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INHALT DES BANDES VIERUNDZWANZIG UND FÜNFUNDZWANZIG

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THE TENTH-CENTURY GEOMETER ABŪ ʿABDALLĀH AL-SHANNĪ ON THE AREA RULE FOR A CYCLIC QUADRILATERAL IN TERMS OF ITS SIDES

JAN P. HOGENDIJK*

1. Introduction

A cyclic quadrilateral is a quadrilateral whose four angular points lie on a circle, as $ABGD$ in Figure 1. The area of a cyclic quadrilateral is in modern notation $\sqrt{(s-a)(s-b)(s-c)(s-d)}$, where a, b, c, d are the four sides and $s = \frac{1}{2}(a+b+c+d)$ is half the perimeter.

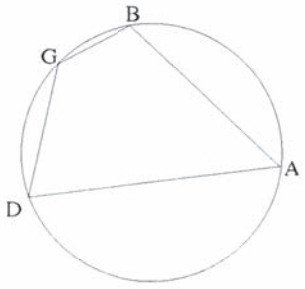

Figure 1

The area rule was unknown in ancient Greek geometry, and it first appeared in India in the seventh century AD. The rule was proved by Abū ʿAbdallāh al-Shannī in the late tenth century AD in a treatise which is now lost. Al-Shannī's proof, which is one of the highlights of the Arabic-Islamic geometric tradition, has reached us through the *Extraction of Chords* by al-Bīrūnī (973-1048 AD). This work is available in two different versions. The purpose of this paper is to publish edited Arabic texts with English translations of al-Shannī's proof in the two versions. We have included the two versions of a related proof by al-Shannī which was also cited by al-Bīrūnī, showing that the area of a triangle with sides a, b, c is $\sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{1}{2}(a+b+c)$.

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2. The historic context

Cyclic quadrilaterals occur in ancient Greek mathematics in Euclid's *Elements* III:22 [8, vol. 2, p. 51] and in Ptolemy's *Almagest* I:10 [19, p. 30], where they are used to prove trigonometric rules. The area rule for the cyclic quadrilateral was stated in the Brāhmasphuṭasiddhānta of Brahmagupta (628 AD) in Sanskrit verses without proof.[1] A proof of the area rule is found in a sixteenth-century work in Malayalam by Jyeṣṭhadeva (ca. 1530 AD) [25, vol. 1, pp. 109-133, 239-255]. The rule was transmitted from India to the Islamic world before the tenth century. The proof by Abū ʿAbdallāh al-Shannī has been preserved in the work by Abū Rayḥān al-Bīrūnī (973 - 1048 AD) entitled "Extraction of Chords in a Circle by the Properties of the Broken Line Inscribed in it" *(istikhrāj al-awtār fi'l-dā'ira bi-khawāṣṣ al-khaṭṭ al-munḥanī al-wāqiʿ fīhā)* [26, p. 381 no. 3]. We will abbreviate this title to *Extraction of Chords*. The work exists in two substantially different versions, which we will call the Patna version and the Leiden version. A German translation of the Leiden version appeared in 1911 in [30], and the Arabic version of the Patna version was printed in 1948 in the unreliable edition [2]. Al-Shannī's proof has recently been analyzed in modern notation by Eisso Atzema in an excellent historical survey [1] of proofs of the area rule for the cyclic quadrilateral.

Cyclic quadrilaterals were studied in Western Europe from the fifteenth century onwards. The area rule was first stated in Europe without proof by the Dutch mathematician Willibrord Snel in 1615 [5, p. 189-190]. Atzema discovered the earliest Western proof in a work printed in 1706 by the Dutch mathematician Abraham de Graaf [1, p. 28]. Most proofs in the Western tradition involve long algebraic computations in terms of the sides a, b, c, d, and the preliminary determination of the length of one of the diagonals. The famous mathematician Leonhard Euler (1707-1783) wrote about the difficulty of finding a strictly geometric proof of the area rule.[2] Thus al-Shannī's straightforward geometric proof of the area rule for a cyclic quadrilateral may also interest a modern student of elementary geometry.

Immediately before the proof for the cyclic quadrilateral, al-Bīrūnī presents a related proof of the area rule for the triangle, often called

[1] See [15] for references and the possibility that Brahmagupta proved the rule.
[2] See for the quotation [1, p. 31].

Heron's rule, after Heron of Alexandria (ca. 70 AD).[3] Al-Bīrūnī attributes the rule to Archimedes (ca. 200 BC) and the proof is attributed to al-Shannī in the Leiden version. The two versions of this proof are also published in this paper, and I will argue below that the attribution of the proof to al-Shannī is plausible. Heron's area rule for the triangle is not found in the extant Greek and Arabic works by Archimedes, and therefore al-Shannī and al-Bīrūnī must have had access to an Arabic translation of a work by Archimedes which is now lost.

Nothing is known about the life of Abū ʿAbdallāh Muḥammad ibn Aḥmad al-Shannī, and only three of his works are extant. The longest of these is the *Book of the Disclosure of the Fallacy of Abu'l-Jūd in the Matter of the Two Lemmas for His Alleged Construction of the Heptagon*.[4] The work deals with constructions of the regular heptagon discovered around 970 AD, and thus al-Shannī must have been active around that time. Thus he was at least one generation older than al-Bīrūnī,[5] who was born in 973 AD. Al-Shannī also authored two brief texts on the rule for the area of a triangle in terms of its sides. His *Book on the Measurement of Every Triangle with Different Sides by Means of its Sides (kitāb misāḥat kull muthallath mukhtalif al-aḍlāʿ min jihat aḍlāʿihi)* has been summarized in [11]. It includes a proof of the triangle rule which is different from al-Shannī's proof in the present paper although there are some similarities in method.[6] The other text is the *Book on the Measurement of Every Triangle by Means of its Sides (kitāb misāḥat kull muthallath min jihat aḍlāʿihi)*. In this unpublished text, al-Shannī proves the area rule by first determining the length of the altitude in a triangle in terms of the sides.[7] These two extant works of al-Shannī do not contain the proofs which are attributed to him in the *Extraction of Chords*.

The present paper continues with a brief analysis of al-Shannī's geometric proofs of the two area rules. Then the two different versions of the *Extraction of Chords* and their publication history will be discussed,

[3]For an English translation of Heron's proof see [12, pp. 499-500].

[4]See [21, p. 832-863], [22, p. 671-688] and [10, p. 287-288].

[5]On the life and work of Abū Rayḥān al-Bīrūnī see [13].

[6]In this text he proves $((a+c)^2 - b^2) : 4[ABG] : 4[ABG] : (b^2 - (a-c)^2)$ for a triangle ABG with sides a, b and c and area $[ABG]$, using mean proportionals in much the same way as in his proofs in the present paper.

[7]I have consulted the manuscript Cairo, Dār al-Kutub, Muṣṭafā Fāḍil Riyāḍa 41m, ff. 148b-150a and ff. 152b-153b, see [16, p. 46].

as well as the Arabic manuscripts and the editorial procedures that have been used. The paper concludes with literal English translations of the two proofs in the two versions and edited Arabic texts.

3. Summary of the geometric proofs

We begin with some general information on al-Bīrūnī's *Extraction of Chords*. This work is about properties of a "broken line" *(khaṭṭ munḥanī)* ABG, that is, a combination of two chords AB, BG of a circular arc which meet at one point B on the arc (Figure 2). Al-Bīrūnī's "first property" and "fourth property" of a broken line will concern us here.

Figure 2

Here is the first property (Figure 3). Suppose that $AB > BG$ and let D be the midpoint of arc AG. Drop a perpendicular DE onto AB. The first property says that this perpendicular bisects the broken line, that is to say $AE = EB + BG$. [8]

In both versions of the *Extraction of Chords*, the Patna version and the Leiden version, al-Bīrūnī gives more than twenty proofs of the first property, citing at least eight mathematicians, including Archimedes [2, pp. 4-24], [30, pp. 12-26]. We now present the proof by the Iranian geometer Abu'l-Ḥasan Ādharkhurā [26, p. 342], whom al-Bīrūnī knew personally and who provided him with information on Persian chronology. This is the first proof in the Patna version [2, p. 6-7] and the fifteenth proof in the Leiden version [30, p. 20]. (Figure 3) Drop the perpendicular DP to the rectilinear extension of GB, and draw DA, DB, DG.

[8] We use the notation AB also for the length of the segment AB; thus AB=BA.

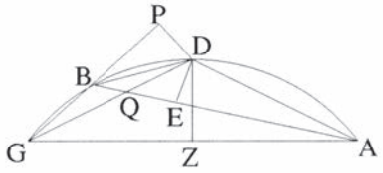


Figure 3

We first show that there are two pairs of congruent triangles: AED, GPD and DBE, DBP. In triangles AED, GPD, angles E and P are right angles, and the hypotenuses AD and GD are equal because D is the midpoint of arc AG. Angles EAD and PGD are equal because they stand on the same arc BD of the circle, by Euclid's *Elements* III:21 [8, vol. 2 p. 49]. Thus the triangles AED, GPD are congruent, hence $DE = DP$. Since $DB = DB$ and angles E and P are right angles, the triangles DBE, DBP are congruent as well. By means of the congruent triangles we conclude $AE = PG = PB + BG = = EB + BG$.

In order to introduce the "fourth property" of the broken line,[9] we call Q the intersection of DG and AB in Figure 3.

The fourth property says that the difference between the areas of triangles ADG and ABG is equal to the area of the rectangle contained by EB and ED, that is the product of the lengths of EB and ED, which we will write as $EB \cdot ED$ from now on.

The fourth property can be proved in a simple way by extending the proof of Abu'l-Ḥasan Ādharkhurā:[10] The area of triangle ADG is the sum of the areas of the three triangles ADE, EDQ and AQG. The areas of ADE and GDP are equal because the triangles are congruent. Thus the area of triangle ADG is the sum of the area of triangle ABG plus the area of kite $EBPD$. The kite consists of the two congruent triangles DBE and DBP with right angles at E and P. The area of each triangle is half the product of the base EB times the altitude ED, and therefore the total area of the kite is $EB \cdot ED$. Thus the fourth property is proved.

[9]The fourth property is discussed in the Patna version with several proofs [2, p. 45-49]; in the Leiden version it is mentioned only implicitly in the "third proof by Abū ʿAbdallāh al-Shannī" of the first property [30, p. 20].

[10]The following proof is not found in the *Extraction of Chords*.

We now turn to al-Shannī's proof that the area of a triangle is in modern notation $\sqrt{s(s-a)(s-b)(s-c)}$, where a, b, c are the three sides and $s = \frac{1}{2}(a+b+c)$ is half the perimeter. In Figure 3, drop perpendicular DZ onto AG. Then Z is the midpoint of AG, therefore the area of triangle ADG is equal to the rectangle $ZA \cdot ZD$. By the fourth property of the broken line, the area of triangle ABG is the difference between the areas of the two rectangles $ZA \cdot ZD$ and $EB \cdot ED$. Because the angles DBA and DAG stand on equal arcs AD and GD, $\angle DBE = \angle DAZ$, thus $ZD : ZA = ED : EB$, and the two rectangles are similar. In the vein of Greek and Islamic geometry, we now express the difference between the areas of the two similar rectangles as the area of a third rectangle similar to the other two, as VWX in Figure 4. Then rectangle VWX has the same area as triangle ABG.

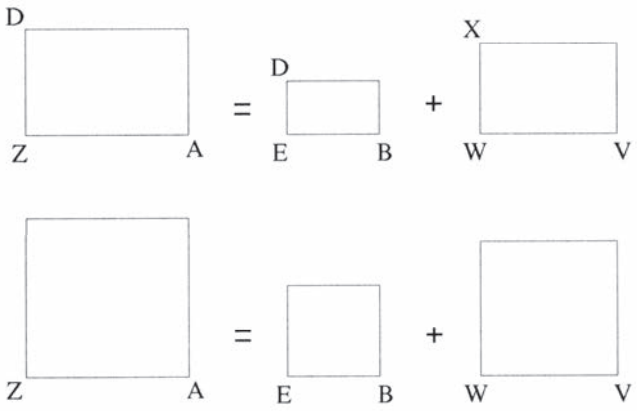


Figure 4

The sides of the third rectangle can be easily found, as suggested by Figure 4: by multiplying the vertical sides of the rectangles by a suitable factor (ZA/ZD), the three rectangles become squares and the equality between the areas is maintained, thus $ZA^2 = EB^2 + WV^2$. By a similar argument for the horizontal sides $ZD^2 = ED^2 + WX^2$.

In Figure 3 put $AB = c, BG = a, GA = b$ and $s = \frac{1}{2}(a+b+c)$ half the perimeter; by assumption $AB > BG$, thus $c > a$.

Then $ZA = \frac{1}{2}b$ and by the first theorem on broken lines, $AE = \frac{1}{2}(c+a)$, hence $EB = c - \frac{1}{2}(c+a) = \frac{1}{2}(c-a)$.

Thus $WV^2 = ZA^2 - EB^2 = (\frac{1}{2}b)^2 - (\frac{1}{2}(c-a))^2 = (s-a)(s-c)$. By the theorem of Pythagoras, $AD^2 = ED^2 + EA^2 = ZD^2 + ZA^2$. Therefore $WX^2 = ZD^2 - ED^2 = EA^2 - ZA^2 =$
$= (\frac{1}{2}(c+a))^2 - (\frac{1}{2}b)^2 = s(s-b)$. Thus the area of triangle ABG is equal to the area of a rectangle with sides $\sqrt{(s-a)(s-c)}$ and $\sqrt{s(s-b)}$, that is $\sqrt{s(s-a)(s-b)(s-c)}$.

Al-Shannī's proof is a bit more complicated in the technical details. No modern notation is used, and auxiliary points H on AE and K on AZ are defined in Figure 7 below, in order to create line segments $EH = s-b, GK = s-a, AK = s-c$. In order to subdivide the area of the square of AD, the text also defines an auxiliary point T on AD such that $AT = AZ$. Secondly, four-dimensional magnitudes are not used in Euclid's *Elements*, and this is why Al-Shannī (according to al-Bīrūnī) avoids multiplication of four line segments until the very end. Instead, he expresses the area of triangle ABG (in my notation: $[ABG]$) as the mean proportional of the rectangles $s(s-b)$ and $(s-a)(s-c)$ as $s(s-b) : [ABG] = [ABG] : (s-a)(s-c)$, in a way acceptable in Greek geometry. To obtain the triangle area as a mean proportional, the text concludes from $ZD : ZA = ED : EB$ that
$ZD : ZA = ZD^2 : ZD \cdot ZA = ZD \cdot ZA : ZA^2 = ED : EB =$
$= ED^2 : ED \cdot EB = ED \cdot EB : EB^2$ and hence by repeated use of a theorem[11] on proportions:
$ZD : ZA = (ZD^2 - ED^2) : (ZD \cdot ZA - ED \cdot EB) =$
$= (ZD \cdot ZA - ED \cdot EB) : (ZA^2 - EB^2)$. where the area of triangle ABG is $(ZD \cdot ZA - ED \cdot EB)$ by the fourth property.

The proof in the Leiden version is similar to that in the Patna version but the explanations in the Leiden version are sometimes unclear, as will be outlined in the footnotes to the English translation of the Leiden version. At the end, the Leiden version explains the easy case of the area of the isosceles triangle, as triangle ADG in Figure 3.

The Leiden version attributes the proof to Abū ᶜAbdallāh al-Shannī, but the Patna version does not contain such an attribution. Nevertheless, I think that the attribution to al-Shannī is plausible, for the following reasons.First, the tenth-century geometer Abu'l-Wafā' al-Būzjānī wrote a small treatise on the triangle rule by Archimedes with a proof

[11]The theorem is to the effect that if p, q, r and s are four magnitudes of the same kind in such a way that $p > r$ and $p : q = r : s$, then $p : q = (p-r) : (q-s)$.

which al-Būzjānī introduced by "Archimedes said." Inspection of the manuscript shows [12] that the Archimedean proof uses the inscribed circle of the triangle and the radius and centre of one of the excircles, and thus it is different from the proof in the *Extraction of Chords*. The Archimedean proof cannot be transferred to the cyclic quadrilateral, but the proof of the triangle rule in the *Extraction of Chords* can be generalized to the proof for a cyclic quadrilateral, which proof is attributed to al-Shannī in both versions. Secondly, al-Shannī was interested in the triangle rule as we can see from his extant works, which have been mentioned above. Al-Shannī knew the "fourth property" of the broken line which plays a crucial role in the proof of the triangle rule in the *Extraction of Chords*.[13] Finally, al-Shannī's proof uses angles and similar triangles as in Euclid's *Elements* and thus it is different from geometric proofs of the rule which might have been developed in the Indian tradition.[14]

According to al-Bīrūnī in the Patna version, Al-Shannī's proof of the area rule for the cyclic quadrilateral was inspired by the previous proof for the triangle. I now summarize the proof in the Patna version.

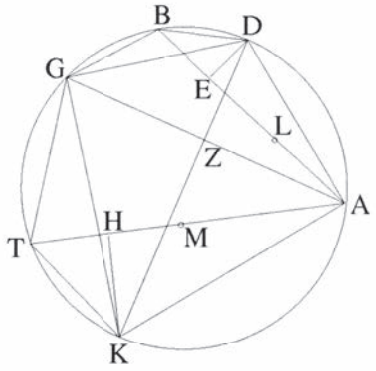


Figure 5

[12]The treatise is in the manuscript Oxford, Bodleian Library, Thurston 3, f. 55b-56a, [26, p. 135 no. 8]. The proof by Archimedes is similar to the proof in proposition 7 of the *Book on the Measurement of the Plane and Spherical Figures* by the Banū Mūsā (ca. 860), see [6, pp. 278-289] and [29, pp. 264-265].

[13]One of the proofs of the fourth property in the *Extraction of Chords* is by al-Shannī; see [2, pp. 47-48]. This proof resembles proof q in [30, p. 20] which is also by al-Shannī and which involves the fourth property without mentioning it by name.

[14]See [15, p. 30] for characteristics of Indian geometric proofs.

Figure 5 shows a cyclic quadrilateral $ABGT$. Again we write the area of a figure using square brackets, thus: $[ABGT]$ is the area of quadrilateral $ABGT$. Al-Shannī assumes $AB > BG$ and $AT > TG$. Points D and K are midpoints of arcs ABG and ATG. He draws DK, which is a diameter of the circle. It is easy to show that DK intersects AG perpendicularly, call Z the point of intersection. Al-Shannī drops perpendiculars DE and KH onto sides AB and AT.

Now ABG is a broken line and D is the midpoint of arc ABG, thus $[ADG]-[ABG] = EB \cdot ED$. Similarly ATG is a broken line and K is the midpoint of arc ATG and therefore $[AKG]-[ATG] = HT \cdot HK$. Adding the two equalities we obtain

$[ADGK]$ - $[ABGT] = EB \cdot ED + HT \cdot HK$.

According to the previous proof, triangle BED is similar to triangle AZD, and also triangle KHT is similar to triangle KZA. Al-Shannī realized that the two triangles AZD and KZA are similar to the big triangle KAD. Thus the three triangles BED, KAD and KHT are similar. Therefore the following three rectangles are similar: (1) the rectangle contained by AK and AD; (2) the rectangle contained by EB and ED; (3) the rectangle contained by HK and HT. See Figure 6.[15] The rectangle $AK \cdot AD$ is the area of the kite $ADGK$.

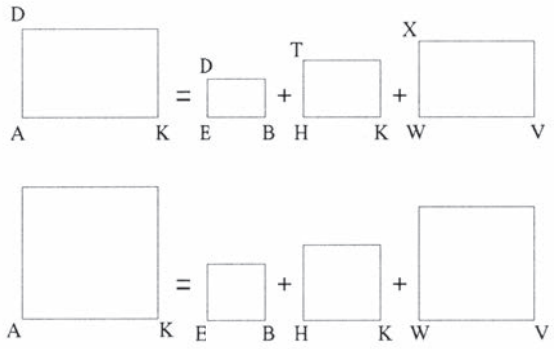


Figure 6

We express the difference $AK \cdot AD - EB \cdot ED - HK \cdot HT$ as the area of a fourth rectangle $WV \cdot WX$ similar to these three rectangles, as in Figure 6. By the same arguments as above,

[15] In Figure 5 $\angle DBE = \angle AKD$, $\angle HTK = \angle ADK$ and $EB : ED = AK : AD = HK : HT$.

$AK^2 = EB^2 + HK^2 + WV^2$, and $AD^2 = ED^2 + HT^2 + WX^2$ and the required area $[ABGT]$ is the area of the rectangle $WV \cdot WX$.

Returning to Figure 5, by the theorem of Pythagoras $AK^2 = AH^2 + HK^2$ and $AD^2 = ED^2 + AE^2$, and thus we can simplify to $AH^2 = EB^2 + WV^2$ and $AE^2 = HT^2 + WX^2$. Putting $c = AB$, $a = BG$, $b = GT$, $d = TA$ and $s = \frac{1}{2}(a + b + c + d)$, we have by assumption $c > a$ and $d > b$, and

$AE = \frac{1}{2}(c + a)$, $EB = \frac{1}{2}(c - a)$, and similarly

$AH = \frac{1}{2}(d + b)$, $HT = \frac{1}{2}(d - b)$, whence

$WV^2 = AH^2 - EB^2 = (\frac{1}{2}(d+b))^2 - (\frac{1}{2}(c-a))^2 = (s-a)(s-c)$,

$WX^2 = AE^2 - HT^2 = (\frac{1}{2}(c+a))^2 - (\frac{1}{2}(d-b))^2 = (s-b)(s-d)$,

and finally $[ABGD] = WV \cdot WX = \sqrt{(s-a)(s-b)(s-c)(s-d)}$.

As above, al-Shannī avoids four-dimensional magnitudes until the very end. He uses a theorem on proportions as above to obtain $(s - b)(s - d) : [ABGT] = [ABGT] : (s - a)(s - c)$. He does not use modern notation and he introduces auxiliary points L on AE and M on AT such that $HM = EB$ and $EL = TH$ in order to get line segments with lengths $AM = s - c$ and $AL = s - d$.

According to al-Bīrūnī. al-Shannī assumed $c > a$ and $d > b$. Other cases such as $c > a$ and $d < b$ can be dealt with in similar ways.

The proof in the Leiden version is similar to that in the Patna version but the exposition in the Leiden version is less clear, although Suter was able to reconstruct the correct argument in his translation and notes [30, pp. 40-42, 70]. The codex Or. 513, which contains the proof, was bought in Istanbul by the German-born orientalist Levinus Warner (1618-1665), bequeated by him to Leiden University, and shipped to the Netherlands before 1674. The *Extraction of Chords* is mentioned in the 1674 catalogue [28, p. 374] as "Birounii Sylloge de Subtensis, cum demonstrationibus Archimedis et aliorum" (al-Biruni's Discussion of Chords, with proofs by Archimedes and others). Thus the manuscript was in the Netherlands before Abraham de Graaf published the first Western proof of the area rule for a cyclic quadrilateral in 1706. We have not found evidence that Abraham de Graaf or anyone else in Western Europe was aware of Al-Shannī's proof before Suter started to work on the Leiden manuscript in the early twentieth century.

4. The two versions of the *Extraction of Chords* by al-Bīrūnī

Al-Shannī's proofs of the area rules for the triangle and cyclic quadrilateral constitute two chapters among the more than sixty chapters in al-Bīrūnī's *Extraction of Chords*. Al-Bīrūnī begins the work with more than twenty chapters on properties of the "broken line" (see above, Figure 2) and several proofs of each of these properties by different mathematicians, whose names are mentioned. Then he presents around fifteen chapters on various applications of these properties, including al-Shannī's proofs of the area rules for the triangle and the cyclic quadrilateral. The work ends with chapters on the application of the properties of the broken lines to the computation of chords in the circle, which are crucial to trigonometry.

The *Extraction of Chords* is available in four Arabic manuscripts which will be indicated by the symbols P, L, M and C.

P = Patna, India, Khuda Bakhs Public Oriental Library no. 2468 (more recent numbering 2519), ff. 282a-298b + 326 a, see [18, p. 92]. The text is complete; the intermediate leaves 299a-325b contain parts of other texts, unrelated to the *Extraction of Chords*. Manuscript P is dated on f. 326a, where the anonymous scribe writes "I finished writing it in Mosul at the end of Dhu'l-Qa'da of the year 631 of the Hijra" (August 1234 AD).The end of the text also contains in red the marginal note "Abu'l-Rayḥān, may God have mercy on him, finished writing it in Rajab of the year 418" (August 7 - Sept. 8, 1027 AD). The text in the manuscript is written in black (or dark brown) ink, and the titles of the chapters are in red ink. The geometrical figures are in black ink, the letters labelling the points are in red ink.

L = Leiden, University Library, Or. 513, ff.108b-129a, see [33, pp. 225-226]. The manuscript is undated but owner's marks show that it was written before 982 A.H / 1575 CE. The manuscript is written in black ink with titles of the chapters in red. The lines in the geometrical figures are drawn in red ink, letters labelling the points are in black ink.

M = Istanbul, Süleymaniye Library, Murat Molla 1396, ff. 52b-72b, see [17, p. 480]. The manuscript is undated. Manuscript M is closely related to manuscript L because in the two propositions that have been edited in this paper, L and M have in common two redundant passages resulting from scribal error, as well as many common mathematical errors. Manuscript M was available in a black and white copy.

C= Cairo, Dār al-Kutub, Muṣṭafā Fāḍil Riyāḍa 41m, ff. 74b-82a, see [16, pp. 48, 112], written in the eighteenth century by the Egyptian mathematician Muṣṭafā Ṣidqī. Manuscript C contains only a small part of the *Extraction of Chords*, which does not include al-Shannī's proofs of the area rules for the triangle and the cyclic quadrilateral. Thus it has not been used in the edition.

Inspection shows that the four manuscripts contain two essentially different versions of the *Extraction of Chords*. One version is only extant in P and will be called the Patna version. The second version is extant in L, M and C; it will be called the Leiden version because L is superior in quality to M, and C contains only part of the text.

It is not the purpose of this article to investigate the exact relationship between the Patna and the Leiden versions. Some of the differences will be listed here. For the Patna version we refer to the unreliable Hyderabad edition [2], and for the Leiden version to the German translation of the Leiden manuscript by Suter [30].

1. There are many structural and editorial differences between the two versions. For the first property of the broken line (Figure 3 above), the Patna and Leiden versions present the proofs in different order. In the Patna version, the proofs are grouped and analyzed according to structure of the argument; structurally different proofs by the same mathematician may occur in different chapters. In the Leiden version, most of the proofs are grouped according to the name of the mathematician, and therefore proofs with similar structure and the same geometrical figure may be repeated in different places. The Patna version discusses four different properties of the broken line, all provided with proofs. The Leiden version discusses only two properties, which correspond to the first two properties of the broken line in the Patna version. In the Leiden version, the third and fourth properties are not mentioned explicitly although they implicitly occur in some of the proofs of the first property. In a few geometrical figures, points are labelled in different ways in the two versions, as in Figures 8 and 10 below. The preface to the Patna version is more elaborate, and the references to Muḥammad ibn Zakariyyāʾ al-Rāzī (865-925 CE) in the Patna version [2, p. 3 lines 5, 10] are missing in the Leiden version [30, p. 11-12].

2. Two large parts of the Patna version are missing in the Leiden version. The first of these parts includes the proofs of the first property of the broken line by the tenth-century geometers Sulaymān ibn ʿIṣmat al-

Samarqandī, Abu'l-Ḥasan ibn Bāmshādh, Abu'l-Ḥasan al-Samarqandī and Abū Jaʿar al-Khāzin [2, p. 36-45 line 3]. The second missing part in the Leiden version consists of the two chapters at the end of the Patna version on the computation of the chord of one degree and the trisection of the angle, including geometrical figures [2, p. 107 line 1 - p. 108 line 14, followed by p. 224 line 2 - p. 226 line 4]. The Leiden version has only one sentence on the subject [30, pp. 63-64]. The Leiden version may ultimately be based on a manuscript of the *Extraction of Chords* from which some leaves were missing.

3. In the Leiden version, two proofs are attributed to Abū ʿAbdallāh al-Shannī where no such attribution is made in the Patna version. The first case concerns the proof of the triangle rule by Archimedes which is published in this paper. Above it has been argued that the attribution to al-Shannī is plausible. The second case concerns a geometrical construction of two line segments beginning at two given points A and B and meeting at a point G in such a way that $\angle AGB$ is given and the product $AG \cdot BG$ is given, compare [30, p. 35] where al-Shannī is mentioned, with [2, p. 53] where no attribution is made.

In the two proofs which are published in this paper, the following differences between the Patna and Leiden versions can be noticed:

4. The Patna version is concise and clear, while the Leiden version is more elaborate and sometimes confused. For details see the footnotes to the translation of the Leiden version.

5. At the end of the proof of the area rule for the triangle, the Leiden version discusses the case where the triangle is isosceles. This case is not mentioned in the Patna version.

The two versions of the *Extraction of Chords* were compared by Saidan [24, p. 771] and by Bulgakov and Rosenfeld [4, p. 9]. Saidan calls the Leiden version a "much abbreviated copy" of the original, which is the Patna version in his opinion. Bulgakov and Rosenfeld add that the Leiden version may have been revised by an anonymous editor, but since the Patna manuscript is imperfect, the Leiden version is necessary for the reconstruction of al-Bīrūnī's original.[16] The precise

[16]The Iranian historian of mathematics A.Q. Qurbani argued in [20] that the Leiden version is a different work by Biruni entitled "Collection of current ways for the determination of chords in the circle" (*Jamʿ al-ṭuruq al-sāʾira fī maʿrifat awtār al-dāʾira*). On the last page f. 326a of the Patna manuscript, al-Bīrūnī says that the *Jamʿ al-ṭuruq*

relationship between the two versions can only be established in the context of a critical edition of the entire *Extraction of Chords* and a comparison with relevant other works of al-Bīrūnī.

The *Extraction of Chords* has a complicated publication history. The first publication of the work in a Western language was Suter's German translation [30] on the basis of the Leiden manuscript only. The Arabic text in the Patna manuscript was first published in 1948 in the Hyderabad edition [2], which is problematic for two reasons. The editors did not check the mathematical meaning of the text, and therefore they did not catch the scribal errors in the imperfect Patna manuscript. Secondly, the editors believed that the whole manuscript text from 282a through 326a belonged to the *Extraction of Chords*. In 1960 A.S. Saidan discovered that the text in the Hyderabad edition on [2, p. 108 line 14] continues on [2, p. 224 line 2] and that the more than hundred pages intermediate text in [2] (corresponding to the leaves 299a-325b in the disorganized Patna manuscript) are fragments at least one other work by al-Bīrūnī and one work by the tenth-century geometer Ibrāhīm ibn Sinān.[17] In 1965 A. S. al-Demirdash published in [7] an edition of the Arabic text of the *Extraction of Chords* on the basis of the Patna version. The Arabic text on the area of the rules for the triangle and the cyclic quadrilateral is in [7, p. 104-119], and al-Demirdash included the proof of the triangle rule in the Leiden version on the basis of manuscript M. The edition by al-Demirdash is not a critical edition but his text is mathematically much superior to the Hyderabad edition [2]. Unfortunately al-Demirdash mixed his own commentaries in Arabic with the Arabic text of al-Bīrūnī. Al-Demirdash was apparently unaware of the article [23], and thus he did not realize that part of his edited text [7, p. 172-286] did not belong to the *Extraction of Chords* but to other works by al-Bīrūnī and by Ibrāhīm ibn Sinān.

An excellent Russian translation of the *Extraction of Chords* with commentary was published in 1987 in [4, pp. 27-77, 259-278]. The

al-sā'ira fī ma'rifat awtār al-dā'ira contains additional material, not found in the Patna manuscript, from his own commentary on the reasons of the Zīj (astronomical handbook) of Ḥabash, related to the approximate determination of the chord of one degree [2, p. 226 lines 1-4]. No such material is found in the Leiden version, and therefore neither the Patna version nor the Leiden version can be the *Jam' al-ṭuruq al-sā'ira fī ma'rifat awtār al-dā'ira*. Qurbani did not have access to the Patna manuscript but based himself on the unreliable Hyderabad edition [2].

[17] See [23] and for more details [9, pp. 148-159].

translators Bulgakov and Rosenfeld did not know Saidan's article [23] but they reached the same conclusions and excised the text in the leaves 299a-325b of the Patna manuscript. The Russian translation of the text on the area rules for the triangle and the cyclic quadrilateral is in [4, pp. 53-56, 269-270]; the translation is based on the Patna version, to which a few sentences from the Leiden version were added in italics.

Most of the secondary literature in Western languages on the *Extraction of Chords* is based on Suter's translation [30] of the Leiden version. Although Suter reconstructed the correct argumentation in the footnotes to his translation and in his notes [30, pp 39-42, 70], the geometric ideas are less than clear. In his influential *Geschichte der Elementarmathematik*, the German historian Johannes Tropfke called the proof complicated and difficult, and too long to be summarized [32, p. 156]. By means of the texts and translations in this paper, the reader may convince himself of the essential simplicity of the proof.

5. Editorial procedures

The Arabic edition of the Patna version of the proofs of the two area rules is based on manuscript P ff. 291a-292a. The manuscript P is not perfect and I have done my best to reconstruct al-Bīrūnī's original text by means of a few corrections which are paleographically possible. These corrections are indicated in the apparatus at the end of the text, with the following exceptions. In references to the labels of points in the geometrical figures, the text in manuscript P often reads ḥāʾ (H) where it should be jīm (G) and vice versa, and initial bāʾ (B) is often indistinguishable from initial lām (L). In such cases I have selected the mathematically correct label, without burdening the apparatus with these trivial corrections. I have indicated all instances where my reconstructed text differs from the Hyderabad edition [2, pp. 61-67], which I have abbreviated to H in the apparatus to the Arabic text, and to Hyd in the translation. My corrections which are also found in the edition of al-Demirdash [7, pp. 104-119] have been credited to him, using the abbreviation D in the apparatus and Dem in the translation. Angular brackets in the Arabic text and the translation $< \ldots >$ include a few passages which I have restored to the text in P in order to reconstruct al-Bīrunī's original. These restorations are inspired by the Leiden version, which is ultimately based on the same original. Such reconstructed

text inside angular brackets is not found in the Hyderabad edition [2]. Page numbers are indicated in square brackets, using the abbreviations P for the Patna manuscript and H for the Hyderabad edition [2]. I have adapted the Arabic text to modern orthography and have added a few full stops.

The Arabic edition of the Leiden version of the two proofs of the area rules is based on the two manuscripts L ff. 119b-121a and M ff. 63b-65a. Page numbers in these manuscripts appear in square brackets in the text. I have attempted to construct an Arabic text which is mathematically correct, and have put the variant readings in the manuscripts in the apparatus, but with the same exceptions H/G and B/L as for the Patna version. It should be noted that the Leiden version may be the product of an editor whose mathematical abilities may have been less than perfect. Therefore the mathematically corrected text may well reflect the original which this anonymous editor used rather than his edited Leiden version. I have adapted the Arabic text to modern orthography and have added a few full stops.

In the translations of the Patna and the Leiden versions and in Figures 7 to 10, the labels in the geometrical figures (which the Arabic-Islamic authors considered as numbers in the abjad-system rather than letters) have been transcribed according to the following key: alif=1=A, bāʾ=2=B, jīm=3=G, dāl=4=D, hāʾ=5=E, zāʾ =7=Z, ḥāʾ=8=H, ṭāʾ=9=T, kāf=20=K, lām=30=L, mīm=40=M. The labels wāw=6 and yāʾ=10 were not used in our text; these two labels were rarely used anyway.

In the translations, parentheses ( ) include explanatory additions made by me. Footnotes to the translation of the Patna version contain mathematical explanations and references to the *Elements* of Euclid which was (in Arabic translation) the standard geometrical textbook in the time of al-Bīrūnī. Such mathematical explanations have not been repeated in the Leiden version. In the translation of the Leiden version I have added footnotes in all cases where the reconstructed text differs from the two manuscripts L and M at the same time, with due references to Suter's translation [30, p. 39-42]. In such cases, the incorrect text in the two manuscripts may have been produced by the anonymous editor of the Leiden version. In the translations of the two versions, words written in red ink in the manuscript text are printed in *italics* in the translation.

6. Translation of the Patna version.

Proof of the procedure of Archimedes in measuring the triangle by means of the excess.

Archimedes said: half the sum of the three sides of the triangle is multiplied by its excess over one of them, and the outcome by its excess over the second, and the outcome by its excess over the third, and the square root of the outcome is taken, and that is the area of the triangle.

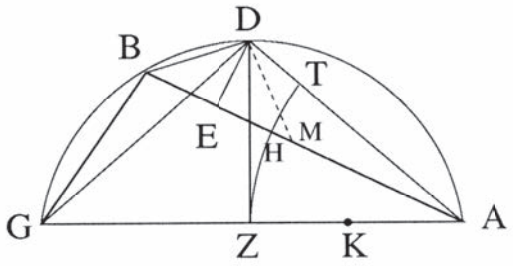


Figure 7

Proof of it: the triangle is ABG. We circumscribe around it a circle. We drop from the midpoint D of arc ABG perpendicular DE onto AB, < and perpendicular DZ onto AG. > We describe with centre A and radius AZ arc ZHT.

Then since the square of DA is equal to the (sum of the) squares of DZ, ZA,[18] (thus) the square of DT and < twice >[19] the product DT by TA and the square of TA are (together) equal to the (sum of the) squares of DZ, ZA,[20] which is equal to TA. Thus if we subtract the squares of AT, AZ, which are equal, then the square of DT and twice the product DT by TA are (together) equal to the square of DZ.

In a similar way, the square of AD is equal to the (sum of the) squares of DE, EA. Therefore the (sum of the) squares of DT, TA and twice the product DT by TA are (together) equal to the square of DE and the (sum of the) squares of EH, HA and < twice >[21] the

[18] $DA^2 = DZ^2 + ZA^2$ and $DA^2 = DE^2 + EA^2$ by the theorem of Pythagoras, Euclid *Elements* I:47 [8, vol. 1 p. 349].

[19] Added by Dem [7].

[20] $DA^2 = DT^2 + 2DT \cdot TA + TA^2$ and $EA^2 = EH^2 + HA^2 + 2EH \cdot HA$ by Euclid, *Elements* II:4 [8, vol. 1 p. 379.]

[21] Added by Dem [7].

product EH by HA. But HA is equal to AT. Thus if we subtract the two equal squares of them, the square of DT and twice the product DT by TA are (together) equal to the (sum of the) squares of DE, EH and twice the product EH by HA, and that is also equal to the square of DZ.

Triangle DZA is similar to triangle DEB because angle DGZ, which is equal to angle DAZ, is (also) equal to angle DBE which is (i.e., stands) together with it (DGZ) on the same arc.[22] Therefore the ratio of DE to EB is equal to the ratio of DZ to ZA.[23] But the ratio of DZ to ZA is equal to[24] the ratio of the square of DZ to the product DZ by ZA and equal to the ratio of the product DZ by ZA to the square of ZA. Just like this also, the ratio of the square of DE to the product DE by EB is equal to the ratio of the product DE by EB to the square of EB.

If one subtracts from mutually proportional magnitudes (other) mutually proportional magnitudes in their (same) ratios, the ratios of the remainders are the same as their (ratios).[25]

Thus we subtract the square of DE from the square of DZ, then the remainder is the square of EH and twice the product EH by HA, that is the product EH by the sum of EA[26] and one time HA.[27] We subtract the product DE by EB from the product DZ by ZA, then the remainder is the area of triangle ABG, because it has been explained

[22] $\angle DBA = \angle DGA$ because they stand on arc AD, by Euclid's *Elements* III:21 [8, vol. 2 p. 49]. The triangles DBE and DAZ are similar because $\angle DBE = \angle DGZ = \angle DAZ$ and $\angle E$ and $\angle Z$ are right angles.

[23] In the similar triangles DBE and DAZ we have $DE : BE = DZ : ZA$ by Euclid, *Elements* VI:4 [8, vol. 2 p. 200].

[24] We have $DZ : ZA = DZ^2 : DZ \cdot ZA = DZ \cdot ZA : ZA^2 = DE : EB = DE^2 : DE \cdot EB = DE \cdot EB : EB^2$ by Euclid, *Elements* VI:1 [8, vol. 2 p. 191].

[25] The text means the following in modern notation. Suppose $a_1 \ldots a_4$ and $b_1 \ldots b_4$ are "mutually proportional magnitudes" of the same kind, that is to say that $a_1 : a_2 = a_3 : a_4$ and $b_1 : b_2 = b_3 : b_4$. If they are in the same ratio, that is to say if $a_1 : a_2 = b_1 : b_2$ and if one assumes $a_1 > b_1, a_2 > b_2$ etc., then $(a_1 - b_1) : (a_2 - b_2) = (a_3 - b_3) : (a_4 - b_4) = a_1 : a_2 = a_3 : a_4 = b_1 : b_2 = b_3 : b_4$ by Euclid, *Elements* V:19 [8, vol. 2 p. 174]. In the text the theorem is used for $a_1 = DZ^2, a_2 = a_3 = DZ \cdot ZA, a_4 = ZA^2, b_1 = DE^2, b_2 = b_3 = DE \cdot EB, b_4 = EB^2$ to obtain $(DZ^2 - DE^2) : (DZ \cdot ZA - DE \cdot EB) = (DZ \cdot ZA - DE \cdot EB) : (ZA^2 - EB^2)$.

[26] P and Hyd [2] have EH.

[27] Above it has been proved that $DZ^2 = DE^2 + EH^2 + 2EH \cdot HA$, and we have $EH^2 + 2EH \cdot HA = EH(EH + HA + HA) = EH(EA + HA)$.

that triangle AGD is equal to the sum of triangles ABG, BDM.[28] Let ZK be equal to EB. We subtract the square of ZK, that is EB, from the square of ZA, then the remainder is equal to the product GK by KA.[29] These remainders are proportional, that is to say that the ratio of the product EH by the sum of EA, AZ to the area of triangle ABG $<$ is equal to the ratio of the area of triangle ABG $>$ to the product GK by KA.

AE is half the (sum of the) sides AB, BG and AZ is half of side AG, thus the sum of EA, AZ is half the sum of the sides of the triangle.[30] Therefore EH is the excess of (the sum of) EA, AZ, half the sum of the sides, over the sum of HA, AZ, that is to say AG, and this is one of the excesses. Since ZK and EB are equal, the sum of AE, ZK is equal to side AB. Therefore AK is the excess of the sum of EA, AZ over EA, ZK, that is to say AB, and this is the second excess. And since (the sum of) EB, BG is equal to AE, therefore (the sum of) EB, BG, AZ is equal to half the sum of the sides, thus the excess of it over BG is (the sum of) EB, AZ. But KZ is equal to EB and ZG is equal to AZ, thus KG is the excess of half the sum of the sides over BG, and this is the third excess.[31] And when we multiply area EH by (the sum of) EA, AZ, which is one of the extreme terms in the ratio, by the area GK by KA, the other extreme term, the outcome is the square of the mean (term), which (term) is the area of the triangle.[32]

[28]The fourth property of the broken line is to the effect that the area of triangle AGD is equal to the area of the triangles ABG plus the rectangle $DE \cdot EB$. Here the text represents $DE \cdot EB$ as the area of a triangle BDM, and we can therefore assume with [4, p. 269 n. 235] that point M is located on the line segment AE in such a way that $EM = EB$. Point M and line DM are not found in the figure in the manuscript. and therefore line DM is displayed as a broken line in Figure 7.

[29]We have $GZ = ZA$ and therefore $ZA^2 - ZK^2 = (GZ + ZK) \cdot (ZA - ZK) =$ $= GK \cdot KA$ by Euclid, *Elements* II:5 [8, vol. 1 p. 382].

[30]If we write the sides in modern notation as $a = BG, b = AG, c = AB$ and the half perimeter $s = \frac{1}{2}(a + b + c)$ as in the introduction, we have $EA = \frac{1}{2}(c + a)$ by the first property of the broken line. Since $GZ = ZA$, also $ZA = \frac{1}{2}b$ and therefore $EA + ZA = s$.

[31]Using the same notation it is easy to check the computations. Because $AH =$ $= AZ = \frac{1}{2}b$, therefore $EH = AE - AH = \frac{1}{2}(a + c) - \frac{1}{2}b = s - b$. Further $ZK = EB = \frac{1}{2}(c - a)$ by the definition of point K, therefore $AK = AZ - ZK =$ $= \frac{1}{2}b - \frac{1}{2}(c - a) = s - c$. Finally $KG = KZ + ZG = \frac{1}{2}(c - a) + \frac{1}{2}b = s - a$.

[32]The text proves $EH \cdot (EA + AZ) : [ABG] = [ABG] : GK \cdot AK$, or in

It is the same if we multiply EH, the first excess, by (the sum of) EA, AZ, half the sum of the sides, and (then) multiply AK, the second excess by GK, the third excess, and then multiply the two products, or if we multiply (the sum of) EA, AZ, half the sum of the sides, by KA, and then the outcome by EH, and then the outcome by GK, for the two (final) outcomes are the same, and that is the square of the area of the triangle. Thus, if we take the square root of it, we obtain what was desired.

Proof of the procedure of India for the measurement of the trapezium[33] *in the circle, by Abū ʿAbdallāh al-Shannī.*

Abū ʿAbdallāh al-Shannī built on this[34] in the proof of the method of India for the area of the quadrilateral in the circle. It is as follows: they multiply the (four) excesses of half the sum of its sides over each side by one another and they take the root of the outcome, then it is the area of the trapezium, and let it be $ABGT$.

modern notation $s(s-b) : [ABG] = [ABG] : (s-a)(s-c)$. We write the area of triangle ABG as $[ABG]$. The multiplication of two areas or four line segments shows $[ABG]^2 = s(s-a)(s-b)(s-c)$, that is to say $[ABG] = \sqrt{s(s-a)(s-b)(s-c)}$, but note that a multiplication of four line segments is not possible in Greek geometry and this is probably the reason why the multiplication is delayed until the very end.

[33] Although the Arabic word is *munḥarif.* meaning trapezium, the first line of the text shows that an arbitrary "quadrilateral in the circle" is meant.

[34] In Figure 8, the letters A, B, G, D, E, Z are labels of the same points as in Figure 7, and for these points the same assumptions hold. We can show that DZ is perpendicular to AG: since DK is a diameter of the circle and arc AD = arc DG, therefore arc AK = arc GK, thus $\angle ZAG = \angle ZDG$ and therefore triangles ZAD and ZGD are congruent because also $AD = GD$ and $ZD = ZD$ by *Elements* I:4 [8, vol. 1 p. 247]. We conclude $AZ = ZG$ and $\angle AZD = \angle GZD$ which must therefore be right angles.

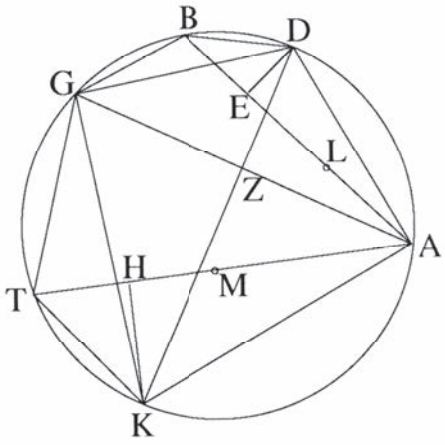


Figure 8

We draw AG and we draw from the midpoint D of arc ABG the diameter DZK, and we drop two perpendiculars DE, KH onto AB, AT. Then, because of the similarity of triangles DEB, DZG and DB being shorter than DG, therefore ZG,[35] that is to say AZ, is greater than EB.[36] But AZ, half of side AG, is less than AH, half of the sum of the sides AT,[37] TG.[38] Therefore AH is much greater than EB. Similar to this it is shown that AE is greater than HT. Thus we cut off EL equal to HT and HM equal to EB.[39]

It is known that the excess of area $ADGK$ over area $ABGT$ is equal to the product DE by EB together with the product KH[40] by HT.[41]

[35]Hyd [2] reads AG, restored to GZ by Dem [7].

[36]Triangles DEB and DZG are similar and $DB : EB = DG : ZG$ as in the previous proposition. Because arc BD is less than arc DG, $DB < DG$, and therefore $EB < ZG$ by Euclid, *Elements* V:14 [8, vol. 2 p 162].

[37]Hyd [2] reads AG, restored in [4, p. 55]. Here al-Shannī uses the fact that ATG is also a "broken line" in the circular arc AKG with midpoint K.

[38]The argument is based on *Elements* I:20, Heath vol. 1, p 286.

[39]Since $EL = HT < AE$ and $HM = EB < AH$, point L is located between E and A and point M is located between H and A.

[40]Manuscript P and Hyd [2] have KG, restored to KH by Dem [7].

[41]Since ABG is a broken line in arc ADG with midpoint D, the area of triangle ADG is the sum of the area of triangle ABG plus the rectangle $EB \cdot ED$. Since ATG is a broken line in arc AKG with midpoint K, the area of triangle AKG is the sum of the area of triangle ATG plus the rectangle $HT \cdot HK$. By addition we obtain the area of kite $ADGK$ as the sum of the area of the quadrilateral $ABGT$ plus the sum of the two rectangles.

Triangle DAK is similar to each of the two triangles DEB, KHT.[42] Therefore the ratio of DA to AK is equal to the ratio of DE to EB and (also) equal to the ratio of TH to HK. But the ratio of DA to AK is equal to the ratio of the square of DA to the product DA by AK <and equal to the ratio of the product DA by AK to the square of AK.> The product of DA and AK is equal to twice triangle DAK and that is area $ADGK$. Thus it (area $ADGK$) is a mean proportional between the product AD by DG and the product AK by KG.[43]

The sum of proportional magnitudes together with other proportional magnitudes in the same ratio or the differences between them - each (magnitude) combined with the corresponding (magnitude), are proportional in the same way.[44] Therefore the ratio of (1) the sum of the squares of DE, TH to (2) the sum of the product DE by EB and the product of TH and KH is the same as the ratio of the sum of these two areas to (3) the sum of the squares of EB, KH.

And if (1) the sum of the squares DE, TH,[45] that is to say EL, is subtracted from the square of AD, and (2) the sum of the product DE by EB and the product of TH and KH (is subtracted) from the area $ADGK$ and (3) the sum of the squares of EB, KH (is subtracted) from the square of AK, the remainders are proportional.[46] As for the first remainder, it is the product AL by the sum of LB, BG[47] because if the square of DE is subtracted from the square of AD, the square of AE remains, therefore if from it one subtracts the square of HT, which is equal to EL, the remainder is the square of AL and twice the product AL by LE, and that is equal to the product AL by the sum of AE, EL, that is to say the product AL by the sum of GB, BE, which

[42]This follows from $\angle DBA = \angle DKA$, $\angle KDA = \angle KTA$ and $\angle BED = \angle DAK = \angle THK$ which are right angles, using Euclid, *Elements* III: 27, 31, VI:4 [8, vol. 2 pp. 58, 61, 200].

[43]The text means $AD \cdot DG : [ADGK] = [ADGK] : AK \cdot KG$, which follows from $AD^2 = AD \cdot AK = AD \cdot AK = AK^2$.

[44]This is a generalisation of the theorem in the previous proposition: if $a_1 : a_2 = a_3 : a_4 = b_1 : b_2 = b_3 : b_4$ then $(a_1 \pm b_1) : (a_2 \pm b_2) = (a_3 \pm b_3) : (a_4 \pm b_4) = a_1 : a_2 = a_3 : a_4 = b_1 : b_2 = b_3 : b_4$. The addition case can be proved by repeated applications of Euclid, *Elements*, V:16, 18, [8, vol. 2 pp. 164, 169].

[45]Hyd [2] reads TG, restored to TH by Dem [7].

[46]The text means $(AD^2 - DE^2 - TH^2) : ([ADGK] - DE \cdot EB - TH \cdot KH) = ([ADGK] - DE \cdot EB - TH \cdot KH) : (AK^2 - EB^2 - KH^2)$.

[47]Hyd [2] reads LG, restored to GB by Dem [7].

(sum) is equal to AE, (added) to LE. As for the second remainder, it is trapezium $ABGT$. As for the third (remainder), it is in a way similar to what has been explained for the first (remainder), the product AM by the sum of MT, TG.[48]

It is known that AE is half $<$ the sum of AB, BG, and that AH is half $>$ the sum of AT, TG, Therefore the sum of EA, AH is half the sum of the sides of the trapezium $ABGT$. Because of the equality of EB and HM, the excess of the sum of EA, AH over side AB, that is to say, (over the sum of) AE, HM, is AM, (which is therefore) the first excess, and (the excess of the sum of EA, AH) over AT is in the same way AL,[49] the second excess. Again, the sum of lines EB, BG, GT, TH is also half the sum of the sides of the trapezium, therefore the excess of it over side BG is the sum of GT, TH together with HM which is equal to EB, and it (the sum of GT, TH, HM) is the third excess, and the excess of it over side GT is in a way similar to this, (the sum of) LB, BG,[50] the fourth (excess).[51]

As has been explained before,[52] the trapezium $ABGT$ is a mean proportional between the product AL, the second (excess), by the sum of LB, BG, the fourth (excess), and the product of AM, the first excess, by the sum of MT, TG, the third excess.[53]

It is the same if we multiply one of these two products by the other, or multiply the first excess by the second, the outcome by the third, and the outcome (of this) by the fourth, for by both of these (methods) one obtains the square of the mean, that is the trapezium. Therefore if we take the root of it, it is the desired (area).

[48]By the theorem of Pythagoras $AD^2 - DE^2 = AE^2$ and $AK^2 - KH^2 = AH^2$. Then the previously defined points L and M are used: $AE^2 - TH^2 = AE^2 - EL^2 = = (AE - EL)(AE + EL) = (AE - EL)(GB + BE + EL) = AL \cdot (GB + BL)$ and $AH^2 - EB^2 = AH^2 - HM^2 = (AH - HM)(AH + HM) = = (AH - HM)(GT + TH + HM) = AM \cdot (GT + TM)$.

[49]P and Dem [7] have AL, Hyd [2] reads incorrectly *ilā*, "towards".

[50]Hyd [2] has LG, restored in [4, p. 56].

[51]In modern notation we can verify these results as follows. Put $c = AB$, $a = BG, b = GT, d = TA$ and $s = \frac{1}{2}(a + b + c + d)$. Then we have $AE = \frac{1}{2}(c + a), HM = EB = \frac{1}{2}(c - a), AH = \frac{1}{2}(d + b), EL = HT - \frac{1}{2}(d - b)$, whence $s = AE + AH = EB + BT + TG + GH$ and therefore $AM = AH - HM = s - c, AL = AE - EL = s - d$, $MT + TG = AH + HM = s - a, LB + BG = AE + EL = s - b$.

[52]Hyd [2] has errors in the following sentence, see the apparatus to the Arabic text.

[53]The text means $AL \cdot (LB + BG) : [ABGT] = [ABGT] : AM \cdot (MT + TG)$.

7. Translation of the Leiden version.

Proof of the rule of Archimedes for measuring triangles by means of the excess of their sides, by Abū ʿAbdallāh al-Shannī.

Archimedes said: if we want the measurement (i.e., area) of any triangle by means of its sides, we take the excess of half the sum of its sides over each of its sides. We multiply one of these three excesses by another of them and then the outcome by the third (excess) and then the outcome by half the sum of the sides of the triangle, and we take the root of the outcome, then the result is the measurement (i.e., area) of that triangle.

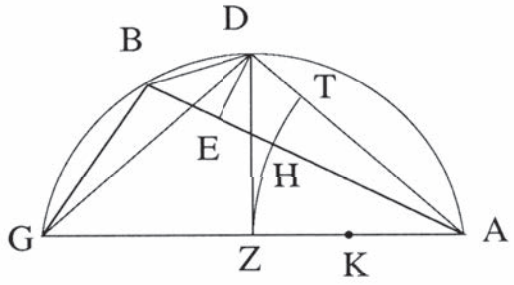


Figure 9

Abū ʿAbdallāh said: Proof of this: we make the triangle (such that) on it (are labels) ABG and we circumscribe on it circle $ADBG$, and let point D be at the midpoint of arc $ADBG$. We drop from it onto line AB perpendicular DE, and onto line AG[54] perpendicular DZ, and we draw DA, DG, DB. We make point A the centre and we draw with radius AZ arc ZHT of a circle, which intersects line AE at point H and line AD at point T.

Then the square of DA is equal to the (sum of the) squares of DE, EA. The two lines AT, AZ[55] are equal. The square of DT and twice the product DT by TA, and that is equal to the square of DZ since we have made AT equal to AZ.[56] The square of DZ is equal to the square

[54]The manuscripts have AD, corrected to AG by Suter [30] and Dem [7].

[55]The manuscripts have AT, AD, Suter [30] and Dem [7] have correctly AT, AZ.

[56]The sentence is grammatically defective. Mathematically, $DT^2 + 2DT \cdot TA = DZ^2$ can be obtained by subtracting $AT^2 = AZ^2$ from $DT^2 + 2DT \cdot TA + AT^2 = DA^2 = DZ^2 + AZ^2$.

of DE together with the square of EH and twice the product EH by HA.[57]

Since triangle DEB is similar to each of the triangles DZG, DZA because angles AGD,[58] ABD, GAD are equal because each of them is the chord of[59] half of arc $ADBG$, thus the ratio of DE to EB is equal to the ratio of DZ to ZA. But the ratio of DZ to ZA is equal to the ratio of the square of DZ to the area DZ by ZA and equal to the ratio of area DZ by ZA to the square of ZA. Therefore[60] also the ratio of the square of DE to area DE by EB is equal to the ratio of area DE by EB to the square of EB.

If from proportional (magnitudes) one subtracts proportional (magnitudes) in the ratio of them, the remainders are proportional.

Thus, if we subtract the square of DE from the square of DZ, the remainder is, by what we have explained, the square of EH and twice the product EH by HA, that is the product EH by the sum of EA, AZ.[61] And if we subtract the product DE by EB from the product DZ by ZA, which is the area of triangle DAG, the remainder is the area of triangle ABG, and that is by what we explain among the properties of the broken line.[62] And if we subtract the square of EB, that is the square of KZ if we make ZK equal to EB, from the square of ZA, the remainder is the product GK[63] by KA. Thus, by subtraction, the triangle ABG is a mean proportional between the area EH by the sum of EA, AZ and the area GK by KA.[64]

As for EH, it is the excess of the sum of EA, AZ, which is half the sum of the sides of triangle ABG, over side AG, since we have

[57]Here the manuscripts repeat: "thus the square of DZ is equal to the square of DE and the square of EH and twice the product EH by HA".

[58]The manuscripts have ADZ, corrected to AGD by Suter [30].

[59]The Arabic verb *tuwattiru*, from the root *watar* (chord), is terminologically incorrect because and angle can never be the chord of an arc.

[60]The manuscripts have "therefore", *li-dhālika*, but the mathematical meaning requires "just like this", *ka-dhālika*, as reconstructed by Suter [30] ("ebenso") and Dem [7, p. 109 line 13].

[61]We have $DZ^2 - DE^2 = EH^2 + 2EH \cdot HA = EH(EH + 2HA) =$
$= EH(EA + HA) = EH(EA + AZ)$.

[62]The property in question is the fourth property of the broken line in the Patna version. In the Leiden version this property is mentioned in the third proof of the first property of the broken line by al-Shannī [30, p. 20].

[63]The manuscripts have DK, restored to GK by Suter [30] and Dem [7].

[64]The manuscripts have KB, restored to AK by Suter [30] and to KA by Dem [7].

made AH equal to ZG, and since the perpendicular DE bisects the sum of the two lines AB, BG at E, and AG is also bisected at Z.[65] AK is also the excess of the sum of EA, AZ over AB because we have made[66] KZ equal to EB, and EH, AK, KG are the excesses of half the sum of the sides of triangle ABG over each of its sides.

It is the same to multiply the area AK by KG by the area EH by the sum of EA, AH, and to multiply AK by KG, that is, one of the excesses by the other, and then the outcome by EH, the third excess, and then the outcome by the sum of EA, AZ, half the sum of the sides. The outcome in all of them is the area of triangle ABG multiplied by itself. That is what we wanted to explain.

And if the triangle is isosceles, as triangle ADG,[67] then the ratio of the square of DZ to the area DZ by ZA is equal to the ratio of exactly the same area to the square of ZA. As for the square of DZ, we have explained that it is equal to the square of DT[68] and twice the product DT by TA, that is to say, equal to the product DT by the sum of DA, AZ. As for the area DZ by ZA, it is the area of triangle ADG. As for the square of AZ, it is equal to the area AZ by ZG. Therefore we multiply AT by GZ,[69] and that is one of the excesses by the other, then the outcome by DT, the third excess, then the outcome by the sum of DA, AZ, and that is the sum of half the sides, and the outcome is the square of area DZ by ZA, and that is what we wanted to explain.[70]

Proof of a rule attributed to India for the measurement of the trapezium circumscribed in a circle, by Abū ʿAbdallāh al-Shannī.

If we want the measurement of the trapezium[71] which is circum-

[65]The manuscripts have ZA, restored to Z by Dem [7].

[66]Here the manuscripts repeat: "AH equal to ZG Since the perpendicular DE bisects the sum of the two lines AB, BG at E, and AG is also bisected at Z, and AK is also the excess of the sum of EA, AZ over AB, because we have made."

[67]The manuscripts have ABG, restored to ADG by Suter [30].

[68]The manuscripts have DK, restored to DT by Suter [30] and Dem [7].

[69]The manuscripts have KZ, restored to ZG by Dem [7].

[70]The special case of the isosceles triangle is not discussed in the Patna version. In the Patna version, the point T is used for dividing the square of AD into the two squares of AT and TD and twice the rectangle $AT \cdot TD$.

[71]The Leiden and Patna versions use the same word *munḥarif*, trapezium, even though an arbitrary cyclic quadrilateral is meant. This is one of the arguments why the two versions are ultimately based on a single original.

scribed by a circle in which it is contained, we take the excess of half of the sum of its sides over each of its sides. Then one of these excesses is multiplied by another excess, and then the outcome by the third excess, and then the outcome by the fourth excess, and then the root of the amount is taken, and the result is the measurement (i.e., area) of that trapezium.

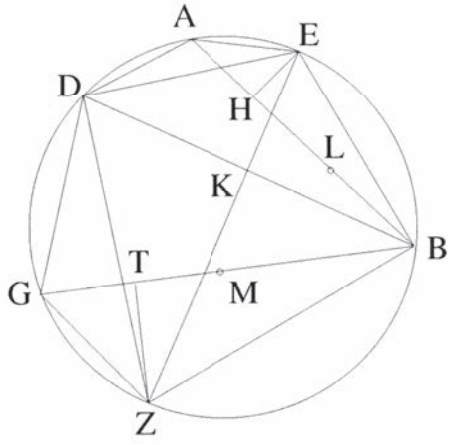


Figure 10

For the proof let us draw a quadrilateral $ABGD$ in a circle $ABGD$. We bisect each of the arcs BAD, BGD at points E, Z and we draw lines BE, ED, DZ, ZB, EA, EZ. We drop perpendicular EH onto AB and perpendicular ZT onto BG. We mark at the intersection of lines BD, EZ the point K. Then triangles EHA, EKD are similar, and ED is longer than EA, therefore KD is longer than HA. But BT is half of the sum of BG and DG as we have explained before, therefore BT is longer than DK, and thus it is much longer than AH. Similarly, we can also explain in the same way of this proof that BH is longer than TG. We cut off from BH line HL equal to TG, and from BT line TM equal to AH.

Since[72] the excess of area $EBZD$ over area $ABGD$ is the product EH by HA together with the product ZT by TG, and triangle EHA is similar to triangle EBZ, the ratio of EH to HA is equal to the ratio

[72]Note that the word "since" is out of place here because the statement on the excess of areas is not used to prove the similarity of triangles EHA and EBZ.

of EB to BZ[73]. Similarly also, triangle TZG[74] is similar to triangle EBZ, thus the ratio of ZT[75] to TG[76] is equal to the ratio of ZB to BE. The ratio of EB to BZ is equal to the ratio of the square of EB to the area EB by BZ and equal to the radio of area EB by BZ to the square of BZ.[77] But the square of BE is equal to the product BE by ED, and similarly the square of BZ is equal to the product BZ by ZD, and the product EB by BZ is the area $EBZD$. Therefore area $EBZD$ is a mean proportional between the product BE by ED and the product BZ by ZD.

If proportional (magnitudes) are in the same ratio, and if the corresponding (magnitudes) are added, the sums are proportional. Therefore the ratio of the sum of the squares of EH, GT to the sum of the areas EH by HA and GT by TZ is equal to the ratio of the sum of these two areas to the sum of the squares of AH, ZT.

Again, if from proportional (magnitudes) proportional (magnitudes) are subtracted, the remainders are proportional.[78]

Thus if we subtract (1) the (sum of the) two squares EH, GT, that is to say, (the sum of) the two squares EH, HL because we have made HL equal to TG, from (2) the square of BE, the remainder is area BL by (the sum of) LA, AD, and this is because if we subtract the square of EH from the square of BE the remainder is the square of BH, and if we subtract from the square of BH the square of HL, the remainder is the square of BL and twice the product BL by LH, and that is equal of the product of BL by the sum of BH, BL. As for BH, it is equal to the sum of HA, AD. Therefore the remainder is equal to the product BL times the sum of LA, AD. And if we subtract the sum of area EH by HA and (area) GT by TZ from area $EBZD$, the remainder is area $ABGD$. And if we subtract the two squares of HA, ZT, that is to say, the two squares of ZT, TM, from the square of BZ, the remainder is area BM by (the sum of) MG, GD in analogy with what we have

[73]The Leiden Ms has MD, restored to BZ by Suter [30].

[74]The manuscripts have TZD, restored to TZG by Suter [30].

[75]The manuscripts have ZK.

[76]The manuscripts have KG.

[77]The manuscripts have BE, restored to BZ by Suter [30].

[78]This statement is not generally true. Example: 9:12=12:16 and 4:6=6:9 are proportional magnitudes but (9-4):(12-6) is not equal to (12-6):(16-9). One has to add the condition that the two series of proportional magnitudes are in the same proportion.

explained before. Therefore, by subtraction, area $ABGD$ is a mean proportional between the two areas BL by (the sum of) LA, AD and (area) BM by (the sum of) MG and GD.

Since BH is half the sum of BA, AD, and similarly also BT is half of the sum of BG, GD as we have explained before, the sum of HB,[79] BT is half the sum of the sides of area $ABGD$. The excess of the sum of HB, BT over AB is BM, since we have made TM equal to AH. Again, the excess of it over BG is BL, since we have made LH equal to GT. Again, the sum of HA, AD, DG, GT is half the sum of the sides of area $ABGD$. Therefore the excess of it over AD is the sum of DG, GM as we have explained, and the excess of it $<$ over $>$ GD is the sum of DA, AL as we have also explained. Therefore the lines BL, LAD, DGM and MB are the excesses of half the $<$ sum of the $>$ sides of area $ABGD$ over each of its sides.

We have explained that area $ABGD$ is a mean proportional between area BL by LAD and area BM by MGD.

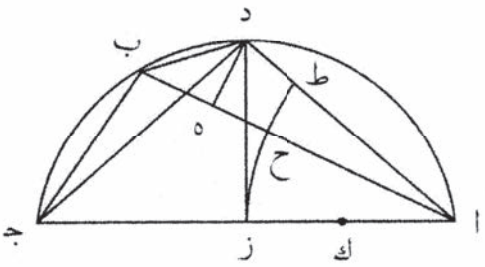
It is the same if we multiply BL by LAD and then the outcome by area BM by MGD or if we multiply BL by LAD and then the outcome by DGM and then the outcome by BM, because the outcome in both of these (procedures) is the area of trapezium $ABGD$ multiplied by itself. Therefore the root is taken, and it is what was desired. That is what we wanted to explain.

8. Arabic text of the Patna version

برهان عمل أرشميدس في مساحة المثلثات بالتفاضل . $[P291a, H61]$

قال أرشميدس يضرب نصف مجموع أضلاع المثلث الثلاثة في فضله على أحدها وما اجتمع في فضله على الثاني وما بلغ في فضله على الثالث ويؤخذ جذر المجتمع فيكون تكسير المثلث .

[79]The manuscripts have HD, restored to BH by Suter [30].



برهانه إن المثلث ابجـ وندير عليه دائرة ونخرج من منتصف قوس ابجـ وهو د عمود ده على اب < وعمود دز على اجـ > وندير على مركز ا وببعد از قوس زحط .

فلأن اد يقوى على دز زا يكون مربع دط وضرب دط في طا < مرتين > ومربع طا مساويًا لمربعي دز زا المساوي لـ طا فإذا ألقينا مربعي اط از المتساويين بقي مربع دط وضرب دط في طا مرتين مساويًا لمربع دز . وكذلك اد يقوى على ده ها فمربعا دط طا وضرب دط [H62] في طا مرتين مساويًا لمربع ده ومربعي هح حا وضرب هح في حا < مرتين > لكن حا مساو لـ اط فإذا أسقطنا مربعيهما المتساويين بقي مربع دط وضرب دط في طا مرتين مساويًا لمربعي ده هح وضرب هح في حا مرتين وذلك أيضًا مساو لمربع دز .

ومثلث دزا شبيه بمثلث دهب لأن زاوية دجز المساوية لزاوية داز مساوية لزاوية دبه الكائنة معها على قوس واحدة فنسبة ده إلى هب كنسبة دز إلى زا ونسبة دز إلى زا كنسبة مربع دز إلى ضرب دز في زا وكنسبة ضرب دز في زا إلى مربع زا . وكذلك أيضًا نسبة مربع ده إلى ضرب ده في هب كنسبة ضرب ده في هب إلى مربع هب .

وإذا ألقي من مقادير متناسبة مقادير متناسبة على نسبها كانت نسب البواقي على حالها .

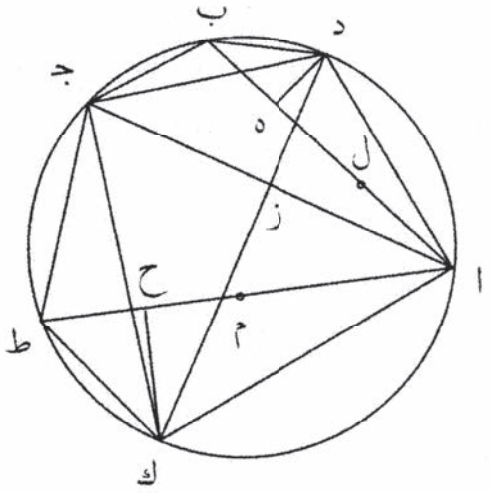
فنلقي مربع ده من مربع دز ويكون ما يبقى مساويًا لمربع هح مع

ضرب هح في حا مرتين أعني ضرب هح في مجموع ها [1] حا مرة ونلقى ضرب ده في هب من ضرب دز في زا فيبقى تكسير مثلث ابج لما تبين من مساواة مثلث ادج مجموع مثلثي ابج بدم . وليكن زك مساويًا لـ هب ونلقي مربع زك أعني هب من مربع زا فيكون الباقي [$H63$] مساويًا لضرب جك في كا وهذه البقايا متناسبة أعني أن نسبة ضرب هح في مجموع ها از إلى تكسير مثلث ابج < كنسبة تكسير مثلث ابج > إلى ضرب جك في كا .

و اه نصف ضلعي اب بج و از نصف ضلع اج فمجموع ها از هو نصف جماعة أضلاع المثلث فـ هح إذن فضل ها از نصف جماعة الأضلاع على مجموع حا از أعني اج وهو أحد الفضول . ولمساواة زك هب يكون مجموع اه زك مساويًا لضلع اب فـ اك إذن فضل مجموع ها از على ها زك أعني اب وهو الفضل الثاني . ولأن هب بج مساو لـ اه فإن هب بج از مساو لنصف جماعة الأضلاع ففضله على بج هو هب از لكن كز مساو لـ هب و زج مساو لـ از فـ كج هو فضل نصف جماعة الأضلاع على بج وهو الفضل الثالث . ومتى ضربنا سطح هح في ها از إحدى الحاشيتين في سطح جك في كا الحاشية الأخرى اجتمع مربع الواسط [2] أعني تكسير المثلث .

وسواء ضربنا هح الفضل الأول في ها از نصف جماعة الأضلاع وضربنا اك الفضل الثاني في جك الفضل [$P291b$] الثالث ثم ضربنا أحد المجتمعين في الآخر أو ضربنا ها از نصف جماعة الأضلاع في كا وما اجتمع في هح [$H64$] وما اجتمع في جك فإن كلي المبلغين يكون سواء وذلك مربع تكسير المثلث فإذا أخذنا جذره كان المطلوب .

برهان عمل الهند في مساحة المنحرف في الدائرة لأبي عبد الله الشني



وعلى هذا بنى أبو عبد الله الشني في البرهان على طريق للهند في تكسير ذي الأربعة الأضلاع في الدائرة وهو أنّهم يضربون فضول نصف جماعة أضلاعه على كل ضلع منه بعضها في بعض ويأخذون جذر المبلغ فيكون تكسير المنحرف وليكن ابجط .

ونصل اج ونخرج من منتصف قوس ابج وهو د قطر دزك وعمودي ده كح على اب اط. فلتشابه مثلثي دهب دزج وقصور دب عن دج يكون زج[3] أعني از أعظم من هب و از نصف ضلع اج [H65] أصغر من اح نصف مجموع ضلعي اط [4] طج فـ اح أعظم كثيرًا من هب وبمثل هذا يتبين أن اه أعظم من حط فنفصل هل مساويًا لـ حط و حم مساويًا لـ هب .

ومعلوم أن فضل سطح ادجك على سطح ابجط مساويًا لضرب ده في هب مع ضرب كح [5] في حط ومثلث داك يشابه كل واحد من مثلثي دهب كحط فنسبة دا إلى اك كنسبة ده إلى هب وكنسبة طح إلى حك ونسبة دا إلى اك كنسبة مربع دا إلى ضرب دا في اك < وكنسبة ضرب دا في اك الى مربع اك > وضرب دا في اك يساوي ضعف مثلث داك

وذلك سطح اجك فهو إذن وسط في النسبة بين ضرب اد في دج وبين ضرب اك في كج .

ومجموع المقادير المتناسبة مع [6] مقادير أخر متناسبة على نسبها أو فضول ما بينها كل واحد مع نظيره كذلك متناسبة . فنسبة مجموع مربعي ده طح إلى مجموع ضرب ده في هب وضرب طح في كح كنسبة مجموع هذين السطحين إلى مجموع مربعي هب كح .

فإن أسقط مجموع مربعي ده طح [7] أعني هل من مربع اد ومجموع ضرب ده في هب وضرب طح في كح [H66] من سطح اجك ومجموع مربعي هب كح من مربع اك كانت البواقي متناسبة . فأمّا البقية الأولى فتكون ضرب ال في مجموع لب بج [8] لأنه اذا أسقط من مربع اد مربع ده بقي مربع اه فإن ألقي [9] منه مربع حط المساوي لـ هل بقي مربع ال وضعف ضرب ال في له وذلك مساو لضرب ال في مجموع اه هل أعني ضرب ال في مجموع جب به المساوي لـ اه إلى له فأمّا البقية الثانية فتكون منحرف ابجط وأمّا الثالثة فتكون لمثل ما تقدم في الأولى ضرب ام في مجموع مط طج فمنحرف ابجط وسط في النسبة بين سطحي ال في لب بج و ام في مط طج .

ومعلوم أن اه نصف مجموع < اب بج و اح نصف مجموع > اط طج فمجموع ها اح نصف جماعة أضلاع منحرف ابجط ولمساواة هب حم يكون فضل مجموع ها اح على ضلع اب أعني اه حم هو ام الفضل الأول وعلى ضلع اط لمثل ذلك ال [10] الفضل الثاني . وأيضًا فإن مجموع خطوط هب بج جط طح هو أيضًا نصف جماعة أضلاع المنحرف ففضله على ضلع [H67] بج هو مجموع جط طح مع حم المساوي لـ هب وهو الفضل الثالث [P292a] وفضله على ضلع جط لمثل ذلك هو لب بج [11] وهو الرابع .

ولكن منحرف [12] $\overline{\text{ابجط}}$ [13] كما تقدم وسط في النسبة بين ضرب $\overline{\text{ال}}$[14] الثاني في مجموع $\overline{\text{لب}}$ $\overline{\text{بج}}$ الرابع وبين [15] ضرب $\overline{\text{ام}}$ الفضل الأول في مجموع $\overline{\text{مط}}$ $\overline{\text{طج}}$ الثالث وسواء ضربنا أحد هذين المضروبين في الآخر أو ضربنا الفضل الأول في الثاني وما اجتمع في الثالث وما اجتمع في الرابع فإن بكليهما يحصل مربع الوسط [16] أعني المنحرف فإذا أخذنا جذره كان المطلوب .

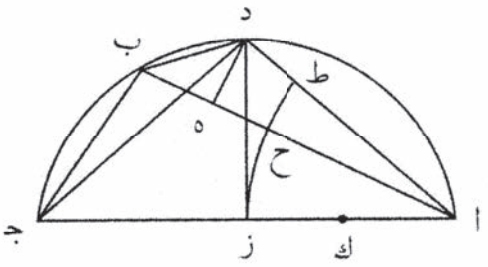
Apparatus to the Patna version

1 $\overline{\text{ها}}$: $\overline{\text{هح}}$ PH . 2 الواسط P : الوسط H .
3 $\overline{\text{زج}}$ P : $\overline{\text{اج}}$ H ، $\overline{\text{جز}}$ D . 4 $\overline{\text{اط}}$ P : $\overline{\text{اج}}$ H . 5 $\overline{\text{كج}}$ D : $\overline{\text{كج}}$ PH .
6 مع P : ـ H . 7 $\overline{\text{طح}}$ D : $\overline{\text{طج}}$ PH . 8 $\overline{\text{بج}}$ P : $\overline{\text{لج}}$ H ، $\overline{\text{جب}}$ D .
9 فإن ألقى P : فألقى H . 10 $\overline{\text{ال}}$ PD : إلى H . 11 $\overline{\text{بج}}$ P : $\overline{\text{لج}}$ H .
12 منحرف P : ضرب H . 13 $\overline{\text{ابجط}}$: $\overline{\text{ابجد}}$ PH ط *above* د P .
14 $\overline{\text{ال}}$ P : $\overline{\text{ل}}$ H . 15 وبين P : بين H . 16 الوسط P : الموسط H .

9. Arabic text of the Leiden version

[$L119b, M63b$] برهان عمل أرشميدس في مساحة المثلثات من جهة تفاضل أضلاعها لأبي عبد الله الشني

[$M64a$] قال أرشميدس إذا أردنا مساحة كل مثلث من جهة أضلاعه فإنا نأخذ فضل نصف جماعة أضلاعه على كل ضلع من أضلاعه ونضرب أحد تلك الفضول الثلاثة في آخر منها ثم ما بلغ في الثالث ثم ما بلغ في نصف جماعة أضلاع المثلث ونأخذ جذر المبلغ فما كان فهو مساحة ذلك المثلث .



قال أبو عبد الله برهان ذلك إنّا نجعل المثلث عليه ابجـ ونخط عليه دائرة ادبجـ وليكن نقطة د على منتصف قوس ادبجـ ونخرج منها على خط اب عمود ده وعلى خط اجـ [1] عمود دز ونصل دا دجـ دب . ونجعل نقطة ا مركزًا وندير ببعد از قوس زحط من دائرة تقاطع خط اه على نقطة ح وخط اد على نقطة ط .

فمربع دا مساو لمربّعي ده ها . وخطا اط از [2] متساويان يكون مربع دط وضرب دط في طا مرتين وذلك مساو لمربع دز لأنّا جعلنا اط مساويًا لـ از يكون مربع دز مساويًا لمربع ده مع مربع هح وضرب هح في حا مرتين [3] .

ولان مثلث دهب شبيه بكل واحد من مثلثي دزجـ دزا لأن زوايا اجد [4] ابد جاد متساوية من أجل أن كل واحدة منها توتر نصف قوس ادبجـ فنسبة ده إلى هب كنسبة دز إلى زا . ونسبة دز إلى زا [5] كنسبة مربع دز إلى سطح دز في زا وكنسبة سطح دز في زا إلى مربع زا . ولذلك أيضًا نسبة مربع ده إلى سطح ده في هب كنسبة سطح ده في هب إلى مربع هب .

والمناسبة إذا أسقط عنها متناسبة على نسبتها كانت البواقي متناسبة .

فإذا أسقطنا مربع ده من مربع دز كان الباقي لما بيّنا مربع هح وضرب هح في حا مرتين أعني ضرب هح في مجموع ها از . وإذا أسقطنا ضرب ده في هب من ضرب دز في زا وهو تكسير مثلث داجـ

كان الباقي هو سطح مثلث ابج وذلك لما نبيّن من خواص الخط المنحنى . وإذا أسقطنا مربع هب أعني مربع كز إذا جعلنا زك مساويًا لـ هب من مربع زا كان الباقي هو ضرب جك [6] في كا فمثلث ابج إذن يبقى موسطًا في النسبة بين سطح هح في مجموع ها از وبين سطح جك في كا [7] .

فاما هح فهو فضل مجموع ها از وهو نصف جماعة أضلاع مثلث ابج على ضلع اج لأنّا جعلنا اح مساويًا لـ زج ولأن عمود ده يقسم مجموع خطي اب بج بنصفين على ه و اج منقسم أيضًا بنصفين [8] على ز [9] .

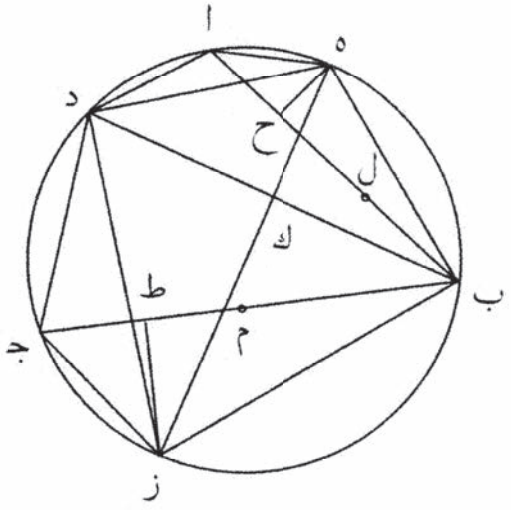
و اك هو فضل مجموع ها از أيضًا على اب لأنا جعلنا [10] كز مساويًا لـ هب . و هح اك كج فضول نصف جماعة أضلاع مثلث ابج على كل واحد من أضلاعه . [$M64b$]

وسواء ضربنا سطح اك في كج في سطح هح في مجموع ها از وضربنا اك في كج وهو أحد الفضول في الآخر ثم ما بلغ في هح وهو الفضل الثالث ثم ما بلغ في مجموع ها از وهو نصف جماعة الأضلاع فإن المبلغ في جميعها هو تكسير مثلث ابج مضروبًا في مثله وذلك ما أردنا أن نبيّن .

وإن كان المثلث متساوي الساقين مثل مثلث ادج [11] كانت نسبة مربع دز إلى سطح دز في زا كنسبة هذا السطح بعينه إلى مربع زا . فأما مربع دز فقد بيّنا [$L120b$] أنه مساو لمربع دط [12] وضرب دط في طا مرتين أعني مساويًا لضرب دط في مجموع دا از . وأما سطح دز في زا فهو تكسير مثلث ادج . وأما مربع از فهو مساو لسطح از في زج . فلذلك نضرب اط في جز [13] وهو أحد الفضول في الآخر ثم ما اجتمع في دط وهو الفضل الثالث ثم ما بلغ في مجموع دا از وهو مجموع نصف الأضلاع فيكون المبلغ مربع سطح دز في زا وذلك ما أردنا بيانه .

برهان عمل ينسب إلى الهند في مساحة المنحرف الذي تحيط به دائرة لأبي عبد الله الشني

إذا أردنا مساحة المنحرف الذي تحيط به دائرة يقع فيها فإنا نأخذ فضل نصف جماعة أضلاعه على كل ضلع من أضلاعه ثم يضرب أحد تلك الفضول في الفضل الآخر ثم ما اجتمع في الفضل الثالث ثم ما اجتمع في الفضل الرابع ثم يؤخذ جذر المبلغ فما كان فهو مساحة ذلك المنحرف .



فلنخط للبرهان ذا أربعة أضلاع ابجد في دائرة ابجد وننصف كل واحدة من قوسي باد بجد على نقطتي ه ز ونصل خطوط به هد دز زب ها هز. ونخرج عمود هح على اب وعمود زط [14] على بج ونعلم على تقاطع خطي بد هز نقطة ك . فمثلثا هحا هكد متشابهان و هد أطول من ها فكد أطول من حا و بط نصف مجموع بج دج على ما قدمنا فبط أطول من دك [15] فهو إذن أطول كثيرًا من اح وكذلك أيضًا نبين بمثل هذا البرهان بعينه أن بح أطول من طج فنفصل من بح خط حل مساويًا لـ طج ومن بط خط طم مساويًا لـ اح .

ولأن فضل سطح هبزد على سطح ابجد هو ضرب هح في حا مع ضرب زط في طج ومثلث هحا شبيه بمثلث هبز فنسبة هح إلى حا

كنسبة هب إلى بز [16] وكذلك أيضًا مثلث طزج [17] شبيه بمثلث هبز فنسبة زط [18] إلى طجـ [19] كنسبة زب إلى به [20] . ونسبة هب إلى بز كنسبة مربع هب إلى سطح هب في بز [$M65a$] وكنسبة سطح هب في بز إلى مربع بز [21] ومربع به [22] مساو لضرب به في هد وكذلك مربع بز مساو لضرب بز [23] في زد وضرب هب في بز هو سطح هبزد فسطح هبزد إذن موسط في النسبة بين ضرب به في هد وبين ضرب بز في زد .

والمناسبة على نسبة واحدة فإن النظائر إذا جمعت كانت المجتمعة [24] متناسبة فنسبة مجموع مربعي هح جط إلى مجموع سطحي هح في حا و جط [25] في طز كنسبة مجموع هذين السطحين إلى مجموع مربعي اح زط .

وأيضًا فإن المناسبة إذا أسقط عنها متناسبة كانت البواقي متناسبة .

فإذا أسقطنا مربعي هح جط أعني [$L121a$] مربعي هح حل لأنّا جعلنا حل مساويًا لـ طجـ من مربع به [26] كان الباقي هو سطح بل في لا اد وذلك لأنّا إذا أسقطنا مربع هح من مربع به كان الباقي هو مربع بح وإذا أسقطنا من مربع بح مربع حل كان الباقي هو مربع بل وضرب بل في لح مرتين وذلك مساو لضرب بل في مجموع بح بل فأما بح فهو مساو لمجموع حا اد فلذلك يكون الباقي مساويًا لضرب بل في مجموع لا اد . وإذا أسقطنا مجموع سطح هح في حا و جط في طز من سطح هبزد كان الباقي هو سطح ابجد . وإذا أسقطنا مربعي حا زط أعني مربعي زط [27] طم من مربع بز كان الباقي هو سطح بم في مجـ جد على نحو ما بيّنا فسطح ابجد إذن يبقى متوسطًا في النسبة بين سطحي بل في لا اد و بم في مجـ جد .

ولأن بح نصف مجموع با اد وكذلك أيضًا بط نصف مجموع بح جد على ما قدمنا يكون مجموع حب [28] بط نصف جماعة أضلاع سطح ابجد ويكون فضل مجموع حب بط على اب هو بم لأنّا جعلنا طم مساويًا لـ اح . ويكون أيضًا فضله على بح هو بل لأنّا جعلنا لح مساويًا

لـ جط . وأيضًا فإن مجموع حا اد دج جط نصف جماعة أضلاع سطح ابجد ففضله على اد هو مجموع دج جم لما بيّنا وفضله < على > جد هو مجموع دا ال لما بيّنا أيضًا فخطوط بل لاد دجم مب هي فضول نصف < مجموع > أضلاع سطح ابجد على كل واحد من أضلاعه .

وقد بيّنّا أن سطح ابجد موسط في النسبة بين سطح بل في لاد وبين سطح بم في مجد .

وسواء ضربنا بل في لاد ثم ما اجتمع في سطح بم في مجد أو ضربنا بل في لاد ثم ما اجتمع في دجم ثم ما اجتمع في بم فإن المبلغ من كليهما هو تكسير منحرف ابجد مضروبًا في مثله فلذلك يؤخذ جذره فيكون المطلوب وذلك ما أردنا أن نبيّن .

Apparatus to the Leiden version

1 اجـ : اد LM . 2 از : اد LM . 3 + فمربع دز إذن مساو لمربع ده ومربع هح وضرب هح في حا مرتين LM . 4 اجد : ادز LM .
5 ونسبة دز إلى ز L : ـ M . 6 جك D : دك LM .
7 كا D : كب LM . 8 بنصفين L : — M . 9 ز D : زا LM .
10 + اح مساويًا لـ زج ولأن عمود ده يقسم مجموع خطي اب بج بنصفين على ه و اج منقسم أيضًا بنصفين على ز و اك هو فضل مجموع ها از أيضًا على اب لأنا جعلنا LM . 11 ادج : ابج LM .
12 دط D : دك LM . 13 جز : كز LM . 14 زط L : بط M .
15 دك L : بك M . 16 بز : مد L ، هد M . 17 طزج : طزد LM .
18 زط : زك LM . 19 طج : كج LM . 20 به M : بز L .
21 بز : به LM . 22 به M : بز L . 23 مساو لضرب بز : : ـ M .
24 المجتمعة L : المجقعة M . 25 جط L : هط M .
26 به M : بز L . 27 زط L : بط M . 28 حب : حد LM .

