

LAPIS LAZULI BETWEEN LEONTIUS MECHANICUS AND AL-BĪRŪNĪ

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Abstract:

While the vividly blue semiprecious stone from Badaḥšān (in modern Afghanistan) had ever since the Neolithic been a much sought-after commodity throughout the Near and Middle East, it has only since c. 600 CE been known under its present name. In this study, the history of the lexeme at the root of modern ‘lazuli’ will be traced from its earliest Greek attestations through Arabic and Persian to c. 1050 CE.

Keywords: Abū Hiffān, Andreas Caesariensis, *Cyranides*, Dioscurides, al-Ḥalīl b. Aḥmad, Īšō̄ bar ʿAlī, al-Layḷ b. al-Muzaffar, *lāzaward*, MS Aya Sofya 3704, MS Leiden Col. or. 289, MS Paris Arabe 2849, Vrtʿanēs Kʿertʿoḷ.

Ever since the Neolithic, lapis lazuli, the strikingly blue opaque semi-precious stone, has been mined in, and traded far and wide from, the mountains of Badaḥšān in present-day Afghanistan.¹ Archaeological evidence—of objects preserved—possibly predates the earliest written attestations by a good two thousand years,² but that differential pales when compared to the millennia separating ancient written testimony from the first textual witness of the—native?—name the stone has been

¹ See, e. g., Lo Giudice *et al.* 2017; Delmas and Casanova 1990 [chemical analysis of archaeological samples from Shahr-i Sokhta appears to suggest lapis lazuli quarries in the Pamirs and the Chaghai hills in Pakistan in addition to those in Badaḥšān]; Herrmann 1968, esp. 22–29.

² The few—and very eclectic!—references given here, first to the archaeological, then to the written evidence will, it is hoped, lend sufficient support to the above chronological sketch: Massa & Palmisano 2018, esp. 76f; Zöldföldi 2011; *eadem et al.* 2012; Casanova 2001, esp. 150–153; Rothman & Peasnell 1999, esp. 106, 110f; Winter 1999; Tosi & Vidale 1990; Lechevallier, Meadow, Quivron 1982, esp. 99f, 102f, 105; Herrmann 1968, esp. 29–37; de la Vaissière & Ward 2005, esp. 18–21. For written testimony which may not refer to the rock itself, but to other natural or man-made materials of comparable color, see the *electronic Pennsylvania Sumerian Dictionary*, s. v. *zagin* (earliest attestations as of 2900 BCE); DCCLT, s. v. *uqnû*; Thavapalan 2020, 310–325 (and 508b [index], s. v. Lapis lazuli); Puhvel 1997, 308–311, s. v. *ku(wa)nna(n)-*; Watson 2018, esp. 318, 2.4c; Harrell, Hoffmeier, Williams 2017, esp. 18ff; Basello 2012, esp. 31–36, 38–41, XVIII–XX (figs. 33–35).

known by for the last 1500 years. Here, focus will be on the early history of the lexeme behind *lazuli* in Arabic—with side glances at testimony from other languages of Western Asia and Europe.³

To the best of my knowledge, Leontius Mechanicus is the earliest approximately datable source of ‘lazuli’ in any language;⁴ by introducing it as ‘the so-called’ (τῷ καλουμένῳ λαζουρίῳ), Leontius at the same time suggests its relative novelty.⁵ The context, directions for the manufacture of a celestial globe, also clarifies the meaning of the term; reference is to the deep blue pigment, not to the rock from which the pigment was prepared. The same usage will be seen in the witnesses here presently to be called in. As regards the dating of Leontius, Fabio Guidetti in his recent edition and study, which is here relied upon, situated him in Alexandria at a time when its scholarly and ‘academic’ life still flourished, thus advancing the conventional dating into the seventh century by some decades to the middle of the preceding, sixth century. Even if, for whatever reasons, Guidetti’s argument were not accepted, the next witness to λαζούριον in chronological sequence, Andreas of Caesarea, still firmly anchors its introduction into the Greek world in the late antique, pre-Islamic period.⁶ Andreas also appears to confirm, if only second hand, on the basis of hearsay, the identification of classical σάπφειρος as lapis lazuli with his comment ‘from which they say lazuli originates’ (ἐξ οὗ φασι καὶ τὸ λαζούριον γίνεσθαι), obviously, like Leontius, referring to the ‘ultramarine’ pigment prepared from it. Now the date of Andreas’s writing is not quite certain either, but Eugenia Constantinou persuasively argues for 611, during the interval between Caesarea’s

³ The fluid classical Greek nomenclature of lapis lazuli, oscillating between κυανός (vel sim.) and σάπφειρος, will not as such be discussed here. For a chronologically broader presentation of the Arabic evidence see Ullmann 1973[–1983], 35–38, s. vv. *lāzaward*, *lāzawardī*, *lāzawardiyya*.

⁴ Barring confirmation by new, indisputable testimony, λαζουρό- in the transmission of—purportedly—John Chrysostom’s (344/7–407) commentary on Psalm 103 will not be taken into account here; regardless of how it might possibly be emended, the passage concerned emphasizes an auditory, not a visual sensation, notwithstanding the verb employed (ιδεῖν). ‘Some people’, he claims, took verse 12b, ἐκ μέσου τῶν πετρῶν δώσουσι φωνήν ([By them shall the birds of the sky lodge:] they shall utter a voice out of the midst of the rocks) to refer to water, not to birds: Τινές μὲν τὰ ὕδατά φασι· καὶ γὰρ πάνυ τερπνὸν καὶ λαζουρὸν τὰς χειμάρρους ἰδεῖν καὶ ἡρέμα ὕδωρ ψοφοῦν καὶ ταῖς ψηφίσις ἐγκροῦον· (...for it is quite pleasant and ἴλαζουρὸν to see the brooks and [note] water softly murmuring and pushing pebbles around); see Malingrey 1987, esp. 355:39f (cf. Eusebius of Caesarea, [*Commentary on Psalms*], esp. *Praefatio*, p. XII f).

⁵ Leontius, ed. Guidetti, esp. 114f (text and trl.), 214–217 (comm.), 68–72 (introd.); cf. ed. Maass, esp. 565:10ff. On the trade and import of this exotic commodity see Lazzarini 2003, esp. 173ff.

