these practices require more advanced expertise than those based on sublunar signs.

Similarly, information on price prediction appears either in general treatises or as single texts. In his 'Dhikr', Abū Maʿšar, at least in one manuscript, places the "chapter on the determination of high and low prices" (*bāb maʿrifat al-ġilāʾ wa-l-raḫṣ*), before he deals with rains.[82] Kūšyār ibn Labbān proceeds the other way round and continues his astrological introduction, the 'Muǧmal', in Part 2 with Chapter VIII "on prices" after dealing with weather forecasting in Chapters VI and VII.[83] ʿUmar ibn Farruḫān al-Ṭabarī follows the same procedure in his 'Masāʾil'.[84]

As a starting point towards a more complete picture of price prediction in the pre- and early modern Islamicate sources, further examples mentioned by Manfred Ullmann and Fuat Sezgin might serve.

(A) 'The Book on the Rising (or: the Judgements]) of Sirius' ('Kitāb al-Ṭulūʿ [or: al-aḥkām] al-šiʿrā l-yamaniyya'), attributed to Hermes Trismegistus,[85] a colourful authority, already present in Ancient Greek texts, which became established in Islamic, Christian, and Jewish traditions.[86]

(B) An extract of 'The Sixteenth Book on Prices' ('Kitāb al-Sādis ʿašar fī l-asʿar'), attributed to Dorotheos of Sidon (fl. 1st century [?]),[87] whose title reinforces the doubts already uttered with regard to independent texts on the topic.

(C) Māšāʾallāh's 'Book of Prices' ('Kitāb al-Asʿār'), which ranks among the earliest Arabic texts dealing with price prediction and the Latin version of which conveys the impression that it is compiled by using more than one text attributed to this author.[88]

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82 Abū Maʿšar (Burnett/Yamamoto) 2000, pp. xvi–xvii; Paris, Bibliothèque nationale de France, Arabe 2588.1, fol. 4b–29b, here fol. 11a–12a; see also n. 61.

83 Kūšyār ibn Labbān (Yano) 1997, pp. 96–101; see also n. 59.

84 Ullmann 1972, p. 306; for the English translation of a Latin version, Dykes 2013, pp. 268–282; see also n. 62.

85 Sezgin 1971, pp. 41 f.; Ullmann 1972, p. 291.

86 Bladel 2009, esp. pp. 125–127; also Schmidl 2021a, p. 202.

87 Sezgin 1979, p. 37 referring to a 4th-/10th-century manuscript in Tehran, Majlis 6452, fol. 122b–123b; not mentioned in Ullmann 1972, pp. 280 f.; also Dykes 2013, pp. 248–250, who presents an English translation of a Latin text with the title 'Dorotheos on the Moon & Prices'.

88 Ullmann 1972, p. 305; Sezgin 1979, p. 104; for a horoscope taken from this treatise, see The Astrological History of Māshāʾallāh, p. 185; for an introduction and an English translation of the Latin version, Dykes 2013, pp. 251–268.

(D) The 'Book of Prices' ('Kitāb al-Asʿār') by Aḥmad ibn Muḥammad al-Siǧzī (late 4th/10th century), whose author also wrote on weather forecasting in a treatise titled 'The Book on the Determination of the Opening of the Doors' ('Kitāb Maʿrifat fatḥ al-abwāb').[89]

(E) 'The Collection of the Judgements of the Year Transfers by the knowledgeable Šayḫ Sahl ibn Bišr' ('Maǧmūʿ al-šayḫ Sahl ibn Bišr fī aḥkām tahāwīl al-sinīn'), apparently not written by Sahl ibn Bishr (d. c. 230/845) but referring to him and Abū Maʿšar as authorities.[90]

At one end, rudiments of price prediction can be identified already in the Ancient Mesopotamian sources,[91] namely in the 'Diaries', with their immense set of data compiled from the 8th or 7th to the 1st century BC and probably continuing nearly another 200 years.[92] The records of economic trends and the river level appear to be included in them due to their regularity and periodicity.[93] At the other end, one finds Arabic treatises on price predictions that were translated into Latin and bear titles such as 'On Market Prices' ('De mercibus').[94] The mainly uncharted territories in between deserve further research to disclose the entanglement of different cultural and linguistic areas as it becomes evident in these treatises.