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Abstract

This paper contains edited Arabic texts and English translations of a tenth-century geometric proof by Abū ʿAbdallāh al-Shannī, of the rule for the area of the cyclic quadrilateral in terms of its sides. Al-Shannī's simple geometric proof is of intrinsic mathematical interest; even the famous mathematician Leonard Euler (who did not know al-Shannī's proof) stated in 1750 that it is difficult to find a geometric proof of the area rule for a cyclic quadrilateral in terms of its sides. Al-Shannī's proof has come down to us only in the *Extraction of Chords*, a work by al-Bīrūnī (973-1048 AD) which has survived in two different versions. This paper contains the texts of al-Shannī's proof in the two versions. We have added edited Arabic texts and English translations of the preceding proof by al-Shannī of the area rule (Heron's rule) for the triangle, because of the close relationship between the two proofs.

ULUGH BEG'S ZĪJ-I SULṬĀNĪ: AN ANNOTATED TABLE OF CONTENTS

BENNO VAN DALEN*

Ulugh Beg, originally named Muḥammad Tūrghāy, was born in 796/1394 as grandson of the Turkish-Mongol conqueror Tamerlane (Timur).[1] In 811/1409 he became the governor of Transoxiana (Māwarāʾ al-Nahr), whose capital Samarqand was in that period the cultural and scientific centre of the Islamic world. Among the impressive buildings that Ulugh Beg had constructed in Samarqand were the Shāh-i Zinda mosque, a *madrasa*, and the famous astronomical observatory. After the death of his father Shāh Rūkh in 850/1447, Ulugh Beg unwillingly became involved in the struggle for power over the Timurid empire. In 853/1449 he was killed on the order of one of his sons and was buried in the mausoleum of his grandfather in Samarqand.

Ulugh Beg was highly skilled in poetry, Koran citation and mathematics, but his main interest lay in the field of astronomy. In his *madrasa* he brought together some of the best scholars and teachers of the time, e.g., Jamshīd Ghiyāth al-Dīn al-Kāshī, Mūsā ibn Muḥammad ibn Maḥmūd Qaḍīzade al-Rūmī, and ʿAlī ibn Muḥammad al-Qūshjī. These three were also the respective directors of the Samarqand observatory, which was founded by Ulugh Beg in 824/1421 and whose remnants were excavated in the first half of the twentieth

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I am grateful to Prof. Edward S. Kennedy (1912–2009), who carefully checked the Persian titles of chapters and tables in the mid 1990s, and to Pouyan Rezvani (Ptolemaeus Arabus et Latinus, Bayerische Akademie der Wissenschaften) for his help in resolving final problems in the Persian transliterations. I also like to thank Dr. Eckhard Neubauer for persuading me to finally bring this article to a conclusion and for numerous corrections in the final stages.

[1] For more information on Ulugh Beg's life and his political and scholarly careers, see the *EI* article 'Ulugh Beg' by Lucien Bouvat; the *DSB* article 'Ulugh Beg' by T. N. Kari-Niyazov; the *EI²* article 'Ulugh Beg' by Beatrice F. Manz; the *BEA* article 'Ulugh Beg' by Benno van Dalen; and Matvievskaya & Sokolovskaya 1997 (in Russian).

century.[2] The main instrument of the observatory was a sextant with a radius of 40 meters built into a monumental three-story building with a circular ground-plan. As a result of the systematic observations made by Ulugh Beg and his collaborators, new planetary parameters were determined and a full star catalogue was compiled which, unlike most Islamic star catalogues, was not directly dependent on Ptolemy's catalogue in the *Almagest*.

The *zīj* of Ulugh Beg was the result of a combined effort of various astronomers working under Ulugh Beg. The *zīj* was originally written in Persian, but was soon translated into Arabic and Turkish. It is known under various names: *Zīj-i Jadīd-i Sulṭānī*, *Zīj-i Gurgānī*, or simply *Zīj-i Ulugh Beg*. The *zīj* contains four treatises (*maqālāt*) dealing with chronology, spherical astronomy, planetary positions, and astrology respectively. Each treatise consists of explanatory text and tables; no numerical examples are presented. The epoch of the *zīj*, the starting point of the tables for planetary motion, is the beginning of the Hijra year 841 (5 July 1437), but the star positions were probably observed around the year 847/1443. The brief colophon of the manuscript Hyderabad, Salar Jung Museum, Haiyat 41 (f. 202v) states that this manuscript was copied by Ulugh Beg himself in 843/1439-40. In any case, it may be assumed that Ulugh Beg's *zīj* was finished a relatively short time before his death.

The most remarkable feature of the *zīj* of Ulugh Beg is the accuracy of the mathematically computed tables. For instance, whereas earlier Muslim astronomers tabulated the sine to four sexagesimal places at most, Ulugh Beg gives sine values for each minute of arc to five sexagesimal places (six in the final part of the table), corresponding to nine (eleven) decimal places. The majority of these values are accurate up to the final digit.

The planetary models underlying the tables in the *zīj* of Ulugh Beg do not contain innovations; they are the standard Ptolemaic models which had been in use in the Islamic world from the early third/ninth century onwards. However, various of the planetary parameters were modified on the basis of the observations made in Samarqand and the tables for the planetary equations, the corrections to be applied to the mean motions, were calculated to a high degree of accuracy. Various non-standard tables simplify the computation of planetary positions,

[2] For an extensive discussion of the construction of, and the activities at, Ulugh Beg's observatory, see Sayılı 1960a, pp. 261–289, and Matvievskaya & Sokolovskaya 1997, pp. 72–118. Interesting insights in the scholarly environment in Samarqand can be gleaned from two letters that al-Kāshī wrote to his father in Kāshān; see Sayılı 1960b; Kennedy 1960; Bagheri 1996, and Bagheri 1997.

eclipses, etc., a feature which the *zīj* of Ulugh Beg seems to have in common with al-Kāshī's *Khāqānī Zīj* (*c.* 1420).[3] The most striking feature of the tables for the equations of the five planets visible to the naked eye is that they use only two reference points for the equation of anomaly (namely the apogee and the perigee of the deferent) rather than the common three (apogee, perigee and an intermediate position).

The influence of the *zīj* of Ulugh Beg was immense. In the Middle East, the *Sulṭānī Zīj*, as well as later works strongly based on it, remained in use up till the nineteenth century. The accuracy of the mathematically computed tables in the *zīj* could be improved upon significantly only by means of advanced mathematical tools which were developed in Europe centuries after Ulugh Beg. In the seventeenth century, various parts of the *zīj* (chronology, star table, geographical table) were published in England. The geographical table remained the best source for the geography of the Middle East until the middle of the 18th century. The observatories founded by Taqī l-Dīn in Istanbul (AD 1575) and by Jai Singh at five localities in India (*c.* AD 1730) were strongly influenced by the observatory in Samarqand.

As a result of its popularity, the *zīj* of Ulugh Beg is extant in hundreds of manuscripts now scattered over libraries mainly in the Middle and Near East and Europe.[4] Soon after European Orientalists had brought copies of the *zīj* to Europe in the seventeenth century, parts of the work that were of particular interest to these scholars were published. Greaves 1648 provides an edition of Ulugh Beg's geographical table together with the one from Naṣīr al-Dīn al-Ṭūsī's *Īlkhānī Zīj*, both with a Latin translation on facing pages. Greaves 1650 contains an edition of the first treatise on chronology, likewise with a Latin translation. Hyde 1665, finally, publishes Ulugh Beg's star catalogue with a Latin translation and extensive commentary. The earliest overviews of larger parts of the *zīj* appeared around 1800 with a report in Burckhardt 1799 and an analysis of mathematical aspects in Delambre 1819, pp. 204–211. The entire explanatory text of Ulugh

[3] For this *zīj* and its simplified tables, see, among other publications, Kennedy 1998a and Van Brummelen 2021.

[4] Some further important copies besides the ones used in this article include: Cambridge, University Library, Or. 566; London, British Library, Or. 11216; Mashhad, Āstān-i Quds, 12082; Oxford, Bodleian Library, Greaves 5 (with annotations by John Greaves, who published parts of Ulugh Beg's *zīj* in 1648 and 1650); Paris, Bibliothèque nationale de France, persan 164; Qom, Mar'ashī Library, 4522; St. Petersburg, Institute of Oriental Manuscripts, C 1843 (apparently copied during Ulugh Beg's lifetime); Tehran, Majlis Library, 6033, and Tehran, Malik Library, 3578.

Beg's *zīj* (with only the tables of the first treatise) was published and translated by Sédillot in the mid-nineteenth century, and a translation of the star catalogue with the French star names from Schjellerup's 1874 edition of al-Ṣūfī's *Book of the Constellations of the Fixed Stars* and commentary and analysis in English appeared in Knobel 1917.

Kennedy 1956a (pp. 125–126 and 166–167) includes a brief overview of the contents of the *Sulṭānī Zīj* with mention of some mathematical characteristics of the most important tables. Kennedy included Ulugh Beg in several of his surveys of topics in Islamic *zīj*es, mentioned below in the table of contents, and gave an evaluation of Ulugh Beg's scholarly achievements in 1998b and 1998c. In 1994, Akhmedov published a full Russian translation of Ulugh Beg's *zīj*, including all the tables. Kaçar & Bir 2012, finally, contains a facsimile of the manuscript Istanbul, Topkapı Sarayı Müzesi, Revan Köşkü 1714 with a full Turkish translation.

All in all, except for the star table (for which, see p. 67), very few systematic investigations of the *zīj* have as yet been conducted. Among the many questions that have not yet been answered are the following: which influences of earlier astronomical works (e.g., the *Īlkhānī Zīj* by Naṣīr al-Dīn al-Ṭūsī) can be found in the *zīj* of Ulugh Beg? Which traces can be recognized of contributions by scholars working for Ulugh Beg such as al-Kāshī and Qaḍizade al-Rūmī? Which mathematical methods did Ulugh Beg and his collaborators use to calculate the highly accurate tables in the *zīj*?

As for the last question, it has been shown for some of the tables that clever methods of interpolation were used in order to avoid direct computation of each single tabular value, but apart from this practically no details of the precise methods of computation have been uncovered. In fact, in spite of some recent progress, very little is known in general about the methods by which Muslim astronomers carried out their calculations of tables. Further investigations of the *zīj* of Ulugh Beg will allow insight into such methods at the peak of their historical development.

Table of Contents of the *Sulṭānī Zīj*

The main manuscript used for the folio references in the below table of contents is a clear and early Timurid copy from the Hamidiye collection, numbered 844 (siglum H), which is currently part of the Süleymaniye Library in Istanbul. Detailed information and scans of this manuscript are available in the portal of the Türkiye Yazma

Eserler Kurumu Başkanlığı (Directorate of the Turkish Institute of Manuscripts, https://portal.yek.gov.tr/works/detail/266478, registration required). The manuscript is nicely written in four colours and has a beautifully ornamented *basmala*. It was presumably a presentation copy and does not show any traces of perusal in the form of marginal notes. The manuscript was originally foliated with Hindu-Arabic numerals in pencil. In this foliation the leaves after ff. 6, 52 and 155 were skipped and are here referred to as 6^{bis}, 52^{bis} and 155^{bis}. An attempt was made to correct some of the omissions with Arabic-European numerals in pencil, mostly overwriting the original folio numbers. However, since these corrections are only indicated for multiples of ten, it turned out to be more practical to continue using the original foliation.

In addition, I provide folio references to the manuscripts Berlin, Staatsbibliothek Preußischer Kulturbesitz, Or. fol. 280 (siglum B; available online in the Qalamos database, https://www.qalamos.net/receive/DE1Book_manuscript_00002417; catalogued in Pertsch 1888, pp. 358–359, no. 337) and Oxford, Bodleian Library, Or. 548 (catalogued in Sachau & Ethé 1889, col. 928, no. 1518; siglum O), as well as page references to the edition and translation by Sédillot (Sédillot 1847 and Sédillot 1853, siglum S) and the Russian translation by Akhmedov primarily based on the manuscript Tashkent, Abu Rayhon Beruniy nomidagi Sharqshunoslik Instituti, 2214 (Akhmedov 1994, siglum A). In the references for S, the page number preceding the slash is that of the edition and the one after the slash that of the translation. In the references for A, the letters a and b refer to the two columns in which the text is typeset on most pages.

The table of contents gives Persian transliterations of the titles of all sections and tables contained in the *zīj* of Ulugh Beg together with an English translation. Variants in the titles are not indicated; I always follow the readings of the Hamidiye manuscript. In titles of sections, *dar maʿrifat-i* is often simply translated as 'about', but more literally as 'on the determination of' if the section deals specifically with the calculation of the quantity mentioned in the title. Note that, although the Sulṭānī Zīj is written in Persian, many astronomical terms are written in their Arabic form (as can be seen, in particular, from the use of the definite article *al-*) and some of the titles of spherical-astronomical tables are entirely in Arabic. Some explanatory additions to the translated titles are given between square brackets. Folio and page references to the Berlin and Oxford manuscripts and to the edition and French and Russian translations are given in a smaller font size between square brackets following the titles. Exclamation marks

indicate significant differences in the manuscripts, such as a change of order of the tables.

Additional information, including mathematical specifications of the tables and references to secondary literature, is given in indented paragraphs under the titles at a smaller font size. In the descriptions of the tables, the following notation is used:

k = number of *fractional* sexagesimal digits of the tabular values (the total number of digits will usually be one larger)

first (*incr*) *last* = range of arguments of the table, where *first* is the first argument, *incr* the increment, and *last* the last argument. For example: the 0 (0;1) 89;59°, k=4 for the sine table indicates that the table displays values to four sexagesimal fractional places for every minute of arc from 0° to 89;59°. For some tables negative arguments may be used to express the range more conveniently, e.g., –90 (1) 90° stands for the range 270, 271, 272, ..., 359, 1, 2, 3, ..., 90° (omitting, in this case, a value for argument zero).

⟨...⟩ : words between angular brackets were omitted by the scribe of manuscript H.

The basic technical terminology is explained in Kennedy 1956a, pp. 139–145. For many of the tables references are given to publications defining less familiar concepts or analysing parts of the *zīj*. Many of the topics occurring in the *zīj* of Ulugh Beg are also discussed in al-Kāshī's *Khāqānī Zīj*, of which Kennedy published an annotated table of contents in 1998a. Extensive studies of Arabic Ptolemaic *zīj*es which are also useful in understanding Ulugh Beg's *zīj* may be found in Nallino 1899–1907, Suter 1914, Neugebauer 1962, Dorce 2002, Bagheri 2009, and van Dalen 2021. An English translation of Ptolemy's *Almagest*, which lay at the basis of most developments in Islamic astronomy, is contained in Toomer 1984. Explanations of Ptolemy's planetary models, which were also used by Ulugh Beg with some modifications, may be found in Pedersen 1974 and Neugebauer 1975, pp. 19–261, and methods of analysing the tables in Van Brummelen 1993.

H 1r: Title page with notes of possession. [B Ir and 1r: several notes of possession; O 1r: five or six notes of possession, explanations of the calculation of planetary positions, drawing of a bearded man.]

H 1v: Ornamental *basmala* in four colours. Preface. [B 1v; O 1v; S 285/1; A p. 31]

H 2r: ***Maqālat-i awwal dar maᶜrifat-i maᶜnī-yi tawārīkh wa īn mushtamil ast dar muqaddamat wa haft bāb*** (First treatise: about the meaning of the calendars, and this consists of an introduction and seven chapters). [B 2v; O 2r; S 291/5; A p. 33]

For the calendars that were used in the Islamic world and were discussed in *zīj*es, see, among others, the *EI²* article ᶜTaᵓrīkh' by François de Blois and Benno van Dalen, which also explains the *madākhil* (*notae*, i.e., the weekday of the beginning of years and months) and the conversion of dates between the most common calendars discussed in the following chapters.

H 2r: *Muqaddamat dar maᶜrifat-i maᶜnī-yi taᵓrīkh wa sāl wa māh wa ajzāᵓ-i ān* (Introduction about the meaning of the calendar, the year, the month, and their divisions). [B 2v; O 2r; S 291/5; A p. 33]

H 2v: (table) *Asāmī-yi chāgh-hā* (The names of the double-hours) [B 3v; O 2v; S 294/9; A p. 33b]

These are the names of the duodecimal animal cycle, which are used in the Chinese calendar discussed in chapter I.6 and are here given both in Chinese and in Turkish.

H 3r: *Bāb-i awwal dar maᶜrifat-i taᵓrīkh-i hijrī* (First chapter: about the Hijra calendar). [B 3v; O 2v; S 296/10; A p. 34a]

H 3r: (table) *Madkhal-i sālhā-yi nāqiṣah* (*Nota* of the incomplete years). [B 4v; O 3r; S 299/13; A p. 34b]

H 3v: (table) *Madkhal-i māhhā-yi ᶜarabī* (*Nota* of the Arabic months). [B 4r; O 3r; S 300/14; A p. 34b]

H 3v: *Bāb-i duwum dar maᶜrifat-i taᵓrīkh-i rūmī* (Second chapter: about the Byzantine calendar). [B 4v; O 3r; S 300/15; A p. 35a]

H 3v: (table) *Madkhal-i taᵓrīkh-i rūmī* (*Nota* of the Byzantine calendar). [B 4v; O 3v; S 302/17; A p. 35b]

H 3v: *Bāb-i sīwum dar maᶜrifat-i taᵓrīkh-i Furs* (Third chapter: about the Persian calendar). [B 5r; O 3v; S 303/18; A p. 35b]

H 4r: (table) *Madkhal-i taᵓrīkh-i fārsī* (*Nota* of the Persian calendar). [B 5r; O 3v; S 304/19; A p. 36a]

H 4r: *Bāb-i chahārum dar istikhrāj-i īn sih taʾrīkh az yak-dīgar* (Fourth chapter: about the extraction of these three calendars from one another). [H has an incorrect *yāʾ* after '*taʾrīkh*'. B 5r; O 3v; S 305/20; A p. 36a]

H 5r: (table) *Jadwal-i ayyām-i marfūʿ az taʾrīkhhā-yi rūmī wa ʿarabī wa fārsī* (Table of the elevated [i.e., expressed as sexagesimal integers] days from the Byzantine, Arabic and Persian calendars). [B 6v; O 4v; S 309/26; A p. 37]

H 5v: (table) *Shuhūr-i taʾrīkhhā-yi mashhūr wa rūzhā-yi īn* (The months of the well-known calendars and their days). [B 7r; O 5r; S 308/26; A p. 38a]

H 5v: *Bāb-i panjum dar maʿrifat-i taʾrīkh-i malikī* (Fifth chapter: about the Maliki calendar). [B 6r, beginning repeated on 6v (!); O 5r; S 309/27; A p. 38a]

> For the true solar Malikī or Jalālī calendar, named after the Seljuk sultan Jalāl al-Dawla wa-l-Dīn Malikshāh (r. 465/1072–485/1092) and the role of ʿUmar al-Khayyām in its creation, see most recently van Dalen 2017, Giahi Yazdi 2020, and Thomann 2021.

H 5v: (table) *Ayyām-i sālhā-yi tānmah-i mālikī* (The days of complete Maliki years). [B 7v; O 5v; S 313/31; A p. 38b]

H 6r: *Bāb-i shashum dar maʿrifat-i taʾrīkh-i khaṭā wa uighūr wa īn mushtamil bar dah faṣl ast* (Sixth chapter: about the calendar of the Chinese and the Turks, and this consists of ten sections). [B 7v; O 5v; S 314/32; A p. 39a]

> For this calendar of Chinese origin, which has been called 'Chinese-Uighur' in the literature, see Ideler 1832 or Ideler 1835 (specifically on Ulugh Beg), Imai 1962 (idem, in Japanese), Kennedy 1964, Melville 1994, van Dalen et al. 1997, Isahaya 2009a, Isahaya 2009b (specifically on Ulugh Beg), and Isahaya 2013. In the Chinese calendar, a day is divided into 12 *chāgh*s (double-hours), which each comprise 8 *keh*s (quarter hours). However, calculations mostly make use of *fen*s, ten-thousandths of a day, and hence basically of a decimal system.

H 6r: *Faṣl-i awwal dar maʿrifat-i adwārī kih dar īn tārīkh iʿtibār karda and* (First section: about the cycles which are used in this calendar). [B 7v; O 5v; S 314/32; A p. 39a]

H 6v: (table) ⟨the elements of the Chinese sexagesimal cycle of days and years⟩ [B 8r; O 6r; S 316/33; A p. 39b]

H 6v: *Faṣl-i duwum dar maᶜrifat-i sālhā wa aqsām-i sāl* (Second section: about the years and the divisions of the years). [B 8v; O 6r; S 318/34; A p. 39b]

H 6bisr: *Faṣl-i sīwum dar maᶜrifat-i madākhil-i aqsām-i sāl az dawr-i sittīnī* (Third section: about the *notae* of the divisions of the year in the sexagesimal cycle). [B 9r; O 6r; S 320/37; A p. 40a]

H 6bisr: (table) *Jadwal-i mabādī-yi aqsām-i sāl ba-ḥasb-i rūzhā wa fankhā wa asāmī-yi aqsām ba-lughat-i ahl-i khaṭāᵓī* (Table of the beginnings of the divisions of the year in days and *fen*s and the names of the divisions in the language of the Chinese people). [B 8v; O 6v; S 320/36; A p. 40ab]

H 6bisv: (table) *Jadwal-i taḍāᶜuf-i faḍl-i sāl* (Table of multiplication of the excess of the year). [B 9v; O 6v; S 322/40; A p. 40b]

H 6bisv: (table) *Jadwal-i mabādī-yi chāgh-hā wa keh-hā az fankhā-yi shabān-rūz* (Table of the beginnings of *chāg*s and *keh*s in *fen*s [i.e., ten-thousandths] of a night and day). [B 10r; O 7r; S 322/40; A pp. 41b–42a]

H 7r: *Faṣl-i chahārum dar maᶜrifat-i madākhil-i māhhā az dawr-i sittīnī* (Fourth chapter: about the *notae* of the months in the sexagesimal cycle). [B 9v; O 7r; S 323/41; A p. 41a]

H 7r: (table) *Jadwal-i taḍāᶜīf-i māh-i qamarī* (Table of multiples of a lunar month). [B 10v; O 7v; S 325/44; A p. 42a]

H 7r: (table) *Jadwal-i taḍāᶜīf-i faḍl-i sāl-i shamsī bar qamarī* (Table of multiples of the excess of the solar year over the lunar one). [B 10v; O 7v; S 325/44; A p. 42a]

H 7v: *Faṣl-i panjum dar maᶜrifat-i ḥiṣṣah-i āftāb wa māh* (Fifth section: about the mean anomaly [*ḥiṣṣah*, lit. 'portion', argument] of the sun and the moon). [B 10v; O 7v; S 326/45; A p. 42b]

H 7v: (table) *Jadwal-i taḍāᶜīf-i faḍl-i sāl-i shamsī bar sīzdah dawr-i khāṣṣah-i qamar* (Table of multiples of the excess of the solar year over thirteen anomalistic periods of the moon). [B 11r; O 8r; S 328/49; A p. 43a]

H 7v: (table) *Jadwal-i taḍāᶜīf-i ḥiṣṣah-i qamar dar yak māh* (Table of multiples of the lunar anomalistic motion in one month). [B 11r; O 8r; S 328/49; A p. 43a]

H 8r: *Faṣl-i shashum dar istikhrāj-i taᶜdīl-i āftāb* (Sixth section: about the determination of the solar equation). [B 11r; O 8r; S 329/50; A p. 43a]

H 8r: (table) *jadwal-i taᶜdīl-i āftāb* (Table of the solar equation). [B 11v; O 8v; S 329/50; A pp. 43b–44a]

H 8v: *Faṣl-i haftum dar istikhrāj-i taᶜdīl-i māh* (Seventh section: about the determination of the lunar equation). [B 12r; O 8r and 9r; S 329/50; A p. 43b]

H 8v: (table) *Jadwal-i taᶜdīl-i qamar* (Table of the lunar equation). [B 12r; O 9r; S 329/51; A p. 44a–b]

H 9r: *Faṣl-i hashtum dar maᶜrifat-i awāᵓil-i māhhā az har sāl kih khwāhand wa taᶜyīn-i māh-i shūn dar sālī kih wāqiᶜ shūd* (Eighth section: about the beginnings of the months from every year that they want and the specification of the [intercalary] month Shun in a year that takes place). [B 12r; O 9r; S 330/51; A p. 44b]

H 9r: (table) *Jadwal-i miqdār-i majmūᶜ-i nīm-shab wa yak rūz* (Table of the collected amount of half a night and one day). [B 12v; O 9v; S 331/53; A p. 45a]

The arguments of this table are *māhhā* (months), and the values are expressed in *fankhā* (*fens*).

H 9r: *Faṣl-i nuhum dar maᶜrifat-i dawr-i chahārum* (Ninth section: about the fourth cycle). [B 12v; O 9v; S 332/53; A p. 45a]

H 9v: *Faṣl-i dahum dar istikhrāj-i īn taᵓrīkh az tawārīkh-i mashhūr wa ᶜaks-i ān* (Tenth section: about the determination of this calendar from the well-known calendars and its reverse [operation]). [B 13r; O 10r; S 333/56; A p. 45b]

H 9v: (table) *Jadwal-i ayyām wa fankhā-yi sālhā-yi khaṭāᵓī* (Table of the days and *fens* of Chinese years). [B 13v; O 10r; S 337/61; A p. 45b]

H 10r: *Bāb-i haftum dar ayyām-i mashhūr az har taᵓrīkhī* (Seventh chapter: about the celebrated days (feasts) in each calendar). [B 14r; O 10v; S 338/62; A p. 46b]

H 11r: ***Maqālat-i duwum dar maᶜrifat-i awqāt wa ṭāliᶜ-i har waqt wa ānchi taᶜalluq bidān dārad bīst wa dū bāb-ast*** (Second treatise: on the determination of the times and the ascendent of each time and that which is connected with it; it is twenty-two chapters). [B 15r; O 11r; S 341/65; A p. 48]

This treatise discusses all needed spherical-astronomical calculations, including those of right and oblique ascensions, distances between two arbitrary points on the celestial sphere, and the ascendant. For a discussion of the spherical astronomy in al-Kāshī's *Khāqānī Zīj*, see Kennedy 1985 and Kennedy 1995. For general explanations of this kind of material, see also van Dalen 2022.

H 11r: *Bāb-i awwal dar taᶜdīl mā bayna al-saṭrayn* (First chapter: about the interlinear equation [i.e., linear interpolation]). [B 15r; O 11r; S 341/65; A p. 48]

H 11r: *Bāb-i duwum dar maᶜrifat-i jayb wa sahm* (First chapter: on the determination of the sine and the versed sine). [B 15v; O 11v; S 342/69; A p. 48a]

H 11v: *Bāb-i sīwum dar maᶜrifat-i ẓill* (Third chapter: on the determination of the shadow [i.e., tangent and cotangent]). [B 16r; O 11v; S 344/84; A p. 49a]

H 12r: *Bāb-i chahārum dar maᶜrifat-i mayl-i ajzāʾ-i falak al-burūj az muᶜaddil al-nahār* (Fourth chapter: on the determination of the declination of the degrees of the ecliptic from the equator). [B 16v; O 12r; S 337/87; A p. 49b]

H 12r: *Bāb-i panjum dar maᶜrifat-i buᶜd-i kawkab az muᶜaddil al-nahār* (Fifth chapter: on the determination of the distance of a star from the equator). [B 17r; O 12v; S 348/89; A p. 50a]

H 12v: *Bāb-i shashum dar maᶜrifat-i ghāyah-i irtifāᶜ wa inḥifāḍ-i kawkab* (Sixth chapter: on the determination of the maximum altitude and depression of a star). [B 17v; O 12v; S 350/91; A p. 50a]

H 12v: *Bāb-i haftum dar maᶜrifat-i maṭāliᶜ-i khaṭṭ-i istiwā* (Seventh chapter: on the determination of the right ascension). [B 17v; O 12v; S 350/92; A p. 50b]

H 12v: *Bāb-i hashtum dar maᶜrifat-i taᶜdīl al-nahār wa qaws al-nahār wa sāᶜāt al-nahār* (Eighth chapter: on the determination of the

equation of daylight, the arc of daylight and the hours of daylight). [B 17v; O 13r; S 351/94; A p. 51a]

H 13v: *Bāb-i nuhum dar maᶜrifat-i maṭāliᶜ-i balad* (Ninth chapter: on the determination of the oblique ascension). [B 18v; O 13v; S 355/98; A p. 51b]

H 13v: *Bāb-i dahum dar ᶜamal-i ᶜaks-i maṭāliᶜ* (Tenth chapter: on the calculation [*ᶜamal*, lit. 'operation'] of the inverse of the ascension). [B 19r; O 14r; S 356/99; A p. 52a]

H 14r: *Bāb-i yāzdahum dar maᶜrifat-i maṭāliᶜ-i mamarr wa darajah-i mamarr-i kawkab* (Eleventh chapter: on the determination of the ascension of the transit and the degree of the transit of a star). [B 19v; O 14v; S 359/103; A p. 53a]

H 14v: *Bāb-i dawāzdahum dar maṭāliᶜ-i tulūᶜ wa ghurūb-i kawkab* (Twelfth chapter: on the determination of the ascension of the rising and setting of a star). [B 20r; O 14v; S 361/105; A p. 53b]

H 14v: *Bāb-i sīzdahum dar maᶜrifat-i samt az irtifāᶜ yā inḥifāḍ* (Thirteenth chapter: on the determination of the determination of the azimuth from the altitude or depression). [B 20v; O 15r; S 362/106; A p. 53b]

H 15r: *Bāb-i chahārdahum dar maᶜrifat-i irtifāᶜ az samt* (Fourteenth chapter: on the determination of the altitude from the azimuth). [B 21r; O 15r; S 364/109; A p. 54a]

H 15v: *Bāb-i pānzdahum dar maᶜrifat-i khaṭṭ-i nisf al-nahār* (Fifteenth chapter: on the determination of the meridian). [B 21v; O 15v; S 365/111; A p. 54b]

H 15v: *Bāb-i shānzdahum dar maᶜrifat-i ṭūl wa ᶜarḍ-i balad* (Sixteenth chapter: on the determination of the longitude and latitude of a locality). [B 21v; O 15v; S 367/112; A p. 55a]

H 16r: *Bāb-i hafdahum dar maᶜrifat-i ᶜarḍ-i iqlīm-i ruᵓyat* (Seventeenth chapter: on the determination of the latitude of the visible climate). [B 22r; O 16r; S 369/115; A p. 55b]

H 16v: *Bāb-i hījdahum dar istikhrāj-i buᶜd-i miyān dū kawkab* (Eighteenth chapter: on the extraction of the distance between two stars). [B 22v; O 16r; S 370/116; A p. 56a]

H 17r: *Bāb-i nūzdahum dar maᶜrifat-i samt-i qiblah wa inḥirāf-i aw* (Nineteenth chapter: on the determination of the azimuth of the qibla and its inclination). [B 23v; O 17r; S 377/120; A p. 56b]

H 17r: *Bāb-i bīstum dar maᶜrifat-i ṭāliᶜ az irtifāᶜ* (Twentieth chapter: on the determination of the ascendent from the altitude). [B 24r; O 17r; S 379/122; A: –]

H 17v: *Bāb-i bīst u yakum dar maᶜrifat-i irtifāᶜ yā inḥifāḍ-i kawkab az ṭāliᶜ* (Twenty-first chapter: on the determination of the altitude or depression of a star from the ascendent). [B 24v; O 17v; S 382/125; A p. 58a]

H 18r: *Bāb-i bīst u duwum dar maᶜrifat-i tāliᶜ az sāᶜāt* (Twenty-second chapter: on the determination of the ascendent from the hours). [B 25v; O 18r; S 385/129; A p. 58b]

[O 18v: after the end of the second treatise follows a paragraph in the main hand which does not occur in H, B, or S. O 19r contains a table *buht al-qamar* ('lunar velocity') which does not belong there.]

H 18v–27r: (table) *Jadwal al-jayb / baqī-yi jadwal al-jayb* (Table of sines / Continuation of the table of sines). [B 26v–35r; O 19v–28r; A pp. 60–76]

This table presents sine values plus tabular differences to sexagesimal fourths (k=4) for each minute of arc: 0 (0;1) 89;59; each page covers 5 degrees; from argument 87° onwards the values are given to sexagesimal fifths (k=5). Schoy 1923, pp. 398–399, gives a brief description of Ulugh Beg's sine table and discusses the accuracy of a small selection of tabular values. Schoy 1927, pp. 92–100, reproduces the entire table up to argument 44°59′. In van Dalen 2002, pp. 351–353, I have shown that the values for non-multiples of 5 minutes in this table were calculated by means of the type of second-order interpolation first described in Kennedy 1962 and Hamadanizadeh 1979. For a treatise describing al-Kāshī's ingenious method for calculating the sine of 1°, see Rosenfeld & Hogendijk 2002.

H 27v–33r: (table) *Jadwal al-ẓill al-awwal wa-yusammā al-ẓill al-maᶜkūs* (Table of the first tangent, which is called the reversed shadow). [B 35v–41r; O 28v–34r (the last column of tabular differences, for arguments 85° to 89°55′, is empty); A pp. 77–90]

Tangent values plus tabular differences (*tafāḍil*) to sexagesimal fourths (k=4) for each minute of arc up to 45° (0 (0;1) 44;59, 5 degrees per page) and for each 5 minutes of arc between 45° and 90° (45 (0;5) 89;55, 15 degrees per page). Schoy 1927, pp. 101–108, reproduces this table up to argument 44°59′.

H 33v: (table) *Jadwal al-ẓill al-thānī wa-yusammā al-ẓill al-mustawī ayḍan* (Table of the second tangent, which is also called the straight shadow). [B 41v; O 34v; A p. 91]

Cotangent values to sexagesimal thirds for gnomon lengths 12 fingers and 7 feet for each integer degree.

H 34r–36v: (table) *Jadwal al-mayl ʿalā an ghāyata-hu* ⟨23;30,17⟩ (Table of the declination, where its maximum is ⟨23;30,17⟩). [B 42r–44v; O 35r–37v; A pp. 92–95]

Solar declination values to sexagesimal thirds for each three minutes of the argument (0 (0;3) 90;0); the minutes run horizontally over two pages; each two pages cover 30°. The value for the obliquity of the ecliptic is omitted from the heading in H but can be read off from the table.

H 37r–38r: (table) *Jadwal al-mayl al-thānī* (Table of the second declination). [B 45r–46r; O 38r–39r; A pp. 96–97]

Second declination values to sexagesimal thirds for obliquity of the ecliptic 23;30,17 and each six minutes of the argument (0 (0;6) 89;54); the minutes run horizontally, each page covers 30°.

H 38v–39r: (table) *Jadwal maṭāliʿ al-burūj li-ʿarḍ Samarqand* (Table of oblique ascensions for the latitude of Samarqand). [B 46v–47r; O 39v–40r; A pp. 98–99]

Oblique ascension values plus tabular differences to seconds for each integer degree of the argument; each page covers 180°.

H 39v–40r: (table) *Jadwal maṭāliʿ al-burūj bi-l-falak al-mustaqīm mubtadaʾ min awwal al-jady wa-yusammā maṭāliʿ al-burūj bi-l-qubba ayḍan* (Table of right ascensions beginning from the first point of Capricorn and also called the ascensions of the signs at the cupola). [B 47v–48r; O 40v–41r; A pp. 100–101]

The normed right ascension plus tabular differences to sexagesimal thirds, 0 (1) 359; each page covers 180°.

H 40v–41r: (table) *Jadwal maṭāliʿ al-burūj li-khaṭṭ al-istiwāʾ* (Table of right ascensions). [B 48v–49r; O 41v–42r; A pp. 101–102]

The ordinary right ascension to sexagesimal thirds, without tabular differences, 0 (1) 359.

H 41v–42r: (table) *Jadwal maṭāliᶜ al-burūj li-ᶜarḍ 1* (Table of oblique ascensions for latitude 1°). [B 49v–50r; O 42v–43r; A pp. 103]

Oblique ascension values for geographical latitude 1° to sexagesimal thirds, 0 (1) 359°, without tabular differences.

H 42v–90r: idem for latitudes 2° till 50°; note that this range of folios includes the unnumbered f. 52bis. [B 50v–99r; O 43v–92r (the tables for latitudes 14° and 15° appear to have been exchanged); A pp. 103–136]

H 90v: (table) *Jadwal-i sāᶜāt-i niṣf al-nahār ba-ᶜarḍ-i Samarqandī kih mawḍiᶜ-i raṣad ast wa ān 39;37,23 ast* (Table of the hours of half daylight for the latitude of Samarqand, which is the place of observation, and that is 39°37′23″). [B 99v; O 92v (B and O do not give the latitude); A p. 138 (this is preceded on p. 137 by a table for the length of half daylight for latitude 23° not found in manuscripts HBO and probably not belonging to the *zīj* of Ulugh Beg).]

Values to seconds for arguments –90 (1) 90°.

H 91r: (table) *Jadwal-i ajzāʾ-i yak-sāᶜat-i ḥaqīqī ba-taqwīm-i shams bi-gīrand* (Table of the parts of one true hour, to be taken with the true solar position). [B 100r; O 93r; A p. 139]

Values to thirds for arguments 0 (1) 359°; local maximum 15;2,36,0 for 0° Cancer, local minimum 15;2,15,6 for 22°–24° Virgo, global maximum 15;2,46,53 for 0° Capricorn, global minimum 15;2,15,36 for 6° Aries.

H 91v–92v: (table) *Jadwal-i aṭwāl-i buldān az jazāʾir-i khālidāt wa ᶜurūḍ az khaṭṭ-i istiwāʾ* (Table of the longitudes of localities from the Fortunate Isles and the⟨ir⟩ latitudes from the equator). [B 100v–102r; O 93v–95v; A pp. 140–142]

Longitudes and latitudes to minutes for localities divided into regions (called *iqlīm-hā* 'climates' in the heading); two columns of 40 localities per page. This table was edited and transliterated/translated in Greaves 1648, pp. 33–64; the coordinates are included in Kennedy & Kennedy 1987, pp. XXXV and 560–564.

H 93r: ***Maqālat-i sīwum dar maᶜrifat-i rawish-i sitāragān wa mawāḍiᶜ-i īshān dar ṭūl wa ᶜarḍ wa tawābiᶜ-i ān wa ān sīzdah bāb ast*** (Third treatise: about the motion of the planets and their positions in longitude and latitude and things depending on them, and that is thirteen chapters). [B 102v; O 96r; S 387/131; A p. 143]

On the calculation of planetary positions, see the discussion of the Ptolemaic planetary models in standard works such as Pedersen 1974 and Neugebauer 1975.

H 93r: *Bāb-i awwal dar maᶜrifat-i taᶜdīl al-ayyām bi-layālī-hā* (First chapter: on the determination of the equation of time). [B 102v; O 96r; S 387/131; A p. 143]

H 93r: *Bāb-i duwum dar istikhrāj-i awsāṭ-i kawākib* (Second chapter: on the extraction of the mean motions of the planets). [B 103r; O 96r; S 390/135; A p. 143b]

H 93v: *Bāb-i sīwum dar taqwīm-i kawākib-i hafta-gāna* (Third chapter: on [the determination of] the true position of the seven planets). [B 103v: adds *wa-raʾs* ('... and the Head', i.e., the lunar ascending node); O 96v: *sabᶜat-gānah wa raʾs* ('... and the Head') instead of *hafta-gānah*; S 391/137; A p. 144a]

H 93v: *Bāb-i chahārum dar ᶜurūḍ-i qamar wa kawākib-i mutaḥayyirah* (Fourth chapter: on the latitudes of the moon and the wandering stars). [B 103v; O 96v; S 394/154; A p. 144b]

H 94r: *Bāb-i panjum dar maᶜrifat-i abᶜād-i nayyirayn az markaz-i ᶜālam* (Fifth chapter: on the determination of the distance of the two luminaries from the centre of the universe). [B 104r; O 97r; S 396/156; A p. 145a]

H 94r: *Bāb-i shashum dar maᶜrifat-i niṭāqāt wa maqāmāt-i kawākib* (Sixth chapter: on the determination of the sectors and stations of the planets). [B 104v; O 97r; S 397/157; A p. 145a]

H 94v: *Bāb-i haftum dar qismat-i taqwīm-i kawākib dar ṭūl wa ᶜarḍ* (Seventh chapter: on the division of the true positions of the planets in longitude and in latitude). [B 105r; O 97r; S 400/160; A p. 146a]

H 95r: *Bāb-i hashtum dar maᶜrifat-i awqāt-i ittiṣālāt-i kawākib bā yak-dīgar wa taḥwīlāt* (Eighth chapter: on the determination of the times of conjunctions of the planets with each other and of transfers). [B 105v; O 97v; S 402/163; A p. 146b]

H 96r: *Bāb-i nuhum dar maᶜrifat-i khusūf* (Ninth chapter: on the determination of lunar eclipses). [B 107r; O 98v; S 408/170; A p. 148a]

H 97r: *Bāb-i dahum dar maᶜrifat-i kusūf* (Tenth chapter: on the determination of solar eclipses). [B 109r; O 99v; S 415/177; A p. 149b]

H 99r: *Bāb-i yāzdahum dar maᶜrifat-i waqt-i ruʾyat-i hilāl wa ẓuhūr wa khafāʾ-i kawākib* (Eleventh chapter: on the determination of the time of sighting of the lunar crescent and the appearance and disappearance of the planets). [B 112r; O 101r; S 425/190; A p. 152b]

H 99v: *Bāb-i dawāzdahum dar maᶜrifat-i taswiyat al-buyūt* (Twelfth chapter: about the equalization of the houses). [B 113v; O 101v; S 429/195; A p. 153b]

On this astrological topic, see van Dalen 2022, pp. 52–57 and the references given there in footnote 63. As part of an overview of methods for calculating the houses, Kennedy 1996 (esp. pp. 575–576) shows that Ulugh Beg's treatment is very similar to that in al-Kāshī's *Khāqānī Zīj*, for which see also Kennedy 1994a.

H 100r: *Bāb-i sīzdahum dar maᶜrifat-i mawāḍiᶜ-i thawābit dar ṭūl wa ᶜarḍ* (Thirteenth chapter: on the determination of the positions of the fixed stars in longitude and in latitude). [B 114r; O 102r; S 431/198; A p. 154a]

H 100v–101r: (table) *Jadwal-i ḥarakat-i markaz wa awj-i shams / āftāb dar sālhā wa māhhā-yi hijrī / dar rūzhā-yi nāqisah / dar sāᶜāt wa kusūr-i ān* (Table of the mean centrum and apogee of the sun in Hijra years and months / in incomplete days / in hours and their parts). [B 115r–v; O 102v–103r; A p. 156 (this is preceded on p. 155 by a table for finding the true solar motion not found in manuscripts HBO)].

The solar mean centrum and apogee in incomplete extended years (841 (1) 871; k=3), complete collected years (30 (30) 300, 600, 1200; k=3), incomplete months (Muḥarram, Ṣafar, ..., Muḥarram; k=3), complete days (1 (1) 30, k=3), and complete hours (1 (1) 60, k=3). Unless otherwise stated, the remaining mean motion tables all have the same structure as the solar table.

H 101r: (table) *Ḥarakat-i markaz wa awj-i āftāb ba-izāʾ-i darajāt-i mā bayna al-ṭūlayni bar-gīrand wa barāyi daqāʾiq nīz az hamīn jadwal munḥaṭṭ bar-gīrand* (Mean motion of the centrum and the apogee of the sun, from which one takes what is opposite the degrees between the two longitudes, and for the minutes one also takes from this same table a lowered ⟨value⟩ [i.e., a value divided by 60]). [B 115v; O 103r (the margin states various values for the difference between the longitudes, in particular for Isfahan and Basra); A p. 156]

The solar mean centrum and apogee motion for 1 (1) 60 degrees of longitude difference (k=3).

H 101v: (table) *Jadwal-i ḥiṣṣah-i taʿdīl al-ayyām ba-markaz bar-dārand wa bar markaz afzāyand* (Table of the contribution of the equation of time, which is taken with the centrum and added to the centrum). [B 116r; O 103v; A p. 157]

Table for the equation of time expressed in solar mean motion. Horizontal argument: zodiacal signs from Aries to Pisces, vertical argument: degrees from 0 to 29; local maximum 0;0,51,53 for 2° and 3° Taurus, global minimum 0;0,0,0 for 8° and 9° Leo (k=3), global maximum 0;1,16,12 for 17° and 18° Scorpio, global minimum 0;0,27,11 for 21° and 22° Aquarius.

H 102r–107v: (table) *Jadwal-i taʿdīl al-shams* (Table of the solar equation). [B 116v–122r; O 104r–109v; A pp. 158–165]

Displaced solar equation with values to sexagesimal thirds for every six minutes (0 (0;6) 359;54), each page covering 30°; the displacement equals the maximum solar equation, 1;55,53,12; there is no shift.

H 108r: (table) *Jadwal-i ḥiṣaṣ-i mā bayna al-markazayn az dāʾir* (Table of the portions of the difference between the two centres from the revolution). [B 123r; O 110r; A p. 177a (!)]

Arguments are 'minutes of the centre' (1 (1) 60, k=3, for which the tabular values are approximately multiples of 6;6,15,25,29), and 'seconds of the centre' (1 (1) 60, k=3), for which the tabular values are multiples of 0;6,6,15,25,29); according to Kennedy 1956a, p. 167b, this table enables the user to quickly determine the number of sidereal days in a given number of sideral years.

H 108r: (table) *Jadwal-i ikhtilāf-i manẓar-i shams dar buʿd-i awsaṭ* (Table of the solar parallax at mean distance). [B 123r (*'buʿd-i abʿad'*); O 110r; A p. 177b (!)]

The argument is the coaltitude (zenith distance), 1 (1) 90, k=3, maximum value: 0;2,29,24 for argument 90°).

H 108v: (table) *Jadwal-i buʿd-i shams az markaz-i ʿālam ba-ajzāʾ-i khārij-i markaz bar-gīrand* (Table of the distance of the sun from the centre of the universe, which is taken with the parts of the eccentricity). [B 123v; O 110v; A p. 175 (!)]

Arguments 0 (1) 179, k=3, maximum value: 62;1,20,0 for argument 0°, minimum value: 57,58,41,9 for argument 179°.

H 109r: (table) *Jadwal-i taʿdīl al-ayyām bi-layālīhā wa ānrā taʿdīl al-ayyām-i aṣlī khwānand* (Table of the original equation of time, which is called 'equation of days'). [B 122v (!); O 111r; A p. 166 (!)]

Arguments 0 (1) 359, k=3, local maximum 0;19,59,47 for 25° Taurus, local minimum 0;9,57,30 for 5° Leo, global maximum 0;31,7,35 for 9°

Scorpio, global minimum 0;0,0,3 for 21° Aquarius. For explanations and analyses of tables for the equation of time, see Kennedy 1988 and van Dalen 1993, pp. 97–152. A transcription of parts of this table was published by Burckhardt (1799) in his brief overview of the contents of the *zīj* and was then used by Gauss to test his method of least squares for estimating the underlying parameters; see Gauss 1929, pp. 64–68.

H 109v–110v: (table) *Jadwal-i awsāṭ-i qamar wa raʾs dar sālhā wa māhhā-yi ʿarabī / dar ayyām wa sāʿāt* (Table of the mean motions of the Moon and the Head for Arabic years and months / for days and hours). [B 124r–125r; O 111v–112v; A p. 167–169]

This table displays the lunar mean centrum, anomaly and mean motion and the mean motion of the ascending lunar node for the same arguments as the solar table; k=3 for the lunar mean motion, k=2 for the other functions.

H 110v: (table) *Tafāwut-i mā bayna al-ṭūlayn awsāṭ-i qamar wa raʾs* (The difference ⟨due to⟩ the difference between the two longitudes in the mean motions of the moon and the Head). [B 125r; O 112v; A p. 169]

Arguments 1 (1) 60, k=3 for the mean motion, k=2 for the other functions.

H 111r: (table) *Jadwal-i taʿdīl-i awwal-i qamar ba-markaz bi-gīrand wa bar khāṣṣah afzāyand tā muʿaddal shawad* (Table of the first lunar equation, to be taken with the centrum and added to the anomaly, so that it becomes corrected). [B 126v; O 113r; A p. 170]

Tabular values without tabular differences, arguments 0 (1) 359, k=2.

H 111v: (table) *Jadwal-i taʿdīl-i duwum-i qamar ba-khāṣṣah-i muʿaddalah bi-gīrand* (Table of the second lunar equation, which is taken with the corrected anomaly). [B 127r; O 113v; A p. 171]

Tabular values without differences; 0 (1) 359, k=2.

H 112r, 112v: (table) *Daqāʾiq al-ḥiṣaṣ-i qamar ba-markaz bi-gīrand agar khāṣṣah-i muʿaddalah kam-tar / ziyādah az shash burj bāshad* (Lunar interpolation function, to be taken with the centrum if the corrected anomaly is less / more than six signs). [B 125v, 126r (!); O 114r–114v; A pp. 172, 173]

Arguments 0 (1) 179, k=2.

H 112r: (table) *Jadwal-i ikhtilāf-i qamar ba-khāṣṣah-i muʿaddalah bi-gīrand* (Table of the lunar difference ⟨in the equation of anomaly⟩, to be taken with the corrected anomaly). [B 125v (!); O 114r; A p. 172]

Arguments 0 (1) 179, k=2, maximum 2;39,49 for arguments 12° and 13° Cancer.

H 112v: (table) *Jadwal-i ḥiṣṣah-i taʿdīl al-ayyām az ḥarakat-i wasaṭ-i qamar ba-taqwīm-i shams bi-gīrand* (Table of the contribution of the equation of time to the lunar mean motion, to be taken with the true solar position). [B 126r; O 114v; A p. 173]

The equation of time expressed in lunar mean motion. Arguments 0 (1) 359, k=2, local maximum 0;10,59 for 23°–25° Taurus, local minimum 0;5,28 for 3°–5° Leo, global maximum 0;17,5 for 8°–10° Scorpio, global minimum 0;0,0 for 20°–22° Aquarius.

H 112v: (table) *Taʿdīl-i sīwum-i qamar ba-ḥiṣṣat al-ʿarḍ bi-gīrand* (Table of the third lunar equation, to be taken with the argument of latitude). [B 126r; O 114v; A p. 173]

Arguments 0 (1) 89, k=2, maximum latitude correction: 6′33″ for arguments 14°–16° Taurus.

H 113r: (table) *Jadwal-i ʿarḍ-i qamar ba-ḥiṣṣat al-ʿarḍ bar-dārand* (Table of the lunar latitude, which is taken with the argument of latitude). [B 127v; O 115r; A p. 174]

Arguments 0 (0;12) 89;48, k=2, underlying maximum lunar latitude: 5°.

H 113v: (table) *Ikhtilāf-i manẓar-i muʿaddal-i qamar ba-dāʾirah-i irtifāʿ dar buʿd-i abʿad wa taʿdīl-ish* (The corrected lunar parallax in the altitude circle for the greatest distance and its equation). [B 128r; O 115v; A p. 178 (A includes on p. 175 a table of the solar distance from the centre of the earth, expressed in parts of the radius of the eccentre, which is not found in manuscripts HBO. The maximum value of this table is 62;1,20,0 for 0° Aries, the minimum 57;58,41,4 for 29° Virgo, and the value for 0° Cancer 60;2,2,39).]

Parallax and parallax equation as a function of the true colatitude; 0 (0) 90, k=2, maximum parallax 0;51,22 for 90°, maximum equation 0;10,14 for 90°.

H 113v: (table) *Daqāʾiq-i nisab-i ikhtilāf-i manẓar-i qamar* (Interpolation function for the lunar parallax). [B 128r; O 115v; A p. 178]

The argument is the corrected anomaly: 0 (5) 180, k=2.

H 114r: (table) *niṣf-i quṭr-i nayyirayn wa ẓill dar ijtimāʿāt* (The radii of the luminaries and the shadow for conjunctions). [B 128v; O 116r; A p. 178]

A small subtable gives the *niṣf-i qamar* ⟨should be *quṭr-i*⟩ *shams* at largest (15;2), mean (15;32) and smallest distance (16;5); the middle column displays the argument, the corrected anomaly (0 (5) 180); the rightmost column gives the *muqawwas-i niṣf-i quṭr-i qamar* in two

subcolumns *dar kusūfāt* and *dar khusūfāt*; the leftmost column gives the *muqawwas-i niṣf-i quṭr-i ẓill*; both functions have k=2.

H 114r: (table) *Daqāʾiq-i nisab-i buᶜd-i qamar* (Interpolation function for the lunar distance). [B 128v; O 116r; A p. 176]

Arguments: 0 (1) 180, k=2.

H 114v: (table) *Jadwal-i buᶜd-i abᶜad-i qamar az markaz-i ᶜālam wa taᶜdīl-ish ba-ajzāʾī kih niṣf-i quṭr-i māʾil shaṣt bāshad* (Table of the furthest distance of the moon from the centre of the universe and its equation, for the parts for which the radius of the inclined sphere is sixty). [B 129r; O 116v; A p. 176]

The column for the equation occurs to the right of the distance; the argument is the corrected anomaly, 0 (1) 180, k=2; the distance varies between 65;12,24 and 54;47,36, the equation between 20;38,50 (for arguments 7° to 11° Cancer) and 20;46,0 (for 0° and 180°).

H 115r–115v: (table) *Jadwal-i khusūf-i qamar ba buht-i qamar wa ᶜarḍ-i ḥaqīqī bi-gīrand* (Lunar eclipse table, to be taken with the lunar velocity and the true latitude). [B 129v–130r; O 117r–117v; A pp. 179–180]

The horizontal argument is the velocity, which is tabulated for 11;50 (0;20) 14;50; the vertical argument is the latitude, tabulated for 0 (2) 60. For each velocity four values are tabulated (stretches of some of these are empty), namely: *aṣābiᶜ-i quṭr*, *aṣābiᶜ-i jirm*, *sāᶜāt-i suqūṭ* and *sāᶜāt-i makth* (all k=1).

H 116r–117r: (table) *Jadwal-i ikhtilāf-i manẓar-i qamar dar ṭūl wa ᶜarḍ dar buᶜd-i abᶜad ba-ᶜarḍ* 25 / 30 / 35 / 40 / 45 / 50 (Table of the lunar parallax in longitude and latitude at largest distance for latitude 25° / ... / 50°). [B 130v–131v; O 118r–119r; A pp. 181–183]

This table gives seasonal hours, the parallax in longitude, and the parallax in latitude for hours before and after midday (vertical argument) and the seven zodiacal signs from Cancer till Capricorn (horizontally); all values are given to seconds; each page covers two latitudes. Kennedy 1956b (esp. pp. 34 and 41) discusses this table and compares it with other Islamic tables for lunar parallax, in particular those of al-Kāshī.

H 117v: (table) *Jadwal-i kusūf-i shams ba-buht-i qamar wa ᶜarḍ-i marʾī-yi ū bi-gīrand* (Solar eclipse table, to be taken with the lunar velocity and its apparent latitude). [B 132r; O 119v; A p. 184]

The horizontal argument is the lunar velocity (11;50 (0;20) 14;50), the vertical argument the apparent latitude (0, 1, 2 (2) 30, 31, 32). The given tabular values (all k=1) are *aṣābiᶜ-i quṭr*, *aṣābiᶜ-i jirm*, and *sāᶜāt-i*

suqūṭ. In the middle of the table we find values for the *sāᶜāt-i makth*: 0;5, 0;6, 0;8, 0;10, 0;12, which appear to belong to the lower half.

H 118r–118v: (table) *Jadwal-i awsāṭ-i zuḥal dar sālhā wa māhhā-yi ᶜarabī / dar ayyām wa sāᶜāt* (Table of the mean motions of Saturn for Arabic years and months / for days and hours). [B 132v–133r; O 120r–120v; A pp. 185–186]

Like all further planetary mean motion tables, this table displays the mean centrum, the mean anomaly and, only in the subtable for collected years (841 (1) 871), the apogee longitude for the same arguments as the solar and lunar mean motion tables; k=2.

H 118v: (table) *Tafāwut-i mā bayna al-ṭūlayn* (The difference between the two longitudes). [B 133r; O 120v; A p. 186]

H 119r: (table) *Jadwal-i taᶜdīl-i awwal-i zuḥal ba-markaz bi-gīrand wa bar markaz afzāyand wa az khāṣṣah nuqṣān kunand* (Table of the first equation of Saturn, to be taken with the centrum and to be added to the centrum and subtracted from the [mean] anomaly); 0 (1) 359, k=2. [B 133v; O 121r; A p. 187]

H 119v: (table) *Jadwal-i taᶜdīl-i duwum-i zuḥal ba-khāṣṣah-i muᶜaddalah bi-gīrand* (Table of the second equation of Saturn, to be taken with the corrected anomaly). [B 134r; O 121v; A pp. 187–188]

Arguments: 0 (1) 359, k=2.

H 120r–120v: (table) *Jadwal-i daqāᵓiq al-ḥiṣaṣ-i zuḥal ba-markaz bi-gīrand agar khāṣṣah-i muᶜaddalah kamtar / bīshtar az shash burj bāshad* (Table of the interpolation function for Saturn, to be taken with the centrum if the corrected anomaly is less / more than six signs). [B 134v, 135r; O 122r–122v has *ba-markaz-i muᶜaddal bi-gīrand*; A pp. 188, 189]

Arguments: 0 (1) 179, k=2.

H 120r: (table) *Jadwal-i ikhtilāf-i zuḥal ba-khāṣṣah-i muᶜaddalah bi-gīrand* (Table of the difference ⟨in equation of anomaly⟩ for Saturn, to be taken with the corrected anomaly). [B 134v; O 122r; A p. 188]

Arguments: 0 (1) 179, k=2.

H 120v: (table) *Jadwal-i ᶜarḍ-i zuḥal* (Table of the latitude of Saturn). [B 135r; O 122v; A p. 189]

With subtables displaying *daqāᵓiq-i nisab* (interpolation minutes) as a function of the corrected centrum, (0 (1) 89, k=2) and *mayl-i shimālī* and

mayl-i janūbī (for the other planets the word *ʿarḍ* is used) as a function of the corrected anomaly (0 (6) 180, k=2).

H 121r–123v: Similar tables for the mean motions, equations and latitude of *mushtarī* (Jupiter). [B 135v–138r; O 123r–125v; A pp. 190–194]

The latitude interpolation function runs over 180° of the argument from 98° till 278°.

H 124r–127r: Similar tables for the mean motions, equations and latitude of *mirrīkh* (Mars). [B 138v–141v; O 126r–129r; A p. 195–200]

The mean motions in years have k=3. The second equation displays zodiacal signs, degrees, minutes and seconds and gives values for each 20′ of the argument for the signs Virgo and Libra; the equation is spread over two pages instead of one. The latitude interpolation function runs over 180° of the argument from 86° till 266°).

H 127v–130v: Similar tables for the mean motions, equations and latitude of *zuharah* (Venus). [B 142r–145r; O 129v–132v has *sigānah* instead of *sīz-gānah*; A pp. 201–205]

The second equation displays zodiacal signs, degrees, minutes and seconds and occupies one-and-a-half pages. The latitude table on folio 130v is headed *Jadwal-i ʿarḍhā-yi sīz-gānah-i zuharah* (Table of the three latitudes of Venus) and consists of a subtable displaying the first latitude and the second and third interpolation functions as a function of the corrected anomaly (0 (1) 89, k=0), and one displaying the *mayl* and the *inḥirāf* as a function of the corrected anomaly (0 (1) 179, k=1).

H 131r–134r: Similar tables for the mean motions, equations and latitude of *ʿuṭārid* (Mercury). [B 145v–148v; O 133r–136r; A pp. 206–210]

Both equations have k=1, the second equation displays zodiacal signs as well. The latitude tables occupy one-and-a-half pages and consist of two subtables. The first one tabulates the first latitude and the second and third interpolation functions as a function of the corrected centrum (sic!, 0 (1) 179). The second subtable displays the *mayl* and the *inḥirāf* as a function of the corrected anomaly (0 (1) 179, k=1).

H 134v: (table) *Jadwal-i maqāmāt-i rajʿat wa istiqāmat ba-markaz-i wusṭā bi-gīrand* (Table of the stations of the retrograde and direct motion, to be taken with the mean centrum). [B 149r; O 136v; A p. 211a]

Displays the stations in zodiacal signs, degrees and minutes for each of the five planets and values of the mean centrum 0 (6) 180.

H 134v: (table) *Jadwal-i niṭāqāt-i kawākib; niṭāq-i awjīrā dar nayyirayn ba-markaz-i muṭlaq wa dar mutahayyirah bar markaz-i muʿaddal bar-gīrand wa niṭāq-i tadwīrīrā ba-khāṣṣah-i muʿaddalah*

bar-gīrand (Table of the planetary sectors; the apogee sector is taken with the absolute [i.e., mean] centrum in the case of the two luminaries and with the corrected centrum in the case of the planets, the epicycle sector is taken with the corrected anomaly). [B 149r; O 136v; A p. 211b]

The values (k=2) are displayed for the apogee sector, the epicycle sector and an equation, twice for each planet, namely once for the distance and once for the motion. Kennedy 1958 (esp. pp. 250–252) reproduces the values from this table and compares them with other Islamic tables for the planetary sectors.

H 135r: (table) *Jadwal-i ṭaʿdīl al-ghurūb ba-ʿarḍ* 25 / 30 / 35 / 40 (Table for the equation of rising for latitude 25° / ... / 40°). [B 149r; O 137r; A p. 212]

The horizontal argument is 'degrees of the lunar latitude', running 1 (1) 5, the vertical argument appears to be the lunar position on the ecliptic, running through the zodiacal signs; k=1.

H 135r: (table) *Jadwal-i qaws al-ruʾyah-i khamsah-i mutahayyirah ba-wasaṭ-i iqlīm-i sīwum / chahārum* (Table of the arc of visibility of the five planets for the middle of the third / fourth climate). [B 149v; O 137r; A p. 212]

This table has the layout of Ptolemy's *Handy Tables*. Column headings are *khafāʾ-i masāʾī qabl az iḥtirāq* ('evening disappearance before burning') and *ẓuhūr-i sabāḥī baʿd az iḥtirāq* ('morning appearance after burning'). For the inferior planets each two columns have an additional heading: *ḥawālī iḥrāq kih dar istaqāmat / rujʿat bawad* ('states of combustion which occur for direct / retrograde motion'). Arguments are the zodiacal signs. Kennedy & Agha 1960 includes this pair of tables in an overview of tables for planetary visibility in Islamic *zīj*es.

H 135v: (table) *Jadwal-i sayr-i āftāb dar daqāʾiq-i buht kih jazw-i al-buʿd wa sāʿāt-i buʿd az īnjā maʿlūm kunand* (Table of the solar motion in minutes of velocity, from which the degree of the distance and the hours of the distance are made known). [B 150r; O 137v; A p. 213].

For each velocity (0;57 (0;1) 1;2) the values (k=2) are constant multiples of the distance (1 (1) 60).

H 136r–143r: (table) *Jadwal-i mizājāt-i qamar bā kawākib* (Table of the 'meetings' of the moon with the planets) [B 150v–157v; O 138r–142v (the last two pages are in a different hand and apparently display the function for velocities 13;24 (0;3) 17;9); A pp. 213–221]

Values (k=2) as a function of the distance (horizontally, 1 (1) 10 (10) 50) and the velocity (vertically, 9;30 (0;1) 17;0 with 0;30 on every page page).

H 143v–149v: (table) *Jadwal-i ittiṣālāt-i kawākib ba buht wa buᶜd bi-gīrand* (Table of conjunctions of the planets, to be taken with the velocity and the distance). [B 158r–163v; O 143r–149r (in the same hand as the extension of the previous table; f. 149v is empty); A pp. 222–230]

The vertical argument is the distance (1 (1) 60), the horizontal argument the velocity (0;1 (0;1) 2;30). There are no values for pairs of arguments for which the distance is larger than 60 times the velocity; at the diagonal border of the table all values equal 24 hours; the triangular parts of the table were folded in order to save space.

H 150r–168v: (table) *Jadwal-i mawāḍiᶜ-i kawākib-i thābitah dar ṭūl wa ᶜarḍ kih mā ba-raṣad yāftīm dar awwal-i sāl-i 841 hījrī / asāmī-yi kawākib wa mawāqiᶜ-i har yak az ṣuwar* (Table of the positions of the fixed stars in longitude and latitude which we have found by observation for the beginning of the year 841 Hijra / the names of the stars and the positions of each of the constellations). [H: This range of folios includes the unnumbered folio 155bis; B 164v–181v; O 150r–170r; A pp. 231–254]

This table has approximately 24 lines per page, subtitles for groups of constellations (*kawākib-i ṣuwar-i shimālī*, *kawākib-i ṣuwar-i minṭaqat al-burūj*, *kawākib-i ṣuwar-i janūbī*) and for the constellations themselves (*kawākib-i dubb-i aṣghar*, *khārij-i īn ṣūrah*, *kawākib-i dubb-i akbar*, etc.). The columns of the table are headed *al-ᶜadad* (running number within the constellations), *(baᶜḍī) asmāʾ-i kawākib-i mashhūr* ([some] names of well-known stars), *ṭūl* (longitude), *ᶜarḍ* (latitude) and *aqdār ᶜalā raʾy al-Ṣūfī* (magnitudes according to al-Ṣūfī). The table was transcribed and translated into Latin in Hyde 1665 and was critically edited in Knobel 1917; its coordinates were used for testing a method of analysis in Evans 1987, pp. 162–165; the table was further analysed in Shevchenko 1990 and Krisciunas 1993, while its dependence on al-Ṣūfī's *Kitāb Ṣuwar al-kawākib al-thābitah* was investigated in Kunitzsch 1998.

H 169r: ***Maqālat-i chahārum dar bāqī-yi aᶜmāl-i nujūmī wa ān mushtamil bar dū bāb ast*** (Fourth treatise: about the remaining astronomical operations, and that consists of two chapters). [B 182r; O 172r; S 434/201; A p. 255]

This treatise deals primarily with astrological topics, for most of which explanations and references to further literature are provided in van Dalen 2022. For a manual on all aspects of Islamic astrology, see Wright 1934. For *tasyīr*s, *intihāʾ*s and *fardār*s, see Kennedy 1964 (esp. pp. 26–30).

H 169r: *Bāb-i awwal dar ānchi taᶜalluq dārad ba-ṭāliᶜ-i mawālīd wa ān haft faṣl ast* (First chapter: about that which is connected with the

ascendent of nativities, and that is seven sections). [B 182r; O 172r; S 434/201; A p. 255]

H 169r: *Faṣl-i awwal dar namūdārāt* (First section: about *namūdār*s ⟨i.e., methods for correcting the ascendant⟩). [B 182r; O 172r; S 434/201; A p. 255]

Al-Kāshī's treatment of *namūdār*s is discussed in Kennedy 1995, pp. 139–144. See also van Dalen 2022, pp. 47–51 and 98–100.

H 169v: *Faṣl-i duwum dar maᶜrifat-i ᶜarḍ-i ufq-i hādith-i har kawkabī ba-ḥasbi mawāḍiᶜ-i aw dar ṣūrat-i tāliᶜ* (Second section: about the latitude of the incidental horizon of any star according to its positions in the horoscope diagram). [B 183r; O 172v; S 438/205; A p. 256a]

H 170r: *Faṣl-i sīwum dar maᶜrifat-i maṭāliᶜ-i muṣaḥḥaḥ-i kawākib* (Third section: about the corrected ascension of the planets). [B 183v; O 172v; S 440/208; A p. 256b]

H 170r: *Faṣl-i chahārum dar maṭāriḥ-i shuᶜāᶜāt-i kawākib* (Fourth section: about the projection of the rays of the planets). [B 183v; O 173r; S 441/209; A p. 257a]

H 170v: *Faṣl-i panjum dar tasyīrāt* (Fifth section: about the *tasyīr*s ⟨i.e., prorogations, progressions or apheses⟩). [B 184r; O 173r; S 443/211; A p. 257b]

H 171r: *Faṣl-i shashum dar intihāʾāt-i mawālīd* (Sixth section: about the *intihāʾ*s [termini] of nativities). [B 185r; O 173v; S 446/215; A p. 258b]
H 171r: *Faṣl-i haftum dar fardārāt-i mawālīd wa sālhāʾ-yi tartīb* (Seventh section: about the nativity *fardār*s [i.e., *firdaria*] and the years of order ['*tartīb*']). [B 185r; O 173v; S 447/216; A p. 258b]

H 171v: (table) *Jadwal-i ḥiṣaṣ-i rūzhā-ī az sāl-i tasyīr-i dalāʾil-i aṣl-i mawālīd; har sāl-i shamsī yak darajah-i maṭlaᶜī* (Table of the contributions of days to the year of the *tasyīr* of indicators of the base nativities; each solar year is one ascensional degree). [B 186r (has '*tasyīr-i sāl wa dalāʾil*'); O 174r; A p. 261]

The argument is days of the year (0 (1) 365) and hours of a day (1 (1) 24), k=2; 1 solar year corresponds to 1 equatorial degree.

H 172r: (table) *Ḥiṣaṣ-i daqāʾiq-i tasyīr az ayyām-i shamsī* (Contributions of the minutes of the *tasyīr* to solar days). [B 186v; O 174v; A p. 262]

The argument is minutes of the *tasyīr* (1 (1) 60), the tabular values are given in days and hours; 1 equatorial degree corresponds to 1 solar year.

H 172r: (table) *Jadwal-i faḍl al-dawr ba-ḥasbi raṣad-i mā* (Table of the excess of rotation according to our observation). [B 186v; O 174v; A p. 262]

Arguments: 1 (1) 120 years, k=1; the excess of revolution amounts to 87;33,6°.

H 172v: (table) *Jadwal-i tasyīr-i awtād-i taḥwīlī bi-sayr-i wasaṭ-i āftāb tanhā bi-ayyām-i sāl bar-gīrand wa bar dalāʾil-i taḥwīlī afzāyand* (Table of the *tasyīr* of the transfer centres based on the mean solar motion, taken only with the days of the year and added to the indicators of the transfers). [B 187r; O 175r; A p. 263]

Arguments: 0 (1) 366 days and 0 (1) 24 hours, k=1; 1 solar year corresponds to 12 zodiacal signs (as for the small world-*intihāʾ*).

H 173r: (table) *Jadwal-i tasyīr-i awtād-i taḥwīlī ba-majmūʿ-i sayr-i wasaṭ-i āftāb wa faḍl al-dawr ba-ayyām bar-gīrand wa bar maṭāliʿ-i ṭāliʿ-i taḥwīl afzāyand* (Table of the *tasyīr* of the transfer centres according to the sum of the solar mean motion and the excess of revolution, which is taken with the days and is added to the the ascension of the ascendent of the transfer). [B 187v; O 175v; A p. 264]

Arguments: 1 (1) 366 days and 1 (1) 24 hours, k=1; 1 solar year corresponds to 360° plus the excess of revolution.

H 173v: (table) *Jadwal-i intihāʾ-i sanawī* (Table of the annual *intihāʾ* [O adds: "which is added to the degree of the base (*aṣl*) or the 'tenth' or the positions of the planets at the time of birth"). [B 188r; O 176r (adds: '*bar juzʾ-i aṣl yā ʿāshir yā mawāḍiʿ-i kawākib-i waqt-i mawlūd afzāyand*'); A p. 265]

Arguments: 1 (1) 365 days and 1 (1) 24 hours, k=1; 12 days correspond to the daily solar motion.

H 174r: (table) *Jadwal-i intihāʾ-i shuhūrī* (Table of the monthly *intihāʾ*) [B 188v; O 176v; A p. 266]

Arguments: 1 (1) 365 days and 1 (1) 24 hours, k=1; 12 days correspond to the solar motion in 13 days.

H 174v: (table) *Jadwal-i khudāwandān-i fardārāt-i mawālīd-i nahārī wa laylī wa shurakāʾ-i īshān* (Table of the lords of the *fardār*s of nativity during day and night and their associates). [B 189r; O 177r; A p. 267]

The columns are headed *sālhā-yi mawlūd-i nahārī*, *sālhā-yi mawlūd-i laylī*, *ṣāḥib-i fardārāt*, and *shurakāʾ*.

H 175r: *Bāb-i duwum dar dalāʾil kih taʿliq ba-ṭāliʿ-i ʿālam dārad* (Second chapter: about the indicators that are connected with the ascendent of the universe). [H: in order to fill up the excessive space in between sets of tables filling full pages, the scribe wrote five lines on f. 175r and seven lines on f. 175v in a zig-zag shape; B 189v; O 177v; S 448/218; A p. 259 (before the tables belonging to chapter IV.1)]

H 176r–176v: (table) *Jadwal-i tasyirāt wa intihāʾāt-i mā bayn sīṣad wa chahār ṣad malikī* (Table of the *tasyīr*s and *intihāʾ*s between three hundred and four hundred Maliki). [B 191r–v (f. 190v is empty); O 178r–178v; A p. 268]

This table has columns for the *tasyīr*s and the *intihāʾ*s with subcolumns for 'mighty' (*aʿẓam*), 'big' (*akbar*), 'middle' (*awsaṭ*) and 'small' (*aṣghar*); the argument is incomplete Maliki years, the increase in the four quantities in agreement with the usual definitions.

H 177r: (table) *Jadwal-i ḥarakat-i tasyīrāt wa intihāʾāt dar sālhā-yi miʾāt wa ulūf wa ʿasharāt ulūf* (Table of the motion of the *tasyīr*s and the *intihāʾ*s for hundreds, thousands and ten-thousands of years). [B 192r; O 179r; A p. 270]

Layout as in the preceding table but now for arguments 100 (100) 1000 (1000) 10000 (10000) 30000, k=1. The increase is in agreement with the usual definitions.

H 177v: (table) *Jadwal-i fardār-i aʿẓam dar sālhā-yi majmūʿah dū hazār wa haftṣad wa chihal sāl bar sālhā-yi nāqiṣah-i malikī afzāyand wa bāz ān ḥāṣil bargīrand* (Table of the mighty ⟨world⟩ *fardār* in collected years; two thousand seven hundred and forty years are added to the incomplete Maliki years and again the result is taken). [B 192v; O 170v (! the remaining tables are inserted before the text of the fourth treatise); A p. 271]

Arguments: 1 (1) 84; for each cycle (numbered from 1 to 84) the total number of incomplete years (1 (360) 29881) and the sign-planet pair (starting with Aries-Saturn) are given.

H 177v: (table) *Ḥarakat-i fardār-i aʿẓam dar sālhā-yi mabsūṭah* (Table of the mighty ⟨world⟩ *fardār* for extended years). [B 192v; O 170v (!); A p. 271]

Argument: 1 (1) 60 (60) 360, k=1; 360 year correspond to 30°, i.e., 1 zodiacal sign.

H 177v: (table) *Jadwal-i fardār-i akbar bīst wa dū sāl bar taʾrīkh-i nāqiṣah-i malikī afzāyand wa kḥ kḥ tarḥ kunand wa ba-bāqī az-īn jadwal bargīrand* (Table of the big ⟨world⟩ *fardār*; twenty-two years are added to the incomplete Maliki date, ⟨then⟩ 28 is subtracted

repeatedly, and the remainder is taken from this table). [H omits '*kẖ kẖ*'; B 192v; O 170v (!); A p. 271]

Arguments: 1 (1) 78 years, k=1; gives the position on the ecliptic of the big *fardār* for incomplete years within the period of 78 year; note that the positions for 1, 13, 24, 34, ..., 78, 79 years are 0^s, 1^s, 2^s, 3^s, 11^s, 12^s respectively.

H 178r–178v: (table) *Jadwal-i dawr-i fardār-i awsāṭ wa aṣghar wa shurakāʾ ba-izāʾ-i sālhā-yi nāqiṣah-i malikī bar-gīrand* (Table of the middle and small *fardār* and the associates, which is taken with what is opposite the incomplete Maliki years) [B 193r–v; O 171r–v (!); A p. 272]

Arguments: 1 (1) 75, k=0 (integer numbers); with columns for each planet and the lunar nodes and a column with only text on the left side of the page.

End of the Hamidiye manuscript.

[B has a colophon in red under the last table (in the bottom margin of f. 193v), written by the scribe of the entire manuscript but with the date 857 (corresponding to AD 1453) in black, possibly by a different hand. This is followed by a *faṣl dar istikhrāj sahāmāt* (194r–195r) with a table *jadwal sihāmāt* ... (194v), both written in the hand of the main scribe (possibly with the exception of the table heading). Ff. 195v–196r are empty, f. 196v carries inscriptions in Gujarātī- and Dīvanāgarī script.

O inserts the last four tables belonging to the *zīj* of Ulugh Beg before chapter IV.2. After f. 179r follow a number of spurious tables.

A adds on p. 274 a table for the motion of the comet Kaid in the days of a Persian year and in groups of Persian years (the motion amounts to 2°30′ per year against the order of the zodiacal signs); and on p. 276 a table for converting the beginnings of the Malikī years 411, 412, 413, ..., 500 (corresponding to 1489–1579 AD) into the Hijra, Byzantine, and Persian calendars, also giving the true solar position and the ascendant.]

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Abstract

This article presents a complete table of contents in transliterated Persian with English translations of one of the most widespread astronomical handbooks of medieval Islam, the *zīj* of the Timurid prince and sultan Ulugh Beg, who ruled over Transoxiana in the first half of the fifteenth century and was also a talented mathematician and astronomer. His *zīj* is one of the greatest computational achievements in the history of Islamic astronomy, which benefited in many ways from the work of the mathematical genius Ghiyāth al-Dīn Jamshīd al-Kāshī (d. 832/1429). The text of Ulugh Beg's *zīj* and the chronological tables from the first treatise were edited by Sédillot in 1847 and translated into French in 1853. Several parts of the *zīj* were studied by scholars ranging from seventeenth-century England to the twentieth-century Soviet Union. However, many aspects of the *zīj* of Ulugh Beg, its dependence on earlier works and its influence on later works remain to be studied. The present table of contents with brief characterisations of the tables is intended to serve such future research. It was originally written in 1995 and has now been updated with recent literature.

DIE ARABISCHEN FRAGMENTE DES AËTIOS VON AMIDA

MATHIAS WITT*

So manches heute im griechischen Original Verlorene ist in den Werken der drei großen byzantinischen Medizin-Kompilatoren Oreibasios (4. Jh. n. Chr.), Aëtios von Amida (6. Jh. n. Chr.) und Paulos von Aigina (7. Jh. n. Chr.) auszugsweise erhalten. Diese Kompilatoren exzerpierten das medizinische Wissen der Kaiserzeit und tradierten es so weiter – in gleicher Weise wie es die römischrechtlichen Digesten mit heute verlorenen Werken kaiserzeitlicher Jurisprudenz tun. Während von Oreibasios und Paulos komplette kritische Textausgaben in der Reihe des *Corpus Medicorum Graecorum* (CMG) verfügbar sind, ist Aëtios noch unvollständig ediert.[1] Im Rahmen einer kritischen Textedition stellt sich die Frage nach der arabischen Überlieferung, da sie auf eine ältere Manuskripttradition zurückgeht als die uns heute zugängliche direkte griechische Überlieferung und somit eventuell Zeugnis für ältere und bessere Lesarten und ggf. in der späteren Überlieferung ausgefallene Textpassagen ablegen kann. In den kritischen Editionen des *Corpus Medicorum Graecorum* für Oreibasios und Paulos von Aigina wurde die arabische Parallelüberlieferung nicht berücksichtigt, da sie seinerzeit noch nicht erschlossen war.[2] Mittlerweile sieht die Situation etwas günstiger aus.

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Für viele wertvolle Hinweise und das Heraussuchen von Originalpassagen sei Herrn Dr. Fabian Käs herzlich gedankt.

[1] Gänzlich unediert sind die Bücher 10 und 14. Eine Erstedition wird derzeit vom Verfasser zusammen mit Irene Calà für die Reihe des *Corpus Medicorum Graecorum* vorbereitet. Von Buch 13 sind 2/3 griechisch unediert (89 von insgesamt 134 Kapiteln). Im Jahr 1906 veröffentlichte Zervos 29 von 134 Kapiteln (22%: Kapitel 1–4, 6, 11–13, 15–24, 32, 34–37, 53–56 und 58–59). In seiner Nikander-Edition (2007) publizierte Jean-Marie Jacques darüber hinaus 16 weitere Kapitel von Buch 13 (51, 52, 57, 60–63, 65, 66, 69, 71, 75–77, 79, 80), zuzüglich der bereits zuvor von Zervos edierten Kapitel 54–56 und 58–59.

[2] Cf. hierzu Schröder Sp. 811: „Bei Rhazes im Continens und bei Serapion jun. finden sich eine große Reihe von Exzerpten [aus Oreibasios]. Daremberg (Œuvres d'Orib. I S. XXXVI) hatte sie aus den lateinischen Drucken gesammelt und wollte sie mit den arabischen Hss. vergleichen. Molinier, der die Ausgabe des O[reibasios] zu Ende führte, hat sie nicht veröffentlicht. Auch Raeder [CMG] erwähnt sie nicht."

Arabische Oreibasios-Fragmente: Aus Rāzīs *Ḥāwī* wurden die Oreibasios-Fragmente gesammelt und provisorisch ediert (Buzzi/ Garofalo). Leider handelt es sich bei diesen Fragmenten ausschließlich um Exzerpte pharmazeutischen Inhalts. Die meisten stammen aus Oreibasios' *Eclogae* und der *Synopsis ad Eustathium* bzw. *ad Eunapium (= Euporista)*. Knapp 100 Passagen, die keiner erhaltenen Oreibasios-Schrift zugeordnet werden können, werden von Buzzi pauschal als verlorene Abschnitte der *Collectiones medicae* angesehen. Zu Recht? Die monumentalen *Collectiones* sind ja griechisch nur partiell überliefert (25 der ursprünglich 72 Bücher). Fraglich ist jedoch, ob Rāzī überhaupt Zugang zu einer arabischen Version der *Collectiones* hatte. Nach den arabischen Bibliographen wurden die *Collectiones* und die beiden *Synopseis* (*ad Eustathium* und *ad Eunapium [= Euporista]*) ins Arabische übersetzt.[3] Ibn an-Nadīm[4] berichtet, dass diese beiden letzten Werke von Ḥunain ibn Isḥāq ins Arabische übertragen wurden, ebenso das „Buch der 70 Kapitel", also die *Collectiones*. Diese seien überdies von ʿĪsā ibn Yaḥyā ins Syrische übersetzt worden. Daneben erwähnt Ibn an-Nadīm arabische Übersetzungen zweier uns griechisch nicht erhaltener Schriften des Oreibasios: „Buch über die Anatomie der Eingeweide" und ein „Buch über die gebräuchlichen Arzneien", ins Arabisch übersetzt von Iṣṭafān Ibn Bāsīl (Stephanos Basilos). Schröder (Sp. 811) geht davon aus, dass das „Buch über die gebräuchlichen Arzneien" mit der *Synopsis ad Eunapium* (*Euporista*) identisch ist. Ibn an-Nadīm müsste somit zweimal hintereinander ein und dieselbe Schrift unter verschiedenem Titel genannt haben. Dies ist nicht zwingend anzunehmen, ist aber durchaus möglich, falls er die Übersetzungen nicht im Original kannte und lediglich nach dem Titel ging, der sich bei Iṣṭafān Ibn Bāsīl und bei Ḥunain unterschied. Von Buzzi werden 12 Oreibasios-Fragmente sicher den *Collectiones* zugeordnet. Prüft man diese nach, so sind jedoch lediglich drei dieser 12 Passagen ausschließlich in den *Collectiones* auf uns gekommen.[5] Für die anderen gibt es eine (von Buzzi nicht bemerkte) Parallelüberlieferung in der *Synopsis ad Eustathium* bzw. *ad Eunapium*![6] Hierdurch wird nochmals unwahr-

[3] Ullmann S. 83–85, *Fihrist* (ed. Flügel) S. 292,12, al-Mağūsī kennt diese drei Werke (Ullmann S. 43, Buzzi/Garofalo S. 132).

[4] Ed. Flügel I 292, 12 und Anmerkung II 154, Buzzi/Garofalo S. 132.

[5] coll. 8,21,3 (S. 159); coll. 7,16,1 (S. 214); coll. 11α 73.

[6] coll. 9,34,7 (S. 152), aber auch *Eustath.* 1,26,8 und 3,80,7; coll. 7,26,153 (S. 154), aber auch *Eustath.* 1,17,30; coll. 8,21,16 (S. 156), aber auch *Eustath.* 1,18,11; coll. 7,26,39 (S. 156), aber auch *Eustath.* 1,17,1 (so auch von Buzzi bemerkt); coll. 43,5,7 (S. 259), aber auch *Eunap.* 3,25,10 (so auch von Buzzi bemerkt); coll. 9,21,1 (S. 202), aber auch *Eustath.* 1,25,1; coll. 14,22, aber auch *Eusthath.* 2,10; coll. 43,57,17, aber auch *Eunap.* 3,25,10; coll. 11μ 12.1 (S. 290), aber auch *Eustath.* 2,56,37–38 (so auch

scheinlicher, dass Rāzī aus den *Collectiones* exzerpiert hätte. Es sei in diesem Zusammenhang eine Parallele zu Aëtios aufgezeigt: bei diesem finden sich einige Rezepte bzw. pharmazeutische Passagen unter dem Namen des Oreibasios überliefert, die im griechischen Oreibasiostext nicht auffindbar sind. Auch Aëtios hat wohl Oreibasios' *Collectiones* nicht direkt benutzt.[7] Es scheint daher wahrscheinlicher, dass einstmals eine Rezeptsammlung unter dem Namen des Oreibasios existierte, die Aëtios wie orientalischen Autoren (z. B. Rāzī) zugänglich war, heute aber verloren ist. Es könnte sich durchaus um das von Ibn an-Nadīm erwähnte „Buch über die gebräuchlichen Arzneien" handeln, was jedenfalls plausibler ist als anzunehmen, dass Rāzī ausschließlich relativ kurze und belanglose Rezepte, wie es die Oreibasios-Fragmente bei ihm nun einmal sind, aus den so unerschöpflichen *Collectiones* exzerpiert hätte. Wenn es denn seltene Passagen unter den Oreibasios-Fragmenten und bei Aëtios gibt, die sich heute nur in den *Collectiones* finden, so dürfte es sich auch um Passagen des verlorenen „Buches über die gebräuchlichen Arzneien" (oder eben einer anderen unter Oreibasios' Namen überlieferten Rezeptsammlung) handeln, bei denen diese Schrift Überschneidungen mit den *Collectiones* aufwies. Eine Sammlung der arabischen Oreibasios-Fragmente bei ibn Sarābiyūn (cf. oben Anm. 2) steht noch aus.

Arabische Paulos-Fragmente: Aus Paulos von Aigina sind im Arabischen überbordend viel Fragmente überliefert. Bedingt durch diese Masse beschränkt sich die Studie von Pormann zur arabischen Paulos-Überlieferung auf eine Auswahl von Paulos-Exzerpten, so z. B. nur aus dem ersten Buch des *Ḥāwī*.[8] Eine vollständige Auswertung der arabischen Paulos-Überlieferung ist noch ein Desiderat. Immerhin finden sich im *Ḥāwī* auch substanzielle, inhaltlich bedeutsamere Paulos-Exzerpte (nicht nur Rezepte), die griechisch nicht auf uns gekommen sind.[9]

Arabische Aëtios-Fragmente: Im Gegensatz zu Oreibasios und Paulos sind im Arabischen nur verhältnismäßig wenige Aëtios-Exzerpte erhalten. Eine vorläufige Inventarisierung der Fragmente in Listenform findet sich bei Ullmann (S. 84f.), weitere Bemerkungen bei Sezgin (S. 164f.)[10]

von Buzzi bemerkt); die Angabe „coll. 3,36" (S. 301) ist unzutreffend, da es sich hier um eine Passage aus *Eustath.* 3,36 handelt.

[7] Gemäß einer voräufigen Quellenanalyse, auch der unedierten Bücher 10 und 14.

[8] Cf. Pormann S. 63.

[9] Cf. Witt (im Erscheinen).

[10] Cf. auch Käs S. 36, 52, 53, 93, 171, 172, 384, 809, 849, 934–936, 1006, 1018 und 1019.

Bei al-Bīrūnī findet sich die Nachricht, dass Aëtios' Pragmatie von einem Abū al-Ḫair in das Arabische übersetzt worden sei (s. u. Fragment Nr. 14, siehe auch Frg. D6 und D10). Dieser Abū al-Ḫair wird von Sezgin mit Ibn al-Ḫammār (4./10. Jh), von Ullmann tentativ mit al-Ḥasan ibn Suwār identifiziert. Ibn Abī Usaibi'a (I,109) überliefert den arabischen Titel *Bāqūquyā* (= „Überreste"?) für Aëtios' Kompilation. Ḫalīfa ibn Abī al-Maḥāsin listet „das Buch des Augenarztes aus Amid"[11] als Quelle seiner augenheilkundlichen Schrift *Kitāb al-kāfī fī al-kuḥl*, wo freilich keine konkrete Passage mit der Autorenangebe „Aëtios" versehen ist. Aufgrund dieser Quellenangabe bei Ḫalīfa folgert Hirschberg, dass bei den Arabern eine separate Edition von Aëtios' siebentem Buch (über Augenkrankheiten) zirkulierte.[12] Im Arabischen wird Aëtios im übrigen als اطيوس الأمدي bezeichnet, teilweise aber auch mit Antyllos verwechselt (so begegnen nicht selten Formen wie انطيلش الأمدي, cf. Frg. 2a, 8c, 9a, c, d und e unten; der Inhalt der Fragmente und der Beiname al-Āmidī zeigt jedoch eindeutlich, dass es sich hierbei um Aëtios-Passagen handelt).