⁶ Andreas Caesariensis, *In ... Apocalypsin*, I 244, pt. 23, ch. 67, ad 21,19c; see Constantinou 2008, esp. II 223.

first capture by the Persians in 609/610 and its conflagration in 612.⁷ Unfortunately, other than Leontius and Andreas, there is a dearth of even plausibly datable attestations of ‘lazuli’ in pre-seventh century writings. In some manuscripts of the notoriously ‘open’, thus difficult to date *Cyranides*, the term χρυσοσάπφειρος is understood to be more precise than simple σάπφειρος, ‘gold’ taken to indicate the characteristic pyritic veins in it (Σάπφειρος λίθος, ἢ κυάνεος· [...] ἔχων καὶ φλεβία χρυσᾶ· διὰ τοῦτο καὶ χρυσοσάπφειρος παρά τισιν ὀνομάζεται· ἀφ’ οὗ ποιοῦσιν οἱ ζωγράφοι τὸ λαζοῦριν τὸ ἄριστον, ὃ καλοῦσιν φυσικόν).⁸ The anonymous writer’s attribution of this coinage to ‘some’, as he seems to suggest, contemporaries of his would put him into chronological proximity to the only other ancient author to use χρυσοσάπφειρος, Alexander of Tralleis (*floruit* c. 565),⁹ thus offering a welcome addition to the late antique corpus. On the other hand, neither does the vulgarism λαζοῦριν permit of precise dating, nor the adjective ὑπολαζοῦριον (*sc.* στρουθίον, *vel sim.*),¹⁰ in which the ‘naturalization’ of λαζοῦρ- as a color term suggests a ‘late’ date—but the question remains of the point of reference of ‘late’.

Further, the wording of *Cyranides* already implies semantic generalization of λαζοῦριν (*vel sim.*) to include pigments prepared from other materials than lapis lazuli. Such blanket usage, apart from actual color resemblance, may have facilitated the confusion between lapis lazuli and azurite (from λίθος Ἀρμένιος, ‘Armenian stone’) as it later frequently occurred among Arabic authors (see below). Well before the first written testimony to ‘lazuli’, Armenian azurite had been in medicinal and artistic use;¹¹ by the time of the physician and medical author Aetius of Amida (no later than mid-sixth century),¹² painters’ demand for it is reflected in his standing phrase Ἀρμένιον, ᾧ οἱ ζωγράφοι χρῶνται (or even more succinctly, Ἀρμένιον τὸ τῶν ζωγράφων—*vel sim.*).¹³ In Armenia itself, however, the earliest record of a noteworthy blue pigment only dates to the mid to late 7th century (if it does indeed), and the substance in question is ‘lazuli’ (*lazowrd*: λωδμηρη); apparently by the time of writing it figured as a matter of course on a painter’s palette. The witness, Pseudo-

⁷ Constantinou 2011, 16, summarizing the detailed exposition in *eadem* 2008, I 4–10.

⁸ *Cyranides* I 18, ed. Kaimakis, 85:8–11; cf. Panayiotou 1990, esp. 321f, *s. v.* λαζοῦριν (ignore his remarks on the derivation of the Greek word from Arabic; see below!). In the Arabic translation the apparently incomprehensible σάπφειρος is simply transcribed (*s’frs*), while its alternative name (ἢ κυάνεος) is rendered as an adjectival phrase: *samāwī šāfī l-lawn* (‘cerulean’ as an Arabic approximation of κυαν- will be encountered again). In *Cyranides* I 5, ‘golden veins’ identify κυανός as lapis lazuli (Εὐανθος λίθος [...] ἢ ὡς κυανός ἔχων χρυσᾶς ἵνας).

⁹ See Nutton 1996.

¹⁰ *Cyranides* III 2, ed. Kaimakis 192:2; variants in app. *ad locum*: ὑπολάζουρίζον, ὑπολάζουρον.

¹¹ See, e. g., Dioscurides V 90; Galen, *SM*, Kühn XII 211:6; Rogić *et al.* 2011:269–289.

¹² See Jones & Martindale 1980: 20, *s. l.* Aetius (of Amida) 5.

¹³ Aëtius I, Pr:107, II, P:52, 47:1, 13, 20, III, P:35, 32:1, VII, 40:26, 80:26, 114:82, VIII, 1:10 (and elsewhere, without reference to painters).

Vrt'anēs K'ert'oi,¹⁴ deserves all the more credit since in his argument against 'iconomachs', he illustrates his point with reference to a variety of painting materials, without highlighting lapis lazuli: 'milk, eggs, arsenic, lapis lazuli, verdigris, cinnabar and similar substances'.¹⁵

Above the bold guess was submitted that the first Greek witnesses of 'lazuli' were altogether the very earliest attestations of the word. Given the obvious derivation of the Greek forms from an Iranian lexeme at the origin of the Neopersian *lāžvard* (vel sim.), the question of its origin and diffusion cannot be avoided.¹⁶ The mines of Badaḥšān are located in or at least close to, what in late antiquity and early Islam was the linguistic domain of East Middle Iranian Sogdian.¹⁷ Thus at first sight, it would stand to reason to search for a Sogdian cognate of *lāžvard*. The evidence, however, is, at the most positive reading, inconclusive. In Sogdian, the phonetically ambiguous Sanskrit name of the elephant king in the *Vessantara Jātaka*, Rājyavardhana, appears 're-etymologized', to quote Pavel B. Lur'e, as *r'čβrt*, *r'zβwrt*, plausibly on the basis of the word for lapis lazuli, as Emile Benveniste suggested.¹⁸ Nicholas Sims-Williams views the plurality of Sogdian forms as indicating a non-Sogdian loan, most likely from a dialect in Badaḥšān. The apparently sudden appearance in Greek of the East Iranian name of lapis lazuli across thousands of miles in the sixth and seventh centuries may best be related to the sufficiently well-documented farflung Sogdian trade of the period. It took oral communication to pass on the name of the merchandise sold, and since in Middle Persian lapis lazuli was still designated by the Old Persian term, Sogdian traders are prime candidates for having been involved. While they themselves may not have crossed the borders of the Roman Empire, they or some fellow traders did not only sell lapis lazuli to Armenians but communicated its 'native' name to them as well. However, an examination of the precise relation between the Armenian *lažowrd* and the Greek λαζουρ- cannot here be undertaken.

In view of the lacunary transmission of Middle Iranian and limitrophe languages, it may not be cause of concern¹⁹ that after the earliest attestation of 'lazuli' in Greek more than two centuries elapsed before *lāzaward* appeared in Arabic. While it is in the nature of things that its first occurrence cannot be dated to a precise year, it is

¹⁴ Traditionally the epistle against iconoclasts was attributed to Vrt'anēs (fl. 604–07) but has repeatedly been athetized and dated considerably later; see Jurczyk 2018, esp. 100ff., 135, 138, 152.