2 Intertwining Weather Forecasting and Price Prediction

Several of the examples provided above deal with weather forecasting and price prediction, though not exclusively in one treatise or even combined in one chapter. One also finds, however, treatises that focus on these two prognostic practices—more exactly, their astrological manifestations—and join them together in one text, e.g. in Abū Maʿšar's 'Kitāb al-Sirr', which deals in its first part with weather forecasting, this being approximately five times as long as the second part

89 Ullmann 1972, pp. 333 f.; Sezgin 1979, pp. 179–181, 333 f., who additionally mentions a 'Kitāb al-Amṭār' ('The Book on Rains') by al-Siǧzī; see also n. 51.

90 Ullmann 1972, p. 311; Berlin, Staatsbibliothek zu Berlin, Preußischer Kulturbesitz, Landberg 221, fol. 99a–132a; Ahlwardt 1893, pp. 279 f., no. 5883 (omitting the adjective "knowledgeable").

91 Slotsky 1997; cf. also Hunger and Pingree 1999, p. 29: "Similarly, a tablet written around -320 makes predictions for business from the positions of the planets […]", referring to Hunger 1976, no. 94, pp. 95–99 (text and German translation), 164 (tablet).

92 For the diaries in general, Hunger and Pingree 1999, p. 2.

93 Hunger and Pingree 1999, p. 140.

94 For an example, see n. 88; for an overview, n. 73.

that provides price prediction.[95] Another example is al-Baqqār's 'Kitāb al-Amṭār wa-l-asʿār', divided into a preface discussing three attitudes towards astrology and three parts that introduce first "the system of the judgement of the crosses" (*ṭarīqat aḥkām al-ṣulub*), then discuss the position of Saturn in one of the zodiacal signs, and conclude with the signs that indicate weather changes, rains, and prices.[96]

Chronologically, these two treatises frame the 'Tabṣira' written in 7th-/13th-century Yemen by al-Ašraf ʿUmar (d. 695/1296), the third of the Rasūlid sultans, who most probably, before ascending the throne in 694/1295, authored at least eleven scholarly treatises and constructed instruments, namely, astrolabes and water-clocks.[97] He therefore forms one of the few examples of a ruler writing scholarly treatises.[98] Apart from dealing with astronomy, astrology, and astronomical instruments, his oeuvre also comprises texts on animal studies, genealogy, mantic arts, medicine, and agriculture.[99] It reflects its author's interest and expertise in these fields of knowledge, in the broadest sense to be described as applied or applicable sciences.[100]

The 'Tabṣira' is preserved in two manuscripts: one in Oxford, most probably from 8th-/14th-century Yemen, and one in Paris, copied in Muḥarram 1036 (March 1626) and given its script from the Eastern part of the Islamicate realm.[101] In the former copy, more reliable and most probably closer to al-Ašraf ʿUmar's version of the text, the treatise comprises 50 chapters on a broad variety of topics: astronomical, astrological, mathematical, and geographical knowledge as well as calculating, prognostic, and magic practices.[102]

The 'Tabṣira' has hitherto defied a clear assignment to a scholarly genre of pre- and early modern astronomy or astrology, such as the *zīǧes*, astronomical–astrological handbooks with tables, or the *mudḫal* literature, astrological introductory

95 Abū Maʿšar: Kitāb al-Sirr; also Sezgin 1979, p. 148; differently Pingree 1970, p. 38b, no. 34 and also Ullmann 1972, p. 323 identify the 'Kitāb al-Sirr' with the 'Kitāb al-Amṭār wa-l-riyāḥ wa-taġayyur al-ahwiya'; see also n. 65.

96 al-Baqqār (Guesmi/Samsó) 2018, esp. pp. 33–174 (summary and commentary) and pp. 187–277 (Arabic text).

97 For the author and his oeuvre, the material provided on tabsira.hypotheses.org; also Schmidl 2007; Varisco 1994, pp. 12–18; King 1983, pp. 27–29; for his scholarly oeuvre, Schmidl 2024; for his astrolabe and his instrument book, King 2005, study XIVa, pp. 615–657.

98 For other examples of rulers as authors, see Brentjes, Fierro and Seidensticker 2024.

99 Schmidl 2024.

100 Schmidl 2024, pp. 470–472.

101 Oxford, Bodleian Library, Huntington 233; Paris, Bibliothèque nationale de France, Arabe 2601.2; a concordance of the two manuscripts is in preparation by the author and will be pre-published on tabsira.hypotheses.org.