Ullmann (S. 85) listet folgende Aëtios-Zitate: Rāzī, *Ḥāwī* 20,518,11; Bīrūnī, *Ǧawāhir* 100,2f.; 117,6; b. Sīnā, *Qānūn* II 130,24,27, Tamīmī, *Muršid* fol. 126a2; b. Baiṭār, *Ǧāmi'* IV 89,1; 161,19f.; Ǧildakī, *Durra* 44 a II. Sezgin (S. 165) erwähnt drei Stellen (12^b, 18^b, 42^b) in einer Handschrift von al-Bīrūnīs *Ṣaidana*. Tatsächlich finden sich dort einige weitere Zitate.[13] Im Folgenden werden diese und alle weiteren bislang bekannt gewordenen arabischen Aëtios-Zitate zusammengestellt. Sie weisen einen unterschiedlichen Grad von wörtlicher Treue zum griechischen Original auf. Ursula Weisser (1991) hat in einer Studie zu Rāzīs *Ḥāwī* eine Typologie der Exzerpte nach dem Grad der Wörtlichkeit im Verhältnis zum Original erarbeitet. Die einzelnen Exzerpttypen sind:

Typ 1: Zitate im engeren Sinn: Textwiedergaben eng am Originalwortlaut, allenfalls kurze Lücken

Typ 2: Paraphrasen, gekürzte sinngemäße Wiedergaben, gelegentlich Abfolge der Argumente geändert

Typ 3: Referate, umfangreiche Passagen in wenigen Sätzen zusammengefaßt

Typ 4: Isolierte Aussagen, aus ursprünglichem Zusammenhang gelöst.

Als Typ 5 sei hier zusätzlich ein Zitattyp eingeführt, der vage Anleihen an das griechische Original zeigt, aber Aussagen ergänzt, die

[11] Lippert/Mittwoch S. 159.

[12] Hirschberg S. 160, Sezgin S. 165.

[13] Bīrūnī ed. °A. Zaryāb, Index S. 750b (s.v. Aṭiyūs Āmidī).

sich in der griechischen Quelle in ihrer heute überlieferten Form nicht finden.

Diese Typologie soll auch der vorliegenden Fragmentsammlung zugrundegelegt werden. Da die Fragmente aus mehreren Büchern des Aëtios stammen (1, 2, 6, 7, 9, 11, 13 und 15), ist anzunehmen, dass den Arabern nicht nur einzelne Bücher, sondern der gesamte Aëtios vorlag. Teilweise scheint direkt, teilweise über Zwischenquellen zitiert wordne zu sein.[14] Die nachstehende Anordnung der Aëtios-Fragmente orientiert sich an der (mutmaßlichen) Buchzugehörigkeit. Fragmente, die keine genaue Entsprechung bei Aëtios haben, erscheinen in eckigen Klammern (z. B. [Frg. 1]).

1. Identifizierbare Aëtios-Fragmente

Aëtios, Buch 1:

[Frg. 1], Aëtios 1,18 (?); Zitat-Typ 5
Bīrūnī, *Ṣaidana* 234,3 (s. v. *ḫāniq aḏ-ḏi'b* خانق الذّئب, ἀκόνιτον, Blauer Eisenhut – *Aconitum napellus*):

اطيوس: نبات يقتل الكلاب والفار والحيوانات.

Aṭiyūs: Eine Pflanze, die Hunde, Mäuse und Lebewesen umbringt.

Es handelt sich hierbei offensichtlich um die Übersetzung des Beginns eines Abschnittes über den blauen Eisenhut, in dem mehrere Synonyme für die Pflanze genannt werden. Es scheinen an dieser Stelle die griechischen Begriffe κυνοκτόνον und μυοκτόνον, beides Synonyme für den Eisenhut, ins Arabische übersetzt worden zu sein. Derartige Synonymenhäufungen finden sich etwa bei Dioskurides und Oreibasios:

Dioskurides, *De materia medica*, 4,76,1:
(1) ἀκόνιτον, οἱ δὲ παρδαλιαγχές, οἱ δὲ κάμμαρον, οἱ δὲ θηλυφόνον, οἱ δὲ κυνοκτόνον, οἱ δὲ μυοκτόνον· φύλλα ἔχει τρία ἢ τέσσαρα, …
Blauer Eisenhut: Manche nennen ihn „Leopardenwürger", manche „Unglückspflanze", manche „Frauentöter", manche „Hundetöter", manche „Mäusetöter". Er hat drei oder vier Blätter.

[14] Man kann davon ausgehen, dass al-Bīrūnī eine solche Übersetzung selbst benutzen konnte, während die übrigen Fragmente verlorenen Zwischenquellen entnommen sein dürften. Als eine kann ein Werk von Ibn Māssa al-Baṣrī erschlossen werden (s.u.). Al-Bīrūnīs Werk war kaum rezipiert worden, weshalb sich hier keine ähnliche Tradition bilden konnte (freundlicher Hinweis Fabian Käs).

Oreibasios, *Coll. med.* 11,25 (CMG VI 1,2, S. 83, Z. 25–26):
Ἀκόνιτον ἢ παρδαλιαγχὲς ἢ κυνοκτόνον φύλλα ἔχει τρία ἢ τέσσαρα, …
Blauer Eisenhut oder „Leopardenwürger" oder „Hundetöter" hat drei oder vier Blätter …

Im griechischen Aëtiostext steht in 1,18 ein entsprechender Abschnitt über den Eisenhut, der jedoch nur ein Synonym (παρδαλιαγχές – „Leopardenwürger") nennt. Ob der arabische Übersetzer auf diese Passage Bezug nahm und woher er dann die hier fehlenden Synonyme ergänzt, ist unbekannt.

Aëtios 1,18 (CMG VIII 1, S. 35, Z. 3):
Ἀκόνιτον ἢ παρδαλιαγχὲς παρέοικε μὲν τῇ ἀγρίᾳ ἴριδι, …
Blauer Eisenhut oder Leopardenwürger gleicht der wilden Iris …

[Frg. 2a], Aëtios 7,101 (?), Typ 5, Aëtios 1,61, Typ 5 (Teil 1), bzw. Typ 2 (Teil 2)
Rāzī, *Ḥāwī* XX, 518,11 Haid. (s.v. *rummān* رمان, ῥόα, βαλαύστιον, Granatapfel, *Punica granatum*):

وقال بعض القدماء وهو انطيلش (اطيوس :recte) الأمدي: إنه إن أكل ثلاثة من أقماع الرمان أمن من رمد العين سنة، وقال: الجلنار نافع جدا للسحج ولإدمال القروح.

Und es sagen einige der Älteren, so auch Anṭūliš [Antyllos] (recte: Aṭiyūs) al-Āmidī: Wenn man drei Kerne (wörtl.: Kegel) vom Granatapfel isst, dann ist man ein Jahr lang sicher vor einer Entzündung des Auges. Und er sagt: Und die Granatapfelblüte hilft sehr bei der Hautabschürfung und beim Zur-Vernarbung-Bringen von Wunden.

Der erste Teil dieses Zitats ist so im griechischen Aëtios-Text nicht belegt. Allerdings findet sich in Aëtios 7,101 eine Aussage zur Wirksamkeit von Granatapfel (Auspressen der Kerne) bei Augenerkrankungen:

Aëtios 7,10 (CMG VIII 2, S. 250, Z. 22–24):
Ὀξυδορκία ὑγρά. ῥοῶν κόκκων τὸν χυλὸν πιάσας βάλε εἰς ἄγγος Ἀττικοῦ ὀστράκου … καὶ ὀθονίῳ ψιλῷ περιδήσας τίθει εἰς ἥλιον, …
Flüssiges Mittel zum scharfen Sehen: presse den Saft von Granatapfelkernen aus und schütte ihn in ein Gefäß von attischem Ton …, binde eine Bandage herum und stelle es in die Sonne …

Eine vergleichbare Stelle findet sich bei Oreibasios, *Eunap.* 4,24,8 (CMG VI 3, S. 447, Z. 22–24):

Ὀξυδερκές· ῥοῶν τῶν κόκκων χυλὸν ἐκπιέσας βάλε εἰς ἄγγος Ἀττικὸν καὶ ὀθονίῳ περιδήσας θὲς εἰς ἥλιον, …
Mittel zum scharfen Sehen: presse den Saft von Granatapfelkernen aus, schütte ihn in ein attisches Gefäß, binde eine Bandage herum und stelle es in die Sonne …

Auch bei Alexander von Tralleis und im *Corpus Hippocraticum* begegnen vergleichbare Bemerkungen, aber wiederum ohne exakte Übereinstimmung zu der bei Rāzī angeführten Stelle:

Alexander Trall. *Therapeutica* 2,35,30:
καὶ ὁ κόκκος δὲ τῆς ῥοιᾶς ἐκπιεζόμενος κατὰ τοῦ ἔχοντος ὀφθαλμοῦ τὸν ἄνθρακα ὠφελεῖ μεγάλως, …
Und der ausgepreßte Granatapfelkern hilft außerordentlich bei demjenigen, der den Karbunkel am Auge hat …

Hipp. *De mulierum affectibus* 105 (VIII,228,13–16 L.):
Ἐὰν ὀφθαλμὸς δακρύῃ καὶ ὀδύνη ἔχῃ· ῥοιῆς γλυκείης τὸν χυλὸν ἐκπιέσας, ἐν χαλκείῳ ἑψεῖν ἐν πυρὶ μαλθακῷ, … εἶτα ὑγρῷ ὑπαλείφειν.
Wenn das Auge träne und Schmerzen hat: dann presse den Saft von süßem Granatapfel aus, koche ihn in einem Bronzegefäß bei schwacher Flamme, … dann bestreiche damit in flüssiger Form.

Zum zweiten Teil des Zitats findet sich aber bei Aëtios (1,61) eine eindeutige Parallele (Typ 2):

Aëtios, *Libr. med.* 1,61 (CMG VIII 1, S. 46, Z. 9–13):
Βαλαύστιόν ἐστιν ἀγρίας ῥοιᾶς ἄνθος, …, εἰ παρατρίμμασι καὶ τοῖς ἄλλοις ἕλκεσιν ἐπιπάττοις αὐτὸ ξηρὸν λειότατον, τάχιστα ἂν ἴδοις εἰς οὐλὴν ἰόντα ἀδήκτως·
„Balaustion" ist die Blüte des wilden Granatapfels …, wenn man sie wundgeriebenen Hautarealen und den anderen Wunden getrocknet und fein pulverisiert aufstreut, dann sieht man, dass sie äußerst schnell und reizlos zur Narbenbildung kommen.

Frg. 2b
Zum ersten, nicht genau bei Aëtios belegten Teil dieses Zitates gibt es eine Parallele bei Ibn Samaǧūn, die eventuell von der Tradition Rāzīs abhängen könnte.

Ibn Samaǧūn, *Ǧāmiᶜ* IV 62,16–18:

وقال ايطس الامدي انه اذا اكل الانسان ثلثة اقماع رمان امن من رمد العين سنة جميعة

Und Aṭiyūs al-Āmidī sagt: Wenn der Patient drei Granatapfelkerne isst, ist er ein ganzes Jahr lang sicher vor einer Entzündung des Auges.

[Frg. 3], [Aëtios zwischen 1,64 und 1,65; CMG VIII 1, S. 46–47] Bīrūnī, *Ṣaidana* 140,-2 (s. v. *bīqiya* بيقية, βῖκος, Futterwicke – *Vicia sativa*):

قال اطيوس حب يشبه العدس يؤكل في المجاعات وخاصة في الربيع طريا.

Aṭiyūs sagt: [Es ist] eine Hülsenfucht, die der Linse ähnelt, man isst sie in Hungersnöten und besonders im Frühling, wenn sie zart ist.

Diese Passage würde man bei Aëtios in Buch 1 zwischen 1,64 und 1,65 erwarten, doch fehlt sie hier, wie auch an anderen Stellen bei Aëtios. Sie begegnet jedoch recht wörtlich (Typ 2) in den *Collectiones* des Oreibasios, was erstaunt, da Aëtios die *Collectiones* sonst nicht zu exzerpieren scheint. Letztendlich geht die Passage zurück auf Galens *De aliment. fac.* Ob sich diese Stelle einstmals auch im Aëtios-Text exzerpiert fand, ist ungewiss.

Oreibasios, *Coll. med.* 1,34: Περὶ βίκου (CMG VI 1,1, S. 18, Z. 12–15):
(1) Τὸ σχῆμα τούτων ἔοικε τοῖς φακοῖς· ἐν λιμῷ δ' ἐσθίουσιν αὐτοὺς οἱ ἄνθρωποι, καὶ μάλιστα τοῦ ἦρος, ἔτι χλωρῶν ὄντων, ὥσπερ ἐρεβίνθων (2) τε καὶ κυάμων.
Ihre Form ähnelt den Linsen; die Menschen essen sie bei Hungersnot, und besonders im Frühling, wenn sie noch grün sind, wie bei Kichererbsen und Bohnen.

Galen, *De aliment.* fac. 1,36, 6,550,17ff. K. (= S. 83 Wilkins), Περὶ ἀφάκης καὶ βίκου:
Τὸ σχῆμα τῶν σπερμάτων τούτων οὐ στρογγύλον ἐστίν, ὥσπερ τὸ (551) τῶν κυάμων, ἀλλ' ὑπόπλατυ μᾶλλον ὁμοίως τοῖς φακοῖς. ἀποτίθενται δ' οἱ γεωργοὶ ... ἐν λιμῷ γε μὴν οἶδα καὶ τούτων ἐνίους φαγόντας καὶ μάλιστα τοῦ ἦρος, ἔτι χλωρῶν ὄντων, ὥσπερ καὶ ἐρεβίνθων τε καὶ κυάμων ἐσθίουσι συνήθως.
Die Form dieser Samen ist nicht rund, wie die der Bohnen, sondern eher etwas flach, ähnlich den Linsen. Die Bauern bewahren sie auf ... Ich weiß, dass einige von ihnen (den Bauern) sie zumindest bei Hungersnot essen, und besonders im Frühling, wenn sie noch grün sind, wie sie gewöhnlich auch Kichererbsen und Bohnen essen.

Frg. 4, Aet. 1,189 [Typ 2]; 6,58 [Typ 2]
Ibn Samağūn, *Ǧāmiᶜ* III 162,7–10 (s. v. *ᶜafṣ* عفص, = Galläpfel [sic!]):

وقال الانطس الامدي ان جوفه اذا وضع على ثقب الاسنان المتاكلة سكن الوجع واذا بل بالماء او بالخل وهو صحيح سوّد ذلك الماء الشعر.

Anṭis al-Āmidī sagt: bezüglich seiner [i. e. des Zahnes] Höhle, wenn [die Arznei] auf das Loch der verfaulten Zähne gelegt wird, lässt der Schmerz nach. Und wenn [sie] mit Wasser oder Essig benetzt wird, und das ist wahr, färbt dieses Wasser das Haar schwarz.

Zum ersten wie zum zweiten Teil dieses Zitats finden sich recht genaue Übereinstimmungen bei Aëtios, wenn hier auch von Zedernöl und nicht von Galläpfeln die Rede ist. Möglicherweise liegt im Arabischen eine Verwechslung zwischen عفص (Gallapfel) und أرز (Zeder) vor.

Aëtios 1,189 (CMG VIII 1, S. 85, Z. 7–8):
Κέδρος … καὶ τοῖς δὲ τρήμασι τῶν ὀδόντων ἐνσταχθεῖσα τὰ μὲν ἀλγήματα πραΰνει, θραύει δὲ αὐτούς.
Zedernöl …und wenn es in die Löcher der Zähne eingeträufelt wird, lindert es zwar die Schmerzen, zerbricht sie [die Zähne] aber.

Diese Stelle ist das Exzerpt einer Passage von Galens *Simpl. med. temp. fac.* 7,15 (12,18,6 K.):[15]

κἀπειδὰν τοῖς τῶν ὀδόντων ἐνσταχθῇ τρήμασι· τὸ μὲν γὰρ ἄλγημα πραΰνει, θραύει δ' αὐτούς.
… und wenn es [das Zedernöl] in die Löcher der Zähne eingeträufelt wird, lindert es zwar den Schmerz, zerbricht sie [die Zähne] aber.

Der zweite Teil von Frg. 4 findet sich bei Aëtios 6,58,10ff. (CMG VIII 2, S. 206, Z. 23–27):

ὅσαι βούλονται μελαίνειν τρίχας, τῇ κεδρέᾳ χριέσθωσαν, πρὸ τριῶν ἢ τεττάρων ὡρῶν τοῦ λουτροῦ, … χρὴ δὲ αὐτὴν ἄμικτον ἐλαίου παραλαμβάνειν ἐπὶ τῶν ξηρανθῆναι σφοδρῶς καὶ θερμανθῆναι δεομένων κεφαλῶν, ἐπὶ δὲ τῶν ἄλλων ἐλαίῳ μιγνύναι·
Diejenigen, die ihre Haare schwarz färben wollen, sollen sich drei oder vier Stunden vor dem Bad mit Zedernharz einschmieren … man muss es aber ohne Beimischung von Olivenöl verwenden, bei den Köpfen, die heftig getrocknet und erwärmt werden müssen; bei den anderen aber mische man es mit Olivenöl.

[15] Auch von Oreibasios *Eunap.* 2,1 κ 38 (CMG VI 3, S. 365, Z. 11-12) wird diese Passage exzerpiert: καὶ τοῖς τρήμασι δὲ τῶν ὀδόντων ἐνσταχθεῖσα τὰ μὲν ἀλγήματα πραῦνει, θραύει δ' αὐτούς. … und wenn es [das Zedernöl] in die Löcher der Zähne eingeträufelt wird, lindert es zwar die Schmerzen, zerbricht sie [die Zähne] aber.

Hierbei handelt es sich wiederum um ein Exzerpt aus Galen, und zwar von *Comp. med. loc.* 1,3 (12,439,15ff. K.):

ὅσαι … μελαίνειν ἠβουλήθησάν πως τὰς τρίχας (440) …, ἐκείναις συνεβούλευσα χρῆσθαι τῇ καλουμένῃ κεδρίᾳ, χριομέναις μὲν αὐτῇ πρὸ τριῶν ἢ τεσσάρων ὡρῶν τοῦ λουτροῦ, … χρὴ δ' αὐτὴν ἄμικτον ἐλαίου παραλαμβάνειν ἐπὶ τῶν ξηρανθῆναί τε καὶ θερμανθῆναι σφοδρῶς δεομένων κεφαλῶν, … ἐπὶ δὲ τῶν ἄλλων ἐλαίῳ μιγνύντας τοῦτο τὸ φάρμακον …
Diejenigen, die sich ihre Haare irgendwie schwarz färben wollten, denen riet ich dazu, das sogenannte Zedernöl zu verwenden, indem sie sich drei oder vier Stunden vor dem Bad damit einschmieren … man muss es aber ohne Beimischung von Olivenöl verwenden, bei den Köpfen, die heftig getrocknet und erwärmt werden müssen; bei den anderen aber mische man diese Arznei mit Olivenöl.

Frg. 5, Aëtios 1,324 (Typ 2)
Bīrūnī, *Ṣaidana* 198,-4 (s. v. *ḥabb al-ṣanawbar* حب الصنوبر, πιτυΐς, Pinie – *Pinus pinea*):

اطيوس :قضم قريش هو حب الصنوبر

Aṭiyūs: Pinienkerne, das ist der Samen der Pinie.

Dieses Zitat entspricht Aëtios 1,324 (CMG VIII 1, S. 123, Z. 17–18):

(324) Πιτυίδες. Ὀνομάζεται δὲ οὕτως ὁ καρπὸς τῶν πιτύων· ἔνιοι δὲ καὶ τὸν τῆς πεύκης ὡσαύτως προσαγορεύουσιν.
Pinienkerne: So wird aber die Frucht der Pinien genannt; manche nennen aber auch so die Frucht der Fichte.

Diese Aëtios-Stelle geht auf Galens *Simpl. med. temp. fac.* 9,22 (12,102,16ff. K.) zurück:[16]

[κβ'. Περὶ πιτυΐδων.] Πιτυΐδες. ὀνομάζεται δ' οὕτως ὁ καρπὸς τῶν πιτύων. ἔνιοι δὲ καταχρώμενοι καὶ τὸν τῆς πεύκης ὡσαύτως προσαγορεύουσιν, …
Pinienkerne: So wird aber die Frucht der Pinien genannt; manche nennen aber auch missbräuchlich so die Frucht der Fichte.

Diese Passage wiederum könnte von Dioskurides (*De materia medica* 1,69,3) inspiriert sein:

[16] Cf. auch Paulos 7,3,16: Πιτυίδες ὁ καρπός ἐστι τῶν πιτύων …

πιτυίδες δὲ καλοῦνται ὁ καρπὸς τῶν πιτύων καὶ τῆς πεύκης ὁ εὑρισκόμενος ἐν τοῖς κώνοις.
Pinienkerne werden aber die Frucht der Pinien und der Fichte genannt, die sich in den Fichtenzapfen findet.

Frg. 6, Aëtios 1,398 (Typ 2)
Bīrūnī, *Ṣaidana* 467,5 (s. v. *filfil al-mā'* فلفل الماء, ὑδροπέπερι, Wasserpfeffer – *Polygonum hydro-piper*):

اطيوس: نبات يشبه طعمه طعم الفلفل.

Aṭiyūs: Eine Pflanze, deren Geschmack dem Geschmack des Pfeffers ähnelt.

Aëtios 1,398 (CMG VIII 1, S. 142, Z. 8–10):
(398) Ὑδροπέπερι. Ἐν ὕδασι φύεται τὸ βοτάνιον … τῇ δὲ γεύσει δριμύ, παραπλήσιον πεπέρει.
Wasserpfeffer. Das Pflänzlein wächst an Gewässern … vom Geschmack her ist es scharf, ähnlich dem Pfeffer.

Aëtios, Buch 2

Frg. 7, Aëtios 2,6 (Typ 4)
Bīrūnī, *Ṣaidana* 413,1 (s. v. *ṭīn šāmus*, طين شامس, Σαμία γῆ, Samische Erde):

اطيوس: يسمي كوكب الارض.

Aṭiyūs: Sie [die Samische Erde] heißt „Stern der Erde".

Aëtios 2,6 (CMG VIII 1, S. 157, Z. 15–17):
Γῆ Σαμία ἢ ἀστήρ. … χρώμεθα δὲ αὐτῆς μάλιστα τῷ ἑτέρῳ τῶν εἰδῶν, ὃ δὴ καὶ Σάμιον ἀστέρα καλοῦσιν, …
Samische Erde oder „Stern" … wir verwenden aber von ihr vor allem die zweite Art, die auch „Samische Sternerde" heißt, …

Exzerpiert aus Galen *Simpl. med. temp. fac.* 10,4 (12,178,15ff. K.):
[δ΄. Περὶ Σαμίας γῆς.] Ἡ Σαμία .. χρώμεθα δ' αὐτῆς θατέρῳ τῶν εἰδῶν μᾶλλον, ὃ δὴ καὶ Σάμιον ἀστέρα καλοῦσιν, …
Die Samische Erde … wir verwenden aber von ihr vor allem die zweite Art, die auch „Samische Sternerde" heißt, …

Frg. 8a, Aëtios 2,25 (Typ 2)
Tamīmī, *Muršid*[17], C V.15 (S. 127):[18]

وذكر أيطياس الأمدي أنّ حجر المغناطيس إذا مسك باليد سكّن وجع المفاصل الكائن في اليدين والرجلين ونفع من الكزاز.

Und Aytiyās al-Āmidī berichtet, das der Magnetstein, wenn er mit der Hand genommen wird, Schmerz der Gelenke, die in den Händen und den Füßen gelegen sind, lindert; und er hilft gegen den Wundstarrkrampf.

Aëtios 2,25 (CMG VIII 1, S. 164, Z. 29 – S. 165, Z. 3):
Μαγνῆτις λίθος. Ἡ δὲ μαγνῆτις καλουμένη λίθος καὶ Ἡρακλεία παραπλησίαν τὴν δύναμιν ἔχει τῷ αἱματίτῃ, μετέχει δὲ καὶ ἑλκτικῆς δυνάμεως. φασὶ δὲ ὡς κατεχομένη τῇ χειρὶ τῶν χειραγρῶν καὶ ποδαγρῶν ἀνωδύνους αὐτοὺς ἐργάζεται, ἴσως δὲ καὶ σπασμοῖς βοηθεῖ.
Magnetstein. Der „Magnetstein" oder „herakleischer Stein"[19] genannte Stein hat seine Wirkung ähnlich dem Hämatit. Denn er hat auch Anteil an ziehender Wirkung. Man sagt aber, dass er, wenn er von Patienten mit Gicht an Händen und Füßen mit der Hand festgehalten wird, diese schmerzlos macht. Womöglich hilft er aber auch bei Krämpfen.

Frg. 8b, Aëtios 2,25 (Typ 2)

Ein Zitat identischen Inhalts findet sich schon bei Rāzī, *Ḥawāṣṣ*, fol. 125r,4–6:[20]

وذكر اطيس الامدي ذلك وقال انه يمنع وجع اليدين والرجلين البتة اذا امسك في اليدي وينفع من الكزاز.

Und folgendes erwähnt Atyas al-Āmidī und er sagt, dass er [der Stein] Schmerzen der Hände und der Füße ganz und gar verhindert, wenn er in der Hand gehalten wird; und er hilft gegen den Wundstarrkrampf.

Frg. 8c, Aëtios 2,25 (Typ 2)

Ebenso zitiert Ibn al-Baiṭār dies unter Berufung auf die Vermittlung von (Ibn Māssa) al-Baṣrī.

[17] Text nach Schönfeld, Ullmann zitiert die Stelle nach der Handschrift.

[18] Im Kommentar (S. 202) verweist Schönfeld u. a. auf „Aetios II 25 (ed. Olivieri p. 165,2f.)" Ihre Quelle war wohl Ullmann, M., *Die Natur- und Geheimwissenschaften im Islam*, Leiden u. a. 1972, S. 139. Freundlicher Hinweis F. Käs.

[19] Zum Adjektiv „herakleisch" cf. Strohmaier, G., *War Herakles ein Epileptiker?* in: *Les Études Classiques* 80 (2012), S. 127-134.

[20] al-Rāzī, *K. al-Ḥawāṣṣ*, MS Kairo, *Dār al-kutub al-Miṣriyya*, Ṭibb 141, fol. 119v-136v.

Ibn al-Baiṭār, *Ǧāmiᶜ*[21] IV, 161,19–21:

البصري قال الانطيلس (الاطيوس : recte) الأمدي عن بعض الناس انه حجر اذا امسك بالكف نفع من وجع اليدين والرجلين ونفع من الكزاز.

Al-Baṣrī: Es sagt der al-Anṭīlis [Antyllos] (recte: al-Aṭiyūs) al-Āmidī, nach Aussage einiger Autoren, dass der Stein, wenn er mit der Hand gehalten wird, Schmerzen der Hände und der Füße verhindert und gegen den Wundstarrkrampf hilft.

Frg. 9a, Aëtios 2,35 (Typ 2)
Ibn al-Baiṭār, *Ǧāmiᶜ* IV, 89 (s. v. *kahrubāʾ* كهرباء, Bernstein):

انطيلس (اطيوس :recte) الأمدي يبرئ من عسر البول واذا شرب مع المصطكى نفع اوجاع المعدة.

Anṭīlis [Antyllos] (recte: Aṭiyūs) al-Āmidī: er heilt von der Schwierigkeit beim Wasserlassen (Dysurie) und wenn man ihn mit Mastix trinkt, hilft er bei Magenschmerzen.

Aëtios 2,35 (CMG VIII 1, S. 167, Z. 23–25):
Ἤλεκτρον ἢ σούκινον ἢ λιγγούριον. Πινόμενον ἰᾶται δυσουρίαν καὶ στομαχικοὺς ὠφελεῖ, καὶ ὁ χρυσήλεκτρος δὲ πινόμενος σὺν μαστίχῃ ἀλγήματα στομάχου ἰᾶται. Bernstein (3 Synonyme: Elektron, Soukinon, Linggourion). Getrunken heilt er Dysurie und hilft Patienten mit Magenschmerzen; und der „Goldbernstein" heilt, wenn er mit Mastix getrunken wird, Magenschmerzen.

Das Zitat ist schon geraume Zeit länger in der pharmakologischen Literatur des Westens belegt, zuerst bei Ibn al-Ǧazzār und Ibn Samaǧūn.

Frg. 9b, Ibn al-Ǧazzār, *Iᶜtimād* S. 18,16 (s. v. *kahrubāʾ* كهرباء, Bernstein):

وزعم اياطيس الآمدي انه يبرئ من عسر البول واذا شرب معه الكية نفع من اوجاع المعدة.

Ayāṭis al-Āmidī behauptete, dass er von Dysurie heile, und wenn er ihn mit Mastix trinke, hilft es gegen Bauchschmerzen.

[21] Allein von Ibn al-Baiṭār hängt auch das Zitat bei al-ᶜUmarī ab (cf. Käs II, S. 936). Derselben Tradition gehört das von Ullmann erwähnte Zitat bei Ǧildakī, *Durra*, MS Berlin, Landberg 157, fol. 44r,11 an.

Frg. 9c, Ibn Samağūn, *Ǧāmiᶜ* II 154,9 (s. v. *kahrubāʾ* كهرباء, Bernstein):

وقال انطيلس الآمدي انه يبرئ من عسر البول واذا شرب معه المصطكى نفع من اوجاع المعدة

Und es sagt Anṭīlis [Antyllos] (recte: Aṭiyūs) al-Āmidī, dass er von Dysurie heile und wenn er ihn mit Mastix trinkt, hilft es gegen Bauchschmerzen.

Al-Idrīsī bietet ein längeres Zitat mit ähnlichem Wortlaut, allerdings unter dem Namen des Paulos.

Idrīsī, *Ṣifāt* II.1, 280,6-9 (cf. I 236,7):

وزعم بوطس انه يبرئ من عسر البول واذا شرب مع المصطكى نفع من اوجاع المعدة واذا نفخ في الأنف قطع الرعاف واذا سرج بالنار كان ناره لا يحترق شيئا...

Būtus (Paulos?) behauptete, er heile von Dysurie, und wenn er mit Mastix getrunken werde, helfe es gegen Bauchschmerzen, und wenn er in die Nase geblasen werde, würde er Nasenbluten stillen, und wenn er mit Feuer angezündet werde, würde sein Feuer nichts verbrennen ...

Paulos 7,3,7 (CMG IX,2, S. 214, Z. 15–17):

Ἤλεκτρον ...· ὅπερ πινόμενον λεῖον στομάχου καὶ κοιλίας ῥεῦμα καὶ αἷμα ἐπέχει.

Wenn Bernstein zerkleinert getrunken wird, beendet er den Fluss (Rheuma) des Magens und der Bauchhöhle und stillt Blut.

Zum selben Umfeld dürften folgende Stellen gehören, deren exakte Vorlage fraglich bleibt. Hier werden, nach Art einer Doxographie, mehrere Gewährsmänner für die Therapie mit Bernstein genannt.

Frg. 9d, Suwaidī, *Taḏkira* A[22], fol. 7r,3:

كهرباء ينفع من الربو وضيق النفس انطيلس والخواص والمالقي.

Bernstein hilft bei Asthma und Atemnot. Anṭīlis [Antyllos] (recte: Aṭiyūs), Ḫawāṣṣ und al-Māliqī.

Frg. 9e, Suwaidī, *Taḏkira* A. fol. 48r,5:

كهرباء ينفع من وجع المعدة شربا وتعليقا ابن بطلان وابن ماسة والاقناع وانطيلس والمالقي.

Bernstein hilft, getrunken und als Kompresse, bei Magenschmerzen nach Ibn Buṭlān, Ibn Māsa, al-Aqnāᶜ, Anṭīlis [Antyllos] (recte: Aṭiyūs) und al-Mālaqī.

[22] al-Suwaydī, ᶜIzz al-Dīn Ibrāhīm b. Muḥammad, *K. at-Taḏkira al-mufīda*, MS Paris, Bibliothèque nationale de France 3002 (Ancien fonds 1034).

Frg. 10, Aëtios 2,81 (Typ 4)
Bīrūnī, *Ṣaidana* 153,5 (s.v. *tinkār* تنكار, χρυσοκόλλα, Borax):[23]

قال اطيوس هو لزاق الذهب منه معدني ومنه معمول...

Aṭiyūs sagt: es ist der Leim des Goldes, von ihm gibt es ein metallisches und von ihm gibt es ein zubereitetes (synthetisches) …

Aëtios 2,81(CMG VIII 1, S. 177, Z. 25–28):
Χρυσοκόλλα. … ἔνιοι μὲν οὖν τὸ μεταλλευόμενον μόνον οὕτως ὀνομάζουσιν. ἄμεινον δὲ τὸ σκευαζόμενον ἐν θυίᾳ χαλκῇ ἐξ ἐρυθροῦ χαλκοῦ …
Borax [wörtl.: der Leim des Goldes] … manche nennen nur das mineralisch vorkommende so. Besser ist aber das in einem bronzenen Mörser aus Kupfer synthetisierte …

Frg. 11, (Aëtios 2,241? 9,21? Typ 5)
Bīrūnī, *Ṣaidana* 60,-5 (s. v. *iṭriyā* اطرية, ἴτριον, Itrion-Kuchen):

وقال الامدي: الزلابية والقطائف وما يعمل من الفطير ويسقى العسل فهو اطرية.

Und al-Āmidī sagt: Die Klöße und die gefüllten Teigtaschen und das, was man von ungesäuertem Brot macht und was der Honig tränkt, nämlich Itrion-Kuchen.[24]

Eine genaue Entsprechung dieser Passage findet sich im griechischen Aëtios nicht. Es begegnen dort jedoch zwei Passagen, die in vergleichbarer Weise Teigwaren auflisten und in diesem Zusammenhang auch Itrion-Kuchen nennen. Möglicherweise wurden die Namen der griechischen Teigwaren nicht adäquat ins Arabische übertragen. Die erste Passage (Aëtios 2,241) gibt eine Auflistung dicksäftiger Nahrungsmittel:

Aëtios 2,241 (CMG VIII 1, S. 239, Z. 22–25):
Ὅσα παχύχυμα. Οἱ ἰτνῖται τῶν ἄρτων καὶ οἱ μὴ καλῶς ἐσκευασμένοι καὶ τὰ διὰ γλεύκους καὶ σεμιδάλεως πέμματα καὶ τὰ ἴτρια καλούμενα καὶ πᾶν ἄζυμον ἐκ πυρῶν σκευαζόμενον πέμμα καὶ οἱ δι' αὐτῶν σκευαζόμενοι πλακοῦντες.
Was dicksäftig ist: Die im Ofen gebackenen Brotsorten und die nicht gut zubereiteten und das Backwerk mit Most und feinstem Weizenmehl und die

[23] Cf. Käs, I, 346. Das Ende des Zitates ist unklar.

[24] πεμμάτιον λεπτὸν διὰ σησάμου καὶ μέλιτος γινόμενον („ein dünnes kleines Gebäckstück, das aus Sesam und Honig gebacken wird") Ath.14.646d.

sogenannten Itrion-Kuchen und jedes ungesäuerte aus Weizenmehl zubereitete Backwerk und die aus diesem zubereiteten Kuchen.

In einer weiteren Passage (Aëtios 9,21) ist vom Heißhunger die Rede. Hier wird als diätetische Maßnahme das Verabreichen länger im Verdauungstrakt verweilender und schwer verdaulicher Nahrungsmittel (τροφὰς δὲ διδόναι μονίμους τε καὶ δυσφθάρτους) angeraten:

Aëtios 9,21 (Zervos S. 316, Z. 8–9):
καὶ σεμίδαλις [recte: σεμιδαλίτης] χωρὶς μέλιτος διὰ λιπαρῶν ζωμῶν ἐσκευασμένη, καὶ ἴτρια ὁμοίως καὶ ὄρυζα καὶ ἄρτος ἄζυμος.
Und Brot aus feinem Weizenmehl ohne Honig, mit fetter Fleischbrühe zubereitet und in gleicher Weise Itrion-Kuchen, Reis und ungesäuertes Brot.

Frg. 12 (Aëtios 2,259, Typ 4)
Bīrūnī, *Ṣaidana* 235,8 (s. v. *ḫubz* خبز Brot):

اطيوس: الروم في بلدانهم يسمون الخبز النقى غاية النقاء سلجن ويتلوه السميد وهو اسم يوناني قديم.

Aṭiyūs: Die Leute aus Anatolien nennen das äußerst reine Brot „Silǧan" (Silignites) und das, das ihm folgt „Samīd" (Semidalites); und dies ist ein alter griechischer Name.

Ganz offensichtlich geht dieser Abschnitt auf die Aëtios-Passage 2,250 zurück, in der die Brotsorten nach Nährwert angeordnet sind. Deshalb steht im Arabischen auch das ohne Kenntnis der griechischen Passage kryptische „das ihm folgt" (يتلوه), was eine Übersetzung von griechisch ἐφεξῆς ist und sich auf die Rangfolge nach Nährwert bezieht.

Aëtios 2,250 (CMG VIII 1, S. 242, Z. 20–21):
τῶν ἄρτων δὲ ὁ σιλιγνίτης τροφιμώτατος, ἐφεξῆς δὲ ὁ σεμιδαλίτης καὶ τρίτος ὁ συγκομιστός.
Von den Brotarten ist Silignites am nahrhaftesten, danach Semidalites und als drittes das aus Schrotmehl.

Aëtios, Buch 6
siehe Frg. 4

Aëtios, Buch 7
siehe Frg. 2a

Aëtios, Buch 9
siehe Frg. 10

Aëtios, Buch 11

Frg. 13, (Aëtios 11,11; Typ 4)
Bīrūnī, *Ṣaidana* 429,8 (s. v. *ʿaṣāfīr al-šawk* عصافير الشوك, τρωγλοδύτης, gemeiner Zaunkönig – *Troglodytes europaeus*):

اطيوس: باليونانية طروغلودوطوس اصغر حجما من جميع انواعه.

Aṭiyūs: Auf Griechisch ist „Troglodytes" die kleinste Größe aller Arten.

Aëtios 11,11,22ff. (Daremberg/Ruelle S. 570, Z. 21–24):
.. τὴν ἐνέργειαν ἔχει τὴν εἰρημένην, (22) ἥνπερ δὴ ὁ τρωγλοδύτης καλούμενος κέκτηται. Στρουθίων δὲ τοῦτο σμικρότατον, ...· Σμικρότατον δὲ τοῦτό ἐστι τὸ ζωΰφιον ἁπάντων σχεδὸν τῶν ὀρνέων, ...
... hat die besagte Wirkung, die der sogenannte „Höhenbewohner" (= Zaunkönig) hat. Dieser aber ist das kleinste Spätzlein ... dieses Tierchen ist beinahe das kleinste aller Vögel.

cf. Paulos 3,45 (CMG IX 1, S. 242, Z. 17–19):
καὶ ὁ τρωγλοδύτης δὲ τῶν ἄγαν ἐπαινουμένων ὑπάρχει βοηθημάτων· ἔστι δὲ στρουθίον ἁπάντων τῶν ὀρνέων τὸ σμικρότατον πλὴν τοῦ λεγομένου βασιλίσκου·
... und der „Höhenbewohner" (= Zaunkönig) gehört zu den über die Maßen gelobten Heilmitteln. Er ist aber das kleinste Spätzlein von allen Vögeln, abgesehen vom sogenannten Wintergoldhähnchen.

Aëtios, Buch 13

Frg. 14, (Aëtios 13,34, Typ 2)
Bīrūnī, *Ǧawāhir* 100,2 (s. v. *al-almās* الالماس, der Basilisk, eig.: „der Diamant"]):

وفي كتاب اطيوس الآمدي الذي نقله ابو الخير الى العربي، ان طول الأرقم ويسمى ابن قترة ذراع ونصف دقيق الجثة احمر اللون يقتل باللسع وبالرؤية وباستماع الصفير وملسوعه اوحى موتا (ed. موقا) من ان يتمكن من علاجه واذا مات بلسعته حيوان كان ما قرب منه يتناثر شعره اولا ثم يخضر ويكمد ويموت ويعفن ...

Und Aṭiyūs al-Āmidī [schreibt] im Buch, das Abū al-Ḫair in das Arabische übersetzt hat, dass die Länge der Arquam-Schlange die auch „Sohn der Finster-

nis (bzw. des Staubs)" genannt wird, 1,5 Ellen beträgt. Der Körper ist dünn und von roter Farbe und sie [die Schlange] tötet durch ihren Biss, dadurch, dass man sie sieht oder ihr Pfeifen hört. Und den von ihm Gebissenen ereilt der Tod, ehe es möglich ist, ihn zu behandeln. Und wenn ein Lebewesen durch seinen Biss gestorben ist, dann tritt bei dem [Lebewesen], das nahe von ihm ist folgendes auf: zuerst fallen seine Haare aus, dann wird es grün, blass, stirbt und verwest.

Aëtios 13,34 (Zervos S. 286f.):
Περὶ Βασιλίσκου.
Ὁ Βασιλίσκος ἔστι μεγέθει παλαιστῶν τριῶν, ὑπόξανθος καὶ ὀξυκέφαλος· ἐπί τε τὴν κεφαλὴν τρεῖς ὑπεροχὰς ἔχει δύναμιν δὲ κέκτηται μεγίστην ὑπὲρ τὰ ἄλλα ἑρπετὰ πάντα, ὡς μὴ δύνασθαι τινὰ αὐτῶν μηδὲ τὸν συριγμὸν αὐτοῦ ὑπομένειν· ἀλλὰ κἂν ἐπὶ τροφὴν ἢ ποτὸν τινὰ τῶν ἄλλων ἐπείγηται ἰοβόλων, καὶ αἴσθηται τὴν τοῦ βασιλίσκου παρουσίαν, ὑποχωρεῖν, μηδὲν τῆς ἀναγκαίας τροφῆς πρὸς τὸ ζῆν φροντίσαντα. Τοῖς δὲ ὑπ' αὐτοῦ δηχθεῖσι συμβαίνει φλόγωσις ὅλου τοῦ σώματος καὶ πελίωσις· ἀπορρέουσί τε καὶ αἱ τρίχες τοῦ σώματος εὐθέως, καὶ ἐν ἀκαρεῖ χρόνῳ ὁ θάνατος ἕπεται· ἀλλὰ μὴν καὶτοῦ νεκροῦ σώματος [θανόντος] οὐδὲ ἓν ζῶον σαρκοφάγον θιγγάνει· εἰ δὲ ὑπὸ λιμοῦ βιασθὲν ἅψοιτο, αὐτίκα καὶ αὐτῷ ὁ θάνατος ἐπισκήπτει. Φασὶ δὲ ὅτι καὶ ὁραθεὶς μόνον καὶ συρίττων ἀκουσθείς, ἀναιρεῖ τοὺς βλέψαντάς τε αὐτὸν καὶ τοὺς ὑπ' αὐτοῦ ὁραθέντας καὶ τοὺς ἀκούσαντας αὐτοῦ· ὅθεν μάταιον καὶ περιττὸν ἡγούμεθα βοηθήματα ἐπὶ τούτων ἀναγράφειν.

Über den Basilisken.
Der Basilisk ist von der Größe her drei mal vier Finger lang, gelblich und spitzköpfig. Auf dem Kopf hat er drei Vorsprünge und er hat die größte Kraft vor allen anderen Kriechtieren, so dass eines von ihnen noch nicht einmal sein Zischeln ertragen kann. Aber selbst wenn eines der anderen Gifttiere Drang zur Nahrungsaufnahme oder zum Trinken hat und die Gegenwart des Basilisken bemerkt, weicht es zurück und bedenkt nicht einmal die Lebensnotwendigkeit der Nahrung. Bei denen, die von ihm gebissen worden sind, tritt eine Entzündung des gesamten Körpers sowie eine gräuliche Verfärbung auf und sie werfen die Haare des Körpers auf der Stelle ab und in kurzer Zeit folgt der Tod. Und den Leichnam des gestorbenen Tieres rührt nicht ein einziges fleischfressendes Tier an. Sollte es ihn vom Hunger gezwungen anrühren, befällt auch ihn sofort der Tod. Man sagt aber, dass es, wenn man ihn auch nur sieht und beim Zischeln hört, diejenigen tötet, die es erblicken und die von ihm gesehen werden und die es hören. Deshalb halten wir es für vergeblich und überflüssig, Heilmittel gegen es zu verzeichnen.

Hierbei handelt es sich um ein Exzerpt vom Typ 2. Das Gleiche gilt für das folgende Fragment.

Frg. 15, Aëtios 13,56 (Typ 2)
Ibn Sīnā, *Qānūn*, ed. Rom[25] II, 130,24–25, 27–28 (*faṣl fī šurb sālāmandrā – Kapitel über das Trinken von Salamander*):

فصل في شرب سالامندرا

وقال غير هذا القائل وهو اطيوس الامدي وغيره انه يعرض من شربه تورم اللسان وذهاب العقل واسترخاء وزمانه واسوداد مواضع من البدن وعفونة اجزاء من البدن تسقط اذا عولج الانسان فصح ... وأما اطيوس الامدي فقد ذكر ان علاجه علاج من اخذ الذراريح ...

ومما يخصه أن يؤخذ الراتينج وعلك البطم واحد منهما أو كلاهما مع الميعة أو مع الجنطيانا وينفعهم ماء طبيخ الكمافيطوس مطبوخاً فيه حب الصنوبر الصغار وورق السرو وبزر الأنجرة ويشرب مع زيت وكذلك ينفع منه مص السلحفاة البحرية والضفادع المطبوخة بفودنج.

Kapitel über Trinken von Salamander.
Und er sagt ein anderer als der hier Sprechende, und zwar Aṭiyūs al-Āmidī und andere, dass von seinem Trinken eine Schwellung der Zunge auftritt und ein Verlust der Vernunft und ein Nachlassen und sein Chronischwerden und ein Schwarzwerden von Bereichen des Körpers und die Fäulnis von Teilen des Körpers; und dann fallen sie ab. Wenn der Patient behandelt wird, wird er gesund … Und was Aṭiyūs al-Āmidī betrifft, so hat er gezeigt, dass seine Behandlung die Behandlung gegen das Einnehmen von spanischen Fliegen ist … Das Besondere daran ist, dass das Harz und das Terebinthengummi, eines oder beide davon, mit Harz vom Storaxbaum oder Enzian eingenommen werden sollen. Sie [die Patienten] profitieren vom Wasser, in dem Chamaipitys gekocht worden ist, jungen Pinienkernen, Zypressenblättern und mit Knospen von *ʾanǧara* (? Brennesselblätter, κνίδης φύλλα?); und man trinke es mit Öl. Ebenso nützt es, Meeresschildkröten auszusaugen und Frösche, die mit Mannstreu (? gr.: συνεψηθεὶς μετὰ τῶν ἠρυγγίου ῥιζῶν?) gekocht wurden.

Aëtios 13,56 (Zervos S. 290):
Περὶ Σαλαμάνδρας.
Ἡ Σαλαμάνδρα ἔστι ζῶον ὅμοιον ἀσκαλαβώτῃ· ταχύτερον δὲ τῆς φαρμακίτιδος σαύρας· διαβαίνει δὲ τὸ ζῶον διὰ πυρὸς καιομένου καὶ οὐδὲν πάσχει, περισχιζομένης καὶ ὑποχωρούσης αὐτῇ τῆς φλογός· εἰ δὲ ἐμμείνῃ τῷ πυρὶ ἐπὶ χρόνον τινά, δαπανηθείσης τῆς ἐξ αὐτοῦ ψυχρᾶς (*correxi*, Zervos ψυχρὰς) καὶ μυξώδους ἐκρεούσης ὑγρότητος, καίεται. φασὶ δὲ αὐτὴν καὶ βάρος ἔχειν, ὃ ἐστὶ σβεστικὸν καὶ ἐναντίον πυρός. Παρέπεται δὲ τοῖς λαβοῦσι τὴν σαλαμάνδραν, γλώσσης φλεγμονή, διανοίας ἀφοδισμός (*correxi*, Zervos ἀποδισμός), τρόμος μετά τινος νάρκης καὶ ἐκλύσεως· πελιοῦται δὲ αὐτοῖς τινὰ μέρη τοῦ σώματος κυκλοτερῶς, ὥστε πολλάκις καὶ σηπόμενα ἀπορρεῖν. Πρῶτον μὲν γὰρ οἱ σπίλοι λευκοὶ φαίνονται κατὰ τὸ σῶμα, εἶτα ἐρυθροί, εἶτα μέλανες μετὰ σήψεως καὶ ῥύσεως τριχῶν. οτέον δὲ καὶ τούτοις τὰ ἐπὶ τῶν κανθαρίδων

[25] Das Ende des Zitats ist nicht ganz sicher. Evtl. gehören weitere Angaben dazu.

εἰρημένα καὶ ἐμείτωσαν· ἰδίως δὲ πιτυΐνην ῥητίνην λεάνας μετὰ μέλιτος, δίδου ἐκλείχειν ἢ χαλβάνην μετὰ μέλιτος ἢ στροβίλια (*correxi,* Zervos στροβήλια) λεῖα μετ' ἀφεψήματος χαμαιπίτυος ἢ κνίδης φύλλα συνεψηθέντα κρίνοις μετ' ἐλαίου· ἢ ὠὰ χελώνης μετὰ καὶ τοῦ αὐτῆς αἵματος δίδου ξηρῷ καὶ [μετὰ] μελικράτου ἢ ὑδρελαίου· παραδόξως δὲ ποιεῖ ἐπ' αὐτῶν, βατράχων ζωμὸς συνεψηθεὶς μετὰ τῶν ἠρυγγίου ῥιζῶν, χελώνης τε ἄκρα κρέα ζωμευθέντα πιεῖν (*correxi,* Zervos ποιῶν) δίδου· ἔοικε δὲ θεῖον καὶ ἄσφαλτος ἀντιπεπονθέναι καὶ τίτανος.

Über den Salamander.
Der Salamander ist ein Tier, das dem Mauergecko ähnlich ist, er ist aber rauher als die giftige Echse. Das Lebewesen schreitet aber durch brennendes Feuer und nimmt dabei keinen Schaden, da sich die Flamme um es herum spaltet und ausweicht. Wenn es aber über eine gewisse Zeit im Feuer bleibt, verbrennt es, da die aus ihm austretende kalte und schleimige Feuchtigkeit, aufgebraucht wird. Man sagt aber auch, dass es einen Einfluss hat, der ein Löschmittel ist und dem Feuer entgegengesetzt ist. Bei denjenigen, die den Salamander anfassen, kommt es zu einer Entzündung der Zunge, einem Schwinden des Verstandes, einem Zittern zusammen mit einer gewissen Betäubung und Schwäche. Bei ihnen werden aber gewisse Körperteile ringsherum grau, so dass oftmals auch fauliges (sc. Sekret) wegfließt. Als erstes erscheinen freilich die weißen Flecken auf dem Körper, dann rote, dann schwarze, begleitet von Fäulnis und Ausfallen von Haaren. Man muss ihnen aber auch die bei den spanischen Fliegen erwähnten Mittel geben und sie sollen erbrechen. In besonderer Weise aber zerkleinere Fichtenharz mit Honig und gib es zum auflecken (als Electuarium) oder Galbanharz mit Honig oder pulverisierte Pinienzapfen mit einem Absud von Berggamander oder Brennesselblätter, die zusammen mit Lilien mit Olivenöl gekocht wurden; oder verabreiche Schildkröteneier, entweder mit ihrem [der Schildkröte] Blut, trocken, oder mit Honigwasser oder Ölwasser. In unerwarteter Weise aber wirkt bei ihnen Froschbrühe, zusammen mit den Wurzeln des Mannstreu gekocht, das äußerste Fleisch einer Schildkröte in Suppe gekocht gib zu trinken. Es scheinen aber Schwefel, Asphalt und Kalk dem entgegenzuwirken.

Frg. 16; (Aëtios 15,15, Typ 4)
Bīrūnī, *Ṣaidana* 487,9 (s. v. *qurrat al-ʿaīn* قرة العين, σίον, Wassersellerie – *Sium latifolium*):

اطيوس: كرفس الماء.

Aṭiyūs: Wassersellerie.

Aëtios 15,15,195 (Zervos S. 76, Z. 11–12):
…, ποταμογείτονος χλωροῦ, ὅν τινες σίον καλοῦσι, …

… vom grünen „Wasseranrainer" (= Laichkraut), den manche „Sion" nennen …
Dies ist die einzige Stelle bei Aëtios, die als Vorlage in Frage kommt. Zu dem kurzen σίον-Kapitel (1,363) findet sich keine Parallele.

2. Dubia/Incerta

Abschließend sei eine Reihe von Fragmenten (vornehmlich aus Bīrūnī, *Ṣaidana*) mitgeteilt, die im überlieferten Aëtios-Text nicht wiedergefunden werden können. Da diese Fragmente oft einen typisch arabisch-persischen Kontext aufweisen ist zu fragen, ob sie fälschlicherweise dem Byzantiner Aëtios zugeschrieben wurden und nicht von einem Araber ähnlichen Namens, evtl. dem Philologen al-Ḥasan b. Bišr.[26]

Wie aus den folgenden Fragmenten aus Bīrūnīs *Ṣaidana* ersichtlich, wird in Zaryābs Edition teilweise die persische Sprache verwendet. Grund dafür ist folgender: Das Original von al-Bīrūnī ist in keiner der bekannten Handschriften vollständig erhalten. Der Herausgeber Zaryāb hat daher – anders als sein Vorgänger Ḥakīm Muḥammad Saᶜīd – die Lücken mithilfe der persischen Version eines Abū Bakr ᶜAlī ibn ᶜUṯmān Aṣfar al-Kāsānī geschlossen. Diese datiert vom Jahr 625 H. / 1228 n. Chr. (cf. Ullmann S. 272; Zaryāb, Vorwort ed. *Ṣaidana*, S. XXIV [بیست و چهار]).[27]

Frg. D1, Bīrūnī, *Ṣaidana* 32,-7 (s. v. *uḏun al-faʾr* أذن الفأر, μυοσωτίς, Scharfkraut – *Asperugo procumbens*):

وقال اطيوس الامدي انها حشيشة يجلى بها الزجاج وليس كذلك.

Und es sagt Aṭiyūs al-Āmidī: es ist ein Kraut, mit dem man das Glas poliert; und es ist nicht so.

Diese Aussage findet sich bei Aëtios nicht; eine Parallele zu Aëtios' Abschnitt über diese Pflanze (1,285) besteht nicht.

Frg. D2, Bīrūnī, *Ṣaidana* 47,8 (s. v. *asnān al-ḏiʾb* اسنان الذيب, ἠρύγγιον, Mannstreu – *Eryngium*):

[26] Cf. Sezgin, GAS II, S. 614. Freundlicher Hinweis von Dr. Fabian Käs.
[27] Freundlicher Hinweis von Fabian Käs.

قال اطيوس الامدي وجبريل وصهاربخت انه بقلة اليهود وقال ابومعاذ

Es sagt Aṭiyūs al-Āmidī, Gabriel und Ṣahārbaḫt, dass es das Kraut der Juden ist. Und es sagt Abū Muᶜāḏ: …

Frg. D3a, Bīrūnī, *Ṣaidana* 103,4 (s. v. پرسیاوشان *parsiyāwušān*, ἀδίαντον, gewöhnlicher Frauenhaarfarn – *Adiantum Capillus-Veneris*):

وبولس واطيوس وابن سرابيون گويند پرسياوشان نباتى است كه عرب او را شعر الجبار گويند و صاحب المنقول گويد بلغت يوناني او را بوليطريخو گويند و بلغت لطينى قافلا گويند.

Und Paulos, Aṭiyūs und Ibn Sarābiyūn sagen, gewöhnlicher Frauenfarn (*parsiyāwušān*) ist eine Pflanze, die die Araber „Haar des Riesen" nennen; und der Autor der Übersetzung sagt in griechischer Sprache nennt man es πολύτριχον und in lateinischer Sprache nennt man es *qāflā* (= capillus [sc. Veneris]). (Satz in Farsi)

Parsiyāwušān ist eine geläufige persische Form des Namens dieses Farns (cf. Steingass, *Persian-English Dictionary*, S. 243a). Da Zaryāb in seiner Edition einen Abstand setzt, müsste man genauer *par-i siyāwušān* lesen. Genau diese Form setzt Dietrich (IV.123, S. 639) als Etymon der diversen arabisierten Schreibweisen an. *Šaᶜr al-ǧabbār* müsste man als „Haar des Riesen" übersetzen (ibid. Anm. 4). Den Arabern und Syrern galt die Pflanze nämlich als Haar eines Dämons. Das griechische Synonym (πολύτριχον) steht auch bei Dioskurides; als *fūlūtrīḫun* findet es sich in Dublers Ausgabe (IV.103, S. 353,13). Dort stehen auch das persische Lehnwort und *šaᶜr al-ǧabbār*. Das Wort πολύτριχον läßt sich in der syrischen Glossographie auf Anhieb nicht finden. Die abweichende Form *būlīṭrīḫū* könnte also durchaus tatsächlich aus einer anderen Übersetzung stammen, wobei der Hinweis auf Ibn Sarābiyūn natürlich vermuten lässt, dass die ganze Zeile aus dessen verlorenem Kompendium stammen könnte. Paulus hatte er regelmäßig verwendet (Pormann S. 20ff.), somit könnte er vielleicht auch Aëtios zitiert haben. Probleme besonderer Natur bietet das arabisch transliterierte lateinische Wort (*qāflā*), das sicher mit *capillus* zusammenhängt. In der alphabetischen Redaktion von Dioskurides (ed. Wellmann IV.134 RV; Bd. II, S. 279) heißt es, dass die Römer diesen Farn *terrae capillus* nennen. Jedoch ist mir keine orientalische Rezeption dieser Version bekannt geworden (die verlorene, halb legendäre Version des Mönches Nikolaos mag von dieser Redaktion abhänig gewesen sein). Unmöglich ist es aber nicht, dass al-Bīrūnī „lateinische" bzw. romanische Wörter in seinen Quellen fand. Fabian Käs

konnte in seiner Studie über die „Mineralien in der arabischen Pharmakognosie" (I, S. 91) nachweisen, dass al-Bīrūnī Ibn Samağūns nur fragmentarisch (*bāʾ* wie *baršiyāwušan* fehlt) erhaltene Drogenkunde benutzt hatte. Dieser hatte u. a. zahlreiche frühe Quellen aus al-Andalus verwendet und auch deren romanische Begriffe aufgeführt. Natürlich ist er auch Quelle für Aëtios-Zitate und es ist ebenfalls nicht unmöglich, dass die ganze Passage aus seinem *Ğāmiʿ* stammt – vielleicht ist dies sogar wahrscheinlicher als ein Bezug zu Ibn Sarābiyūn (oder dieser war seine Zwischenquelle). Etwas ungewöhnlich im Fragment ist die Bezeichnung „Autor der Übersetzung" (*ṣāḥib al-manqūl*). Für „Übersetzer" würde man eigentlich das übliche arabische *mutarğim* erwarten. Prinzipiell heißt *manqūl* auch „übersetzt", aber eben auch „übertragen" und „abgeschrieben". Es könnte sich also um einen anderen Überlieferer, z. B. einen Kopisten, Lexikographen oder Fragmentsammler handeln. Damit entfiele aber auch der direkte Bezug zu Paulus und Aëtios, da es dann schon ein davon unabhängiges, neues Zitat wäre.[28]

Frg. D3b, Bīrūnī, *Ṣaidana* 371,13 (s. v. *šaʿar al-ġūl* شعر الغول – ἀδίαντος, *Adiantum Capillus-Veneris*, τριχομανές, *Asplenium trichomanes*):

واطيوس گويد شعر الغول پرسياوشان را گويند.

Und Aṭiyūs sagt, dass das Frauenhaar *parsiyāwušān* heißt. (Satz in Farsi)

Frg. D4, Bīrūnī, *Ṣaidana* 150,3 (s. v. μηλέα, *tuffāḥ* تفاح):

وقال اطيوس هو نوع من الفوتنج ينبت بين الصخور يفرك ويؤكل بالملح ويسمي بالموصل تفاحا بريا.

Und Aṭiyūs sagt: es ist eine Art von Minze (الفوتنج mittelpersiches Lehnwort), die zwischen den Felsen wächst; es wird gerieben und mit Salz gegessen und heißt in Mossul „wilder Apfel".

Frg. D5, Bīrūnī, *Ṣaidana* 323,10 (s. v. *zaītūn* زيتون – ἐλαία, زيت – ἔλαιον, ὀμφάκιον):

اطيوس: الزيت العذب المعتصر من المدرك وزيت الانفاق المعتصر من الغض.

[28] Dieser gesamte Abschnitt basiert auf Beobachtungen von Dr. Fabian Käs, wofür ihm herzlich gedankt sei.

Aṭiyūs: das süße [Öl] wird von reifen [sc. Oliven] gepresst und das „Anfak"-Öl (ὀμφάκιον), wird von grünen [Oliven] gepresst.

Frg. D6, Bīrūnī, *Ṣaidana* 349,2 (s. v. *samaka* سمكة – Fisch):

ابو الخير في اطيوس :السمك الرحلى اقل رطوبة من العراقي كما ان العراقي اقل رطوبة من المتولد في النيل.

Abū al-Ḫair in Aṭiyūs: Wanderfisch ist weniger feucht als der Irakische so wie der Irakische weniger feucht ist als der, der im Nil geboren ist.

Zwar findet sich bei Aëtios 11,30 eine Passage über verschiedene Fischarten (Meeres-, Fluss- und Seefische), jedoch ist der Abschnitt nicht mit diesem speziell auf ein arabisches Publikum gemünzten Satz zu vergleichen. Könnte es sich möglicherweise um eine Glosse des Übersetzers Abū al-Ḫair zum Aëtios-Text handeln?

Frg. D7, Bīrūnī, *Ṣaidana* 434,11 (s. v. *ʿakraš* عكرش, ἄγρωστις, Kriech-Quecke – *Agrorypum repens, Aeluropus repens*):

اطيوس: هو شجر الكلب وحسك الفراخ وبالسجزية بنو.

Aṭiyūs: Es ist der Hundebaum und Geflügeldorn, und in der Sprache von Sīstān [heisst er] Bunū.

Eine Paralele bei Aëtios findet sich nicht. Zumindest findet sich aber beim Grammatiker Aristophanes[29] eine Erklärung, warum die Pflanze „Hundebaum" heißt: καὶ τοῦτον ἐσθίοντα διαζῆν, καθάπερ ἄρα καὶ ἄγρωστιν μὲν οἱ κύνες – und wenn die dies essen, überleben sie, so wie die Hunde mit der Kriech-Quecke.

Frg. D8, Bīrūnī, *Ṣaidana* 479,13 (s. v. *qātil abīhi*, قاتل ابيه, κόμαρος, westlicher Erdbeerbaum – *Arbutus unedo*):

اطيوس: هو قطلب اي قاتل ابيه وهو شجرة تصدع ثمرتها. قيل سمي بهذا الاسم لانه يأكل ورقه واغصانه وسائر ما يطرح عليه. قيل هو الكندش.

Aṭiyūs: Es ist *qaṭlab* d. h. der „Mörder seines Vaters". Und es ist ein Baum, dessen Früchte platzen. Es heißt, er habe seinen Namen daher erhalten, weil er seine Blätter und Äste auffrisst. Und es ist allgemein bekannt, was über ihn gelehrt (?) wird. Vorher war er *al-kandaš*.

[29] Aristophanes, *Gramm. Aristophanis historiae animalium epitome* 2,239.

Auch hier werden wieder rein arabische Etymologien präsentiert. Eine Parallele zur Abschnitt κόμαρος bei Aëtios (1,231) findet sich nicht.

Frg. D9, Bīrūnī, *Ṣaidana* 529,8 (s. v. *kurnub* كرنب, κράμβη, Gemüsekohl – *Brassica oleracea*):

اطيوس: الكرنب البحرى هو حب النيل. قيل معنى القنبيط قن نبط اي غرسته النبط. وتتران هو القنبيط البرى ويرتفع من ارض اسبيجاب والشاش وفرغانة واسروشنه. صاحب المشاهير: القنبيط هو الخفج.

Aṭiyūs: Meereskohl ist der Samen von Indigo (Nil-Körner, Scammonium?). Es wurde gesagt, dass die Bedeutung von Blumenkohl (*qunnabīṭ*) *qinn nabaṭ* [Sklave der Nabatäer] ist, da ihn nämlich die Nabatäer gepflanzt haben. *Tatrān* ist der wilde Blumenkohl und er erhebt sich aus dem Land von Isbīǧāb, Šāš [Taschkent], Farġāna und Usrūšana. Allgemein bekannter Autor: Blumenkohl ist *ḫafaǧ*.

Wenngleich die bei Bīrūnī an dieses Exzerpt anschließenden Zitate von Paulos und Oreibasios stammen, zeigt der rein orientalische Inhalt dieses Zitats (Etymologien und Toponyme), dass dieses nicht von Aëtios von Amida stammen kann. Zu Aëtios' kurzem Abschnitt über κράμβη θαλαττία (1,223) findet sich keine einzige Parallele.

Frg. D10, Bīrūnī, *Ṣaidana* 536,-2 (s. v. *kalankard?* كلنكرد):

ابو الخير في اطيوس: الخرنوب الكبير وهو الكنكر وقال ايضا العكوب وهو الكنكر.

Abū al-Ḫair in Aṭiyūs: der große Johannesbeerbaum ist der *kankar* (?) und er sagt auch, dass der *ʿakūb* der *kankar* ist.

Frg. D11, Bīrūnī, *Ṣaidana* 557,-5 (s. v. *lisān al-kalb* لسان الكلب – κυνόγλωσσον):

اطيوس: اطرافه مثل السلق.

Aṭiyūs sagt: Seine Sprossen sind wie Mangold.

Es findet sich wiederum keine Parallele bei Aëtios, der (1,246) einen Abschnitt λειμώνιον ἢ κυνόγλωσσον hat.

Frg. D12, Bīrūnī, *Ṣaidana* 412,9 (s. v. *ṭīn maḫtūm* طين مختوم – Ἀρμενία βῶλος – armenische Tonerde):[30]

اطيوس هو في جزيرة كيوس ويعرف بتلّ الكهّان.

Aṭiyūs: Sie [findet sich] auf der Insel Chios und diese ist bekannt als „Hügel der Wahrsager/Priester".

Ullmann schreibt Aëtios ein weiteres Zitat aus dem Steinbuch zu (p. 117,6 s. v. *asmāʾ al-laʾālī*). Dort wird der Autor nur „al-Āmidī" genannt:

Frg. D13, Bīrūnī, *Ǧawāhir 117,6*:

قال الآمدي؟ الذي فيه صفرة يسيرة يفضل على الأبيض اليقق (اليقين؟) كفضل الذهب على الفضّة. ولأنّ الدرّة النفيسة الناصعة البياض القريبة العهد بالبحر ممّا يلحقها كدر وتغيّر لا يزال يسرى فيها ويزداد إلى أن تسودّ كالبعرة، فإذا بدت فيها الصفرة اليسيرة المعروفة أمن منها ذلك الداء واستيقن أنّها لا تتغيّر على الأزمان.

Al-Āmidī sagt: die leicht gelbe [Perle] ist besser als die gänzlich weiße. In ähnlicher Weise ist Gold besser als Silber. Der Grund dafür ist, dass die sehr weiße Perle, die erst jüngst aus dem Meer entnommen worden ist, sich mit dem Alter verändert, wobei sie die Trübung und Veränderung in ihrer Farbe anhält und zunimmt. Sie wird allmählich dunkel, in Richtung braun. Aber wenn sie etwas von erwünschter Gelbfärbung hat, ist sie vor dieser Krankheit sicher. Und es ist dann sichergestellt, dass sie sich im Laufe der Zeit nicht ändert.

[30] Cf. Käs, II, S. 849.

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Abstract

In the paper, the Arabic fragments of the medical compendium by Aëtius of Amida are collected, edited and translated for the first time. All in all, there are 16 different fragments, excerpts and paraphrases of passages from books 1, 2, 6, 7, 9, 11, 13 and 15 of Aëtius' work. The underlying passages in the

Greek Aëtius text are indicated and discussed. The lost Arabic translation of Aëtius to which these passages ultimately go back was by Abū al-Ḫair. There are 13 dubious fragments which seem to be by a homonymous Arabic author rather than by Aëtius himself. At times, even in the genuine fragments, Aëtius is confounded with Antyllos.

DIE HANDSCHRIFTLICHE ÜBERLIEFERUNG VON AR-RĀZĪS *KITĀB AL-ḤĀWĪ* UND SEINE NUTZUNG ALS FRAGMENTQUELLE: FORSCHUNGSSTAND UND PERSPEKTIVEN

Von MATHIAS WITT*

a. Einführung

Medizinische Exzerptensammlungen bzw. „-Enzyklopädien" sind in erster Linie aus byzantinischer Zeit bekannt, man denke an die Medizinpandekten des Oreibasios (4. Jh. n. Chr.), Aëtios von Amida (6. Jh. n. Chr.) und Paulos von Aigina (7. Jh. n. Chr.). Diese Werke bewahren in Exzerptform so manches Material aus anderweitig verlorenen medizinischen Traktaten. Diese byzantinischen Exzerptpandekten sind im Wesentlichen wohlgeordnet und redaktioniert. Im Gegensatz dazu existiert eine ähnliche Exzerptensammlung aus dem arabischen Mittelalter, die vielleicht von den byzantinischen Sammlungen inspiriert ist und ebenfalls viel Material aus sonst verlorenen (u. a. griechischen, persischen, arabischen, syrischen und indischen) Medizinschriften bewahrt. Die Rede ist vom *Kitāb al-Ḥāwī* des Rhases (ar-Rāzī; 865–925 n. Chr.). Im Gegensatz zu den byzantinischen Exzerptensammlungen ist dieses Werk jedoch weitestgehend unredaktioniert, nur grob thematisch geordnet und gleichsam im Skizzenstadium steckengeblieben. Es bietet zahlreiche Dubletten, Wiederholungen und entbehrt gänzlich einer Feingliederung.

Der persische Arzt, Philosoph und Alchemist Rhases wurde von seinen Zeitgenossen wegen seiner umfassenden Bildung sowie seiner zahlreichen Schriften als „zweiter Galen" bezeichnet.[1] Er war einer der bedeutendsten Mediziner und Denker des arabisch-islamischen Mittelalters.[2] Vielseitig gebildet war er neben der Medizin u.a. auf den Gebieten der Philosophie, Theologie, Logik, und Mathematik schriftstellerisch tätig. Er leitete Kliniken in Rey und Bagdad und war daneben ein viel gefragter Leibarzt arabischer Fürsten und Stammesführer. Unter den etwa 250 Schriften, die Rhases verfasst haben soll und von

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[1] Sezgin S. 275, Richter-Bernburg S. 389.

[2] Browne S. 44, Richter-Bernburg S. 377.

denen noch viele unediert sind,[3] sind zwei[4] Titel bekannt, die den Charakter von Exzerptensammlungen tragen: 1. der *Kitāb al-Ǧāmiᶜ al-kabīr* und 2. der *Kitāb al-Ḥāwī*. Ob es sich hierbei um zwei verschiedene Schriften oder ein uns dasselbe Werk handelt, ist in der Forschung umstritten.

1. Nach Angaben der arabischen Bibliographen Ibn an-Nadīm und Ibn Abī Uṣaibiᶜa bestand der *Kitāb al-Ǧāmiᶜ al-kabīr* aus 12 Büchern. Beide Autoren überliefern ein Inhaltsverzeichnis, das deutlich vom uns bekannten *Kitāb al-Ḥāwī* abweicht und auch Bereiche der Medizin umfasst, die nicht im *Ḥāwī* adressiert werden.[5] Offensichtlich hat jedoch keiner der arabischen Autoren, die den *Kitāb al-Ǧāmiᶜ* erwähnen, diesen je selbst gesehen.[6] Nach Rhases' eigener Angabe hat keiner seiner Landsleute vor oder nach ihm jemals etwas seinem *Ǧāmiᶜ* Vergleichbares verfasst.[7] Er habe 15 Jahre Tag und Nacht an diesem *opus magnum* gearbeitet. Der *Ǧāmiᶜ* wird von Rhases selbst in fünf seiner Schriften erwähnt,[8] auch im *Ḥāwī*, wobei diese Referenzen nicht zwangsläufig implizieren, dass ein anderes Werk gemeint ist.[9] Iskandars These, diese Erwähnung des *Ǧāmiᶜ* im *Ḥāwī* sei ein Indiz, dass der *Ḥāwī* auch nach Fertigstellung des *Ǧāmiᶜ* weiter vermehrt wurde, scheint somit nicht haltbar.[10] Den Titel *Kitāb al-Ḥāwī* nennt Rhases jedenfalls in keiner seiner Schriften.

2. Dieser *Kitāb al-Ḥāwī* sei auf Geheiß des Wesirs, Gelehrten und Bibliothekars Abū al-Faḍl ibn al-ᶜAmīd (gest. 970 n. Chr.) von Rhases' Schülern aus dessen Nachlass herausgegeben worden, wie Ibn Abī Uṣaibiᶜa im 13. Jahrhundert berichtet; jedoch erwähnt dies kein Autor vor ihm.[11] Es könnte sich hierbei um eine konstruierte Geschichte handeln, um den ungeordneten Charakter des *Ḥāwī* zu erklären.[12] Der *Ḥāwī* folgt der Anordnung *a capite ad calcem* und umfasst 25 Bücher. Die einzelnen Exzerpte sind teils ausführlich und nahezu wortwörtlich, teils aber auch bis zur Unkenntlichkeit verdichtet und bearbeitet; auch

[3] Cf. Richter-Bernburg S. 381. Ullmann S. 128ff., Sezgin S. 278ff.. Browne S. 47. Rhases hatte, offenbar nach dem Vorbild Galens, ein Verzeichnis eigener Schriften verfasst, das jedoch verloren ist.

[4] Iskandar (1967, S. 1f. und 1975, S. 42) erwähnt ein *Kitāb al-Ḥāwī* in vier Büchern, dagegen cf. jedoch Fischer/Weisser S. 213, Anm. 6.

[5] Savage-Smith (2011) S. 4-7.

[6] Savage-Smith (2011) S. 8.

[7] Iskandar (1975) S. 43.

[8] Iskandar (1975) S. 44, Savage-Smith (2011) S. 13–17 (Kritik und Korrektur von Iskandar).

[9] Savage-Smith (2011) S. 17.

[10] Savage-Smith (2011) S. 17.

[11] Savage-Smith (2011) S. 6.

[12] Savage-Smith (2011) S. 6.

kommen Dubletten desselben Exzerptes in unterschiedlichen Redaktionsstufen vor. Eine Klassifikation in vier Exzerpttypen, je nach Grad der Wörtlichkeit, stammt von Ursula Weisser (1991). Viele der Exzerpte sind zudem mit Anmerkungen und Kommentaren aus Rhases' eigener Feder versehen (eingeleitet mit einem *lī auctoris* – „von mir").[13] Der insgesamt ungeordnete und unabgeschlossene Gesamteindruck des Werkes erklärt sich dadurch, dass Rhases die Sammlung offensichtlich in Form von Zettelkästen oder Notizheften angelegt hatte (wahrscheinlich bereits eingeteilt in genannte 25 Abteilungen). Richter-Bernburg, der den *Kitāb al-Ǧāmiᶜ* und den *Kitāb al-Ḥāwī* als zwei voneinander verschiedene Traktate ansieht, vermutet, dass es sich beim *Ḥāwī* um eine gezielte Vorarbeit für den *Kitāb al-Ǧāmiᶜ* handelt.[14] Auch könnte der *Ḥāwī* als Zettelarchiv eine kontinuierliche Fundgrube Rhases' medizinischer Lesefrüchte gewesen sein.[15] Iskandar wies darauf hin, dass sich viele von Rhases' Schriften skizzenhaft im *Ḥāwī* angelegt finden und sich auch von Rhases geplante, aber nicht verwirklichte Traktate aus diesem rekonstruieren lassen.[16] Der *Ḥāwī* ist also gleichsam eine gewaltige „Ursuppe" bzw. Rohmasse für seine medizinische Schriftstellerei.

Die Überlieferungslage des *Ḥāwī* ist ausgesprochen komplex. Bereits 50 Jahre nach dem Tod des Autors waren Kopien des vollständigen arabischen Textes nur noch schwer zu erhalten, da eine Abschrift des äußerst umfangreichen Werkes extrem kostspielig war. Al-Maǧūsī waren seinerzeit nur noch zwei komplette Abschriften bekannt.[17] Die uns heute bekannten arabischen Manuskripte umfassen stets nur Teile des Werkes.[18] Allerdings wurde ein nahezu vollständiger *Ḥāwī*, der aus dem Besitz des Kalifen von Tunis stammte und fünf Bände umfasste (s. u.), 1279 von dem jüdischen Arzt Farağ ibn Sālim (Faragut) unter dem Titel *Liber Continens* ins Lateinische übersetzt. Es hat sich unter Philologen eingebürgert, vom *Continens* zu sprechen, wenn Faraguts lateinische Version, vom *Ḥāwī*, wenn die arabische Version des Werkes gemeint ist. Diese terminologische Konvention

[13] Bryson S. X für Alternativen was *lī* bedeuten kann.

[14] L. Richter-Bernburg, ḤĀWĪ, AL-, Encyclopaedia Iranica, Vol. XII, Fasc. 1, 64–67.

[15] Al-Maǧūsī spekuliert, dass Rhases den *Ḥāwī* entweder zum rein persönlichen Gebrauch gedacht habe oder so seine Lesefrüchte zur Publikation bringen wollte (Iskandar [1974] S. 44).

[16] Iskandar S. 42: „Many of al-Rāzī's published works have been traced to their original rough drafts in *al-Ḥāwī*. Certain private notes in it provide conclusive evidence that he had the intention and the subject matter to write three more books …".

[17] Al-Maǧūsī, *Al-Kitāb al-malakī*, zitiert bei Bryson S. 8.

[18] Cf. Sezgin S. 279 und Ullmann (1970) S. 130.

soll hier beibehalten werden. Der *Continens*, im lateinischen Mittelalter zunächst handschriftlich tradiert und im 15. und 16. Jahrhundert dann mehrfach gedruckt, gibt die bis heute vollständigste bekannte Fassung des *Ḥāwī* wieder und beruht auf einer älteren und zuverlässigeren Vorlage als alle uns bis heute bekannt gewordenen arabischen Manuskripte.

Bis zur Mitte des 20. Jahrhunderts mussten sich die Forscher mit dem *Continens* begnügen, sofern sie nicht (in seltenen Fällen) Zugang zu einzelnen arabischen *Ḥāwī*-Manuskripten hatten.[19] Der arabische Text des Werks wurde erst mit der sogenannten „Haiderabader Edition" Mitte der 1950er Jahre graduell verfügbar. Obgleich die Bedeutung des *Ḥāwī* durch alle Epochen unbestritten war, hatten Medizinhistoriker und Philologen bislang nur einen sehr erschwerten Zugang zu den Inhalten der Schrift.[20] In Ermangelung einer stringenten Gliederung, eines inneren Zusammenhangs und in Anbetracht der Heterogenität der Sammlung sowie des Fehlens eines Index war bislang kein systematischer Zugriff auf die Informationen des Werks möglich. Über den *Ḥāwī* und seine Überlieferung existiert in der Literatur eine Fülle unvollständiger, veralteter und teils widersprüchlicher Informationen, die in diesem Beitrag übersichtsweise gesammelt und berichtigt werden sollen. Im Grunde genommen begründet oder perpetuiert jede bisherige Studie mindestens einen gravierenden Irrtum über den *Ḥāwī*.

Neben dem Problem der fehlenden Indizierung soll das Hauptaugenmerk der vorliegenden Studie auf folgenden besonders kritischen Punkten der *Ḥāwī*-Überlieferung liegen:

1. dem Problem des Vorhandenseins einer oft von Forschern fälschlich verwendeten, allerdings philologisch unbrauchbaren, da umsortierten lateinischen *Continens*-Edition.
2. dem bislang wenig bekannten Problem der groben Lückenhaftigkeit der arabischen (Haiderabader) Edition gegenüber dem lateinischen *Continens*, der seinerseits allerdings auch (gegenüber der arabischen Überlieferung) lückenhaft ist.

[19] So Max Meyerhof, der selbst einige fragmentarische *Ḥāwī*-Handschriften besaß (s. u.) und sich auch einen Abschnitt aus einer Escorial-Handschrift kopieren ließ.

[20] Gurlt kapituliert angesichts dieser Schwierigkeiten gänzlich vor einer Auswertung des *Liber Continens* (cf. I, 603): „In Betreff des Continens ist allerdings die große Schwierigkeit vorhanden, dass, bei der Massenhaftigkeit und Unübersichtlichkeit seines Inhaltes und bei der mit vielen arabischen Ausdrücken untermischten Uebersetzung in schlechtem Latein, die Durchdringung desselben fast unmöglich ist." Cf. auch Hirschberg (1908), 23, Anm. 4: „Durch die greuliche Verstümmelung der Namen [in den lateinischen *Continens*-Druckausgaben] wird die geschichtliche Forschung in dem gedruckten Continens arg gehemmt".

3. dem Fehlen eines zuverlässigen Handschrifteninventars mit Angaben, welches Buch in welcher Handschrift überliefert ist. Ein solches Inventar soll nachstehend mitgeteilt werden, um diese Lücken im arabisch edierten Text (teilweise) schließen zu können und künftigen Editionen und Fragmentsammlungen als Orientierung zu dienen.
4. Es sollen nähere Informationen über die zuerst von Meyerhof (1935) edierten klinischen Kasuistiken aus dem *Ḥāwī* gegeben werden (entstanden nach dem Vorbild der hippokratischen Epidemien), zu deren Überlieferung unzutreffende Informationen in der Literatur kursieren.

Eine Konkordanz des arabischen und des lateinischen Texts, die es ermöglicht, einzelne Textpassagen schnell in der jeweils anderssprachigen Version aufzufinden, wurde bereits von uns publiziert (Witt 2021).

b. Stand der Forschung

1. Lateinische Fassung

Der *Continens* ist in drei lateinischen Handschriften überliefert: im *Cod. Par. lat.* 6912[21] und in dem etwa zeitgleich angefertigten *Cod. Vat. lat.* 2398/2399. Eine dritte Handschrift, Bibliothèque de la Sorbonne, 126 und 127 ist ein rund 100 Jahre später (1379) erstellter *Codex descriptus* von letzterer. Wenn der *Par. lat.* 6912 in der Tat die sogenannte Präsentationskopie für Charles I. ist (wovon die Forschung seit Durrieu ausgeht), wurde er im Jahr 1282 fertiggestellt,[22] also drei Jahre nach Beendigung der Übersetzung, 1279. Neben dem *Par. lat.* 6912 und dem *Vat. lat.* 2398/2399 könnte zeitgleich noch ein weiteres, drittes Exemplar erstellt worden sein, dessen Schicksal unbekannt ist.[23]

Die Vatikanische Handschrift besteht aus zwei Bänden; der Pariser Kodex ist dagegen aktuell in fünf rote Maroquinbände gebunden, mit dem Wappen Jean-Baptiste Colberts (1619-1683) als Supralibros. Einstmals war jedoch auch die Pariser Handschrift in zwei Bände gebunden, wobei der erste die aktuellen Bände 1-2 und der zweite den Rest umfasste.[24] Die Pariser wie die Vatikanische Handschrift sind mit nahezu identischen Miniaturen illuminiert, wobei die der Pariser

[21] Cf. Fischer S. 278f.
[22] Dies erfahren wir aus den Registern der angevinischen Hofhaltung, s.u.
[23] Cf. Bryson S. 95.
[24] Durrieu S. 196.

Handschrift aufwendiger ausgeführt wurden. Die Pariser Kopie weist überaus zahlreiche Korrekturen in Form von Marginalien auf, das gleiche gilt für das vatikanische Exemplar. Diese Marginalien treten in beiden Handschriften in zweierlei Gestalt auf: Am häufigsten begegnen sie einem von der Hand des Haupttext-Schreibers, im gleichen kalligraphischen Schriftduktus wie der Haupttext. Die Marginalien sind stets rot oder blau mit dünnen Strichen (kästchenartig oder rund) umrandet. Dann finden sich (seltener) Randnotizen in zeitgenössischer Kurrentschrift, offenbar von zweiter Hand, ohne Umrandung.

Durrieu identifiziert den Pariser Kodex, wie erwähnt, mit der ersten Reinschrift, der besonders luxuriösen „Erstausgabe" der lateinischen Übersetzung, die für Charles I. persönlich gedacht war (sogenannte „Präsentationskopie"). Nähere Informationen zu dieser ersten Ausfertigung finden sich in den sogenannten angevinischen Registern (Registres Angevins, Registri Angioini), dem Archiv der Hofhaltung Charles I., die Durrieu noch eingehend im Original in Neapel studieren konnte.[25] Diese Register gaben Auskunft über die arabische Vorlage (ein fünfbändiges Exemplar aus dem Besitz des Kalifen von Tunis),[26] die Anfertigung der Übersetzung, die von der lateinischen Übersetzung erstellten Kodizes sowie die Besoldung der hierbei involvierten Personen. Nach Auskunft der Register sei „à cause de la difficulté de l'écriture" eine umfangreiche Kollation und kostspielige Korrektur der Präsentationskopie unter den Augen Faraguts erfolgt.[27] Als weitere Merkmale dieses ersten Reinschriftexemplars werden in den angevinischen Registern angegeben: zwei Bände mit Pergamentseiten à zwei Kolumnen in Minuskelschift („lettres de tieuste"), die Bögen in Quinternen geheftet. Als Schreiber wird ein gewisser Angelo de Marchia genannt. Alle diese Merkmale, inklusive der Schreiberangabe, weist nun auch die Pariser Handschrift auf. Deren zahlreiche und nicht selten lange Marginalien wären dann plausiblerweise Ausdruck der in den Registern erwähnten Korrekturtätigkeit, gleichsam „Verbesserungen letzter Hand".[28] Die Vatikanische Handschrift sei nach

[25] Die Register (378 Folio-Bände) wurden 1943 durch einen Brand zerstört und seitdem aus Teilabschriften rekonstruiert. Durrieu konnte die originalen Foliobände vor der Zerstörung noch eingehend studieren. Cf. auch G. L. Borghese, *Les registres de la chancellerie angevine de Naples: Un exemple de destruction et reconstitution de sources archivistiques à travers les siècles*, Médiévales, No. 69, Travailler à Paris (XIII^{e}-XVI^{e}) (Automne 2015), 171–182.

[26] Durrieu S. 197.

[27] Durrieu S. 195, mit Anm. 4.

[28] Bryson (S. 96) hält die Marginalien fälschlicherweise für eigenhändige Anmerkungen Faraguts. Cf. aber Durrieu S. 194: „Des indices certains montrent que le travail s'est effectué en plusieurs fois …, et … les indices se rencontrent plus

Durrieu eine Abschrift der Pariser, da sich bei ersterer die Marginalien in den Haupttext inkorporiert fänden.[29]

Indes fällt bei einer genaueren Untersuchung beider Kodizes auf, dass die Vatikanische Handschrift nicht weniger und auch nicht weniger umfangreiche Marginalien als die Pariser aufweist, nur an anderen Stellen, an denen sich der Marginalientext dann wiederum im Haupttext der Pariser Handschrift „inkorporiert" findet. Somit könnte prinzipiell genauso gut die Pariser Handschrift eine Abschrift der Vatikanischen sein. Bemerkenswert ist, dass ein spezifischer Typ von Marginalien in beiden Handschriften konsequent am Rand vorkommt und nirgends in den Haupttext übernommen wurde: Es handelt sich um (stets mit blauen oder roten Strichen) rechteckig umfasste Übersetzungsvarianten vom Schreiber des Haupttextes, die mit *al.* (*al<ias, al<iter>, al<ii>*?) eingeleitet werden: z. B. Haupttext „in collo", am Rand: „al. in profundo".[30] Hierbei scheint es sich durchweg um lateinische Übersetzungen arabischer Varianten zu handeln (beim konkreten Beispiel: في العنق vs. في العمق), die sich entweder in der von Faragut verwendeten arabischen Handschrift aus Tunis als Marginalien fanden (eine Kollation anderer Manuskripte erscheint der Überlieferung nach ausgeschlossen) oder die durch eine schwer lesbare arabische Handschrift bedingt sind, bei der die Ambiguität einzelner Buchstaben verschiedene Lesarten erlaubte.[31] Dieser Typ von Marginalien ist also kein Ausdruck von bei einem Korrekturdurchgang entdeckten Auslassungen (wie die meisten Marginalien), sondern scheint als eine Art „kritischer Apparat" intendiert gewesen zu sein. Erst in den Druckausgaben wurden diese Übersetzungsvarianten in den Haupttext übernommen (verbunden durch „vel": „in collo vel in profundo").

fréquemment au debut de l'œuvre, tandis qu'ils disparaissent vers la fin. D'autre part les corrections sont extrêmement nombreuses et quelquefois assez longues. Un pareil fait, rapproché du grand soin matériel apporté à la confection de ce luxueux exemplaire, serait tout à fait incompréhensible s'il s'agissait d'une copie de seconde main. Il s'explique au contraire très bien du moment où l'on est en face de ce que j'appelle une première édition, ayant pour base un manuscript autographe difficile à lire, et corrigé par les soins de l'auteur en personne, soit, dans l'espèce, du traducteur Farag, qui aura profité de l'occasion pour amender et compléter son oeuvre, pour remplacer par des termes meilleurs les expressions dont il était mécontent, absolument comme nous les faisons de nos jours sur les premières épreuves d'un ouvrage livré à l'impression."

[29] Durrieu S. 196.

[30] Z. B. im Antyllos-Fragment 2a (Witt; XV,150,7 Haid. = 356rII Ven. = IV 27vI Par.).

[31] Im genannten Beispiel differieren beide Lesarten um nur einen Buchstaben; bei unpunktierter und flüchtig ausgeführter Handschrift kann diese Verlesung leicht vorkommen.