¹⁵ The translation is adapted from Jurczyk 2018 and Samuel 1912, esp. 292; Daniel Kölligan's armenologist forthcomingness is gratefully acknowledged.

¹⁶ See Bailey 1955, esp. 21ff.

¹⁷ For a convenient summary see Plahter 2010, esp. 68f, 72.

¹⁸ *Vessantara Jātaka*, ed. Benveniste, 91, annotation to line 68; Bailey 1955, esp. 21ff; Mayrhofer 1986–2001, III 427, s. v. *rājāvarta*; Lurje [Lur'e] 2010, 328, s. v. *r'z-bwrt*; *idem* 2020, paras. 20, 111.

¹⁹ As Nicholas Sims-Williams assures me (personal communication, May 2022).

possible to delimit quite narrowly the space of time of its import into the material as well as literary culture of Islam. In the foundational Arabic dictionary, *Kitāb al-ʿAyn*, which was devised and begun by al-Ḥalīl b. Aḥmad (d. 175/791 at the latest) and completed by his student al-Layṭ b. al-Muẓaffar (d. c. 185/800), the lemma *ʿawhaq* does not yet, in contrast to corresponding entries in later works, feature the Iranian loan *lāzaward*; instead, the proffered definition reads *lawnun ka-lawni s-samāʾi muṣrabun sawādā* (a color like the color of the sky, saturated in darkness).²⁰ Of subsequent lexicographers, who all drew on *K. al-ʿAyn*, the earliest, if al-Azharī’s (282–370/895–980) quotation be trusted, was Abū ʿUbayda Maʿmar b. al-Muṭannā (c. 110/728 – c. 210[207–213]/825);²¹ his entry: *al-ʿawhaq al-lāzawardu l-laḍī yuṣbaḡu bih* (...lapis lazuli which is used as a dye) at the same time casts light on the material culture of the period: lapis lazuli served, ground up, as pigment, not as hard stone for jewelers or lapidaries.²² A similar, at that roughly contemporaneous, witness to the use of ‘lapis lazuli’ in interior decoration is to be found in *Aḥbār Abī Nuwās* by Abū Hiffān (d. 258/872);²³ in the relevant passage, “the deposed one” (i. e. the caliph al-Amīn, d. 198/813) wants to show off to his boon companions and poets his sumptuous new palace with decorations in white, gold and lapis lazuli.²⁴ A

²⁰ *Kitāb al-ʿAyn*, eds. al-Maḥzūmī & as-Sāmarrāʾī, I 97; the problematics of—culturally predicated—color perception and nomenclature will not be discussed here. – Barring new, incontrovertible evidence to the contrary, the occurrence of *lāzaward* in the quotation, under al-Ḥalīl’s name, in *Maqāyīs al-luḡa* by Ibn Fāris (d. 395/1004) will not be accepted as genuine, but as an inadvertently ‘modernizing’ rephrasing (*al-ʿawhaq ... wa-huwa ayḍan lawnu l-lāzaward*; ed. Hārūn, IV 171) or a secondary gloss erroneously inserted into the text itself. Other than Ibn Fāris, al-Azharī more correctly credits his corresponding quotation from *al-ʿAyn*, notably without reference to *lāzaward*, to al-Layṭ (see note 22). – A further chronological outlier among attestations of *lāzaward* will not be accepted as evidence either: a ‘cloak of lazuli[-colored] silk’ (*ḥirqat ḥarīr lāzaward*) is featured in a patently anachronistic report by a presumed *mawlā* of ʿUṭmān’s (killed 35/655) and *via* a similarly inadmissible *isnād* related by Ibn Abī d-Dunyā (208–281/823–894), for whose own time the witness is dispensable; see Ibn Abī d-Dunyā, *Muḥāsabat an-naḥs*, 129.

²¹ See Weipert 2007.

²² al-Azharī, *Tahqīb*, I 91; *ibid.*, p. 92, on authority of Taʿlab (200–91/815–6 – 904), Ibn al-Aʿrābī (150–231/767–846) is quoted to the same effect (see Weipert 2016). For the present argument, the numerous later witnesses do not carry sufficient weight; cf. Ibn Durayd (223–321/837–933), *Ġamhara* II 1174: *wa-l-ʿawhaqu ayḍan ṣibḡun yuḡālu innahu l-lāzaward*.

²³ *Apud* Ibn al-Muʿtazz, *Ṭabaqāt aš-ṣuʿarāʾ*, 209; cf. Bencheikh 1980.

²⁴ As a color term ‘lazuli’ gained currency in descriptions of architectural decoration during the third/ninth century, as witness, e. g., at-Ṭabarī (224–5–310/839–910), *Annales* III 2, 1332:3, s. a. 229/843–4 (on the authority of ʿAzzūn b. ʿAbd al-ʿAzīz al-Anṣārī as eyewitness; reference is to teakwood painted ‘lazuli’ and gold in a recently erected domed hall in al-Wāṭiq’s palace complex at Sāmarrā). In 246–247/860–862, al-Mutawakkil’s rebuilding of the nilometer on ar-Rawḍa involved painting the background of the relief inscriptions in the shaft ‘lazuli’ (Ibn Ḥallikān, *Wafayāt*, III 112–115, esp. 113:9f, no. 355: Ibn ar-Raddād, Abū r-Raddād ʿAbdallāh b. ʿAbd as-Salām). Al-Azraqī (d. 251/865[?])

reference to a lapis lazuli jewel (*al-ḥanẓa al-lāzawardīyya*) from no later than 219/834 would seem to indicate that *lāzaward* was not exclusively known as a pigment, but also as a solid gemstone, whatever the mineralogical identity of the intended material.²⁵

Admittedly al-Ḥalīl's, or al-Layṭ's, lack of positive testimony about *lāzaward* does appear unfit to base an argument on, even though they were by no means averse to including loanwords as lemmata or to introducing Persian terms as glosses when they saw fit. For supportive evidence just a very few examples may be adduced here, such as the entries *anbiġ*, the fruit of an Indian tree, and *anbiġāt*, honey-preserves of lemon, myrobalans and 'similar' fruits; *ḥawḥa*, a *Ḥiġāzī* term for a specific kind of opening in walls, which "the Persians call *banġaraqāt*,"²⁶ *kāġa/id*, the unique—*ḥurāsānī*—combination of *ġayn* and *kāf* in a trilateral root.²⁷

As just alluded to, arguments *e silentio* are notoriously weak, but al-Ḥalīl's or rather al-Layṭ's silence is, as it were, made even more audible, or more difficult to ignore, by the testimony of roughly contemporaneous translations from Greek, in case the above-quoted witnesses (Abū 'Ubayda and Abū Ḥiffān), and others like them, were rejected because of their 'late' attestation. Just like in poetry and in prose other than translated or derived from translations, the appearance of *lāzaward*[ī] also marks a cesura in translations from Greek.