102 For the contents of the 'Tabṣira' in general, Schmidl 2021d; Schmidl 2016, pp. 36–40; for specific chapters, the pre-prints and materials published on tabsira.hypotheses.org.

texts.[103] The first part of the 'Tabṣira', Chapters I–XIII, includes basics commonly included in the latter, albeit with peculiar and conspicuous variations.[104] Other chapters present different information, e.g. geographical data,[105] tables for timekeeping,[106] an almanac,[107] or mathematical basics.[108] Besides these scattered topics, another focus of the 'Tabṣira' is prognostic practices, such as an onomantic scheme, announced in the heading although omitted in the manuscripts;[109] palmomantic tables that allow the interpretation of spontaneous convulsions of the body parts;[110] or a double-argument table with incidents;[111] aeromantic and meteromantic practices that interpret rainbows, shooting stars, and haloes in parts similar to what is found in the *malḥama* literature.[112]

Therefore, Chapter XXXV does not belong to a properly defined textual context but fits to the overall contents of the 'Tabṣira'. Merging weather forecasting and price prediction, both belonging to the astrological tradition strand and showing parallels to what is known so far about these practices in the pre- and early modern Islamicate sources, in a single chapter appears rather unusual. However, al-Ašraf ʿUmar combines them in five statements, the first three attributed to Mūsā ibn al-Ḥasan ibn Nawbaḫt (fl. c. 290/900).[113] They begin with discussing the amount of rainfall depending on the ecliptic position of the Sun, either being in the first degree of Taurus or Scorpio (1° Tau or 1° Sco), and the directional quality of Venus and Mercury, either being easterly or westerly.[114] It then continues with listing price trends linked again to the ecliptic position of the Sun, this time leaving its dejection (19° Lib),[115] and the position of the Moon in the houses, namely, their four quadrants. Finally, it closes by informing of the occurrence or non-occurrence

103 For the *zīǧ*es, Kennedy 1956; King and Samsó 2001; Gaida 2021a; for the *mudḫal* texts, Burnett 2007; Gaida 2021b.

104 Schmidl 2020a.

105 For the *qibla* scheme, Schmidl 2022b; also Schmidl 2007, pp. 666 f., 676; for the geographical table, Schmidl 2020b; also Schmidl 1997, p. 108.

106 Schmidl 2019.

107 Varisco 1994, pp. 41–60 (Arabic text) and pp. 23–40 (English translation).

108 Schmidl 2021d; Schmidl 2021e.

109 Schmidl 2020c, p. 221, note a.

110 In the initial part of Chapter XLI.

111 In the final part of Chapter XL; also Hertogh, Rhijn, Schalekamp, Schmidl 2023; shortly Schmidl 2021c, pp. 222 f.

112 Schmidl 2022a.

113 On the attribution, see n. 135; on Mūsā ibn Nawbaḫt (Nawbajt): al-Kitāb al-Kāmil, pp. 23–27; also Mūsā ibn Nawbaḫt (Nawbajt): Kitāb al-Azmina wa-'d-duhūr, pp. 15–18.

114 Also Dykes 2013, pp. 21 f.

115 If the Sun's leaving of 19° Libra is related to what Dykes 2013, pp. 22–24 calls "Method 5: Sun at 20° Scorpio", one of seven procedures he lists for weather forecasting and for which

of rain related to the Sun's and the Moon's conjunction or opposition and establishes to which planets the Moon applies.[116]

The fourth statement in Chapter XXXV, attributed to Abū l-ʿAnbas Muḥammad ibn Isḥāq al-Ṣaymarī (d. 275/888),[117] discusses price trends requiring the determination of the month and employing different astrological concepts. Sign and interpretation are apparently linked by analogy, e.g. when the lord of the ascendant applies to a planet in the third or the ninth house, both cadent houses falling from the cardines, the food costs will decrease; or if it is in the fourth or the seventh house, two of the cardines and of specific stability, the prices will stand stable without increasing or decreasing.