Durrieus These des *Par. lat.* als korrigierte Erstausgabe (Faraguts Manuskript in Kurrentschrift sei von professionellen Schreibern in Minuskelschrift abgeschrieben worden, wobei diese Abschrift dann eine Korrektur durchlief) erscheint dadurch problematisch, dass eben auch der *Vat. lat.* die gleichen Merkmale aufweist. Mithin könnte es sich sowohl bei den Marginalien des *Par. lat.* wie des *Vat. lat.* schlichtweg um Nachlässigkeiten des bzw. der Kopisten handeln, die jeweils bei einem anschließenden Korrekturdurchgang in Form von Nachträgen *in margine* behoben wurden. Hierfür spricht, dass der *Ḥāwī* durch seine oft schematischen und repetitiven Formulierungen insbesondere anfällig für Auslassungen ist. Außerdem begegnen einem ebenso arabische *Ḥāwī*-Handschriften mit zahlreichen marginalen Nachträgen, während andere (von aufmerksameren Schreibern gefertigt) praktisch nachtragsfrei sind.

Das vermeintliche Inkorporieren von Marginalien kann mithin nicht als Argument dafür verwendet werden, dass die Vatikanische Handschrift eine Abschrift der Pariser darstellt. Dafür, dass die eine Abschrift der anderen ist, spricht hingegen ein anderes Indiz: In beiden Manuskripten finden sich mehrere identische, teils umfängliche Auslassungen bzw. Textverluste, die in den Druckausgaben (untersucht wurden die älteste und die jüngste: Brescia 1486 und Venedig 1529)[32] nicht (!) begegnen.[33] Den Drucken kann mithin weder die Pariser Handschrift noch die Vatikanische unmittelbar oder mittelbar zugrundeliegen. Es muss vielmehr eine weitere, heute unbekannte Handschrift als Druckvorlage gedient haben (Faraguts Manuskript?), welche nicht die Lücken der beiden uns bekannten Kodizes aufwies. Den Druckausgaben kommt somit neben den Handschriften ein eigener Quellenwert zu, als Zeugnis einer streckenweise besseren Überlieferung. Dass die Vatikanische Handschrift von der Pariser kopiert wurde, ist zwar nicht anhand der Marginalien begründbar, wohl aber am Textbefund beider Handschriften: Das Vatikanische Exemplar weist neben den Fehlern

[32] Der Text in den untersuchten Passagen ist identisch, bis auf orthographische Fehler in Br, die in V korrigiert wurden.

[33] Z. B.: I 87vII(14) Paris et non teneret pilum *V deest P*; I 72rII Paris contracta, ut colligatur et occultetur humiditas fluxus inter ipsos digitos *deest P*, I 79rII,-2 Paris et que est fortis congelationis *V deest P*; I 79vI Paris alius. et similiter iaceat supinus et dormiat supinus et ligetur deest P; I 128rI/II Paris in panniculo sistenti inter eos, Daneben darf nicht unerwähnt bleiben, dass sich Unregelmäßigkeiten, Auslassungen und Wortumstellungen im Druck finden. Cf. schon A. v. Haller, *Bibl. med. pract.* I, Basel/Bern 1776, S. 367: „Elchavi, s. *Continens* … Editiones huius maximi operis barbaro typo prodierunt, versione pessima … in hac ipsa immensa collectione, adeo male editos libros cum codicibus consentire Casirius monuit … Ego vero, qui huius immensae farraginis taedium devoravi, reperi [sic] manifestas interpolationes. …".

der Pariser Handschrift zusätzliche eigene Irrtümer auf und gibt sich hierdurch als *Codex descriptus* zu erkennen.

Auf einen bemerkenswerten Punkt sei noch verwiesen: Am Anfang von Buch 6,1, am Ende von Buch 11,5 und am Ende von Buch 21,7 bzw. 22,1 finden sich – allerdings nur in den lateinischen Handschriften (!) – die zunächst irritierenden Vermerke: „incipit liber secundus" (Par. lat.), „explicit liber secundus" (Par. lat.) „explicit liber quartus" (Vat. lat.) und „incipit liber quintus" (Vat. lat.). Diese Angaben haben an den genannten Stellen weder mit der Buch- noch mit der Kapiteleinteilung im lateinischen Text das Geringste zu tun und stehen mit dieser geradezu im Widerspruch. Wenn man jedoch bedenkt, dass die Handschrift aus Tunis, aus der Faragut übersetzte, fünf Bücher umfasste, wie wir aus den angevinischen Registern wissen,[34] dann scheint es sich hier offenkundig um Incipit- und Explicitvermerke dieser arabischen Vorlage zu handeln, die versehentlich mitübersetzt und (teilweise) nicht getilgt wurden (man beachte, dass diese Vermerke teils in der Pariser, teils in der Vatikanischen Handschrift stehen und in der jeweils anderen fehlen). Folgt man diesen Vermerken, waren die Buch- und Kapitelgrenzen dieser verlorenen fünfbändigen arabischen Handschrift: Band 1 (1,1-5,3), Band 2 (6,1-11,5), Band 3-4 (11,6-21,7, Grenze zwischen beiden Bänden unbekannt)[35], Band 5 (22,1-25,24).

Bekanntermaßen war die Pariser Handschrift ursprünglich in zwei Bände gebunden,[36] wie heute noch die Vatikanische (auch die Druck-

[34] Durrieu S. 195, mit Anm. 4.

[35] Denn es findet sich kein zugehöriges *Implicit* oder *Explicit* in den Handschriften. Man beachte, dass in der Haiderbader Edition nach 11,5 (lateinischer Zählung) ein neues Buch beginnt, also hier der Einteilung des Manuskripts aus Tunis nähersteht als der lateinische *Continens*, der diese Buchgrenze durch Neunummerierung vollkommen nivelliert hat.

[36] Cf. Durrieu S. 196 „on peut constater facilement, par l'examen de grands rinceaux tracés en noir sur les tranches, qu'il ne formait à l'origine que deux volumes, le premier contenant les tomes I et II actuels et le second les trois autres." Cf. ebenso den online-Katalogeintrag auf der Internetseite http://archivesetmanuscrits.bnf.fr/ark:/12148/cc90779w: „Le manuscrit était à l'origine composé de deux volumes (vol. 1-2 et vol. 3-5), comme l'indiquent les incipit notés dans les inventaires de la librairie du Louvre de 1411 et 1413 … Il figure dans les inventaires de la Librairie du Louvre dressés sous le roi Charles VI entre 1411 et 1424 : « Item le livre de medecine que fist Helham, contenant XXV livres en deux volumes, tres bien escript de lettre boulenoise, a deux coulombes, le premier volume contenant XII livres, commençant ou II[e] foillet du texte : varios expellandi (vol. 1, f. 2), et ou derrenier: accuunt morbum (vol. 2, f. 271) » ; « Et l'autre volume contenant XIII livres, commençant ou II[e] foillet : humiditatem non dissolvunt (vol. 3, f. 2), et ou derrenier : linga arietis, et sont touz lesdits deux volumes couvers de taffetaz jaune, chascun a IIII fermoirs d'argent dorez, esmaillez des armes du roy de Jherusalem et de Secile, qui lesdits deux volumes envoya pieça au roy de France » (BnF., Français 2700, f. 116v, n° 762 [inv. D, 1411] ; ibid.,

ausgaben teilen den *Continens* in zwei Bände!), wurde dann aber im 17. Jahrhundert, zur Zeit Jean-Baptiste Colberts, dessen Supralibros die Bände auch tragen, umgebunden. Offenbar geschah dies nicht zufällig, sondern in Kenntnis der mitübersetzten Incipit- und Explicitvermerke. Band zwei der Colbert-Neubindung beginnt nämlich genau dort, wo die Handschrift „incipit liber secundus" hat. Dann scheint die Bandeinteilung aber nach der Phantasie weiterverfolgt zu sein, da schon der Vermerk „explicit liber secundus" bei der Neubindung unberücksichtigt blieb. Erstaunlicherweise ist dann aber wieder die Grenze von Band 4 zu 5 korrekt, da Band 5 von Colbert dort anfängt, wo in der Venezianischen (nicht der Pariser!) Handschrift „incipit liber quintus" steht. Ob dies Zufall ist oder nicht, muss offenbleiben.

Zu den Drucken: Die erste Druckausgabe des *Continens* wurde 1486 zu Brescia besorgt (J. Britannicus). Es folgten weitere Drucke in Venedig: 1506 (B. Locatelli), 1506 (O. Scoto), 1515 (Locatelli), 1529 (Scoto). Eine von Choulant gelistete Ausgabe Venedig 1500 (Locatelli) scheint ein Phantom zu sein. In welchem textuellen Abhängigkeitsverhältnis die Drucke stehen, ist derzeit noch nicht untersucht. Nach Bryson (S. 101) differieren die Ausgaben orthographisch und verwenden unterschiedliche Abbreviaturen. Ein lateinischer Textverlust am Ende von Buch 21,6 (lat. Zählung = Buch XX ed. Haid.) kommt nur in den Druckausgaben und in der Vatikanischen Handschrift vor, was ein starkes Indiz dafür sein könnte, dass die Druckausgaben von der Vatikanischen Handschrift abstammen. Jedoch steht dieser Beobachtung paradoxerweise entgegen, dass die Druckausgaben stellenweise zusätzlichen Text auf Satzebene bieten, der sich in keiner der uns bekannten Handschriften findet und der schwerlich eine Zutat des Druckers sein kann.[37]

Français 9430, f. 54, n° 786-787 [inv. E, 1413] ; inv. de 1424 [inv. F] : même description (Bibl. Sainte-Geneviève, ms. 964, f. 69v, n° 710 [inv. F]." Nach der gleichen Quelle gibt es einen Codex descriptus von dieser Handschrift (Mss. 126 und 127 der Bibliothèque de la Sorbonne, abgeschrieben im Jahr 1379 von Guillaume Hervé für Guibert de Celsoy, Leibarzt Charles V.).

[37] Unter den Antyllos-Fragmenten finden sich im *Continens* beispielsweise folgende Passagen, die nur in der Druckausgabe (Ven.) vorhanden sind, aber in beiden lateinischen Handschriften fehlen: et non teneret pilum, (46rIIult. Ven., Buch 2,6, Antyllos-Fragment 13a), contracta, ut colligatur et occultetur humiditas fluxus inter ipsos digitos deest (37rII Ven., Buch 2,2, Frg. 16), et que est fortis congelationis (41vI Ven., Buch 2,3, Frg. 18b) alius. et similiter iaceat supinus et dormiat supinus et ligetur (41vI Ven., Buch 2,3, Frg. 18c), in panniculo sistenti inter eos (68vI Ven., Buch 3,7, Frg. 25b).

Als philologisch besonders fatal hat sich die Ausgabe Venedig 1509 (B. Benalio)[38] erwiesen, die zahlreichen modernen Fragmentsammlungen vom 19. Jahrhundert bis in die jüngste Gegenwart zugrundeliegt (s. u.). Deren Herausgeber, Girolamo Soriano, hat das von Rhases gesammelte Material in 37 Büchern völlig neu angeordnet und gekürzt, mithin eine eigene Neuredaktion des *Continens* geschaffen.[39] Da Stellenangaben nach dieser Ausgabe keinerlei valide Anhaltspunkte für die Lokalisierung einer bestimmten Passage im arabischen Originaltext liefern, müsste die Bestimmung der Position jedes einzelnen aus ihr gewonnenen Zitats in der ursprünglichen lateinischen Version des *Continens* einem Abgleich mit dem arabischen Text vorausgehen. Dies aber würde in Ermangelung eines elektronisch durchsuchbaren Volltextes mehr Arbeits- und Zeitaufwand erfordern, als die Fragmente erneut aus einer konventionell angeordneten gedruckten oder handschriftlichen Fassung des lateinischen *Liber Continens* zu sammeln.

2. Arabische Fassung

Die bis heute maßgebliche Edition des arabischen *Ḥāwī*-Textes, basierend auf 19 Manuskripten,[40] wurde von 1955-1971 in Haiderabad publiziert und umfasst 25 Bände (numerisch 23 Bände: Band 21 und 23 in jeweils zwei Abteilungen). Diese Edition wurde vielfach und noch bei Erscheinen für ihre zahlreichen editorischen Fehlleistungen getadelt,[41] blieb und bleibt aber mangels Alternativen der primäre Zugang zum arabischen *Ḥāwī*. Der gravierendste Fehler, nämlich, dass in dieser Ausgabe weite Passagen des *Ḥāwī* fehlen, war weiten Kreisen der Forschung bislang unbekannt und soll im folgenden weiter ausgeführt werden: Gegenüber dem *Continens* fehlen darin die Kapitel 13,8–10, 14,1–3 und 15,3–6 (s. unten). Des Weiteren finden sich umfangreiche Lakunen in den Bänden 9–10.[42] Von dieser Haiderabader Edition erschien ab 1974 eine zweite Auflage in veränderter Paginierung mit im Wesentlichen unverändertem Text, die jedoch in Wissenschaftskreisen kaum verbreitet ist und die erste Auflage als

[38] Choulant S. 343 (hier fälschlich Locatelli zugeordnet). Die Ausgaben 1506 Scoto, 1515 Locatelli und 1529 Scoto fehlen bei ihm.

[39] Cf. Bryson S. 100–101, Ullmann (1994) S. 1299 und Choulant S. 343. Die Krankengeschichten (hierzu siehe den letzten Abschnitt dieses Aufsatzes) wurden beispielsweise auch gänzlich umgestellt und erscheinen als Appendix (Bryson S. 101).

[40] Cf. Kahl S. XIII mit Anm. 18; die verwendeten Handschriften sind auf den Titelblättern der Bände der Haiderabader Edition angegeben.

[41] Cf. Ullmann S. 130: „der Haiderabader Druck ist verdienstlich, jedoch philologisch unter jeglicher Kritik", Bryson S. 103 u. öfter.

[42] Ullmann (1994), S. 1301.

Referenzausgabe nicht ablösen konnte.[43] Nachdrucke dieser ersten Auflage wurden verschiedentlich von arabischen Verlagen herausgebracht (z. B. die „Bagdader Ausgabe"). Diese sind jedoch wissenschaftlich bedeutungslos, da sie lediglich den Text der ersten Haiderabader Ausgabe in neu gesetzter und eher verschlechterter als verbesserter Form bieten, die für Referenzzwecke wichtige Bucheinteilung und Paginierung der ersten Haiderabader Ausgabe aber ebensowenig dokumentieren wie ihren kritischen Apparat. Im Jahr 2001 erschien die Dissertation von Bryson, die erstmals eine textkritische Edition mit Übersetzung von Buch 1, Kapitel 1 des *Ḥāwī* bietet (basierend auf allerdings nur drei Manuskripten)[44] und mustergültig Aufgaben und Herausforderungen der künftigen *Ḥāwī*-Forschung umrissen hat. Ende 2012 veröffentlichte der ägyptische Philologe Ḫālid Ḫarbī von der Universität Alexandria eine Neuedition des *Ḥāwī* in 10 Bänden. Diese Ausgabe, die lediglich auf 9 Handschriften basiert (während die Haiderabader Editoren wie erwähnt auf 19 zurückgriffen), bietet jedoch kaum textuelle Verbesserungen gegenüber der Haiderabader Ausgabe. Im Gegenteil wurden einige Bücher (7–10 der Haiderabader Ausgabe) in dieser neuen Alexandrinischen Ausgabe ohne erkennbaren Grund oder Rechtfertigung umgestellt. Der Text selbst scheint weitgehend aus der Haiderabader Ausgabe übernommen worden zu sein, während sich die Ergebnisse der Kollation der neun Manuskripte lediglich in einem spärlichen textkritischen Apparat niederschlagen.[45] Die Auslassungspunkte, mit denen die Editoren der Haiderabader Ausgabe Fehlstellen und Lakunen markierten, hat Ḫarbī getilgt, ohne aber aus neu erschlossenen Quellen den fehlenden Text zu ergänzen. Auch die fehlenden Passagen 13,8–10, 14,1–3 und 15,3–6 konnte Ḫarbī aus den von ihm benutzten Manuskripten nicht beibringen, ebensowenig vermochte er die Lücken in den Bänden 9–10 zu schließen (es ist anzunehmen, dass ihm all diese Lakunen nicht einmal bewusst waren). Zusammen mit dem Umstand, dass sich in seiner Ausgabe weder Seitenangaben noch Querverweise zur Haiderabader Edition oder gar einer Fassung der lateinischen Übersetzung finden, erscheint Ḫarbīs Edition allenfalls als ein sehr geringr Fortschritt für die wissenschaftliche Erschließung des *Kitāb al-*

[43] Es erschien sogar eine dritte Auflage der Haiderabader Ausgabe, die in manchen Bänden geegnüber der zweiten unverändert ist.

[44] Süleymaniye 850, Escurial 806 und Şehid Ali 2081 (cf. Bryson S. 114), nicht zugänglich waren McGill University, Osler collection 65 und Rampur (Indien) I,474, ṭibb 66 (S. 115).

[45] Kahl S. XIII–XIV.

Ḥāwī erscheinen. Der ersten Auflage der Haiderabader Edition bleibt somit ihr Status als Referenzausgabe.[46]

3. Handschriftenverzeichnisse

Ein auch nur annähernd systematisches, geschweige denn vollständiges Handschrifteninventar des *Ḥāwī* fehlt bislang. Auf Grundlage der von ihnen ausgewerteten Handschriftenkataloge diverser westlicher und östlicher Bibliotheken bieten Sezgin (S. 279f.) und Ullmann (S. 130, Anm. 5) ein skizzenhaftes Inventar von *Ḥāwī*-Manuskripten.[47] Sezgin listet ca. 53, Ullmann ca. 38 Handschriften, die mehr oder weniger umfangreiche Teile des *Ḥāwī* enthalten. Dabei ist zumeist nicht ersichtlich, welches Buch des *Ḥāwī* in welchem Manuskript enthalten ist. Angaben in den Handschriften wie „Teil 3" oder „Teil 7" beziehen sich nicht auf Bücher, sondern auf Grobunterteilungen zusammengehöriger Manuskriptserien, wobei ein „Teil" meist mehrere Bücher umfasst. Die Einteilung in Teile scheint recht uneinheitlich gewesen zu sein; nähere Untersuchungen zu dieser Thematik fehlen noch. Der untenstehende Handschriftenkatalog basiert auf Ullmann und Sezgin, fügt weitere Funde hinzu und versucht erstmals Auskunft über die in den jeweiligen Manuskripten enthaltenen tatsächlichen Ḥāwī-Bücher (nach Maßgabe der Haiderabader Ausgabe bzw. des gedruckten lateinischen *Continens*) zu geben.

4. Fragmentsammlungen / Indizierungen

Pionierarbeit einer Fragmentsammlung von Zitaten griechischer Autoren aus dem *Continens* leistete Charles Daremberg, der um 1860 von Hilfskräften die Fragmente der wichtigsten dort zitierten griechischen Autoren sammeln ließ.[48] Publiziert wurden allerdings nur die Fragmente aus den Werken des Rufus von Ephesos (in der Rufus-Edition von Daremberg-Ruelle).[49] Darembergs restliche Fragmentkollektionen (Antyllos, Philagrios, Archigenes, Erasistratos etc.) blieben unveröffentlicht.[50] Auch die von Daremberg aus dem *Continens* sowie

[46] Cf. Kahl cit. supra.

[47] Dietrich S. 46.

[48] Ullmann (1994) S. 1299.

[49] Cf. C. Daremberg, C. E. Ruelle, *Œuvres de Rufus d'Ephèse*, Paris 1879.

[50] Über den Verbleib der Exzerptsammlungen ist nichts bekannt. Cf. C. Daremberg, C. E. Ruelle (wie zuvor), XLIX, Anm. 2 : „M. Daremberg, pour le dire en passant, a relevé, dans le *Continent* de Rhazès, en groupes séparés, non seulement les citations de notre auteur [Rufus], mais, en outre, celles des médecins Antyllus, Philagrius, Timée, Museia (?), Apollonius, Archigène, Érasistrate, Philumène, etc." Was es mit dem besagten Museia in auf sich hat, wird nicht ganz klar. Der kaiserzeitliche Arzt Musa hat

aus den Werken Serapions d. J. gesammelten Oreibasiosfragmente wurden nicht publiziert.[51] Doch selbst wenn uns die Ergebnisse dieser Sammeltätigkeit zur Verfügung stünden, wäre ihr philologischer Wert für uns heute sehr eingeschränkt, da Daremberg als Grundlage seiner Arbeit die von Soriano gekürzte und umsortierte Ausgabe (Venedig 1509) verwendte. Moritz Steinschneider hat um 1870 an einer Studie über die Quellen des *Continens* gearbeitet, ohne sie aber jemals zu veröffentlichen.[52] Pergens sammelte aus dem *Continens* die ophthalmologischen Fragmente von Ibn Māsawaih (1899a), Ḥunain ibn Isḥāq (1899b), verschiedenen Autoren (1900), Ibn Aṭāl und aṭ-Ṭabarī (1901) sowie von Rhases selbst (1902),[53] bedauerlicherweise wiederum aus der „falschen" Ausgabe (Soriano, Venedig 1509).[54] Julius Hirschberg (1904) teilte mit, dass er „die 1267 Paragraphen des zweiten Buchs vom *Continens* genau durchgesehen, und die Citate aus dem Griechischen – sie umfassen die größere Hälfte – … mit den Originalen … sorgsam verglichen"[55] habe. Diese Arbeit war von Hirschberg zur Publikation vorgesehen, wozu es jedoch bedauerlicherweise nicht kam. Albert Dietrich plante um 1970 eine Quellenanalyse des *Ḥāwī*,[56] die jedoch nicht umgesetzt oder veröffentlicht wurde. Masullo, die 1999 eine Sammlung der Philagrios-Fragmente vorlegte, wählte wiederum irrigerweise die umgestellte Ausgabe Venedig 1509 als Ausgangspunkt

im Arabischen eigentlich keine Spuren hinterlassen. Wahrscheinlich liegt hier eine Verwechselung mit Ibn Māsawaih vor.

[51] Cf. hierzu Schröder (RE-Suppl. 7) Sp. 811: „Bei Rhazes im Continens und bei Serapion jun. finden sich eine große Reihe von Exzerpten [aus Oreibasios]. Daremberg (Œuvres d'Orib. I S. XXXVI) hatte sie aus den lateinischen Drucken gesammelt und wollte sie mit den arabischen Hss. vergleichen. Molinier, der die Ausgabe des O[reibasios] zu Ende führte, hat sie nicht veröffentlicht. Auch Raeder [CMG] erwähnt sie nicht."

[52] Dietrich S. 45: „Von der größten Wichtigkeit wäre eine Monographie über die Quellen dieser Kompilation [des *Ḥāwī* M .W.]; Steinschneider hat eine Zeitlang an einer solchen gearbeitet, sie aber nicht abgeschlossen (Virchows Archiv 52, 1871, 468)."

[53] E. Pergens, Les fragments ophtalmologiques de Mesuë l'ancien chez Rhazes, in: Annales d'Oculistique, 122, 1899, 348–356; ders., Les fragments ophtalmologiques de Honein ben Ishak dans le Hawi de Rhazes, in: Annales d'Oculistique 122, 1899, 407–424; ders., Fragments ophtalmologiques de divers auters chez Rhazes, Annales d' Oculistique, 123, 1900, 401–431; ders., Les fragments ophtalmologiques d' Ibn Thalaüs et d' el Taberi dans le Hâwi, in: Bull. Soc. de méd. de Gand 48, 1901, 188–192; ders., Les conceptions ophtalmologiques personnelles de Rhazes dans le Hawi, in: Annales d' Oculistique 127, 1902, 105–133, 272–287, 413–432.

[54] Pergens (1902) S. 107 „puis il y eut des éditions de Venise … J'ai employé celle de 1509 par Hieronymus Surianus."

[55] J. Hirschberg, Die Aussaugung des Stars, eine Radical-Operation der Araber, in: Centralblatt für Augenheilkunde 28, 1904, 225–235 (S. 226 mit Anm. 6).

[56] Angekündigt in Ullmann (1970) S. 130.

ihrer Edition. Sie versuchte erstmals, lateinische und korrespondierende arabische Fragmente parallel zu edieren, aber – da sich in der umgestellten Ausgabe die arabischen Fragmente kaum wiederfinden lassen – mit recht bescheidenem Resultat.[57]

Weitere Beiträge in Richtung einer Quellenanalyse sind Sezgins und Ullmanns Indizierungen der im arabischen *Ḥāwī*-Text zitierten Autoren, die erstmals eine fokussierte Arbeit mit einzelnen im *Ḥāwī* zitierten Autoren erlaubten; auf den *Continens* hat keiner der beden Autoren zurückgegriffen. Für diesen existiert ein vergleichbarer Stellenindex in Form eines unveröffentlichten und unter Forschern nahezu unbekannten handschriftlichen Zettelkastens (erstellt von Jutta Kollesch auf Grundlage des *Cod. Par. lat.* 6912), der in den 1960er Jahren zum internen Gebrauch der Redaktion des *Corpus Medicorum* der (heutigen) Berlin-Brandenburgischen Akademie der Wissenschaften erstellt wurde, noch gegenwärtig dort aufbewahrt wird und auf Anfrage für Forscher konsultierbar ist.[58] Weitere Beiträge zur *Ḥāwī*-Forschung sind (sämtlich auf Grundlage des arabischen *Ḥāwī*): Weissers Studien über Rhases' Exzerpierverhalten aus Galens *Methodus medendi* (1991, 1997; Ergebnisse liefert Weisser in Listenform, nicht als Synopsen), Ullmanns Studien zu Rufus von Ephesos (1983, 1994), Kahls Fragmentsammlung eines anonymen „alten Dispensariums"[59] sowie die Fragmentsammlung bzw. -auswertung von Pormann (2005), in der er die im *Ḥāwī* überlieferten Zitate aus dem ersten von sieben Büchern des byzantinischen Kompendiums der Medizin des Paulos von Aigina untersucht.[60] Anastassiou und Irmer

[57] Trotz der Ankündigung auf S. 38 „si sono forniti in apparato pagine e linee del corrispondente testo arabo e di esso si sono segnalate anche eventuali aggiunte o omissioni nelle apposite note di commento" wird diese Gegenüberstellung von Masullo praktisch nicht durchgeführt; selbst Stellenangaben des arabischen Textes fehlen zumeist. Fragmente des *Ḥāwī* werden nirgends arabisch abgedruckt, mit Ausnahme eines Faksimiles (!) zweier Seiten aus der Haiderabader Ausgabe (cf. 237f.). Die im Vorwort angekündigten Unterschiede zwischen lateinischer und arabischer Version werden praktisch nirgends verzeichnet. Ein Blick in die Stellenindizes (446f.) zeigt, dass auf ca. dreimal so viele lateinische *Ḥāwī*-Stellen wie arabische Bezug genommen wird, d. h. von einer konsequenten Gegenüberstellung (Verhältnis 1:1) kann nicht die Rede sein.

[58] Für die Erstellung des Kollesch-Zettelkastens wurde seinerzeit keine Druckausgabe des lateinischen *Ḥāwī* (*Continens*) indiziert, sondern der *Codex Parisinus Latinus* 6912 (offenbar, weil damals zu DDR-Zeiten keine Druckausgabe des *Continens* an der Akademie der Wissenschaften verfügbar war).

[59] O. Kahl, *Fragments of an Anonymous 'Old Dispensatory' in ar-Rāzī's* Kitāb al-Ḥāwī, Journal of Semitic Studies, 49,2, 1 October 2004, S. 289-301.

[60] P. E. Pormann, *The Oriental Tradition of Paul of Aegina's Pragmateia*, Leiden 2004.

haben in ihrem 2012 erschienen dritten Band der „Testimonien zum *Corpus Hippocraticum*" mehrheitlich vom lateinischen *Continens*-Text ausgehend die Hippokrates-Zitate gesammelt[61] und hierbei erfreulicherweise eine „gute" Ausgabe in althergebrachter Textanordnung (Venedig 1529) verwendet. Doch ist auch ihre Fragmentsammlung nicht unproblematisch.[62] Zu kritisieren ist bei Anastassiou/Irmer insbesonders, dass eine beträchtliche Anzahl von Hippokrates-Fragmenten, die keiner uns bekannten hippokratischen Schrift zuordenbar sind (ca. 80% der gefundenen Fragmente) nicht in die Publikation der „Testimonien" aufgenommen wurden, nicht einmal in Form eines Stellenverzeichnisses, so dass diese gewaltige Textmasse für künftige Forschungen nicht verfügbar ist und erst wieder mühsam von Neuem gesammelt werden müsste.[63] Ab 2011 verfolgten Stefan Weninger und Oliver Kahl in Marburg das Projekt einer Quellenanalyse des *Ḥāwī*. Ziel des DFG-geförderten Projekts war es anfänglich, den arabischen *Ḥāwī* in sämtliche Einzelzitate zu fragmentieren und diese in einer nach modernen wissenschaftlichen Kriterien organisierten Materialkartei zu sammeln. Aufbauend hierauf sollte eine doppelläufige Konkordanz der Textparallelen zwischen dem *Ḥāwī* und den darin zitierten Originalschriften erstellt werden und schließlich ein arabisches Korpus von Textpassagen, die in den Originalschriften verloren oder nicht nachweisbar sind, erstellt werden.[64] Dieses sehr ambitionierte Projekt konnte jedoch nicht im geplanten Umfang verwirklicht werden und fokussierte sich schließlich auf die syrischen, persischen und Sanskrit-Quellen des *Ḥāwī*. Die Publikation der Ergebnisse erfolgte 2015 (Kahl 2015). Kahl hat primär mit der Haiderabader Ausgabe gearbeitet, punktuell aber auch den lateinischen *Continens* beigezogen – jedoch bedauerlicherweise wiederum in der „falschen", von Soriano umsortierten Ausgabe Venedig 1509.[65] Dass Kahl kaum lateinische Passagen beibringen konnte, verwundert daher kaum. Der Verfasser hat im Jahr 2015 als Habilitationsschrift eine

[61] A. Anastassiou, D. Irmer, *Testimonien zum Corpus Hippocraticum.* Teil III: *Nachleben der hippokratischen Schriften in der Zeit vom 4. bis zum 10. Jahrhundert n. Chr.*, Göttingen 2012.

[62] Cf. Witt (2013).

[63] Cf. Witt (2013) S. 502.

[64] Cf. die Beschreibung des Projekts in der Gepris-Datenbank der DFG: http://gepris.dfg.de/gepris/projekt/200785966

[65] Die Wahl dieser Edition wird wie folgt begründet (Kahl S. 17, Anm. 96): „The Latin Edition Venice 1509 s.t. *Continens*, which I have been using here, is considered one of the better out of several Renaissance prints." Von wem diese „consideration" stammt, belegt und begründet Kahl nicht. Seit Daremberg finden hartnäckige Fehlgriff von Philologen gerade auf diese untaugliche Edition statt.

Sammlung sämtlicher (arabischer und griechischer) Fragmente der χειρουργούμενα des kaiserzeitlichen Chirurgen Antyllos (2. Jh. n. Chr.) vorgelegt,[66] wobei die arabischen Fragmente mehrheitlich aus dem *Ḥāwī* und dem *Continens* (Edition Venedig 1529 und *Cod. Par. lat.* 6912) stammen. Erstmals wurden hier die arabische und die lateinische Version konsequent nebeneinander verwendet, in Gestalt dieser schon oft geforderten (siehe sogleich), aber noch nie durchgeführten, Doppeledition.

Nachdem der Verfasser in seiner Habilitationsschrift und sodann im Jahr 2017 anlässlich einer von ihm organisierten Fachtagung[67] auf die der Teheraner Schwestermanuskripte McGill 449 (McG), Yale Or. 10 (Y) und Teheran, Millī Malik 4785 (Th) hingewiesen hat und den Umstand, dass sie arabisch unpublizierte Passagen (Buch 13,8–14,3) des *Ḥāwī* enthalten, haben Garofalo (2018) und Buzzi/Garofalo (2019) diese Manuskripte verwendet und ausgewertet, ohne hinreichend kenntlich zu machen, dass es sich bei ihren Ergebnissen teils um die auf der Tagung präsentierten Erkenntnisse des Verfassers handelt, die ihnen direkt bzw. über einen Tagungsteilnehmer kommuniziert wurden. So liefert Garofalo in „Appendice II - I manoscritti arabi non usati nell'edizione di Razi, Hyderabad" eine ausführliche Beschreibung der Handschriften McY sowie Y und auf S. 170–173 eine synoptische Inhaltsübersicht beider Manuskripte. Buzzi/Garofalo verwenden gleichfalls die Handschriften McG und Y für ihre Sammlung der im *Ḥāwī* überlieferten Oreibasios-Fragmente. Die Fragmentedition enthält konsequent die arabische Textgestalt (in italienischer Übersetzung) und die lateinische des *Continens* nebeneinander, in Gestalt einer synoptischen Doppeledition.

Wie aus der gerade gegebenen Übersicht hervorgeht, haben sich zur Edition von Fragmenten aus Werken antiker und byzantinischer Autoren in arabischer Überlieferung noch keine festen philologischen Standards etabliert. Bisherige Fragmentsammlungen bieten meist entweder nur einen Abdruck der lateinischen Übersetzung des *Ḥāwī* (Masullo, Anastassiou/Irmer) oder aber die Studien basieren allein auf dem arabischen Text (Pormann, Weninger/Kahl). Da nun aber, wie erwähnt, immer wieder einzelne Textpassagen oder gar komplette

[66] Für eine nähere Beschreibung dieses Projekts siehe in der Gepris-Datenbank der DFG unter: http://gepris.dfg.de/gepris/projekt/246321084 Publikation im Erscheinen, als Vorabpublikationen erschienen in englischer Übersetzung die Fragmente über Blasenstein bzw. Steinschnitt und die Augenchirurgie (Witt 2019 und 2024).

[67] Tagung *Sammlung und Fragmentierung: Medizinische Kompilationen des Morgen- und Abendlandes und ihre Quellen*, Humboldt-Universität Berlin/Charité Universitätsmedizin Berlin 30.09.2017-02.10.2017.

Abschnitte im *Ḥāwī* sowie im *Continens* fehlen, erscheint eine konsequente und vollständige Doppel-Edition der sich gegenseitig ergänzenden arabischen und lateinischen Fassungen des *Ḥāwī* als unabdingbare Voraussetzung für eine Rekonstruktion des ursprünglichen Bestandes (so vom Verfasser in seiner Antyllos-Fragmentsammlung praktiziert und zuletzt auch von Buzzi/Garofalo). Nur so können auch „versteckte" Fragmente (die bei der Erfassung der Stellenangaben der Stellenlisten von Ullmann und Sezgin übersehen wurden oder deren ursprünglichen Lemmata in der arabischen oder lateinischen Edition fehlen) über einen systematischen Abgleich beider Fassungen gewonnen werden. Dass davon abgesehen auch aus inhaltlichen und textkritischen Gründen eine arabisch-lateinische Paralleledition zwingendes Erfordernis ist, wurde wiederholt betont – blieb bislang jedoch ohne wesentliche Konsequenzen in der Forschung:

Flashar S. 88:[68] „So kommt es, dass an zahlreichen Stellen die arabische von der lateinischen Fassung abweicht, ohne dass es möglich wäre, einer Fassung insgesamt den Vorzug zu geben. Vielmehr erhellen sich beide Fassungen gegenseitig, enthält bald die eine, bald die andere Fassung Kürzungen, Unterbrechungen, Mißverständnisse."

Ullmann S. 130, Anm. 7 „Die Lakunen im arabischen Text … können durch die lateinische Übersetzung ergänzt werden. "

Garofalo S. 398: „L'utilizzo della versione latina di Faraj ibn Salim at-Talmid (Faragut) per la costituzione del testo arabo di Razes è ovviamente indispensabile. Ma anche il testo latino si avvantaggia della comparazione."

Bryson S. 103: „The Latin translation of the *Ḥawī* is a relatively good, reliable, indeed almost indispensable, source of information about the text … [for those, who] would like a more reliable text than the poor quality Hyderabad editions … [and being] a witness to an Arabic manuscript far older than all of the extant ones, it is indispensable for any critical edition of the Arabic text. … when comparing the Latin translation with the Hyderabad edition, one must consider that the Hyderabad edition is very flawed and what may at first appear to be errors by the Latin translator may in fact be errors by the editors of the Hyderabad edition. "

[68] H. Flashar *Melancholie und Melancholiker in den medizinischen Theorien der Antike*, Berlin 1966, S. 88.

c. Diskrepanzen Ḥāwī/Continens, *Textlücken*

Wie bereits eingangs erwähnt weist der edierte *Ḥāwī* (Haiderabader Ausgabe) eine Reihe von Textlücken auf, deren größte zwei der bisherigen Forschung entgangen sind. Hierauf wurde vom Verfasser in seiner Habilitationsschrift sowie in Witt (2021) hingewiesen (Konkordanz des *Ḥāwī* und des *Continens*, aus der die Textlücken beider Versionen hervorgehen).

aa. Die zweite Lücke (15,3–16,2 Mitte)

Dass Iskandar (1975, S. 42) bereits auf einen Teil der zweiten dieser großen Textlücken hinwies, scheint unbeachtet geblieben zu sein: „Indeed, MS Marsh 156 contains much material on *taqdimat al-maʿrifa* (prognosis) and on *al-ḥummayāt* (fevers), which is altogether missing from the Hyderabad edition of *al-Ḥāwī*. This lacuna at the beginning of part 14 [Haid. = 16 lat.] should have been filled with the text of the first sixty-five folios in MS Marsh 156."

Doch bereits aus Antuña (1935) hätte man diesen (sich überdies noch auf 15,3–6 erstreckenden) Textverlust ebenso wie die erste große Lücke (13,8–14,3 Mitte) der späteren Haiderabader Edition ersehen können. Letztere basiert schließlich in erster Linie auf den Escorial-Handschriften des *Ḥāwī*. Diese wurden von Antuña in seinem Aufsatz umfangreich mit dem lateinischen *Continens* verglichen und deren Büchern und Kapiteln zugeordnet. Er folgt hierbei der Bucheinteilung des (lateinischen) *Continens*, wobei er in Klammern die jeweils zugehörige Kapitelzahl angibt (z. B. Liber undecimus (8)) und dann vermerkt, in welchem Escurial-Manuskript die entsprechenden Bücher bzw. Kapitel überliefert sind („Los siete primeros caps. en el cód. …; los cinco primeros caps., en el cód. …; los cinco últimos, en el cód. …"; „Integro, en el cód. „"; cf. S. 485f.).

Wenn dann Antuña zum „Liber decimus tertius (10)" vermerkt „Los siete primeros caps. en el cód. 813, fol. …", dann ersieht man hieraus, dass offenkundig die Kapitel 13,8–10 in keiner Escurial-Handschrift enthalten sind. Ähnliches gilt für den „Liber decimus quartus (7)": „El cap. tercero acéfalo … y los cuatro [siguientes M. W.] completos en el cod. 856, fols. …". Aus dieser Beobachtung folgt, dass die Kapitel 14,1–3 Mitte in den Escurial-Handschriften fehlen. Es ergibt sich daher insgesamt eine (erste) Lücke von 13,8–14,3 Mitte.

Zum „Liber decimus quintus (6)" stellt Antuña fest: „Completos el primero y segundo caps. en el cód. 856, fols. … ". Es fehlen also auch die Bücher 15,3-6 in den Escurial-Manuskripten. Beim „Liber decimus sextus (2)" wird vermerkt: „El cap. segundo acéfalo … en el cód. 855 …

el primer cap. acéfalo y el segundo incompleto por el fin … en el cód 818". Hieraus ergibt sich in summa die (zweite) Lücke in der Haiderabader Ausgabe von 15,3–16,2 Mitte, da die Haiderabader Editoren zwar die Handschrift 855, nicht aber 818 beigezogen haben.[69]

An dieser Stelle erscheint ein Textvergleich der von Iskandar erwähnten Handschrift Marsh 156 mit dem Scorialensis 818 interessant, da beide Handschriften Teile von Kapitel 16,1–2 enthalten. Wie eine genauere Untersuchung des Manuskripts Marsh 156 zeigt, ist in diesem leider nicht der gesamte in der Haiderabader Ausgabe fehlende Text von Buch 16 enthalten. Denn das Manuskript weist in Kapitel 16,1 zwei große Lücken auf: das arabische Äquivalent zu 322rb–323rb[70] Ven. und 330rb–332vb Ven. fehlt. Nun enthält aber der Scor. 818 auf fol. 10r–18v den Text 331ra–332vb Ven. Hierbei handelt es sich um das Ende des arabisch unedierten Kapitels 16,1. Der Scor. 818 kann somit die letzte Lücke des Marsh 156, wenn auch nicht komplett, so zumindest teilweise schließen. Somit hat sich dann die zweite Lücke des Marsh 156 auf die Seiten 330rb–331ra verkleinert. Fol. 18v–32r des Scor. 818 enthalten den Anfang von 16,2, arabisch ebenfalls unediert, bis zum Beginn der Haiderabader Druckausgabe auf fol. 32r. Der Anfang von Buch 16,2 ist mithin im Scor. 818 und Marsh 156 in gleicher Weise überliefert.

Bedauerlicherweise ist bis dato keine Handschrift bekannt, die den Text der Kapitel 15,3–6 enthält, so dass hier weiterhin ersatzweise auf den lateinischen Text des *Continens* zurückgegriffen werden muss.

bb. Die erste Lücke (13,8–14,3) und die „Teheraner" Handschriftengruppe

1. Drei Teheraner „Schwestermanuskripte"

Während die „zweite Lücke" der Haiderabader Ausgabe nun in ihrem letzten Drittel durch die bislang bekannte handschriftliche Überlieferung gefüllt werden kann, sind wir bei der „ersten Lücke" in einer glücklicheren Situation. Es sind nämlich gleich drei Handschriften des späten 17. Jahrhunderts erhalten, die den fehlenden Text fast komplett überliefern. Die Rede ist von den Manuskripten Montreal McGill 449 (McH), Yale Or. 10 (Y) und Teheran, Millī Malik 4429 (Th). Mutmaßlich enthält darüber hinaus auch die Handschrift Bonham's-Sotheby's (datiert 1496–97 n. Chr., hierzu weiter unten)

[69] Kahl S. XIII, Anm. 18.

[70] Ven. = der Venezianische Druck von Scoto 1529.

diesen fehlenden Abschnitt. Alleine Kapitel 14,3 ist in allen drei Handschriften (McG, Y, Th) unvollständig. Diese brechen allesamt an derselben Stelle in der Kapitelmitte ab. Der Forschung waren die drei Manuskripte bislang weitestgehend unbekannt. Sezgin und Ullmann listen von diesen drei Manuskripten lediglich Millī Malik 4429. Bryson (S. 115 mit Anm. 1) ist die Handschrift McGill bekannt, sie war ihr jedoch für ihre Studie nicht zugänglich. Hamerneh/Sonnendecker haben nach ihrer Auskunft sowohl die Handschriften McGill als auch Yale für ihre Studie verwendet, doch scheinen sie den Inhalt nicht inventarisiert und die arabisch unpublizierten *Ḥāwī*-Abschnitte nicht entdeckt zu haben.[71]

Alle drei Manuskripte (McG, Y, Th) stammen aus Teheran, wobei sich nur noch das letzte vor Ort befindet. Die ersten beiden wurden Anfang des 20. Jahrhunderts von den berühmten Ärzten Sir William Osler (1849–1919) (McG) und Harvey Cushing (1869–1939) (Y) erworben und sind dann mit ihrem Nachlass nach Kanada bzw. in die USA gelangt. Mittelsmann bei der Erwerbung war in beiden Fällen der in England ausgebildete Arzt, ehemalige Mullah und christliche Konvertit Dr. Mohamed (Mirza) Saᶜīd Khan Kurdestani (1863–1942), über dessen bewegtes Leben eine Biographie aus der Feder eines seiner Neffen Auskunft gibt.[72] In dieser werden auch die Handschriftenaquisitionen erwähnt (hierzu sogleich). Ein Brief von Dr. Saᶜīd an Lady Osler ist erhalten und in die Handschrift Montreal McGill 449 eingebunden. Aus diesem werden wir aus erster Hand über die Beschaffung informiert:

Hassanahad / Tehran / 9. iii. 22

Dear Lady Osler,
Twice I send some / of the letters of the beloved Sir Williams / written to me, to Dr. Cushing, as / he requested for them but I have / not heard from him. I hope some / day to be able to recieve my / treasures back. Herewith / I enclose two more, in one of them / as you see he gave me the mission / to buye for him a copy of AlHawi of / the great Rhazes for £ 20, but the / man did not like to part with / his precious vol. so I searched / in other quarters to find a very / nice copy for Sir William which / would cost him only £ 13, it was / packed &

[71] S. K. Hamarneh, G. A. Sonnedecker, *A Pharmaceutical View of Abulcasis Al-Zahrāwī in Moorish Spain: With Special Reference to the „Adhān"*, Leiden 1963, S. 147.

[72] J. M. Rasooli, C. H. Allen: *The Life Story of Dr. Sa'eed of Iran: Kurdish Physician to Princes and Peasants, Nobles and Nomads, Grand Rapids*, Michigan ²1958 (Nachdruck Pasadena 1986) und Isaac Malek Yonan, *The beloved physician of Teheran: the miracle of the conversion of Dr. Sa'eed, Khan, Kurdistani, lokman-il-mulk, the man who walks and talks with God*, Nashville 1934.

delivered to Dr. Neligan / of the British Legation & he / forwarded me the Foreign Office / tag, but before the courier had / started, the news of Sir William's / death reached Tehran and natur- / ally the work was not sent. / of this I wrote you then and enclosed / two long letters which I had written / to the dear Sir William, now / that work remains and as / you know I am not a rich / man, Will not the liberary of / the College to which Sir William's / rich liberary went like to get this / copy of this same and wonderful / work? Can't you help me in / this line? / And after Dr. Cushing sees / these two letters I like to have them/ back again. My son who was wounded / in France, was a field Engineer ... [es folgt Familiäres; Unterstreichungen von M. W.]

Wie es zu dem Kontakt mir Osler kam, erfahren wir aus Rasoolis Biographie (wie Anm. 72, S. 152):

At some time prior to World War I, Sir William Osler ... had tried to secure an Avicenna manuscript in Arabic. He wrote to Dr. A. R. Neligan, physician to the British Legation in Teheran, who at once referred Osler's request to Dr. Sa'eed, his friend of many years.

Wenig darauf, berichtet Rasooli, habe Saʿīd ein Avicenna-Manuskript aus dem 14. Jahrhundert bei einem Patienten gesehen und dies (wohl auf seine Bitte hin) anstatt des ärztlichen Honorars erhalten. Dieses Manuskript sei dann Osler im Juli 1913 zugesandt worden (Rasooli S. 153).

In die Chronologie des Sommers 1916 fügt sich folgende Bemerkung Rasoolis (S. 160):

At this time Sa'eed ran across a copy of the medical writings of Razi ... To Osler he wrote on his discovery ... Sir William replied enthusiastically ... He begged that the manuscript be sent to him – a great sacrifice for Sa'eed, for he too was a lover of books. He was sad to part with the newly found treasure: nevertheless he sent the book to Osler.

Jedoch sind hier offenkundig eine Reihe von Fakten unzutreffend. Wie dem oben transkribierten Brief Saʿīds zu entnehmen ist, fällt der Erwerb der Handschrift nicht in das Jahr 1916, sondern in Oslers Todesjahr 1919, und die Handschrift wurde todesbedingt nie an Osler versandt. Auch scheint Saʿīd weniger am Besitz der Handschrift gelegen zu haben als daran, sein für den Kauf der Handschrift verauslagtes Geld wiederzubekommen, was ihm erst durch den Brief an Lady Osler im Jahr 1922 gelungen zu sein scheint. Die folgende, sich unmittelbar anschließende Notiz Rasoolis (S. 161) ist chronologisch entsprechend dem eben Dargestellten wohl ebenfalls auf das Jahr 1919 zu datieren:

Eight days later Sa'eed's bookseller friend dropped in, and lo, among his collection of odd [sic] manuscripts the doctor found an older and even better

copy of the same book! At once he paid the price demanded and was elated to have it, but only a short time elapsed till his copy went to Dr. Cushing. Cushing was at that time writing Osler's biography and he asked Sa'eed for the correspondence he had had with him. Gradually their friendship grew ... and continued till the end of Cushing's life.

In der Tat hat Cushing ein wesentlich bibliophileres Exemplar als Osler erhalten: der Maroquineinband ist in zweifarbigem Leder gefertigt, teils blindgeprägt mit Tier- und Pflanzenmotiven, teils mit Goldprägungen versehen, und es findet sich eine aufwendige farbige florale Illumination des Titels auf der ersten Seite der Handschrift. Fraglich ist, ob Rasoolis Bericht vom Buchhändler stimmt. Es könnte sich ebensogut um das erste Exemplar für £ 20 handeln, das möglicherweise doch noch verkauft wurde. Der um £ 7 höhere Preis würde sich aus der luxuriösen Aussstattung erklären, im Vergleich zu Oslers sehr schlicht gebundenem und unverziertem Exemplar. Von Rasooli erfahren wir nun auch, weshalb Cushing an Oslers Briefen Interesse hatte. Ob Saᶜīd jemals seine Osler-Briefe von Cushing zurückbekommen hat, ist unbekannt.

Doch nun zum Inhalt der drei „Schwestermanuskripte": Diese umfassen den Text von Buch 1–14,3 des *Ḥāwī* und brechen alle an derselben Stelle in Kapitel 14,3 ab. Von Buch drei ist jeweils nur der Anfang erhalten und Buch vier fehlt ganz. Die gleiche Kapitelanordnung inklusive der seltsamen Umstellung (8,203 nach 14,3) zeigt, dass die Handschriften auf dieselbe Vorlage zurückgehen. In den Handschriften McG und Y findet sich überdies derselbe Kopistenfehler: der Abschnitt 11,208–14,3 wurde versehentlich zweimal kopiert und begegnet an zwei Stellen der Handschrift. Dies weist auf eine besonders enge stemmatische Verwandtschaft von McG und Y. Ein Textvergleich zeigt indes, dass keine der beiden Handschriften „descriptus" ist. McG weist einige kleinere Textlücken auf, die sich durch Y (und teils auch Th) füllen lassen.[73] Gegenüber McG und Y wurde Th (bzw. dessen Subarchetyp) vermehrt, indem Buch 19 des *Ḥāwī* Buch eins vorangestellt wurde und die Bücher 20ff. dem integralen Textbestand nachgestellt wurden. Bemerkenswert (gegenüber McG und Y) ist, dass in Th zwischen Buch 13,8 und 13,9 ein Abschnitt aus Buch 12 des *Ḥāwī* interpoliert wurde.

[73] Hierzu cf. meine im Erscheinen begriffene Antyllos-Edition.

Haiderabader Edition (Haid.)	McGill 449 (McG)	Yale Or. 10 (Y)	Teheran, Millī Malik 4492 (Th)
XIX	Fehlt		**1–279**
I,1 – I Ende	18–81	1–28	282–407
II,1–III,92	82–159	29–199	409–437
V,240–VII	160–263	200–287	Fehlt
VII–VIII	264–325	288–340	Fehlt
VIII	326–349	341–359	545–598
X,303,14–XI	350–405	360–409	819–934
XI,280 – **13,8 - 14,3**	406–487 **447**	410–487 **449u.**	Fehlt
VIII,203,3f – X,153,15	488–564	488–560	499–754
X,153,15 – X,303,13	566–595	561–589	755–817
XI,29 –	596–636	596–634	Fehlt
XI,280 –	638–717	634–710	935–977 (–13,8)

13,8–14,3	**678**	**673u.**	978–1035 Buch 12 1035–1110 (13,9–14,3)
XXff.	Fehlt	Fehlt	1111ff.

2. Weitere Handschriften der „Teheraner Gruppe"

Die besonders enge Verwandtschaft von McG, Y, und Th wird nicht nur an der ähnlichen Makrostruktur deutlich, sondern zeigt sich nicht zuletzt auch an weitstreckigen Textumstellungen, denen offenkundig Blattvertauschungen eines Subarchetyps zugrundeliegen, die unerkannt in der invertierten Reihenfolge abgeschrieben wurden. Hierzu vergleiche die nachstehende Tabelle. Bemerkenswerterweise weist auch die ca. 300 Jahre ältere Handschrift Ar die gleichen Umstellungen auf, wobei Ar nur einen Teil des *Ḥāwī* (Buch 7–10) überliefert, aber aufgrund dieses charakteristischen Befundes evident vom selben Subarchetyp wie die anderen drei Manuskripte abstammen muss. Dieser gemeinsame Subarchetyp mit vertauschter Blattfolge muss entsprechend vor 1313 n. Chr. entstanden sein. Ar stammt aus dem Besitz des Duke of Norfolk, dessen Wappen sich als Supralibros auf dem in rotem Maroquin gebundenen Einband findet. Der Name der Handschrift (Arundel Or. 10) leitet sich von Arundel Castle, dem Stammsitz der Dukes of Norfolk ab, zu dessen Bibliothek das Manuskript einst gehörte.[74] Nachfolgend eine Liste der genannten Textvertauschungen:[75]

[74] Die Sammlung gelangte im Jahr 1678 an die Royal Society, dann 1831 ins British Museum und später in die British Library.

[75] Dies betrifft, wie aus der Tabelle ersichtlich, die Passage X,108,17–122,11 Haid., dabei fehlt X,108,17–109,8 Haid.; es findet sich eine Dublette X,107,6–10.

Haid.	Ar	McG	Y	Th
–X,108,17	–367v,3	–555,11	[X,106,2–109,8 fehlt]	– (732),8
X,112,4–X,117,6	367v,3–370v,2	555,11–556,16	ab X,114,19: 552,1–552,-20	(732),8–(734),-5
X,119,20–122,11	370v,3–372r,4	556,16–556,-1 (Spatium ca. 3 Wörter)	552,-20–553,2 (Spatium 4 2/3 Zeilen)	(734),-5–(736),4 (Spatium 10 Zeilen)
X,109,8–112,4	372r,4–373v,4	556,-1–557,-16	553,3–553,-12	(736),5–737,-2
X,107,6–10 (Dublette)	373v,4	557,-15	553,-12	737,-2
X,117,6–119,20	373v,7–375r,11	557,-14–558,7	553,-11–554,13	(738),1–739,11
X,122,11ff.	375r,11ff.	558,7ff.	554,14ff.	739,11ff.

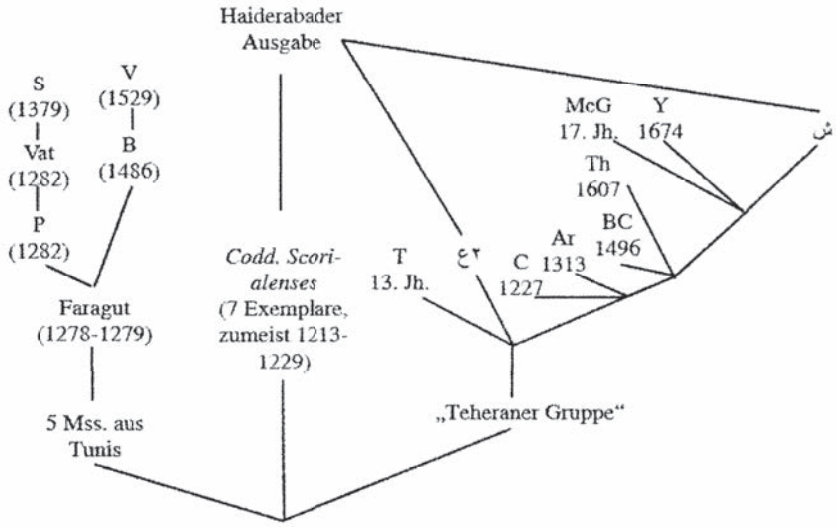
Zur Gruppe gehören weiterhin die von den Haiderabader Editoren verwendeten Handschriften ش und ع٢ (Ḥāwī-Bücher XI–XII). Bemerkenswerterweise enthält ش den gleichen charakteristischen Textverlust

wie McG und Y (X,8,9–10,11 Haid.), muss also vom selben Subarchetyp abstammen wie die beiden vorgenannten Handschriften.

Aus den bisherigen Beobachtungen kann ein vereinfachtes Stemma der Handschriften wie folgt abgeleitet werden: Am engsten sind die Manuskripte McG und Y affiliiert (gleicher überlieferter Textbestand, gleicher tradierter Kopistenfehler [Doppelung des Passage XI,280 bis Kap. 14,3]). Auch ش gehört wegen des genannten Textverlustes und einer Anzahl von Bindefehlern in die Nähe dieser beiden Handschriften. Etwas früher im Stemma ist Th zu lokalisieren, bei dem auch der tradierte Kopistenfehler nicht vorhanden ist. Eng zu Th, McG und Y gehört dann auch die Handschrift Ar, die die gleichen charakteristischen Textumstellungen aufweist (s. oben). Wegen gleicher Bindefehler gehören schließlich auch T und ع[۲] in diese Gruppe. Über eventuelle gemeinsame Textduplikationen und -vertauschungen sind hier keine Aussagen möglich, da die entsprechenden Passagen in den letzten beiden Handschriften nicht überliefert sind. In den Umkreis der Handschriften Th, McG und Y gehört, wie oben schon angesprochen, auch die auf das Jahr 1496-97 datierte Handschrift Bonham's-Christie's (BC). Wie Probekollationen zeigen, weist diese Handschrift die gleichen Bindefehler und Textvarianten wie die drei Teheraner Schwesterhandschriften Th, McG und Y auf. Es ist anzunehmen, dass sie wohl die gleichen Bücher des *Ḥāwī* überliefert wie die Handschrift Th. All diese Beobachtungen können nur mit Einschränkungen gemacht werden, da BC nicht autopsiert werden konnte. Die Beobachtungen fußen auf einer Kollation der wenigen von den Auktionshäusern Bonham's und Christie's zur Verfügung gestellten digitalisierten Seiten. Die Handschrift BC weist nun allerdings noch eine Besonderheit auf. Auf einer nicht paginierten Seite findet sich inmitten des 10. Buches des *Ḥāwī* bei einer Kapitelüberschrift „Über die Schwierigkeit des Wasserlassens" (في عسر البول) der vorangestellte Vermerk „Achter Teil des *Ǧāmiᶜ al-kabīr*, der bekannt ist als der *Ḥāwī*" (الجزء الثامن من الجامع الكبير المعروف بالحاوي). Man könnte zunächst meinen, hier eine Lösung für das Dilemma der vermeintlich zwei Exzerptensammlungen des Rhases – *Ǧāmiᶜ al-kabīr* und *Ḥāwī* – gefunden zu haben. Da der *Ḥāwī* in verschiedenen Bucheinteilungen überliefert ist und hier ausdrücklich als *Ǧāmiᶜ al-kabīr* bezeichnet wird, könnte man annehmen, dass es eine eigene (*Ǧāmiᶜ*-) Redaktion des Werks gibt. Jedoch findet sich diese Überschrift zum Beginn des „achten Teils" unmotiviert einem Unterkapitel des zehnten Buches des *Ḥāwī* vorangestellt und stimmt auch nicht mit der Kapiteleinteilung des *Ǧāmiᶜ al-kabīr* nach Ibn Abī Uṣaibiᶜa überein. Es scheint sich also bei der Doppelnennung von Titeln lediglich um eine Interpretation eines

Kopisten zu handeln. Ähnlich werden in der Oxforder Handschrift Arab. b10 [76] die Titel *al-kitāb al-Ḥāwī*, *al-Ḥāwī al-kabīr* und *al-kitāb al-Ǧāmiᶜ al-kabīr* synonym verwendet.

3. Stemma der wichtigsten Überlieferungsträger des *Ḥāwī*



B	Druck Brescia 1486
P	Par. Lat. 6912
S	Bibliothèque de la Sorbonne, 126 und 127, abgeschrieben im Jahr 1379 n. Chr.
Vat	Vat. Lat. 2398/2399
V	Druck von Scoto, Venedig 1529 n. Chr.
Th	Teheran, Millī Malik 4492, 1607 n. Chr., Bücher I–III und V–14,3, XIX, XXff Haid.
McG	Osler Medical Library, McGill 449, ca. 17. Jh. n. Chr., I–III und V–14,3
Y	Yale Cushing Ar.10; 1674 n. Chr., I–III und V–14,3
T	Saray Ahmed III 2125 (11 versch. Bände), 13. Jh. n. Chr., Bücher I–VIII, XIII–XXV
BC	unbekannter Privatbesitz, vormals Auktionen Bonham's-Christie's, 1496–97 n. Chr., u.a. Bücher I, II, X, XXIII,1 und XIII,2 Haid.
C	unbekannter Privatbesitz, vormals Auktion Christie's, 1227 n. Chr.

[76] Savage-Smith (2011) S. 168-169.

Ar	London British Library Arund. Or. 14, vormals British Museum 445, Bücher VII–X, 1313 n. Chr.
ش	Wohl Nationalmuseum Delhi, Bücher XI, XII
ع٢	Wohl Maulana-Azad-Bibliothek, muslimische Universität Aligarh, Bücher XI, XII

d. Übersichten

aa. Handschrifteninventar

Nachstehend soll ein alphabetisch nach Kontinenten und Ländern geordnetes Inventar aller arabischen *Ḥāwī*-Manuskripte gegeben werden, die dem Verfasser bislang bekannt geworden sind. Nukleus dieser Aufstellung sind Ullmanns und Sezgins skizzenhafte Handschriftenverzeichnisse zum *Ḥāwī*. Es wurden darüber hinaus alle derzeit verfügbaren Informationen über weitere erhaltene und verschollene *Ḥāwī*-Manuskripte zusammengetragen. Hinweise zu weiteren erhal–tenen *Ḥāwī*-Handschriften werden jederzeit dankbar entgegengenommen. Es wurde versucht anzugeben, welche Abschnitte des *Ḥāwī* die jeweiligen Manuskripte erhalten, nach Möglichkeit unter Angabe der Band-, Seiten- und Zahlenzählung der arabischen Haiderabader Ausgabe (Bandangaben in römischen Zahlen, z. B. Band VIII oder X,113,5 Haid.). Dagegen beziehen sich arabische Bandangaben (z. B. 15,3 lat.) auf die lateinische Version (*Liber Continens*), welche manche arabisch noch nicht edierte Kapitel und Passagen enthält und ab Band 6 leicht, ab Band 11 deutlich von der Bandzählung der arabischen Haiderabader Edition abweicht (cf. Witt [2021] für eine Konkordanz beider Versionen). Möglichst exakte Stellenangaben schienen insbesondere nötig, da sich die bisweilen in den Handschriften selbst enthaltenen Informationen zu Werkteilen („Teil 2" etc.) in der Regel nicht auf die Bucheinteilung des *Ḥāwī* beziehen, sondern eine Nummerierung innerhalb einer Serie (ehemals oder noch jetzt) zusammengehöriger Handschriften bezeichnet. Nach Möglichkeit wurde versucht, die Handschriften in Form von Digitalisaten zu sichten – zumindest die jeweils ersten und letzten Seiten – um bestimmen zu können, welcher Abschnitt des *Ḥāwī* jeweils überliefert ist. Derartig „autopsierte" Handschriften sind mit einem Asteriskus (*) gekennzeichnet. In allen anderen Fällen entstammen die Angaben zu den enthaltenen *Ḥāwī*-Büchern den Bibliothekskatalogen. Oft warten die Handschriften mit Überraschungen auf: bisweilen sind die Katalogangaben irrig; manchmal handelt es sich um Sammelhandschriften

mit verschiedenen Teilen des *Ḥāwī* oder gar verschiedenen medizinischen Traktaten unterschiedlicher Autoren. Textvertauschungen oder -auslassungen erschweren bisweilen die Identifikation.

aaa. Spuria

Manchmal werden medizinische Handschriften in den Bibliothekskatalogen fälschlich als Teile des *Ḥāwī* bezeichnet. Am häufigsten wird Rāzīs *Kitāb al-Ḥāwī* mit Quṭb ad-Dīn Maḥmūd b. Masᶜūd aš-Šīrāzīs *al-Ḥāwī aṣ-ṣaġīr* verwechselt (für eine Kurzcharakteristik dieser Schrift cf. Ullmann S. 178).[77] Die folgenden Handschriften konnten als der *Ḥāwī* aš-Šīrāzīs identifiziert werden:

- University of Birmingham, Cadbury Research Library, Collection: Mingana Islamic Arabic 930 (566), 243 fol., ca. 12. Jh. H. = 18. Jh. n. Chr., IV[78] (*)
- Baku, Azerbaidschan[79] (*)
- Istanbul Topkapi Sarayi, Bibliothek Ahmed III, 2125/(X) (cf. Dietrich S. 47)
- Vaziry-Bibliothek in Yazd (ehemals Meshed, med. 13) (*)

In der Ẓāhirīya-Bibliothek (Dār al-Kutub al-Ẓāhirīya, jetzt Maktabat al-Asad al-waṭanīya) befinden sich zwei weitere Handschriften, die als Rāzīs *Ḥāwī* katalogisiert sind, aber andere Traktate zu enthalten scheinen:

- Ẓāhirīya 1969, nach Bryson (S. 115, Anm. 2) „rather another shorter medical compendium"
- Ẓāhirīya ᶜāmm 8515 (komplett anderer Text, auch nicht der *Ḥāwī* aš-Šīrāzīs; freundl. Hinweis Fabian Käs).

Die Oxforder Handschrift Laud B. 92 (I 607) (aktuelle Signatur Laud. Or. 289), welche von Ullmann (S. 130) als *Ḥāwī*-Manuskript gelistet wird, beinhaltet in Wirklichkeit Rhazes' *Kitāb al- Fāḫir*.

[77] Bisweilen auch mit Naǧm ad-Dīn aš-Šīrāzīs *al-Ḥāwī fī ᶜilm at-tadāwī* verwechselt.

[78] Band IV des Bibliothekskatalogs.

[79] F. Alakbarli, *Medical Manuscripts of Azerbaijan*. Baku, HAF, 2006, § 4: "the funds and catalogs of the Institute have been examined by the author of the present work. It has been revealed that the Institute's collection includes 363 medieval manuscripts … on medicine and pharmacognosy … we should mark such fundamental works as: …"Kitab al-Hawi" by Abu Bakr ibn Zakariya ar-Razi (865-925 AD) …". In der Tat handelt es sich aber um aš-Šīrāzīs *al-Ḥāwī* (freundliche Mitteilung Farid Alakbarli).

bbb. Handschrifteninventar des Ḥāwī

Afrika

Ägypten

- Kairo, *Dār al-Kutub*
  - Ṭibb 1519 (II,2 – II,269 Haid. [komplett][80]) (*)
  - Ṭibb 1718, „Teil 2" (II,2 – II,269 Haid. [komplett])
    „Teil 3" (III,2 – III,74,10 Haid.)
    „Teil 4" (XI,280,10 Haid. über XII,70 Haid. [S. 80] bis III[sic],155 Haid. [im Kolophon als „2. Teil" bezeichnet)
    „Teil 5" (VI,117 Haid. [Z. 13 Ende] – VII,142,7 Haid.),
    „Teil 6" (VII,143,12 – VIII,101,7 Haid.)
    „Teil 7" (IX,189,6 – X,153,15 Haid.)
    „Teil 8" (X,153,16 – XI,280,8 Haid.)
    (cf. Ḫarbī Bd. 1, S. 126ff. [Faksimileseiten der Handschriften]) (*)

- Kairo, Universität (Zentralbibliothek), Handschriftenabteilung
  - 26 207 *Rāzī, al-Ḥāwī*, Photographie, [GSI 418], H 134.
  - 26 222 *Al-Rāzī, al-Ḥāwī al-kabīr*, 795 S., [GSI 418], H 61.[81]

  Hierbei handelt es sich um Handschriften aus dem Nachlass des deutsch-jüdischen Augenarztes und Medizinhistorikers Max Meyerhof in Kairo. Er berichtet (1935, S. 330), ein eigenes Exemplar des *Ḥāwī* (langes Fragment von Buch 7) besessen zu haben. Des Weiteren habe er Fragmente von fünf Manuskripten des *Ḥāwī* kaufen können (S. 325). Ob es sich bei der 795 Seiten umfassenden Handschrift 26 222 um einen Sammelband all dieser Handschriftenfragmente handelt oder eine Handschrift, die Meyerhof später erwerben konnte, ist unbekannt. Falls letzteres der Fall ist, könnten sich Meyerhofs *Ḥāwī*-Fragmente noch in anderen ägyptischen Bibliotheken befinden. Der ägyptische Staat hat, teils noch zu Meyerhofs Lebzeiten, teils

[80] Man glaubt auf dem sehr verschwommenen letzten Folium die letzte Zeile der letzten Seite von Bd. II Haid. zu erkennen . وكرمه بمنه ليه العون تعالى الله أسهل ..ذكر جميع و علاج معونة به لأن.

[81] Angaben nach P. B. Fenton, *Les manuscrits de Max Meyerhof, perdus et retrouvés*, in: Annales Islamologiques 34 (2000), 139–149 (S. 149).

unmittelbar nach seinem Tod, die wissenschaftliche Bibliothek, Handschriftensammlung und Aufzeichnungen von Meyerhof erworben und diesen Nachlass auf mehrere Bibliotheken aufgeteilt. Auf jeden Fall sind diese Manuskripte nicht mit denen im *Dār al-Kutub* identisch, welche sich bereits vor Meyerhofs Ankunft in Ägypten in den dortigen Bibliothekskatalogen verzeichnet finden (freundl. Auskunft Muhammed Sarh, Kairo). Bei Nr. 26 207, der „Photographie", könnte es sich um Handschiften-Photographien aus dem Abschnitt zu Augenkrankheiten (*Ḥāwī*, Buch 2) des Scorialensis 806 handeln die Meyerhof in einer Publikation aus dem Jahr 1932 erwähnt.[82]

Asien

Aserbaidschan

- Baku, siehe oben unter „Spuria"

Türkei

- Istanbul, Bibliothek von Ragib Paşa Nr. 1482, 52; medizinische Sammelhandschrift. „Teil aus dem *Ḥāwī* über die Krisen" فصل من الحاوي في البحران Buch 19(?)[83]
- Istanbul, Şehid Ali Paşa 2081/2,[84] 164 fol., *Ḥāwī*: 110b–163a (cf. Dietrich S. 49, [M]), 901 H. = 1496 n. Chr., I,3 – I,290,10 Haid. [Buch 1 komplett]
- Istanbul, Süleymaniye 850, 202 fol., (cf. Dietrich S. 48f., [L]), 7. Jh. H. = 13. Jh. n. Chr., I,3 – II,129,8 Haid.
  Anm.: 1. Teil des Exemplars Saray Ahmed III, A, B, C, D, das nur aus diesen fünf Teilen bestand (cf. Dietrich S. 48)
- Istanbul, Topkapi Sarayi, Bibliothek Ahmed III, Nr. 2125 (11 verschiedene Bände)
  - 2125/2A (/C2 Dietr.), 199 fol. (cf. Dietrich S. 46, 50

[82] M. Meyerhof, *L'opération de la cataracte du Chirurgien Antylle d'Alexandrie (II^ième siècle après J.-C.)*, in: J. Koumaris (Hrsg.), Livre d'or à l'occasion du jubilé de vingt-cinq ans d'activité chirurgicale du docteur Théodore L. Papayoannou ... Le Caire, le 8 mai 1932. Naumburg (Saale) 1932, 115–119 (S. 116): „J'ai eu la bonne fortune de me procurer une photographie de toute la section ophthalmologique du dit manuscrit [Scorialensis Nr. 806]".

[83] *Koskada kâin sadriesbak merhum Ragip Paşa Kütüphanesinde mevcut olan kütüb-i şerifinin defteridir.* Istanbul 1868, S. 78.

[84] Der erste Teil (fol. 1b–106a) enthält den *Kunnāš* des Rhases.

[A]), 7. Jh. H. = 13. Jh. n. Chr., „Teil 2", II,129,9 – III,281,5 Haid. (*)

- 2125/3A (/C3 Dietr.), 226 fol., (cf. Dietrich S. 46, 51 [B]), 7. Jh. H. = 13. Jh. n. Chr., „Teil 3", IV,1,3 – V,189,20 Haid. (*)
- 2125/4A (/C4 Dietrich), 236 fol., (cf. Dietrich S. 46f., [C]), Verkäufervermerk eines Zweitbesitzers aus dem Jahr 713 H. = 1313 n. Chr., „Teil 4", V,188,7/189,20[85] – VII,18,13 Haid. (*)
- 2125/5A (/C5 Dietrich), 234 fol., (cf. Dietrich S. 47 [D]), 707 H.[86] = 1308 n. Chr., „Teil 5", VII,19,1 – VIII,101 Haid. (*)
- 2125/11B (/(6) Dietrich), 695 fol., *Ḥāwī*: 1b–198b u. 395b–596b[87], (cf. Dietrich S. 47, 54 [E]), 893 H. = 1488 n. Chr., XX,1 – XXI/2,203 Haid. (fol. 190a)
- 2125/3B (/(7) Dietrich), 262 fol., (cf. Dietrich S. 47, 51ff. [F]), 624 H. = 1227 n. Chr., „Teil 3", IV,118,4 – VI,87,10 Haid.[88] (*)
- 2125/10 (Dietrich) (cf. Dietrich S. 47, 53f. [G]), 251 fol., 7. Jh. H. = 13. Jh. n. Chr., XVII,120 – XIX,448 [Ende] Haid. (*)
- 2125/11C (/11 Dietrich) (cf. Dietrich S. 47, 54 [H]), „Teil 11", 178 fol., XX,1 – XXI,1,150,9 Haid. (*)
- 2125/10D (/10(13) Dietrich) (cf. Dietrich S. 47, 53f. [I]), 182 fol., 609 H. = 1213 n. Chr., „Teil 18 u. 19", XVII,120 – XIX,448 Haid. (*)
- 2125/12D (/12 Dietrich) (cf. Dietrich S. 48 [K]), 179 fol., 610 H. = 1214 n. Chr., „Teil 12", XXI/1,260 – XXI/2,203 Haid. (fol. 88a), (*)
- 2125/(X), siehe oben unter „Spuria"
- Sarayi Ahmet III, 1949, 112 fol., Bd. 20, 6. Jh. H. = 12. Jh. n. Chr.

[85] Verkürzt aus beiden Stellen.

[86] Eine Datierung fehlt bei Dietrich und findet sich nur bei Sezgin.

[87] Die Handschrift enthält zwei andere Werke von Ibn Sīnā (Dietrich S. 47).

[88] Dietrich S. 53 schreibt fälschlicherweise „Die hier aufgeführten Rezepte müssten also den Schluss des *bāb fi l-mushila* bilden und unmittelbar vor Beginn des *bāb fī llatī tumsiku l-baṭn* stehen. Sie sind aber an der entsprechenden Stelle von Haid. (VI 161 und den vorhergehenden Seiten) nirgends zu finden, so dass sich der Schluss von F synoptisch nicht festlegen lässt."

- Hekimoğlu-Ali-Paşa-Bibliothek
  - 569, *Ḥāwī ṣaġīr* (?) [89]
  - 570 *Ḥāwī kābīr* (416 fol., Bücher 1, 2 und 8)

Iran

- Teheran, Millī Malik
  - 4492, 1016 H. = 1607 n. Chr., 1249 fol., I–III, V–14,3, XIX, XXff. Haid.[90] (*)
  - 4522, 1067 H. = 1657 n. Chr., 975 S., I (ab S. 132), II, VIII Ende (ab S. 250), 817 S., IX Haid. (ab S. 153) [91] (*)
  - 4785, 571 H. = 1175 n. Chr.; V,2,3–VII,265,18 Haid. (vorletzte Seite; letzte Seite bis VII,280,5 Haid.) (*)
- Teheran, private Bibliothek ᶜAlī Rīḍā Bahrāmī
- Meshed, med. 13 = Vaziry Library in Yazd, siehe oben unter „Spuria"
- Qom, Mar'ashi-Najafi-Bibliothek in Qom
  - 4282 (Bd. 11 des Bibliothekskatalogs)
  - 8143 (Bd. 21 des Bibliothekskatalogs)

Irak

- Mosul, al-Madrasa al-Aḥmadīya,[92] Nr. 135 (Ğalabī[93] S. 32), *al-*

[89] Cf. A. Fonahn, *Zur Quellenkunde der Persischen Medizin*, Leipzig 1910, S. 56, Nr. 92.

[90] Dieser Teil der Handschrift Millī Malik 4522 enthält die zweite *Maqāla* von ar-Rāzīs *al-Kunnāš al-fāḫir* (GAS III 286, Nr. 13). Im Vergleich zur Handschrift Istanbul, Şehit Ali Paşa 2081, fol. 1–207r (901 d. H.) des *Fāḫir* sind sowohl der Wortlaut der Stichproben als auch die Kapitelanordnung identisch. Der Anfang der Teheraner Handschrift entspricht Ms. Istanbul fol. 105v (Anfang Maq. II). Ms. Teheran bricht im Kapitel *dubailāt* schon auf fol. 129v (pag. 257) mit dem Wort *ṣifa* ab. Diese Stelle entspricht Ms. Istanbul fol. 163v,12. Man erkennt auch, dass ab fol. 130r (pag. 258) der Duktus und Schriftspiegel anders sind. Ms. Teheran überliefert also etwas mehr als die Hälfte der zweiten *Maqāla* des *Fāḫir*. In diesem Teil scheinen keine Störungen vorzuliegen (freundliche Mitteilung Fabian Käs).

[91] Der Anfang der Handschrift ist nicht identifizierbar – eventuell ein Teil aus aš-Šīrāzī?

[92] F. Sezgin, *Geschichte des arabischen Schrifttums*, Bd. I, S. 728 bemerkt zum Katalogs von Ğalabī, er wisse nichts über den Verbleib der Handschriften. Die Signaturen habe er von Brockelmann übernommen. Die Erwähnung der Handschrift Ğāmiᶜ al-Paša Nr. 143 bei Salem/Razzak suggeriert, dass sich dieses Manuskript noch 1988 vor Ort befand.

[93] Dā'ūd Ğalabī al-Mauṣilī (Hrsg.), *Kitāb Maḫṭūṭāt al-Mauṣil*, Mosul 1927.

Ḥāwī al-kabīr, ein Band, kopiert von Muḥammad Taqī ibn Rafīᶜ al-Dīn ibn ᶜAlī al-ᶜAfārī al-Qāšānī (1036 H. = 1626 n. Chr.)

- Mosul, al-Madrasa al-Aḥmadīya, Nr. 143 (Ǧalabī S. 33), *al-Ḥāwī al-kabīr*, incipit وما يتعلق به ,قال في الجماع „zweiter Band", alte Naschī
- Mosul, al-Madrasa al-ᵓAmīnīya der Ǧāmiᶜ al-Paša Nr. 143 (Ǧalabī S. 58) bzw. 19/2 (Salem/Razzak S. 157)[94], XVI,189 – XXIII Haid. (Beginn: XVI,189 ff. Haid. „6. Teil" Krankengeschichten, dann XXII,61 ff. Haid.: pharmazeutische Tabellen[95] [81 fol.], dann XXIII/1, 1 Haid. [49 fol.], nach Ǧalabī S. 58f.) – enthält u. a. Buch XVI Haid. (Iskandar S. 42), 796 AH = 1394 n. Chr., 17x35cm, 368 fol., 33 Zeilen pro Seite, Kopist Ṣadr al-dīn ibn Iskandar

Syrien

- Damaskus, Dār al-Kutub al-Ẓāhirīya, jetzt Maktabat al-Asad al-waṭanīya,
  - ᶜāmm 6771
  - 1969, siehe oben unter „Spuria"
  - ᶜāmm 8515, siehe oben unter „Spuria"

Europa

Deutschland

- Berlin, nr. 249 (= Qu. 688), arabisch in hebräischen Buchstaben, Fragment einer arabischen Bearbeitung des *Ḥāwī*, II,269ff. Haid.[96]

Frankreich

- Paris, Bibliothèque nationale

[94] A. Salem, A. Razzak (Hrsg.), *A descriptive catalogue of Manuscripts in the Awqaf Library at Mosul*, Volume 4, Al-Amenia School Collection Bagdad 1988, S. 157.

[95] Zu den pharmazeutischen Tabellen im *Ḥāwī* cf. O. Kahl, *The Pharmacological Tables of Rhazes, Journal*, in: Journal of Semitic Studies 56(2), 2011, 367-399.

[96] M. Steinschneider, *Die Handschriften-Verzeichnisse der Königlichen Bibliothek zu Berlin, zweiter Band, Verzeichnis der hebräischen Handschriften*, zweite Abteilung, Berlin 1897, S. 100.

- arabe 2918 (ancien fonds arabe 1056), fol. 56–95, Fragment des *Ḥāwī*, Abschnitt über Fieber: XVI,54,14 – 165,1 Haid. (*)
- arabe 2947, 135 fol. 49v: sehr kurzer Auszug (15 Z.) aus dem *Ḥāwī* (*)[97]
- hébr. 1212, R. Juda b. Abraham aus Toledo, *K. Tanẓīm al-Ḥāwī*

Großbritannien und Irland

- London British Library, vormals British Museum
  - 9790, 18. Jh. n. Chr., Buch II und VIII
  - 9799, 18. Jh. n. Chr., gleicher Schreiber wie 9790, Buch I
  - Arund. Or. 14, Buch VII–X [lt. Katalog VIII–X], 415ff., 713 H. = 1313 n. Chr.[98]
- London, Wellcome
  - Or. 123, 669 H. = 1270 n. Chr., *Kitāb al-Ḥāwī* (Buch I–IV)
  - Or. 159, 7. Jh. H. = 14. Jh. n. Chr., 225 fol., Buch IV–V Haid.
  - Or. 160, 8. Jh. H. = 15. Jh. n. Chr, 202 fol., Buch XVIII–XX Haid.
- London, Auktionshäuser
  - Christie's London 01.05.2001, Live Auction 6428 Islamic Art and Manuscripts, Los 66: "ABU BAKR IBN ZAKARIA AL-RAZI (D. AH 311/923 AD): AL-HAWI FI SANA'AT AL-TIBB (Part v) Copied by Ibn Abi Usaybi'a, Damascus, AH beginning of Dhu-l-Qa'da 624 AH/end October 1227 AD On medicine, Arabic manuscript on cream paper, 86ff. with 21ll. of sepia naskh, titles in red, final folio with colophon signed Ahmad ibn al-Qasim ibn Khalifa al-Kharazi known as Ibn 'Abi Usaibi'a at the Nuri hospital in Damascus and dated beginning of Dhu-l-Qa'da 624, first half of manuscript with water staining, otherwise very good condition, in brown morocco Mamluk-style binding composed of parts of old binding, Folio 9¼ x 6 1/8in. (23.3 x 16cm.)" (Katalogtext), Schätzpreis

[97] Im Drucktext der Haiderabader Ausgabe des *Ḥāwī* nicht auffindbar.
[98] = British Museum 445.

GBP 6,000 – GBP 8,000, Zuschlag: GBP 7,638, bei Christie's abgebildete Seite: X,91,3–17 Haid.

- Manuskript Bonham's–Christie's: jetzt unbekannte Privatsammlung, zuvor: Christie's, London, Live Auction 17178 Art of the Islamic and Indian Worlds Including Oriental Rugs and Carpets, Closed: 24 Oct 2019, Los 34, Zuschlagpreis GBP 21,250 (Schätzpreis: 10,000–15,000 GBP), zuvor: Auktionshaus Bonham's, London, Islamic and Indian Art including Modern and Contemporary South Asian Art, 23.10.2017, Los 9 (Schätzpreis £ 20,000 - 30,000, unverkauft), „copied by Muhammad Ja'far bin Amir Abu'l-Qasim al-Razavi, Timurid Persia, dated AH 902/AD 1496-97. Arabic manuscript on paper, 465 leaves, 25 lines to the page [Katalog Christie's: „430ff. and three flyleaves, each folio with 25-27ll."] written in elegant nasta'liq script in black ink, titles and names picked out in red throughout, inner margins ruled in blue and gold, catchwords in wide margins, first folio containing an illuminated title-page a later replacement, otherwise in good condition, later Safavid or Indian 17th Century brown morocco covers with stamped central medallions decorated with floral sprays in red on a gold ground, rebacked and repaired, 265 x 177 mm" (Katalogtext Bonham's), enthält u.a. die Bücher I, II, X, XXIII,1 und XIII,2 Haid. (bis Ende)
- Sotheby's London, Arts of the Islamic World & India including Fine Rugs and Carpets (26 October 2022), Los 14: "Abu al-Fadl Dawud ibn Abi al-Bayan al-Isra'ili (d. circa 1240), Mukhtarat min kitab al-hawi (extracts from the medical encyclopedia of al-Razi), Near East, dated [Jumada I] 600 AH/[January-February] 1204 AD. Arabic manuscript on paper, 123 leaves, plus 3 fly-leaves, 19 lines to the page written in loose naskh script in black ink, headings and keywords in red, f.1a with colophon of another text signed and dated, f.123b with dated colophon, f.1b a later replacement, in Mamluk brown leather binding, brown leather doublures 24.6 by 16.2cm." (Katalogtext). Schätzpreis: 40,000–60,000 GBP (unverkauft) (Kurzfassung des *Ḥāwī*)

- Oxford[99]
  - Marsh 156 (= I,565), 845 H. = 1441 n. Chr., 513 fol., Buch XIV–XIX,448,8 Haid. (incl. dem fehlenden Anfangsabschnitt von Buch 16 auf fol. 1–66v;[100] fol. 239b-245b: Krankengeschichten (s. unten). Beginn Buch XIV: fol. 66a,24, B. XV: 142a,4, B. XVI: 186b,6, B. XVII: 282a,22, B. XVIII: 353a, B. XIX: 416b,6. „6. und 7. Teil" (6. Teil bis fol. 238b,11-14 = XVI,189,3 Haid.), Besitzervermeke: Akhī Zādah, Kollationsvermerk Christian Raue aus Berlin († 1677) Konstantinopel 1640, Sammlg. Jacob Golius († 1667), 1696 Narcissus Marsh († 1713), dann an Bodleian Library.
  - Or. 561, 7. Jh. H. = 13. Jh. n. Chr, 272 fol., XXII,1 (–404) – XXIII/2,234,1 Haid., arab. Besitzervermerk 1077 H. (1666/67), zwischen 1695 und 1822 von der Bodleian Library erworben.
  - Arab. b. 10, wohl Indien 17. Jh. n. Chr., 539 fol. (2 Bde.), (Fragmente *Ḥāwī* mit Fragmenten des *Kitāb al-Fāḫir*), II,60,11–269,9 Haid., III,2–155,8 Haid., V,68–, Bücher VI-XII und XIV,1,1–132 Stiftungsvermerk 1069 H. = 1658/95 n. Chr., im Juli 1948 von T. Bahrami erworben,
  - Laud B. 92 = I 607, aktuell: Laud Or. 289 siehe oben unter „Spuria".
- University of Birmingham, Cadbury Research Library, Sammlung Mingana, Islamic Arabic 930: siehe oben unter „Spuria".
- Dublin: Chester Beatty Library
  - 3987, 6. Jh. H. (13. Jh. n. Chr.), X,290,9 – XII,199,10 Haid.
  - 3029 Dāwūd b. a. l'Bayān al-Yahūdī, *Muḫtārāt min Kitāb al-Ḥāwī* (Kurzfassung des *Ḥāwī*)
  - 3988, a l-Ḥasan ʿAlī b. Muḥ. Al-Quraší, *Muntaḫab al-Ḥāwī* (Kurzfassung des *Ḥāwī*)
  - 3989, Anon., *Muḫtaṣar al-Ḥāwī* (Kurzfassung des *Ḥāwī*)

[99] Die Angaben zu den drei Oxforder Handschriften nach Savage-Smith (2011), S. 163–165, 165–167 und 168–169.

[100] Savage-Smith (2011) S. 163: „The first 65 folios (concerned to a large extent with prognosis) have not been alligned with a known copy of the *Ḥāwī* ..."

Spanien

- Escorial (*Scorialenses* = *Scor.*; cf. Casiri, Derenbourg[101])
  - 806, 182 fol., 610 H. = Toledo 1213 n. Chr., erster Band eines Exemplars in 8 Bd., 13. Jh.: Bücher 1 und 2 der lateinischen Übersetzung (*Liber Continens*)
  - 807, 208 fol., 623 H. = Toledo 1226 n. Chr., „zweiter Teil des *Ḥāwī*", Ende Buch 3 bis Anfang Buch 6
  - 808, 167 fol., „vierter Teil des *Ḥāwī*", Ende Buch 4 bis Anfang Buch 5
  - 809, 103 fol., „fünfter Teil des *Ḥāwī*", Buch 5,2–6,1 und weiter
  - 810, 222 fol., 623 H. = Toledo 1226 n. Chr., „dritter Teil des *Ḥāwī*", Buch 6–9,5
  - 811, 156 fol., größter Teil von Buch 8
  - 812 280 fol., Buch 9,6, Buch 18, Buch 21 (Anfang fehlt)
  - 813, 198 fol., Anf. 7. Jh. H. = 13. Jh. n. Chr., „vierter Teil des *Ḥāwī*", Buch 9,6–13
  - 814, 224 fol., 824 H. = 1421, „siebenter Teil des *Ḥāwī*", Buch 20–23
  - 815, 270 fol., „20. Buch des *Ḥāwī*", Buch 14
  - 816, 194 fol., Toledo 1229 n. Chr., Teile von Buch 11 und 12
  - 817, 235 fol., 1227 n. Chr., „sechster Teil des *Ḥāwī*", Buch 17,4–20,1
  - 818, 196 fol., 1345 n. Chr., Bücher 5, 2 und 16,1–2 (unediert!)
  - 854, 186 fol., „18. Buch des *Ḥāwī*", Bücher 21, 4, 5 und 20
  - 855, 241 fol., 523 H. = 1129 n. Chr., „sechster Band", Buch 17
  - 856, 102 fol., Ende Buch 13, 14, Anfang Buch 15
- Madrid, Biblioteca Nacional, 555, Fragmente Buch 12, Buch 13[102]

USA

- Princeton, University Library Garrett deposit 2160/1, Sammelhandschrift 17. Jh. n. Chr., unvollständige Kopie Buch 2

[101] M. Casiri, *Bibliotheca Arabico-Hispana Escurialensis*, 2 Bde., Madrid 1760; H. Derenbourg, *Les manuscrits arabes de l'Escurial*, Escorial 1884, Bd. 2,2.