Its textual loci were the responses to two of the challenges to Syriac and Arabic translators, the opaque terms *κούρευος* (vel sim.)²⁸ and 'Armenian stone' (azurite:

mentions 'the color of lazuli' along with other hues of 'marble' (*ruḥām*) in his description of the paneling of the arched gateways of the Meccan *ḥaram* (*apud* al-Fākihī, *Aḥbār Makka* [composed 272–275/885–889], II 191:1). Considering the material as well as aesthetic value of *lāzaward* (not to mention its metrically convenient syllabic structure), it cannot come as a surprise to encounter it in verse from the middle of the 3rd/9th century on; see, e. g., Ibn ar-Rūmī (223–283/837–896), *Dīwān*, II 194:1; al-Buḥturī (206–284/821–897), *Dīwān*, I 407 [last verse]; Ibn al-Mu'tazz *apud* Ibn ad-Dawādārī, *Kanz*, I 335. From among these pioneers' numerous followers just the—to the best of my knowledge—earliest two are to be mentioned here: al-Mufaġġa' al-Baṣrī, Muḥammad b. Aḥmad b. 'Ubaydallāh (d. 327/939; see Yāqūt, *Iršād* V 2336, no. 973) *apud* as-Sarī ar-Raffā' (d. 362/972–3), *al-Muḥibb wa-l-maḥbūb*; aṣ-Ṣanawbarī, Aḥmad b. Muḥammad al-Ḍabbī (d. 334/945) *apud* al-Ḥuṣrī (d. 413/1022), *Nūr at-tarf wa-nawr az-zarf*.

²⁵ Abū Nu'aym al-Faḍl *apud* Ibn Abī Ṣayba (d. 297/909–10) via the latter's father (156/773–237/851 or 239/853) as transmitter; the person thus praised was Sufyān b. 'Uyayna (d. 196/811); see Ibn Abī Ṣayba, *Masā'il Ibn Abī Ṣayba*, 116f, no. 44.

²⁶ See *Loġatnāme-ye Dehḥodā*, s. v. *panġare*, with witness texts; cf. Vullers 1855, 265a, s. v. *banġare*, 375a-b, s. v. *pa/inġare* (cf. Steingass 1892, q. vv.). In Persian, the predominant meaning appears to have been 'grilled window'.

²⁷ *al-'Ayn* VI 153, s. radice *nbġ*; IV 317, s. radice *ḥwḥ*; IV 356, s. litteris *ġk*: *bāb al-ġayn wa-l-kāf wa-huwa muḥmalun illā l-kāġada wa-hiya ḥurāsāniyya* (on *kāġad* cf. Richter-Bernburg 2022, esp. 374, n. 16).

²⁸ The Syriac equivalents of the Greek, *qūnā'ā* and *qūnā'ā*, questionably said to denote lighter and darker values respectively, covered a bewildering gamut of hues, as detailed by

λίθος Ἀρμένιος [vel sim.]).²⁹ The lexeme *lāzaward*[ī], signifying shades of blue with or without a material substrate, helped meet this challenge, yet as shown below, earlier approximations, such as *lawn as-samā*, *asmānġūnī* and *kuḥlī*, were not replaced entirely nor was the diffuse meaning of Greek κυάνεος necessarily captured by the relatively precise *lāzaward*[ī].³⁰ Similarly, the available textual witnesses for ‘Armenian stone’ in Arabic suggest that a comprehensible rendition rather than merely the literal translation of the name only became possible when *lāzaward* was sufficiently well known and seemed to fill the need. The drawn-out process of adoption of *lāzaward* can perhaps be most amply illustrated by the several versions of the much revered *Materia medica* by Dioscurides (fl. 65–75 CE)³¹ and its secondary transmission by way of quotations in later authors, but the Arabic Galen,³² Aristotle and other writings will be shown to provide analogous evidence.

In the very opening lemma of Dioscurides (I 1), *Iris illyrica*, κυανίζον[τα, scil. ἄνθη] represents one hue in the ‘rainbow’ of its flowers’ variants. In the ‘old’ Arabic version (henceforth *Vetus translatio* [VT]),³³ this became *fuqqāḥun yaḍribu ilā lawnī s-samā*,³⁴ in subsequent revisions and quotations *lawn as-samā* (‘cerulean’) was

Īsō’ bar ‘Alī (and repeated by Ḥasan bar Bahlūl); see Payne Smith 1879–1901, II 3542, s. v. *qūnā’ā*; cf. Brockelmann 1928, 674b, 678b, s.vv. *qūnā’ā*, *qūnā’ā*. Even if Īsō’ bar ‘Alī’s authorship were questioned, ‘his’ note adequately reflects the wide range of meanings of the two terms.

²⁹ For pre-Islamic references see above, with ns. 11, 13; for a much larger canvas of mostly Arabic sources than here sketched see Käs 2010, 219–222, 395–400, 944–948, 957–960, 1006, s.vv. *armāniyā*, *ḥaġar armanī*, *lāzuward*, *līnaġ*, *mashaqūniyā*.

³⁰ See below, n. 41, and Galen, *SM*, X 13 (ed. Kühn XII 276) in Ḥubayš’s Arabic translation, *apud* Ibn al-Bayṭār, IV 153:–8: the discoloration of the bile of animals because of hunger or thirst can tend toward lapis lazuli (*yaḍribu lawnūhā* [...] *wa-marratan ilā l-lāzawardīyya*). Movaffaq Haravī has the genuinely Iranian, not Arabic-mediated form *lāzvardī* in the corresponding and other passages (ed. Seligmann, 98:3, 259:4f; ed. Tehran, II 77:5, 94:2–5); the roughly contemporaneous *Hodudo l-‘ālam*, of 372/982, offers *lāġvard*, an alternative, but also non-Arabic reading (ed. Bartol’d, fol. 22v:4; trl. Minorsky, ²112, no. 24).