The fifth and final statement is taken from a "text collection" (*kitāb maǧmūʿ*) that does not limit itself to weather forecasting and price prediction but also includes, e.g. prognostications concerning illnesses. It asks again for the lord of the ascendant—this time, however, at the first degree of Aries—and calls it "the indicator of the year" (*dalīl al-sana*). What is foretold mainly relates to the general characteristics of the planets. In the final part of this statement, it seems that the zodiacal sign of the ascendant is also taken into consideration, because the method is only suitable for those regions to which the zodiacal sign is related. To find this relationship, Chapter XXXV refers to the 'Book of the Introduction to the Craft of Astrology' ('Kitāb al-Mudḫal ilā ṣināʿat aḥkām al-nuǧūm') by al-Qabīṣī (fl. late 4th/10th century).[118] Al-Ašraf ʿUmar—or the unknown author of his source—classifies this method as "easiest to use".

The methods and procedures in Chapter XXXV of the 'Tabṣira' show some similarities to what is provided by Abū Maʿšar in his 'Kitāb al-Sirr' and al-Baqqār in his 'Kitāb al-Amṭār wa-l-asʿār', and also to weather forecasting practices in the astrological introductory literature and in treatises on mundane astrology, but appear in general to be less complex and less comprehensive—an observation that fits with the emphasis on their user-friendliness noted at the end of Chapter XXXV.

Weather forecasting as an independent subject is also dealt with in Chapter XXXVI of the 'Tabṣira', which discusses the times of rain, seeding, and the winds and, as far as one can tell at the moment, rather focuses on the time base

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some sources use instead the entrance of the Sun, its ingress (in Libra) deserves further research.

116 For the application of a planet, see n. 133.

117 See n. 126.

118 al-Qabīṣī (Alcabitius): The Introduction to Astrology (Arabic text and English translation); a list of astrological treatises dealing with this topic in al-Baqqār (Guesmi/Samsò) 2018, p. 60.

function of the celestial bodies.[119] The topic occurs, however, in many other chapters as part of more general prognostications, e.g. in Chapter XXXII, an almanac;[120] Chapter XXXIV, interpreting rainbows, shooting stars, and haloes;[121] or in the incident table in the second part of Chapter XL.[122] Price prediction, however, does not occur that prominently in the 'Tabṣira', in parallel with what is known in general of the role and place of these two prognostic practices in pre- and early modern Islamicate sources.

As opposed to most of the other chapters of the 'Tabṣira', which barely mention their sources but whose contents clearly demonstrate al-Ašraf ʿUmar's familiarity with the general as well as the local scholarly traditions, Chapter XXXV provides three authors' names. The first, Mūsā ibn Nawbaḫt, also occurs in Chapter XLVIII of the 'Tabṣira', which deals with astrological elections.[123] This author wrote several treatises, many of them dealing with astrology, including 'The Book on Times and Ages' ('Kitāb al-Azmina wa-l-duhūr') and 'The Complete Book' ('al-Kitāb al-Kāmil'), both of which deal with historical astrology: the former taking rather a theoretical point of view, the latter a more practical one. Being organised in two parts, it first presents a series of horoscopes and second lists quarterly prognostication calculated for the equinoxes and the solstices.[124] However, neither of these treatises includes what al-Ašraf ʿUmar presents at the beginning of Chapter XXXV. Rather, these paragraphs attributed to Ibn Nawbaḫt closely resemble "this chapter of the rains of the year (taken) from Māšāʾallāh" (*hāḏihī bāb al-amṭār fī l-sana min qawl Māšāʾallāh*).[125] The final statement of Chapter XXXV is also attributed to Ibn Nawbaḫt and relates Yemen with Scorpio, the only time al-Ašraf ʿUmar's authorship shines through.

Similar to Mūsā ibn Nawbaḫt, the second author mentioned in Chapter XXXV, al-Ṣaymarī, also appears in Chapter XLVIII of the 'Tabṣira'. Mainly known for his humorous pieces, this author also wrote several treatises on astronomy and astrology, which are, however, only partially preserved.[126] One of them, 'The Book of the Foundation of Foundations on the Characteristics of the Stars' ('Kitāb Aṣl

119 For the wording of the headline of Chapter XXXVI, Schmidl 2021d, pp. 229 f.; a publication is in preparation in cooperation with Razieh S. Mousavi, Berlin.

120 See n. 107.

121 Schmidl 2022a.

122 See n. 111.

123 For the wording of the headline of Chapter XLVIII Schmidl 2021d, pp. 231 f., a major part is taken from Kūšyār ibn Labbān (Yano) 1997, iv.2, pp. 240–259.