[102] *Catálogo de los manuscritos árabes existentes en la Biblioteca Nacional de Madrid*, Madrid 1889, S. 226f.

- Yale Cushing Arabic Ms. 10; 1085 H. = 1674, kopiert im Iran, Bücher I–III, V–14,3 (Ende unvollständig)[103]
- Cleveland, Army Med. Libr. A 17, 489 H. = 1096 n. Chr., Buch V,1–VI,160,-2 Haid., Textausfall letzte 7 Zeilen bis Kapitelende; Buch 5–6 lat., „3. Teil"[104]
- University of California, Auswahl, Iskandar (1959) S. 61f., (Kurzfassung des *Ḥāwī*)

Kanada

- Osler Medical Library, McGill 449, 16. Jh. n. Chr., Buch I–III, V–14,3 (289rI Ven.), Ende fehlt; endet fast an gleicher Stelle wie Ms. Yale)!!, über gleichen Arzt beschafft, gleiche Provenienz, Teheran[105]

Indien

- Aligarh, Indien, Lytton (jetzt Maulana Azad) Library (Bd. X–XI Haid.)[106]
- New Delhi National Museum (Bd. X–XI Haid.)[107]
- Arzt (Hakeem) Ashufta, jetzt Haiderabad (Bd. XIV–XIX und XXIII/1–2 Haid.)
- Phulwari Sharif, ehemals Patna, dann Haiderabad (Bd. XVIII–XIX und XXIII/1–2 Haid.)
- Rampur, Raza Library[108]

[103] http://findit.library.yale.edu/catalog/digcoll:1084329

[104] A Shelflist of Islamic Medical Manuscripts at the National Library of Medicine: „463 p., bound, (18-20 lines) 30 cm, purchased in 1941 by the Army Medical Library from A. S. Yahuda, who acquired it in An Najaf in Iraq, where it was said to have been in the possession of the same family for six centuries (ELS No. 1621). Described in: Schullian & Sommer. Cat. of Incun. & MSS., 1950, A17".

[105] https://archive.org/details/McGillLibrary-108941-466

[106] http://www.amu.ac.in/malibrary/index.jsp?lid=Manuscripts

[107] http://www.nationalmuseumindia.gov.in/departments-manuscripts.asp?lk=dp10

[108] Angaben zu den Handschriften folgen Imtiyāz ᶜAlī Arshī (Hrsg.), *Catalogue of the Arabic Manuscripts in Raza Library, Rampur, Vol. 5, Mathematics, Medicine, Natural Science, Agriculture, Occult Sciences, Ethics & Politics, Education & Military Science*, Raza Library Publication Series 17, 1975, S. 174f.. Bei Sezgin (S. 280) sind dagegen mit der Katalogangabe „I, 474" als *Ḥāwī*-Handschriften dieser Bibliothek „ṭibb 66, 1 Bd., 468 ff., 1271 H." und „[ṭibb] 67 (1 Bd., 308ff.)" verzeichnet. Diese Siglen sind dem Bibliothekspersonal in Rampur nicht bekannt. Bei ṭibb 66 könnte es sich (wegen des gleichen Kopierdatums) um die Handschrift ṭibb 3846 handeln – doch weichen die Folioangaben bei Sezgin von der des Bibliothekskatalogs ab.

- Ṭibb 3846, 617 fol., 1271 H. = 1855 n. Chr., I,4,3–X,303,13 Haid., abgeschrieben von einem gewissen Mīr Muḥammad und anderen, 1870 von Shiwrāj Singh der Bibliothek übereignet
- Ṭibb 3847, 291 fol., 13. Jh H. = 19. Jh. n. Chr., ab XVI,89,3 Haid.
- Ṭibb 3848, 145 fol., 12. Jh H. = 18. Jh. n. Chr., IV,280,10–(VIII)–XII,5,5 Haid.

- Nizamiah Medical College Library, Haiderabad, Telangana, India
- Bankipur Library, Patna, zwei Handschriften
  - Buch XVII Haid.
  - XXIII,1–2 Haid., in der Haiderabader Ausgabe als Handschrift ف

bb. Handschriften nach Büchern des Continens *angeordnet*

In den drei hier eingefügten Faltblättern ist eine Übersicht der Handschriften gegliedert nach Büchern des *Ḥāwī* gegeben. Dass eine Handschrift ein Buch enthält, heißt nicht, dass es dort vollständig enthalten ist. Mit inneren Lücken, verfrühtem Buch- oder Kapitelabbruch ist stets zu rechnen.

e. Krankengeschichten

Ein Wort sei noch zu den Krankengeschichten (Buch 18,4 des *Continens*) verloren, die so gar nicht zum sonstigen Konzept des *Ḥāwī* zu passen scheinen. Es handelt sich hierbei nicht um Exzerpte oder Lesefrüchte, sondern um eine Sammlung klinischer Kasuistiken aus Rhases' eigener Erfahrung, verfasst nach dem Vorbild der hippokratischen Epidemien.[109] Auf diesen Abschnitt des *Ḥāwī* hatte zuerst Edward Granville Browne in seiner „Arabian Medicine"[110] (S. 24) hingewiesen und dabei die erste der Fallgeschichten musterweise übersetzt. Der gesamte Abschnitt wurde zuerst von Meyerhof (1935)

[109] Cf. M. Meyerhof, *Thirty-Three Clinical Observations by Rhazes (ca. 900 A.D.)*, in: Isis 23 (1935), S. 321-356 (zzgl. 41 S. arab. Text), S. 332 und Ullmann S. 131.

[110] E. G. Browne, *Arabian Medicine, Being the Fitzpatrick Lectures delivered at the College of physicians in November 1919 and November 1920*, Cambridge 1921, (S. 48-53 zum *Ḥāwī*; hier zahlreichende unzutreffende und überholte Angaben zu diesem Werk).

aus der Oxforder Handschrift Bodleian Library, Marsh 156 arabisch ediert,[111] wobei er von einer Interpolation der Kasuistiken in den Handschriften des *Ḥāwī* ausging: „As I have had no opportunity of examining the complete Oxford volume of the *Ḥāwī*, I have not been able to form an idea of where the following cases have been interpolated by the editors of the deceased master's main work. This is of minor importance as they seem to have been independent of the other parts of the book ..." (Meyerhof S. 331). Meyerhof bezeichnet diesen Abschnitt als einen „hitherto unknown text" (S. 330) und bemerkt (ebd.), dass Paul Kraus aus Paris diesen Abschnitt in seinem Auftrag „in einer der lateinischen Druckausgaben" (welche, wird nicht mitgeteilt) gesucht habe und nicht habe finden können.[112] Temkin (1942)[113] hat dann in der Druckausgabe Venedig 1509 (der „falschen", gänzlich umsortierten von Suriano!!) den Text als „Libellus eiusdem [Rasis] de mirabilibus" finden können, dem *Continens* vorangestellt, nach einer kurzen deontologischen Schrift von Rhases am Anfang der Ausgabe. Temkin zitiert die eben angeführte Bemerkung von Meyerhof, dass Kraus den Text in einer lateinischen Druckausgabe nicht finden konnte, und folgert: „This seems to prove that the little collection was not included in all [sic!!] the Latin editions of the Continens" (S. 104, Anm. 9). Temkin meint somit, eine bislang unbekannte lateinische Übertragung der von Browne „entdeckten" Kasuistiken gefunden zu haben, von unbekanntem Übersetzer,[114] und ediert sie daher nach der Ausgabe Venedig 1509: „the fact remains that for at least 412 years prior to Browne's book, a translation of these clinical observations was accessible to western scholars, though apparently its existence was hardly noticed ... This, together with the fact that it is not included in all [sic!!] the Latin editions of the Continens, induced me to republish the Latin text." (S. 104). Temkin ist sich unschlüssig, ob die Kasuistiken ursprünglich zum *Continens* gehörten.[115]

Bryson (S. 101, Anm. 14) gibt an, den Text als „appendix" der Ausgabe Venedig 1509 (wieder die „falsche" Ausgabe von Suriano!!) gefunden zu haben, offenbar aber nicht in den anderen von ihr beige-

[111] Cf. Meyerhof (wie Anm. 109).

[112] Cf. Meyerhof (wie zuvor), S. 330: „They are missing from the Latin translation as I am informed by Dr. Paul Kraus (of Paris), to whom I am indebted for the search he made for me in one of the editions of the *Continens*."

[113] O. Temkin, *A Medieval Translation of Rhazes' Clinical Observations*, in: Bulletin of the History of Medicine, 12,1 (Juni 1942), 102-117.

[114] Cf. Temkin (wie zuvor), S. 104: „I do not know when or by whom the Latin translation of these case-histories was made".

[115] Cf. Temkin (wie zuvor), S. 104: „the question whether the clinical observations originally were incorporated in the *Continens* is still unsolved".

zogenen Ausgaben Brescia 1486 und Venedig 1506 (cf. dies. S. 100); sie verweist in diesem Zusammenhang auf Ullmann, demzufolge 34 Kasuistiken in der Haiderabader Ausgabe (XVI,189,2–208,8) enthalten seien.[116]

Der Umgang der Forschung mit den Kasuistiken zeigt exemplarisch, welche Irrtümer entstehen können, wenn die falsche *Continens*-Ausgabe (Venedig 1509, Suriano) benutzt wird und wenn Informationen anderer Forscher ungeprüft übernommen werden! In den traditionell angeordneten *Continens*-Ausgaben ist dieser Abschnitt mit Krankheitsgeschichten nämlich als Kapitel 18,4 ganz regulärer Bestandteil des Werks, kommt somit auch in der Haiderabader Edition an der entsprechenden Stelle (XVI,189,2–208,8) vor! Natürlich im traditionell sortierten lateinischen *Continens* nicht mit dem Titel „libellus … de mirabilibus, que ei acciderunt in medicina", sondern ohne „libellus". Dies ist offenkundig eine Hinzufügung von Suriano, der das Kapitel gleichsam als „Einzeltraktat" aus dem *Continens* separiert hat. In Anbetracht der sonstigen Überlieferungssituation (überall regulärer Werkbestandteil als Kapitel 18,4) kann jedoch sicher davon ausgegangen werden, dass Faragut auch hier der Übersetzer ist und dass es sich um keine Interpolation handelt. In den dem Verfasser bekannt gewordenen Handschriften fehlen auch nirgends die Kasuistiken an der genannten Stelle.

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[116] Cf. Bryson S. 101, Anm. 14: „… at least in the 1509 edition, this treatise is included as an appendix to the text. Also, according the [sic] Manfred Ullmann, in volume 16 (pp. 189.4–208.8) of the Arabic Hyderabad edition (which I have been unable to consult in either Arabic or Latin), there are 34 cases of clinical observation. Ullmann *Die Medizin im Islam*, … p. 131." Ullmann selbst (S. 131, Anm. 1) zitiert in diesem Zusammenhang noch einen dem Verfasser nicht zugänglichen Aufsatz von Iskandar.

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Abstract

In the paper, the Arabic and Latin tradition of Rāzī's *Kitāb al-Ḥāwī* (*Liber Continens*) is analysed and discussed. An inventory of manuscripts is provided, along with a basic stemma of the manuscript tradition. It is indicated, wherever possible, which manuscript contains what books of the *Ḥāwī*. Thus the lacunae of the Haiderabad print edition, which is incomplete, can be partly filled. The provenance of a particular group of manuscripts from Teheran is explored in detail.

Buch I	Buch II	Buch III	Buch IV	Buch V	Buch VI	Buch VII	Buch VIII
McGill 449 (McG)	McGill 449	McGill 449 (bis III,92)		McGill 449 (ab V,240)	McGill 449	McGill 449	McGill 449
Yale Or. 10 (Y)	Yale Or. 10	Yale Or. 10 (bis III,92)		Yale Or. 10 (ab V,240)	Yale Or. 10	Yale Or. 10	Yale Or. 10
Bonham's/ Christie's (B/C)	Bonham's/ Christie's	Bonham's/ Christie's (?)		Bonham's/ Christie's (?)	Bonham's/ Christie's (?)	Bonham's/ Christie's (?)	Bonham's/ Christie's (?)
Millī Malik 4492 (Th)	Millī Malik 4492	Millī Malik 4492 (bis III,92)			Millī Malik 4492	Millī Malik 4492	Millī Malik 4492
Millī Malik 4522	Millī Malik 4522			Millī Malik 4785	Millī Malik 4785	Millī Malik 4785	Millī Malik 4522
Rampur 3846	Rampur 3846	Rampur 3846	Rampur 3846	Rampur 3846	Rampur 3846	Rampur 3846	Rampur 3846
			Rampur 3848 (Frg.)				Rampur 3848 (Frg.)
	Kairo 1718	Kairo 1718 (III,2–III, 74,10; nach Interpol. bis III,155)			Kairo 1718 (ab VI,117)	Kairo 1718 (bis VII,143,12)	Kairo 1718 (bis VIII, 101,7)
Şehid Ali Paşa 2081/2	Kairo 1519					Kairo, Ms. Meyerhof	
Süleymaniye 850	Süleymaniye 850 (bis II,129,8)						
Hekimoğlu 570	Hekimoğlu 570						Hekimoğlu 570
	Topkapi 2125/2A (ab II,129,9)	Topkapi 2125/2A (bis III,281, 5)	Topkapi 2125/3A (ab IV,1,3)	Topkapi 2125/3A (bis V,189, 20)			
			Topkapi 2125/3B (ab IV,118, 4)	Topkapi 2125/3B	Topkapi 2125/3B (VI,87,10)	Topkapi 2125/4A (bis VII,18,13)	
				Topkapi 2125/4A (ab V,188,7)	Topkapi 2125/4A		
Scor. 806	Scor. 806	Scor. 807 (Ende B. 3)	Scor. 807	Scor. 807	Scor. 807 (Anfang B. 6)	Topkapi 2125/5A (ab VII,19,1)	Topkapi 2125/5A (bis VIII, 101)
			Scor. 808 (Ende B. 4)	Scor. 808 (Anfang B. 5)			
				Scor. 809 (ab B. 5,2)	Scor. 809 (Anfang B. 6)		
	Scor. 818			Scor. 818	Scor. 810	Scor. 810	Scor. 810
			Scor. 854	Scor. 854			Scor. 811
Wellcome Or. 123	Wellcome Or. 123	Wellcome Or. 123	Wellcome Or. 123				British Library 9790
British Library Or. 9799	British Library Or. 9790		Wellcome Or. 159	Wellcome Or. 159			
	Oxf. Arab. b. 10	Oxf. Arab. b. 10		Oxf. Arab. b. 10	Oxf. Arab. b. 10	Oxf. Arab. b. 10	Oxf. Arab. b. 10
	Berlin 249 (Bearb.)					Arund. Or. 14	Arund. Or. 14
	Princeton, 2160/1			Cleveland A17	Cleveland A17 (bis VI, 160,-2)		

Buch IX	Buch X	Buch XI	Buch XII	Buch XIII	Buch XIV	Buch XV	Buch XVI
McGill 449	McGill 449	McGill 449	McGill 449 (bis 14,3 [Lat.])				
Yale Or. 10	Yale Or. 10	Yale Or. 10	Yale Or. 10 (bis XIV,3 [Lat.])				
Bonham's/ Christie's (?)	Bonham's/ Christie's	Bonham's/ Christie's (?)	Bonham's/ Christie's (?)				
Millī Malik 4492	Millī Malik 4492	Millī Malik 4492	Millī Malik 4492 (bis 14,3 [Lat.])				Paris ar. 2918 (XVI,54,14 –165,1)
Millī Malik 4522							
Rampur 3846	Rampur 3846		Rampur 3848 (Frg.)				Rampur 3847 (ab XVI,89,3)
Kairo 1718 (ab IX,189, 6)	Kairo 1718	Kairo 1718 (bis XI, 280,8)	Kairo 1718 (bis XII,70)				Patna I
Scor. 810 (bis B. 9,5)							
Scor. 812 (B. 9,6)				Scor. 815			
Scor. 813 (B. 9,6)	Scor. 813	Scor. 813	Scor. 813	Scor. 818 (B. 16,1–2)	Scor. 817 (ab B. 15,4)	Scor. 817	Scor. 817
	Scor. 816	Scor. 816		Scor. 856	Scor. 855	Scor. 855	
		Madrid 555 (Frg.)	Madrid 555 (Frg.)		Oxf. Marsh 156	Oxf. Marsh 156	Oxf. Marsh 156
Oxf. Arab. b. 10	Oxf. Arab. b. 10	Oxf. Arab. b. 10	Oxf. Arab. b. 10		Oxf. Arab. b. 10		
Arund. Or. 14	Arund. Or. 14				Hakeem Ashufta	Hakeem Ashufta	Hakeem Ashufta
	Christie's (bis X,91,17)						
	Chester Beatty 3987 (ab X,290,9)	Chester Beatty 3987	Chester Beatty 3987 (bis XII,199,10)				
	Aligarh	Aligarh					
	New Delhi	New Delhi					

Buch XVII	Buch XVIII	Buch XIX	Buch XX	Buch XXI	Buch XXII	Buch XXIII
			Bonham's/ Christie's (?)	Bonham's/ Christie's (?)	Bonham's/ Christie's (?)	Bonham's/ Christie's
		Millī Malik 4492	Millī Malik 4492	Millī Malik 4492	Millī Malik 4492	Millī Malik 4492
Topkapi 2125/10 (ab XVII,120)	Topkapi 2125/10	Topkapi 2125/10				
Topkapi 2125/10D (ab XVII,120)	Topkapi 2125/10D	Topkapi 2125/10D	Topkapi 2125/11B	Topkapi 2125/11B (bis XXI/2, 203)		
			Topkapi 2125/11C	Topkapi 2125/11C (bis XXI/1, 150,9)		
		Istanbul, Ragib 1482?	Saray Ahmet III, 1949	Topkapi 2125/12D (XXI/1,260–XXI/2,203)		
	Scor. 812			Scor. 812		
		Scor. 814	Scor. 814	Scor. 814		
Scor. 817	Scor. 817 (bis B. 20,1)	Scor. 854	Scor. 854			
	Wellcome 160	Wellcome 160	Wellcome 160			Bodl. Or. 561 (bis XXIII/2, 234,1)
Oxf. Marsh 156	Oxf. Marsh 156	Oxf. Marsh 156			Bodl. Or. 561	
Mosul, Paša 143 (ab XVII,189)	Mosul, Paša 143	Mosul, Paša 143	Mosul, Paša 143	Mosul, Paša 143	Mosul, Paša 143	Mosul, Paša 143
Hakeem Ashufta	Hakeem Ashufta	Hakeem Ashufta				Hakeem Ashufta
	Phulwari Sharif (Haiderabad)	Phulwari Sharif (Haiderabad)				Phulwari Sharif (Haiderabad)
						Patna II

ʿABD AL-WADŪD IBN ʿABD AL-MALIK'S *RISĀLA FĪ DHAMM AL-TAKASSUB BI-ṢINĀʿAT AL-ṬIBB*

OLIVER KAHL*

The Arabic text edited and translated here for the first time bears the title *Risāla fī Dhamm al-takassub bi-ṣināʿat al-ṭibb*[1] "Epistle on the Blameworthiness of Making a Living from the Craft of Medicine". It was written by an otherwise largely elusive physician called ʿAbd al-Wadūd ibn ʿAbd al-Malik who, as will be seen, must have lived around the year 493/1100,[2] most probably in Iraq. Whilst an edition of the Arabic original has never been established before, certain aspects of ʿAbd al-Wadūd's *Risāla* were described very briefly, and rather eclectically, by two previous researchers, who embedded their respective observations into a broader topical frame and hence omitted many of the salient features of the text[3] — in the present article, we will try to remedy this state of affairs by providing not only an Arabic edition but also a complete English translation of ʿAbd al-Wadūd's small, difficult work. The *Risāla* is, no doubt, a highly interesting text: it allocates a fair amount of space to the deplorable relations between physicians and their reluctance to share responsibilities, risks and rewards; it teems with examples of incompetence, false treatment, ignorance of the most basic Hippocratic or Galenic tenets, and obliviousness to the high ethical demands of the medical profession; it touches upon the hierarchical world of court physicians, misconceptions and prejudices of ordinary people, obstinacy and arrogance of patients, and the dubious role of go-betweens or 'mediators'; it deals with the intellectual challenges mounted by philosophically trained foes of medicine; and it invites neat comparisons to the crafts of leather workers and instrument makers. Yet whilst its author clearly aspires to scholastic sophistication, to the

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[1] The system of transliteration used in this article is that of the *Encyclopaedia of Islam*[3], see https://brill.com/fileasset/downloads_products/27684_EI3-Instructions-for-Authors.pdf, p. 8.

[2] Dates separated by a slash refer to the Islamic and Christian calendars respectively.

[3] See F. Rosenthal, "The Defense of Medicine in the Medieval Muslim World", in: *Bulletin of the History of Medicine* 43 (1969), esp. pp. 520, 522 f. and 526 f.; then H.H. Biesterfeldt, "Some Opinions on the Physician's Remuneration in Medieval Islam", in: *Bulletin of the History of Medicine* 58 (1984), esp. pp. 17 f. and 22.

hoary traditions of classical Arabic prose and to the learned evocation of famous Greek predecessors, his literary style is uneven, at times awkward, and strangely oscillates between the sublime and the vulgar. Certain deficiencies of the text may well be due to ignorance or negligence on the part of the copyist of the manuscript, but the overall impression of a stylistically mediocre and conceptually somewhat idiosyncratic piece of writing remains.

ᶜAbd al-Wadūd's *Risāla* is attested by a single Arabic textual witness, which in turn forms part of a larger collective manuscript (*majmūᶜa*) preserved in Istanbul as *Hekimoğlu Ali Paşa* 691. In this collection, the *Risāla* is found on folios 128b–133b;[4] unfortunately, the text is not entirely complete — there is at least one folio missing between 128b and 129a, and possibly another between 131b and 132a.[5] The first (western) scholar to draw attention to ᶜAbd al-Wadūd's *Risāla*, albeit only in passing, was Franz Rosenthal, who mentioned it in the preface to his edition and translation of Isḥāq ibn Ḥunayn's (d. 298/910) *Taʾrīkh al-aṭibbāʾ* or "History of Physicians", published in 1954.[6]

Almost nothing can be said with certainty about ᶜAbd al-Wadūd ibn ᶜAbd al-Malik 'the physician' (*al-ṭabīb*), as he is referred to in the title of the present *Risāla*. Rosenthal already pointed out that he might be identical with a physician from Valencia called ᶜAbd al-Wadūd al-

[4] A copy of this section was kindly provided to me, back in 1995, by Prof. Fuat Sezgin (d. 2018), the erstwhile director of the *Institut für Geschichte der Arabisch-Islamischen Wissenschaften*, Frankfurt am Main.

[5] Cf. notes 30 and 81 below.

[6] See F. Rosenthal, "Isḥâq b. Ḥunayn's *Taʾrîḫ al-aṭibbâʾ*", in: *Oriens* 7 (1954), p. 58 (after him M. Ullmann, *Die Medizin im Islam*, Leiden–Köln [E.J. Brill] 1970, p. 225). In his article, Rosenthal also briefly summarizes the items of this collective manuscript as follows: [1] Ibn al-Qifṭī's *Taʾrīkh al-ḥukamāʾ* (fols 1a–109a); [2] a fragment from the second part of Ibn al-Nadīm's *al-Fihrist*, dealing with the Muᶜtazila (fols 109b–110a); [3] Ibn Riḍwān's *Maqāla fī Sharaf al-ṭibb* (fols 111b–120b); [4] Ibn Riḍwān's *Maqāla fī l-Taṭarruq bi-l-ṭibb ilā l-saᶜāda* (fols 121b–124b); [5] Isḥāq ibn Ḥunayn's *Taʾrikh al-aṭibbāʾ* (fols 125a–126b); [6] ᶜAbd al-Wadūd's present *Risāla*; and [7] a short discourse titled *Faṣl fī l-Usṭuqussāt* (fol. 134a). Rosenthal moreover provides the name of the copyist (a certain physician [*mutaṭabbib*] called Sulaymān ibn al-Asᶜad) as well as the date of copying (20 Dhū l-Ḥijja 811 / 14 [not: 6] May 1409), cf. for all this information ibid. pp. 57 f. ᶜAbd al-Wadūd's *Risāla*, together with the bulk of the manuscript, is written in small, coarse, unvocalized, inconsistently dotted *Naskh* (for a specimen see p. 198 below) — in this connection, it may be worth noting Rosenthal's overall judgement: "The manuscript, thus, contains some interesting works. Its outward appearance, however, is no match for its contents. The writing is ugly. And there are other flaws. The text is poor. In fact, the manuscript turns out to be a defective copy which omits a good deal of the text", see ibid. p. 58.

Andalusī, who emigrated (*hājara*) to Iraq and Khorasan, became known among the rulers in the time of Muḥammad ibn Malikshāh,[7] and regarding to whom a contemporary composed the following scathing verses (metre *Basīṭ*):

عَبْدُ ٱلْوَدُودِ طَبِيبٌ طِبُّهُ حَسَنٌ * أَحْيَى وَأَيْسَرُ مَا قَاسَيْتُ مَا قَتَلَا

لَوْلَا تَطَبُّبُهُ فِينَا لَمَا وَجَدَتْ * لَهَا ٱلْمَنَايَا إِلَى أَرْوَاحِنَا سُبُلَا

ᶜAbd al-Wadūd is a physician whose medicine is good?
I am alive, but the least I endure will be deadly!
Were it not for him giving us treatment,
Death would never find ways to our souls! [8]

Rosenthal also mentions a passage in another Arabic biographical source, where ᶜAbd al-Wadūd 'the physician' appears in a chain of transmitters of a story involving Awḥad al-Zamān;[9] here, ᶜAbd al-Wadūd transmits directly from a pupil of Awḥad al-Zamān,[10] who was a contemporary of Muḥammad ibn Malikshāh. It is therefore quite possible that Ibn al-Qifṭī and Ibn Abī Uṣaybiᶜa refer to the same person. Finally, there are two small pieces of internal evidence: at the beginning of §2 of the present *Risāla*,[11] ᶜAbd al-Wadūd recalls an unnamed master in Baghdad, to whom he was attached in his youth, presumably as an apprentice (*ḥafiẓtu wa-anā ṣabiyy li-baᶜḍ al-*

[7] That is Abū Shujāᶜ Ghiyāth al-Dunyā wa-l-Dīn Muḥammad ibn Malikshāh, also known as Tapar, the Seljuk sultan of Iraq and western Persia, who was born in 474/1082 and reigned from 498/1105 until his death in 511/1118; cf. Rosenthal, "Isḥâq", p. 58.

[8] This biographical information — the most detailed we possess — is obtained from Ibn al-Qifṭī, *Taʾrīkh al-ḥukamāʾ*, ed. J. Lippert, Leipzig (Dieterich'sche Verlagsbuchhandlung) 1903, p. 228. As Ibn al-Qifṭī indicates, the second hemistich of the first verse and almost the entire second verse are decontextualized and topically adapted borrowings from the famous poet al-Mutanabbī (d. 354/965), see *Dīwān Abī l-Ṭayyib al-Mutanabbī*, ed. F. Dieterici, Berlin (E.S. Mittler) 1861, p. 24 nos 1 and 3.

[9] That is Abū l-Barakāt Hibat Allāh ibn Malkā al-Baghdādī (b. ca. 470/1077, d. after 559/1164), a well-known philosopher and physician who, in the latter capacity, served the caliphs in Baghdad as well as the Seljuk sultans; cf. Rosenthal, "Isḥâq", p. 58.

[10] See Ibn Abī Uṣaybiᶜa, *ᶜUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ*, 1–3 [in 5 vols], ed. and tr. E. Savage-Smith, S. Swain, G.J. van Gelder et al., Leiden–Boston (Brill) 2020, 2.1/697,-3 (Arabic) = 3.1/764,1 (English).

[11] The division of the Arabic text and, correspondingly, the English translation into paragraphs is mine; for the reader's convenience, references to paragraphs always appear in bold type.

shuyūkh bi-Baghdād);[12] and at the beginning of §10, he says that he used to know a physician (*ḥakīm*) named Ẓāfir ibn Jābir al-Mawṣilī, who died after the year 482/1089.[13] These meagre and not entirely consistent findings, taken together, allow us nonetheless to conclude that ᶜAbd al-Wadūd must have lived in the late 5th/11th and early 6th/12th centuries.[14]

Broadly speaking, ᶜAbd al-Wadūd's *Risāla* belongs to the literary genre of medical ethics, and here more specifically to a cluster of writings that were composed in defence of medicine *as such*, rather than in defence of certain aspects or individual protagonists of the field.[15] ᶜAbd al-Wadūd's choice of this essentially deontological subject is by no means unprecedented;[16] yet the decision to present his apologetic arguments against the alleged flaws of medicine by playing the devil's advocate is quite exceptional, as is his passionate, often sarcastic and at times bitter intellectual disposition. Another noteworthy aspect of ᶜAbd al-Wadūd's *Risāla* is that it explicitly addresses "novice physicians" (*aḥdāth al-aṭibbāʾ*), rather than seasoned practitioners (§39), which lends to the work a clear and strong didactic flavour.

Before tackling the edition and translation of ᶜAbd al-Wadūd's *Risāla*, it may not be in vain to recount, in his own words (§3), those precarious features which formed the baseline of attack against the medical science, and which indeed may have given rise to malpractice: [1] the complexity of the field (*ṣuᶜūbat al-maṭlūb*); [2] the great number of useless people who take up medicine (*kathrat al-ardhalīna mimman yadkhulu fī-hā*); [3] the nobility of the subject underlying this craft, and the risk involved in (practising) it (*sharaf al-*

[12] If our ᶜAbd al-Wadūd is indeed to be identified with Ibn al-Qifṭī's ᶜAbd al-Wadūd *al-Andalusī*, the latter must have arrived in the East at a quite young age.

[13] Cf. note 139 below.

[14] Cf. Rosenthal, "Defense", p. 520 and Biesterfeldt, "Opinions", pp. 16 f.

[15] At the beginning of §19, ᶜAbd al-Wadūd himself states that he deliberately refrained from vilifying his professional colleagues 'by name' (*bi-asmāʾihim*); and at the beginning of §27, he clearly indicates the presence of those who refute, not the benefits of medicine but the craft 'in itself' (*fī nafsihā*).

[16] For a concise survey of the genre and some of ᶜAbd al-Wadūd's literary precursors still see Ullmann, *Medizin*, pp. 223–227 ('Standeskunde und Berufsethik der arabischen Ärzte'), together with the genre-specific literature (primary and secondary) listed by U. Weisser, "Unter den Künsten die nützlichste: Aspekte des ärztlichen Berufs im arabisch-islamischen Mittelalter", in: *Medizinhistorisches Journal* 26 (1991), pp. 17–25; further Rosenthal, "Defense" and Biesterfeldt, "Opinions", *passim* in both; for a more recent, general monograph cf. also J.C. Bürgel, *Ärztliches Leben und Denken im arabischen Mittelalter*, Leiden–Boston (Brill) 2016.

mawḍūᶜ li-ẓuhūr hādhihi l-ṣināᶜa wa-l-mukhāṭara bi-hī); [4] the inadequacy of the students (*rakākat al-ṭālibīna*); [5] the lack of understanding on the part of those who consult a physician, and their inability to tell the difference between him who excels and him who is excelled (*qillat ifhām al-mustaṭabbīna wa-jahluhum bi-l-farq bayn al-fāḍil wa-l-mafḍūl*); [6] the difficulty to prevail over someone who seeks to refute this craft, and who claims that it has no impact on the body (*ᶜasr ghalabat man yaṭlubu l-ᶜinād fī hādhihi l-ṣināᶜa wa-yazᶜumu annahū lā taᵓthīr la-hā fī l-abdān*); and [7] (the false notion) that what is attributed by the physicians to their craft is in reality due to God (*anna mā yansubu l-aṭibbāᵓ ilayhā innamā huwa min Allāh*). Framed by a short prologue (§§1–3) and an even shorter epilogue (§§39–40), these conceptual divisions are rephrased, and rearranged, in the chapter headings (*abwāb*) of the *Risāla* as follows:

Heading 1	missing in the manuscript[17]	—
Heading 2	missing in the manuscript[18]	—
Heading 3	the blameworthiness of practising the craft of medicine on the grounds of the subject's nobility	*dhamm al-taᶜarruḍ li-ṣināᶜat al-ṭibb min jihat sharaf al-mawḍūᶜ*
Heading 4	the blameworthiness of practising the craft of medicine on the grounds of the feeble-mindedness of those who consult a physician, and the difference between him who excels and him who is excelled	*dhamm al-taᶜarruḍ li-ṣināᶜat al-ṭibb min jihat rakākat al-mustaṭabbīna wa-l-farq bayn al-fāḍil wa-l-mafḍūl*
Heading 5	the blameworthiness of practising this craft on the grounds that some diseases are hard to cure, and that it is difficult to prevail over someone who seeks to refute it	*dhamm al-taᶜarruḍ li-hādhihi l-ṣināᶜa min jihat ᶜasr al-burᵓ fī baᶜḍ al-ᶜilal wa-ᶜasr ghalabat man yaṭlubu l-muᶜānada*
Heading 6	the blameworthiness of practising it on the grounds of the inadequacy of its students and those who are identified with it	*dhamm al-taᶜarruḍ la-hā min jihat rakākat ṭālibīhā wa-l-musammayna bi-hā*
Heading 7	the warning against a pit of this craft which scholars have forgotten as they frequently fall into it	*al-taḥadhdhur min balīya fī hādhihi l-ṣināᶜa qad ghafala ahl al-ᶜilm ᶜanhā ᶜalā kathrat wuqūᶜihim fī-hā*

It is also clear from these observations that the title of ᶜAbd al-Wadūd's *Risāla*, which prominently features the term *takassub*

[17] See note 30 below.
[18] See note 30 below.

"making a living", is highly reductive — the question of remuneration plays, in fact, only a very marginal role in the extant parts of the text.[19] Further note that the above chapter headings do not always, and sometimes not at all, correlate clearly with the subject matter(s) they profess to explore, which may indicate that they were inserted at a later stage, presumably by the copyist of the text.

The paragraph distribution is as follows:

Chapter 1	—[20]
Chapter 2	§§4–10 (incomplete)[21]
Chapter 3	§§11–19
Chapter 4	§§20–26
Chapter 5	§§27–29
Chapter 6	§§30–36
Chapter 7	§§37–38

Arabic Text

[ب ١٢٨] بسم الله الرحمٰن الرحيم وبه نستعين

رسالة عبد الودود بن عبد الملك الطبيب
في ذم التكسب بصناعة الطب

[§١] قد قصدتُ أنا عبد الودود بن عبد الملك في هذه المقالة الطريقةَ المألوفة المشهورة في مدح التصدي لصناعة الطب والتظاهر بها، ولستُ مع مفارقتي لمدح هذه الصناعة عن ذمّها من أجل ما يعتروها من الآفات التي تكثّر عيوبَها، فإن الإنسان لرأيٍ يراه قد يمسك عن مدح شيء من الأشياء ويمسك أيضًا عن ذمّه، وأما أنا فلستُ بتارك مدح التعرض لهذه الصناعة فقط لكني ذامّ لها ومع ذمّي لها لا أقنع لها بالذمّ الذي دون الغاية حتى أتوغل في ذلك وأنصره كالمبرهِن عليه، فليس أحدًا أحرص على إظهار الحجة وشَوَفان البرهان من رجل يتعرض لنصره رأيٌ ضعيف، فإن المتناوِل لهذا الفن أو

[19] For example in §§20–21.
[20] See note 30 below.
[21] See note 30 below.

غيره مَن نصره المحال إنما هو كالطاعن في عين الشمس أو الرائم أن يعكس جريان النِيل إلى بلاد غَانَة أو جرية الفُرات إلى بلاد الرُوم، ومَن ذا الذي يستطيع أن يردّ أيدِيَ الناس في أفواههم إذا كانوا على خطاء وأما وهُمْ على صواب فإن ذلك ممتنع، ولكن على حال قد ينفث المصدور ومَن طَلَبَ عيبًا وَجَدَ.

[§٢] حفظتُ وأنا صبي لبعض الشيوخ ببغداد يعاتب رجلاً قد جفاه ويهدِّده بالجفاء والهجو، قال الفاضل:[22] الجهالة داء ليس يُرْجى لبرئها من دواء رُبّ عُرْضٍ بطِمْرٍ من عيوب دلّتْه مجاذبات الهجاء،[23] لوْ أراد الأديب أن يهجو البدر رماه بالحظة الشَنْعاء قال: أبدرٌ أنت تغدر بالساري وتُرْدى بزورة الجُشاء[24] ويَلِيك المَحاق حتى يُرى منه شبيه القلامة الهَجْناء ويَليك السَرار في آخر الشهر منحول في أديم السماء كلفّ في أديم وجهك نمشًا فوق وجنة بَرْشاء؟ وإذا البدر يُثَلّ[25] بالهجو فليَحْشُ ذوي الفضل ألسنُ الشُعَراء، فقد سمعتُ لهذا الفاضل كيف رام فقَدَرَ وذمَّ أخسّ ما به يضرب الناس في كمال المحاسن المَثَل.

[§٣] وهذه الصناعة إن كانت ممدوحة[26] في نفسها فإني قد بحثتُ فوجدتُ لها مذامّ كثيرة ليس في نفس العلم بها لكن في التعرض إليها والتحلي بها وتلك المذامّ مجتمعة في سبعة أشياء وهى هذه: الأول صعوبة المطلوب، الثاني كثرة الأرذلين ممن يدخل فيها، الثالث شرف الموضوع لظهور[27] هذه الصناعة والمخاطرة به، الرابع ركاكة الطالبين، الخامس قلة إفهام المستطبّين وجهلهم بالفرق بين الفاضل والمفضول، السادس عسر غلبة[28] مَن يطلب العناد في هذه الصناعة ويزعم أنه لا تأثيرَ لها في الأبدان، السابع أن ما ينسب الأطباء إليها إنما هو من الله تعالى.[29]

[22] قال الفاضل : باانا الفصلا MS (?).
[23] الهجاء ... رب : MS in the margin.
[24] الجشاء : الحساء MS.
[25] يثل : ىىل MS.
[26] ممدوحة : محموده MS in the margin.
[27] لظهور : MS in the margin.
[28] غلبة : علته MS.
[29] تعالى : MS وقبل underneath, presumably as a custodian of the next, now missing folio.

[§٤] [آ ١٢٩] [...[30]] بما هى[31] أرجله، وإذا قيل لهم: إن أصحاب الرياضة المعتدلة والأغذية المتوسطة أحسن صحةٍ من أصحاب التعب وأصحاب التلطف جاؤوا يذكر كل بِكار وجِمال ولم يفرقوا بين الأقوى والأصحّ.

[§٥] يصل لأهل كل بلد هذيان واعتقاد سوءٍ في بلدهم أو في شيء منه يظنونه صوابًا، فأهل مصر نفسها يعتقدون أن الحِمّية إنما هى أكل خبز بسكّر أو بزبيب أحمر أو مع رمّان حلو وأن فِرْعَوْن كان يعيش من الموز لأنه على رأيهم لا يجتمع له في المِعَى بَوار.

[§٦] وأهل تِنّيس يجمعون بين لبن البقر وبين السمك على مائدة واحدة يقولون مرعاها واحد لعِلْمِهم أن بُحَيْرة[32] تِنّيس ترعى بقر الجيش على حافاتها ويصطادون السمك منها ويضعون مع السمك واللبن على المائدة أيضًا البطّيخ السِنْدي ويقطعونه قطعًا ويأتدمون به وهُمْ من أجل هذا يُدْهَوْن في أبدانهم بالبهق الأبيض والبرص ويأخذهم في زمن الخريف الفواق المزعج لِما يلجّج في معدتهم من دُهنية السمك ويكون أكثر من ذلك المرطوبين من الرجال والنساء حتى أن عامة التُجّار يقولون: إن أهل تِنّيس يهيجون مثل السنانير في كل سنة هيجة، وهُمْ عَلِمَ الله أبعد الناس من الغلمة في رجالهم خاصةً وذلك أن أفحل مَن فيهم يشكو الغنة وأن الرجل منهم يُدْخِل بيتَه عروسًا فيقيم سنة وسنتيْن لا يتمّ له مع المرأة شيء.

[§٧] وأهل بغداد يعتقدون أنه لا يأخذ أحدًا منهم علةٌ من برد وأهل قسطنطينية يعتقدون أنه لا يأخذ أحدًا منهم علةٌ من الحَرّ حتى كان الأُسْطُقُسّ الحار معدوم عند هؤلاء والأُسْطُقُسّ[33] البارد معدوم عند أولائك، فدكاكين العطارين في بغداد مملوءة مستكملة من جميع العقاقير الباردة وبالضد في دكاكين العطارين في قسطنطينية فإن تلك مستكملة لجميع العقاقير الحارة فلوْ طُلِبَ من هؤلاء دواءٌ مما ينفو في بلاد هؤلاء لَما وُجِدَ، وما علمت الناس أن مُصيبة مَن[34] به حمى من مادة حارة في قسطنطينية أعظم لأن حرارة تقاوم ذلك الهواء المحيط بهم إنما هى في معنى النفط الذي يحرق على سطح الماء،

[30] Due to at least one missing folio, the entire first chapter and the beginning of the second chapter are no longer extant; cf. also Biesterfeldt, "Opinions", p. 17 note 7.

[31] The two (?) words بما هى are incomprehensible without a context.

[32] بحيرة : بحبره MS.

[33] الاسطقس : الاسطقس MS.

[34] مصيبة من من : مُصيبه من MS.

وكذلك بغداد فإن المفلوج أخطر ممن في بلد أحرّ لأن مادة تقاوم ذلك الاحتراق ويعسر نضجها على إقليم العراق لِبؤس في خيرها وصلاح صاحبها.

[§٨] فكان يجب على أقل الأقسام أن يعتقدوا أن هذا العالَم الأصغر مركَّب من الأُسْطُقُسّات الأربع ولكن[35] نُقْدِم على العامة، أترى أفضل مَن في بغداد يجسر أن يقرّ بهذا لعامتها؟ لا واللهِ ولوْ فعل لَرفضوه ولكنه إذا ابْتُلِيَ بشيء من هذه الأشياء تَحيَّل وبَدَلَ أسماء العقاقير وعَمِلَ عمل أهل العلم، ومَن يقدر على مناظرة المصريين في ماء الليمون والبغداديين في ماء الحصرم؟ وقد عَلِمَ الله تعالى وشَهِدَ أن المصريين أحقّ بماء الحصرم وأن البغداديين أحقّ بماء الليمون، ومَن يُغْضِب الدايات والقوابل على تدبير الأطفال والحبالى واستخراج المشيمة أو تسهيل الولادة أو شيء من علل الأرحام والمجدور والمحصوب؟ هذا كله لا شغل [ب ١٢٩] فيه للطبيب عند أهل المدن وعامتهم.

[§٩] وأهل حَلَب لوْ رأوا لواحد منهم قد لفّ في حصيرٍ ملوَّثٍ بقطران ورأى في حفرة نارٍ ما اعترفوا بأن هذا سببه حار وقالوا:[36] إن هذا صفقه هو أحصل للمريض، وجميع ما يرونه من حرارة وتلهُّب وكرب وعطش، ويُعْطونه برأى فُلان ورأى فُلانة الزهرَ بنفسج والعرقَ سوس وقَطْرَ ذلك وينهون[37] عن فصده وإسهاله ويزيدون في الدثار ويثقلون الرأس بقَلَنْسُوَة مِرْعِزَّى، فإذا تحكم البلاء وقلحت أسنانه واسودّ لسانه قالوا: كان ضعْفه هواء وتثوُّر حُمّى، لا سيما إن كان أقرب الأسباب إلى المرض الحمامُ ودخلها قبل ضعْفه بيوم أو يومَيْن، فإذا شكت العجوز أو الشيخ إلى الطبيب ساعَدهم على نوبة الحُمّى والهواء وإلّا صلبوه.

[§١٠] وأنا أعرف حكيمًا[38] يُسمَى ظافِر بن جابِر الموْصِلي رَحِمَه الله قد سكن بينهم نحو أربعين سنة قال لي: أناظرهم على هذا هذه المدة كلها ولا يرجعون عن عتوّهم، وآخر الأمر تَرَكْهم واعترف بألفاظهم وجزى عليهم من المداواة على ما هُمْ عليه إلى[39] أنه كان يقرّب من الأدوية التي قد عهدوها ويساعدهم على ذكر الهواء في مرض يعرف أنه لا أصل في الهواء.

[35] ولكن : + ن MS.
[36] قالوا : لقالوا MS.
[37] ينهون : يهنون MS.
[38] حكيما : حكيم MS.
[39] الى : الا MS.

باب ذمّ التعرُّض لصناعة الطب
من جهة شرف الموضوع

[§١١] اعلم وقد علمتَ لا شكّ أن كل صناعة إنما تُشرَّف بموضوعها لها والغاية التي بها، والموضوع لظهور أثر هذه الصناعة هو بدن الإنسان وإذا كان هذا الشيء هو الموضوع فقد علمتَ أنك تخاطر بنفيس، وذلك أن الإسكاف إذا فصل الجلد الذي هو موضوع لصناعته وعون على أنه يجيء منه شَرَج أو خفّ فلم يجئ منه غرضه لخطاء أخطأه فأما أفسدُ جلدٍ اتّخذ منه الغرض لتلك الغاية المطلوبة بأقلّ منه أو أصغر أو غيَّر تلك الصورة نحو العيب وغيَّر ذلك مما يَعمل من الأوَمّ،[40] والإنسان إذا قُضِيَ عليه وتَلِفَتْ تلك الجثة يصعب أن يقدر على أن نحرفها إلى حيوان آخر وإلى الآن ما رأينا مَن مات بين يديْه إنسانٌ فردّه أو عمل منه حيوانًا[41] آخر ولوْ كان لنا في التبدل في الصُوَر فسحةٌ لَكُنّا قد عملنا من جثة الميت حيوانًا آخر عِجْلاً أو قِرْدًا أو غير ذلك ولَكان أحبّ إلينا من تعريضه له للبِلَى.

[§١٢] ولذلك قال إبقراط: والتجربة خَطْراء، فترى إذا تقدَّمتَ إلى مريض وأنت تدقّ بيديْك الأدوية وتطبخ وكل شيء يُتعمله ويُعْمَل بأمرك شيءٌ مجرى الصواب في كل ما يجب إلّا الوقت فإنه فاتك أو أعجلك لا سيما في الأمراض الحادة، فإنك إن سقيتَ أو قربتَ من المريض شيئًا من خارج أخطأتَ وإن تركتَ علمتَ أنك منتظر خطرًا، هذا إذا كان الطبيب في طبقة إبقراط وأخطأ وهو من أهل غير[42] الخطاء، وأما إذا كان مقصِّرًا ووقع خطاؤه من كل جهة أو تأتّى غلطه من جهتيْن الكم والكيف والوقت والترتيب وجهة الاستعمال فرَحِمَ الله ذلك المريض، [آ ١٣٠] وإن عاش فما أقوى تلك الطبيعة وما أحسن تلك القوى المدبِّرة[43] لذلك البدن ولا امتثل[44] لك بغير الغشى حيث لا تقدر أن تسأل العليل أن يعلِّمك.

[§١٣] وإن أخبروك أهله لم تكنْ على غاية الثقة وكذا أنت معوّل على قياس البياطرة لأن البيطرة تصعب من هذه الجهة وذلك لأنها طب الحيوان غير الناطق وذلك أن الفرس أو غيره لا يقدر على الشكوى إلى البيطار

40 الاوم : الاوم MS sic.
41 حيوانا : حيوان MS.
42 غير : MS in the margin.
43 المدبرة : MS above the line.
44 امتثل : اسثل MS.

ويشبّهها[45] من طب[46] الناس طب الأطفال والخُرْس، وأما طب الناس وأن استعمل فيه الحدس فإنه يُنتفع فيه بالمسألة انتفاعًا ليس باليسير، فإن قعدتَ تعمل الفكر في أمر هذا العليل وقعتَ فيما قال إبقراط: والوقت ضيّق، وربما وقعتَ في قوله: والقضاء عَسِر، لأنك أنت تفكر والشخص ملزوز والطبيعة تستفضل الفرج،[47] وأنت إذا رأيتَ ما أقول وعلمتَ من نفسك أنك خائض في الهول من كونك متحكمًا في شخص إن استعملتَ فيه ما ينبغي كان قد سبقك إلى مثله ألف طبيب مَن لا يعلم عددهم إلّا الله سبحانه وتعالى ولم يحصل لك من الشكر والآخِرة عُشْر ما يحصل عليك من الذمّ والإثم والملامة إن مات المريض بين يديْك فأنت في موته بين أن يُقال: جَهِلَ ما به، أو يُقال: أخطأ عليه في علاجه.

[§١٤] فانظر إلى هذا الفصل كيف كان[48] نهيًا عن الطب وسماع حديثه، وعلى رأى المُعْتَزِلَة من المشرعين وهُمْ قادة الكلام فإنهم يرون التجليد في النار[49] وعلى ظُلَمٍ شعيرةً، وأما على رأى أهل[50] الصناعة التي نحن نقتبسها فإن إبقراط أخذ عليهم العهد بأغلظ يمينٍ، وأعظم تحرُّج أنهم لا يصفون فَرْزَجَة تُدِرّ الطمث حذرًا أن ينحدر بمثلها الجنين، هذا تغليظه وتحريجه في إفساد المادة، فكيف يكون الأمر في إفساد الصورة؟

[§١٥] وقد كان جالينوس في أيام حداثته على أيام قيْصَر الملك اسْتُفْتِيَ في رجل كان قتل جماعة بسمّ كان قد عرفه فلما استقرّه الحاكم قال: نعم هذه حشيشة كنتُ عرفتُها في بعض الأوقات لسبب عجيب وذلك أني وضعتُ عليها كبد خنزير واشتغلتُ عنها قدر ساعة فوجدتُ الكبد قد ذابت وصارت كلها دمًا فحدستُ أنها تفعل ذلك بأكباد الناس فكنتُ أبيعها لمَن يطلب قتل عدوّه فيسهل الذي يشربها دمًا حتى يموت، فلما أمر الحاكم بقتله أشار عليهم جالينوس بأن يعصبوا عينيْه في المدينة قبل إخراجه للقتل حذرًا من أن يغمز أحدًا عليها من مَعارفه في طريقه فيورثه إياها واجتهد في قطع هذه الحشيشة هذا[51] الاجتهاد.

[45] يشبهها : نشها MS.
[46] طب : MS in the margin.
[47] تستفضل الفرج : تستفصل الفرح MS.
[48] كان : + بى بكون MS.
[49] النار : النا MS.
[50] اهل : MS in the margin.
[51] هذا : هده MS.

[§١٦] وقصة[52] حُنَيْن بن إسْحاق مع المأمون معروفة وذلك أن المأمون قال لمَن يثقه من جلسائه: إن حُنَيْن قد طال المكث في بلاد الروم وقد خشيتُ أن يداخل على بعض أهل الدولة الرومية طلبًا للفائدة فيدسّ إليَّ سمًّا وأنا في هذه المدة أختبر أمانته وأجرّب ثقته، فقال له: يا حُنَيْن إن السموم لا بد لخزائن الملوك منها والصواب أن تشرع في شيء تعلمه منها [ب ١٣٠] ليكون في الخزانة، فقال حُنَيْن: يا أمير المؤمنين إنما مضيتُ إلى رومية وتكلمتُ بلغة القوم حتى أتعلم شيئًا يخلص الناس من الموت وأما ما يوقعهم فيه فهذا شيء ما تعلمتُه بعد فإن أذنتَ لي رجعتُ إلى بلد الروم فأتعلم هذا العلم، فقال له أمير المؤمنين المأمون: وَيْلَك إن هذا لا يخلصك مني، ولجّ في ذلك عليه فاستسلم حُنَيْن إلى الله تعالى فأرغبه بإقطاع وضياع ومال وكسوة وذخائر نفيسة وأظهر إليه أمسّ الحاجة إلى هذا الشيء فلم يجد فيه قهرًا فحلف له بالله: إنني أقتلك إن لم تفعل، فقال: يا أمير المؤمنين قد قلتُ لك ما فيه كفاية فإن أردتَ أن تظلم نفسك فافعلْ ما شئتَ، فأمر بحلّ العصابة عن عينيْه وأمر له بجوائز سنية ورفع محله وكنّاه بأبي زيْد وقال له بعد أن زال روعه: ما أصبرك على الهول وكيف وطّنتْ نفسُك على القتل، فقال: يا أمير المؤمنين إن شريعتي وصناعتي ينهيانّي عن هذا أما شريعتي فإن السيّد المسيح لذكره التقديس والتعظيم قال لنا وأمرنا أن نحسن إلى مَن ظلمنا وأما صناعتي فإن إبقراط قد أخذ العهد علينا أن لا نَصِفُ دواءً يحدر الطمث ثم فكرتُ وعلمتُ أن موضعك موضع مَن يقتل على الظلم لا[53] على العدل وعلمتُ أنك لا ترضى لنفسك أن تكون مثلي عادلاً ومثلك ظالمًا.

[§١٧] فإذا كان هذا هكذا فما ظنّك بالطبيب الجاهل؟ ولوْ قلتُ لك إنهم يقتلون على أجمل الوجوه لم أبْعُدْ عن الحق، وإنّا نبيّن لك كيف ذلك، اعلم أن الواحد منهم ربما سمّى نفسَه متطببًا[54] وقال: أنا لا أخرج عن البزور وماء الشعير، وما يعلم أنه بماء الشعير ربما كان به أفتك من الحَجّاج بن يُوسُف الثَّقفي إذا استعمله في غير وقته وذلك أنه ربما سقاه للعليل في الابتداء قبل نوع من أنواع الاستفراغ المقصودة ولا التي من عمل الطبيعة والأوردة بعد ممتلئة بالسدة في البدن كله، فأقول: إن هذا ولا سيما إن كان به حُمّى سُونُوخُوس وفُعِلَ به هذا لا يجوز أن يعيش قط، ولبقراط في ماء الشعير كتابه

[52] قصة : قضيه MS.
[53] لا : MS in the margin.
[54] متطببا : متطببًا MS, perhaps read مُتَفَطِّنًا "intelligent"?

المعروف الذي إذا قرأه مَن قرأه استغنيتَ بعد عن ذكر شيء آخر من هذا وذلك أن الصواب منه يستنبط الخطاء فإذا رأيتَ مثل إبقراط يأمر بشيء فيه الصواب فخالِفْه إن شئتَ أن تخطئ فإن ذلك هو الخطاء بعينه.

[§١٨] وقد رأيتُ مثل هذا في الرحبة وغلام قد أصبح محمومًا فكان السبب الأقرب أنه أكل كِشْكية فضلاً وأصبح في معدته منها جزء لم يتحكم[55] هضمه واشتعلت فيه الحرارة الغريزية[56] وابتداؤه[57] الصداع والحُمّى والعطش ولم يعمل الطبيب الذي لهم شيئًا غير أن أمر بماء الشعير فعُمِلَ لهذا الغلام المذكور فدخلتُ أنا عليه بعد أن شرب ماء الشعير وحصل له كرب عظيم ثم جاء القيء فخرج ماء الشعير وفضلة الكِشْكية فكيف كان الحال[58] لوْ طلب ماء الشعيرالنفوذ إلى الماسارَيْقا مع فضلة الكِشْكية إلّا أن الله تعالى لطف بذلك الفتى بالقيء؟ وسبب هذا[59] القيء هو [آ ١٣١] أن المعدة ليس وراءها خلوّ تدفع إليه الغذاء البتة فدفعته إلى المريء ثم إلى الفم ليخرج من خلاف الجهة[60] الطبيعية، وأما ما رأيتُه من خطائهم من غير هذه فكثير ليس لي حاجة بذكره لأنه لا يمرّني[61] يوم إلّا أجد لهم فيه أمرَ سوءٍ إما في مريض بمشاهدتي وإما بحديث استُقِرّ به من بعض مَن يشكو من علة.

[§١٩] واعلم أن لم يكن غرضي في ذكر مَن ذكرتُه من الأطباء شتمًا لهم إني لوْ أردتُ أشتمهم[62] لَذكرتُهم بأسمائهم وإنما ذكرتُ مَن ذكرتُه في ذلك الشعر في وسط المقالة من الرُقَعاء بأسمائهم من حيث هُمْ رُقَعاء ولم أقذفهم ولا هُمْ أيضًا متّسِمون بالطب ولا يستدعيهم أحدٌ ولا يستطبّهم، وإنما ذكَرتُ لك مَن هو طبيب ولَعَمْري لَقد سلكتُ من الصبر على أعراضهم والاتّقاء عليها ما لم يسلكه الفاضل جالينوس، فإن ذلك في الثلاث مقالات الأُوَل من حيلة البرء وفي كتابه في الأُسْطُقُسّ ذكَرَ الخصوم بأسمائهم وشتمهم وشخّصهم على أن أولائك ممن يغالب مثل جالينوس، وأنا أرى أن هذا لا ينفع وأعوذ بالله من صناعة يكون الغلط فيها تَلَفُ نَفْسٍ على يدئ أحبّ الناس في بقائها وإفادتها الحياة.

[55] يتحكم : ينحكم MS.
[56] الغريزية : الغريبه MS.
[57] ابتداؤه : ابتدايه MS.
[58] الحال : + نكون MS.
[59] هذا : هد MS.
[60] الجهة : + الى MS.
[61] يمرّني : يمرّنى MS.
[62] اشتمهم : اشقمهمم MS.

باب ذمّ التعرُّض لصناعة الطب
من جهة ركاكة المستطبّين
والفرق بين الفاضل والمفضول

[§٢٠] اعلم أن من الموقعات في الرداءة والمعرضات للبغض اجتماعك أنت وطبيب آخر على مداواة مريض فهذا لا يسمح به نفس من العلماء لأن الطبيب الآخر لا يخلو من أن يكون في أنفسهم مثلك فقُلْ لهم ليقتصروا على واحد منكما أو يكون دونك فقُلْ لهم ليقتصروا عليك ويصرفوه أو يكون فوقك فقُلْ لهم عليكم فُلانًا واصرفوني ولا يهون عليك هذا المقدار فإنه مُخْدَع[63] للعقل ضارّ في باب الكسب، وأما الفائدة فأنت تعلم أن ذلك ينقسم بينك وبينه إن كان خيرًا، وأما من باب الدنيا فإن كنتَ صبيًا نبيه الذكر وهو خامل الذكر شرّفتَه بمصاحبته إياك وصار نظيرًا لك وقال أهل المريض: قد جاء الأطباء فُلان وفُلان، وإن كنتَ أنت خامل الذكر وهو نبيه الذكر كنتَ عندهم بمنزلة التابع له والمستفيد منه، هذا إذا ضمنتَ لي أن ذلك مُنْصِف من أهل العلم ولم يكن رقيعًا يقول لهم إذا غبتَ: ذلك الطبيب مسكين يستأهل منكم الإحسان، فيظهر أنه يشفع لك وإن اضْطُرّ إلى الثناء عليك وَصَفَك بالكيْس والخير والدين والظرف وسِيَةِ ذلك وأما إن يَصِفك بقوى النفس[64] فذلك شيء لا تَرِحَه.[65]

[§٢١] وأما إن كان واحد من الطبيبيْن قد لحس جحر بعض الأمراء أو شمّ بول بعض الولاة في سالف زمانه أو في حالته تلك وزمانه ذلك فإن الآخر لوْ كان رُوفُس الذي أثنى عليه جالينوس بالفضل ما حَسُبَ المتعطِّلُ عند أهل المريض وعجائز الناحيةِ الأدويةَ، وربما كان المريض من خُدّام السلطان فجاء الطبيب بعدك فوجدك قاعدًا[66] فقعد فوقك وولّى باذخًا[67] بوجهه إلى ناحية المريض مُسارًّا له ثم أعاد وجهه إلى ناحيتك فنظر إليك نزًّا[68] كالكاتم له بسِرٍّ[69] [ب ١٣١] وكالقائل لك: قُمْ فأنا في خلوّه، ثم يقول: مولانا يصبّحك وقد سألني من ساعة عنك فقلتُ له هو بسعادتك في عافية وبعد يوميْن أو ثلاثة ادخلْ به الحمام، وأنت مع ذلك كله ترى وتشاهد نقصانه ويتكلم بوجهيْن

63 مخدعه : مخدع MS.
64 اعالم او مساهر + : النفس MS (?).
65 ترحه : ترجه MS.
66 قاعد : قاعدا MS.
67 بازخا : باذخا MS.
68 ننزا : نزا MS.
69 بسرا : بسر MS.

الوجه الواحد إلى إن نقبتَ له نقصانه استفاد ذلك ولم يشكرك والآخر أنه ربما شقّ ذلك على المريض، أما نقصانه فيكون خَرّاب البيت[70] موافق حديثه وأما[71] من أيام البحران فتتعوّق الطبيعة المدبّرة للبدن بما يسمعه من ذلك عن إخراج ما رأيتُ إخراجه فتتحكم البلية بحيث لا ينفعه أمير ولا وزير وإذ قد نهى إبقراط عن سماع صوت الحمير وكفّ المطر فما أحْوَجَ العليل إلى أن يكون في البحران أعمى أصمّ من غير سوء يلحقه.

[§٢٢] وأما ما نراه من استعمال الملوك لأطباء كثيرة أو طبيبيْن[72] أو ثلاثة كما قد كان في بغداد ومصر وليس من الصواب أن يُجْعَلَ ذلك مثالاً لك تتعزّى به، فإن الملوك يستعملون ذلك للجمال والمعوَّل من جملة الأطباء وإن كثّروا على واحد منهم في المهمّ والبقية يدخل كل واحد منهم القصر إلى جهة من الجهات، وإنما يجتمعون كلهم عند الصاحب لأمرٍ هائلٍ وهُمْ بعد ذلك كالأتباع لذلك المقدَّم، وأيضًا فإن لهم عند الصاحب إذا اجتمعوا عنده عذرٌ ألّا يجوز غيرَه وليس الصواب إلّا فيه، وذلك أن واحدًا منهم لوْ انفرد بالمخدوم في مرضه ثم مات قال بقية الجماعة: لم انفردْ وَحْدَه، فما فائدة الاجتماع إلّا الموافقة على ما يعملونه في حقه ولا بد من شيء من إنصاف لأن التحرير الكثير والمشاحنة في ذلك وأمثاله ليس هذا وقته ولا موضعه، فمَن رأى منهم صوابًا قد سبق إليه سلّمه وسكت[73] ومَن رأى خِطْءً[74] يُحيل في صَرْف صاحبه عنه[75] في جَسّ مَسّ اتّقاءً على[76] نفسه وادّخارَ الجميل والصنيعة.

[§٢٣] وأيضًا فإن الملوك في اتّخاذهم للطب الكثير واستكثارهم من الأشخاص الفاضلة كالطبيعة التي قد عمّلتْ في الأعضاء الجليلة القدرَ، وينبغي أن يكون اثنيْن حتى إذا وقعت الآفة بالواحد تعوّضتْ بالآخر نحو العينيْن والأذنيْن والمنخريْن واليديْن والرجليْن والثدييْن من النساء خاصةً والخصيتيْن،[77] وربما عملتْ عضوًا واحدًا فكثرتْ شعوبُه وإن كان واحدًا في نفسه، فالقحف وإن كان واحدًا فإن تحته غشائيْن يجلّلان جوهر الدماغ ويحفظانه وللدماغ في نفسه ثلاثة بطون إن وقعت الآفة ببطنٍ سَلِمَ بطنان

[70] خراب البيت : حراب السب MS.
[71] اما : ما MS.
[72] طبيبين : طبيبين MS.
[73] سكت : نسكت MS.
[74] خطء : خطَهُ MS.
[75] عنه : MS above the line.
[76] على : عل MS.
[77] الخصيتين : الخصين MS.

وكذلك الكبد ذات زوائد والمعدة ذات طبقات إذ لم تكن معدتان كانت آلة تخصّ لأشياء يطول شرحها.

[§٢٤] وكذلك الصُنّاع ذوو[78] الآلات على الأكثر ألا ترى إلى أوتار العود أصلها أربعة ثم ضاعفوها اثنيْن اثنيْن وربما عملوها ثلاثة وهو الأصوب وكل صانع إنما يتشبه بالطبيعة في الاستعداد[79] لشيئيْن أو أشياء، وكذلك الملوك إن[80] مات من أطبائهم طبيب أو مَرِضَ خلفته الجماعة وإن عوّل عليه في شيءٍ دهم ليلاً فوجد سكرانَ أو قد برز إلى ضيعته فبات فيها خلفته الجماعة، وليس هذا عمل الملوك في الأطباء فقط بل في الآلات كلها والخيل والسلاح والدور وأبواب الدور ولعل لدار الملك[81] [آ ١٣٢] بابان[82] أو ثلاثة ليوم ما.

[§٢٥] وأما دون الملوك فلا تدخلْ معهم في شيء مما نهيتُك عنه، فإن فعلتَ فأيْسَرُ[83] تعبٍ تلقاه إن كان خيرًا قال: أنا فعلتُ وصنعتُ، وإن كان شرًّا قال:[84] هذا بشرط الاعتدال، وأما إن وقع بينك وبينه عند العليل مشاحنة فذلك مقام لا أزَحْناه لذي بصر.

[§٢٦] وقد بُلِيَ جالينوس بقوم خاصمهم عند المرضى لم يذكر الرجل قِصَصَه معهم ليفخر بذلك ولكن ليعلّمك الطب القياسي وذلك مثل الذي جرى له مع ثالِس الطبيب من الفرقة المعروفة بالمُجَرَّبِيّة[85] عند الملك في مرض دِيُوجانِس[86] الكَلْبي ومَرْهَم الدِياخِيلُون وهى قصة عجيبة طويلة إلّا أن جالينوس لما غلب بالحجة نهره طبيب الملك وانتهره فقال جالينوس: أيها الملك إذا كان عند طلوع الشمس غدًا[87] يعرق دِيُوجانِس[88] في نواحي جبهته عَرَقًا لَثِقًا كأنه العسل باردًا[89] ثم يموت، فكان كما قال جالينوس ومَن أراد أن

[78] دوى : ذوو MS.
[79] الاستفداد : الاستعداد MS.
[80] من + : ان MS.
[81] الملك : MS below the line, *perhaps* as a custodian of (another) missing folio, cf. note 30 above. Biesterfeldt, "Opinions", p. 17 note 7, reckons that something has certainly gone missing between 131b and 132a, but this assertion is far from obvious.
[82] بانين : بابان MS.
[83] فانسر : فايسر MS.
[84] وقال + : قال MS.
[85] بالمجربه : بالمجربية MS.
[86] دوجانس : ديوجانس MS.
[87] غدا : MS above the line.
[88] دوجانس : ديوجانس MS.
[89] باردا : بادد MS.

يقف على هذا كله فليقرأ كتاب حيلة البرء، وقد رأيتُ من خطائهم القاتل كثيرًا لا سيما اليهود في نواحي العراق ولكن حسبُنا الله.

باب ذمّ التعرُّض لهذه الصناعة
من جهة عسر البرء في بعض العلل
وعسر غلبة مَن يطلب المعاندة

[§٢٧] اعلم أن من الناس خلقًا كثيرًا يطلبون المعاندة في هذه الصناعة العظيمة الفائدة ولا أقول يجحدون فضلها بل يجحدونها في نفسها، فإن كان الطبيب الذي يتفزع لمحاجّتهم ويروم إثباتها معهم عاجزًا فذلك قُرّة أعينهم وسُحْبة عين الصناعة، والمحنة في ذلك أن يُثْبِتَها، لا يخلو مَن يروم استعمال الطُرُق البرهانية فبعد كَدٍّ يظفر[90] منها بالبرهان الخَطائي أو الجَدَلي على الأمر الأكثر، وأما ما[91] يأخذ به بعض فِرَق المتكلِّمين نفوسهم من دفع الراح في وجه صاحبها وتكفيره فذلك شيء يضيق الورق عنه ولا[92] أرى أن أذكر ما يعتقدون في الطب من قبيح الرأى ولا حاجة لنا به في هذه الرسالة.

[§٢٨] فقد لاح من هذه الجملة أن هذه الصناعة متى انتدب إلى نفيها من الوجود معاندٌ عارفٌ بالعناد وأعني بقولي عارفًا صبورًا على اللجاجة وإلّا فليس للعناد قانون يسلك فيكون فيه المقصِّر وغير المقصِّر، فإذا انتدب إليها معاندٌ كما قلتُ لك وقال: هَلْ هِيَ؟ فإنك لا تقدر له على جواب يقطعه ويسكته[93] إما لجهل الطبيب لشَوَفان البرهان وإما لتشكيكه[94] في نفسه، وأما جواب مَا هِيَ وأىّ شَيْءٍ هِيَ ولِمَ هِيَ فذلك أمل[95] لا يظفر به من منازل[96] في حق هذه الصناعة.

[§٢٩] وأما كيف تعاملوا[97] في المحاجّة فلعل ذلك لوْ نشط له بعض العارفين بممارسته فرع منه نحو[98] خمسين فرقة وإن أمدّ الله في عَمْري فعلتُ في ذلك شيئًا فإني إلى الآن لم أرَ[99] طبيبًا يُبْلَى بواحد من هؤلاء فيحسن

[90] يظفر : تظفر MS.
[91] ما : — MS.
[92] لا : — MS.
[93] يسكته : تسكته MS.
[94] لتشكيكه : اما تشكيكه MS.
[95] امل : ابل MS.
[96] منازل : مناذل MS sic.
[97] تعاملوا : تعاملون MS.
[98] نحو : + من MS in the margin.
[99] ار : ارى MS.

التخلص منه ولا يأخذه حَمِيّة ولا أنفة أن يتفرد فيعمل في ذلك شيئًا، ولقد سمعتُ العامة مرارًا[100] لا أُحْصِيها يقولون ويتواصون: لا تُعْطي نفسَك في يد طبيب ولا تطرح نفسَك إلى فراش، فالطبيب والفراش عندهم في منزلة واحدة من الكراهة.

باب ذمّ التعرُّض لها
من جهة ركاكة طالبيها والمسمَّين بها

[§٣٠] اعلم وَفِّقَك الله أن الهمة لفظة تقع على إرادة[101] الشيء ثم انقلبت إلى معالي الأمور واطّراح حبسها، قال مُعاوية [ب ١٣٢] لأصحابه: هُمّوا فإني هممتُ بالخلافة فنِلْتُها، ومن معالي الأمور في هذه الصناعة ألّا[102] تتولّى العمل فيها وأنت مزعوج بشيء ولا ناقص الاقتراح قلق الوطأة، فمن أوكد ما تعمل فيه همتك وتروض عليه مستطيلٌ من أهل بلدك ليعرفوك به ويقولوا عليه من خلفك ألّا تدخل على عليل بعد الرابع وبالجملة بعد انفرد به غيرك أو انفرد هو بجهله، فإن كثيرًا[103] من المرضى في أول كفره يتهاون بما هو فيه ولا يستشير طبيبًا ولا يمرّه على ما له والبلية تتزايد إما بنفسها وإما بوجه من وجوه الخطاء، فإذا بلغتَ الحلقوم وظهرتْ علامات السوء وفهمت العجوز منه الوجه الذي تفهمه ممن يموت بكثرة دربتها فتقول لأهله: قد اشتهيتُ لكم فُلانًا، ولا سيما إن سمعوا أنك أنجحتَ في عليل قبله كان خطرًا فاتَّقِ الله في نفسك.

[§٣١] وإياك والانخداع للمتشفِّعين إليك وانفضْ يدك في وجوههم وانتهرْ مَن تستصغر قدره منهم واقطعْ حدتهم بقيامك إن كانوا قعودًا وانفصالك عنهم إن كانوا وقوفًا واعمل الحيلة في مفارقتهم ولوْ على القبيح وإن كان عندك من العليل عِلْمٌ قبل سؤالهم فلا تأذنْ لهم ولا تدخلْهم منزلك إن قطنتَ[104] بهم فهؤلاء جُهّال لا يدعونك لمداواة مريض وإنما يدعونك للعُجُز والعِيط وشغل القلب ويريدون منك أن تكون عُرْضة للجور ومثلاً للباغي ومغمزة لأهل المريض، فقدِّم العذر وأنذِرْ بالأيمان الغِلاظ فهُمْ لا يعاودونك سُؤّالاً فإن

100 مرار : مرارا MS.
101 ازاده : ارادة MS.
102 ان : الا MS.
103 كثر : كثيرا MS.
104 فطنت : قطنت MS.

ناظرك بعد اليمين أحدٌ[105] منهم مسهّلاً لذلك عليك فلا تهبّه وانتهرْه[106] فذلك لا دين له ومَن لا دين له لا قيمة له ألّا تراه يسهّل عليك أن تحنث بعد اليمين فإن عكفتَ[107] وقطعك الخجل وإرادة الخير والحرص على اكتساب السُمْعة.

[§٣٢] ثم دخلتَ فرأيتَ الدلائل المهلكة في السخنة والأفعال وهيئة الاضطجاع والنبض والبول فصِفْ له الماء البارد والجُلاب واخرجْ ولا ترجعْ واعتذرْ بشغل دَهِمَك ولا تقطعْ عند أحد[108] من أهله ولا ممن يعرفه[109] ويصادقه بموت، فإن الأمر في هذا صح إن كان المرض حادًّا كما قال إبقراط: إن القضية بالموت والحياة في الأمراض الحادة ليست على غاية الثقة، وإنما قال ذلك لِما يعلمه من سرعة تقلّب الأمراض الحادة[110] من خير إلى شر ومن شر إلى خير، وأما إن كان المرض مزمنًا فما تكاد[111] دلائله تجزم، واعلم أنه ليس بينك وبين الأطباء حاجز عند العامة لا يجوزك مما حذّرتُك منه.

[§٣٣] فأما العلم فهُمْ لا يعرفون فاضلاً من مفضولٍ واحرصْ أن تُبْرِئَه[112] بضد مداواة العلل العسرة البرء القليلة القبول للنجح ولا يُغْريك[113] ما قاله جالينوس في كتابه الموسوم بالمواضع الآلمة من أن انصداع الرئة يبرأ إذا عومل بما ينبغي، فكمْ سوّد هذا الكلام وجهًا، ومتى يقع لك مثل ذلك العليل فإن وتغ فاعملْ كما قال لك فإن العافية لا تجزم إن لجئ وإنما أخاف أن مَثَّلَ له ما[114] لا يظفر به.

[§٣٤] وهذه العلل المحذورة[115] منها التي لا تقبل الفلاح وتموّت الطبيب وغيره ولم يُرى أحدٌ[116] يخلص من مثلها إلّا قليلاً مثل الجذام الذي معه تساقُط الأطراف وداء الفيل والدوالي والاستسقاء الزِقّي والصرع في مَن جاوز حدّ

105 احدا : احد MS.
106 انتهزه : انتهره MS.
107 عكنت : عكفت MS.
108 احدا : احد MS.
109 تعرفه : يعرفه MS.
110 ليست ... الحادة : MS in the margin.
111 يكاد : تكاد MS.
112 تبرئه : تبرنه MS.
113 يغرنك : يغريك MS.
114 ●-●ق ا : له ما MS (?).
115 المحدور : المحذورة MS.
116 احدا : احد MS.

نموّ الأعضاء وافطيفس[117] [آ ١٣٣] والذبول في المشايخ والذرب الذي خرج معه قطعة من أحد الأمعاء والتشنُّج الاستفراغي والوَرَشْكِين وعضة الكَلْب الكَلِب الذي قد فزع من الماء وأيلاوُس بعد قيء الرجيع والحصى في الكلى من ذوي الكهول والماء في العين والسرطان المتقرح والبواصير النافذة والفالج واللقوة في مَن جاوز السبعين والمالِنْخُولِيا في الرجال المجترّ في المزاج فهذه كلها علل منها ما يُرْجى بعد كَدٍّ ومنها ما لا حيلة فيه فلا يدخل في مداواتها مَن له عقل ورأى.

[§٣٥] فإن دُعِيتَ إليها على سبيل تَطيُّب خاطر المريض وقيل لك: إن انقطعتَ عنه داخلةَ الوهم ومات، فلا تسمعْ لقولهم فقطِّع قلب مَن لا بد من انقطاع قلبه أحبّ إليك من بناء النموّ والسلام، وأنا أعلم بعد هذا كله أنك سَتُبْلى بشيء من هذا إلّا أن السلامة من الناس قليلة فتحيَّلْ في إظهار الفضيلة وبَشِّرْهم بما تعمله ولا تأمنْ من شيء فيه بعض الرجاء.

[§٣٦] ولوْ فرضتَ أن شابًا قد اعترض صوتَه البحة ويعجِّز وجهه وبياض عينيْه بحمرة كمدة وابتداء شعر حاجبيْه فانتثر بعضه ويظن لنفسه أنه سألك في طريق الخُدَام أو قيل له ذلك ويظن فيك أنك من أهل العلم أو قيل له ذلك وكان قد برئ على التداوي وكان الملمس قويًا[118] على الاستفراغ صبورًا على الحِمْية فأنا لا أشكّ أن هذا شخص لا سيما إن كان الزمان ربيعًا لا يأتي عليه الفصل الآخر الذي قبل الشتاء إلّا وقد نوى أو دنا من البرء وأنه لا حاجز بينك وبين عافيته إلّا الجهل، وقِسْ هذا على العلل الأُخر التي حدّثتْك فيها بالكلية ولكن اجتهدْ أن تلحقها من أوائلها وتُعْلِمْ صاحبَها مقدار شرّها فإن المال منها يكسب الذكر الجميل وبالله التوفيق.

باب التحذُّر من بلية في هذه الصناعة
قد غفل أهل العلم عنها على كثرة وقوعهم فيها

[§٣٧] اعلم أنه كثيرًا ما يُبْتَلى أهل هذه الصناعة بقوم متخصِّصين وهُمْ لَعَمْري تَتحرّف السِين أوَّلِيَّ ذهوبِهم إلَيْك وليس مصيبتهم هَيِّنة فلا تحقرنَّها، وذلك أن البزازين وأماثلهم ربما شاركوا الطبيب في الحديث مشاركةً ربما

[117] افطيفس : MS sic, a possible corruption of either *ἀπόστασις* "a suppurative inflammation" or *ἔκτηξις* "melting away, exhaustion", for which terms see H.G. Liddell and R. Scott, *A Greek-English Lexicon*, Oxford (Clarendon Press) 1968[9], pp. 199a and 445a.

[118] قوى : قويا MS.

حملتُه على الصيحة[119] غيظًا، فمنهم مَن يقول: أنا أعرف طبعي لا تصِفْ لي هذا وصِفْ لي هذا، ومنهم مَن يقول: يا مولايَ الحكيم كان قد دخل علينا ذلك الكلب فُلان، ويذكر شخصًا آخر من الأطباء قد دخل عليه قبلك ووصف له كذا وكذا، وصرفتُه عني وقد وصفوك أنت لي فانظرْ إلى هذه البلية، إن كان ذلك المصروف على الصواب ومرض الشيخ يتزايد فقد خيَّرك وجلب إليك فكرًا كثيرًا وذلك أنك إن وصفتَ ما كان ذلك يصفه فقد سمعتَ ما جرى على عرض ذلك وربما استُدرك الغلط مع طبيبه الأول وصَرَفَك وإن غيَّرتَ القانون تَلِفَ العليل فليس لك إلّا استعمال [ب ١٣٣] أدوية أُخر تفعل فعل تلك الأدوية فيُضْطَرُّك إلى الكذب والملق.

[§٣٨] وكان بَرْ[120] رِضْوان المِصْري رَحِمَه الله سيّئ الخلق بالطبع كثير المال، فكان إذا دخل على مريض فسمعه يشاركه في ألفاظ الأطباء مثل أن يقول: بي العلة المعروفة بدُوسِنْطارِيا، أو: قد جاء عليَّ بُحْران الرابع، أو: ظهر في قارورتي رُسوب، وبالجملة إن سمعه يستعمل لفظة من ألفاظ الأطباء قطع الحديث إن كان يتحدث أو الاستماع إن كان يسمع وقام وهو غضبان ولوْ غضب بعد ذلك لَضُرِبَ رقبته أو ضُمِنَ له مُلْك الأرض لم يَعُدْ إلى تلك الدار قط ولا قَبِلَ فيها شفاعةَ شافع، وهذا هو الحزم لأنه كان يقطع الصداع ويُبْطِل القصة من أولها، وذلك أن مثل هذا المريض الذي هذه صفته يعترض عليك في الأنفاس ويناظرك في كل قليل وكثير إلّا أن يكون في سَرْسام لا يعلم ما به فيجوز وإذا برئ لم يبقَ معه تعب.

[§٣٩] وهنا أستخير الله تعالى وأقطع بعد أن أقرّ على نفسي بأشياء، فمنها أني إنما خاطبتُ بهذه المقالة أحداث الأطباء عِلْمًا وذلك أن العالم المجرب الفاضل يعلم من عيوب التعرض لهذه الصناعة أكثر مما كتبتُ أضعافًا مضاعفةً لكنه لم يفزع أحدًا ولا حدَّث نفسَه فيها بجمع هذا الأسلوب، ومنها أن اعتقادي في الصناعة الطبية إنما هو أنها لشرف الصنائع وأجلّها قدرًا وأكثرها تقريبًا إلى الله تعالى لا يشكّ في ذلك إلّا أحمقُ غير أنها محفوفة بهذه الرذائل محوَّطة بهذه الأمم الأراذل، فهي في ذلك كما قال بعض الشعراء وهو الصاحب ابن عَبّاد رَحِمَه الله [من مجزوء الرمل]:

119 الضجنه : الصيحة MS.

120 بر : MS sic, Syriac (!) for *ibn* "son (of)".

قَالَ لِي إِنَّ[121] رَقِيبِي ⋆ سَيِّئُ ٱلْخُلْقِ فَدَارِهْ
قُلْتُ دَعْنِي وَجْهَكَ ٱلْجُنْـ ⋆ ـنَةُ حُفَّتْ بِٱلْمَكَارِهْ

[§٤٠] فجزى الله خيرًا مَن سيَّر على نفسه المعرفة بهذه الصناعة و[122]استعملها كما كانت تُستَعمل في زمان إبقراط وأسْقِلِبِيُوس من قبله، والحمد لواهب العقل ومُمْسِك الكل وله الكبرياء في السموات والأرض وهو العزيز الحكيم.

English Translation

[128b] In the name of God the Merciful the Compassionate
to Whom we turn for help

ᶜAbd al-Wadūd ibn ᶜAbd al-Malik the physician's epistle *On the Blameworthiness of Making a Living from the Craft of Medicine*

[§1] I, ᶜAbd al-Wadūd ibn ᶜAbd al-Malik, have followed in this treatise the familiar, well-trodden path of pretending to cheer the opposition against the craft of medicine. Yet I am not substituting the praise of this craft by its blame on account of the calamities that may befall it and multiply its flaws — for whatever opinion a person holds, he is free to refrain from praising as much as from blaming a given thing. I, however, will not only omit any praise of practising this craft but I will blame it, and in my blame I will not be satisfied until I have taken the matter to its final conclusion, acting as a counter-advocate — for nobody is more keen to produce evidence and to adorn himself[123] with a proof than a man who defends a weak opinion. Now, he who resorts to this procedure, or indeed anyone who defends the absurd, is like somebody who throws a spear towards the eye of the sun, or who wishes that the Nile would reverse its course and flow into the land of Ghana, or that the Euphrates would flow into the land

[121] ان : — MS.
[122] او : و MS.
[123] *shawafān* in the sense of *tashawwuf* "adorning oneself" is a vulgarism, see E.W. Lane, *An Arabic-English Lexicon*, 1–8, London–Edinburgh (Williams and Norgate) 1863–1893, p. 1619b.

of Byzantium. One is hard pushed to change people's minds[124] when they are in the wrong, but it is much harder still when they happen to be right. However, a chesty patient must cough out at times, and he who looks for a weak spot will find it.[125]

[§2] I remember how, when I was a boy, one of my masters in Baghdad scolded, ridiculed and humiliated a man who had treated him harshly. The distinguished teacher said: "Ignorance is an illness which no remedy can be hoped to cure, and many a lowlife in filthy rags is hoaxed by the attractors of mockery. Were an elegant scholar to lampoon the moon, he would aim at it with splendid contempt and say: 'Are you the full moon that leads the nightly traveller astray and that is annihilated by the arrival of dawn? The one that is followed by waning until in the end no more than something like a lowly nail cutting can be seen? The one that, when the month draws to a close, is followed by concealment, then reappears emaciated on the surface of the sky, with freckles all over his face and ugly spots above a chequered cheek?' Only once the full moon is degraded through such derision can the tongues of the poets silence the righteous!" And so I heard this distinguished teacher trying his best, and succeeding in his rebuke of the most worthless stereotypes which people employ to show off.[126]

[§3] Whilst this craft is no doubt laudable in and of itself, I investigated it and discovered several weaknesses which have nothing at all to do with its knowledge but with its practice and prestige. These weaknesses can be summarized under seven topics, to wit: first, the complexity of the field; second, the great number of useless people who take it up; third, the nobility of the subject underlying this craft, and the risk involved in it; fourth, the inadequacy of the students; fifth, the lack of understanding on the part of those who consult a physician, and their inability to tell the difference between him who excels and

[124] The phrase *yarudd aydiya l-nās fī afwāhihim*, lit. "he returns people's hands to their mouths", is an allusion to *Qurʾān* 14:9, where it says: "Their messengers brought them clear proofs, but they returned their hands to their mouths (*fa-raddū aydiyahum fī afwāhihim*) [in a gesture of denial and rejection]". However, the current context suggests that the phrase is used in the sense of "to change people's minds".

[125] In this paragraph, ᶜAbd al-Wadūd explains why he plays the devil's advocate: as people by and large are *rightly* convinced of the value of medicine, any attack against this craft will fall on deaf ears and only confirm their high esteem of it; therefore, in order to reach people, one must pretend to endorse a false position, with the aim of reinforcing the opposite, correct point of view. Besides, it is not possible to suppress an urge to speak up ('cough out') forever, and the inquisitive mind can always identify a logical fallacy ('weak spot').

[126] Much of this paragraph is composed in somewhat effete rhymed prose, which cannot be rendered adequately into English even at the best of times.

him who is excelled; sixth, the difficulty to prevail over someone who seeks to refute this craft, and who claims that it has no impact on the body; and seventh, that what is attributed by the physicians to their craft is in reality due to God the Sublime.

[§4] [129a] [...[127]] ...[128] his feet. And if one says to them: "Those who exercise moderately and who have a balanced diet are in better shape than those who labour heavily or who live in luxury", they come up with all sorts of nonsense,[129] failing to distinguish between the most strong and the most healthy.

[§5] In every country, people are prone to delusions and false doctrines, which may be widespread or local, and which they believe to be true. Thus, the inhabitants of Egypt, no less, are convinced that dieting consists in the consumption of bread with sugar or with red raisins or with sweet pomegranates, and that the Pharaoh used to live off bananas, which, in their opinion, do not lead to the accumulation of rotten matter in the guts.

[§6] The inhabitants of Tinnīs[130] combine cow's milk and fish on the same table, saying that the 'pasture' of these animals is the same — they know that the cattle of the army graze on the shores of the lake around Tinnīs, and that from there they catch the fish; next to the milk and the fish they also put sliced watermelons from Sind on the table, so as to render their bread more pleasant. For this reason, their bodies are afflicted with vitiligo and leprosy, and in the season of autumn they are overcome by irksome hiccups, due to the oiliness of the fish which inundates their stomachs. The majority of these phlegmatics[131] are adults, hence all merchants say: "The inhabitants of Tinnīs get randy like cats — once a year". And, God knows, these people are the furthest removed from sexual desire, especially the men! Which means that even the most virile among them suffer from a nasal twang, and that any one of them may well take a bride into his house, stay there for a year or two, and accomplish nothing with the woman.

[§7] The inhabitants of Baghdad believe that none of them can be affected by a cold-induced illness, whilst the inhabitants of

[127] See note 30 above.

[128] See note 31 above.

[129] *jā'ū yadhkur kull bikār wa-jimāl*, lit. "they start to mention each and every young and old camel".

[130] Tinnīs, the ancient Tenessos, was a town of the eastern part of the Nile Delta, occupying almost all of a small island in the so-called Lake Manzala or Lake of Tinnīs, cf. *EI²* 10/531b–532b (J.-M. Mouton).

[131] The term *marṭūb*, lit. "moistened", is used here in the sense of *marṭūb al-mizāj* "of moist (scil. phlegmatic) temper".

Constantinople believe that none of them can be affected by a heat-induced illness, as though the hot element[132] did not exist among the latter and the cold element did not exist among the former. Therefore the drugstores in Baghdad are completely filled with all kinds of cold substances whilst, on the other hand, the drugstores in Constantinople are filled with all kinds of hot substances[133] — such that, if one were to seek a drug which is considered worthless in the respective city, one would not find it. What people fail to realize is that someone in Constantinople can actually suffer from an elementarily hot fever, and that in this case his misfortune is even greater, because over there, heat withstands the surrounding air in the same way as naphtha keeps burning on the surface of water.[134] Similarly Baghdad: the hotter a city is, the more at risk is a hemiplegic, because the morbiferous matter[135] withstands that burning altogether and is very difficult to ripen in a clime like Iraq, which offers hardship amidst welfare and impedes the recovery of such a patient.[136]

[§8] At the very least, people should accept that the lesser world[137] is composed of the four elements,[138] and yet we have to challenge the mob! Can you imagine the most learned man in Baghdad having the courage to insist on any of that in front of the masses? No, by God, and if he did they would drive him away! So when they come and pester him with this or that problem, he has to use tricks and change the names of the drugs, all the while acting like a scientist. And who is willing to quarrel with the Egyptians over lemon juice and with the Baghdadians over grape juice? Alas, God the Sublime knows and bears witness that the Egyptians are more deserving of grape juice, whilst the Baghdadians are more deserving of lemon juice! And who dares to anger the wetnurses and the midwives when it comes to the regimen for young infants and pregnant women, the expulsion of the

[132] *usṭuquss* < *στοιχεῖον* "element", see M. Ullmann, *Wörterbuch zu den griechisch-arabischen Übersetzungen des 9. Jahrhunderts*, 3 vols [1 + 2 *Suppl.*], Wiesbaden (Harrassowitz) 2002–2007, p. 640 and *S* 2/339 f.