³¹ For biographical information see Touwaide 2000; for the Arabic reception of his work, the foundational *Fī hayūlā ṭ-ṭibb* (“De materia medica”), see Chipman 2014.

³² For recent surveys of Galen (129 – c. 216 CE) see Nutton 1998; Boudon-Millot 2013. Relevant Arabic passages will be discussed below.

³³ Ullmann 2009b, 69–78 and *passim*; he dates this version to c. 184/800, *ibid.* 149.

³⁴ Ullmann 2009b: 174, s. v. *arġuwān*, 233, s. v. *smw*; VT, fol. 12v:4. It would seem that the Arabic nominal clause *lawn as-samā* was not a calque of Syriac *gūn šamayyā* (R. Payne Smith 1879–1901, I, col. 682, s. v. *gūn*), but a rendering of *qūnā’ā* (vel sim.), as witness *qūnātā* (*ibid.*, II, col. 3542, q. v.) and *šūšanē qūnātā* (J. Payne Smith 1903, 496a, s. v. *qāwnā*). For (*habbāḥā ḍa*) *qūna*’ in Sergius’s Syriac version of Galen’s *SM*, VI 1, no. 39, Ḥunayn’s (or his school’s) Arabic has the equivalent Persian loan, (*an-naw*’) *al-asmānġūnī* (*az-zahra*) (*hunaynnet*).

retained in this passage,³⁵ whereas the eventually current synonym *asmāngūnī* came to be adopted for the heading of the entry.³⁶

At the next occurrence of κῶαv- in Dioscurides, under the lemma τέρμινθος (I 71, the terebinth tree³⁷), the translators appear to have followed precedent: *wa-lawnuhū mā'ilun ilā lawnī s-samā'* (with minor syntactic variations in mss. and quotations).³⁸ Unfortunately, the corrupt and lacunary condition of the unique manuscript of *VT* does not permit of indubitably attributing to it either the passage on the terebinth or

³⁵ The following list, although incomplete, may still prove the point: Iṣṭifān, fol. 2v:-7, *minhā bayāḍun ... wa-lawnu s-samā'* (quoted by ar-Rāzī, *Hāwī*, VII 10, s. v. *al-īrisā*); an-Nātilī, fol. 3v:-6f; Ibn Ġanāḥ, 200 (if Ibn Ġanāḥ's quotation be trusted, the Arabic translation of Ahrun also read: *al-īrisā huwa uṣūlu s-sawsani l-laḍī 'alā lawnī s-samā'* [*ibid.*]); Avicenna, *Qānūn*, I 255:-10; Ibn al-Bayṭār, *Ġāmi'*, I 97:-3f. — The present focus on the early rendition of 'cerulean' iris in Dioscurides and later revisions is not to suggest that in the course of the third/ninth century alternative translations of κῶαv- generally superseded *lawna as-samā'*; a scan of *al-Ḥāwī* would promptly dispel such a notion.

³⁶ Ar-Rāzī, *Hāwī*, VI, 207: *wa-ammā aṣlu s-sawsani l-asmāngūnī* ilkh (but see VII, 10:-9, as in n. 35); in the Paris ms. of Iṣṭifān's version with Ḥunayn's annotations (see Ullmann 2009b:2–26, 319), the entry is not immediately glossed, but corresponding to the Greek simply reads *īris, huwa naw'un mina s-sawsan, waraquh* ilkh (fol. 2v:-9), while *VT* right away glosses *al-'rsy* as *aṣl as-sawsan*. Both versions omit the reference to Illyria as habitat in the opening sentence but preserve it further down. An-Nātilī, fol. 3v:-9, does not use *asmāngūnī* in the heading either: *Fī aṣl as-sawsan al-ma'rūf bi-l-īrisā* nor in the opening sentence: *inna l-īrisā naw'un mina s-sawsan* ilkh, whereas it became common in later authors; see Movaffaq Haravi, fol. 19r:4f (ed. Seligmann, 23:5f; ed. Teheran, I 37:4f): *iresā biḥ-e sowsan-e āsmān gun-ast*; Ibn Ġanāḥ, 200: *wa-l-īrisā huwa s-sawsanu l-asmāngūnī*; Avicenna, *Qānūn* I 255:-14: *huwa [ya'nī l-īrisā] aṣlu s-sawsani l-asmāngūnī*; Ibn al-Bayṭār, I 71:6: *īrisā huwa s-sawsanu l-asmāngūnī*. Although the history of Arabic *asmāngūnī* cannot be comprehensively discussed here (cf. Ullmann 2009a: 2476, n. 110), a few remarks may be in order. Quotations in ar-Rāzī's *al-Ḥāwī* and other medical writings show the wide-ranging application of *asmāngūnī*, extending far beyond the hue of blue iris and pimpernel. A closer examination of its apparently indiscriminate use, masking the indeterminacy of κῶαv-, would be well worth the effort. As for early attestations of *asmāngūnī*, suffice it to point to the report of an event in 85/704, featuring a *yāqūta asmāngūniyya* and which aṭ-Ṭabarī relates on the authority of al-Madā'inī (d. 228/842–3; *Annales*, 1163). A 'minimalist' reading would yield al-Madā'inī's death as *terminus ante quem* for the Arabic attestation of *asmāngūnī*, which at any rate would not run counter to the testimony of Ḥunayn's (and his circle's) translations and other writings; see Galen, *SM*, liber VI, 1, no. 39 (ed. Kühn XI 829) (= ar-Rāzī, *Hāwī* VI 133 [cf. *ibid.* 43]); Ullmann 2002: 371. Most probably, however, *asmāngūnī* was borrowed at the latest in the second half of the second/eighth century since Arabic /ḡim/ was still the voiced velar plosive, /g/, instead of the voiced affricate, /dʒ/; the word stayed alive in Persian, i.e., was not merely reintroduced from Arabic, as witness, e. g., Movaffaq Haravi, as above.

³⁷ To be precise, κῶαvζουσα [scil. ῥήτινη, the gum-resin of the tree], which Wellmann athetized but which the—direct or indirect—*Vorlage* of the Arabic evidently also had.