124 Mūsā ibn Nawbaḫt (Nawbajt): al-Kitāb al-Kāmil; Mūsā ibn Nawbaḫt (Nawbajt): Kitāb al-Azmina wa-ʾd-duhūr.

125 Della Levi Vida 1934, p. 271; see also n. 135.

126 Pingree 1983; Pellat 2004; also Sezgin 1979, pp. 152 f.

al-uṣūl fi ḫawāṣṣ al-nuǧūm') does not mention any information related to astrological weather forecasting and price prediction, according to the descriptions in the relevant literature.[127] The third author, al-Qabīṣī, on whose 'Mudḫal' Chapter IV of the 'Tabṣira' mainly relies,[128] is an outlier because he is not included due to his contribution to astrological weather forecasting and price predictions, as Ibn Nawbaḫt and al-Ṣaymarī are, but as a reference for a basic astrological relation, namely, of zodiacal signs and regions. Furthermore, Chapter XXXV refers to a "text collection", so far not identified, as its source.

3 Entanglements

Chapter XXXV of al-Ašraf 'Umar's 'Tabṣira' illustrates several entanglements, most obviously the merging of astrological weather forecasting and price prediction in a single chapter. The methods and techniques introduced for both prognostic practices are based on similar astrological manifestations. So, although it appears natural to combine them in one chapter, as in the 'Tabṣira', they are dealt with separately in the Islamicate sources investigated so far.

Less conspicuous are the entanglements that are reflected in the different tradition strands used for weather forecasting and price prediction, both interpreting not only supra- but also sublunar signs to meet their objectives and, therefore, belonging to two different disciplines: astral sciences and mantic arts. This combination entails a wide range of methods, from the simplest techniques, e.g. observing an animal's behaviour, to the most elaborate, e.g. casting a horoscope; the skills required similarly range from a basic to an expert level. Seen from a more general angle, Chapter XXXV illuminates the concept 'as in the heavens, so on earth' and emphasises the importance of analogical reasoning that is so common in many prognostic practices.

The contents and the context of the 'Tabṣira' reveal two further entanglements. It combines topics in one treatise that modern research rather considers to be independent and exemplifies a ruler as author who writes in a scholarly manner on prognostic practices, emphasising his interest in this topic, be it personally or politically motivated.

Finally, translations of treatises on weather forecasting and price prediction into other languages, e.g. into Latin and Hebrew, discloses an intercultural

127 Ahlwardt 1893, no. 5711, p. 181 and no. 5898, pp. 297 f.; Ullmann 1972, pp. 325 f.

128 Schmidl 2022c.

entanglement and highlights the wide interest both prognostic practices attracted. They apparently stroke a chord.[129]

4 Appendix: Chapter XXXV of al-Ašraf ʿUmar's 'Tabṣira'

The following item presents Arabic text and facing English translation of Chapter XXXV in al-Ašraf ʿUmar's 'Kitāb al-Tabṣira fī ʿilm alnuǧūm' (fol. 114b,1–115a,16 in manuscript Oxford, Bodleian Library, Huntington 233, hence: H; omitted in manuscript Paris, Bibliothèque nationale, Arabe 2601.2).

In the Arabic text, *hamza*, *madda*, *šadda* and diacritical points have been silently added. The punctuation marks follow the manuscript by presenting paragraph marks either by dots (in the case of blank spaces), by[ى] ـهـ [انتـ] (in case of a ـه), or by three dots arranged as a triangle (∴) when this is found in the manuscript. Orthographical irregularities in numerals are not corrected. Omitted text whose reading can be deduced appears in square brackets [ ]. Folios of H are provided in angular brackets < >; paragraphs numbered in square brackets [ ].

In the English translation, parentheses ( ) have been inserted to assist the flow of the text; angle brackets < > for translations of corrected or omitted text whose reading can be deduced. Emphases in the Arabic text follow the manuscript and are rendered by bold script in the English translation.

129 For their input and their sharing of materials, the author would very much like to thank all colleagues, especially Bram van den Berg, Charles Burnett, David Juste, David A. King, Levente László, Berenike Metzler, Taro Mimura, Luís Ribeiro, Razieh S. Mousavi, Julio Samsó, Laura Tribuzio, and Kirsten Waltert. She is also grateful for the helpful input of the unknown reviewer and of the workshop participants in Bern in November 2023.