[133] This reasoning makes sense, in principle, on the basis of the doctrine *contraria contrariis curantur*. However, as ʿAbd al-Wadūd proceeds to explain, matters are not always quite that simple.

[134] Hence it is wrong to assume that a cold atmosphere is sufficiently effective in preventing, never mind countering, pathogenic heat.

[135] Hemiplegia was thought to be caused by an excess of phlegm, which is cold and moist, in the ventricles of the brain.

[136] The second half of this paragraph is rather opaque, and possibly defective; my translation of it therefore remains tentative.

[137] *al-ʿālam al-aṣghar*, the microcosm.

[138] Namely: earth (~black bile, cold-dry), water (~phlegm, cold-moist), fire (~yellow bile, hot-dry), and air (~blood, hot-moist).

placenta, the facilitation of birth, uterine disorders, and children with smallpox or measles? None of this, [129b] according to the average townsfolk, is the physician's business!

[§9] The inhabitants of Aleppo, if they saw one of them wrapped in a tar-stained garment and looking into a fire pit, would not admit that this is why he feels hot! Instead they would say: "Something struck him and he is going to be ill", despite seeing the heat, the flames, the heavy breathing and the thirst. Then, on the advice of some random man or woman, they give him a syrup made from violet flowers and liquorice roots, forbid to bleed or to purge him, cover him with an extra blanket, and put on his head a thick goat-hair cap. And if matters get worse, if his teeth turn yellow and his tongue becomes black, they say: "He is weakened by the air and the rising fever", especially if the most likely cause of his condition is the bathhouse, which he may have visited a day or two before his deterioration. So when an old woman or an old man come to the physician with a complaint, he helps them with their 'fever attack' and 'air', lest they crucify him.

[§10] I know a physician called Ẓāfir ibn Jābir al-Mawṣilī[139] — may God have mercy upon him — who had lived among them[140] for about forty years. He said to me: "During all this time, I have argued with them over that matter, but they remained stubborn". In the end, he let them be, yielded to their proclamations, and offered them the kind of treatment they considered appropriate; he prescribed only drugs which they recognized and went along with their notion of morbiferous air, knowing full well that 'air' has nothing to do with it.

Chapter on the blameworthiness of practising the craft of medicine on the grounds of the subject's nobility

[§11] You must know — and no doubt know already — that the nobility of each craft is determined by the subject it is concerned with and by the purpose it serves. Now, the subject underlying the exhibition of the craft in question is the human body, and as this is the case, you also know that you are precariously dealing with something precious. In other words, a shoemaker can afford to make a mistake when he divides the leather which is the subject of his craft and which

[139] Abū Ḥakīm *Ẓāfir ibn Jābir* ibn Manṣūr al-Sukkarī *al-Mawṣilī* — a philosopher-physician, littérateur and older contemporary of ʿAbd al-Wadūd — was still alive in the year 482/1089, see Ibn Abī Uṣaybiʿa, *ʿUyūn*, 2.2/1173 (Arabic) = 3.2/1324 (English). ʿAbd al-Wadūd's addition of the phrase *raḥimahu llāh* "may God have mercy upon him" could mean that at the time of writing, Ẓāfir was already dead.

[140] That is, the Aleppines.

helps him to produce a stringed purse or a pair of boots — even with the most spoiled piece of leather he is able to modify his original design, to take less material, or reduce its size, or adjust its shape according to the defect, and fabricate something less fancy instead. But when man's hour has struck and his corpse is falling apart, it would be difficult for us to change him into some other animal[141] — so far, we have not come across anyone who witnessed the death of a person and brought him back to life, or made from him a different living being! If we had the power of transformation, we could turn the body of a deceased into another creature — a calf, a monkey, or whatever else — and we would much rather do that than leaving him to rot.

[§12] Hence Hippocrates said: "And experience is perilous".[142] See: you can visit a patient, grind with your own hands the drugs, cook them, and make sure that everything he learns or receives is strictly by the right rules; but get the time wrong, and it will slip away from you or force you to haste, especially in acute diseases. If, at that point, you administer a potion to the patient or apply something externally, you may make a mistake; and if you do nothing, you are knowingly waiting for a disaster to happen. And all this is assuming that the fallible physician ranks in the same league as Hippocrates and does not normally make mistakes! As for a less able physician — one who makes mistakes on all sides, or merely errs on the sides of quantity and quality, or timing and sequence, or modes of application: well, may God have mercy on that patient! [130a] And even if the patient survives, his constitution will not regain strength, the faculties that govern his body[143] will not fully recover, and he will not be susceptible to following orders, though he may be conscious, because you cannot elicit from him a response to your questions.

[§13] As information coming from the patient's relatives is never entirely trustworthy either, you end up relying on extrapolation, like the veterinarians do, whose task is more demanding in this respect

[141] One would expect the text to read 'impossible', rather than 'difficult', but the semantic range of the root *ṣ'b* does not accommodate this option.

[142] *wa-l-tajriba khaṭrā'* < *ἡ δὲ πεῖρα σφαλερή*, part of the first Hippocratic aphorism (sec. 1), see *Œuvres complètes d'Hippocrate*, 1–10, ed. and tr. É. Littré, Paris (Baillière) 1839–1861, 4/458 f.; cf. further G. Fichtner, *Corpus Hippocraticum. Bibliographie der hippokratischen und pseudohippokratischen Werke*, no. 13, online at: https://cmg.bbaw.de/fileadmin/Webdateien/Dateien/Hippokrates-Bibliographie_2017-12.pdf.

[143] On the concept of "governing faculties" (*quwan mudabbira*, the latter term < *τὸ ἡγεμονικόν*), which are exponents of the autonomic nervous system, see M. Ullmann, *Islamic Medicine*, Edinburgh (Edinburgh University Press) 1978, pp. 61 f.

because it involves the treatment of animals, which are incapable of speech — a horse, for example, cannot verbalize a complaint to the veterinarian. In human medicine, too, this problem arises when treating infants or mute people, but the advantage of being able to ask questions, rather than working with conjectures, is by no means insignificant. So, if you pause and ponder the predicament of such a patient,[144] you may well remember that Hippocrates said: "And time is narrow",[145] or perhaps you recall this statement of his: "And judgement is difficult".[146] Yet whilst you are thinking, the person is stuck and nature is left without an escape! Just picture my words and you will realize yourself that you would be submerged in terror at the prospect of being solely responsible for a person: try as you might, a thousand physicians — whose exact number is known only to God the Praiseworthy and the Sublime — have found themselves in a similar situation before you! And do not expect, if you succeed, to receive so much as a tenth of gratitude and heavenly reward compared to the blame, the peccability and the abuse you are going to reap if the patient dies under your hands — for in this case people will either say: "He had no idea what was the matter with him", or: "He gave him the wrong treatment".

[§14] Contemplate how much this disparity deters from pursuing medicine and from listening to its venerable traditions — the Muʿtazilite pettifoggers are the loudmouthed ringleaders here, they who believe that fire can freeze over and that one can discern a barleycorn placed on top of a mountain! We, however, adopt the stance of the practitioners of this craft, whom Hippocrates put under the most binding obligations,[147] restricting them in particular from the prescription of a pessary that induces menstruation, for fear of aborting an embryo.[148] This[149] is what he[150] swears by and accepts as a

[144] That is, a patient as discussed in §12.

[145] *wa-l-waqt ḍayyiq* < *ὁ δὲ καιρὸς ὀξύς*, part of the first Hippocratic aphorism (sec. 1), see *Œuvres complètes d'Hippocrate* (ed. Littré), 4/458 f.

[146] *wa-l-qaḍāʾ ʿasir* < *ἡ δὲ κρίσις χαλεπή*, part of the first Hippocratic aphorism (sec. 1), see *Œuvres complètes d'Hippocrate* (ed. Littré), 4/458 f.

[147] This is a reference to the so-called Hippocratic Oath (*Ὅρκος*, Arabic *al-ʿAhd* or *al-Aymān*), for which see *Œuvres complètes d'Hippocrate* (ed. Littré), 4/628–633; cf. further Fichtner, *Corpus Hippocraticum*, no. 14.

[148] Cf. *Œuvres complètes d'Hippocrate* (ed. Littré), 4/630 f. (*Ὅρκος*): *ὁμοίως δὲ οὐδὲ γυναικὶ πεσσὸν φθόριον δώσω*, which simply says "likewise, I will not give an abortive pessary to any woman".

[149] That is, the Hippocratic Oath.

[150] That is, the physician.

boundary with regard to the corruption of matter; but how about the corruption of his reputation?

[§15] When[151] Galen was still a young man, in the days of king Caesar,[152] he was called to testify in the case of a man whom he used to know and who had killed a number of people with poison. Pressed by the judge, Galen said: "Yes, I became acquainted with the herb in question at some point and for a strange reason. It happened that I put the liver of a pig upon it, then went off to do something else for an hour or so; later I discovered that the entire liver had dissolved and turned into blood. I suspected that this herb would have the same effect on human livers, and I started selling it to anyone who wished to kill his enemy — lo and behold, all those who swallowed it were drained of blood and died".[153] After the judge had sentenced the man to death, Galen suggested that he should be blindfolded before being hauled off through the city towards the place of execution, for fear that on the way he might wink at one of his comrades and thereby bequeath to him details about the herb. So much for Galen's efforts to ban it.[154]

[§16] Well known is the story of Ḥunayn ibn Isḥāq and al-Maᵓmūn.[155] It was that al-Maᵓmūn said to one of his confidants: "Ḥunayn spent a long time in the lands of the Byzantines. I fear that in search of support he may have become closely associated with certain

[151] The following anecdote — involving Galen, a deadly poison, a murderer, a court trial and an execution — appears to be a curiously twisted and strangely embellished version of a chapter in Galen's treatise *Περὶ τῆς τῶν καθαιρόντων φαρμάκων δυνάμεως*, for which see *Claudii Galeni Opera Omnia*, 1–20, ed. and tr. [into Latin] C.G. Kühn, Leipzig (Carolus Cnobloch) 1821–1833, 11/323–342; cf. further G. Fichtner, *Corpus Galenicum. Bibliographie der galenischen und pseudogalenischen Werke*, no. 75, online at: https://cmg.bbaw.de/fileadmin/Webdateien/Dateien/Galen-Bibliographie_2019-01.pdf. In the Greek text, the relevant passage runs from p. 336,-3 (*εὗρέ τις ἄνθρωπος τοιαύτην βοτάνην…*) to 337,-2 (*…ὅπως μή τινι μεταξὺ δείξειεν*).

[152] This is a chronological blunder: (Julius) Caesar died in 44 BCE, Galen was born in 129 CE; the Roman emperor who reigned at the time of Galen's 'youth', that is around the year 150 CE, was Antoninus Pius. Whilst it is true that the term *qayṣar* (< *καῖσαρ*) may denote *any* Roman (or Byzantine) emperor, the phrase used here by ᶜAbd al-Wadūd, scil. *qayṣar al-malik*, does not actually allow for a more general interpretation.

[153] According to Graeco-Arabic humoralism, blood is produced by the liver from the juice of digested food, see Ullmann, *Medicine*, pp. 58 and 64.

[154] There is no irony in this final sentence.

[155] For another version of the following anecdote, which also involves the famous translator-physician Ḥunayn ibn Isḥāq al-ᶜIbādī (d. 260/873 or 264/877) and the ᶜAbbāsid caliph *al-Mutawakkil* (instead of al-Maᵓmūn), see Ibn Abī Uṣaybiᶜa, *ᶜUyūn*, 2.1/470 f. (Arabic) = 3.1/499 f. (English).

government officials and now has a cunning plan to poison me. I must examine his loyalty and put his trustworthiness to the test immediately!" And so he said to him: "O Ḥunayn! There surely are poisonous substances in the storehouses of their kings, and it is your duty to reveal to us the ones you know, [130b] so that we, too, can store them away". When Ḥunayn replied: "O Commander of the Faithful! I only left for Byzantium and spoke the local language in order to find out what saves people from death — the stuff that plunges them into it, I have yet to learn. With your permission, however, I will return to the land of the Byzantines and acquire that knowledge also", al-Maʾmūn, the Commander of the Faithful, exclaimed: "Woe unto you! This is not going to save you from me!" And as he kept insisting on the matter, and as Ḥunayn referred himself to God the Sublime, al-Maʾmūn tried to bribe him with an estate, acres, money, a robe of honour and priceless treasures, making it absolutely clear to him how keen he was for his wish to be satisfied — alas, there was no way Ḥunayn could be coaxed. Then al-Maʾmūn swore to God in front of him: "I will have you killed if you refuse!", but Ḥunayn only said: "O Commander of the Faithful! I have told you all there is to say. If you want to sin against your soul, do as you please!" At that point, al-Maʾmūn ordered to remove the bandage from Ḥunayn's eyes, showered him with splendid gifts, gave him a promotion, waited for his fear to subside and finally, addressing him as 'Abū Zayd',[156] he said: "How calm you remained in the face of terror, and how serene you stayed in the face of death!" And Ḥunayn replied: "O Commander of the Faithful! Both my confession and my profession prohibit me from doing such a thing. As regards my confession, the lord Christ, when mentioning pureness and laudableness, said to us, nay, instructed us to act right towards those who wrong us; and as regards my profession, Hippocrates made us swear an oath[157] not even to prescribe a drug that precipitates menstruation.[158] Then I thought about it and realized that you were in the position of someone who kills for a wrong, rather than for a right reason; and I also realized that somebody like you would not allow himself to be unjust whilst somebody like me is being just".[159]

[156] The caliph here switches to a more intimate and, at the same time, more respectful form of address.

[157] Cf. note 147 above.

[158] Cf. note 148 above.

[159] Ḥunayn ibn Isḥāq was a (Nestorian) Christian, the caliph al-Maʾmūn, obviously, a Muslim.

[§17] As this is so, what do you make of a reckless physician? Even if I told you that they kill in all sorts of ways, I would not be far from the truth! Let me explain to you how that happens. You must know that any one of them may call himself a physician[160] and say: "I only ever use seeds and barley-water", without realizing that barley-water, when administered at the wrong time, can be more destructive than al-Ḥajjāj ibn Yūsuf al-Thaqafī;[161] the reason is that when barley-water is given to a patient at the onset — before any induced, non-natural variety of evacuation has taken place — the veins swell up all over the body due to obstruction. I say: such a patient, especially if he suffers from unintermitted fever[162] and is exposed to this treatment, cannot possibly survive. Hippocrates dedicated a widely known book to barley-water[163] — whoever has read it can safely dispense with anything else that is being said about the subject, because by describing what is appropriate he also implies what is inappropriate. And if you see someone like Hippocrates give the right instruction, disregard it at your own peril and make the ultimate mistake!

[§18] I myself have witnessed something like that in the countryside: a lad had woken up in the morning with a fever; the most probable cause was that he had eaten too much *kishkiyya*[164] the day before and some of it lay still undigested in his stomach; then the innate heat flared up.[165] It had all started with a headache, said fever, and thirst. The physician who was with them did nothing except prescribe barley-water, which was duly prepared for the lad. I called on him only after he had drunk the barley-water; he was in a state of great anxiety; then vomiting came, and the barley-water together with the rest of *kishkiyya* gushed forth. But what would have happened had the barley-water and the remaining *kishkiyya* sought to go through the

[160] Cf. note 54 above.

[161] al-Ḥajjāj ibn Yūsuf al-Thaqafī (d. 95/714) was an Umayyad governor infamous for his ruthlessness and (alleged) mass executions, cf. *EI²* 3/39b–43a (A. Dietrich).

[162] *sūnūkhūs* < *σύνοχος* "unintermitted (fever)", generally called in Arabic *(ḥummā) al-diqq*, see Ullmann, *Wörterbuch*, *S* 2/393.

[163] This is a reference to a section in Hippocrates' *Περὶ διαίτης ὀξέων*, dealing with barley-water (*πτισάνη*, Arabic *māʾ al-shaᶜīr*), see *Œuvres complètes d'Hippocrate* (ed. Littré), 2/244–279; cf. further Fichtner, *Corpus Hippocraticum*, no. 4. In the Arabic tradition, this section has also been transmitted as a separate treatise, see Ullmann, *Medizin*, p. 29 no. 6 and F. Sezgin, *Geschichte des arabischen Schrifttums*, vol. 3, Leiden (E.J. Brill) 1970, p. 33 no. 4.

[164] *kishkiyya* is a kind of oatmeal porridge, cf. R. Dozy, *Supplément aux dictionnaires arabes*, 1–2, Leiden–Paris (E.J. Brill and Maisonneuve) 1927², 2/472b.

[165] On the concept of "innate heat" (*ḥarāra gharīziyya* < *τὸ ἔμφυτον θερμόν*) see Ullmann, *Medicine*, pp. 65 ff.

mesentery,[166] and had God the Sublime not kindly granted vomiting to the young man? Vomiting of this kind has a particular cause, namely [131a] that, as there is no cavity at all beyond the stomach into which it could push the food, it pushes it into the oesophagus and then into the mouth, whence it emerges in a direction opposite to the natural one. There is no need for me to recount all the other numerous malpractices that I have seen — not a single day goes by without me discovering a gross medical blunder, either through personally examining a patient or through the corroborating accounts of some of those who suffered from an illness.

[§19] You must know that I am not interested in vilifying the physicians whom I just referred to — had I wanted to vilify them, I would have mentioned them by name. As regards the fools whose names I explicitly stated in that poem in the middle of the treatise,[167] well, they are only fools! Besides, I did not accuse them of anything, nor indeed do they identify with medicine, and nobody would send for them or seek their medical advice. I am calling your attention merely to those who in fact are physicians, and here, by my life, I am showing greater tolerance for their appalling malpractices than the distinguished Galen ever did! For he, in the first three treatises of *The Method of Healing*[168] as well as in the book *On the Element*,[169] does mention his opponents by name and scolds them one by one for daring to challenge a man like himself.[170] In my opinion, this is futile. I seek the protection of God from a craft in which a life can be ruined by a simple error on the part of someone who, of all people, should desire nothing more than its preservation and enhancement!

[166] *māsārayqā* < *μεσαραϊκά* "mesentery", see Dozy, *Supplément*, 2/565a. It is not clear how exactly ʿAbd al-Wadūd understood this term.

[167] We do not know which 'fools' (*ruqaʿā'*) ʿAbd al-Wadūd named "in that poem in the middle of the treatise" — this poem must have been part of the lost section of the manuscript, cf. note 30 above.

[168] This is a reference to the first book of Galen's *Θεραπευτικῆς μεθόδου* (Arabic *Ḥīlat al-burʾ*), for which see *Claudii Galeni Opera Omnia* (ed. Kühn), 10/1–77 with Fichtner, *Corpus Galenicum*, no. 69.

[169] This is a reference to Galen's *Περὶ τῶν καθ' Ἱπποκράτην στοιχείων* (Arabic *Kitāb al-Usṭuqussāt ʿalā raʾy Ibuqrāṭ* [here simply *al-Usṭuquss*]), for which see *Claudii Galeni Opera Omnia* (ed. Kühn), 1/413–508 with Fichtner, *Corpus Galenicum*, no. 8.

[170] In his *Method of Healing* (cf. note 168 above), Galen does indeed name and, as ʿAbd al-Wadūd says, 'scold' his opponents, see *Claudii Galeni Opera Omnia* (ed. Kühn), 10/52 f.; as regards Galen's *Elements* (cf. note 169 above), he there merely recounts the names and doctrines of some of his predecessors, without openly attacking them, see op.cit., 1/444 and *passim*.

Chapter on the blameworthiness of practising
the craft of medicine on the grounds
of the feeble-mindedness of those who
consult a physician, and the difference between
him who excels and him who is excelled

[§20] You must know that sharing the responsibility for the treatment of a patient with another physician is not a good situation for you to be in, it is a fairground of animosity which no judicious person would condone. Inevitably, the other physician is either your professional equal, in which case you can say to him that one of you should suffice; or he is your junior, in which case you can say to him that you alone will suffice and that he should leave the patient; or he is your senior, in which case you can say to him: "So-and-so is all yours, allow me to leave!" And do not underestimate the problem of crowding — it confuses the mind and is bad for profit, though you can expect that the latter will be split between yourself and the other physician, provided he is a decent man. Staying with mundane matters: if you are a fellow of well-known reputation and he is of little renown, you honour him by your company, he becomes your peer, and the relatives of the patient may say: "The physicians So-and-so and So-and-so have arrived"; on the other hand, if you are the one who is of little renown and he is a man of well-known reputation, they may regard you as his subordinate and his beneficiary — promise me, though, that the other is not an idiot but a fair-minded, civilized person who says to them in your absence: "This physician is poor, he deserves that you reward him well", thereby showing that he has your interest at heart. And should he be compelled to sing your praise, he better describe you as intelligent, kind, pious, gracious and the like, for even if he attributed to you all virtues of the soul, it would cost him nothing.

[§21] Further, if one of the two physicians, be it in bygone times or just yesterday, has licked the hole of some emir or sniffed the piss of some governor, the other may well be Rufus whom Galen so highly vaunts:[171] in the eyes of the patient's relatives and the local old women, an undecorated doctor is worth less than the drugs he prescribes. Sometimes, the patient is a servant of the sultan. In that scenario, the other physician arrives after you and finds you sitting; he takes a seat in front of you, turns his face pompously towards the patient, and whispers in his ear; then he turns his face back to you and

[171] Galen does, on occasion, approvingly refer to Rufus of Ephesus (fl. around 100 CE), see for all passages *Claudii Galeni Opera Omnia* (ed. Kühn), 20/536b (index).

gives you a quick look, so as if he wanted to hide something from the patient [131b] and to say to you 'Get up, I need to be alone with him!' Then he says: "Our associate will come to you in the morning. He has just asked me about your condition and I told him that he is safe to look after Your Grace. In two or three days time, go with him to the bathhouse". And all the while you watch and witness the patient's decline! This physician spoke with two faces — on the one hand, if you manage to get to the bottom of the patient's decline, he envisages to make a profit, without thanking you; on the other hand, he knows that a condition like this may well break the patient. Now, during his steady decline, the deplorable patient will be able to follow medical advice. Yet when he enters the days of the crisis, he may catch bribes of conversation which impede the governing faculty of the body[172] from effectively tackling what I consider an otherwise perfectly solvable problem; as a result, his condition deteriorates to a point where not even an emir or a vizier can be of help anymore. This is why Hippocrates forbade to listen to the braying of donkeys and the tapping of the rain:[173] during a crisis, the patient needs nothing more than to be blind, deaf, and shielded from all bad tidings that might upset him.[174]

[§22] Regarding the habit of the kings to consult two, three or more physicians, as we see it in Baghdad and Cairo, it would not be right for you to console yourself by this example. The kings do that because it looks good, and because it enables them to rely on the succour of a whole range of physicians. In important cases, the kings may call upon more than one physician, but otherwise each of them goes to the palace separately, depending on the nature of the problem. They only gather all together around the master for a truly alarming reason, and then they generally follow the lead of a chief physician. Also, when they assemble to hear which one of them is called to the master, they always look for an excuse to be replaced by somebody else, professing that the other is a better choice. This is so as to avoid being alone with the lord in his illness — for if he dies, the colleagues

[172] On this 'faculty' (here: *ṭabīʿa*) cf. note 143 above.

[173] This appears to be a faint, extremely warped reference to a passage in Hippocrates' *Περὶ ἱερῆς νούσου*, where he polemicizes against charlatans, sorcerers and other 'impostors', saying (in Littré's translation): "En effet ils prétendent savoir les moyens de faire descendre la lune, d'éclipser le soleil, de provoquer l'orage et le beau temps, la pluie et la sécheresse, de rendre la terre et la mer infécondes, et tant d'autres merveilles", see *Œuvres complètes d'Hippocrate*, 6/359 and 361; cf. further Fichtner, *Corpus Hippocraticum*, no. 32.

[174] The final part of this paragraph contains some interesting *psychological* observations.

will say: "You should never have attended him all by yourself!" Acting as a group has the singlemost advantage of being able to agree collectively on the appropriate treatment. And this is certainly a fair point, because in such a situation, there is neither the time nor the place for self-promotion and competitiveness: rather, whoever comes up with a good idea first, the others accept it in silence; and whoever has a bad idea, the others will turn his mind gently gently away from it, restraining themselves and keeping up an appearance of harmony and magnanimity.

[§23] Moreover, the kings, when they make use of several physicians and frequently augment them by peers of distinction, are like nature, which delegates power to the important organs: ideally, these come in pairs, so that if one is damaged, the other can be used as a substitute, for example the eyes, the ears, the nostrils, the hands, the feet, the breasts notably of women, and the testicles. Sometimes, nature makes a single organ which, even though it is just one, has nonetheless many branches: underneath the skull, even though there is only one, are two membranes which cover and protect the matter of the brain; the brain itself has three ventricles, so that if one is damaged, two remain intact.[175] Similarly the liver, which possesses ducts, and the stomach, which possesses layers — there may not be two stomachs, but it is still an organ that fulfills a variety of specialized functions, whose description, however, would lead too far.

[§24] The same is true for the artisans, who get by with only a few implements. Just look at the strings of a lute: originally, it had four; then they were doubled to form sets of two each; and sometimes, they are arranged in sets of three, which is the best option.[176] And so every artisan resembles nature in his ability to work with a mere two or three items. The kings are no different: if one of their physicians dies or falls ill, others from the group will take his place. And if a physician offends the king in one way or another — by being caught drunk in the middle of the night, or by trespassing on the king's estate and spending the night there — others from the group will take his place. Kings treat like that not only physicians but all their 'tools' — horses, weapons, houses and even doors, for the house of a king [132a] may well have two or, as it happens, three doors.

[175] In the absence of a microscope and no legally permissible routes to dissection, the above brief excursion into the basic anatomy of the brain would appear to be fairly representative of the knowledge base of the average medieval Arab practitioner.

[176] ᶜAbd al-Wadūd here refers to: a lute with four single strings; a lute with four courses (i.e. four sets of eight singles); and a lute with three courses (i.e. three sets of six singles).

[§25] As regards lower-ranked, non-royal physicians, do not associate with them under any of the circumstances which I warningly laid out for you![177] But if you do, expect the least trouble from a decent colleague who says: "I am going to take care of everything"; a wicked colleague, however, may say: "Provided that you toe the line". And should a quarrel break out between you and him in front of the patient, well, this is a situation from which we cannot rescue even the most circumspect man!

[§26] Galen's patience was sometimes tested by people with whom he then had to argue in front of patients — the man does not mention his dealings with them in order to boast, but to teach you deductive medicine. Something along those lines happened between him and the physician Thales from the so-called empiricist school, in the presence of the king, on the occasion of the illness of Diogenes the Cynic, and regarding the *diyākhīlūn* ointment. This is a strange and long story, so suffice it to say that Galen, having won the argument and still been badly berated by said court physician, declared: "O King! If tomorrow at sunrise Diogenes has droplets of sweat resembling cold honey on the sides of his forehead, he will die" — and it was like Galen predicted.[178] Anyone who wishes to find more information about all of this, should read the book *The Method of Healing*.[179] I have seen many fatal mistakes made by physicians, especially among the Jews in the regions of Iraq, but let us be content with God!

Chapter on the blameworthiness of practising this craft on the grounds that some diseases are hard to cure, and that it is difficult to prevail over someone who seeks to refute it

[177] Cf. §§20–21.

[178] The preceding story — featuring Galen, a court physician named Thales (*Thālis*) "from the empiricist school" (*min al-firqa… al-mujarrabiyya*), an unspecified king (*malik*), a patient named Diogenes (*Diyūjānis*, MS: *Dwjāns*) "the Cynic" (*al-kalbī*), and an ointment (*marham*) called *diyākhīlūn* (< διάχυλον) — cannot be traced to any of Galen's extant writings. It is possible that 'Thales' is a corruption of Thessalus (طثالس instead of ثالس), a physician (but no contemporary of Galen), against whom he frequently polemicizes (e.g. *Claudii Galeni Opera Omnia* [ed. Kühn], 10/250), but that does not take us any further. Looking at the chronologically incompatible protagonists as well as the overall setting of this story, it bears all the hallmarks of a later literary fabrication, probably gnomological in nature.

[179] On Galen's *Ḥīlat al-burʾ* cf. note 168 above.

[§27] You must know that there are a great many people who seek to refute this magnificent, beneficial craft. And here I am not saying that they decline to recognize its usefulness, but that they deny its validity as such. Now, if the physician who is anxious to debate them and keen to convince them of its value fails to do so, their eyes light up and a cloud settles on the eye of the craft. The challenge for the physician is to assert his trade! In most cases, one can gain the upper hand through sophistic or dialectic arguments, but the fact remains that it takes hard work on the part of the advocate to master the different methods of demonstration. As regards certain groups of speculative theologians, who are obsessed with a whiff of wine on the physician's face and swiftly accuse him of infidelity, there is not enough paper to deal with this! I have no inclination to go through all the foul opinions they hold about medicine, nor do I see any need for it in this epistle.

[§28] It is clear from this summary that if an opponent who is skilled in the art of refutation — and here I mean someone who is both knowledgeable and tenacious — applies himself to denying the very existence of this craft, he will succeed; if, however, he has no refutational training to fall back on, it can go either way. Now, as soon as a dedicated opponent — the kind which I just described to you — says: "Does medicine exist?", you will not be able to give an answer that humbles and silences him, because the average physician either ignores how to adorn himself[180] with a proof or lacks self-confidence. As regards questions like 'What exactly is medicine?' or 'What is its defining feature?' or 'What is its purpose?' — this is something that almost no defender of the honour of this craft can hope to answer well.

[§29] But even when physicians stand up together in medicine's defence and one amongst them happens to be a sufficiently competent advocate, he is swiftly confronted by another fifty or so branches of opposition! Should God let me live long enough, I might write something about that. So far, I have never seen a physician who was pestered by one of these people and who managed to extricate himself well, without losing his temper or feeling resentful that he is left to deal with this task all on his own. And countless times I have heard ordinary folks say with general approval: "Do not put yourself in the hand of a physician and do not take to your bed!" — thus placing doctor and sickbed into the same category of dislike.

[180] On *shawafān* cf. note 123 above.

Chapter on the blameworthiness of practising medicine on the grounds of the inadequacy of its students and those who are identified with it

[§30] You must know — may God give you success — that the word 'intention' basically implies to want a thing, but it is also extended to matters of the highest importance and to the removal of anything that stands in their way. Muᶜāwiya said [132b] to his companions: "Strive for something! I strove for the caliphate and got hold of it!"[181] Now, among matters of the highest importance in this craft is that you do not embark on exercising it if you are easily troubled, nor if you lack authority and struggle to assert yourself. One of the most daunting scenarios you need to envisage and prepare for is a chronically sick patient whose case is brought to your attention by the locals, who at the same time tell lies about him behind your back: do under no circumstances visit a patient after the fourth day of his illness, and never after another physician had been alone with him or after that patient had been abandoned to his ignorance! For many sick people, in their initial disbelief, take their complaint lightly, do not consult a physician nor even make him aware of their complaint in passing, and all the while the affliction worsens, either by itself or as the result of some mistake. Further, suppose you get to the throat and the signs of something nasty become apparent; an old woman, who thanks to her ample experience recognizes death in the face of the patient, says to his relatives: "I could not have wished for you anyone better than this So-and-so!"; and on top of it all, word has spread that you previously had success with another serious case — then turn to God in fear for your soul!

[§31] Beware of being misled by go-betweens: wave your hand in their faces, chase off those for whom you have little respect, cut their zealousness short by getting up if they happen to be sitting or by walking away from them if they happen to be standing, and use any pretext, however brazen, to quit them. And should you already know something about the patient before they ask you for help, do not listen to them and do not let them into your house if you live among them — for they are ignoramuses who call upon you, not to treat a truly sick person but to comfort old or sterile women and to soothe a heartache, with the intention of turning you into a target of disdain, an object of

[181] I have not been able to substantiate this alleged saying of Muᶜāwiya ibn Abī Sufyān, the founder of the Umayyad dynasty of caliphs, who reigned from 41/661 to 60/680. Regardless of its 'authenticity', the saying appears to contain an allusion to *Qurʾān* 9:74, where it says: "[The disbelievers] had intended what they could not achieve (*wa-hammū bi-mā lam yanālū*)".

ridicule, and a scapegoat in the eyes of the patient's relatives! Rather, make excuses and intimidate them by swearing solemn oaths, so that they do not again bother you with requests; and if one of them, even after you have sworn an oath, continues to negotiate glibly with you, do not threaten but get rid of him, for such a one has no religion, and he who has no religion has no value! Just look at how he encourages you to break your oath: give in, and he will cripple your sense of shame, weaken your resolve to act righteously, and thwart your ambition to make a name for yourself.

[§32] Another time you go to see a patient and recognize fatal forebodings in his raised temperature, his reflexes, his lying sideways, his pulse and his urine — in this case, just prescribe him cold water and rose-water, then leave and do not come back; excuse yourself with some unexpected, urgent business, and do not share your thoughts with any of the patient's relatives nor with anyone who knows him well or who might certify his death. Such a situation arises notably when the disease is acute, like Hippocrates said: "In acute diseases it is not possible to predict either life or death with absolute certainty";[182] and he said that because he understood how quickly acute diseases turn from good to bad and from bad to good. The symptoms of a chronic disease, on the other hand, are almost never clear-cut. You must know that in the eyes of ordinary people there is nothing that separates you from all other physicians, so you have no reason not to heed my warnings.

[§33] On the subject of people's perception, they are also unable to distinguish between a physician who excels and one who is excelled, so try your best to get the patient back on his feet by treating him with the opposite of what is used in diseases that are difficult to cure and very unlikely to come to a happy ending. And do not let yourself be drawn in by what Galen said in his book titled *Affected Parts*, namely that a pulmonary rupture is curable when treated appropriately[183] — how many faces have been blackened with grief[184] by this statement!

[182] *inna l-qaḍīya bi-l-mawt wa-l-ḥayāh fī l-amrāḍ al-ḥādda laysat ᶜalā ghāyat al-thiqa* < *τῶν ὀξέων νοσημάτων οὐ πάμπαν ἀσφαλέες αἱ προδιαγορεύσιες οὔτε τοῦ θανάτου οὔτε τῆς ὑγιείης*, that is the nineteenth Hippocratic aphorism (sec. 2), for which see *Œuvres complètes d'Hippocrate* (ed. Littré), 4/474 f.; cf. further Fichtner, *Corpus Hippocraticum*, no. 13.

[183] The strange allegation that Galen, in his *Περὶ τῶν πεπονθότων τόπων* (Arabic *al-Aᶜḍāʾ* [here: *al-Mawāḍiᶜ*] *al-ālima*), describes a pulmonary rupture (*inṣidāᶜ al-riʾa*) as conveniently treatable, cannot be substantiated. For the cited Galenic work see *Claudii Galeni Opera Omnia* (ed. Kühn), 8/1–452 with Fichtner, *Corpus Galenicum*, no. 60.

[184] On the expression *sawwada... wajhan* see Lane, *Lexicon*, p. 1461a.

Should you ever have to deal with a patient like that, do as Galen tells you, but only if he is on the brink of death, for then a good outcome is certainly not achieved by hiding away; I also fear that otherwise it might dawn on the patient how far he is from winning this battle.

[§34] There are some dreadful illnesses which do not respond to treatment; which may kill even the physician alongside others;[185] and from the likes of which nobody has been seen to escape except very rarely. For example: leprosy with gradual loss of the fingers; elephantiasis; varicose veins; ascites; epilepsy in those who have reached the age when organs stop growing; *ʾf/qṭyfs*;[186] [133a] emaciation in old men; diarrhoea that contains bits of gut; vomit-inducing spasms; erysipelas;[187] the bite of a rabid, water-fearing dog; ileus[188] preceded by faecal vomiting; kidney stones in middle-aged men; water in the eye;[189] ulcerating cancer; internal haemorrhoids; hemiplegia; facial paralysis in those who have passed the age of seventy; and melancholy[190] in men who are predisposed to this humour.[191] Among those illnesses are some that can be hoped to improve after a lot of effort, and some from which there is no rescue at all. This is why nobody in their right mind would even begin to treat them!

[§35] And should you ever be called to see such a patient in order to cheer him up, and people say to you: "If only you could get him out of this gloomy mood, so he may die in peace!" — do not listen to their talk, for breaking the heart of someone whose heart is about to be broken anyway is better than raising illusions of progress and salvation. I know, after all, that sooner or later you, too, will be confronted with a similar condition, one which most patients cannot survive — then resort to showing them compassion, do whatever you can to make them comfortable, but place no hope at all in any of this!

[§36] Imagine a young man whose voice is afflicted with hoarseness, whose face looks old, the white of his eyes is mingled with a dull redness, and he is losing hair on the edges of his brows; he thinks to himself that he should approach you for help in the manner of servants, or so it was suggested to him, and he also thinks that you

[185] This seems to be an implicit reference to contagious diseases.

[186] See note 117 above.

[187] For *warashkīn* "erysipelas" see *Marwān ibn Janāḥ: On the Nomenclature of Medicinal Drugs (Kitāb al-Talkhīṣ)*, 1–2, ed. and tr. G. Bos, F. Käs, M. Lübke and G. Mensching, Leiden–Boston (Brill) 2020, 1/489 no. 307.

[188] *aylāwus* < *εἰλεός* "ileus", see Ullmann, *Wörterbuch*, p. 222 and *S* 1/314.

[189] That is, cataracts.

[190] *mālinkhūliyā* < *μελαγχολία* "melancholy", see Ullmann, *Wörterbuch*, p. 410.

[191] Namely, the black bile.

are a learned person, or so it was suggested to him; he had received treatment in the past and gotten better; his pulse after evacuation is strong, and he patiently endures dieting. Without any doubt he is one of those people who feel worse in the season of spring and whose condition improves again in autumn,[192] so the only obstacle between yourself and his wellbeing is ignorance.[193] Compare this to the other illnesses which I told you about summarily![194] The latter you must catch in their early stages, and inform the patient of how far advanced they are — revenue from them comes in the form of a good reputation, and God grants success!

Chapter on the warning against a pit of this craft which scholars have forgotten as they frequently fall into it

[§37] You must know that quite often practitioners of this craft are pestered by a special breed of people who, by my life, mess up the letter *sīn* before they even come to you![195] The nuisance they pose is far from trifling, so do not take it lightly! The thing is that these cloth merchants and their ilk like to engage the physician in chitchat, which sometimes pushes him to shouting in anger. One of them may say: "I know my constitution — prescribe me this and not that!" The next may say: "O learned friend! We were already visited by this dog So-and-so" — and he mentions another physician who had come to see him before you and who had prescribed him such and such — "but in the end I sent him away. You, however, have been recommended to me, so please take a look at this mess!" Well, assume this dismissed physician had done all the right things and the illness of the old boy had still gotten worse; in that case, he chose you deliberately and after careful consideration: for if you prescribe him exactly the same stuff, then surely because you have heard and now simply follow the other's

[192] Lit. "the other season which is before winter" (*al-faṣl al-ākhar alladhī qabl al-shitāʾ*).

[193] This description, though rather clumsily phrased in the original, seems to refer to a case of hayfever, which is a perfectly harmless complaint.

[194] See §34.

[195] The phrase *wa-hum… tataḥarrafu l-sīn awwaliyya dhuhūbihim ilayka* "and they [the smart-asses] mess up (the letter) *sīn* before they even come to you" is a sarcastic metaphor, implying that certain patients, who possess (or believe to possess) some half-baked knowledge of medicine, harass the physician with preconceived self-assessments which are just as wrong as misspelling the letter س (for example by writing ش or ص). Consider also the possibility that the strange manuscript reading اليق (instead of اليك) may in this context be a *deliberate* spelling mistake to drive home the aforesaid point.

advice, despite the fact that an error of the first physician is not seldom rectified by the second, and so the patient dismisses you as well; if, on the other hand, you change his regimen, the patient is certain to go downhill. You have therefore no other option but to employ [133b] different drugs that have the same effect, which compels you to lying and cheating.

[§38] Bar[196] Riḍwān the Egyptian — may God have mercy upon him — has always had a vile character and a lot of money.[197] When he went to see a patient and heard him joining in the use of medical jargon, such as: "I suffer from the illness called dysentery",[198] or: "I am overcome by the crisis of the fourth day", or: "My phial shows a sediment" — in short, as soon as he heard the patient using physicians' terminology, he abruptly stopped talking or listening, whichever he was in the middle of doing, and left in such a fury that one could have threatened to cut off his head or handed him all the wealth of this world, he would never return to that house nor cede to the pleadings of a mediator. This is sound management: it prevents a headache and puts palaver to rest right from the start! A patient like that, one who fits the above description, will question you with every breath and quarrel with you over absolutely everything — he only calms down when seized by phrenitis,[199] in which state he no longer knows what is happening to him and, even if he pulls through, will cause no more trouble.

[§39] At this point, I seek the blessing of God the Sublime and come to an end, but not before reassuring myself of a couple of things. First, it has been my aim in this treatise to convey information specifically to novice physicians; the experienced, erudite professional already knows a great deal more about the pitfalls of practising this craft than I have been able to put into writing here — he fears no-one and will not be surprised by this collection of guidelines. Second, my

[196] Cf. note 120 above.

[197] The following anecdotal set-pieces — meant to illustrate the character and, more specifically, the professional attitude of the well-known physician ʿAlī ibn Riḍwān al-Miṣrī (d. 453/1061 or 460/1068) — are found nowhere else as such. Given the nature of these items of information, it is quite likely that ʿAbd al-Wadūd obtained them from hearsay; they do not seem to have been part of Ibn Riḍwān's autobiography, which is now lost but was cited, apparently *in full*, by Ibn Abī Uṣaybiʿa, *ʿUyūn*, 2.2/1062–1065 (Arabic) = 3.2/1192–1197 (English). On Ibn Riḍwān cf. *EI*[2] 3/906a–907a (J. Schacht).

[198] *dūsinṭāriyā* < *δυσεντερία* "dysentery", see Ullmann, *Wörterbuch*, pp. 210 f. and *S* 1/298.

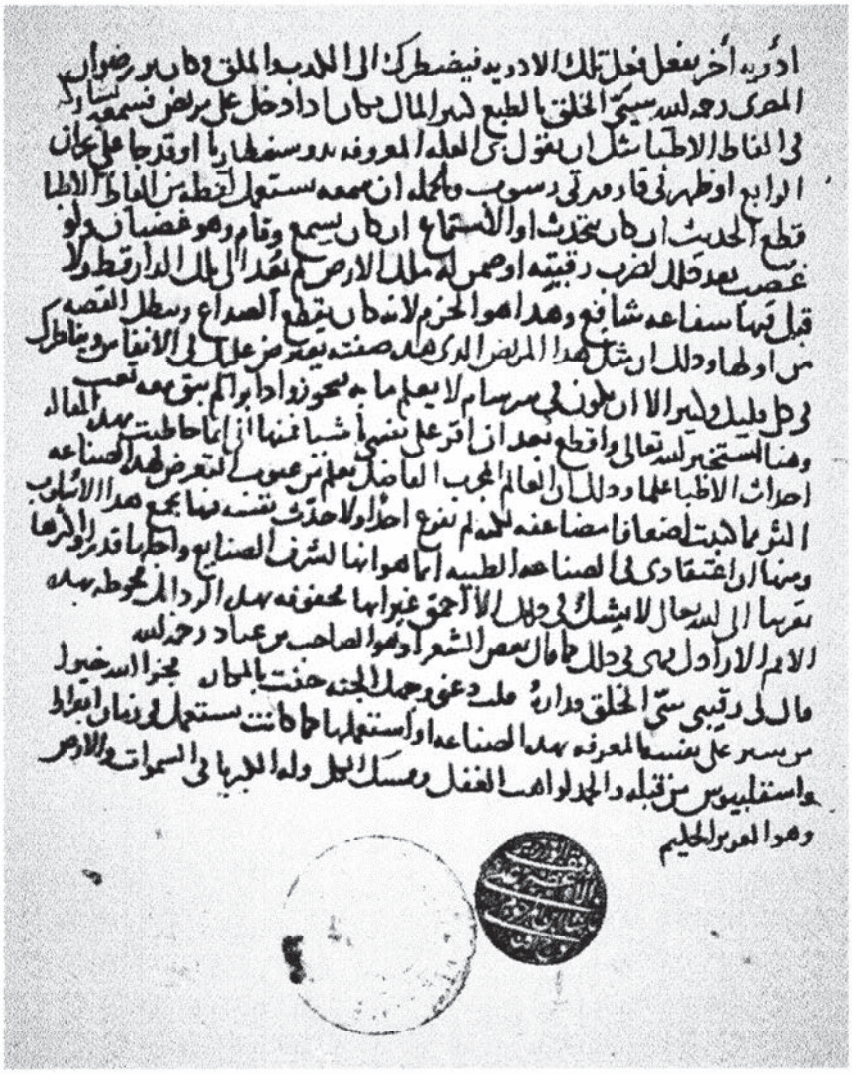
[199] *sarsām*, a Persian term, denotes "phrenitis", see Dozy, *Supplément*, 1/648b; further F. Steingass, *A Comprehensive Persian-English Dictionary*, London (Routledge and Kegan Paul) 1963[5], p. 674b: "frenzy, delirium".

belief in the medical craft is based on the fact that it is concerned with accomplishing noble and most valuable deeds, which are in close proximity to God the Sublime — only a fool can harbour any doubts about that! Yet our craft is also surrounded by vices and encircled by gangs of riffraff. In this respect, it is as one of the poets — al-Ṣāḥib Ibn ᶜAbbād, may God have mercy upon him — remarked:

He said to me: "My master has
A vile character, you must flatter him!"
I said: "Spare me your face! Patronage
Is surrounded by calamities!"[200]

[§40] May God reward anyone who burdens himself with the knowledge of this craft and employs it like it used to be employed in the time of Hippocrates and, before that, Asclepius. Praise be to Him Who bestows reason and Who holds everything! His is the glory in the heavens and upon the earth — He, the Almighty and the Ever-Wise!

[200] For these two verses from the pen of the Būyid vizier and littérateur al-Ṣāḥib Ibn ᶜAbbād (d. 385/995), see *Dīwān al-Ṣāḥib Ibn ᶜAbbād*, ed. Ibrāhīm Shams al-Dīn, Bayrūt (Muᵓassasat al-Aᶜlamī lil-Maṭbūᶜāt) 1422/2001, p. 153 no. 98. On Ibn ᶜAbbād cf. *EI*² 3/671a-673a (Cl. Cahen and Ch. Pellat).



MS Istanbul *Hekimoğlu Ali Paşa* 691, fol. 133b (explicit)

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Abstract

This article deals with an Arabic treatise on medical deontology, written in defence of medicine *as such* and conceived, quite exceptionally, from the viewpoint of the devil's advocate; the treatise is explicitly addressed to novice physicians and hence has a strong didactic flavour. The text itself is preserved in a unique, undated manuscript from Istanbul. It was composed by

a rather elusive physician called ᶜAbd al-Wadūd ibn ᶜAbd al-Malik, who lived around the year 1100 CE, most probably in Iraq. His highly interesting essay is critically edited here in its Arabic original, and accompanied by an annotated English translation. ᶜAbd al-Wadūd touches upon a number of philosophical, ethical, social and practical subjects that are otherwise hardly expressed in relevant Arabic literature, and he does so in an unusually personal, remarkably sarcastic and polemic fashion. Thus, the treatise offers a rare, and in all likelihood authentic insight into the daily life and professional challenges of a medieval Arab physician.

WHO IS THE AUTHOR OF *AL-QĀNŪN AL-ṢAĠĪR FĪ L-ṬIBB* ("THE LITTLE CANON OF MEDICINE")?

FAKHRIDDIN NUSRATOVICH IBRAGIMOV*

Introduction[1]

In 2013, the United Nations Educational, Scientific and Cultural Organization (UNESCO) announced the international celebration of the millennium anniversary of Abū ᶜAlī b. Ibn Sīnā's *al-Qānūn fī l-ṭibb*. Conferences dedicated to Ibn Sīnā and his work were held in different parts of the world and numerous books and studies on the scientific heritage of the great philosopher were published by various research groups with expertise on the heritage of Ibn Sīnā. In particular, Kadircan Keskinbora, head of the Department of History of Medicine and Medical Ethics of Bahcesehir University in Istanbul, translated a lesser-known work of Ibn Sīnā, *al-Qānūn al-ṣaġīr fī l-ṭibb*, from Arabic into Turkish and published it along with a facsimile of the manuscript. He also gave a lecture about that book in Bukhara where the "The International Ibn Sīnā's Readings" conference is held annually. Keskinbora used a manuscript with shelf mark 2529 from the collection of Veliyüddin Efendi of the Beyazıt State Library as the basis for the translation and facsimile of the work. Because *al-Qānūn al-ṣaġīr fī l-ṭibb* is not mentioned in a biography written by Ibn Sīnā and his student Abū ᶜUbayd al-Jūzjānī, (d.462/1070), nor in the catalogues of Ibn Sīnā's works, nor in medieval bio-bibliographic sources, scholars at al-Biruni Institute of Oriental Studies, Academy

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[1] I would like to express my gratitude the Director of al-Biruni Institute of Oriental Studies, Professor Bakhrom Abukhalimov who made valuable suggestions. I wish to express a special word of thanks to Associate Director Professor Surayyo Karimova who did a systematic proofreading of a manuscript and proposed many useful corrections. Thanks are due to the staff of the Sülaymaniye Library in Istanbul for allowing me to work in the library, as well as to Dr. Ahmed Abdelbaky Hussain of Egypt, who provided the *al-Kāfī fī l-ṭibb* edition of the book. I also express my gratitude to Dr. Ato Kenjayev, honorable professor of the Turan Academy of Sciences in Uzbekistan, for his precious medical suggestions. I am indebted to Dr. James Pickett (University of Pittsburgh) for his comments and suggested revisions. I express my special thanks to Dr. Raphaela Veit (University of Cologne) for her general remarks to the article.

of Sciences of the Republic of Uzbekistan, have doubted that it was in fact written by Ibn Sīnā. Additionally, after the publication of the work in Keskinbora's edition, new copies of the manuscripts came to light which have led to questions about the authorship of the *al-Qānūn al-ṣaġīr fī l-ṭibb*.

Attributing apocryphal accounts to famous scholars was a widespread practice both in Islamic and European contexts to ensure the dissemination of the work being written (or in many cases copied) and to increase marketability. Sometimes, if a part of the author's name was the same as that of another more famous author (for example, patronymic (*kunya*) or onomastics (*nisba*)), the copyist would either deliberately or unintentionally attribute the work to the more famous scholar.[2] Moreover, in practice, a given work was often attributed to different authors or circulated under different names, despite the fact that authorship was generally attributed to a particular author. This situation applies to the works of Ibn Sīnā. However, it should be noted that despite the fact that some of the works of the great philosopher were burned and destroyed during his lifetime, most of them survived in greater numbers than those of other famous philosophers.[3]

Although Ibn Sīnā left a rich scientific legacy, the preservation and transmission of his works to subsequent generations were far from straightforward. Ibn Sīnā's disciple and biographer al-Jūzjānī wrote that his master was very liberal with his works "and showed little interest in keeping copies [for himself].[4] Ibn Sīnā's peripatetic lifestyle also led to the dispersion of his books and treatises. One cannot confidently state that al-Jūzjānī, who collected the works of his master, listed them completely. Ibn Sīnā's frequent participation in social disputes produced many adversaries and it is possible that they played a negative role in preserving his works for later generations. Moreover, Ibn Sīnā's writings were not equally well received by Muslim scholars, which led to the disappearance of some of them.

[2] Hamed Arezaei in his article "Ibn Sīnā and the fear of death; Correction of a mistake about the monograph attributed to Ibn Sīnā" states that the work belongs to Ibn Sīnā's contemporary Abū ʿAlī Aḥmad b. Muḥammad b. Yaʿqūb b. Miskawayh (d. 1030 CE). Arezaei states that the work is part of *Taḏhīb al-aḫlāq wa taṭhīr al-ʿarāq* ("Treatise on Ethics and Purification of Dispositions"). As for Arezaei, the attribution of the work to Ibn Sīnā could be intentional or an inadvertent mistake of scribes. See: Du faṣlnoma-iʿelmīye ḥikmat-i sīnāwī, davra-i 24, shumore 64, Pāyiz ve zemistān 1399/2021. Ṣafḥa-i 79-94.

[3] Ömer Mahir Alper, *Ibn Sina*, İstanbul, İslam Araştırmaları Merkezi, 2010, p. 24.

[4] Dimitri Gutas, *Avicenna and the Aristotelian tradition introduction to reading Avicenna's philosophical works*, Leiden, Brill, 2014, p. 79.

Furthermore, one may also notice that some of Ibn Sīnā's works mentioned in the bibliography remain undiscovered. At the same time, the fact that Ibn Sīnā was well known as a great scholar during his lifetime led to the emergence of pseudo-autographic works as well as apocryphal compositions under his name.

In order to determine the authenticity of Ibn Sīnā's works, Gutas states that "the study of the transmission of the works of Avicenna is intimately related to the intellectual history of the Islamic world in the three or four centuries after his death".[5] It should be noted that the content and transmission of Ibn Sīnā's medical works are under-researched, which is why drawing final conclusions about their authenticity is impossible.

At present, European scholars are collecting Ibn Sīnā's philosophical works and producing critical editions. In particular, the manuscripts copies of sections of *al-Ilāhiyyāt* ("Theology") in Ibn Sīnā's *Kitāb al- Šifāʾ* ("The book of Healing") are being collected from the libraries around the world for the eventual compilation of a critical edition.[6] Similarly, Turkish researchers have been conducting work on the interrelations of Ibn Sīnā's philosophical works.[7] Gutas mentions that there are sixteen misattributions of Ibn Sīnā's works and four philosophical works of unknown authorship. However, the research on the determination of the interrelations of the texts of Ibn Sīnā on medicine is still in its early stages.[8] *Anjuman-i āṯār-i millī* published a list of works that are of questionable attribution to Ibn Sīnā.[9] *Al-Qānūn al-ṣaġīr fī l-ṭibb* is one of such misattributed works. Furthermore, whether works of Ibn Sīnā on medicine are derivatives from his main work – *al-Qānūn fī l-ṭibb* – is also questionable.

[5] *Ibid.*, 389.

[6] http://project.avicennaproject.eu/#

[7] According to Ferruh Özpilavchi in the article, "The manuscripts of Avicenna's works on Logic that are preserved in the Library of the manuscript institution of Turkey" published in "*Abū ʿAlī ibn Sīnā's Manuscripts in the Libraries of Turkey*", (Istanbul, Mega Basim, 2021), Ali Durusoy, professor at Marmara University, found out that Ibn Sīnā's *al-Muʿjaz al-ṣaġīr fī l-manṭiq* ("Shorter Epitome on Logic") was a part of *ʿUyūn al-ḥikma* ("Elements of Philosophy") the work that has been dedicated to logic. See also: Ali Durusoy, "İbn Sînâ'nın "El-Mûcezü'ṣ-Ṣaġîr Fi'l-Manṭık" risalesi", *Marmara Üniversitesi İlahiyat Fakültesi Dergisi* [İstanbul], 15 (1997), p. 143–166. http://isamveri.org/pdfdrg/D00072/1995-1997_13-15/1995-1997_13-15_DURUSOYA.pdf; Moreover, Gürbüz Deniz discovered that Ghazzālī's Arabic work *Maqāṣid al-falāsifa* ("The aims of Philosophers") was an Arabic translation of Ibn Sīnā's *Dāniš-nāma-i ʿAlâ'î* ("Philosophy for ʿAlāʾal-Dawla"), which was written in Persian. See https://www.youtube.com/watch?v=Rgaj0Zp7XjI&t=2069s

[8] Gutas, *Avicenna and the Aristotelian tradition*, pp. 523–528.

[9] Alper, *Ibn Sīnā* , pp. 41–42.

Abū al-Ḥasan Aḥmad Farīd al-Mazīdī published the first edition of *al-Qānūn al-ṣaġīr fī l-ṭibb* in 2003.[10] Keskinbora published Turkish and English translations of the work in 2013 and 2015 along with a facsimile in which the work is attributed to Ibn Sīnā.[11] In 2020, Keskinbora republished the English version of *al-Qānūn al- ṣaġīr fī l-ṭibb* in Berlin.[12] Al-Mazīdī states that the author of the work is Ibn Sīnā and says, "Ibn Sīnā wrote the work for one of the emirs of his time,[13]" but does not mention where he obtained this information. He used two manuscripts attributed to Ibn Sīnā from the Institute of Arabic Manuscripts. Additionally, the Iraninan sinologist Dr. Shākir Livā'ʾī translated the work into Persian based on the edition of Abū al-Ḥasan Aḥmad Farīd al-Mazīdī under the editorship of Dr. Ḥusain Reżāʾīzāde.[14] It should be noted that both the translator and the editor doubt Ibn Sīnā's authorship of this work. Furthermore, they compared the text of *al-Qānūn al-ṣaġīr fī l-ṭibb* to the text of Ibn Sīnā's *al-Qānūn fī l-ṭibb* ("The Canon of Medicine"), emphasizing that there are aspects of these two works that are incompatible in terms of style and text. Some of them are listed below:

- Types of hair are mentioned in *al-Qānūn al-ṣaġīr fī l-ṭibb* but not mentioned in *al-Qānūn fī l-ṭibb*. However, there is a similar classification of hair with minor changes in Čaġmīnī's Qānūnča ("The Small Canon").

- Natural things (al-Umūr al-Ṭabīᶜiyya) are not listed separately in *al-Qānūn fī l-ṭibb* but in this work. Ibn Sīnā mentioned natural things in the part, "General Definition and Topics of Medicine".

- Medicins that are not found in other sources are presented in *al-Qānūn al-ṣaġīr fī l-ṭibb* such as *asfarjad*.

- Prescriptions used in treatment as in *al-Qānūn al-ṣaġīr fī l-ṭibb* are not given in other sources, for example, the prescription for nasal medicine for nasal diseases is not found in any other source. *Al-Qānūn fī l-ṭibb* does not include any text on toothache.

Although al-Mazīdī's edition mentions Ibn Sīnā as the author of the work, the attribution is qualified as "a work ascribed to Ibn Sīnā",

[10] Ibn Sīnā, *al-Qānūn al-ṣaġir fī l-ṭibb*, ed. Abū al-Ḥasan Aḥmad Farīd al-Mazīdī, Beirut, Dār al-kutub al-ᶜilmiyya, 2003.

[11] Ibn Sīnā, *İbn Sina'nın Küçük Tıp Kanunu*, ed. Kadircan Keskinbora, Istanbul, Bahçeşehir Üniversitesi yayınları. 2013, 2015.

[12] Ibn Sīnā, *The Little Qanun of Ibn Sina*, ed. Kadircan Hidir Keskinbora, Berlin, Peter Lang GmbH, Internationaler Verlag der Wissenschaften, 2020.

[13] Ibn Sīnā, *al-Qānūn al-ṣaġir fī l-ṭibb*, ed. al-Mazīdī, p. 4.

[14] Ibn Sīnā, *al-Qānūn al-ṣaġīr mansub ba-Ḥujjat al-Ḥaq Shaykḫ al-Raʾīs Abū ᶜAlī Ḥusain ibn ᶜAbdullāh Pūri Sīnā*, translated from the Arabic by Shākir Livāʾī, Tehran, al-Maᶜi, 2010.

"al-Qānūn al-ṣaġīr ascribed to Ḥujjat al-Ḥaq Shaykh al-Raʾīs Abū ʿAlī Ḥusain ibn ʿAbdullāh Pūri Sīnā," because the style of the work does not resemble Ibn Sīnā's. Keskinbora considers Ibn Sīnā to be the author of the work, citing similarities between these two works and the fact that Ibn Sīnā is indicated as the author in four manuscripts in Turkey.[15]

Dr. Raphaela Veit in her article "*The Smaller Canon of Medicine* (*al-Qānūn al-ṣaġīr fī l-ṭibb*) *Ascribed to Avicenna*" doubts that the work belonged to Ibn Sīnā for the following reasons:

The systematic presentation of medical knowledge so highly valued by Avicenna in his time was not incorporated into *The Smaller Canon*;

The heavily abbreviated content of the Smaller Canon only partly corresponds to the larger Canon;

There is considerable overlap between the discussions of the theoretical aspects of medicine in both Canon texts, which may be due to the Greek model that both followed;

The concept formulated by Avicenna, that practical expertise requires nothing more than mastery of medical theory, was not incorporated as an independent discussion into the *Smaller Canon*;

At least in some cases the *Smaller Canon* resembles the concepts of ancient Greek doctors more closely than the argumentations of Avicenna do.[16]

Although Veit pointed out the differences between the two works, she did not identify the real author of *al-Qānūn al-ṣaġīr fī l-ṭibb*. She only draws the conclusion that this work was not written by Avicenna.

In 2019 and 2021 the same work was published under a different name by the Egyptian scholar Dr. Aḥmad ʿAbd al-Bāqī Ḥusain who attributed it to the Iṣfahānī physician Abū ʿAlī Aḥmad b. ʿAbd al-Raḥmān b. Mandawayh.[17] Keskinbora was unaware of this publication.

Dr. Aḥmad ʿAbd al-Bāqī Ḥusain did not realize *al-Qānūn al-ṣaġīr fī l-ṭibb* ascribed to Ibn Sīnā, because he did not see any manuscripts that noted Ibn Sīnā as the author. He explains that this work belongs to Ibn Mandawayh for the following reasons:

[15] As a result of our research, it has been revealed in catalogues that there are two more manuscripts in Turkey.

[16] Raphaela Veit, The Smaller Canon of Medicine (al-Qānūn al-ṣaġīr fī l-ṭibb) Ascibed to Avicenna. *Philosophy and Medicine in the Formative Period of Islam, Warburg Institute Colloquia* [London], 31 (2017), p. 269–280.

[17] Ibn Mandawayh, *al-Kāfī fī l-ṭibb*, ed. Aḥmad ʿAbd al-Bāqī Ḥusain, Amman, Dār ward al-urduniyya li-l-našr wa-l-tawzīʿ, 2021.

- Ibn Mandawayh is indicated as the author of the work in two manuscripts in Ireland;

- According to the *Ṭabaqāt* and other sources this work was written by Ibn Mandawayh;[18]

- Abū Rayḥān al-Bīrūnī quoted Ibn Mandawayh a total of 70 times in his work. Moreover, he quoted *al-Kāfī fī l-ṭibb*;

- The writing style of Ibn Sīnā was mixed with philosophy, but this work was written in a different style;

The following information about Ibn Mandawayh's authorship of *al-Kifāya* (*al-Qānūn al-ṣaġīr fī l-ṭibb*) is given in the preface of the Tehran edition[19] of the work:

- Niżāmī-i ʿArūżī-i Samarqandī mentioned Ibn Mandawayh's *al-Kifāya (al-Qānūn al-ṣaġīr fī l-ṭibb)* in his work *Čahār maqāla*;

- Ibn Abī Uṣaybiʿa considered Ibn Mandawayh as one of the skillful physicians (*ḥakīm*) in Iṣfahān;

Ibn Mandawayh's *al-Kāfī* (*al-Qānūn al-ṣaġīr fī l-ṭibb*) is also mentioned in the preface of *Tuḥfa-i Ḥakīm-i Muʾmin or Tuḥfat al-muʾminīn* written in Persian by Muḥammad Muʾmin b. Muḥammad Zamān al-Ṭabīb al-Tunakābunī (1110/1698).[20]

The existence of different views on *al-Qānūn al-ṣaġīr fī l-ṭibb* has prompted my research on the authenticity of the work and the identity of the author. First, let us consider the structure and the content of the work. *Al-Qānūn al-ṣaġīr fī l-ṭibb* consists of an introduction, followed by ten sections (*maqālāt*) with 104 chapters[21] (*bāb*). The first section consists of seven chapters, which explains the creation of man, the structure of the body, parts of medical science, pulse, and urine tests, and cleansing of the body. The second section is about herbs, food and drinks, clothes, and their powerful effects in twenty chapters. The third section consists of ten chapters and is devoted to being healthy and the periods of pregnancy and child rearing. The eighteen chapters of the fourth section describe the diagnosis and treatment of diseases occurring in the head and the chest. The fifth section covers diseases of the throat, and in four chapters, the diagnosis and treatment of cough, cold, diphtheria, pertussis, and pneumonia. The sixth section is

[18] Below we will quote the information about Ibn Mandawayh in the *Ṭabaqāt*.

[19] Ibn Mandawayh, *Kitāb al-Kāfī fi l- ṭibb (Kifāya)*, Dānishgāh-i ʻulūm-i pizishkī-i Iran, Muʾassasa-i mutāʿāt-i tārīkh-i pizishkī-i ṭibb-i islāmī ve mukammal, Tehran,1386/2008, p. 3.

[20] Muḥammad Muʾmin b. Muḥammad Zamān al-Ṭabīb al-Tunakābunī, *Tuḥfa-i Ḥakīm-i Muʾmin or Tuḥfat al-muʾminīn*, Muqaddime Dr. Maḥmūd Najmābādī, Tehran, Ketāb-furūš-i Muṣṭafā, p. 4.

[21] 105 chapters in manuscript No. 101 in the Reisülküttap collection.

about diseases that occur in the abdominal area and digestive organs and is divided into fourteen chapters. The seventh section is about the genital area, in seven chapters. The eighth section consists of one chapter and is devoted to the diagnosis and treatment of sciatica and joint pain. The ninth section deals with dermatosis, vascular bleeding, and the cupping (*ḥijāma*), in sixteen chapters. The seven chapters of the tenth section deal with various types of fever.[22]

To date, twelve copies of *al-Qānūn al-ṣaġīr fī l-ṭibb* have been identified in libraries in Turkey, Egypt, Ireland and Iran. Nine manuscripts mention Ibn Sīnā as the author of the work while the remaining three manuscripts attribute the work to Ibn Sīnā's contemporary, the famous Iṣfahānī physician Ibn Mandawayh (Appendix I).

Although the titles of *al-Qānūn al-ṣaġīr fī l-ṭibb* ascribed to Ibn Sīnā and Ibn Mandawayh's *Kitāb al-Kāfī* are different, we have found that their content and context are almost the same. We have come to this conclusion after comparing nine manuscripts and two editions of *al-Qānūn al-ṣaġīr fī l-ṭibb* and the two copies and two editions of *al-Kāfī* (Appendix II).

The structure and content are the same in all manuscripts and printed editions, except for some minor differences. The fact that Ibn Sīnā is mentioned as the author of nine of the manuscripts of *al-Qānūn al-ṣaġīr fī l-ṭibb*, is not sufficient evidence of authorship. The Turkish bibliographer Ramazan Şeşen named this work *al-Qānūn al-aṣġar li-Ibn Sīnā* ("The Smallest Canon of Ibn Sīnā") and included it in the list of works written by Ibn Sīnā.[23] "In a conversation with the author on February 26, 2020 in Istanbul, professor Şeşen said that he did not conduct any thorough research on the ascription of this work and relied only on the name of the manuscript

We have found evidence for Ibn Mandawayh's authorship in several medieval sources. First, neither the *Risāla fī tarīkhi Ibn Sīnā* ("Treatise on Ibn Sīnā's biography") by Abū ʿUbayd al-Jūzjānī nor other medieval bio-bibliographic sources contain any information about the existence of Ibn Sīnā's *al-Qānūn al-ṣaġīr fī l-ṭibb* or anything akin to that attributed to him. The Egyptian bibliographer Georges Chehata Anawati (1905-1994), who compiled a catalogue of Ibn Sīnā's works, added the book to the list of anonymous works that

[22] The 10th article consists of 6 chapters in al-Mazīdī's edition.

[23] Ramazan Şeşen, *Muḫtārāt min al-maḫṭūṭāt al-ʿarabīya al-nādira fī maktabāt Turkīya*, İstanbul, İslam Tarih, Sanat ve Kültürünü Araştırma Vakfı, 1997, p. 95.

we attributed to him.[24] Meanwhile, there is evidence that Ibn Mandawayh wrote such a work and that he was also known by other names. Let us consider Ibn Mandawayh himself before moving onto other topics.

The scholar's full name is Abū ʿAlī Aḥmad b. ʿAbd al-Raḥmān b. Mandawayh.[25] There is not much information about Mandawayh's life and scientific activities. The Ottoman scholar and bibliophile Kātip Çelebī (d. 1067/1657) who is known as Ḥājjī Khalīfa, states in *Kašf al-ẓunūn ʿan asmāʾ al-kutub wa-l-funūn* ("The Removal of Doubt from the Names of Books and the Arts") that the year of Ibn Mandawayh's death was 410/1019 CE, while the historian Ismaʿil Pasha al-Baghdadi. (d. 1338/1920) mentions the date as 440/1048 CE. Considering that the ruler ʿAḍud al-Dawlah died in 372/983, the year of Ibn Mandawayh's death seems closer to Ḥājjī Khalīfa's date.[26] Ibn Mandawayh's father, ʿAbd al-Raḥmān b. Mandawayh, was a pious man who wrote beautiful poems.[27]

Ibn Mandawayh was well-known and highly regarded by Abbasid rulers as a physician (*ḥakīm*). He was one of the twenty-four physicians invited to *al-Bīmāristān al-ʿAḍudī* ("The al-ʿAḍudī Hospital"), founded by ʿAḍud al-Dawlah in Baghdad.[28] This shows that he had reached a high level in the field of medicine. Ibn Mandawayh wrote around fifty works, eighteen of which have survived.[29] Among his works are reviews of Galen's books and forty treatises (*risāla*) dedicated to his medical colleagues.[30] He also authored a treatise dedicated to Ibn Sīnā titled, *Risāla ilā al-ʾUstāḏ al-Raʾīs fī ʿilāj šiqāq al-bawāsīr* ("A treatise dedicated to our master on the treatment of piles"). Thus the two scholars had a good relationship.[31]

[24] Georges Chehata Anawātī, *Muʾallafāt Ibn Sīnā*, Cairo, Dār al-našr, 1950, p. 211.

[25] Emilie Savage-Smith et al., *A Literary History of Medicine: The ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ of Ibn Abī Uṣaybiʿah*, Leiden, Brill, 2020, scholarly edition online, chapter d, passage reference 11.16.

[26] Türkiye Diyanet Vakfı İslâm Ansiklopedisi, vol. 20, Istanbul 1999, p. 182.

[27] Emilie Savage-Smith et al., *A Literary History of Medicine: The ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ of Ibn Abī Uṣaybiʿah*, Leiden, Brill, 2020, scholarly edition online, chapter d, passage reference 11.16.

[28] Khalīl b. Aybak al-Ṣafadī, *Kitāb al-Wāfī bi-l-wafāyāt*, Beirut, Dār iḥyāʾ al-turāṯ al-ʿarabī, n.d. vol.VII, p. 35.

[29] Fuat Sezgin, *GAS*, Frankfurt am Main, Institut für Geschichte der Arabisch-Islamischen Wissenschaften, 1995, vol. III, p. 328–329.

[30] ʿAbd al-Bāqī, *al-Kāfī*, p. 27.

[31] *Ibid.*, 30.

As a physician, Ibn Mandawayh worked on diabetes, pediatric diseases, pharmacology, and ophthalmology in addition to general therapy.[32] Several medieval sources state that Ibn Mandawayh wrote *al-Kāfī fī l-ṭibb* ("The Sufficient Book on Medicine") which is also referred to as *al-Qānūn al-ṣaġīr* ("The Little Canon"). The first of the sources that mention Ibn Mandawayh is *Kitāb al-ṣaydana fī l-ṭibb* ("Pharmacognosy in Medicine") by Abū Rayḥān al-Bīrūnī (d. 439/1048). In the twelve paragraphs dedicated to different medicaments, al-Bīrūnī refers to Ibn Mandawayh, and in another six paragraphs, he mentions Ibn Mandawayh's work *al-Kāfī fī l-ṭibb*.[33] After al-Bīrūnī, ᶜAlī b. Yūsuf al-Qifṭī (d. 646/1248) refers to Ibn Mandawayh and his book *al-Kāfī fī l-ṭibb*.[34] In *ᶜUyūn al-anbāᵓ fī ṭabaqāt al-aṭibbāᵓ* ("The Source of Information on the Category of Physicians") Ibn Abī Uṣaybiᶜa (d. 667/1269) states that Ibn Mandawayh's works included *Kitāb Nihāyat al-ikhtiṣār fī l-ṭibb* ("Compact Book of Medicine") and *Kitāb al-Kāfī fī l-ṭibb* or *al-Qānūn al-ṣaġīr*.[35]

The work of Ibn Mandawayh, which is the object of our research, is found only in Ibn Abī Uṣaybiᶜa under the name *Kitāb al-Kāfī fī l-ṭibb* or *al-Qānūn al-ṣaġīr*. In the *Kitāb Ikhbār al-ᶜulamāᵓ bi akhbār al-ḥukamāᵓ* Ibn al-Qifṭī (d. 646/1248) reported that Ibn Mandawayh wrote a work called *Kitāb al-Kāfī*. Later authors confirmed and repeated the title in the version of Uṣaybiᶜa.

The later bibliographer Khalīl b. Aybak al-Ṣafadī (d. 764/1363) confirms Ibn Abī Uṣaybiᶜa's statements in his thirty-volume *Kitāb al-Wāfī bi-l-wafāyāt* ("Biographical Dictionary of Notable People").[36] The title *Kitāb al-Kāfī* is also mentioned in *Kašf al-ẓunūn ᶜan asmāᵓ al-kutub wa-l-funūn* by Ḥājjī Khalīfa (1017/1609-1067/1657)[37] and *Īḍāḥ al-maknūn fī al-ḏayl ᶜalā Kašf al-ẓunūn ᶜan asmāᵓ al-kutub wa-l-funūn* ("The Explanation of the hidden in the tail of removal of doubt

[32] Türkiye Diyanet Vakfı İsâm Ansiklopedisi, vol. 20, Istanbul 1999, p. 182.

[33] Beruni, Abu Rajchan, *Farmakognozija v medicine*, issledovanije, perevod, primechanija i ukazateli U. I. Karimova, izbrannije proizvedenija, Taškent, Fan, 1974, vol. IV, p. 100.

[34] Ibn al-Qiftī, *Taᵓrīḫ al-Ḥukamāᵓ*, ed. Julius Lippert, Leipzig 1903, repr. Frankfurt am Main: Institute for the History of Arabic-Islamic Science 1999, p. 438 (Islamic Philosophy, vol. 2).

[35] Emilie Savage-Smith et al., *A Literary History of Medicine: The ᶜUyūn al-anbāᵓ fī ṭabaqāt al-aṭibbāᵓ of Ibn Abī Uṣaybiᶜah*, Leiden, Brill, 2020, scholarly edition online, chapter d, passage reference 11.16.

[36] al-Ṣafadī, *al-Wafī*, vol. VII, p. 35–36.

[37] Ḥājjī Khalīfa, *Kašf al-ẓunūn ᶜan asmāᵓ al-kutub wa-l-funūn*, Beirut, Dār iḥyāᵓ al-turāṯ al-ᶜarabī, vol. II, p. 574.

from the names of books and the arts") by Ismāʿīl Bāšā al-Baġdādī (1839-1920).[38] Fuat Sezgin (1924-2018), a renowned bibliographer and specialist in the history of science, also relies on the work of Ibn Abī Uṣaybiʿa and suggests that the author of *al-Qānūn al-ṣaġīr fī l-ṭibb* is very likely to be Ibn Mandawayh and not Ibn Sīnā.[39]

The comparison of the manuscripts of *al-Qānūn al-ṣaġīr fī l-ṭibb* with *al-Qānūn fī l-ṭibb* of Ibn Sīnā confirms, that *al-Qānūn al-ṣaġīr fī l-ṭibb* was not written by Ibn Sīnā. There is significant contrast between those two works in their writing style and content. These discrepancies concern theoretical aspects of medicine, including human anatomy, the division of medical science, the definition of *mīzāj* ("temperament") and *quwwa* ("power"), as well as practices in diagnostics, therapeutic modalities, and pharmacology. Below are some examples from the results of my comparative analysis:

1. Anatomy: in *al-Qānūn fī l-ṭibb*[40] the number of bones forming the face and the joints between them is not mentioned. [41] *Al-Qānūn al-ṣaġīr fī l-ṭibb* states that the upper jaw itself consists of eighteen bones.[42] In *al-Qānūn fī l-ṭibb*, Ibn Sīnā states that the thorax is composed of twelve thoracic vertebrae,[43] whereas *al-Qānūn al-ṣaġīr fī l-ṭibb* mentions that the thorax is made up of seven bones.[44] *Al-Qānūn fī l-ṭibb* states that the number of lumbal vertebrae is five,[45] but *al-Qānūn al-ṣaġīr fī l-ṭibb* mentions that the waist is made up of seventeen vertebrae and twenty-four ribs.[46]

It appears that the details in *al-Qānūn al-ṣaġīr fī l-ṭibb* do not correspond with *al-Qānūn fī l-ṭibb*. Furthermore, the statement to the effect that "the waist is made up of seventeen vertebrae and twenty-four ribs" in the *al-Qānūn al-ṣaġīr fī l-ṭibb* is inaccurate from the anatomical point of view, as there are no ribs in the waist (*ẓahr*).

[38] Ismāʿīl Bāšā al-Baġdādī, *Īḍāḥ al-maknūn fī l-ḏayl ʿalā Kašf al-ẓunūn*, Beirut, Dār iḥyāʾ al-turāṯ al-ʿarabī, vol. II, p. 259.

[39] Fuat Sezgin, *Geschichte des arabischen Schrifttums*, vol. III, Leiden, Brill 1970, pp. 328-329.

[40] It was not accessible to me Ibn Sīnā, *Kitāb al-Qānūn fī l-ṭibb*, 5 vols., ed. Hakeem Abdul Hameed (New Delhi: Jamia Hamdard, 1982-96).

[41] Ibn Sīnā, *al-Qānūn fī l-ṭibb*, edited and notes by Muḥammad Amīn al- Ḍinnawī, 3 vols, Beirut, Dār al-kutub al-ʿilmiyya, 1999, vol. I, pp. 45–47.

[42] Ibn Sīnā, *al-Qānūn al-ṣaġīr fī l-ṭibb*, Süleymaniye library, MS Veliyüddin 2529, f. 5[b].

[43] Ibn Sīnā, *al-Qānūn*, vol. I, 51.

[44] Ibn Sīnā, *al-Qānūn al-ṣaġīr*, MS Veliyüddin, f. 5[b].

[45] Ibn Sīnā, *al-Qānūn*, vol. I, 51.

[46] Ibn Sīnā, *al-Qānūn al-ṣaġīr*, MS Veliyüddin, f. 5[b].

2. On the divisions of medical science: Both books divide medicine into theoretical and practical parts. The theoretical part includes natural sources of medicine, essentials of medicine as well as causes, types, and symptoms of diseases. The natural sources of medicine in *al-Qānūn fī l-ṭibb* are seven: elements, mood, thrombus, organs, spirit, faculties, and actions. *Al-Qānūn al-ṣaġīr fī l-ṭibb* adds four more to the listed seven: age, color, fats, and gender differences.[47] The essentials of medicine in the theoretical part are also discussed in both sources; however, they are mentioned in Ibn Sīnā's *Urjūza fī l-ṭibb* ("Poem on medicine") and in *al-Qānūn al-ṣaġīr fī l-ṭibb* under the same name[48] while in *al-Qānūn fī l-ṭibb* they are mentioned as "influencing causes." Furthermore, they are divided into six types: air, food and drinking water, excretion and rest, physical activity, sleep and consciousness, bodily movements, and tranquility.[49] In *al-Qānūn al-ṣaġīr fī l-ṭibb*, there are seven of them, "bodily movements and tranquility" is called "mental states," and "bathing" is added as the seventh category.[50]

If both works being compared indeed belonged to Ibn Sīnā, the composition of the natural sources of medicine along with the essentials of medicine in the division of medical science would have been the same.

3. Concerning "*temperament*" *(mīzāj)*: In *al-Qānūn fī l-ṭibb* the word *mīzāj* is used to describe the nature of a particular element, organ, consumer product or medication because *mīzāj* is composed of nature and temperature, reflecting the properties of impact and impact absorption. However, *al-Qānūn al-ṣaġīr fī l-ṭibb* uses the word "power" (*quwwa*) instead of *mīzāj*. For example, the "power" of fire is hot-dry; the "power" of air is hot-wet, the "power" of water is cold-wet and the "power" of earth is cold-dry.[51] Similarly, in the second article of *al-Qānūn al-ṣaġīr fī l-ṭibb* entitled "On the Capacities of Food, Beverages, and the Others" *mīzāj* levels are described as well as the consumption of different types of products as powers.[52] But the definition of *quwwa* in the *al-Qānūn fī l-ṭibb* is fundamentally different. Ibn Sīnā divides types of powers and the effects that arise from them into three categories: psychic power, physical power, and vital (i.e., lively) power. The place, effect, and origin of the psychic

[47] *Ibid.*, ff. 11^{b}–12^{b}.
[48] Ibn Sīnā, *Tibbiy urjuza*, ed. Šoislom Ša, Taškent, Fan, 1972, pp. 30–35.
[49] Ibn Sīnā, *al-Qānūn*, vol. I, p. 14.
[50] Ibn Sīnā, *al-Qānūn al-ṣaġīr*, MS Veliyüddin, f. 12^{b}.
[51] *Ibid.*, f. 11^{b}.
[52] *Ibid.*, f. 18^{a}.

power is the brain, natural powers originate in the liver and testicles, and the source of the vital power is the heart.[53]

4. Matters related to Diagnostics: Observing the pulse and getting samples of urine were among the most important diagnostic measures in medieval medicine since the analysis of urine paved the way for inspecting the activity of the liver, spleen, thrombus, vessels and passages, as well as the activity of urinary organs: kidneys, urinary tract, and bladder. In *al-Qānūn fī l-ṭibb* Ibn Sīnā mentions the color of urine as one of the seven indicators and he divides them into five types: yellow, green, black, white, and red, and he explains them separately.[54] *Al-Qānūn al-ṣaġīr fī l ṭibb* mentions six different colors of urine: white, yellow, fiery, light red, dark red, and black.[55] The difference in the color of the urine indicates the presence of different diseases.

5. Therapeutic modalities: In the treatment of headache due to hot blood substances, Ibn Sīnā says that it is crucial to immediately draw blood from the *qīfāl* (Vena cephalic) in the wrist. "In the case, where such blood drawing is not sufficient, and the pain persists, and all the veins bulge, blood is to be drawn from a vein on either side of the nose and forehead, because when the blood is drawn from the vein of the nose and forehead, headaches often disappear altogether."[56] *Al-Qānūn al-ṣaġīr fī l-ṭibb* does not specify the measures to be taken in this case: "When headache along with a high temperature occurs because of the blood, it is to be drawn from the vein and the cupping (*ḥijāma*) procedure ought to be carried out." The author also did not specify from which vein of the body blood should be drawn and from where to proceed when practicing *ḥijāma*.[57]

In *al-Qānūn al-ṣaġīr fī l-ṭibb* coughs, running nose and pleuropneumonia are included in the section on "Throat diseases," and a general description of the causes, symptoms, and treatment of the three are given. Cough is not interpreted as a symptom of a disease, but the disease itself.[58] Ibn Sīnā, on the other hand, listed all the above-mentioned symptoms and origins of diseases as "lung diseases" and described each of them separately.[59]

[53] Ibn Sīnā, *al-Qānūn*, vol. I, p. 94.
[54] *Ibid.*, vol. I, p. 184–185.
[55] Ibn Sīnā, *al-Qānūn al-ṣaġīr*, MS Veliyüddin, f. 15^{b}.
[56] Ibn Sīnā, *al-Qānūn*, vol. II, p. 55.
[57] Ibn Sīnā, *al-Qānūn al-ṣaġīr*, MS Veliyüddin, f. 28^{b}.
[58] *Ibid.*, f. 36^{a}.
[59] Ibn Sīnā, *al-Qānūn*, vol. II, pp. 330–340.

Similarly, there are deviations in the symptoms and causes of liver and spleen disorders, as well as in the methods of treatment. In the case of splenic pain, *al-Qānūn al-ṣaġīr fī l-ṭibb* prescribes that blood is taken from the veins of *usaylim* ("Venae interdigitates") and the vein of the left armpit. [60] On the contrary, Ibn Sīnā advised, "do not draw blood from the veins unless it is absolutely crucial."[61]

Numerous discrepancies between the two works can also be observed in the chapters related to the bumps and rashes that occur on the outside of the body, and in the variations of color on the skin and its causes.

Was al-Qānūn al-ṣaġīr fī l- ṭibb *dedicated to Ibn Sīnā?*

At the invitation of ᶜAḍud al-Dawlah (949-983), Ibn Mandawayh also wrote small treatises on medicine while practicing medicine at a hospital in Baghdad. It is known that he wrote 40 treatises dedicated to his colleagues. The existence of his *Risālat ilā Ustādh al-Raʾīs fī ᶜilāj šiqāq al-bawāsīr* ("Treatise to Master *al-Raʾīs* on the Treatment of Hemorrhoid Fissures"), which he dedicated to Ibn Sīnā, shows that the two physicians Ibn Mandawayh and Ibn Sīnā had a good relationship.[62] It is curious that the word *al-shaykh* was mentioned three times after the end of the work of the Tehran edition of *al-Kāfī* or the *al-Qānūn al-ṣaġīr fī l-ṭibb* and the copy of Reisülküttap (No. 103). The word shaykh also appear at the beginning and end of the manuscript in the Hagia Sofia collection (No. 3724) of Ibn Mandawayh's *Nihāyat al-ikhtiṣār fī l-ṭibb* (discussed below), and after the end of the work in the manuscript of the Beyazıt Library (No. 4161). At the end the style and the volume of this work is short and Ibn Mandawayh asks God to satisfy the *al-shaykh*.

We think that by al-shaykh the author must have meant Ibn Sīnā here, because, as we have seen, there was a correspondence between these two scholars on medical topics.

Nihāyat al-ikhtiṣar fī l-ṭibb *and* al-Qānūn al-ṣaġīr fī l-ṭibb

Medieval sources mention a work by Ibn Mandawayh entitled *Nihāyat al-ikhtiṣār fī l-ṭibb* "A very concise book on medicine". Ibn

[60] Ibn Sīnā, *al-Qānūn al-ṣaġīr*, MS Veliyüddin, f. 32[b].

[61] Ibn Sīnā, *al-Qānūn*, vol. II, p. 579.

[62] Emilie Savage-Smith et al., *A Literary History of Medicine: The ᶜUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ of Ibn Abī Uṣaybiᶜah*, Leiden, Brill, 2020, scholarly edition online, chapter d, passage reference 11.16.

Abī Uṣaybiᶜa includes this work among the works of Ibn Mandawayh. Thus far, two manuscripts have been found: Süleymaniye Library Hagia Sophia Collection (No. 3724) and Bayezid Library (No. 4161). The first copy is older and can be dated to the 5th/11th century on paleographic grounds. The title of the book is stated as *Nihāyat al-ikhtiṣār fī l-ṭibb taʾlif Abī ᶜAlī Aḥmad b. ᶜAbd al-Raḥmān b. Mandawayh* ("A very concise book on medicine" by Abū ᶜAlī Aḥmad b. ᶜAbd al-Raḥman b. Mandawayh) on folio 48b. In the introduction, it is noted that the shaykh told the author to write it (ff. 48b - 49a). When we compared this work with Ibn Mandawayh's book *al-Kifāya fi-t-ṭibb*, we realized that their contents are very close to each other (see Appendix II). Thus, we may conclude that Ibn Mandawayh is the author of the *al-Qānūn al-ṣaġīr fī l-ṭibb* on the basis of the similarity of the style and content of Ibn Mandawayh's work, *Niḥāyat al-ikhtiṣār fī l-ṭibb* and the above mentioned *al-Qānūn al-ṣaġīr fī l-ṭibb*.

Conclusion

Because the name of *Shaykh al-Raʾīs* Abū ᶜAlī Ibn Sīnā was famous in the Middle Ages, some authors attributed their own works (as well as works copied by some scribes) to Ibn Sīnā, either unknowingly or to increase the acclaim of the falsely attributed work. Medieval bibliographers were aware of this situation and carefully studied each work before including it in their catalogues. Even now, the works, which Ibn Sīnā did not write but are attributed to him, are kept in world libraries and published in the name of the great philosopher. The reason for this is that the publishers draw conclusions based on the title of a single manuscript without thoroughly studying the style and content of the work. This can also lead to incorrect perceptions and interpretations of Ibn Sīnā's scientific potential and his scientific knowledge. As a result, the reader may have unnecessary doubts about the level of Ibn Sīnā's knowledge. To avoid this, to show the original aspects of the medical heritage of Abū ᶜAlī Ibn Sīnā is one of the important problems facing manuscript studies.

Furthermore, a factor contributing to the misattribution may be the fact that Ibn Mandawayh's *kunya* was also Abū ᶜAlī.

Based on the preceding analysis, it can be conclused that the authorship of *al-Qānūn al-ṣaġīr fī l-ṭibb* belongs to Ibn Sīnā's contemporary, the physician Aḥmad b. ᶜAbd al-Raḥmān b. Mandawayh, whose *kunya* was also Abū ᶜAlī just like Ibn Sīnā's.