³⁸ Iṣṭifān, fol. 17v:-2; an-Nātilī, fol. 19v:3; Avicenna, *Qānūn*, I, 323:-7; *al-Ḥāwī* apparently lacks a corresponding entry.

every other occurrence of *lawn as-samā* ' ('cerulean') for κῶαv- in revisions or putative new versions of the Arabic Dioscurides,³⁹ although the cumulative evidence appears to confirm such attribution: Whereas in *VT*, the color of the blue pimpernel (κυάνεον [...] ἄνθος; *Lysimachia foemina*) is rendered as *lawn as-samā* ' in two entries (see preceding note!), the corresponding passages in Iṣṭifān's and an-Nātilī's versions as well in indirect transmission have *lāzawardī*.⁴⁰ Elsewhere too, in the Arabic Dioscurides⁴¹ and in other (medical) texts later than *VT*, *lāzawardī* came to

³⁹ The entry terebinth is not extant in *VT* (see Ullmann 2009b: 70); in a correct text, the next regular occurrence would have been fol. 62r:4 (Diosc. II 176, anemone), but the *muḏāf* following *lawn, as-samā* ', is wanting. In the next passage preserved (*ibid.*, fol. 63r:1, 6, *re* *Anagallis* [pimpernel; Diosc. II 178]), *as-samā* ' is twice corrupted to *as-summāq*. *Ibid.*, fol. 65r:6f (Diosc. II 182, ὀθὼννα, possibly the sap of the greater celandine), the blue pimpernel again occurs; the wording as restored by Ullmann 2009b: 233, s. v. *smw*, reads '*uṣāratu anagalīsa l-laḏī fuqqāhuhū <fi> lawni s-samā*'. Regrettably, in what should have been the next occurrence (Diosc. II 183, *Myosotis* [forget-me-not]), a homoioteleuton in Greek—μελανίζοντα and κραινίζοντα—likely caused the loss of the comparison of the plant's blue flowers—not its black leaves—to those of the pimpernel (*VT*, fol. 65v:1). The further Dioscuridean series of κῶαv-, III 6, 9, 21, V 74, 90, 92, 98, 130 is not extant in *VT*; in book III the text is truncated (fols. 68r, v, 71v), book V copies, with few exceptions, Iṣṭifān (Ullmann 2009b: 78). Neither for him nor his 'successors', however, was *lawn as-samā* ' any more the only answer to the challenge of κῶαv-, as will shortly be shown. The κραινοειδῆ leaves of 'black chameleon' (Diosc. III 9; cf. Dietrich, *Triumphans*, II, 353–355) 'tend toward cerulean' (*ilā lawni s-samā* '); Iṣṭifān, fol. 58r:7; Ibn al-Bayṭār, I, 37:-6. An-Nātilī incongruously adds *lawn as-samā* ' to the description of the *yāqūtī* ('hyacinthine') flower of the plant, and qualifies as *asmāngūn* (*sic* in ms) one of the hues its leaves can assume (fols. 109v:-1, 110r:-7). In *VT*, as mentioned above, the list of 'minerals' in Diosc. V transmits Iṣṭifān's version, yet *lawn as-samā* ' ('cerulean') reoccurs in sections 74 (calamine: ... *ṣabīh bi-lawni s-samā* '), and 90 ('Armenian stone': *lawn as-samā* ' in marginal correction) (fols. 116v:-6, 122v:8 [*VT*, fol. 163r:6 (deest fol. 169r:11)]); Ibn al-Bayṭār, IV, 30:17, copies Iṣṭifān on calamine, but IV, 91:8, on 'Armenian stone', diverges slightly: *lawnuhū ka-s-samā 'i muṣba 'ā*. An-Nātilī in his turn additionally keeps 'cerulean' in V 92 ('Indian blue': *ilā lawni s-samā* ') and, likely combining *VT* and Iṣṭifān, in V 98 (vitriol: *lawn al-lāzaward aw lawn as-samā* '); fols. 198v:1, 203v:6, 15, 204v:13).

⁴⁰ Iṣṭifān, fols. 53v:-9 (*[zahruhū] lāzawardī*), 54r:1 (*ka-lawni l-lāzaward*), 54v:13 (*lawn al-lāzaward*); ar-Rāzī, *Hāwī* VI, 43; an-Nātilī, fols. 102v:-9f, 103r:6f, 104r:-4 (s. lemma *anāgalis*, *al-Qānūn* I, 263:8–13, Avicenna peculiarly deviates from his teacher an-Nātilī [Ullmann 2009b, 322ff], reading *[zahraturhū ...] asmāngūniya* and *al-azraq [az-zahr]*); Ibn Ḡanāh, I 237f, no. 32; Ibn al-Bayṭār, I 86:2, 10, 95:8 [same as in Iṣṭifān]. The Paris ms. of Iṣṭifān includes, from its *Vorlage*, a gloss by Ḥunayn (192–260/808–873) à propos of *ādān al-fa 'r* (fol. 53v: left margin -10 etc.); he records seeing, on a visit along the 'Blind Tigris' (Diḡla al-awrā', today's Ṣaṭṭ al-'Arab), a ground-hugging plant with small *lāzaward*<ī> flowers.

⁴¹ As indicated in n. 39, the relevant passages are: II 183 (*lawnuhā lāzawardī*; Iṣṭifān, fol. 55r:1; an-Nātilī, fol. 104v:-5; Ibn al-Bayṭār, I 17:12 [*lawnuhā* deest]); V 90 ('Armenian stone' mistranslated as *lāzaward*: Iṣṭifān, fol. 122v:8 (*VT*, fol. 169r:10); ms. Bodl. Arab. d. 138, fol. 203v: -3; an-Nātilī, fol. 203v:5; Ibn al-Bayṭār, IV 91:7 [citing the—justified—

be used regularly,⁴² but apparently at some lag after *asmānġūnī* and *kuḥlī*—which easily agrees with the length of the interval between *VT* and the approximate date an-Nadīm assigns to Iṣṭifān’s Dioscurides, al-Mutawakkil’s reign (232–247/847–861; Ullmann 2009b, 23). As alluded to above, an acquaintance with ‘lapis lazuli’ in whichever shape—rock, pigment, or merely color—seemed to facilitate the proper identification of ‘Armenian stone’.⁴³ But lingering doubts were articulated long before Ibn al-Bayṭār (as in n. 41), if at times only indirectly. Thus ar-Rāzī feels the

rejection of this identification by *ba’d ‘ulamā’inā*, *ibid.* 9]; V 130 (‘magnetic rock’: *lāzawardī* of color; Iṣṭifān, fol. 129r:-4; an-Nātilī, fol. 210v:9; ms. Bodleian Arab. d. 138, fol. 207a; Ibn al-Bayṭār, IV 161:17). Al-Bīrūnī, rightly taking exception to this coloristic misdescription, says he never saw nor heard of, lapis lazuli-colored magnetic rock; *al-Ġamāhir*, 347:6f. Possibly contaminating Dioscurides and Galen (see above, n. 34; al-Rāzī, *Ḥāwī*, VI 43, 133), al-Bīrūnī’s entry on the pimpernel reads *zahrūhū lāzawardīyyu l-lawni*; *aṣ-Ṣaydana*, 19:-1.