Arabic Text and English Translation

[1]<H, 114b> **البـاب الخامس والثلاثون في معرفة دلائل عزّ الأمطار وقلّتها :. ودلائل الغلاء والرخص والله أعلم .**

[2] قال ابن نوبخت إذا أردت عزز الماء والمطر فانظر عند تزول الشمس أوّل درجة من برج الثور فإن كانت الزهرة وعطارد شرقيين دلّ على توقّف الأمطار وإن كانا غربيين دلّ على كثرة الأمطار . [3] وانظر أيضاً إذا تزلت الشمس أوّل درجة من برج العقرب إلى الزهرة وعطارد فإن كانا شرقيين دلّ على توقّف المطر وإن كانا غربيين دلّ على كثرة الأمطار .

[4] **ومن قوله في الشعر** إذا تزلت الشمس أوّل دقيقة من الدرجة العشرين من الميزان وهو انفصالها من درجة الهبوط فاعرف أين موضع القمر في ذلك الوقت فإن كان فيما بين الطالع والرابع فإنّه يدلّ على الغلاء الشديد . وإن كان بين الرابع والسابع فإنّه يدلّ على اضطراب الشعر والغلاء والرخص إلّا أنّه إلى الغلاء أقرب . وإن كان بين السابع والعاشر فإنّه يدلّ على الاضطراب إلّا أنّه إلى الرخص أقرب . وإن كان بين العاشر والطالع فإنّه يدلّ على رخص الأشعار .

<H, 114b> [1] **The thirty-fifth chapter on the knowledge of the indications of the abundance or scarcity of rain. And on the indications of high and low (prices)—and God knows best.**
[2] Ibn Nawbaḫt said, if you want (to know if) water and rain will be abundant, look at the Sun leaving the first degree of Taurus. If Venus and Mercury are (at this time) easterly, it indicates an interruption of rain. If they are westerly, it indicates abundance of rain. [3] Look also at Venus and Mercury when the Sun leaves the first degree of the sign of Scorpio. If they are easterly, it indicates an interruption of rain. If they are westerly, it indicates abundance of rain.[130]

[4] **From (Ibn Nawbaḫt's) statement on the prices.** If the Sun leaves the first minute of the twentieth degree of Libra, this is (the Sun's) separation from the degree of the dejection,[131] determine the position of the Moon at this time. If (the Moon) is between the ascendant and the fourth (house), it indicates extra high (prices). If (the Moon) is between the fourth and the seventh (house), it indicates disorder of the prices, high and low (prices), except that high (prices) are more likely. If (the Moon) is between the seventh and the tenth (house), it indicates disorder (of the prices), except that low (prices) are more likely. If (the Moon) is between the tenth (house) and the ascendant, it indicates low (prices).[132]

130 Cf. al-Kindī (Bos/Burnett) 2000, Letter II, p. 253: "The planets which indicate rainfall are, as we said above, Venus, Mercury and the Moon, for Venus is the essence of rain, the Moon is the essence of water, and Mercury is the essence of the Wind and the air". Cf. also al-Baqqār (Guesmi/Samsó) 2018, p. 104: "Los mejores indicatores de lluvias son Venus, Mercurio y la Luna".

131 The Sun's dejection, or fall (*al-hubūṭ*), takes place in 19° Libra (Schmidl 2021b, p. 539).

132 See n. 130.

[5] **ومن قوله في المطر** قال انظر إذا اجتمع الشمس والقمر في درجة وحدة أو ساعة الاستقبال ما الطالع وأين الكواكب وبمن يتّصل القمر منها . فإن اتّصل بالزهرة أو (؟) بعطارد كان في ذلك الشهر مطر . [6] واعلم أنّ القمر إذا بلغ أحد أوتاد الطالع فاتّصل بالزهرة أو بعطارد دلّ على المطر إلّا إن كان القمر عند الاجتماع يتّصل بالمرّيخ فإنّه يكون رعد وبرق من غير مطر [7] وإن وجدت القمر يتّصل بالسعود حين يفارق الشمس في النصف الأوّل من الشهر أمطار كثيرة وذلك طالع الاستقبال [8] إذا حلّ القمر أحد أوتاده واتّصل بالزهرة أو بعطارد دلّ على المطر [انتـ] ـهـ [ـى] .