Abstract

In medieval sources, modern catalogues and research works, the Arabic book *al-Qānūn al-ṣaġīr fī l-ṭibb* ("The Little Canon of Medicine") has been attributed to two different authors: Abū ᶜAlī b. Sīnā (Avicenna) from Bukhara (d. 428/1037), a philosopher and a physician well-known throughout the world, and Abū ᶜAlī b. Mandawayh, a physician from Isfahan (d. ca. 410/1019). In the current study 12 existing manuscripts and four publications are examined in order to identify the real author of this work. We compare the text of the *al-Qānūn al-ṣaġīr fī l-ṭibb* to Ibn Sīnā's *al-Qānūn fī l-ṭibb* ("The Canon of Medicine"). We argue that the structure, content, and style of the *al-Qānūn al-ṣaġīr fī l-ṭibb* casts doubt on Ibn Sīnā's authorship. Medieval sources and a comparative textual analysis reveal that the author of the work was Abū ᶜAlī Aḥmad b. ᶜAbd al-Raḥmān, an elder contemporary of Ibn Sīnā, known as Ibn Mandawayh.

APPENDIX I: Manuscripts

№	Title	Author	Scribe
1	*al-Qānūn al-aṣġar*	Ibn Sīnā	Muḥammad b. Abī al-Majd al-Ṣīrwānī
2	*Mukhtaṣar al-Qānūn*	Ibn Sīnā	-
3	*Kitāb al-Qānūn al-ṣaġīr*	Ibn Sīnā	Ibn Abī al-Ḥasan Salama b. Wafāʾ
4	*Kitāb al-Qānūn al-ṣaġīr*[1]	Ibn Sīnā	-
5	*Mukhtaṣar al-Qānūn wa-yuʿraf bi al-Qānūn al-ṣaġīr*	Ibn Sīnā	Muḥammad b. Aḥmad b. Muḥammad b. Yūsuf al-Šanduwaylī
6	*Kitāb al-Qānūn al-ṣaġīr fī l-ṭibb*	Ibn Sīnā	-
7	*Kitāb al-Kāfī fī l-ṭibb*	Ibn Mandawayh	Muḥammad b. Qiwām al-Dīn Bid Gulī
8	*Kitāb al-Kifāya fī ʿilm al-ṭibb*	Ibn Mandawayh	al-Sayyid Muṣṭafā al-Ṣafī
9	*Kitāb al-Kifāya fī ʿilm al-ṭibb*	Ibn Mandawayh	al-Sayyid Muṣṭafā al-Ṣafī
10	*al-Qānūn al-ṣaġīr*	Ibn Sīnā	-
11	*al-Qānūn al-ṣaġīr*	Ibn Sīnā	ʿAbd al-Wahhāb b. Ibrāhīm
12	*Mukhtaṣar fī uṣūli l-ṭibb*	Ibn Sīnā	-

of The Little Canon of Medicine (*al-Qānūn al-ṣaġīr fī l-ṭibb*)

Copying date	The place of copying	Number of folia	Location
670/1271	Marāġa	30	Turkey, Istanbul, Süleymaniye Library, Reisülküttap collection №103
732/1332	-	40	Egypt, Institute for Arabic Manuscripts The Cairo, ***hā*** *manuscript*
AD 1333?	-	10	Spain, EL Escorial, Manuscrito, Arabe Codico № 873
1380-88	-	20	Spain, EL Escorial Manuscrito Arabe Codico № 868
793/1390-91	Šanduwayl (village belonging to Marāġa)	64	Turkey, Istanbul, Beyazıt Library № 04123
983/1575/6	-	46	Turkey, Istanbul, Süleymaniye Library, Fātih collection № 03593
857/1453	-	74	Iran, National Library № 2974/7
1111/ 1699-1700	Constantinople	50	Ireland, Chester Beatty Library № 3676
1111/ 1699-1700	Constantinople	50	Ireland, Chester Beatty Library № 3676 MK. MG 4
-	-	46	Turkey, Isparta Library, № 1955
-	Ṭarābulus (Tripoli)	53	Turkey, Istanbul, Bayazit Library Veliyüddin Efendi collection. № 02529
-	-	23	Turkey, Istanbul, Süleymaniye Library, Ayasofya collection № 03642

APPENDIX II: The structure of the *al-Qānūn al-ṣaġīr fī l-ṭibb* ascribed to Ibn Sina[63]

Maqāla 1: On the creation of the human being (7 chapters)
Maqāla 2: On the powers of food and drinks (20 chapters)
Maqāla 3: On the maintenance of health (10 chapters)
Maqāla 4: On head illnesses (18 chapters)
Maqāla 5: On breast illnesses (4 chapters)
Maqāla 6: On abdominal illnesses and their relations to food and nutrition (14 chapters)
Maqāla 7: On genital organs (6 chapters)
Maqāla 8: On gout disease, sciatica and joint pains (3 chapters)
Maqāla 9: On illnesses that occur on the skin related to drawing blood and *ḥijāma* (16 chapters)
Maqāla 10: On fevers (7 chapters)

[63] *Kitāb al-Kāfī fī l-ṭibb* and *Kitāb Nihāyat al-Iḫtiṣār fī l-ṭibb* have the same structure.

IBN RUŠD'S MEDICAL WORKS
SOME NEW INSIGHTS*

RAPHAELA VEIT**

Abū l-Walīd Muḥammad ibn Aḥmad ibn Rušd from Córdoba (1126–1198 CE), Latinised Averroes, is undoubtedly one of the most important authors of the Middle Ages. He was a judge and a polymath known for his unique linking of the disciplines of philosophy, medicine, Islamic law and Islamic theology, and publishing important writings on all of these areas[1]. Although his extensive œuvre has received much attention and initiated extensive research activity in recent years and decades, the role of Ibn Rušd as a court physician of the Almohads and author of medical treatises has received less attention in the literature[2].

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[1] J. Lirola Delgado/I. Ferrando/M. Forcada/J. M. Puerta Vílchez/J. Puig Montada/D. Urvoy/M. C. Vázquez de Benito, *Ibn Rushd al-Ḥafīd, Abū l-Walīd*, in: J. Lirola Delgado/J. M. Puerta Vílchez (eds.), Biblioteca de al-Andalus, 7 voll., Almería 2004–2012, vol. 4 (2006): *De Ibn al-Labbāna a Ibn al-Ruyūlī*, 517–617, no. 1006/83. For medicine, cf. esp. 542–549, 572, 584.

[2] In bibliographical collections on the works of Ibn Rušd, his works on medicine are often only marginally touched upon, if mentioned at all, cf., e.g. G. Endress, *Averrois Opera. A Bibliography of Editions and Contributions to the Text*, in: G. Endress/J. van Aertsen (eds.), *Averroes and the Aristotelian Tradition. Sources, Constitution and Reception of the Philosophy of Ibn Rushd (1126–1198)*, Leiden 1999, 339–381. The assessment of M. Ullmann, *Die Medizin im Islam* (Handbuch der Orientalistik, 1. Abteilung, VI.1), Leiden–Cologne 1970, 166) "Über seinen Ruhm als Philosoph ist seine Bedeutung als Mediziner in der Forschung fast vergessen worden" must still be considered, despite the fact that since 1970 more findings have been published including M. Forcada, *Ética e ideología de la Ciencia: El médico-filósofo en al-Andalus (siglos X–XII)*, Almería 2011, 325–343, H. Azar, *The Sage of Seville.*

This article will present some insights into Ibn Rušd's medical works as they have emerged from various contexts of my work in recent years. It is divided into three parts: after a general introduction to Ibn Rušd's medical works (I.: Overview and Chronology), I will focus on two aspects that have not yet been taken into account by research on Ibn Rušd: one asks about the features of his commentaries on Galenic texts (II. The Medical *Talḫīṣ*: Ibn Rušd Teaching Galen), the other deals with some issues in the context of Arabic foodstuff literature (III.: Ibn Rušd's Treatise 'On the Preservation of Health').

I. Overview and Chronology

A compilation of Ibn Rušd's works is given by Ibn Abī Uṣaybiʿa (d. 1270 CE) in his famous collection of biographies of physicians[3]. His writings are also listed in the *barnāmağ* (inventory) of Ibn Rušd in Ms. El Escorial, Real Biblioteca de San Lorenzo, árabe 884, foll. 82v–83r[4]. My overview of Ibn Rušd's medical works focuses on his extant writings[5].

Main Works:

1) *al-Kulliyyāt fī ṭ-ṭibb* ('The Generalities of Medicine', abbr. *al-Kulliyyāt*)

Ibn Rušd's main work on medicine is the medical encyclopaedia *al-Kulliyyāt fī ṭ-ṭibb* ('The Generalities of Medicine'). The book follows the precepts of Graeco-Arabic medicine and is critical of the expositions of Galen, based on

Ibn Zuhr, His Time, and His Medical Legacy, Cairo-New York 2008 or L. I. Conrad, *An Andalusian Physician at the Court of the Muwaḥḥids: Some Notes on the Public Career of Ibn Tufayl*, in: Al-Qanṭara 16 (1995), 3–13. Regarding the medical works of Ibn Rušd, cf. also J. Chandelier, *Averroes on Medicine*, in: P. Adamson/M. Di Giovanni (eds.), *Interpreting Averroes*, Cambridge 2019, 158–176; id., *Medicine and Philosophy*, in: H. Lagerlund (ed.), Encyclopedia of Medieval Philosophy, Heidelberg 2010, 735–742, esp. 737 sq. and 740; M. Cruz Hernández, *Abū-l-Walīd Muḥammad ibn Rušd (Averroes), Vida, Obra, Pensamiento, Influencia*, Córdoba ²1997, 50–56.

[3] Ibn Abī Uṣaybiʿah, *A Literary History of Medicine – The ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ*, edd. and translated by E. Savage-Smith/S. Swain/G. J. van Gelder, Leiden 2020, Chapter 13 Biography 66 (13.66.6), URL: <https://scholarlyeditions.brill.com/reader/urn:cts:arabicLit:0668IbnAbiUsaibia.Tabaqatalatibba.lhom-tr-eng1:13.66/?q=rabbih&qk=form&right=lhom-ed-ara1>(last access on December 20, 2024).

[4] The *barnāmağ* is printed in Cruz Hernández, *Abū-l-Walīd Muḥammad ibn Rušd* (nt. 2), 360–369 (Apéndice II).

[5] For a provisional list of Ibn Rušd's medical writings, including treatises which are lost or assumed to be his penship, cf. ibid., 50–56. A short introduction to Ibn Rušd's medical works is also given by Chandelier, *Averroes on Medicine* (nt. 2), 159–162. For more information, cf. Lirola Delgado/Ferrando/Forcada/Puerta Vílchez/Puig Montada/Urvoy/Vázquez de Benito, *Ibn Rushd al-Ḥafīd, Abū l-Walīd* (nt. 1). For a bibliography of his philosophical works, cf. Endress, *'Averrois Opera'* (nt. 2).

principles developed by Aristotle[6]. In the pharmacological section of *al-Kulliyyāt*, Ibn Rušd's interest in *Materia medica* becomes clear: this was a field that was popular in the Western Islamic world and one that Ibn Rušd developed further[7]. This book is also available in Latin (under the title *Colliget*) and Hebrew (under the title *Qulliyyaṭ* or *Sefer ha-kollel ba-refuʾah* or *Sefer ha-miḳlal*). The Latin translation was undertaken by the Jewish translator Jacob Bonacosa in 1285 in Padua. As for the Hebrew version, there are at least two translations: an earlier one which is anonymous, and a second one which was carried out by Solomon ben Abraham Ibn Daud (14th century CE)[8]. Parts of the *Colliget* became part of the curriculum at Western universities[9].

[6] J. C. Bürgel, *Averroes "contra Galenum": das Kapitel von der Atmung im Colliget des Averroes als ein Zeugnis mittelalterlich-islamischer Kritik an Galen*, in: Nachrichten der Akademie der Wissenschaften in Göttingen. I. Phil.-Hist. Kl. 9 (1967), 263–340 and id., *Dogmatismus und Autonomie im wissenschaftlichen Denken des islamischen Mittelalters*, in: Saeculum 23 (1972), 30–46.

[7] Y. Tz. Langermann, *Another Andalusian Revolt? Ibn Rushd's Critique of al-Kindī's Pharmacological Computus*, in: J. P. Hogendijk/A. I. Sabra (eds.), The Enterprise of Science in Islam: New Perspectives, Cambridge MA, 2003, 351–372, 365 sq.

[8] This work is listed as no. 4 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Ibn Rušd's *al-Kulliyyāt fī ṭ-ṭibb* was edited by J. M. Fórneas Besteiro/C. Álvarez de Morales, 2 voll., Madrid 1987, by S. Šaybān/A. Ṭālibī, Cairo 1989, and by M. Maḥfūẓ, Beirut 1999 (²2008, ed. M. ʿA. al-Ǧābirī). None of these editions are free of reading errors and it is often not clear why a certain manuscript variant has been chosen. The present work follows the Cairo edition and the Madrid edition because they are more established in research circles than the Beirut editions. For more on the quality of the Madrid and the Cairo editions, cf. H. Eichner, *Averroes' Mittlerer Kommentar zu Aristoteles' De Generatione et Corruptione* (Averroes Arabicus XVII; Abhandlungen der Nordrhein-Westfälischen Akademie der Wissenschaften Nr. 111), Paderborn 2005, 150 with nt. 37. A Spanish translation was published by M. C. Vázquez de Benito/C. Álvarez de Morales, *Averroes. Libro de las generalidades de la medicina*, Madrid 2003. For the Latin translation, cf. R. Veit, *Transferts scientifiques de l'Orient à l'Occient. Centres et acteurs en Italie médiévale (XIe-XVe siècle) dans le domaine de la médecine*, in: R. Abdellatif/Y. Benhima/D. König/E. Ruchaud (eds.), *Acteurs des transferts culturels en Méditerranée médiévale*, Munich 2012, 147–156, 153; for the Hebrew version, cf. S. Muntner, *Ibn Rušd u-sefaraw ha-refuʾiyim be-yiḥud ha-kulliyat*, in: Kirjath Sepher 23 (1946/47), 62–71, 64. A critical edition of the Latin translation is being prepared in Paris by J. Chandelier, incorporating the Arabic and Hebrew versions, cf. URL: <www2.univ-paris8.fr/histoire/?page_id=1602> (last access on December 20, 2024). More generally on this work Chandelier, *Averroes on Medicine* (nt. 2), 159 sq., 163 sq., 176 and also Forcada, *Ética e ideología de la Ciencia* (nt. 2), 333–334.

[9] Chandelier, *Averroes* (nt. 2), 176 and also I. Ventura, *Wie beherrscht man die Kenntnis der* medicamina*? Fehler und Normierung in der universitären Pharmakologie*, in: Miscellanea Mediaevalia 40 (2018), 123–148.

2) *Šarḥ li-Urǧūzat Ibn Sīnā fī ṭ-ṭibb* (Commentary on Ibn Sīnā's didactic poem on medicine)

Ibn Rušd's commentary on Ibn Sīnā's (Latinised Avicenna) medical didactic poem *Urǧūza fī ṭ-ṭibb* was also influential, although it has received less attention in the literature thus far. Further evidence of its relevance are the translations from Arabic into both Latin and Hebrew, and that it has a considerable manuscript tradition in all three languages[10]. It was translated into Latin by Armengaud Blaise (c. 1264–1312 CE), one of the pioneer translators of Arabic and Hebrew medical texts in Latin Europe[11]. In the 13th

[10] This commentary is listed as no. 5 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). There are two editions of the text (both with reading errors): Ibn Rušd, *Šarḥ li-Urǧūzat Ibn Sīnā fī ṭ-ṭibb*, ed. ʿA. aṭ-Ṭālbī, Algiers 2011; *Averroes: Avicennae Cantica. Texto árabe, versión latina y traducción española*, edd. J. Coullaut Cordero/E. Fernández Vallina/M. C. Vázquez de Benito, Salamanca 2010. For more on this didactic poem and its commentaries, cf. M. Forcada, *Didactic poems on medicine and their commentaries in medieval al-Andalus and Western Islam*, in: Suhayl 18 (2020–2021), 163–202, 169–175; id., *De Alejandría a Córdoba: la medicina según Ibn Rushd y la tradición araboislámica*, in: Asclepio. Revista de Historia de la Medicina y de la Ciencia 72/2 (2020), 1–15; G. J.van Gelder, *Arabic Didactic Verse*, in: J. W. Drijvers/A. A. MacDonald (eds.), *Centres of Learning: Learning and location in pre-modern Europe and the Near East*, Leiden 1995, 103–117, 108. Cf. also Chandelier, *Averroes on Medicine* (nt. 2), 161, 165, 167 sq. An introduction to Ibn Sīnā's *Urǧūza* is given by M. Khan, *The Two Ibn Sīnās: Negotiating Literature*, in: Intellectual History of the Islamicate World 6 (2018), 1–26.

[11] This Latin translation was probably based on the Arabic original, but it is also conceivable that the Hebrew version was its *Vorlage*. On these discussions, cf. J. Chandelier, *Comment Averroès a empoisonné Avicenna: histoire d'une légende*, in: N. Weill-Parot/M. Ausécache/J. Chandelier/L. Moulinier-Brogi/M. Nicoud (eds.), *De l'homme, de la nature et du monde: Mélanges d'histoire des sciences médiévales offerts à Danielle Jacquart*, Geneva 2019, 37–58, 50 sq. and M. McVaugh, *Averroes comes to Montpellier*, in: Weill-Parot/Ausécache/Chandelier/Moulinier-Brogi/Nicoud (eds.), *De l'homme, de la nature et du monde* (this same note), 26 sq. In this article (ibid., 21), McVaugh contradicts Chandelier, according to whom this translation had little influence on Latin medical studies (cf. Chandelier, *Comment Averroès a empoisonné Avicenna* (this same note), 51). In the 15th/16th century CE, this Latin translation, reviled for its linguistic quality (ibid., 51), was revised in humanist circles. This revised version of Andrea Alpago (Ed. Venice 1553) is printed as part of Averroes: *Avicennae Cantica*, edd. Coullaut Cordero/Fernández Vallina/Vázquez de Benito (nt. 10). For the Latin version of this text, cf. also C. Burnett, *Learned Knowledge of Arabic Poetry, Rhymed Prose, and Didactic Verse from Petrus Alfonsi to Petrarch*, in: J. Marenbon (ed.), Poetry and Philosophy in the Middle Ages, Leiden 2000, 29–62, 45 sqq. and M. McVaugh, *Reading Averroes*, in: M. T. Abate (ed.), Convivencia and Medieval Spain, Mediterranean Perspectives, Basingstoke/Hampshire 2019, 409–421. For Alpago, cf. R. Veit, *Entry 'Andrea Alpago'*, in: Encyclopaedia of Islam-Three, Leiden 2008, 82–83 and ead., *Le Canon d'Avicenne et son importance dans l'œuvre d'Andrea Alpago*, in: Mélanges de l'Université Saint-Joseph 68 (2019–2020), 59–68.

century CE, Moses Ibn Tibbon prepared the Hebrew version of the text[12].

Most of Ibn Rušd's other medical works are preserved in Arabic in the only known manuscript, Ms. Madrid, Real Biblioteca de San Lorenzo de El Escorial, árabe 884 (abbr. Ms. El Escorial, árabe 884), which plays a crucial role for the transmission of Ibn Rušd's medical writings as it was compiled a mere forty years after Ibn Rušd's death (1237 CE and 1240 CE) in the castle of Purchena. Another important manuscript in this context is Ms. Madrid, Real Biblioteca de San Lorenzo de El Escorial, árabe 881 (abbr. Ms. El Escorial, árabe 881)[13].

Ibn Rušd's commentaries on Galen's works:

3) 'Commentary on Galen's *On the Elements*' (*Talḫīṣ Kitāb al-usṭuqussāt li-Ǧālīnūs*)[14]

4) 'Commentary on Galen's *On the Natural Faculties*' (*Talḫīṣ Kitāb al-quwwā aṭ-ṭabīʿiyya li-Ǧālīnūs*)[15]

[12] It is striking here that the Hebrew translation transfers the rhymed original of Ibn Sīnā into a prose version, whereby the special character of the text is lost, cf. H. Kahana-Smilansky, *Moses Ibn Tibbon's Answers to Queries on Physics: Sources and Problems*, in: Aleph 12.2 (2012), 209–241. Cf. also M. Kozodoy, *Medieval Hebrew Medical Poetry: Uses and Contexts*, in: Source: Aleph 11.2 (2011), 213–288, 241, 258 sq. as well as Muntner, *Ibn Rušd* (nt. 8), 64.

[13] These smaller treatises of Ibn Rušd's medical works have been edited twice: *Commentaria Averrois in Galenum*, ed. M. C. Vázquez de Benito, Madrid 1984 and Ibn Rušd, *Rasāʾil Ibn Rushd aṭ-ṭibbiyya (Les Traités médicaux d'Averroes)*, edd. G. C. Anawati/S. Zāyed, Cairo 1987. Both editions are not free of flaws. Vázquez de Benito, however, is closer to the writing in the manuscript than Anawati/Zāyed. There is also a Spanish translation of these texts (*Averroes, Obra Médica*, translated by M. C. Vázquez de Benito, Córdoba–Málaga–Sevilla 1998) which should be seen in some parts as a paraphrase rather than a verbatim rendering of the text. Somewhat careless English translations (with gaps) of most of these texts were provided by G. C. Anawati/P. Ghalioungui, *Medical manuscripts of Averroes at El-Escorial*, Cairo 1986. For more information about these textes, cf. the descriptions of the individual treatises below. For information about the two manuscripts, cf. H. Derenbourg, *Les manuscrits arabes de l'Escurial*, vol. 2, 2, Paris 1903 (catalogue revised by H. P. J. Renaud in 1941), 91 sq. (Ms. 881) and 95–97 (Ms. 884).

[14] Ms. El Escorial, árabe 884, foll. 1v–21r; no. 16 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 9–34 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 29–72.

[15] Ms. El Escorial, árabe 881, foll. 69v–130v and Ms. El Escorial, árabe 884, foll. 7v–41v; no. 18 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 95–183 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 163–296.

5) 'Commentary on Galen's *On Mixtures*' (*Talḫīṣ Kitāb al-mizāǧ li-Ǧālīnūs*)[16]

6) 'Commentary on Galen's *On Fevers*' (*Talḫīṣ Kitāb al-ḥummayāt li-Ǧālīnūs*)[17]

7) *Kalām fī l-Kitāb al-ᶜilal wa-l-aᶜrāḍ li-Ǧālīnūs* ('Discourse on Galen's 'On Diseases and Symptoms')[18]

'On Diseases and Symptoms' is an Alexandrian compilation of four Galenic treatises devoted to related topics: *De differentiis morborum*, *De morborum causis*, *De symptomatum differentiis*, *De symptomatum causis*. There has been some confusion about the translation of this title because *ᶜilal* means not only "diseases" but also "causes". According to M. Ullmann, *ᶜilal* has to be understood as "diseases"[19].

[16] Ms. El Escorial, árabe 881, foll. 22r–68v; no. 17 in Ibn Abī Uṣaybiᶜah, *ᶜUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 35–94 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 73–162. The completion of this *talḫīṣ* is dated by Ibn Rušd on a Wednesday of the month Rabīᶜ II 588 h. (April / May 1192 CE), cf. Ms. El Escorial, árabe 881, fol. 68v.

[17] Only the end of this commentary is preserved in Ms. El Escorial, árabe 884, foll. 1r–7r. There may also be another manuscript of this text in Syria – Ms. Aleppo, Estate of Sayyid Bakrī Zābidī, 128 – but we do not know for certain and if it does exist, the location is not known (cf. Cruz Hernández, *Abū-l-Walīd Muḥammad ibn Rušd* (nt. 2), 438). This commentary is listed as no. 21 in Ibn Abī Uṣaybiᶜah, *ᶜUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 187–199 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 297–316. The completion of this *talḫīṣ* is dated by Ibn Rušd to the Wednesday following the month of Muḥarram 589 h. (February 11, 1193), cf. Ms. El Escorial, árabe 884, fol. 7r.

[18] Ms. El Escorial, árabe 884, foll. 42r–58v; no. 19 in Ibn Abī Uṣaybiᶜah, *ᶜUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 201–235 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 317–369. Cruz Hernández (*Abū-l-Walīd Muḥammad ibn Rušd* (nt. 2), 53, no. 78) mentions not only this commentary but also another, similar and obviously lost title which is listed in the so-called *barnāmaǧ* (cf. above nt. 4). This refers to a treatise called *Kalām ᶜalā masʾala min al-ᶜilal wa-l-ʾaᶜrāḍ* ('Discourse on a Question Regarding Diseases and Symptoms'), cf. also ibid., 367, no. 58.

[19] Ullmann, *Die Medizin* (nt. 2), 42, no. 22. Cf. also Galen, *On Diseases and Symptoms*, ed. and translated by I. Johnston, Cambridge, 2006.

Further Medical writings:

8) *Fī t-tiryāq* ('On Theriac')[20]	In this treatise, Ibn Rušd expands upon the theory of remedies presented in *al-Kulliyyāt* and offers a more mature and differentiated argumentation. Hebrew and Latin translations of the text are also available: the latter was the subject of debate among Latin scholars, especially at the Medical School of Montpellier[21].
9) *Fī aṣnāf al-mizāǧ* ('On the Types of Mixtures')[22]	In this short text, Ibn Rušd presents his theory on mixtures in an argumentatively mature and closed format. This is essentially a rejection of Galen's concept of mixtures[23].

[20] Ms. El Escorial, árabe 873, foll. 5v–10v (incomplete at the end) and Ms. El Escorial, árabe 884, foll. 65r–74r; no. 47 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 249–266 (based on Ms. El Escorial, árabe 884 only) and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 387–422 (based on both manuscripts).

[21] An introduction to this text is provided by J. Ricordel, *Le traité sur la thériaque d'Ibn Rushd (Averroes)*, in: Revue d'histoire de la pharmacie 88 (2000), 81–90. For the originality of this work compared to *al-Kulliyyāt*, cf. Langermann, *Another Andalusian Revolt?* (nt. 7), 353. There is no modern edition of the Latin or the Hebrew text. On the reception of the Latin version, cf. M. McVaugh, *An early discussion of medical degrees at Montpellier by Henry of Winchester*, in: Bulletin of the history of medicine 49 (1975), 57–71 and id., *Averroes comes to Montpellier* (nt. 11). A research project on this treatise, including all three language versions, is currently being undertaken by Y. Tz. Langermann.

[22] Ms. El Escorial, árabe 632, foll. 96r–102r and Ms. El Escorial, árabe 884, foll. 58v–63v; no. 41 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). There are four editions of this treatise: Both manuscripts were consulted for the editions in Ǧ. ad-D. al-ʿAlawī, *Maqālāt fī l-manṭiq wa-l-ʿilm aṭ-ṭabīʿī li-Abī l-Walīd Ibn Rušd*, Casablanca 1983, 63–66 (Introduction), 244–257 (Edition) as well as in A. Ǧumʿa, *Abū l-Walīd Ibn Rušd: Kitāb al-muqaddimāt fī l-falsafa aw al-masāʾil fī l-manṭiq wa-l-ʿilm aṭ-ṭabīʿī wa-ṭ-ṭibb*, Tunis 2008, 278–294. Only the text of Ms. El Escorial, árabe 884 was used in the editions in Commentaria Averrois, ed. Vázquez de Benito (nt. 13), 237–245 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 371–386.

[23] Cf. Eichner, *Averroes' Mittlerer Kommentar* (nt. 8), 154–157 (including a German paraphrasing of this text).

10) *Fī nawāʾib al-ḥummā* ('On Bouts of Fever')[24]

In this short text, Ibn Rušd develops the argument he introduced in the fever-*talḫīṣ*. There has been some confusion about this title because the title listed by Ibn Abī Uṣaybiʿa indicates the text's *Incipit* in which to the "time of the bout" (*zamān an-nawba*) is referred to. Thus, *nawba* ("bout" or "attack") sometimes has been translated as "crisis" but this would have been *buḥrān* in Arabic[25].

11) *Fī ḥifẓ aṣ-ṣiḥḥa* ('On the Preservation of Health')[26]

This very short text addresses health questions and seems to have been written at the request of some of Ibn Rušd's friends at court. This text is not to be confused with the sixth book of *al-Kulliyyāt* which bears the same title *Ḥifẓ aṣ-ṣiḥḥa*.

[24] Ms. El Escorial, árabe 884, foll. 63v–64v; no. 42 with the title *Masʾala fī nawāʾib al-ḥummā* in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). Edition: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 247–248 (not in Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13)). In Ms. El Escorial, árabe 884 (fol. 63v) no name is designated to this short text. For *nawba* as "crisis", cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), (Introducción) X, no. 4, XI, no. 5 as well as *Ibn Rušd, Obra Médica*, translated by ead., (Introducción) 12, no. 4 and also Cruz Hernández, *Abū-l-Walīd Muḥammad ibn Rušd* (nt. 2), 51, no. 52.

[25] Cruz Hernández (ibid.) also mentions a possible Latin translation of this text under the title *Quaestio de convalescentia a febre* without giving any further information. However, no Latin or Hebrew translations are known. Another treatise on fever is listed as no. 43 in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3): *Maqāla fī ḥummayāt al-ʿafan* ('Treatise on fevers of putridity'). This text did not survive but it would have aligned with Ibn Rušd's fever *talḫis* in which putrid fevers are discussed in great detail.

[26] Ms. El Escorial, árabe 884, foll. 74v–76r; not listed in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). There are three editions of this text, of which none are free of occasional errors: E. García Sánchez, *Un opúsculo inédito de Averroes sobre higiene individual: Fī Ḥifẓ al-Siḥḥa (ms. árabe 884 de El Escorial). Edición, traducción y notas*, in: Dynamis 4 (1984), 247–263, *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267–270 and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13), 423–430. The title of this short treatise is not explicitly stated in Ms. El Escorial, árabe 884 but can be construed from the text's *Incipit* (fol. 74v) where the "preservation of health" (*ḥifẓ aṣ-ṣiḥḥa*) is mentioned. Cruz Hernández (*Abū-l-Walīd Muḥammad ibn Rušd* (nt. 2), 51, no. 51) also mentions a possible Latin translation of this text under the title *Epistola de sanitate conservanda* but without giving any further information. No Latin or Hebrew translations are known. For more on this text, cf. below 'III. Ibn Rušd's Treatise 'On the Preservation of Health''.

12) *De venenis* ('On Poisons')[27]	This text is preserved only in Latin. Its discussion on poisons is more detailed than that in *al-Kulliyyāt*, which becomes apparent in a strong focus on the practical use of poisons. The question about the authenticity of Ibn Rušd's authorship of this text has not yet been conclusively clarified.

The authorship of Ibn Rušd could not be confirmed for:

13) *Maʾamar ha-šilšul* ('Information about Diarrhoeal Diseases')[28]	This text is preserved only in Hebrew. In terms of style, it is very unlikely that this text can be traced back to Ibn Rušd himself.
14) *Šorašim kollelim be-ʿinyanim moʿilim ba-samim ha-mešalšelim / Articuli generales proficientes in medicinis laxativis magni abeloys .i. Averoys* ('General Principles of Laxative Remedies')[29]	This text was compiled by a converted Jew, Magister Maynus of Réalmont, from various recipe collections, first in Hebrew and then translated into a Latin. The Latin version dates from 1304.
15) 'On Simple Remedies'[30]	This Hebrew text, ascribed to Ibn

[27] This treatise is not listed in Ibn Abī Uṣaybiʿah, *ʿUyūn al-anbāʾ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). For more information on this Latin text, cf. Chandelier, *Averroes* (nt. 2), 159, F. W. Gibbs, *Poison, Medicine, and Disease in Late Medieval and Early Modern Europe*, Abingdon–New York 2019, 27, 38 with nt. 171 and nt. 172 as well as D. N. Hasse, *Success and Suppression: Arabic Sciences and Philosophy in the Renaissance*, Cambridge–London 2016, 345.

[28] There are three editions of this text: *Abu Walid Ibn Rušd ha-filosof, Maʾamar ha-šilšul*, ed. I. I. Goldblum, in: id. (ed.), Mi-ginzey Yisraʾel, vol. 1, Vienna 1893/94, 24–31; *Haqdamat Yaʿaqov ha-metargem*, ed. A. Z. Schwarz, in: ʿAley le-bibliografia we-qorot Yisrael 1 (1934/35), 37–41, 39–41; Abul Walid Ibn Rušd, *Maʾamar ha-šilšul*, ed. S. Muntner, in: Harofé Haivri 23, 2 (1950), 62–68.

[29] For more information and for the edition of the Latin version, cf. M. McVaugh/J. Shatzmiller, *A Jew on the Edge of Latin Medical Culture. "Magister Maynus" of Réalmont (1304)*, in: F. Käs/J. Kley/F. Hedderich (eds.), A Key to Locked Doors. Festschrift for Gerrit Bos on the Occasion of His 75th Birthday, Leiden–Boston 2024, 336–367.

[30] The manuscript in question is Ms. Oxford, Bodleian Library, Mich. Add. 42. M. Steinschneider (*Die Hebräischen Übersetzungen des Mittelalters und die Juden als Dolmetscher*, Berlin 1893, 676) identified an anonymous treatise in Ms. Biblioteca Vaticana, Vat. Ebr. 357 as the Arabic *Vorlage* of this text which in the meantime was proven to be the work of Abū ṣ-Ṣalt, cf. B. Richler, *Hebrew Manuscripts in the*

Rušd and preserved in only one single manuscript, is a translation of the treatise by the Andalusian polimath Abū l-Ṣalt (c. 1068–1134 CE) on the same topic.

16) *Fī ṭ-ṭarīqa aṣ-ṣanāᶜiyya fī ḥīlat al-burᵓ* ('On the Correct Way Concerning the Method of Healing') / shortened title: *Maqāla fī ḥīlat al-burᵓ* ('Book on the Method of Healing')[31]

The author of this text is Ibn Rušd's son Abū Muḥammad ᶜAbd Allāh (Averroes Junior) who also drafted a treatise on the intellect[32]. This text by Averroes Junior should not be mistaken for his father's lost commentary (*talḫīṣ*) on the second half of Galen's 'Method of Healing' (*Ḥīlat al-burᵓ*) which is listed by Ibn Abī Uṣaybiᶜa[33].

Vatican Library, Città del Vaticano 2008, 302. E. Renan (*Averroès et l'Averroïsme*, Paris ³(révue et augmentée) 1866, 78 no. 14) pointed out that "un traité *De simplicibus* en hébreu" should not be mistaken for the apparently lost *talḫīṣ* to Galen's 'Simple Drugs' which is listed as no. 22 in Ibn Abī Uṣaybiᶜah, *ᶜUyūn al-anbāᵓ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). In this context, Renan (ibid.) also mentions a Latin treatise *De simplicibus* which has been identified as the fifth book of the *Colliget*. Cruz Hernández (*Abū-l-Walīd Muḥammad ibn Rušd* (nt. 2), 55, no. 7. c.) also refers to this identification of *De simplicibus*: "Se trata del libro V del Kullīyāt, posiblemente en la versión representada por el ms. 1 de la B. del Sacromonte de Granada, lo que explica la diferencia entre la traducción hebrea y el libro V del Colliget de la edición de las Juntas."

[31] This treatise is preserved under the name of Abū Muḥammad ᶜAbd Allāh (Averroes Junior) in Ms. El Escorial, árabe 884, foll. 76v–78v. Editions: *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 271–275 and Ibn Rušd, *Rasāᵓil*, edd. Anawati/Zāyed (nt. 13), 431–438. Ibn Abī Uṣaybiᶜa mentions Averroes Junior as the author of a 'Book on the Method of Healing' (*Maqāla fī ḥīlat al-burᵓ*), cf. Ibn Abī Uṣaybiᶜah, *ᶜUyūn al-anbāᵓ*, edd. Savage-Smith/Swain/van Gelder (nt. 3), Chapter 13 Biography 67 (13.67), URL: <https://scholarlyeditions.brill.com/reader/urn:cts:arabicLit:0668IbnAbiUsaibia.Tabaqatalatibba.lhom-tr-eng1:13.67/?q=rabbih&qk=form&right=lhom-ed-ara1> (last access on December 20, 2024). On these discussions and attributions, cf. H. Daiber, Entry *'Ibn Rushd, Abū Muḥammad ᶜAbdallāh'*, in: Encyclopaedia of Islam-Three, Leiden 2009, 181–182 and esp. E. Wakelnig, *Ibn Rušd, His Son and Galen's 'Method of Healing' (Ḥīlat al-burᵓ)*, in this volume, 287-306.

[32] For an edition of this text, C. Burnett/M. Zonta, *Abū Muḥammad ᶜAbdallāh Ibn Rušd (Averroes Junior). On Whether the Active Intellect Unites with the Material Intellect whilst it is Clothed with the Body. A Critical Edition of the Three Extant Medieval Versions, together with an English Translation*, in: Archives d'histoire doctrinale et littéraire du Moyen Age 67 (2000), 295–335.

[33] Cf. no. 23 in Ibn Abī Uṣaybiᶜah, *ᶜUyūn al-anbāᵓ*, edd. Savage-Smith/Swain/van Gelder (nt. 3). There was some misunderstanding amongst the editors as to the edition, cf. ibid., nt. 41.

Chronological Overview

It seems that Ibn Rušd's medical works were all written (or revised) in years between the early and mid-nineties of the 12th century CE, before the banishment of Ibn Rušd from the Almohad court in 1197 CE and his death in 1198 CE[34].

al-Kulliyyāt fī ṭ-ṭibb ('The Generalities of Medicine')	The oldest version of *al-Kulliyyāt* has been dated to the early sixties of the 12th century CE. Different stages of revision can be identified, which becomes evident not only in the Arabic but also in the Latin and Hebrew editions[35]. In one of these later revisions Ibn Rušd refers to his fever *talḫīṣ* which means that this revision took place after February 11, 1193 CE[36].
Commentary (*šarḥ*) on Ibn Sīnā's didactic poem on medicine	This commentary was compiled by Ibn Rušd probably in the year 1180 CE[37].
Commentary (*talḫīṣ*) on Galen's 'On Mixtures'	This commentary dates to a Wednesday of the month Rabīᶜ II 588 h. (April / May 1192 CE)[38].

[34] For more on the last years of Ibn Rušd's life, cf. M. Fierro, *Ibn Rushd's (Averroes) 'Disgrace' and his Relations with the Almohads*, in: A. Al Ghouz (ed.), Islamic Philosophy from the 12th to the 14th Century, Bonn 2018, 73–118.

[35] For more information on the dating and subsequent revisions of *al-Kulliyyāt*, cf. H. Gätje, *Probleme der Colliget-Forschung*, in: Zeitschrift der deutschen Morgenländischen Gesellschaft 130 (1980), 279–303, 280 sq., 296 sq. and id., *Die Vorworte zum Colliget des Averroes*, in: Zeitschrift der deutschen Morgenländischen Gesellschaft 136 (1986), 402–427, 406–408. For more on these discussions, cf. also D. Urvoy, *Averroès. Les ambitions d'un intellectuel musulman*, Paris 1998, 106 as well as C. Álvarez de Morales/M. C. Vázquez de Benito, *Apuntes y reflexiones en torno al Kulliyyāt de Averroes*, in: C. Álvarez de Morales (ed.), Ciencias de la naturaleza en al-Andalus. Textos y estudios VI, Madrid 2001, 93–112.

[36] This information is only found in the Latin translation of *al-Kulliyyāt*, cf. Averroes, *Colliget*, Venice 1557, fol. 4r. Urvoy, *Averroès* (nt. 35), 106 dates this revision to the year 1194.

[37] Ǧ. ad-D. al-ᶜAlawī, *al-Matn ar-Rušdī: madḫal li-qirāʾa ǧadīda*, Casablanca 1986, 99.

[38] Cf. above nt. 16 as well as *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 94, 1–2.

Discourse (*kalām*) on Galen's 'On Diseases and Symptoms'	This text, on the one hand, refers to Ibn Rušd's commentary on Galen's 'On Mixtures'[39] while, on the other, it announces Ibn Rušd's commentary on Galen's 'On the Different Types of Fevers'[40]. This means that it was compiled between April / May 1192 CE and February 11, 1193 CE.
Commentary (*talḫīṣ*) on Galen's 'On the Different Types of Fevers'	This commentary dates to the Wednesday following the month of Muharram 589 h. (February 11, 1193 CE)[41].
Commentary (*talḫīṣ*) on Galen's 'On the Elements'	There is no dating for these two commentaries. The textual character of these texts suggests that they were composed within the context of his other *talḫīṣāt* on Galen, that is, in the twilight of his life.
Commentary (*talḫīṣ*) on Galen's 'On the Natural Faculties'	

More generally, Ibn Rušd's statements in the colophon of his commentary on Galen's 'On Mixtures' might lead one to the assumption that this *talḫīṣ*, written at the request of his sons and provided with the general announcement that he wanted to explain Galen's works to medical students[42], was the first of his explanatory texts on Galen. However, according to Galen's thematic order, 'On the Elements' should have been commented on before 'On Mixtures'. In other words, this would mean that Ibn Rušd started commenting on Galen in 1192 CE at the latest, and his other works on Galenic texts were compiled in the years that followed.

'On the Types of Mixtures'	The textual character of these texts suggests that both treatises have to be placed in the context of Ibn Rušd's commentaries on Galen's 'On Mixtures' and 'On the Different Types of Fevers'.
'On Bouts of Fever'	
'On Theriac'	This treatise presents more mature arguments than those found in *al-Kulliyyāt*, and should therefore be

[39] Ibid., 202, 13–14.
[40] Ibid., 230, 2; 230, 22; 231, 21.
[41] Cf. ibid., 10–11 as well as above nt. 17.
[42] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 94, 3–7. For this passage, cf. also below 'II. The Medical *Talḫīṣ*: Ibn Rušd Teaching Galen'.

	dated to this creative period during the nineties of the 12th century CE[43].
'On the Preservation of Health'	This short text can be understood as a practical supplement to the relevant passages in *al-Kulliyyāt* and was probably also written in the nineties of the 12th century CE. Ibn Rušd discusses its contents in an argumentative and structural way similar to the manner in which they appear in the relevant sections of the fifth and sixth books of *al-Kulliyyāt*[44].

II. The Medical *Talḫīṣ*: Ibn Rušd Teaching Galen*

For many, Ibn Rušd is best known for his commentaries on the *Corpus Aristotelicum*, which, in their structure, take the form of Small Commentaries or *epitomai*, Middle as well as Long Commentaries. He also compiled compendia, summaries and paraphrases as well as stand-alone works. The different text forms were compiled to meet the demands of the different reader groups. Thus, the *epitomai* tend to be viewed as introductory readings for beginners, while the Middle Commentaries were intended for an audience who was already familiar with the subject; the Long Commentaries were a thorough scholarly presentation of the relevant topic intended for contemporaries. While this basic classification may not apply to all these commentaries, it does provide an initial framework to understand Ibn Rušd's works and his intended audiences[45]. Texts created for other disciplines during the Almohad period had similar formats[46].

[43] Langermann, *Another Andalusian Revolt?* (nt. 7), 353.

[44] For more on this text, cf. below 'III. Ibn Rušd's Treatise 'On the Preservation of Health''.

* I would like to express my gratitude to Y. Tz. Langermann who, despite time constraints, discussed important aspects of this contribution with me. Many thanks also to E. Wakelnig for our stimulating discussions and for providing me with bibliographical data. I would also like to thank H. H. Biesterfeldt and G. Endreß for all their valuable suggestions and advice.

[45] For further discussion of Ibn Rušd's commentaries and how they are linked to one another, cf. H. Gätje, *Das Kapitel über das Begehren aus dem mittleren Kommentar des Averroes zur Schrift über die Seele*, Amsterdam 1985, 23–31, esp. 25 sq. and A. L. Ivry, *Averroes' understanding of the philosopher's role in society*, in: A. Akasoy/W. Raven (eds.), *Islamic thought in the Middle Ages. Studies in text, trans-*

In the terminology of Ibn Rušd's philosophical commentaries, the *epitomai* are referred to as *ǧawāmiᶜ* (plural form of *ǧāmiᶜ*), the Middle Commentaries *talḫīṣāt* (plural form of *talḫīṣ*), and the Long Commentaries *šurūḥ* (plural form of *šarḥ*). To fully comprehend the different types of medical literature Ibn Rušd compiled as well as the audiences he had in mind while composing these works, the categorisation of the individual medical texts will be considered in more detail here[47].

As seen above, Ibn Rušd's primary work on medicine is his medical encyclopaedia *al-Kulliyyāt*, which was also known as *Colliget* in medieval and early-modern Europe. Further, Ibn Rušd wrote a commentary on Ibn Sīnā's medical didactic poem *Urǧūza fī ṭ-ṭibb* entitled *Šarḥ urǧūza fī ṭ-ṭibb*. This commentary uses *šarḥ* in the title as it was the term he typically took for his Long Commentaries on the *Corpus Aristotelicum*. Additionally, the textual structure of this medical *šarḥ* corresponds to that of a philosophical Long Commentary where original quotations from Aristotle alternate with scholarly explanations by Ibn Rušd. A detailed examination of this commentary by Ibn Rušd, however, has not yet been carried out.

He also wrote commentaries on Galen's 'On the Elements'[48], 'On the Natural Faculties'[49], 'On Mixtures'[50], 'On the Different Types of Fevers'[51], and 'On Diseases and Symptoms'[52]. He refers to the first

mission and translation in honour of Hans Daiber, Leiden 2008, 113–122. The subheadings employed by Ibn Rušd in his works are not discussed here as they are not of relevance for the present discussion.

[46] This tripartite structure is also found in the writings of other scholars of different disciplines who were active at the Almohad court. I would like to thank M. Fierro for bringing this to my attention.

[47] For details about Ibn Rušd's medical works, cf. above 'I. Overview and Chronology'.

[48] This commentary mentions *talḫīṣ* in the title and in the colophon, cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 9 and 34.

[49] This commentary is repeatedly referred to as *talḫīṣ* in both the title and colophon of the three books of 'On the Natural Faculties', cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 95 and 122 for Book I, 123 and 150 for Book II, 151 and 183 for Book III.

[50] This commentary is repeatedly referred to as *talḫīṣ* in both the title and colophon of the three books of 'On Mixtures', cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 35 and 53 for Book I, 55 and 78 for Book II, 56 and 94 for Book III.

[51] Only the final part of this treatise is preserved, and in the colophon it is referred to as *talḫīṣ*, cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 199.

[52] This treatise, is called *kalām* in the title and in the colophon, cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 201 and 235.

four commentaries as *talḫīṣāt* ("Middle Commentary" in the Aristotelian context) while the latter he refers to as *kalām* ("discourse").

Moreover, we find the terms *ǧumla* ("summary") and *maqāla* ("chapter", "treatise") for 'On the Types of Mixtures'[53]; *maqāla* is also given for 'On Theriac'[54].

The title *kalām* is given to 'On the Preservation of Health', only in the colophon[55]. There is no known title for 'On Bouts of Fever': in the colophon we read "what he said" (*mā qālahu*)[56]. Both works are short texts which cannot be clearly categorised within the context of his medical work. Perhaps he did not give them titles due to their brevity or because he considered them to be less significant. The copyist then simply used *kalām* or *mā qālahu*.

This study seeks to clarify and identify matters pertaining to Ibn Rušd's medical works. It focuses on Ibn Rušd's commentaries on Galen which are typically referred to as *talḫīṣ*. It aims to point out whether these texts show similarities and parallels with Ibn Rušd's Middle Commentaries on Aristotle beyond the commonality of being referred to as *talḫīṣ*. The present work does not, however, consider Ibn Rušd's commentary on Galen's 'On Diseases and Symptoms' which is labelled as *kalām* and deviates in form from a Middle Commentary as will be shown below.

Ibn Rušd's commentaries on Galen mostly consist of content analyses and supplementary explanatory information. Galen's work is repeatedly criticised, especially in the *talḫīṣ* on 'On Mixtures'. This criticism mainly refers to issues which Aristotle explains differently to Galen's explanation. Often, however, Ibn Rušd provides additional information on the subject matter, presumably to give readers a better understanding of the text. It should also be emphasised that Ibn Rušd explicitly endorses Galen's doctrines and encourages his readers to adhere to them[57].

[53] This treatise is preserved in the manuscripts Mss. El Escorial, Real Biblioteca de San Lorenzo, árabe 632, foll. 96r–102r and árabe 884, foll. 58v–63v. In both manuscripts in the *Explicit*, this treatise is entitled *ǧumla*. Furthermore, in the colophon of Ms. El Escorial, árabe 884, this title is also called *maqāla*. Ms. El Escorial, árabe 632 has no colophon. For more details, cf. above nt. 22 and nt. 23.

[54] *Maqāla* is mentioned in the colophon of this text, cf. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 266.

[55] Ibid., 270.

[56] Ibid., 248.

[57] Cf., e.g. ibid., 166, 23 – 167, 2 (*talḫīṣ* on Galen's 'On the Natural Faculties'); ibid., 94, 4–5 (colophon to the *talḫīṣ* on Galen's 'On Mixtures'); ibid., 194, 10–14 (*talḫīṣ* on Galen's 'On Fevers'). In this context, cf. furthermore Chandelier, *Averroes* (nt. 2), 165.

According to H. Gätje (1985), in contrast to the Long Commentaries where Ibn Rušd follows the source text closely and inserts his explanations between the original words of Aristotle, in the *epitomai* and the Middle Commentaries, he uses a less rigid system for his *Vorlage* texts but still staying relatively closely to the original text. For his Middle Commentaries, he divided the Aristotelian texts into sections of different lengths, each separated by the introductory word *qāla* ("he <i.e. Aristotle> says")[58].

It should be noted that Ibn Rušd does not comment on Arabic translations of Galen treatises: instead, he relies on paraphrased or partially shortened versions of the original Greek texts. Occasionally, he also works with longer versions of the original writings. When one compares the Galenic texts upon which Ibn Rušd bases his commentary to the Arabic translations of Ḥunayn ibn Isḥāq, there are seldom literal equivalents to be found. Instead, they should be considered as texts devoted to the same content but with different wording. M. Wernhard (2005) characterised these texts as "exzerpierende Paraphrase" in his edition of the Ḥunayn ibn Isḥāq translation of Galen's treatise 'On the Different Types of Fevers'. Furthermore, Wernhard was not able to establish that Ibn Rušd depended on the manuscript tradition of the Ḥunayn translation of 'On the Different Types of Fevers' for his commentary[59].

The use of shorthand versions of Galen's work in Syriac and Arabic translations for teaching purposes was already common in late antiquity in the Islamicate world. The most well-known texts are compiled in *Summaria Alexandrinorum*, which also includes the works of Galen that were commented on by Ibn Rušd[60]. However, a comparison shows that the Galenic texts used by Ibn Rušd in his commentaries do not correspond to the respective abridged versions presented in the *Summaria Alexandrinorum*.

In 1903, in his descriptions of the two El Escorial manuscripts Ms. árabe 881 and Ms. árabe 884, which include three of these Ibn Rušd commentaries on Galen, H. Derenbourg alludes to the fact that the Galenic texts used by Ibn Rušd for his commentaries do not correspond to the Greek originals, describing them as "trois abrégés d'ou-

[58] Gätje, *Das Kapitel über das Begehren* (nt. 45), 27.

[59] *Galen: Über die Arten der Fieber in der arabischen Version des Ḥunain Ibn Isḥāq*, ed. and translated by M. Wernhard, Munich 2005, XXVI with nt. 32.

[60] O. Overwien, *The Summaria Alexandrinorum (Ǧawāmiᶜ al-Iskandarāniyyīn): Medical Compilations from Late Antique Alexandria in the Medieval Arabic Tradition*, forthcoming in a volume on medicine and philosophy which is expected to be published in 2027.

vrages de Galien, qui sont probablement dus à Averroès"[61]. Wernhard follows Derenbourg when, in the context of 'On the Different Types of Fevers', he ascribes to Ibn Rušd the authorship of these Galen paraphrases without further explanation[62]. This assumption, however, has not yet been fully established and other explanations are also possible, to which reference is made below.

Further observations on the characteristics of Ibn Rušd's Middle Commentaries on philosophical topics must be considered to better understand his Middle Commentaries on Galen. For example, with regard to Ibn Rušd's Middle Commentary on Aristotle's 'On Generation and Corruption', S. Kurland (1958) wrote that the text "like all of his Middle Commentaries is in the form of a running commentary. Quoting or summarising a short portion of the Aristotelian text he proceeds to explain it"[63]. H. Eichner (2005), noted vis-à-vis the same Middle Commentary that the Aristotelian text parts are "fortlaufende Paraphrase" [64]. A. L. Ivry (2002) remarked on Ibn Rušd's Middle Commentary on Aristotle's 'On the Soul' that "Averroes highlights certain sentences from an Aristotelian passage, quoting some of them but paraphrasing more, summarising the text"[65]. Finally, in relation to Ibn Rušd's Middle Commentary on Porphyry's Isagoge, H. A. Davidson (1969) outlined: "Generally, he opens each new section with the expression *qāla*; this expression does not mean that what follows is a verbatim quotation; the citations are paraphrases incorporating the language of the original in varying degree"[66].

With regard to the structure of the Galenic works, neither the Greek originals nor their Arabic translations are subdivided into sections, apart from their internal division into books. The Galen paraphrase in Ibn Rušd's commentaries, however, is divided into sections which are separated by means of inserting the abovementioned word *qāla* ("he <i.e. Galen> says"). Ibn Rušd's commentary on

[61] Derenbourg/Renaud, *Les manuscrits arabes de l'Escurial* (nt. 13), 91.

[62] *Galen: Über die Arten der Fieber*, ed. and tr. Wernhard (nt. 59), XXV, nt. 31: "... Ḥunains arabische Übersetzung von Galens *De differentiis febrium*, ..., die Übersetzung, die Ibn Rušd zweifellos exzerpiert hat".

[63] *Averrois Cordubensis Commentarium medium & Epitome in Aristotelis De generatione et corruptione libros*, Hebrew text ed. by S. Kurland, Cambridge MA, 1958, xv sq.

[64] Eichner, *Averroes' Mittlerer Kommentar* (nt. 8), 17.

[65] *Averroës, Middle Commentary on Aristotle's De anima*, ed., translated, notes and intr. by A. L. Ivry, Provo UT 2002, xiv with nt. 9.

[66] *Middle commentary on Porphyry's Isagoge, translated from the Hebrew and Latin versions, and on Aristotle's Categoriae*, translated from the original Arabic and the Hebrew and Latin versions, with notes and intr. by H. A. Davidson, Cambridge MA 1969, xiv sqq.

the texts, on the other hand, begins with the word *qultu* ("I say"). Nevertheless, Ibn Rušd does not comment on each *qāla* passage: instead, he supplements information and discussions on selected sections, which range in volume from a few lines to several pages.

Subdivisions of the texts using *qāla* and *qultu* are also found in Ibn Rušd's Middle Commentaries on the philosophical works of Aristotle. Galen's argumentation, however, does not mandate this substructure. In other words, these subdivisions of the respective Galenic text, in units of meaning, reasonably make sense as a whole, but other subdivisions of meaning would also have been conceivable[67]. Such findings were also observed, for example, by C. Butterworth (1983) in the context of Ibn Rušd's Middle Commentary on the 'Categories' and *De Interpretatione* and by Eichner in her study of Ibn Rušd's Middle Commentary on Aristotle's 'On Generation and Corruption'[68].

The structuring of the texts using *qāla* and *qultu* can also be found in Ibn Rušd's commentary on Galen's 'On Diseases and Symptoms' but with one fundamental difference: here, only the *qultu* passages, that is, Ibn Rušd's explanations, have been fully formulated, while in the *qāla* passages, Galen's texts are not replicated in a comprehensive manner but in the form of rather short basic statements. This deviation from the typical features of a Middle Commentary (*talḫīṣ*) may be the reason, as stated earlier, for this commentary being called a *kalām*.

In my following presentation, with the above-quoted descriptions of *qāla* passages in Ibn Rušd's philosophical Middle Commentaries in mind, some characteristics of the Galenic texts in the form in which they occur in Ibn Rušd's *talḫīṣāt* will be highlighted. The examples

[67] This becomes clear, e.g. when the traditional chapter division in the Greek text of Galen's 'On Mixtures' is compared with the corresponding Galenic text as part of Ibn Rušd's *talḫīṣ* on the same text: some of the chapter separations as they were inserted for the edition of the Greek text cuts through a *qāla* paragraph as given in Ibn Rušd's *talḫīṣ*. Cf., e.g. all of the chapters in Ibn Rušd's *talḫīṣ* on the third book of Galen's 'On Mixtures' (*Galeni De temperamentis libri III*, ed. G. Helmreich, Leipzig 1904 (reprint Stuttgart 1969), URL: <http://cmg.bbaw.de/epubl/online/wa_galen_temp.php> (last access on December 20, 2024), 86–115 (*Galen: Works on Human Nature*, vol. 1: *Mixtures (De Temperamentis)* (Cambridge Galen translations), translated by P. N. Singer/Ph. J. van der Eijk/with the assistance of P. Tassinari, Cambridge 2018, 154–184) and *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 79–93. Here, it is also interesting to note that the paragraph structure (apart from the *qāla*) and punctuation varies in the two main editions of Ibn Rušd's medical works (*Commentaria Averrois*, ed. Vázquez de Benito (nt. 13) and Ibn Rušd, *Rasāʾil*, edd. Anawati/Zāyed (nt. 13)).

[68] *Averroes' Middle Commentaries on Aristotle's Categories and De interpretatione*, translated with notes and intr. by C. E. Butterworth, Princeton NJ, 1983, 8 sq.; Eichner, *Averroes' Mittlerer Kommentar* (nt. 8), 18.

cited in the following are mainly taken from his *talḫīṣ* on the third book of Galen's 'On Mixtures', but comparable passages can also be found in the other Ibn Rušd commentaries on Galen.

As mentioned, it must be noted that the contents of Galen's texts are not usually reproduced in the same format as the original text, but freely paraphrased, deviating from the original text and occasionally shortened, but in some cases also augmented by means of didactic interventions, thereby expanding on information for better comprehension. Ibn Rušd's approach to the texts of Aristotle and Porphyry are described in a similar manner in the context of his Middle Commentaries.

Due to revision or rewording of the Galen paraphrase, there is an occasional rearrangement of information. At times, the original Galenic text is even replaced and paraphrased by the commentary of Ibn Rušd introduced by *qultu*. This is done sporadically either with or without additional explanatory information, which resonates with Ivry's description of Ibn Rušd's Middle Commentary on Aristotle's 'On the Soul'[69].

In addition to the shortening and contraction of the original Galen text in the paraphrase, which may seem justified in view of frequent redundant expressions in the Galenic text, the omission of some long text passages is striking. All the more as, on the one hand, it is impossible to deduce an clear justification for these omissions, while, on the other hand, didactically valuable additions to the formulations can frequently be found. The following two examples will clarify what is meant here:

When asked whether a cold remedy has compelling cooling effects, Galen cites an aphorism of Hippocrates: "In convulsions, at the height of summer, the pouring of large amounts of cold water on a young man in good condition affects a recall of the warmth"[70]. Here, Galen

[69] E.g. *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 89, 21–25 (*talḫīṣ* on Galen's 'On Mixtures') compared with *Galeni De temperamentis*, III, 4, ed. Helmreich (nt. 67), esp. 105, 18–27 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 174–175). Cf. also two further examples of this in *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 193, 3–13 and 194, 10–14 (*talḫīṣ* on Galen's 'On Fevers') compared with *Galen: Über die Arten der Fieber*, II, 17, ed. and tr. Wernhard (nt. 59), 276, 278, 280, 282, 284 and ibid., II, 18, 286, 14 as well as 288, 1–3 (the pages with an odd number contain the German translation). Moreover, cf. *Averroës, Middle Commentary*, ed. Ivry (nt. 65), xiv with nt. 9.

[70] *Galeni De temperamentis*, III, 5, ed. Helmreich (nt. 67), 112, 1–3 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 181, 3–5 with nt. 124). For this aphorism, cf. *Hippocrates, Aphorisms*, V, 21 (Littré IV, 538), ed. W. H. S. Jones (Loeb Classical Library 150), Cambridge MA–London 1931, URL: <https://www.loebclassics.com/view/LCL150/1931/volume.xml> (last access on December 20, 2024), 97–221, 162. /

gives the theoretical background for this phenomenon as it is described by Hippocrates[71]. So far, the Galenic paraphrase as part of Ibn Rušd's text follows the original Galenic text in the form of an expanded, more understandable paraphrase. Galen then explains how to understand this aphorism of Hippocrates: The cold water causes the young man's skin to contract, forcing the internal heat of the body back into deeper parts of the body. Consequently, this heat cannot escape very well, for example, by sweating, resulting in an additional warming of the body. These explanations are missing in Ibn Rušd's version, without any replacement[72]. Next, Galen explains how, depending on the constitution of the patient, the physician makes the right choice of remedies in terms of their qualities hot, cold, moist or dry. This information, which might be of interest for medical treatment, was considerably shortened as well as altered for the Galen paraphrase in Ibn Rušd's text. Additionally, in the following there are rather big differences between the original Galen text and its reproduction in Ibn Rušd's *talḫīṣ*[73].

Another example of this kind is the following: When asked whether a plant should be classified as medicine or food, Galen stresses that both are possible: Hemlock, for example, is food for the starling but medicine for humans, while hellebore is food for quails but a treatment for humans, because the mixture of the quail is capable of absorbing hellebore, whereas that of man is not. This information is also found in Ibn Rušd's paraphrase of the Galenic text, but with this introductory extension: "what is left for Zayd, is right for ᶜAmr, and so what is food for man is medicine for another being and vice versa"[74].

Occasionally, the Galenic formulations that are phrased rather generally, are considered in a more precise medical context in the

Histoire du texte et edition critique, traduite et commentée des Aphorismes d' Hippocrate, V, 21 (Littré IV, 538), ed. C. Magdelaine, vol. 2: *Texte critique et traduction*, Paris (Dissertation) 1994, 434, 7–9.

[71] *Galeni De temperamentis*, III, 5, ed. Helmreich (nt. 67), 112, 3–9 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 181) and *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 92, 11–21.

[72] *Galeni De temperamentis*, III, 5, ed. Helmreich (nt. 67), 112, 9 – 113, 8 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 181–182) and *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 92, 21–22.

[73] *Galeni De temperamentis*, III, 5, ed. Helmreich (nt. 67), 113, 9 – 114, 13 (*Galen: Works*, tr. Singer/van der Eijk (nt. 26), 182) and *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 92, 22 – 93, 4.

[74] *Galeni De temperamentis*, III, 4, ed. Helmreich (nt. 67), 109, 6–13 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 178) and *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 90, 20–27.

Galen paraphrase. For example, where Galen generally speaks of a "thing", in the Galen paraphrase the same "thing" is specifically referred to as "drugs" (*adwiya*)[75]. In the first example, the young man is introduced as "the young patient" (*ṣāḥib al-ʿilla šābban*) in the Galen paraphrase[76]. In terms of content, it is noteworthy that it is not altered by these reformulations, because Galen is always considered in a medical context. However, from a stylistic perspective, the medical significance of these Galen passages is emphasised by Ibn Rušd, which may be didactically beneficial for medical instruction.

These findings once again raise the question of the concrete *Vorlage* for the Galenic text with which Ibn Rušd worked. Was it perhaps not Ḥunayn ibn Isḥāq's translation but rather a revision of the text which had already been carried out during the reception of this Galenic work in Greek Antiquity or in the Arabic-writing world? Could this explain the occasional considerable deviations from the original Galenic text and the Galen paraphrase in Ibn Rušd's *talḫīṣ*, despite the proximity of their content? As H. Gätje (1985) has already discussed in the context of Ibn Rušd's commentaries on 'On the Soul', Ibn Rušd mainly, but not exclusively, used the Arabic Aristotle translations of Ḥunayn ibn Isḥāq. Thus, Ibn Rušd clearly had access to different Arabic versions of Aristotle's 'On the Soul' which may have been elaborated upon to greater or lesser extents based on the original. Further, there were more translations from Greek into Arabic or more compilations from the Greek-Syriac-Arabic tradition than are extant today. Similar text losses can be assumed in the field of medicine[77].

Another possible explanation might be that Ibn Rušd quoted Galen from memory. This was suggested by D. Gutas (1993) when he wrote that the *qālā* passages of the Middle Commentaries "may well be taken from memory"[78]. Memorising as a learning method is well documented for Galen himself who required his students to learn their

[75] *Galeni De temperamentis*, III, 5, ed. Helmreich (nt. 67), 110, 11 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 179) and *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 91, 14.

[76] The passage with this formulation belongs to the context of the above-mentioned aphorism by Hippocrates, cf. nt. 70.

[77] Cf. Gätje, *Das Kapitel über das Begehren* (nt. 45), 38–40. Examples of these discussions in the medical field are such as the importance of the works of Rufus of Ephesos for Ḥunayn ibn Isḥāq's *Kitāb al-Aġḍiya*: they found their way into compilations which are no longer extant but which were used by Greek and Arabic authors. For details, cf. M. Wernhard, *Die syrischen Fragmente des Rufus von Ephesos. Edition, Übersetzung, Kommentar*, Munich 1997, 12 sq.

[78] D. Gutas, *Aspects of literary form and genre in Arabic logical works*, in: C. Burnett (ed.), *Glosses and commentaries on Aristotelian logical texts: the Syriac, Arabic and medieval Latin traditions*, London 1993, 30–76, 56.

material by heart. Memorisation as a learning method was and still is fundamental in Islamicate regions: it suffices to refer to Quranic lessons.

With respect to textual deviations, a deeper look at the methods employed for Ibn Rušd's commentaries on Aristotle's work may also provide more insight. Gätje provides context for the textual differences between the Aristotle passages as given in the Middle Commentary on 'On the Soul' and the original Aristotelian text. He discovered that Ibn Rušd did not use the original text by Aristotle, but the ancient Greek revision by Themistios. Gätje emphasises that in his Middle Commentary on 'On the Soul' Ibn Rušd mostly follows Themistios but does not do so blindly[79]. Therefore, despite his reliance on Themistios' revision, the *talḫīṣ* on 'On the Soul' must still be regarded as an independent work of Ibn Rušd. However, Ibn Rušd's familiarity with Themistios is of interest beyond his *talḫīṣ* on 'On the Soul'. Themistios' method of paraphrasing is distinct from the kind of commentary consisting of *lemmata* of the original text followed by explanations. By paraphrasing the original text, Themistios was able to streamline it, to concretise its content and to edit it in a way that would make it pedagogically valuable to the reader, for example, by introducing further structural elements or by providing additional explanation[80]. With this in mind, Themistios' method can be compared to the method used by Ibn Rušd for both his philosophical commentaries and also for his Galen commentaries, which are both categorized as *talḫīṣāt*.

Ibn Rušd used revisions of the original Aristotle texts not only for his texts on the soul but also for his commentaries on meteorology. P. Lettinck (1999) describes the Middle Commentary on meteorology as "largely a rendering of Ibn al-Biṭrīq's version, with explanatory remarks and commentaries inserted between Ibn al-Biṭrīq's phrases". Most of these additions are taken from Alexander of Aphrodisias, others from Ps.-Olympiodorus. As a result, this creates, according to Lettinck, "a more faithful version of Aristotle's text", which is "more comprehensible and more in agreement with Aristotle than Ibn al-Biṭrīq's text"[81].

[79] Gätje, *Das Kapitel über das Begehren* (nt. 45), 31–39.

[80] Ibid., 34.

[81] P. Lettinck, *Aristotle's Meteorology and its Reception in the Arab World: With an Edition and Translation of Ibn Suwār's Treatise on Meteorological Phenomena and Ibn Bājja's Commentary on the Meteorology*, Leiden–Boston–Cologne 1999, 13.

Ibn Bāǧǧa's (1080–1138 CE) influence on Ibn Rušd is well documented[82]. Ibn Bāǧǧa compiled relevant treatises on the elements, mixtures and fevers[83], which, however, do not seem to be the texts that Ibn Rušd used for his Galen commentaries, if only because they are far too brief. A detailed examination of the possible connections between these texts is still lacking, but for the subject of "fevers" some remarks can be made: Only the final part of Ibn Rušd's commentary on Galen's fever treatise remains preserved. When comparing this fragment with Ibn Bāǧǧa's fever text, it becomes clear that the last part of Galen's work on fevers was not of interest for Ibn Bāǧǧa, but was for Ibn Rušd. With regard to Ibn Rušd's Short Commentary on 'Meteorology', however, Lettinck identifies Ibn Rušd's use of, among others, Ibn Bāǧǧa's work. This is of interest because Eichner, in her work on Ibn Rušd's commentaries on 'On Generation and Corruption', came to a similar conclusion, namely that Ibn Rušd used Ibn Bāǧǧa for his Short Commentary on this text – but not for the Middle Commentary[84]. In other words, not only in the case of philosophical, but also in that of medical *talḫīṣāt*, the work of Ibn Bāǧǧa seems to have been only of minor, if any, interest to Ibn Rušd.

This all indicates that the differences from the original Greek text in Ibn Rušd's paraphrases as part of his *talḫīṣāt* also might be explained by the existence of various Arabic translations of the Greek originals, which are no longer extant or accessible, or by deviations ensuing from the memorisation of learned material. However, as we have seen, there are also cases in which Ibn Rušd used ancient Greek or Islamicate revisions of ancient texts, which are characterised by a pedagogical treatment of the content. This type of text was also popular in medicine, as the example of the *Summaria Alexandrinorum* demonstrates, which, however, was not used by Ibn Rušd in his Galen commentaries.

[82] On Ibn Bāǧǧa, cf. M. Geoffroy, *Ibn Bājja, Abū Bakr ibn as-Sā'iġ (Avempace)*, in: H. Lagerlund (ed.), Encyclopedia of Medieval Philosophy, Heidelberg 2010, 483.

[83] These texts by Ibn Bāǧǧa are not edited, cf. Ms. Krakow, Biblioteka Jagiellońska, Ms. Berol. Wetzstein I 87: 'On the Elements' (foll. 79v–81v), 'On Mixtures' (82r–84v), 'On Fevers' (foll. 98v–101v). For more on the history of this manuscript which was lost after World War II and rediscovered by G. Endress in Krakow in 1988, cf. D. Wirmer, *Vom Denken der Natur zur Natur des Denkens: Ibn Bāǧǧas Theorie der Potenz als Grundlegung der Psychologie*, Berlin–Boston 2014, 25. Ms. Oxford, Bodleian Library, MS. Pococke 206 has similar content to the Krakow manuscript, cf. P. Lettinck, *Aristotle's Physics and its Reception in the Arab World: With an Edition of the unpublished parts of Ibn Bājja's Commentary on the Physics*, Leiden–New York, 1994, 677–679.

[84] Cf. Lettinck, *Aristotle's Meteorology* (nt. 81), 12 sq. and Eichner, *Averroes' Mittlerer Kommentar* (nt. 8), 9, 159.

At present, there are no known extant revisions that would explain the deviations of Ibn Rušd's paraphrases from the original Galenic text which means that the authorship of Ibn Rušd for these texts might also be assumed. But in Ibn Rušd's *talḫīṣ* on Galen's 'On Mixtures', there is an entire paragraph that may indicate that Ibn Rušd was working with a Galen text that had already been revised. This paragraph was inserted directly before the colophon and begins with *qāla*. However, it is found neither in the Greek original nor in Ḥunayn ibn Isḥāq's Arabic translation[85]. This short text contains some remarks on the entirety of Galen's treatise 'On Mixtures' which consists of three books. It not only indicates that the third book of Galen's 'On Mixtures' concludes at this point, it also specifies that the first two books of the treatise were only included for the sake of completeness (*bi-l-ʿaraḍ*) in this particular paraphrase of the Galenic text. Thus, it is clear that the author of the last *qāla* section was more interested in 'On Mixtures' III than in 'On Mixtures' I or 'On Mixtures' II. Ibn Rušd, however, when commenting on Galen's 'On Mixtures' clearly focuses on 'On Mixtures' I, the part which enabled him to discuss the main aspects of his theory on mixtures in detail. Thus, it is not plausible that Ibn Rušd himself was the author of this paragraph.

More generally, it is also important to keep in mind that there was a systematic destruction of manuscript material directly after the Almohad period and then also on a large scale as a result of the Reconquista[86].

Summing up so far, Ibn Rušd's commentaries on Galen must be considered in the context of the didactic editing of Galen's works[87]. More precisely, these commentaries can be placed in the pedagogical context of Ibn Rušd's Middle Commentaries on the *Corpus Aristotelicum*. On the one hand, there are close structural and stylistic similarities with Ibn Rušd's Middle Commentaries on philosophical works. In his commentaries on Aristotle and on Galen, Ibn Rušd does not take the Greek original in Arabic translation as the respective source text, but rather pedagogically prepared paraphrases of the original texts, which was typical of the didactic teaching texts of late

[85] *Galeni De temperamentis*, III, ed. Helmreich (nt. 67), 115 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 184) / *Commentaria Averrois*, ed. Vázquez de Benito (nt. 1) 93, 22–28. For Ḥunayn ibn Isḥāq's translation of Galen's 'On Mixtures', cf. Ms. Madrid, Real Biblioteca de San Lorenzo de El Escorial, árabe 848 (foll. 1r–47v), end of text on fol. 47v (there is no edition of this text).

[86] E. Fricaud, *Les ṭalaba dans la société almohade (le temps d'Averroes)*, in: Al-Qanṭara 18 (1997), 331–388, 331–333 ('La désalmohadisation').

[87] Cf. also above 'I. Overview and Chronology'.

antiquity and early Islam. On the other hand, Ibn Rušd's *talḫīṣāt* on Galen support the theory that these kinds of texts, found as Middle Commentaries in philosophy, were intended for both intermediate and advanced students who were still being taught[88]. Ibn Rušd himself in his colophon to his *talḫīṣ* on Galen's 'On Mixtures' explains that it was his two sons, Abū l-Qāsim and Abū Muḥammad, who encouraged and asked their father to comment on the Galenic literature for their medical studies. In this colophon, Ibn Rušd specifically formulates and sets as an objective to make all the books of Galen accessible to those who wish to study the art of medicine, since, according to Ibn Rušd, it is only through Galen's books that the necessary knowledge for this can be obtained, although, because of their length, many students (*kaṯīran min aṭ-ṭullab*) seem to struggle with them[89]. A similar passage is found in the introduction to Ibn Rušd's commentary on Galen's 'On Diseases and Symptoms', entitled *kalām*[90], but still to be read in the context of a pedagogical *talḫīṣ* of Galen.

Interestingly, it is only in his explanations to Galen that Ibn Rušd refers to the context of medical instruction, while in his other medical works more educated court elites are addressed[91]. Against this background, the question of patronage and the intended audience of these commentaries should be raised in a more general way. By naming them *talḫīṣāt*, Ibn Rušd places his commentaries on Galen in direct relation to his broad commentary work on Aristotle. The scholarly interest of the Almohad rulers, which was openly celebrated at events and receptions, has often been pointed out[92] and, according to a well-known anecdote, it was the Almohad ruler Abū Yaʿqūb Yūsuf himself who in around 1169 CE commissioned Ibn Rušd to explicate the Aristotelian work[93].

[88] Cf. above nt. 45.

[89] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 94, 3–7.

[90] Ibid., 201, 1–5.

[91] For more information in this context, cf. Forcada, *Ética e ideología de la Ciencia* (nt. 2), 325–343, id., *Didactic poems* (nt. 10), 169–170 and id., *De Alejandría a Córdoba: la medicina según Ibn Rushd y la tradición araboislámica*, in: Asclepio. Revista de Historia de la Medicina y de la Ciencia 72/2 (2020), 1–15.

[92] For more on these debates, cf. *Averroës, Middle Commentary*, ed. Ivry (nt. 65), xiv with nt. 7 and nt. 8; L. I. Conrad, *An Andalusian Physician at the Court of the Muwaḥḥids: Some Notes on the Public Career of Ibn Tufayl*, in: Al-Qanṭara 16 (1995), 3–13, 12; a different perspective on this subject is given by S. Stroumsa, *Philosophes almohades? Averroès, Maïmonide et l'idéologie almohade*, in: P. Cressier/M. Fierro/L. Molina (eds.), Los almohades: problemas y perspectivas, Madrid 2005, vol. 2, 1137–1162, 1143.

[93] For more on this anecdote, ibid., 1141 nt. 12.

Ibn Rušd's medical works such as his encyclopaedia *al-Kulliyyāt* and his commentary on Ibn Sīnā's medical poem are also known to have been written in court circles under the direct influence of the Almohad rulers. Furthermore, it was at the behest of the Almohad caliph that Ibn Rušd reworked *al-Kulliyyāt* during the nineties of the 12th century CE[94]. Ibn Rušd's commentary on Ibn Sīnā's medical *Urǧūza* has been described as not addressing beginners but readers who were advanced in medicine or in natural philosophy. Similarly, Ibn Rušd's treatise 'On Theriac' was meant for more advanced audiences and at the beginning of this treatise, Ibn Rušd explicitly refers to court patronage by Almohad elites[95]. In his short instruction, 'On the Preservation of Health' Ibn Rušd responded – according to his own statements – to the request of "some of his friends" (*li-baʿḍ iḫwānihī*)[96] who were also likely to belong to circles of the Almohad elites.

The character of his Galenic commentaries and the above-mentioned information from Ibn Rušd himself with regard to a student audience might give the impression that Ibn Rušd gave medical classes at the Almohad court during the early to mid-nineties. Ibn Rušd addresses his sons as students of medicine and also in general, without further specification, he speaks of "students" (*ṭullab*). It is suggested that medical training took place at the Almohad court but there is thus far no evidence to confirm this[97].

When considering the medical work of Ibn Rušd as a whole, it must be seen as a product of the intellectual environment under Almohad patronage and as such it served to instruct rulers and courtiers, their friends and families – thus, an educated audience but not academic scholars in the strict sense[98]. His commentaries on Galen – four *talḫīṣāt* and one *kalām* – should also be situated in this space, but here a more specific purpose than educating the elites emerges: Ibn Rušd profited from this environment by being able to teach his sons about medicine, and his sons may not have been the only two students to attend these classes.

[94] Cf. above 'I. Overview and Chronology'.

[95] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 249, 1–2.

[96] Ibid., 267 (heading). For more on this text, cf. below 'III. Ibn Rušd's Treatise 'On the Preservation of Health''.

[97] Forcada, *Didactic poems* (nt. 10), 165, 179.

[98] For more information about these complex relationships, cf. Forcada, *Ética e ideología de la Ciencia* (nt. 2), 325–343.

III. Ibn Rušd's Treatise 'On the Preservation of Health'*

The main objective of this article is to provide an initial overview of the short treatise 'On the Preservation of Health' (*Fī ḥifẓ aṣ-ṣiḥḥa*) and to contextualise it within the scope of Ibn Rušd's medical works as well as, on the basis of representative examples, within Islamicate food literature[99]. This text provides brief and general information on how to maintain a healthy diet and how to eliminate digestive residues that occur during this process, supplemented by specific recipes that correspond to the needs of the inquirer and/or other readers. At the beginning of this treatise, Ibn Rušd gives the information that he has written it "for some of his friends" (*li-baʿḍ iḫwānihī*)[100]. Further, in the last part of the treatise, a concrete reader is addressed directly and repeatedly with reference to his state of health[101].

As the following will demonstrate, this objective can only be accomplished by taking a close look at the relevant texts of Ibn Rušd's medical encyclopaedia, *al-Kulliyyāt*, as well as on the Galenic treatise 'On the Properties of Foodstuffs'[102], the reception of which is funda-

* I am indebted to F. Käs and M. Wernhard for their help with this study as well as for sharing unpublished material with me.

99 At the 1st International Prof. Dr. Fuat Sezgin Symposium on History of Science in Islam (Istanbul, June 13–15, 2019), a lecture was given by P. Herráiz-Oliva and M. Yavuz with the title "An Epistle of Averroes: 'On the Conservation of Health'". The two speakers presented an overview of the treatise *Ḥifẓ al-ṣiḥḥa* as well as a description of Ms. El Escorial, árabe 884. They did not, however, publish their paper in: F. Başar/M. Kaçar/M. C. Kaya/A. Z. Furat (eds.), *The 1st International Prof. Dr. Fuat Sezgin Symposium on History of Science Proceedings Book*, Istanbul 2020. – For general information about this text, cf. above 'I. Overview and Chronology', esp. nt. 26.

100 *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267 (end of heading).

101 Ibid., 270.

102 'On the Properties of Foodstuffs' (*De alimentorum facultatibus libri III*) / Περὶ τροφῶν δυνάμεως λόγοι γ': For more on the Greek text, cf. *Galeni De sanitate tuenda*, ed. K. Koch, *De alimentorum facultatibus, De bonis malisque sucis*, ed. G. Helmreich, *De victu attenuante*, ed. K. Kalbfleisch, *De ptisana*, ed. O. Hartlich, CMG V 4,2, Leipzig-Berlin 1923, 199–386, URL: <https://cmg.bbaw.de/epubl/online/cmg_05_04_02.php?p=26> (last access on December 20, 2024). This edition should be considered with the notes and commentaries of the English translation *Galen: On the Properties of Foodstuffs*, translated by O. Powell, Cambridge 2003. Information on its Arabic translation is provided in F. Sezgin, *Geschichte des Arabischen Schrifttums*, 17 voll., Leiden 1967–2000, vol. 3 (1970): *Medizin – Pharmazie – Zoologie – Tierheilkunde bis ca. 430 H.*, 117, no. 60 and in Ullmann, *Die Medizin* (nt. 2), 47, no. 45. For further editions and literature, cf. CORPUS GALENICUM, *Bibliographie der galenischen und pseudogalenischen Werke*, zusammengestellt von Gerhard Fichtner, weitergeführt durch die Arbeitsstelle „Galen als Vermittler, Interpret und Vollender der antiken Medizin (Corpus Medicorum Graecorum)" der

mental for Islamicate food literature. A thorough examination of the reception of 'On the Preservation of Health' within the framework of the abundant Arabic *Materia medica* and *Regimen* literature would be beyond the scope of this study[103], not least because the entirety of the *aġḏiya* literature goes back to Galen, on the one hand, while, on the other hand, the specific text version or compilation of Galen's works that the authors based their texts upon have not yet been determined[104]. Nevertheless, starting from selected texts, a preliminary attempt will be made to place Ibn Rušd's work within the framework of the Islamicate food literature. Ḥunayn ibn Isḥāq's (808–873 CE, Bagdad) 'The Book of Foodstuffs' (*Kitāb al-Aġḏiya*), a book of great significance for the development of Islamicate treatises on foods, was taken into account for information about the literature that came before Ibn Rušd[105]. With regard to the Andalusian context, works on food by his contemporaries Ibn Zuhr (c. 1092/95–1162 CE, Seville, Latinised as Avenzoar)[106] and Maimonides (c. 1135/1138, Córdoba –

Berlin-Brandenburgischen Akademie der Wissenschaften, erweiterte und verbesserte Ausgabe 2015/09, no. 38, online Publikation, URL: <https://cmg.bbaw.de/fileadmin/Webdateien/Dateien/Galen-Bibliographie.pdf> (last access on December 20, 2024).

[103] For more on this kind of literature, cf. above all Ullmann, *Die Medizin* (nt. 2), 190–192 and 199–203; cf. also P. Gil Sotres, *The Regimens of Health*, in: M. D. Grmek (ed.), Western Medical Thought from Antiquity to the Middle Ages, Cambridge MA 1998, 291–318, M. Weiss Adamson, *Medieval Dietetics: Food and Drink in Regimen Sanitatis Literature from 800 to 1400*, Frankfurt/Main 1995 and H. Schipperges, *Arabische Medizin im lateinischen Mittelalter*, Berlin 1976, 134–144.

[104] For more on examples of this kind of medical discourse, cf., e.g. Wernhard, *Die syrischen Fragmente* (nt. 77), 12 sq.

[105] Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya* consists of three parts (*maqālāt*): the first is 'A General Discussion by Galen and Others on Foodstuffs', the second is about 'Seeds and Fruit Used as Foodstuffs', and the third discusses 'Plants and Animals Used as Foodstuffs'. The second and the third part of Ḥunayn's treatise follow in structure and arrangement on content Galen's 'On the Properties of Foodstuffs', expanding on Galen's text by incorporating quotes from other ancient-Greek doctors (some of the texts by these other authors are only preserved in these fragments); for details, cf. R. Degen, *The Kitāb al-Aghdhiya of Ḥunain ibn Isḥāq*, in: A. Y. al-Hasan/G. Karmi/N. Namnum (eds.), Proceedings of the First International Symposium for the History of Arabic Science, vol. 2, Aleppo 1978, 291–299 and also Wernhard, *Die syrischen Fragmente* (nt. 8), 8–9 (Introduction). The only known extant manuscript of Ḥunayn's *Kitāb al-Aġḏiya* is Ms. Bankipur, Khuda Bakhsh Oriental Public Library, 2142; the final part of this manuscript has been lost with the text stopping during the chapter on the discussion about the differences between the body parts of birds. M. Wernhard prepared a transcription of this text which was not published as of the time of writing. I am therefore grateful to him for providing me with access to significant information on Ḥunayn's compilation for this study.

[106] The Sevillian doctor Ibn Zuhr also wrote 'The Book of Foodstuffs' (*Kitāb al-Aġḏiya*), cf. *Abū Marwān ʿAbd al-Malik b. Zuhr, Kitāb al-Aġḏiya (Tratado de los Alimentos)*, ed. and translated by E. García Sánchez, Madrid 1992. Ibn Zuhr was a

1204 CE, al-Fusṭāṭ / Old Cairo)[107] were consulted. Finally, the detailed discussion of the topic in 'The Book of Foodstuffs and Drinks' (*Kitāb al-Aġḏiya wa-l-ašriba*) by the physician Naǧīb ad-Dīn as-Samarqandī (d. 1222 CE during the Mongol invasion of Herat) was considered as this work is regarded as the last major Arabic monograph on dietetics of the Islamicate East[108]. References to these treatises are included in the Appendix to this study to demonstrate parallels and differences between Ibn Rušd's 'On the Preservation of Health' and the relevant passages from *al-Kulliyyāt*.

Texts related to 'On the Preservation of Health'

Ancient ideas about healthy nourishment can be traced back to the *Corpus Hippocraticum*. The idea that the preservation of health or recovery from illness is inextricably linked to healthy food and drinks was developed in the ancient *Regimen* literature where individual foods were classified and described. In particular, Galen's work 'On the Properties of Foodstuffs' was formative for this type of text, from which eventually extensive food encyclopedias emerged, especially in the Islamicate period; Ḥunayn ibn Isḥāq's 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*) plays a crucial role in these reception processes. In the Islamicate East, most of the Arabic texts on dietetics were composed between the ninth and 12th centuries CE; the corresponding literature

member of the Banū Zuhr, a family of prominent Andalusian physicians in the service of the Almoravid and Almohad dynasties. Ibn Zuhr's famous work 'The Book of Simplification Concerning Therapeutics and Diet' (*Taysīr fī l-mudāwāt wa-t-tadbīr*) may have been written at the request of Averroes; however, it seems more likely that it was the Almohad caliph ʿAbd al-Muʾmin who asked Ibn Zuhr to compose this treatise. For details, cf. C. Álvarez Millán, *Ibn Zuhr*, in: T. F. Glick/S. J. Livesey/F. Wallis (eds.), Medieval Science, Technology and Medicine: An encyclopaedia, London–New York 2005, 259–261, 259. On the relationship between Averroes and this family, cf. Langermann, *Another Andalusian Revolt?* (nt. 7), 363 sq., 366 sq.

[107] In the work of Maimonides, the personal physician of Sultan Saladin, the question of the appropriate diet for maintaining health is a central principal. For this study, consideration of the following works proved to be particularly helpful: *Maimonides, On the Regimen of Health*, ed. and translated by G. Bos, Latin Translations by M. R. McVaugh, Leiden–Boston 2019 and id., *On the Elucidation of Some Symptoms and the Response to Them (Formerly Known as On the Causes of Symptoms)*, ed. and translated by G. Bos, Leiden–Boston 2019 as well as id., *On Asthma*, ed. and translated by G. Bos, vol. 1, Provo UT 2002.

[108] As-Samarqandī used Ḥunayn ibn Isḥāq's 'The Book of Foodstuffs' as one of the main sources for his descriptions of more than five hundred nutriments, drinks, spices and fragrances; for details about the author and his work, cf. J. Müller, *Nahrungsmittel in der arabischen Medizin: Das Kitāb al-Aġḏiya wa-l-ašriba des Naǧīb ad-Dīn as-Samarqandī*. Edition, Übersetzung und Kontext, Leiden 2017.

from the Islamicate West, on the other hand, appears mainly from the 12th century CE on. While the Eastern texts are usually characterised by a comprehensive description of foods, the doctors from al-Andalus mostly concentrated on the foods they were familiar with in their geographical region[109]. Ibn Rušd, at the end of his discussion of foods in *al-Kulliyyāt*, emphasises this: "these are now the most well-known foods used among us" (*fa-hāḏihī hiya ašharu l-aġḏiyati l-mustaᶜmalati ᶜindanā*)[110]. His clear demarcation between his and the work of his Andalusian peers, on the one hand, and that of the doctors of the east, on the other, is worth noting here. The Andalusian doctors may have taken a different approach to their colleagues in the Islamicate East as the Eastern texts did not necessarily apply to the reality of life in the Western Islamicate world[111]. However, one could also understand their work in the context of an Almohad response to the academic discourse of the east[112].

Almost all prominent Islamicate physicians wrote on dietetics. As this discourse was integral to medical manuals, these chapters are often entitled 'The Preservation of Health' (*Ḥifẓ aṣ-ṣiḥḥa*); this is also the case for the relevant chapter in Ibn Rušd's *Kulliyyāt* as well as for the short text that is in the focus of the present work[113]. There is no title in the heading of the short treatise, but *Ḥifẓ aṣ-ṣiḥḥa* can be found in the *Incipit*; in the colophon, this text is entitled *kalām* ("discourse")[114]. The sixth book of Ibn Rušd's medical encyclopaedia

[109] For more details on ancient and Islamicate *Regimen* literature, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 23 (Introduction) as well as Müller, *Nahrungsmittel* (nt. 108), 2–8 (Introduction).