⁴² In the earlier of the two Arabic versions of Galen’s *SM*, which has been attributed to al-Bīṭrīq, the respective colors of the red and the blue species of pimpernel are reportedly called *wardī* and *lāzawardī* (Ḥunaynnet *ad SM* VI 1, no. 39), which together with the use of *zahr* instead of *fuqqāh* for ‘flower’ demonstrates that the phrase was interpolated at some time no earlier than the middle of the third/ninth century. In support of this dating, Ḥunayn himself may be cited, as he adopts *lāzawardī* instead of *asmānġūnī* fairly late in years; see, other than his note in the Paris Iṣṭifān and ar-Rāzī’s quotation on the blue pimpernel (both as in n. 40), *lāzaward* as an ingredient of compound medicines in his *Ḥṭiyārāt* and *al-Aqrābādīn al-kabīr* (*al-Ḥāwī*, II, 341); regardless of the (mineralogical) identity of the *signifié*, the lexeme of the *signifiant* is an indicator. However, Ḥunayn may well have been preceded by his senior colleague and erstwhile teacher Yūḥannā b. Māsawayh (d. 243/857), whom ar-Rāzī quotes concerning *ḥaḡar al-lāzaward* in compound medicines (*al-Ḥāwī* II 449 from *al-Ġawāmi’* and IV 486 without title of work). — The earliest expressly dated attestation of *lāzaward* [ī] in medical writing is found in ‘Alī b. Rabban al-Ṭabarī’s *Firdaws al-ḥikma* of 235/850, ed. aṣ-Ṣiddīqī, 364:19–23 (ed. al-Ġundī 364, 258:-2 – 259:2). Here, concerning the origin of colors, the pair *al-lāzawardī wa-l-kuḥlī* exemplifies the effect of the mixture of ‘whiteness and greenness’ (*al-bayāḍ wa-l-ḥuḍra*); in the following exposition, however, the author solely refers to *al-kuḥlī*, without any further mention of *lāzawardī*. It would seem that either of two possibilities may have to be entertained: the author’s insufficient familiarity with this new, ‘exotic’ term or the posterior interpolation of a marginal gloss into the text. – The translator of Aristotle’s *Historia animalium*, whom its editor is inclined to identify as Uṣṭāṭ (ed. Filius, 9–14), appears to waiver; he ‘conservatively’ renders τὰ δὲ ἐπάνω [...] κούνεον as: *wa-a’lāhu ilā s-sawādi mā huwa* (ed. Filius, 56, *ad* 615b29 [p. arab. 216:-10]), yet shortly afterwards (616a15 [p. arab. 217:8f]), in τὸ δὲ χρῶμα καὶ κισσοῦν ἔχει he again, as twice before, opts for *wa-lawnuhū miṭlu lawni l-lāzaward* (see 592b27, 593b11 [pp. arab. 170:-9, 172:2]). – In close proximity (616a18 [217:10f]) to one of the above-mentioned passages the *ilā ... mā huwa* syntagma reoccurs for the compound ὑπόχλωρον: [*fa-ammā...fa-]ilā l-ḥuḍrati mā huwa* (cf. Ullmann 1994, 6, 36).

⁴³ Thus, it cannot come as a surprise to see *lāzaward* in *al-Ḥāwī* included in prescriptions both ante- and postdating Ibn Māsawayh and Ḥunayn, right down to ar-Rāzī himself (I 343). Cf. Käs 2010, as in n. 29; Ibn Ġanāḥ, I 243 and 532, nos. 37 and 354 (with caveat against linguistic derivation of *lāzaward*).

need to defend his equating ‘Armenian stone’ with *lāzaward* with reference to ‘several authors of books on stones’ (*al-Ḥāwī* II 343); in keeping with his cavalier handling of sources, he elsewhere has Ḥunayn identify ‘Armenian stone’ as the inferior part of lapis lazuli and Pseudo-Theophrastus point out that because of the similarity in color, ‘decorators’ substitute ‘Armenian stone’ for lapis lazuli.⁴⁴ Without crediting the quotation, as was his habit, Avicenna also mentions this practice, but he clearly distinguishes between the two kinds of stone, marking ‘Armenian stone’ as inferior in color and consistency.⁴⁵ Yet again, in al-Bīrūnī’s quotation from Pseudo-Theophrastus on ‘Armenian stone’ (*ḥaḡar armanī*) in *aṣ-Ṣaydana*, 201, no. 302, the meaning appears reversed: because of the identity of color of the two ‘stones’ *lāzaward* was called *armīnāqūn*—cognizant of the derivation of the word, al-Bīrūnī leaves it here, other than in *al-Ġamāhir*, 310, uncommented.⁴⁶ There he appears to be more reserved about the alleged Armenian origin of lapis lazuli, as that was only based on the ‘similarity’ of azurite to it. Still, he reports that lapis lazuli was imported to ‘the land of the Arabs’ (*arḍ al-‘Arab*) from Armenia, but to Ḥurāsān and al-‘Irāq from Badaḡṣān.

The above assertion that the opacity of the Greek κρᾶν- presented a challenge to translators into Syriac and Arabic is supported by the uncertain, as if groping variance of its Arabic renditions, which persisted throughout consecutive textual revisions. As for *kuḥlī* (‘stibnite-colored’) as an approximation of κρᾶν- in Dioscurides, the manuscript of *VT* regrettably again lacks attestations in the passages where Iṣṭifān, an-Nātilī and Ibn al-Bayṭār concur in their witness.⁴⁷ Obviously their

⁴⁴ The Latin translation of *al-Ḥāwī* by Farāġ b. Sālīm (completed February 1279; ms. Paris 6219, II 23, IV 186) offers a better text of the two passages than the Arabic prints (*dixit quod lapis armenicus est inferior pars lapis lazuli* [...*huwa* bṭb’nt *al-lāzaward*; II 341]; *lapis armenus secundum <th>eofrastem eius color assimilatur colori lapidis lazuli et pictores pingunt cum ipso loco lazuli* [*ḥaḡar armīnī qāla lwftws (?) inna ḥādā ḥaḡaru l-lāzaward, wa-fīhi quwwatun mushilatun muqayyi’a, wa-yanfā’u min <...> wa-qāla Būlus (!) inna l-ḥaḡara l-armīniyya lawnahū lawnu l-lāzawardī yasta’miluhu l-muzawwiqūna badala l-lāzaward <...> wa-huwa layyinun ilkh*; VI 127]. Obviously, further textual criticism is required.