[9] **ومن قول الصيمري في الأشعار** قال انظر في أوّل كلّ شهر إذا اجتمع الشمس والقمر في دقيقة واحدة إلى برج الطالع في ذلك الوقت فإن كان صاحب الطالع زائد في السير فأنّه يزيد ثمن الطعام في ذلك الشهر وإن كان في وسط السماء ارتفع ثمن الطعام وكذلك إن كان سائراً إلى شرقه دلّ على الغلاء وإن كان يتّصل بكوكب في وسط السماء ارتفع الشعر أيضاً وإن كان صاحب الطالع ناقصاً في السير وهو سائر إلى هبوطه اتّضع الشعر ورخص [10] وإن اتّصل صاحب الطالع بكوكب في <H,115a> الثالث أو التاسع اتّضع ثمن الطعام ورخص . وإن كان صاحب الطالع في وتد الأرض أو في السابع قام الشعر من غير زيادة ولا نقصان .

[5] **From (Ibn Nawbaḫt's) statement on the rains.** He says, when the Sun and the Moon conjunct in one degree or (are at) the moment of the opposition (*sāʿat al-istiqbāl*), look, what is the ascendent, where the planets are, and to whom (?) of them the Moon applies.[133] If (the Moon) applies to Venus or to Mercury, there will be rain in this month.[134] [6] Know that when the Moon arrives at one of the cardines, is rising, and applies to Venus or to Mercury, it indicates rain except if the Moon is in conjunction (with the Sun [?] and) applies to Mars, (then) there will be thunder and lightening without rain. [7] If you find the Moon applying to the benefic (planets) while the Sun departs (from them [?]) in the first half of the month, (there will be) abundant rain. That is (applicable for [?]) the ascendant at (?) the (conjunction and [?] the) opposition. [8] If the Moon halts in one of its cardines and applies to Venus or to Mercury, it indicates rain—e(nd).[135]

[9] **From al-Ṣaymarī's statement on the prices.** He says, look at the beginning of each month, when the Sun and the Moon conjunct in one minute,[136] at the zodiacal sign of the ascendant at that time. If the lord of the ascendant is increasing in motion,[137] (then) food costs will increase in this month. If it is in midheaven, (then) food costs will rise. Likewise, if it is moving eastwards, it indicates high (prices). If it is applying to a planet in the midheaven, the prices will also rise. If the lord of the ascendant is decreasing in motion,[138] i.e., it is moving toward its dejection,[139] the prices will sink down and become low. [10] If the lord of the ascendant applies to a planet in <H, 115a> the third or the ninth (house), the food costs will sink and become low. If the lord of the ascendant is in the cardine of the earth (i.e., lower midheaven) or in the seventh (house), the prices will stand without increase or decrease.

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133 For the term *ittiṣāl* ("application"), cf. e.g. the explanation in al-Bīrūnī: Kitāb al-Tafhīm, §489 (495) and al-Bīrūnī: The Book of Instruction, § 489, p. 303: "The terms application and separation (*ittiṣāl* and *inṣirāf*) refer to the formation of aspects between the planets and withdrawal from such positions. These are dependent on the signs […]", where "and withdrawal from such positions", which was omitted in the Arabic text, was restored by Wright.

134 Cf. al-Kindī (Bos/Burnett) 2000, Letter II, p. 258: "When its [sc. the Moon's] application is with Venus and Mercury, it indicates rainfall during those weeks".

135 These three paragraphs show close resemblance to a chapter beginning with "This chapter of the rains of the year (taken) from Māšāʾallāh" in Della Levi Vida 1934, p. 271 (Arabic text), 277 f. (Italian translation); for an English translation based on the Latin version, see Dykes 2008, p. 312, updated in Dykes 2013, pp. 144 f.

136 The phrase "at the beginning of each month" is referring here to a lunar month, because the conjunction of Sun and Moon always takes place at New Moon.

137 For the concept of 'increasing in motion', also discussed in Chapter XIII of the 'Tabṣira', see al-Qabīṣī (Alcabitius): The Introduction to Astrology, pp. 90 f.: "when […] it is descending [sc. the planet] in the orb of the apogee and increasing in light, magnitude and motion".