⁴⁵ Given ar-Rāzī’s loose way of quoting in *al-Ḥāwī* and the poor state of the printed text, the question of Avicenna’s proximate source will be left open at this point; in the *Būlāq Qānūn* (I 497), the passage reads *ḥaḡar fīhi adnā lāzawardīyya laysa fī lawni l-lāzawardī wa-lā fī ktināzihī bal kāna fīhi ramliyyatun mā ilkh* (Ibn Faḍlallāh al-‘Umarī, XXII 204, in his turn depends on Avicenna, again in poor textual condition).

⁴⁶ *aṣ-Ṣaydana*, 201, no. 302: [Pseudo-]Iṣṭifān: *lawnuḥū lawnu l-lāzawardī bi-‘aynihī wa-li-ḥādā qīla li-l-lāzawardī armīnāqūn*.

⁴⁷ At II 176 (anemone), the text of *VT* is lacunary; κερφάλια μέλανα ἢ κωνίζοντα: ρίζα κτλ reads *wa-ra’suhū aswadu ‘alā lawn <...> wa-aṣluḥū ilkh* (fol. 62r:3f); Iṣṭifān: *ru’ūsun lawnuḥā aswadu aw kuḥliyyun ilā s-sawād* (fol. 53r:5f; in Ibn al-Bayṭār, II 85:-2, the published text has *wa-* instead of *aw*) and an-Nātilī: *ru’ūsun lawnuḥā aswadu aw kuḥlī* (fol. 102r:16f) fundamentally agree with each other (Avicenna, *al-Qānūn* I 433:19, in turn quotes an-Nātilī). At III 6 (cornflower) and 21 (eryngo), the relevant passages are altogether omitted

agreement is to be expected, given the later writers' dependence on Iṣṭifān. In book V, of which the bulk has not been transmitted in *VT*, Iṣṭifān's version, including later adaptations, presents all three alternative renditions of κῠαυ-, *lawn as-samā'*,⁴⁸ *kuhlī'*⁴⁹ and *lāzaward[ī]*,⁵⁰ which would seem to imply a somewhat haphazard process of work, yet apparently with *lāzaward[ī]* coming last.

During the course of the third/ninth century, both the semi-precious stone and the color term *lāzaward[ī]* won rights of citizenship in Islamicate civilization and in Arabic—subsequently also in Persian—letters. Around the turn of the fifth/eleventh century, the completion of the process found a beautiful reflection in Naṣr b. Ya'qūb ad-Dīnawārī's scale of tones of blue,⁵¹ which al-Bīrūnī transmitted a few decades later;⁵² in his terms, saturation *increases*—the reverse of modern usage—from 'blue cerulean' to 'azure', 'indigo' and finally 'stibnite'.⁵³

in *VT* (fols. 68r:1 etc., 71v:1 etc.), whereas Iṣṭifān (fols. 57r:8, 59r:-2), an-Nātilī (fols. 108v:8, 113v:-7) and Ibn al-Bayṭār (IV 33:19, IV 13:11) all have *kuhl[ī]*, notwithstanding some textual corruption. In any case, the rendition of κῠαυ- by *kuhl[ī]* in Dioscurides supports Bar Bahlūl's quoting *kuhl[ī]* for Syriac *gūn šamayyā* (*Lexicon*, col. 467, from Ḥananīšō' bar Sērōšway [c. 900?]). Outside the area of translation from Greek and Syriac, or perhaps generally of 'scientific' writing, *kuhlī* was not necessarily accepted, as witness al-Āmidī, *Muwāzana*, II 96f; according to him the word 'is not used orally nor do the Arabs record it with colors' (*lā yulfazu bih, wa-l-'arabu lā taḍkuruhū bi-l-alwān*). But see below!

⁴⁸ See above, n. 39

⁴⁹ 'Indigo', Diosc. V 92: *kuhlī al-lawn* (Iṣṭifān, fol. 122v:15 [*VT*, fol. 169r:-2]); Ibn al-Bayṭār, I 70:-6 (ms. Bodl. Arab. d. 138, fol. 204r:2: *mā kāna lawnuhū ramādī* [sic]).

⁵⁰ On the identification of Armenian azurite (Diosc. V 90) as lapis lazuli see above, esp. n. 41. Κόραος (V 91, copper sulphate) was difficult to identify; Iṣṭifān transcribes it as *qw'nṣ* (fol. 122v:10), which is perceptively glossed as *lāzaward nuḥāsī* in the margin (*VT*, fol. 169r:-8, has a mangled transcription only; in V 74, on calamine, the 'mineral' name κόραος, transcribed as *qw'zws* [*qw'bys* in margin], is glossed as denoting 'a kind of vermilion [*zingāfi*]' (Iṣṭifān, fol. 117r:10; Ibn al-Bayṭār, IV 31:8f [corrupt]). Finally, in V 98, on copper vitriol, the color term κόραεον is rendered as *lawn al-lāzaward* (Iṣṭifān, fol. 123v:8 [*VT*, fol. 170r:7]); Ibn al-Bayṭār II 150:11). An-Nātilī, as if reverting to an earlier version, adds *aw lawn as-samā'* (fol. 204v:7). As seen above (n. 41), the newfound response to the challenge of κῠαυ- proved so tempting that magnetic rock (V 130) was assigned the color of lapis lazuli as well.

⁵¹ On this author see Orfali 2016; his best-known work, on dream interpretation, was completed in 399/1009. 'Tones' is used here since they are introduced as gradations of *al-akhab*, which, being predicated of lead, must imply greyness, whatever the precise extent of its meaning.

⁵² In *al-Ġamāhir*, 149:4f (dedicated to sultan Mawdūd [r. 432–440/1041–48/49])

⁵³ *Inna li-l-akhabi marātiba tatafāḍalu bi-š-šab'i mina l-lawn, fa-awwaluhu l-āsmānġūniyyu l-azraq, tumma l-lāzawardī, tumma n-nīlī, tumma l-kuhlī, fa-huwa ašba 'uhā; on 'indigo' see Ullmann 2009a, 2068, s. v. līlangġ.*

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