138 See n. 137.

139 For "toward its dejection", see n. 131.

[11] **وجه آخر في دلائل الشعر والمطر** متقوّل من كتاب مجموع قال انظر إذا تزلت الشمس أوّل دقيقة من برج الحمل إلى طالع ذلك الوقت واعرف صاحبه ويسمّه دليل السنة فإن كان الدليل الزهرة أو المشتري فأنّه يكون في تلك السنة خصب كثير وكثرة أمطار ورخص وسعة في قلوب الناس واعتدال الهوّاء والمهيجة [؟] وإن كان الدليل زحل دلّ على أمطار مفسدة غير مصلحة يغرق بها الناس وبرد شديد ويبس في الهوّاء وغلاء في الشعر وضيق في قلوب الناس وقلّة ريح في المتابعة[140] وإن كان الدليل المرّيخ دلّ على قلّة الأمطار ويبس الهوّاء وكثرة الصواعق والزلازل وغلاء الشعر والأمراض الحادة كالطاعون والحمّيات والبرسام وذلك في المواضع التي من قسمة البرج الذي هو دليل السنة ∴ [12] هذه الدلائل أقرب مأخذاً ليس منها إلّا ما هو موضوع في التقويم غير محتاج إلى عمل كطالع السنة والأوتاد وطوالع الاجتماعات والاستقبالات وخروج الشمس عن درجة الهبوط . وإن عيّن فيه درجة حلولها درجة الهبوط فإن ساعة خروجها مثل صي عند الحاجة إلى ذلك [انتـ] ـهـ [ـى] .

[13] **قال** ابن نوبخت اليمن خاتلك الساعة من اليوم الثاني بعد أربع وعشرين ساعة من حلولها الهبوط وزيادة مسير الكواكب ونقصانه . وأمّا قسمة البلدان للبروج فمذكور في المدخل القبيصية للعقرب وذكر أن طالع المهتجم [؟] الثور والله أعلم بالصواب .

140 H writes rather مبايعة ا (?).

[11] **Another method on the indications of prices and rain** purported from a text collection (*kitāb maǧmūʿ*). It said, look at the ascendant of this time, when the Sun leaves the first minute of the zodiacal sign of Aries, and you will recognise its lord. It is called the indicator of the year. If the indicator is Venus or Jupiter, there will be in that year abundant fertility, abundance of rain, low (prices), ease in the hearts of the people, moderate air, and (the sky becomes) cloudy (*al-muhīǧa* [?]) (?).[141] If the indicator (of the year) is Saturn, it indicates destructive, not constructive rain that people are drowned in, heavy hail, dryness in the air, high prices, unease in the hearts of the people, and subsequent (?) lack of wind (?). If the indicator is Mars, it indicates lack of rain, dryness of the air, abundance of thunderbolts, earthquakes, high prices, and major illnesses such as the plague, fevers, and pleurisy. That is (applicable [?]) at the places that are among the part of the zodiacal sign that is the indicator of the year. [12] These indicators are easiest to use, they do not ask what is put down in the ephemeris, they do not (?) require an operation such as (determining) the ascendant of the year, the cardines, the ascendants of the conjunctions, and the oppositions (of the Sun and the Moon). (Concerning) the departure of the Sun at the degree of dejection.[142] If the degree of (the Sun's) halt assigns to the degree of the dejection, (then) the moment of (the Sun's) departure is similar to that moment at the second day after twenty-four hours of the (Sun's) halt (namely in [?]) the (degree of its) dejection, (although) the movement of the planets are in increase and in decrease.[143] Concerning the divisions of the regions according to the zodiacal signs, so it is mentioned in al-Qabīṣī's 'Mudḫal' among the topic—e(nd).[144] [13] Ibn Nawbaḫt said, the Yemen is attributed to Scorpio. He mentioned that the ascendant of the attacker (?) is Taurus—and God knows best and rightly.

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141 For the translation of the term *al-muhīǧa* [?] ("and [the sky becomes] cloudy"), Lane 1863–1893, vol. 8, p. 2910c: "The sky became cloudy and windy, and we were rained upon", and p. 2911a: "A day of wind: or, of clouds, or of mist, and rain".

142 For "degree of dejection", see n. 131.

143 These three sentences have their issues; other interpretations are also feasible, e.g. that "the departure of the Sun from the degree of dejection" belongs to the series of items listed in the previous sentence.

144 al-Qabīṣī (Alcabitius): The Introduction to Astrology, pp. 34–37.

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