[110] *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٠٢/329; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 255. Similar statements can be found in the works of Ibn Zuhr, Ibn Ḫalṣūn, al-Arbūlī, Ibn al-Waqqār, ar-Rundī, Ibn al-Ḫaṭīb, and Maimonides who also compiled an abridged version of Galen's 'On the Properties of Foodstuffs', concentrating mainly on foods that were native to or more common in the Islamicate West in the 12th century CE; for details, cf. Müller, *Nahrungsmittel* (nt. 108), 7 with nt. 30 and nt. 31 (Introduction). – The Bagdad doctor Ḥunayn ibn Isḥāq did, however, also omit some Galenic foods when compiling his *Kitāb al-Aġḏiya*, possibly because he found them of no interest for his time and region, cf. ibid., 337 and 526 (Summary).

[111] For more on this, cf. ibid., 8 with nt. 32 (Introduction).

[112] For more on these aspects, cf. Langermann, *Another Andalusian Revolt?* (nt. 7), 366.

[113] Müller, *Nahrungsmittel* (nt. 108), 5–6 (introduction).

[114] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267, 1 (*Incipit*) and 270, 18 (Colophon).

al-Kulliyyāt also has the title *Ḥifẓ aṣ-ṣiḥḥa*[115] but the treatise 'On the Preservation of Health' is different to *al-Kulliyyāt* VI[116].

Ibn Rušd's treatise 'On the Preservation of Health' is not to be understood as a systematic medical book on food like Galen's 'On the Properties of Foodstuffs' or the sections on food in *al-Kulliyyāt*. This work comprises a short, concise discourse on maintaining health, which Ibn Rušd clearly wrote upon the request of friends. The text briefly mentions the best foods for a healthy diet, grouping the foods into sections in the same manner as they are found in Galen's 'On the Properties of Foodstuffs'.

Although there are sections in the fifth and sixth books of *al-Kulliyyāt* that share not only thematical-[117] but also content-related[118] parallels to 'On the Preservation of Health', there is no mention of *al-Kulliyyāt* in 'On the Preservation of Health' or mention of the treatise in *al-Kulliyyāt*. However, Ibn Rušd does refer to Galen four times in 'On the Preservation of Health', albeit without naming a specific title. Further, there are diverse parallels between 'On the Preservation of Health' and Galen's 'On the Properties of Foodstuffs'[119], and occasionally between Galen's 'On Good and Bad Humours'[120]. No similarities, however, could be established to Galen's pharmacological

[115] *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٧/394; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 315.

[116] This was suggested by E. Renan (*Averroès et l'Averroïsme*, Paris ³(révue et augmentée) 1866, 76–77) and was also mentioned by M. Steinschneider (*Die hebraeischen Uebersetzungen des Mittelalters und die Juden als Dolmetscher*, Berlin 1893, 672). M. Bouyges (*Notes sur les philosophes arabes connus des Latins au Moyen Age: V. Inventaire des textes arabes d'Averroès*, in: Mélanges de l'Université Saint-Joseph 8 (1922), 3–54, 36, no. 65.2) also took this information from Renan. However, that this identification was incorrect had already been stated by H. Derenbourg in 1903 (*Les manuscrits arabes* (nt. 2), 96) and later again by G. C. Anawati (*Ibn Rušd, Rasā'il*, edd. Anawati/Zāyed (nt. 3), 12: 'La conservation de la santé').

[117] Cf. table 1) in the Appendix.

[118] Cf. synopsis 2) – synopsis 8) in the Appendix.

[119] Cf. table 1) in the Appendix.

[120] 'On Good and Bad Humours' (*De bonis malisque sucis*) / Περὶ εὐχυμίας καὶ κακοχυμίας τροφῶν: For more on the Greek text, cf. *Galeni De bonis malisque sucis*, ed. Helmreich (nt. 102), 387–429, URL: <https://cmg.bbaw.de/epubl/online/cmg_05_04_02.php?p=453> (last access on December 20, 2024). Information, on the Arabic translation is provided in Sezgin, *Geschichte* (nt. 102), 118, no. 62 as well as in Ullmann, Die Medizin (nt. 2), 47, no. 46. For further editions and literature, cf. CORPUS GALENICUM (nt. 102), no. 39. – Cf. below nt. 139 and also synopsis 3) in the Appendix. Furthermore, there is a short passage under the category of *fish* which may reference Galen's 'On Good and Bad Humours'; however, this passage is also found in Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya*; for details, cf. synopsis 5) with nt. 200 in the Appendix.

treatises 'On the Mixtures and Properties of Simple Drugs'[121], 'On the Composition of Drugs According to Places [in the Body]'[122], and 'On the Composition of Drugs According to Genera'[123]. It is striking that, regarding the question of verbatim equivalents, there are none between the two texts of Ibn Rušd, on the one hand, or, on the other, between these works and the above-mentioned treatises of Galen[124].

There are many parallels in terms of content but few[125] direct points of correspondence between Ibn Rušd's texts and the selected texts from the comparative *Regimen* literature mentioned above. The question of which *Vorlage(n)* used by Ibn Rušd becomes relevant here[126]. Given the current state of research, it is rather difficult to explain deviations in the different treatises on foods when they are not obvious errors by the copyist. Furthermore, it has to be taken into account that information on a particular food may have been adapted by different authors to address their specific questions and thereby

[121] On the Mixtures and Properties of Simple Drugs (*De simplicium medicamentorum temperamentis et facultatibus* / Περὶ κράσεως καὶ δυνάμεως τῶν ἁπλῶν φαρμάκων βιβλία) voll. I–V: theoretical part / voll. VI–XI: alphabetical list of substances. For the Greek text, cf. *Claudii Galeni Opera Omnia*, ed. K. G. Kühn, vol. XX, Leipzig 1821–1833, vol. XI (1826), 379–892 and XII (1826), 1–377. Information on its Arabic translation is given in Sezgin, *Geschichte* (nt. 102), 109, no. 44 and in Ullmann, *Die Medizin* (nt. 2), 47, no. 49. Cf. also P. E. Pormann, *The Formation of the Arabic Pharmacology between Tradition and Innovation*, in: Annals of Science 68.4 (2011), 493–515, 495. For further editions and literature, cf. CORPUS GALENICUM (nt. 102), no. 78 (voll. I–VI) and no. 79 (voll. VII–XI).

[122] On the Composition of Drugs according to Places [in the body] (*De compositione medicamentorum secundum locos libri X* / Περὶ συνθέσεως φαρμάκων τῶν κατὰ τόπους βιβλία): For the Greek text, cf. *Claudii Galeni Opera*, ed. Kühn (nt. 121), vol. XII (1826), 378–1007 and XIII (1827), 1–361. Information on its Arabic translation is given in Sezgin, *Geschichte* (nt. 102), 118, no. 64 and Nachtrag I, 407 as well as in Ullmann, *Die Medizin* (nt. 2), 48, no. 50a. Cf. also Pormann, *The Formation* (nt. 121), 495. For further editions and literature, cf. CORPUS GALENICUM (nt. 102), no. 80 (voll. I–VI) and no. 81 (voll. VII–X).

[123] On the Composition of Drugs according to Genera (*De compositione medicamentorum per genera libri VII*) / Περί συνθέσεως φαρμάκων τῶν κατὰ γένη βιβλία ζ'): For the Greek text, cf. *Claudii Galeni Opera*, ed. Kühn (nt. 121), vol. XIII (1827), 362–1058. Information on its Arabic translation is given in Ullmann, *Die Medizin* (nt. 2), 48, no. 50b. Cf. also Pormann, *The Formation* (nt. 121), 495. For further editions and literature, cf. CORPUS GALENICUM (nt. 102), no. 82.

[124] Cf. also the information in the Appendix.

[125] There might be direct points of reference in Ibn Zuhr's *Kitāb al-Aġḏiya* and *al-Kulliyyāt*, but this needs to be examined in more detail and within the framework of a larger text corpus, cf. synopsis 6) with nt. 207 and synopsis 7) with nt. 214 in the Appendix.

[126] For more on Ibn Rušd's *Vorlage(n)*, cf. above 'II. The Medical *Talḫīṣ*: Ibn Rušd Teaching Galen'.

incorporated into their respective contexts[127]. Be this as it may, Ibn Rušd adheres to the tradition of Islamicate food literature, which is based on ancient models, above all on Galen's 'On the Properties of Foodstuffs'[128], as will become clear in the following.

Ibn Rušd's short treatise 'On the Preservation of Health' is divided into three parts. First, Ibn Rušd discusses the care required for a healthy diet and second, the subsequent excretion of the digestive residues occurring in this process. In the third and final part, Ibn Rušd becomes more personal by directly addressing the reader and giving concrete practical advice on how to maintain good health.

Part 1: *"About the Quality of Foods" in 'On the Preservation of Health'*, al-Kulliyyāt *V and Galen's 'On the Properties of Foodstuffs'*

This topic is also widely discussed by Galen as well as by Ibn Rušd in *al-Kulliyyāt* V.

Galen's 'On the Properties of Foodstuffs' is divided into three books: The first is devoted to seeds, grains and cereal products, the second is about fruits and vegetables, while the third book deals with animal products such as different types of meat, eggs and dairy produce as well as honey and interestingly also wine but not water. Galen's treatise is far more extensive and detailed than Ibn Rušd's two texts.

In *al-Kulliyyāt*, the fifth book is entitled 'On Remedies and Foods'. While medication is mainly discussed in the first part of this book, the second part focuses on food; most areas mentioned by Galen in 'On the Properties of Foodstuffs' are covered in the latter. Explanations on grains and cereal products are followed by information on diverse types of meat such as quadrupeds, fowl and fish, as well as milk, eggs and various types of water. At this point, Ibn Rušd discusses explanations about the pharmaceutical aspects of food. Then, fruits and vegetables are considered. The corresponding passages in *al-Kulliyyāt* are considerably shorter than the explanations in Galen, but still longer than the corresponding sections in 'On the Preservation of Health'.

In the fifth book of *al-Kulliyyāt*, there are further explanations to answer the question of whether the plants discussed in each specific case can be used as food or as medicine. After listing various *Materia*

[127] For details, cf. synopsis 2) – synopsis 8) in the Appendix. Maimonides' food instructions, e.g. must be considered within the context of his background as court physician to the Ayyubids in al-Fusṭāṭ (Old Cairo).

[128] Ullmann, *Die Medizin* (nt. 2), 199.

medica, the fifth book of *al-Kulliyyāt* concludes with instructions for the composition of remedies, taking into account their actions and qualities and the importance of practical experience in the production and administration of medication. Pharmacological aspects can only occasionally be found Galen's 'On the Properties of Foodstuffs' but more frequently in his separate work on pharmaceuticals[129]. In this part of the fifth book in *al-Kulliyyāt*, Ibn Rušd's greatest achievements in the field of medicine thus far are thematised. These are his revolutionary distinction between food and remedies, his calculations on the mode of action of a drug and his emphasis on the importance of experiments and practical knowledge in the medical field[130].

In Ibn Rušd's short treatise 'On the Preservation of Health', however, only a limited range of food, and not that of medicine is discussed, with the exceptions of one reference to the importance of experimentation in remedies and some recipes near the end of the text. In Galen's treatise on foods, in *al-Kulliyyāt* as well as in 'On the Preservation of Health', "wheat and bread", "the meat of quadrupeds, fowl and fish", "fruits" and "vegetables" are explored. Dairy products and eggs are not referred to in Ibn Rušd's short text but are mentioned by Galen and in *al-Kulliyyāt*. In both of Ibn Rušd's texts, the quality of "water" is described while in the Galenic text the topic of "wine" is found.

Part 2: "*About Good Excretion*" *in 'On the Preservation of Health' and* al-Kulliyyāt *VI*

There are no content-related parallels between Ibn Rušd's 'On the Preservation of Health', on the one hand, and *al-Kulliyyāt* V and Galen's 'On the Properties of Foodstuffs', on the other.

It is in the introductory part of the sixth book of *al-Kulliyyāt*, which, as mentioned above, also bears the title *Ḥifẓ aṣ-ṣiḥḥa* or 'On the Preservation of Health', that Ibn Rušd first refers to the importance of diet for establishing and maintaining health which can vary depending on the respective physique of the people. He also addresses

[129] Cf. above nt. 121, nt. 122 and nt. 123.

[130] For more on these discussions, cf. Langermann, *Another Andalusian Revolt?* (nt. 7), 365–366; McVaugh, *An early discussion* (nt. 21), 57–71; id., *Arnaldus de Villanova Opera medica omnia: Aphorismi de gradibus*, Barcelona 1981; id., *Averroes comes to Montpellier*, in: Weill-Parot/Ausécache/Chandelier/Moulinier-Brogi/Nicoud (eds.), *De l'homme, de la nature et du monde* (nt. 11), 21–36. Cf. also Ventura, *Wie beherrscht man die Kenntnis der medicamina?* (nt. 9), 126 and Chandelier, *Averroes* (nt. 2), 170 sqq.

general aspects about longevity and natural death[131]. The text continues with a discussion of the two principal methods to avoid illnesses – namely the care required for a healthy diet and the subsequent excretion of the digestive residues occurring in this process – which are also mentioned at the beginning of 'On the Preservation of Health'. After this point, however, in 'On the Preservation of Health', information about high-quality nutrition is inserted (cf. Part 1), which corresponds to the parallel passages in the fifth book of *al-Kulliyyāt* and Galen's 'On the Properties of Foodstuffs'.

After this discussion of Part 1 in 'On the Preservation of Health', Ibn Rušd returns to the contents of *al-Kulliyyāt* VI, describing necessary measures to ensure good digestion and the elimination of its residues[132].

Part 3: *Advice for the Reader*

In the third main part of 'On the Preservation of Health', the text continues with concrete recommendations for the recipient of this text. In *al-Kulliyyāt* VI, on the other hand, at this point detailed dietary instructions follow with respect to the nine mixtures of people as they are described by Galen[133]; they are then adapted to apply to the individual ages of the people.

As the text directly addresses the reader of this short treatise, with one exception[134], no direct *Vorlage* or parallel texts can be determined for Part 3 in 'On the Preservation of Health'.

The Contents of 'On the Preservation of Health'

Ibn Rušd's text begins with the information that the preservation of health takes place in two ways as mentioned, through good digestion and the subsequent excretion of the remains[135].

[131] *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٧/394 – ٣٦٨/395; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 315–316.

[132] An overview of the parallels between the two texts is given in table 1) in the Appendix.

[133] Cf. below nt. 156.

[134] Cf. below nt. 167.

[135] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267, 1–2. In the introductory part of *al-Kulliyyāt* VI, Ibn Rušd refers to two methods for avoiding illnesses which are also mentioned in 'On the Preservation of Health'. On the one hand, this occurs by means of an appropriate diet, on the other hand, residues from digestion must be eliminated from the body, cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٨/395, 24 – ٣٦٩/396, 1; *Ibn Rušd, al-*

His first main point starts by indicating the importance of the selection of suitable foods for healthy digestion, which is determined by the criteria of quality, quantity, eating time and sequence. Foods of good quality are considered balanced (*muʿtadil*) in their mixture and have a similar mixture to the nutrient (*muġtaḏī*)[136].

Following this, Ibn Rušd discusses in succession the staple foods of bread, meat, fish, fruits, vegetables and finally water.

In the case of bread, care must be taken to ensure that it is fermented, that the wheat is soaked in water and that the dough is baked in a dome oven made of clay (*tannūr*)[137]. If the latter is not possible, the bread should be baked in a simple clay oven (*furn*), although, according to Galen, the result is difficult to digest. It is essential that the wheat for the dough as well as the seeds for the sowing process are of the highest standards[138].

Kulliyyāt, edd. Šaybān/Ṭālibī (nt. 8), 316, 22–25. However, while in 'On the Preservation of Health' Ibn Rušd emphasises his "concern for excellent digestion" (*al-ʿināyatu bi-ǧūdati l-haḍmi*), in *al-Kulliyyāt* his formulation refers to "food whose humour is balanced" (*isti'mālu l-aṭʿimati l-muʿtadilati l-kaymūsi*) corresponding to the medical rules (*ʿalā l-qānūni ṭ-ṭibbīyi*. The use of *qānūn* in the context of "foods" is noteworthy because Langermann (*Another Andalusian Revolt?* (nt. 7), 353) pointed out that Ibn Rušd repeatedly used this term in his description of the preparation of medicines. According to Langermann (ibid., 354), this expression "originally referred to manipulative, procedural rules, i.e. general instructions as to how to act, but evolved to mean natural law, i.e. general observations concerning the natural world, which form the basis or justification for the procedures accepted by the medical profession".

[136] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267, 2–4; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٨/395, 24; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 316, 23. In *al-Kulliyyāt* VI, "quality" and "sequence" are missing from this passage; instead, there is mention of "place" (*waḍʿ*), an aspect that is not mentioned in 'On the Preservation of Health'.

[137] The *tannur* is used today in Islamicate regions such as Yemen but also in the Indian-Pakistani area (under the denomination *tandoor*); for details, cf. R. Mielck, *Terminologie und Technologie der Müller und Bäcker im islamischen Mittelalter*, Glückstadt–Hamburg 1913, 55. On the historical use of *furn*, cf., e.g. the work of *Maimonides Mišnah im peruš Rabbenu Mošeh ben Maymon. Seder Ṭoharot*, ed. and translated by Y. Qafiḥ, Jerusalem 1963, 58 (Kelim 8:9); for more general infomation about *furn*, cf. C. Pellat, *Khubz*, in: Encyclopaedia of Islam, vol. 5, Leiden ²1986, 41–43, 42.

[138] *Commentarial Averrois*, ed. Vázquez de Benito (nt. 13), 267, 5–11; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٢٩٣/320, 7; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 248, 9; *Galeni De alimentorum*, I, 2, 12, ed. Helmreich (nt. 102), 221 (*Galen: On the Properties*, tr. Powell (nt. 102), 42–43). For more on this passage, cf. also synopsis 2) in the Appendix.

In the corresponding chapter, Galen first writes that the best bread should be baked in an earthenware hearth tile. Further in the text, Galen corrects himself in this assessment, stating, like Ibn Rušd, that the best bread is baked in a dome. Although

With respect to the quality of meat types, Ibn Rušd first distinguishes between quadrupeds and fowl. Among the quadrupeds, the best meat for maintaining health is that of suckling animals. The milk calf is followed by the one-year-old lamb in this hierarchy. Ibn Rušd further specifies that meat should always be of excellent quality and that people should mainly consume kid meat[139].

Galen's explanations are more detailed than Ibn Rušd's, Galen lacks Ibn Rušd's specific reference that bread baked in a *furn* is difficult to digest. As Galen discusses in detail the disadvantages of bread baked in a *furn*, one might conclude that digestive problems can occur after eating this bread. For this passage, there are, however, smaller textual divergences in the possible *Vorlage(n)* of Ibn Rušd. For more on this, cf. the text above with nt. 126 and nt. 127 and the below synopsis 2) with nt. 179 in the Appendix.

Galen mentions, among others, a third method of baking bread, which is considered inferior to baking bread in a *furn* or *tannūr*, i.e. bread baked over hot ashes. Most descriptions of bread baking in Islamicate food literature refer to the method with ashes, but this is not the case for Ibn Rušd or Maimondies; for details, cf. synopsis 2) in the Appendix. For more on baking bread in or over ashes, cf. Mielck, *Terminologie* (nt. 139), 50.

In *al-Kulliyyāt*, Ibn Rušd only mentions that the bread must be baked in a *tannūr* without further reference to the *furn* or to concerns about digestion.

More generally, it should be noted that between the corresponding text passages in Galen and in *al-Kulliyyāt*, there are parallels but also considerable differences in the choice of content. While Galen, at the beginning of his discussion, explores the quality of wheat varieties and their testing, the text of *al-Kulliyyāt* starts directly with the characteristics of white flour. Towards the end, Galen classifies different types of bread in terms of their quality based on different baking methods. In *al-Kulliyyāt*, however, there are references to the use of wheat beyond bread such as flour or crumb soup and cereal mush. Furthermore, about the half of the Galenic text comprises a thematic insert that addresses the compatibility of food according to the respective living conditions. These considerations are absent from both of Ibn Rušd's texts.

[139] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267, 12–16; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٢٩٤/321, 14 – ٢٩٥/322, 7; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 249, 14 – 250, 3. For more on this passage, cf. also synopsis 3) in the Appendix.

In the corresponding text in *al-Kulliyyāt*, Ibn Rušd initially holds back with his own opinion and discusses different views on the subject. First, somewhat illogically, the chicken appears in the context of the quadrupeds. For most people, according to Ibn Rušd, the best meat is that of the young chicken, followed by kid meat and adult chicken. As stated by the ancient doctors, kid meat is the best meat, next comes the young mutton. The differing opinions of Galen, Ibn Sīnā and "most physicians" follow this but this passage is not clearly legible in the different editions of *al-Kulliyyāt*, cf. below synopsis 3) with nt. 191 in the Appendix. The passage on quadrupeds in *al-Kulliyyāt* concludes with a reference to ar-Rāzī, further information about mutton and veal and a passage where Ibn Rušd emphasises the quality of veal.

Galen's text on the meat from quadrupeds in 'On the Properties of Foodstuffs' is rather different to Ibn Rušd's two texts. According to Galen, pork is the best for nutrition. The advantages and disadvantages of eating pork and beef are then discussed in detail; in terms of meat quality, the meat of younger animals must be

In the case of chickens, partridges and fowl in general, birds from the mountains are preferable to birds from swamps and lakes, because waterfowl is harmful to the humour and difficult to digest[140].

Finally, marine fish, especially those from rocky waters, <are of better quality>[141] than freshwater fish or fish from near the beach, of which both, according to Galen, are harmful to humour. Ibn Rušd also refers to fish which can live in both salt water and fresh water and specifically names carp (*šabābīṭ*) and grey mullet (*būrī*). According to Ibn Rušd, these fish, which mainly live near the coast, are to be assessed as being between marine and river fish in quality and can be

considered as better than that of older animals. For details, cf. Galeni De alimentorum, III, 1, 2–7, ed. Helmreich (nt. 102), 332–334 (*Galen: On the Properties*, tr. Powell (nt. 102), 115–116) and also synopsis 3) in the Appendix.

The divergences between the texts of Ibn Rušd and Galen can be explained by the fact that in the case of quadrupeds Ibn Rušd did not base his description on Galen's 'On the Properties of Foodstuffs' but on another Galenic treatise, 'On Good and Bad Humours': in this text, Galen's ranking starts with pork, followed by kid meat, veal and lamb. This is the same order to Ibn Rušd's, except that he does not mention pork as it is prohibited to eat pork in Islam. Furthermore, the Galenic description is expanded upon as the kid and calf are referred to as suckling animals, while the lamb is said to be one year old. For details, cf. *Galeni De bonis*, 6, 8–9, ed. Helmreich (nt. 102), 412, 28–29 and also synopsis 3) in the Appendix.

[140] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267, 17–19; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٢٩٤/321, 14–15 and ٢٩٥/322, 7 – ٢٩٦/323, 2; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 249, 14–15 and 250, 3–17; *Galeni De alimentorum*, III, 18, 2–6, ed. Helmreich (nt. 102), 356–357 (*Galen: On the Properties*, tr. Powell (nt. 102), 131–132). For more on this passage, cf. also synopsis 4) in the Appendix.

All information on the meat of fowl in 'On the Preservation of Health' can be found in Galen's discussion of the topic. Clearly, Ibn Rušd's short treatise and the Galenic text are closely related, but there are only some slight parallels with *al-Kulliyyāt* in the first part of the argument.

In 'On the Preservation of Health', but not in *al-Kulliyyāt*, there is the distinction, as also mentioned by Galen, between birds that live in the mountains and those that inhabit water and swamp areas. The information that the habitat (mountains or marshland) of the birds affects their meat quality, however, is only available in Galen's text.

Furthermore, pigeons and other small bird species are not mentioned in 'On the Preservation of Health' but they are discussed, with different focuses, in both *al-Kulliyyāt* and Galen's treatise.

More generally, the focus in *al-Kulliyyāt* is on the description of the individual types of bird meat with regard to their qualitative properties hot, cold, moist and dry – a method that is not found in either 'On the Preservation of Health' or in Galen's treatise. In general, the discussion in 'On the Preservation of Health' seems more focused but the text in *al-Kulliyyāt* is more comprehensive.

[141] This text is not legible in the only extant known manuscript, Ms. Escorial, árabe 884 (fol. 75r, 1). It was reconstructed based on the parallel passages from synopsis 5) in the Appendix.

consumed without any problems. However, one should avoid those which live in water near large cities[142].

Ibn Rušd goes on to say that, with the exception of figs and grapes, fruit should not be consumed. Further, figs and grapes may only be eaten if they are ripe and not mixed with anything else[143].

[142] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 267, 20 – 268, 3; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٢٩٦/323, 2–6; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 250, 17–22; *Galeni De alimentorum*, III, 24, 1–5, ed. Helmreich (nt. 102), 361–362 (*Galen: On the Properties*, tr. Powell (nt. 102), 135–136). For more on this passage, cf. also synopsis 5) in the Appendix.

This reference to Galen cannot be found in the Galenic text even though the problem that the quality of water near the beach and fresh water is prejudicial for the meat of fish is discussed extensively in his treatise. In addition, basically all the information given by Ibn Rušd in 'On the Preservation of Health' can also be found in Galen's more detailed text. However, these contents are formulated by Ibn Rušd in the context of a general framework, citing the genera "carp" (not in Galen's text) and "grey mullet" only as examples of fish whose habitat includes both salt water and fresh water. In the case of Galen, on the other hand, all of these statements are found in the chapter on "grey mullet", whereby Galen points out that what has been said here applies to all fish with a similar habitat.

In the corresponding text of *al-Kulliyyāt*, there are parallels to 'On the Preservation of Health' but also differences: occasionally, additional information from the Galenic text is included in *al-Kulliyyāt*, but there is also information missing which can be found in the other two texts. There is some rearrangement of text. Further, in *al-Kulliyyāt*, it is not "carp" but "allis shad" (*šābil*) that is added to the mention of "grey mullet".

Ibn Rušd's final advice in 'On the Preservation of Health', that fish from waters near large cities should be avoided, is also found in the Galenic text as well as in *al-Kulliyyāt*, with both texts mentioning the reason for this being that waters near large cities are generally polluted.

In general, the information on fish in 'On the Preservation of Health' is closer to the corresponding Galenic text than to the respective passages in *al-Kulliyyāt*.

[143] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 268, 4–5; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٢٩٧/324, 3–8; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 251, 9–16; *Galeni De alimentorum*, II, 8, 1 – 9, 2, ed. Helmreich (nt. 102), 273–276 (*Galen: On the Properties*, tr. Powell (nt. 102), 76–78). For more on this passage, cf. also synopsis 6) in the Appendix.

The information here as well as in the corresponding parts of *al-Kulliyyāt* refer to Galen's much more detailed text. It is interesting to note that Galen also discussed fig and grape together.

In *al-Kulliyyāt*, ripe figs are considered, as in the Galenic text, as being the best of fruits. Furthermore, in *al-Kulliyyāt* Ibn Rušd describes figs in terms of the qualities hot and moist while grapes are described as being moderately hot and moist in a balanced manner, characteristics that are not mentioned in 'On the Preservation of Health' or the Galenic treatise.

On the other hand, both *al-Kulliyyāt* and Galen's text offer explanations about the digestion of these fruits, which essentially correspond in terms of content, but Galen is more extensive in his discussion.

Vegetables are generally considered by Ibn Rušd to be harmful to humour. An exception here is lettuce; however, even lettuce should be avoided if those concerned about their health suffer from a cold stomach[144].

Before proceeding with the subject of "water", Ibn Rušd concludes with the summary sentence that these are the foods of the right quality[145].

According to Ibn Rušd, the best kind of water is sweet and odourless like the water that flows from powdery, earthy springs that face east. If this type of water is not available, then he recommends the water of large rivers, which is sweet but should not be mixed with snow or rainwater[146].

Finally, the advice in 'On the Preservation of Health', that the fruits should not be mixed with anything else, is not in the Galenic text or *al-Kulliyyāt*.

[144] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 268, 6–7; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٠٠/327, 17 – ٣٠١/328, 1; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 254, 22–24; *Galeni De alimentorum*, II, 39, 5 – 40, 7, ed. Helmreich (nt. 102), 307–310 (*Galen: On the Properties*, tr. Powell (nt. 102), 99–101). For more on this passage, cf. also synopsis 7) in the Appendix.

This information on vegetables in general and lettuce in particular is also given in the Galenic text and *al-Kulliyyāt*. However, while Ibn Rušd in 'On the Preservation of Health' mentions the harmful "humour" (*al-kaymūs*), in *al-Kulliyyāt* he refers to harmful "black bile humours" (*al-aḫlāt as-saudāwiya*).

In *al-Kulliyyāt*, in addition to lettuce, borage (*kuḥaylā'*) is given as a further exception. Borage must have been quite popular in al-Andalus; for details, cf. Müller, *Nahrungsmittel* (nt. 108), 406. The mention of the cold and moist qualities of lettuce in *al-Kulliyyāt* goes back to Galen.

It is only in Ibn Rušd's 'On the Preservation of Health' where the advice that people with a cold stomach should avoid all vegetables including lettuce is given; for details, cf. synopsis 7) in the Appendix.

More generally, on lettuce as both food and drug, cf. *Galeni De temperamentis*, III, 4, ed. Helmreich (nt. 67), 105, 5–17 (*Galen: Works*, tr. Singer/van der Eijk (nt. 67), 174).

[145] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 268, 8.

[146] Ibid., 268, 9–12; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٢٩٧/324, 8 – ٢٩٨/325, 5; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 251, 18 – 252, 8; for Galen's passage on "wine", cf. *Galeni De alimentorum*, III, 39, 3–4, ed. Helmreich (nt. 102), 383 (*Galen: On the Properties*, tr. Powell (nt. 102), 149–150). In the context of the different kinds of water, Galen's treatise 'On the Properties of Foodstuffs' is omitted as a comparative text, since Galen does not comment on "water" but on "wine" in this work. For more on this passage, cf. also synopsis 8) in the Appendix.

The information about the powdery, earthy nature of a good spring and that the taste of the water should not be affected by anything else is not in *al-Kulliyyāt*. In general, however, the discussion in *al-Kulliyyāt* is more detailed and includes references to Hippocrates, ar-Rāzī and regional particularities of al-Andalus.

At this point, Ibn Rušd concludes that the food and beverages he has mentioned are best suitable to maintain good health[147]. This statement marks the end of the passage about the quality of food and how it should be taken into account to maintain health.

Ibn Rušd now continues with the criteria of "quantity" and "eating time". A proper and healthy amount of food will not burden the stomach and drinks should not flood it. One should not consume more food until the last meal has been digested by the stomach, liver and other organs, that is, in the three places of digestion. "Modern" doctors recommend three meals a day; if this is not possible, then at least twelve hours between meals is considered balanced, so that the quality and the amount of food are appropriate. Ibn Rušd ends this paragraph with a reference to Galen, according to whom the food remains in the stomach for approximately fifteen hours[148]. Furthermore, the physicians recommend a substantial dinner because of the subsequent sleep and more so because of the long duration of the night and the shortness of the day[149].

The last criterion of the appropriate "sequence" of foods determines that one should first consume something that softens the stomach, such as broths made from Swiss chard and other softening vegetables, with something salty, some vinegar and some oil. Foods which do not nourish the body, however, are to be avoided, and, according to Ibn Rušd, Galen went as far as to claim that when the cockroaches realised this, they ate bread and had meat for dinner[150].

To conclude, Ibn Rušd repeats at this point that these are the basic rules for excellent digestion, and that these belong to the first principle for maintaining good health[151].

With this remark, Ibn Rušd moves on to his second main point, that is, proper excretion of the digestive residues via urine and bowel

[147] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 268, 13.

[148] This information could not be found in the work of Galen, although, e.g. in 'On the Natural Faculties', the subject of digestion is extensively discussed, cf. *Claudii Galeni Opera*, ed. Kühn (nt. 121), vol. II (1821), 1–214. – Regarding the three places of digestion, the first of these places is the stomach, the second the liver and the third the other organs, cf., e.g. J. Kollesch/D. Nickel, *Antike Heilkunst. Ausgewählte Texte aus dem medizinischen Schrifttum der Griechen und Römer*, Leipzig ^{6}1989, 20 sq., 63sq. or W. U. Eckart, *Geschichte der Medizin*, Berlin–Heidelberg ^{5}2005, 62.

[149] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 268, 14–21.

[150] Ibid., 268, 22–26; this quote about the cockroaches could not be found in the *Corpus Galenicum*.

[151] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 268, 27–28.

movement[152]. This is his second principle for preserving health, but in this context, Ibn Rušd emphasises that the first principle on healthy foods must also be considered.

Regarding Part 1, the following can be summarised so far: It is not surprising that there are parallels between the two texts written by Ibn Rušd, but regarding the subject of "fish", Ibn Rušd, in his 'On the Preservation of Health', is closer to Galen than to his discourse in *al-Kulliyyāt*. In the context of fruits and vegetables, however, the passages in *al-Kulliyyāt* and those in the Galenic text are closer to each other than to 'On the Preservation of Health'. Nonetheless, this may simply be explained by the fact that Ibn Rušd's discussion of these topics in 'On the Preservation of Health' is brief. Given the authority and influence of Galen's 'On the Properties of Foodstuffs' on the development of Islamicate food literature, it is not surprising that 'On the Preservation of Health' (and *al-Kulliyyāt*) are largely based on this Galenic treatise. In at least one case, however, Ibn Rušd relies more on the Galenic treatise 'On Good and Bad Humours' and Ibn Zuhr[153] may also have been considered.

Now, according to Ibn Rušd in Part 2, the excretion of digestive residues is triggered in two ways, namely, on the one hand, via physical exercise and activities which follow a bath such as massaging or rubbing[154], on the other hand, via administering laxative remedies[155].

Following this, Ibn Rušd describes four groups[156], who need to consider different aspects when they apply these measures:

[152] Ibid., 269, 1–2; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٨/395, 24 – ٣٦٩/396, 1; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 316, 22–25.

[153] Cf. above nt. 120 and nt. 125.

[154] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 2–3. This information is also given in *al-Kulliyyāt* VI, albeit in different formulations, and in the order of the recommended measures the "massage" is mentioned before the "bath", cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٩/396, 2; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 316, 28.

[155] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 3–4; *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٩/396, 2–3; this passage is lacking in *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 316, 28–29. In *al-Kulliyyāt* VI, the specific action mode of these remedies is not given, but Ibn Rušd points out (this information is not found in 'On the Preservation of Health'), that this kind of medication is meant especially for people with an unbalanced mixture.

[156] In *al-Kulliyyāt* VI, at this point more detailed explanations follow about "physical activities", "massages", "bathing" and also "sleep" in order to induce excretion, cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٩/396 – ٣٧٢/399; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 317–320. These contents are not given in 'On the Preservation of Health'.

People with a balanced mixture[157] who maintain healthy digestion, exercise and take baths do not need additional medication to support the excretion of digestive residues. For people with the constitution of a balanced mixture who neither maintain a healthy digestive system nor are physically active, laxatives are necessary.

People with naturally weak main organs[158] such as a weak stomach or liver who maintain a healthy digestive system, are physically active and take baths must also take remedies, not only laxatives but also remedies to strengthen weak main organs. If patients with this predisposition do not have a healthy diet or good physical condition through exercise or bathing, then taking medication alone cannot maintain their health and their vitality is at risk.

Ibn Rušd writes that the optimal time to exercise is after the food has been processed in the three places of digestion, stomach, liver and other organs, and before eating again. The physical activity should take the form of vigorous walking or riding in a balanced manner so that the body becomes moist and the breath is lifted. To maintain health, movement after periods of fasting is beneficial, because if it is carried out directly after eating, this can lead to illness. Ibn Rušd makes an exception here for people with a weak stomach: For them, it may be favourable to take a light walk after eating so that the food reaches the mouth of the stomach in a more efficient manner[159].

Moreover, it should be noted here that in *al-Kulliyyāt* VI, the measures for a good digestion are not discussed according to the four groups mentioned in 'On the Preservation of Health' but with reference to the nine mixtures as they were defined by Galen. Galen's description of the nine mixtures is found in *Galeni De temperamentis*, III, I, 8 and II, 1, ed. Helmreich (nt. 67) *(Galen: Works*, tr. Singer/van der Eijk (nt. 67). In his 'Commentary on Galen's *On Mixtures*' and also in his treatise 'On the Types of Mixtures', Ibn Rušd heavily criticises Galen's theory on mixtures; for details, cf. Eichner, *Averroes' Mittlerer Kommentar* (nt. 8), 148–157.

[157] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 5–14. This information can also be found in more detail in *al-Kulliyyāt* VI, cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٧٢/399, 8–14; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 320, 12–19: In addition to what is stated in 'On the Preservation of Health', people with a balanced mixture should not overeat and they should sleep well, control their emotions and strive for balanced air in their environment. In *al-Kulliyyāt*, the information that people with this healthy lifestyle do not need laxatives is attributed to Galen.

[158] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 5–14. A similar passage can be found in *al-Kulliyyāt* VI in the context of hot-humid mixtures without, however, explicitly mentioning or referring to "naturally weak main limbs", cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٨١/408, 21–24; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 330, 15–19.

[159] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 15–20. These instructions are not found in *al-Kulliyyāt* VI; the corresponding chapter gives a

Finally, the right time to bathe is after exercising and before eating; the food that follows bathing should be of adequate quantity and quality[160].

These instructions are followed by the third and last section of this short treatise with personal references to the reader, who is repeatedly addressed in the second person singular.

First, Ibn Rušd states that, if he is to continue discussing these questions, he should formulate them in more detail, but he lacks the time for this. Nevertheless, he would like to add some specific suggestions for the reader, should the problems described below arise, from which God may protect him[161]. Ibn Rušd does not advise him, however, to research this subject in *al-Kulliyyāt* where the discussion thereof is more extensive. This can be interpreted in two ways: Either that the corresponding texts in *al-Kulliyyāt* had not yet been finalised or, more likely, Ibn Rušd considered these texts too demanding for the intended reader.

Now, regarding 'On the Preservation of Health', Ibn Rušd's first suggestion for treatment applies to people with weak main organs such as the liver and especially the stomach. As described, they should strive for healthy digestion, exercise and bathing. In addition, Ibn Rušd recommends rose jam with mastic, spikenard, aloe vera, clove and cinnamon bark. According to Ibn Rušd, this is a remedy that is highly regarded, has been tested in experiments (*taǧriba*) and is specifically given to strengthen the stomach; then Ibn Rušd recommends the so-called "electuary (*dabīd*) of the ten ingredients"[162] for building

general description of what different movements mean for each body part and their effect on digestion and excretion, cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٦٩/396–٣٧٠/397; *Ibn Rušd, al-Kulliyyāt*, edd. Šayḥān/Ṭālibī (nt. 8), 317–318.

[160] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 21–22. A similar passage can be found in *al-Kulliyyāt* VI in the context of hot-humid mixtures, cf. above nt. 158.

[161] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 22–24.

[162] The word *dabīd* and the variants thereof means "electuary" and is rarely used in Islamicate pharmaceutical literature; for details, cf. I. Fellmann, *Das Aqrābāḏīn al-Qalānisī. Quellenkritische und begriffsanalytische Untersuchungen zur arabisch-pharmazeutischen Literatur*, Beirut–Wiesbaden 1986, 182 (no. 3.10). According to Ibn Zuhr, electuaries, referred to as *ḏabīd*, are generally good for strengthening the liver. He mentions the "*ḏabīd* of the ten ingredients" as one of its varieties, cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 90. A recipe for the "*ḏabīd* of the ten ingredients" is also given in C. Álvarez de Morales y Ruiz-Matas, *"El libro de la almohada" de Ibn Wafid de Toledo (Recetario médico árabe del siglo XI)*, Toledo 1980, 172.

up the liver[163]. The reference to trials and experiments in this first instruction is remarkable. He attaches great importance to practical experience in the medical field, and these discussions ultimately should lead to new approaches to medicine in the Latin West[164].

Ibn Rušd's second instruction is to be used if indigestible remains are found in the stomach. Laxatives provide a remedy here; taking aloe vera, which is known for its cleansing properties, is specifically mentioned. If this is not possible, myrobalans with almond oil should be taken mixed[165].

The third instruction is for people with a slim body and weak limbs as was apparently the case with the client of this treatise. Here, caution should be exercised when administering powerful and laxative remedies such as the fat of colocynth. With such a constitution, bloodletting is only permitted in urgent and necessary situations. Ibn Rušd ends this passage with the invocation: "May God protect and strengthen you![166]"

Ibn Rušd's fourth and final instruction involves local references and is suggested for fighting fevers in summer or in intense heat and subsequent rain, weather typical for a place like Ibn Rušd's second home Marrakesh. Taking oxymel juice with celery root, fennel, chicory and liquorice will help, the drinking of barley water is also advised[167].

What follows reads like a response to a letter whose addressee has asked Ibn Rušd for this information. In this context, Ibn Rušd specifically refers to an imminent journey to an undisclosed destination, which stood in the way of a more detailed discussion of the topic[168]. The text ends with wishes for peace and blessings and a short colophon[169].

Conclusion

It should be recognised once again that Ibn Rušd's texts on healthy nourishment belong to the tradition of Islamicate food literature.

[163] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 269, 25 – 270, 3.

[164] Cf. above nt. 130.

[165] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 270, 4–8.

[166] Ibid., 270, 9–11.

[167] Ibid., 270, 12–14. A similar passage can be found in *al-Kulliyyāt* VI in the context of hot-dry or only hot mixtures, cf. *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1, ٣٨٠/407, 17–23; *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8), 329, 10–17.

[168] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13), 270, 15–16.

[169] Ibid., 270, 16–18.

However, although they refer to ancient models, they focus on the foods typical of al-Andalus[170]. In general, 'On the Preservation of Health' should not be considered a summary of passages from *al-Kulliyyāt*. It presents specific questions from Ibn Rušd's milieu, and – not only in the final part – also provides information that does not appear in *al-Kulliyyāt*. Additionally, the texts of 'On the Preservation of Health' seem to be more comprehensibly formulated than those of *al-Kulliyyāt* which are often more scientific in nature. This becomes clear when, for example, Ibn Rušd refers to the nine mixtures as defined by Galen as this was a topic upon which Ibn Rušd disagreed with Galen and also discussed in separate treatises[171].

It should be clear from the discussion thusfar that there are parallels and divergences between the texts in addition to the omissions and annotations. Furthermore, the order on which content is presented has been changed in places (cf. the synopses in the Appendix). There are no direct literal adaptations of the wording and style of the texts; the references to Galen from 'On the Preservation of Health' could not be found in the concrete wording of the *Corpus Galenicum*. This may be due to the ambiguity surrounding the *Vorlagen(n)* which were available to and known by Ibn Rušd[172]. There were late antique and also Islamicate medical collections such as those of Oribasius, Ḥunayn ibn Isḥāq as well as ar-Rāzī (Latinised Rhazes)[173]. There were excerpts and variants of these collections, and one must assume that not all of these texts are extant. It must be pointed out, however, that the passages in both Galen and *al-Kulliyyāt* usually include more detail than 'On the Preservation of Health' and that all three texts have different focuses. Furthermore, the fifth and sixth books of *al-Kulliyyāt* have additional chapters and discussions of content which are not included in the considerably shorter 'On the Preservation of Health'.

Appendix

For a better understanding of the main text, the following table and synopses provide an overview of the discussed passages from 'On the Preservation of Health', *al-Kulliyyāt* V and VI, and Galen's 'On the

[170] Cf. nt. 110, nt. 178, nt. 198, nt. 199, nt. 203, nt. 204, and nt. 218.

[171] For details about this discussion, cf. above nt. 156.

[172] Cf. below synopsis 2) with nt. 179 in the Appendix and above 'II. The Medical *Talḫīṣ*: Ibn Rušd Teaching Galen'.

[173] Cf. nt. 105 (Ḥunayn ibn Isḥāq), nt. 181 (ar-Rāzī) and nt. 202 (Oribasius).

Properties of Foodstuffs'. Of these texts, Galen's 'On the Properties of Foodstuffs' is by far the most extensive while the passages from *al-Kulliyyāt* are more detailed than those from 'On the Preservation of Health'. The formulations differ from one another; no direct literal borrowings could be identified. For better comparability, the following synopses focus solely on the content-related aspects from the three texts without taking into account the respective specific formulation. Beyond this, Galen's 'On Good and Bad Humours', Ḥunayn ibn Isḥāq's 'The Book of Foodstuffs', the relevant works on food by Ibn Zuhr and Maimonides as well as 'The Book of Foodstuffs and Drinks' by Nağīb ad-Dīn as-Samarqandī were taken into account. When deemed necessary, additional authors were considered for selected passages.

1) Concordance between the Three Texts

Topics	Galen, 'On the Properties of Foodstuffs' (3 Books)[174]	Ibn Rušd, 'On the Preservation of Health'[175]	*Ibn Rušd, al-Kulliyyāt* V and VI[176]
Two methods for the preservation of health		267, 2–4	VI: Ed. Madrid ٣٦٨/395, 24 – ٣٦٩/396, 1; Ed. Cairo 316, 22–25
1st Content Aspect: 1st method – the quality of foods:			
seeds, grains, bread	I, 2, 12 / 221 (I, 42–43)	267, 5–11	V: Ed. Madrid ٢٩٣/320, 7; Ed. Cairo 248, 9

[174] *Galeni De alimentorum facultatibus*, ed. Helmreich (nt. 102) (*Galen: On the Properties*, tr. Powell (nt. 102)).

[175] *Commentaria Averrois*, ed. Vázquez de Benito (nt. 13).

[176] *Ibn Rušd, al-Kulliyyāt*, edd. Fórneas Besteiro/Álvarez de Morales (nt. 8), vol. 1 (Ed. Madrid); *Ibn Rušd, al-Kulliyyāt*, edd. Šaybān/Ṭālibī (nt. 8) (Ed. Cairo).

meat: quadrupeds	III, 1, 2–7 / 332–334 (III, 115–116)[177]	267, 12–16	V: Ed. Madrid ٢٩٤/321, 14 – ٢٩٥/322, 7; Ed. Cairo 249, 14 – 250, 3
meat: fowl	III, 18, 2–6 / 356–357 (III, 131–132)	267, 17–19	V: Ed. Madrid ٢٩٤/321, 14–15 and ٢٩٥/322, 7 – ٢٩٦/323, 2; Ed. Cairo 249, 14–15 and 250, 3–16
meat: fish	III, 24, 1–5 / 361–362 (III, 135–136)	267, 20 – 268, 3	V: Ed. Madrid ٢٩٦/323, 2–6; Ed. Cairo 250, 17–22
milk	discussed after "quadrupeds"		V: discussed after "fish"
eggs	discussed after "fowl"		V: discussed after "milk"
fruit	II, 8, 1–9,2 / 273–276 (II, 76–78)	268, 4–5	V: Ed. Madrid ٢٩٧/324, 3–8; Ed. Cairo 251, 9–16
vegetables	II, 39, 5 – 40, 7 / 307–310 (II, 99–101)	268, 6–7	V: Ed. Madrid ٣٠٠/327, 17 – ٣٠١/328, 1; Ed. Cairo 254, 22–24
water	III, 39, 3–4 / 383 (III, 149–150) – not "water" but "wine"	268, 9–12	V: Ed. Madrid ٢٩٧/324, 8 – ٢٩٨/325, 5; Ed. Cairo 251, 18 – 252, 8

[177] Ibn Rušd texts on the meat of quadrupeds are based on information from the Galenic treatise 'On Good and Bad Humours', cf. *Galeni De bonis*, 6, 8–9, ed. Helmreich (nt. 102), 412, 28–29 and also synopsis 3) in the Appendix.

2nd Content Aspect: 2nd method – the excretion of digestive residues:	267, 1–2	VI: Ed. Madrid ٣٦٨/395, 24 – ٣٦٩/396, 1; Ed. Cairo 316, 22–25
the methods for good excretion	267, 3–4	VI: Ed. Madrid ٣٦٩/396, 2–3; Ed. Cairo 316, 28–29
treatment for a balanced temperament	269, 5–14	VI: Ed. Madrid vol. 1 ٣٧٢/399, 8–14; Ed. Cairo 320, 12–19
in the context of "naturally weak main organs" and "the best bathing time"	269, 15 – 270, 11	VI: Ed. Madrid vol. 1 ٣٨١/408, 21–24; Ed. Cairo 330, 15–19 in the con text of treat ment for hot-humid mixtures
3rd Content Aspect: Personal references to the reader (treatment when it is hot)	270, 12–14	VI: Ed. Madrid ٣٨٠/407, 17–23; Ed. Cairo 329, 10–17

2) Bread

Galen, 'On the Properties of Foodstuffs'[178]	Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V

[178] An overview of different types of flour products and breads in Islamicate food literature is given in Müller, *Nahrungsmittel* (nt. 108), 353 sqq. Müller points out that most Islamicate books on food are based on Galen's discourse in their description of

The best bread is baked under a dome. <...> Next comes bread baked in an oven[179],	The bread is baked in a dome oven made of clay (*tannūr*). If this is not possible, then it should be baked in a simpler clay oven (*furn*),	The bread is baked in a dome oven made of clay (*tannūr*).
but the crumbs are not cooked as well as bread from the dome oven.	although this oven bread – as Galen says – is difficult to digest[180].	

bread. She also refers to flour and bread types, which apparently were typical mostly for al-Andalus.

[179] This content is also given in the Arabic translation of Galen's Greek text but in different wording: "and second, with regards to fineness and goodness, after bread of the dome oven (*tannūr*) comes bread of the oven (*furn*)" (*wa-ṯ-ṯānī baʿda ḫubzi t-tannūri fī l-ǧūdati wa-l-faḍīlati ḫubzu l-furni*), from the text of Ms. Cairo, Dār al-kutub, ṭibb 1727. I am grateful to F. Käs who informed me about this reading which is quite similar to the corresponding passage in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), II, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 45v, 12–13: "with regards to fineness, after bread baked in the dome oven (*tannūr*) comes bread baked in the oven (*furn*)" (*wa baʿda l-ḫubzi l-muḫtabazi fī t-tannūri fī l-ǧūdati l-ḫubzu llaḏī yuḫtabazu fī l-furni*). For more on the the possible *Vorlage(n)* that were available to Ibn Rušd, cf. above 'II. The Medical Talḫīṣ: Ibn Rušd Teaching Galen'.

[180] The corresponding passage from Galen in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), II, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 45v, 13–14 explains here that the inside of bread baked in an oven (*furn*) receives less coction than bread baked in the dome oven (*tannūr*). It is possible that Ibn Rušd's remark about bad digestion of oven bread refers to this information that can be understood in such a way that oven bread is not done inside. In the original Greek version, however, Galen's text is different. Here, again the ambiguity surrounding possible *Vorlage(n)* is relevant.

In two places, Ibn Zuhr provides information about the quality of bread according to the way it is baked. First, he notes that bread baked in the dome oven (*tannūr*) is better than bread baked in an oven (*furn*) (cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 10). Later, he repeats this ranking, adding, however, that bread baked over hot ashes is inferior to bread baked in an oven (*furn*) (ibid., 11). Thus, the first passage corresponds to Ibn Rušd's text while the second one mentions the Galenic information, including ashes, which is also given in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), II, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 45v, 16–17.

Maimonides, following Galen, states that the *tannūr* is the best while the *furn* is the second best baking method for bread; however, he does not refer to digestion nor, like Ibn Rušd, does he mention bread baked in ashes. For details, cf. *Maimonides, On the Elucidation*, ed. and tr. Bos (nt. 107), 57 [27] and id., *On Asthma*, ed. and tr. Bos

Bread baked over a grill,
hot ashes, or hearth tile
used as a dome is bad[181].

The wheat and its seeds
for sowing should be of
excellent quality.

3) Quadrupeds

The relevant passages on the meat of quadrupeds in Galen's 'On the Properties of Foodstuffs'[182] differ greatly from the two corresponding texts in Ibn Rušd's work. First, Galen frequently emphasises with examples that it is pigs that provide the best meat for good nutrition. A direct comparison between pork and beef is followed by the general observation that animals with a drier mixture are more moderate when young, while the nature of animals with a moister mixture transforms into a more balanced mixture as they age. This is why veal is better for digestion than beef, kid meat is preferable to goat, and lamb meat is preferable to mutton. Furthermore, with regard to the quality, the meat of a nanny is superior to the meat of a buck followed by the meat of rams and bulls. More generally, the meat of old animals are more difficult to digest than young ones, and this also applies to the meat of pigs. Ibn Rušd does not refer to this passage; in this case, Ibn Rušd's *Vorlage* can be found in Galen's treatise 'On Good and Bad Humours'[183]:

(nt. 107), 11–12 [3.1]; in id., *On the Regimen*, ed. and tr. Bos (nt. 107), 53 [12] only *tannūr* is mentioned as the oven for baking best bread.

As-Samarqandī values bread baked in the *tannūr*, but makes no mention of bread baked in the *furn* or in ashes, cf. Müller, *Nahrungsmittel* (nt. 108), 30 [1].

[181] In the fragmentary tradition of Rufus of Ephesos (c. 80 – c. 150 CE), there is a passage with this division into three types of bread: according to the different manners of preparation – deviating from Galen – the best bread is baked in the *furn*, the second best in the *tannūr* and the worst in ashes. This passage is found neither in the Syriac tradition of Rufus nor in Ḥunayn ibn Isḥāq's quotations from Rufus in his *Kitāb al-Aġḏiya* but in the *Kitāb al-Ḥāwī* by ar-Rāzī, cf. Wernhard, *Die syrischen Fragmente* (nt. 77), 25 [4] as well as Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), II, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 48v, 8–11 and fol. 50r, 10 – 50v, 1 and also *Abū Bakr Muḥammad ibn Zakarīyā' ar-Rāzī, Kitāb al-Ḥāwī fī ṭ-ṭibb*, 23 voll., Hyderabad 1955–1970, vol. 20 (1967), 289.

[182] *Galeni De alimentorum*, III, 1, 2–7, ed. Helmreich (nt. 102), 332–334 (*Galen: On the Properties*, tr. Powell (nt. 102), 115–116)

[183] *Galeni De bonis*, 6, 8–9, ed. Helmreich (nt. 102), 412, 28–29. Ḥunayn ibn Isḥāq does not quote this passage of Galen's 'On Good and Bad Humours'; only the

Galen, 'On Good and Bad Humours'	Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V
The best food quality is ascribed to pork[184], followed by kid meat,	For quadrupeds, the best meat is that of suckling animals[185],	For most people, the best meat is that of young chicken,
followed by veal, then lamb.	followed by the milk calf[186], followed by the one-year-old lamb[187].	followed by kid and then chicken.

information on the meat of quadrupes taken from Galen's 'On the Properties of Foodstuffs' is given in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), III, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), foll. 91v, 9 – 93v, 3.

[184] Ibn Rušd, without explanation, refrains from mentioning pork, which Galen praises highly but which is forbidden in Islam; for details about the discussion of meat from different animals in Islamicate food literature, cf. Müller, *Nahrungsmittel* (nt. 108), 367 sq. Wine, which is also forbidden by Islam, is also not mentioned by Ibn Rušd, cf. below synopsis 8) with nt. 220.

[185] The meat of kid and calf, both suckling, is praised in Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya*, who states that this meat is better than the meat from older animals or from suckling piglets, cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), III, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), foll. 94r, 9 – 94v, 1. The relevant passages in Ḥunayn's treatise are ascribed to the ancient physician Mnesitheus of Athens (around 380 BCE) whose work is preserved only in fragments, cf. Ullmann, *Die Medizin* (nt. 2), 199. Maimonides generally describes lamb as the best meat from quadrupeds (cf. below nt. 187). However, the meat of a suckling kid is highlighted in the context of good nourishment and efficient digestion, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 59 [14]. Another passage also expressly recommends the meat of a suckling kid among the meat of land animals, cf. id., *On the Elucidation*, ed. Bos (nt. 107), 63 [32]. For more details about Maimonides' discussion of meat, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 25 (Introduction) and id., *On the Elucidation*, ed. and tr. Bos (nt. 107), 58 with nt. 107.

[186] Cf. the passage ascribed to Mnesitheus of Athens in the preceding note. According to Ibn Zuhr, beef is difficult to digest but veal is safe to eat, cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 22. Veal is not explicitly referred to by Maimondes.

[187] Ibn Zuhr writes that the best quality mutton is from sheep that are neither too young nor too old; the meat of suckling sheep has an exquisite taste but should not be eaten because it causes much moisture in the body, cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 21. According to Maimonides, the best meat of land animals is that of lamb, provided that they are in their first or second year. Unless the lamb is of the perfect age, their meat is harmful; the meat of suckling kids, on the other hand, provides good nourishment. For details, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 57, 59 [14] and id., *On the Elucidation*, ed. and tr. Bos (nt. 107), 61

Anyone who wants to maintain their health should definitely eat only these types of quadruped meat.	<More information follows about the properties of chicken[188].>
It is always necessary to pay attention to excellent meat, that is, one should eat more kid meat[189] than others[190].	According to the ancient physicians, kid meat is followed by that of the young mutton.

In *al-Kulliyyāt*, what follows are the opinions of Galen, Ibn Sīnā and "most physicians" concerning the quality of individual animals. This passage is not clearly legible in the different editions of *al-Kulliyyāt* but it is clear that the contents of the different manuscripts (mainly Ms. St. Petersburg, Russian National Library, Ant. B. Imp.

[28] as well as id., *On Asthma*, ed. and tr. Bos (nt. 107), 15 [3.6]. Thus, neither Ibn Rušd nor Ibn Zuhr nor Maimonides recommend the meat of suckling lambs but prefer animals that are more or less yearlings or at least no longer too young.

[188] Cf. below synopsis 4) in this Appendix.

[189] In addition to Mnesitheus' short text (cf. above nt. 185), Ḥunayn also praises kid meat in another passage which is attributed to Hippocrates. This passage is found in the Ps.-Hippocratic treatise 'On Regimen', but only with reference to goat meat and not to kid meat. For details, cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), III, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), foll. 93v, 4 – 94r, 8 and *Hippocratis De diaeta*, II, 46, 1–2, ed. R. Joly/S. Byl, Berlin ²2003, 168, 13–14, URL: <https://cmg.bbaw.de/epubl/online/cmg_01_02_04.php?custom=1&pn=158&AnzFrames=1> (last access on December 20, 2024). Ibn Zuhr describes the quality of meat in the context of individual animal species without actually comparing the meat of different animal species. Regarding goat meat, he writes that the best meat of the goat is that of the young goats; the worst meat of goat is that of older animals, cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 21. Thus, kid meat is considered to be quite healthy and wholesome in ancient-Islamicate food literature. While Maimonides refers to the "suckling kid" (cf. above nt. 185), Ibn Rušd only mentions "kid" but in 'On the Preservation of Health', the meat of "suckling animals" is described as best.

[190] As-Samarqandī deviates from the views of the authors presented so far. On the one hand, in terms of the nutritional value, he considers sheep the best because its mixture is closest to that of humans; veal comes after that in excellence. On the other hand, he prefers kid meat to lamb, without mentioning, however, that authors like Ibn Rušd or Maimonides, for kid or lamb, differentiate in terms of suckling animals or yearlings. For details, cf. Müller, *Nahrungsmittel* (nt. 108), 80 [2.1]. Rufus of Ephesos discusses the meat of quadrupeds in a rather general way with information about its durability and cooking instructions, cf. Wernhard, *Die syrischen Fragmente* (nt. 77), 18–20 [2].

124[191]) are not identical. The passage continues with a reference to ar-Rāzī who, like Galen, thinks that kid meat is better than lamb. It also includes information about how to determine the quality of mutton and veal. Ibn Rušd concludes this passage by stating that veal is excellent, but in the quality of the humour it produces, goat meat is superior.

4) Fowl

Galen, 'On the Properties of Foodstuffs'	Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V
General introduction to birds, pointing out that their meat is less nutritious than that of mammals; pigs are the most nutritious.		For most people, the best meat is that of young chicken[192], followed by kid meat, and then chicken[193].
The meat of poultry is more digestible than that of quadrupeds,	Good for maintaining health	<More information is presented here on chicken, which can be used to treat leprosy and is good for the brain and memory because of its balanced mixture and hot properties[194].>
especially that of partridge, hazel grouse,	are firstly chicken and partridge[195],	Good poultry meat includes partridge (which

[191] This manuscript of *al-Kulliyyāt* also includes important variants in the context of "mixtures", cf. Eichner, *Averroes' Mittlerer Kommentar* (nt. 8), 152 with nt. 40.

[192] Cf. below nt. 195.

[193] The passage that follows is about quadrupeds, cf. above synopsis 3).

[194] The information that chicken broth is beneficial for lepers is first found in *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 15 and 18; then also in *Maimonides, On the Elucidation*, ed. and tr. Bos (nt. 107), 59 [28].

[195] Chicken ranks highest among the meat of fowl in the work of most Islamicate doctors while francolins and partridges often follow in the hierarchy; for more details and an overview of fowl in Islamicate food literature, cf. Müller, *Nahrungsmittel* (nt. 108), 364 and 372 sqq.

Galen, in 'On the Properties of Foodstuffs', ranks partridge meat the highest, followed by chicken, while in the respective Galenic passage in Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya*, this list begins with francolin, followed by partridge and then chicken, cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), III, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 108r, 4–5.

pigeons, rooster and chickens.		has a slight tendency to be cold and dry) and woodland chicken (which can be binding, especially when cooked).
<The text that follows discusses explanations about the edibility of pheasant and peacock meat.>		<The text that follows are explanations of the qualities of wild pigeon and dove.>
Differences in the habitat of birds affect the quality of meat: Birds from mountainous regions have characteristics like the region, i.e. dry, clean and easily digested meat.	as well as all birds from mountainous regions.	

According to Ibn Zuhr, chicken is followed by francolin and partridge; he considers chicken to be the best kind of meat, cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 15.

Maimonides also has a high opinion of chicken, young chickens and partridge, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 25 (Introduction) and 53 [12] as well as id., *On Asthma*, ed. and tr. Bos (nt. 107), 14 [3.4]. Elsewhere, however, Maimonides warns against eating partridge because it causes constipation, cf. id., *On the Elucidation*, ed. and tr. Bos (nt. 107), 59 and 61 [28]. For more details about Maimonides' discussion of meat, cf. id., *On the Regimen*, ed. and tr. Bos (nt. 107), 25 (Introduction) and id., *On the Elucidation*, ed. and tr. Bos (nt. 107), 58 with nt. 107.

Rufus of Ephesos discusses fowl according to the seasons and includes cooking instructions, cf. Wernhard, *Die syrischen Fragmente* (nt. 77), 18 [1], 20 sq. [2]. According to Ḥunayn ibn Isḥāq's compilation, Rufus prefers wild birds to domestic ones; for him, the best wild birds are thrush and blackbird, followed by partridge, francolin and others. The best domestic birds are young roosters when they start to crow and hens before they lay eggs, cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), III, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 109r, 14 – 109v, 14.

As-Samarqandī's description of fowl is clearly based in part on the passage on Rufus in Ḥunayn's 'Book of Foodstuffs' (cf. ibid.): as-Samarqandī also classifies wild fowl as generally better than domestic fowl. Young partridges are followed by young chickens and pheasant; older partridges, however, are not considered to be good. He describes young chickens in a similar manner to Rufus when he mentions the best domestic birds. For more details, cf. Müller, *Nahrungsmittel* (nt. 108), 86 [2.3].

Birds from swamp regions have characteristics of the region, i.e. moist, spoiled and difficult to digest meat.	Birds from marshes and lake areas are harmful to the humour and difficult to digest[196].	<Poultry digestion explanations>
Thrushes, blackbirds and small sparrows have tougher meat than those mentioned so far. The meat of turtle dove, wood pigeon and duck is even tougher.		Dove is beneficial for lepers and paralytics[197].
		Turtle dove has the qualities of hot and dry. Hollow dove[198] has a delicate nature and a pleasant taste. Small birds are all hot and dry with extreme heat. <Information on the nature and manner of digestion of the meat of quail and starlings but without reference to "tough meat" is presented here (cf. the Galenic text).>

5) Fish

Galen, 'On the Properties of Foodstuffs' (Chapter on "Grey Mullet")	Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V

The grey mullet inhabits both salt water

[196] General statements about the meat of mountain or water birds are not found in Ibn Zuhr's work or Maimonides' work. According to as-Samarqandī, the meat of both mountain birds and water and marsh birds is harmful to health, cf. Müller, *Nahrungsmittel* (nt. 108), 86, 88 [2.3].

[197] In his description of domestic pigeons, Ibn Zuhr refers to various forms of paralysis, but not to leprosy, cf. *b. Zuhr, Kitāb al-Aġdiya*, ed. García Sánchez (nt. 106), 16.

[198] Hollow dove (*yamām*) is mentioned only in food literature from al-Andalus, cf. Müller, *Nahrungsmittel* (nt. 108), 373 sq. with nt. 161.

and fresh water; the quality of its meat depends on this:		
	<The best>[199] are sea fish, especially those from rocky waters[200];	The best quality fish are from rocky waters, with many scales, not too big and not too small, of fast movement and little fat.
Fish from rivers or canals should be avoided because of sewage; it is also better to avoid fish from stagnant, muddy waters.	fish near the beach and from fresh water, on the other hand, are harmful[201]	

[199] For this passage, cf. the text above with the main text of nt. 141.

An overview of different fish and their specific mention by Islamicate authors is given in Müller, *Nahrungsmittel* (nt. 108), 375 sqq. Müller points out, that food literature from al-Andalus generally offers more comprehensive information on fish and seafood than works from the Islamicate East.

[200] This information is not presented in Galen's 'On the Properties of Foodstuffs' but is found in Ḥunayn's *Kitāb al-Aġḏiya*, cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), I, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 15v, 7–8; Wernhard references this passage to Galen's 'On Good and Bad Humours', cf. *Galeni De bonis*, 3, 1, ed. Helmreich (nt. 102), 396, 21 – 397, 3. In Ḥunayn ibn Isḥāq's 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), there is no chapter on fishes; it may have been part of the last and no longer extant part of Ms. Bankipur, Khuda Bakhsh, 2142 (nt. 9). However, the first part of Ḥunayn's book, 'A General Discussion by Galen and Others on Foodstuffs', includes some passages on the consumption of fish similar to these references to the good quality of fish from rocky waters. Degen suggests that the passages on fish in Ḥunayn's *Kitāb al-Aġḏiya* may not be lost but integrated into the first part of the book, cf. Degen, *The Kitāb al-Aghdhiya* (nt. 105), 298.

Ibn Zuhr also considers fish from rocky waters as the best, cf. *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 36. Maimonides and as-Samarqandī present similar information but on saltwater fish, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 63 [18] (without mentioning explicitly rocky waters) and for as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 96 [2.4] (with a reference to fish of rocky waters).

[201] This information is also in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), I, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 35v, 16–18 and in *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 36, as well as later in as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 96 [2.4]. Maimonides, however, discusses bad waters in a rather general manner when he describes fish as poor nourishment, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 63 [18].

for the humour, according to Galen[202].

The best are the fish from clear and turbulent seas.
<The passage that follows presents a further elaboration on turbid and marshy water as well as flowing water (the fish from the latter are of a better quality).>

Fish who inhabit salt water and fresh water	The best fish is
like carp and grey mullet are good for the health[203];	the grey mullet, followed by large allis shad[204].

[202] An information about bad digestion after eating freshwater fish is also found in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), I, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 39r, 11–15, this information is ascribed to the pharmacologist Xenocrates <of Aphrodisias> (c. 70 CE). Further, Wernhard (ibid.) identified Oribasius as possible source for this passage, cf. *Oribasii Collectionum medicarum reliquiae*, II, 58, 9, ed. J. Raeder, 4 voll. (1,1–2,2), Leipzig–Berlin 1928–1933 (reprint Amsterdam 1964), vol. 1,1 (1928): libros I–VI, 47, 23–26, URL: <https://cmg.bbaw.de/epubl/online/cmg_06_01_01.php> (last access on December 20, 2024). The Arabic translation (*Kunnāš*) of Oribasius' medical encyclopedia Ἰατρικαὶ Συναγωγαί is not extant, cf. Ullmann, *Die Medizin* (nt. 2), 83 sq.; for Xenocrates of Aphrodisias, cf. K. Meister/K.-H. Stanzel/B. Zimmermann/R. Neudecker/C. Hünemörder/A. Touwaide, [6] *Xenocrates*, in: H. Cancik/H. Schneider (eds.), Brill's New Pauly (English Edition by C. F. Salazar), Online Edition 2006, URL: <http://dx.doi.org/10.1163/1574-9347_bnp_e12212900> (last access on December 20, 2024).

Instead of warning against consuming freshwater fish, Maimonides highlights the positive aspects of consuming smaller saltwater fish for digestion, cf. *Maimonides, On Asthma*, ed. and tr. Bos (nt. 107), 14–15 [3.4–5]. As-Samarqandī mentions both positive (saltwater fish) and negative (freshwater fish) aspects of consuming fish for digestion, cf. Müller, *Nahrungsmittel* (nt. 108), 96 [2.4].

[203] Maimonides refers to this particular kind of fish which lives in salt and also in fresh water, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 63 [18]. Neither carp (*šabābīṭ*) nor allis shad (*šābil*; cf. *al-Kulliyyāt*) are mentioned in Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya* or in Maimonides' work. As-Samarqandī does not refer to fish that inhabitat salt water and fresh water, cf. Müller, *Nahrungsmittel* (nt. 108), 375.

The grey mullet is referred to as *qayfāl* (from Greek κέφαλος) in the description of fat fish in Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), I, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), fol. 38v, 3–6. The

The quality of the fish is also due to its nutrition, which in turn depends on its habitat (distinction between clear and polluted waters, the latter being found mainly near cities).	however, those near large cities should be avoided[205].	If you fish this fish in rivers far from the sea, the water there is cleaner due to less waste.
<After the detailed description of polluted waters, Galen presents the ideal conditions:>		
Best for the fish is clear sea		This fish, because of its nature, seeks cold water,
with sandy and rocky coasts and ideally north wind, because then the fish has to move more.		and it moves more, <by swimming up rivers>.

name *qayfāl* for "grey mullet" is also found in Aristotle's 'Book of Animals' (*Kitāb al-Ḥayawān*), cf. L. S. Filius, *The Arabic Version of Aristotle's* Historia Animalium: *Book I–X of* Kitāb al-Hayawān. *A Critical Edition with Introduction and Selected Glossary*, Leiden–Boston 2019, 46, 395, 520. Aristotle's *Kitāb al-Ḥayawān* was translated from Greek into Arabic presumably in around 850 CE, i.e. during the lifetime of Ḥunayn ibn Isḥāq; the translator of this Aristotle text has not been identified thus far, for details cf. ibid., 2 and 8. In the works of the Andalusian 12th century CE authors Ibn Rušd and Maimonides, however, *būrī* is used for grey mullet. Maimonides also refers to a fish called *rāy* which may be the same species of fish as *būrī*, cf. J. Levinger, *Maimonides'* Guide of the Perplexed *on Forbidden Food in the light of his own Medical Opinion*, in: J. L. Kraemer (ed.), *Perspectives on Maimonides: Philosophical and Historical Studies*, Oxford 1991, 195–208, 204, nt. 45. For more on these passages, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 63 [18] and id., *On Asthma*, ed. and tr. Bos (nt. 107), 14–15 [3.4–5].

[204] The important Andalusian surgeon az-Zahrāwī (936–1013 CE) also appreciated these two types of fish, describing them as two of the best fish to be found in al-Andalus, cf. Müller, *Nahrungsmittel* (nt. 108), 378.

[205] Ḥunayn ibn Isḥāq provides this information in his 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), I, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105) fol. 37v, 1–5 as does Maimonides in his treatise *On Asthma*, ed. and tr. Bos (nt. 107), 14–15 [3.4–5] and as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 96 [2.4].

Only in Galen's 'On the Properties of Foodstuffs': The text that follows provides further elaboration on the different configurations of sea and coastlines and their effect on the quality of the fish. What applies for lagoons, is generally true for fish that thrives in salt and also in fresh water. The remarks made about grey mullet can be generalised to this. The remainder of the chapter offers further explanations, now specific to grey mullet.

6) Fruit

Galen, 'On the Properties of Foodstuffs'[206]	Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V[207]
The fig has unhealthy properties like any fruit but less than other fruit.	Fruits are to be avoided[208], apart from ripe figs and ripe grapes[209].	The best fruits are figs and grapes.
		The fig is hot and humid,
But it also contains good properties and is good for the digestion and for the body as a whole, and it is a laxative.		relaxes the stomach and has a cleansing effect.

[206] Ḥunayn ibn Isḥāq compiled the information on figs and grapes from Galen's 'On the Properties of Foodstuffs', cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), II, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), foll. 63v, 9 - 64v, 12 (figs) and foll. 65r, 7 – 66v, 14 (grapes). – An overview of fruits which are generally mentionend in Islamicate food literature is given in Müller, *Nahrungsmittel* (nt. 108), 397.

[207] The text of these passages in *al-Kulliyyāt* corresponds to *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 43.

[208] Maimonides also imparts this information, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 67 [21] and [22] as well as id., *On Asthma*, ed. and tr. Bos (nt. 107), 17 [3.9]. According to as-Samarqandī, fruits that are not yet fully ripe should be avoided; more generally, one should wait until fruits have dried a little before consumption, cf. Müller, *Nahrungsmittel* (nt. 108), 124 [5].

[209] This information is also given in *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 67 [21]. Grapes and figs are only briefly mentioned by Rufus of Ephesos in the chapter on dates, cf. Wernhard, *Die syrischen Fragmente* (nt. 77), 31 [13]. Dates are also of great importance for as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 124, 126, 128 [5]. According to as-Samarqandī, the most nutritious fruits are figs, sweet ripe grapes and dried dates (ibid., 124); the best figs are the ripe ones (ibid., 128).

<The following text provides further explanations for these properties.>		
Figs and grapes are the best of the autumn fruits, because they nourish better and are more wholesome than other fruits; the important thing is that they are ripe.		It is best when fully ripened. The grape is moderately hot and evenly humid.
<The following text provides explanations for the nutritional content as well as the digestion of grapes, which is less well tolerated than the fig.>	The two types of fruit should not be consumed together[210].	<The following text provides explanations about the digestion of grapes, which, unlike the fig, produces flatulence[211].>
<The next substantial point is about raisins.>		<The following text provides explanations about raisins and the wine made from them (*nabīḏ*)[212].>

[210] The warning that the two fruits should not be eaten together is not found in any of the works examined, including *al-Kulliyyāt*.

[211] This information is not only included in Galen's text but also given by as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 130 [5].

[212] Arabic doctors distinguished between *šarāb* and *nabīḏ*, with *šarāb* usually referring to grape wine and *nabīḏ* to wines made from other ingredients such as, as is the case here in *al-Kulliyyāt*, raisins or dates, figs, honey, sugar and cereals; for details, cf. Müller, *Nahrungsmittel* (nt. 108), 426. There was no consensus among Muslim scholars about whether the Islamic ban on wine should also include *nabīḏ*, which is not mentioned in the Koran; for details, cf. P. Heine, *Weinstudien: Untersuchungen zu Anbau, Produktion und Konsum des Weins im arabisch-islamischen Mittelalter*, Wiesbaden 1982, 45. About these discussions cf. also synopsis 8) with nt. 220 in this Appendix.

7) Vegetables

Galen, 'On the Properties of Foodstuffs'[213]	Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V[214]
The food of wild plants as a whole is not good for the digestion.	Vegetables as a whole lead to harmful humours (*al-kaymūs*)[215]	All vegetables, by their nature and substance, tend to produce harmful black bile humours (*al-aḫlāṭ as-saudāwiya*) –
Among cultivated plants	–	
lettuce is considered by many doctors to be better than other vegetables because it is more wholesome.	except lettuce[216].	except lettuce
Its juice is moist and cold but still not bad.		because of its cold and moisture[217]
<The texts that follow provide explanations for the peculiarities of the digestion of lettuce.>		and borage[218].

[213] Ḥunayn ibn Isḥāq compiled the information from Galen's 'On the Properties of Foodstuffs', cf. Ḥunayn ibn Isḥāq, 'Book of Foodstuffs' (*Kitāb al-Aġḏiya*), I and III, Ms. Bankipur, Khuda Bakhsh, 2142, transcription Wernhard (nt. 105), foll. 28v, 7–11, 29r, 1–2 and 78v, 4–16. – Galen, like most Arabic writing authors, considers lettuce to be the best and least harmful vegetable; for details about the description of vegetables in Islamicate food literature, cf. Müller, *Nahrungsmittel* (nt. 108), 404 sqq.

[214] The text of these passages in *al-Kulliyyāt* is similar in wording to *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 55.

[215] This general remark on vegetables, based on Galen, is also made in *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 64 with nt. 69 and 65 [20] as well as by as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 174 [6].

[216] Lettuce as such is not referred to in *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107); it is only mentioned as an ingredient in recipes for fever in id., *On the Elucidation*, ed. and tr. Bos (nt. 107), 31 [6]. This Galenic remark on lettuce, however, is also found in the work of as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 176 [6]. Similarly, Rufus of Ephesos pointed out the positive properties of lettuce, cf. Wernhard, *Die syrischen Fragmente* (nt. 77), 33 [17].

[217] This information is also given by as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 176 [6]. More generally, Müller (ibid., 405) refers to the dependence of as-Samarqandī on Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya* in this context.

[218] The *borage* (*lisān aṯ-ṯawr* or *kuḥayla'*) plant is quite popular especially in Western Islamicate food literature, cf. Müller, *Nahrungsmittel* (nt. 108), 406.

	However, if somebody has a cold stomach, this should also be avoided[219].	
<Text on other cultivated plants such as endives, mallow, ...>		<This brief introduction is followed by a list and discussion of different types of vegetables.>

8) Water

Ibn Rušd, 'On the Preservation of Health'	*Ibn Rušd, al-Kulliyyāt* V
About the types of water[220]:	According to Hippocrates and also other physicians:
The best water flows from powdery-earthy springs that face east[221],	The best water flows from springs that face east,

[219] This warning for those with a cold stomach is not found in any of the works examined, including *al-Kulliyyāt*.

[220] As stated above (cf. nt. 146), there is no chapter on water in Galen's 'On the Properties of Foodstuffs'; there is, however, one on wine. In Ḥunayn ibn Isḥāq's *Kitāb al-Aġḏiya*, the chapter on wine is missing; it probably belonged to the last and lost part of Ms. Bankipur, Khuda Bakhsh, 2142, cf. Degen, *The Kitāb al-Aghdhiya* (nt. 105), 298.

Maimonides does not discuss water as such either; with regard to the use of wine and other nutriments that are prohibited in Islam, he does refer to their medicinal benefits, cf. *Maimonides, On the Regimen*, ed. and tr. Bos (nt. 107), 62, 63 [21], 64 with nt. 66 and 65 [21]. As-Samarqandī and Ibn Riḍwān take a similar approach in their discussion of wine, cf. Müller, *Nahrungsmittel* (nt. 108), 258 [10.1] and *Ibn Riḍwān, Medieval Islamic Medicine: Ibn Riḍwān's Treatise "On the Prevention of Bodily Ills in Egypt"*, translated by M. W. Dols, ed. A. S. Gamal, Berkeley CA 1984, 91 with nt. 106

With regard to Muslim doctors in al-Andalus, az-Zahrāwī, e.g. expressed criticism of wine consumption while Ibn Zuhr and Ibn Rušd refrain from mentioning wine in their discussion of food and drinks. For more on this, cf. Müller, *Nahrungsmittel* (nt. 108), 424–428.

An overview on 'water' in Islamicate food literature is given in ibid., 429 sqq. For more on *nabīḏ* wine in the work of Ibn Rušd, cf. the above synopsis 6) with nt. 212 in this Appendix.

[221] This information is also given in *b. Zuhr, Kitāb al-Aġḏiya*, ed. García Sánchez (nt. 106), 68 and by as-Samarqandī, cf. Müller, *Nahrungsmittel* (nt. 108), 268 [10.2].

	in regions that are neither mountain ous nor muddy, but in balanced areas;
is pleasant and of unadulterated sweetness, its taste and smell is not affected by anything else, and it is clear and light[222].	it is the sweetest and best of all waters, light and also balanced in terms of heat and cold.
	<The text that follows is an insertion on water from major rivers with references to ar-Rāzī and Hippocrates[223].>
If this water is not available, then you should drink the water of the great rivers and make sure that it is pleasant, not mixed with snow and rain water[224].	Due to the diversity of waters and soils, it is necessary to pay attention, that in winter the water does not mix with rain and snow and thus becomes polluted. Therefore, the water of the great rivers, which are far from their sources, is very unhealthy.
	<This text is followed by explanations that include regional

This passage presumably references Rufus of Ephesos who not only describes the water of springs with an eastern orientation but also the water of springs facing the other cardinal directions; for more on this description, cf. *Oribasii Collectionum medicarum*, V, 3, 12–15, ed. Raeder (nt. 202), 118, 16–23. Rufus also discusses various types of water, such as rainwater, well water, spring water, canal water, snow and ice water and water from lakes and swamps. This passage is neither extant in the Syriac fragments of Rufus' work (cf. Wernhard, *Die syrischen Fragmente* (nt. 77)) nor in Ḥunayn ibn Isḥāq's *Kitāb al-Aġdiya* (nt. 105); cf. also here above nt. 220.

[222] For more on this, cf. also Rufus in *Oribasii Collectionum medicarum*, V, 3, 12–15, ed. Raeder (nt. 202), 118, 16–23 as well as as-Samarqandī in Müller, *Nahrungsmittel* (nt. 108), 266 [10.2].

[223] For more about these contexts and about the different types of water listed by most Islamicate doctors in their compilations on foods, cf. ibid., 429 sq.

[224] As-Samarqandī informs us that rainwater putrefies quickly while ice and snow water are more viscous; for details, cf. ibid., 268 [10.2].

references to the Guadalquivir,
to Córdoba and to Seville.>

Abstract

This article presents some new insights into Ibn Rušd's (1126–1198 CE, Latinised Averroes) medical works. It is divided into three parts.

"I.: Overview and Chronology" provides information on the preserved medical works of Ibn Rušd.

"II. The Medical *Talḫīṣ*: Ibn Rušd Teaching Galen" refers to Ibn Rušd's commentaries on Galen, which are called *talḫīṣ*, showing that they must be placed and understood in the formal and educational field of his philosophical Middle Commentaries. Thus, his explanations to Galen should meet the needs of advanced students in the medical field.

"III.: Ibn Rušd's Treatise 'On the Preservation of Health'" deals with some issues in the context of Arabic foodstuff literature. This short text, which is strongly based on Galen, has the same title but is not identical with the sixth book of Ibn Rušd's medical encyclopaedia 'The Generalities of Medicine' (*al-Kulliyyāt fī ṭ-ṭibb* VI: *Ḥifẓ aṣ-ṣiḥḥa*). A first attempt is made to place this treatise within the framework of the Islamicate food literature, taking into account the relevant works of Ḥunayn ibn Isḥāq, Ibn Zuhr, Maimonides and also Nağīb ad-Dīn as-Samarqandī.

IBN RUŠD, HIS SON AND GALEN'S 'METHOD OF HEALING' (*ḤĪLAT AL-BURʾ*)

ELVIRA WAKELNIG *

I. *Ibn Rušd and Galen's 'Method of Healing'*

The thirteenth century physician and bio-bibliographer Ibn Abī Uṣaybiʿa credits Ibn Rušd with a commentary on the second half of Galen's 'Method of Healing' (*Talḫīṣ al-niṣf al-ṯānī min Kitāb Ḥīlat al-burʾ li-Ǧālīnūs*)[1]. This commentary is not known to be extant. However, its preserved title allows us to pose an interesting question, namely how this voluminous Galenic treatise was divided in the Arabic tradition. A first division of the 'Method of Healing' was already introduced by Galen himself who had written the work in two parts which he indicated by a second dedication at the beginning of book 7. This division is taken up by Ibn Abī Uṣaybiʿa in his entry on Galen where we read[2]:

> "The composition (*kitāb*) of the 'Method of Healing' has fourteen books (*maqāla*). [... Galen] had put down six books of them for a man called Hieron (ʾIyārun) [...] Then, when Hieron died, Galen cut off completing the composition until Eugenianus (ʾŪǧāniyānūs) asked him to complete it and so [Galen] put the remaining eight books down for him."

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[1] Cf. E. Savage-Smith/S. Swain/G. J. van Gelder (edd. and trs.), *A Literary History of Medicine. The ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ of Ibn Abī Uṣaybiʿah*, Leiden–Boston 2020, number 23 of Ibn Rušd's works in section 13.66.6, i.e. II.2, 997 (Arabic text) and III.2, 1121 (English translation), URL: <https://scholarlyeditions.brill.com/reader/urn:cts:arabicLit:0668IbnAbiUsaibia.Tabaqatalatibba.lhom-ed-ara1:13.66/?right=lhom-tr-eng1> (last access on December 28, 2024). Note 41 to the English translation (1121) refers to two Arabic editions and one Spanish translation and thus gives the impression as if Ibn Rušd's commentary were still extant. This is not the case, as the editions and the translation are editions and a translation of a short treatise on the 'Method of Healing' by Ibn Rušd's son, on which cf. below.

[2] Cf. ibid., section 5.1.37.20, i.e. II.1, 254 (Arabic text) on which my above translation is based. For the English translation ibid., cf. III.1, 246–247. URL: <https://scholarlyeditions.brill.com/reader/urn:cts:arabicLit:0668IbnAbiUsaibia.Tabaqatalatibba=lhom-ara1:5.1?right=lhom-tr-eng1> (last access on December 28, 2024).

This information is based on Ḥunayn's 'Epistle on the Account of What was Translated of Galen's Compositions According to his [i.e. Ḥunayn's] Knowledge and of Some which were not Translated' *(Risāla fī ḏikr mā turǧima min kutub Ǧālīnūs bi-ʿilmihi wa-baʿḍ mā lam yutarǧim)*[3]. Yet, neither Ḥunayn nor Ibn Abī Uṣaybiʿa uses the term 'half' *(niṣf)* in the context of this division of the Galenic 'Method of Healing'[4]. The Arabic translation of the 'Method of Healing' does not seem to have survived in its entirety[5] and as no manuscript witness of books 6, 7 and 8 is known to be preserved, it is difficult to judge whether this Galenic division was somehow present in the Arabic manuscript tradition. There is, however, evidence that the Arabic translation of another voluminous work of Galen, i.e. 'On the Usefulness of the Parts' *(Manāfiʿ al-aʿḍāʾ)* in 17 books was copied and maybe circulated in two halves containing books 1–8 and books 9–17 respectively. The Paris manuscript BnF, Arabe 2853, dated to the year 1283 CE in the colophon, presents the clearest evidence thereof. Although now bound in one volume, the manuscript is made up of two sets of 19 quires each, with two sets of quire marks indicating the first up to the nineteenth quire. The first set of quires contains books 1–8 which finish on folio 151a in the middle of the page. The second half of 151a and 151b are left empty as is the first page of the second set of quires, i.e. 152a. This sits well with the usual practice in Arabic manuscripts to always start writing on the first double page of a codex. The manuscript of the National Library of Medicine in Bethesda, Maryland with shelf mark A 30.1 and dated to the seventeenth century CE[6], which must stem from the same manuscript family as the Paris manuscript, indicates the division by leaving an empty page between book 8 and book 9, yet does not reflect it in its quire structure. The earliest known witness of 'On the Usefulness of the Parts' is Madrid, Escorial, MS Arab. 850 which is dated in the colophon to the year 1145 CE. It is incomplete and contains only

[3] Cf. J. C. Lamoreaux, *Ḥunayn ibn Isḥāq on His Galen Translations*, Provo UT 2016, 34–35.

[4] In his entry on Galen's 'Method of Healing' further down, Ḥunayn refers to 'the second part' (*al-ǧuzʿ al-ṯānī*) of it.

[5] F. Sezgin, *Geschichte des arabischen Schrifttums* III: *Medizin – Pharmazie. Zoologie – Tierheilkunde bis ca. 430 H.*, Leiden 1970, 98 mentions manuscripts of books 1–5 and 10–14 and one manuscript for which he does not specify its contents, but which seems not voluminous enough to contain all fourteen books.

[6] Cf. E. Savage-Smith, *A Shelflist of Islamic Medical Manuscripts at the National Library of Medicine*, Bethesda MD 1996, 42.

books 9[7]–17, i.e. the second half and thus provides evidence that the Galenic work did indeed circulate in two separate volumes. This division can in no way be explained by any indication in the Galenic text, but seems to be based purely on physical considerations and conditions, i.e. the practicality of copying and binding rather two volumes of moderate size than a single massive one. A similar division may be envisaged for the Arabic translation of the 'Method of Healing', even if there is so far no direct manuscript evidence to corroborate this. Yet, some indication of such a division may be gleaned from the corresponding *Ǧawāmiʿ* tradition. *Ǧawāmiʿ*[8] are summaries of Galenic treatises most probably going back to the Late Antique Alexandrian tradition, preserved almost exclusively in Arabic and there ascribed to the Alexandrians. The *Ǧawāmiʿ* were also further developed and updated in the Arabic tradition which resulted in a huge number of versions differing in various degrees from each other. There exist at least three *Ǧawāmiʿ* versions of the 'Method of Healing'[9] and the most comprehensive one is preserved in three manuscripts which differ from each other. In one manuscript, Istanbul, MS University Library A6158, the information that Galen's work on the 'Method of Healing' has seven books is added after the title[10]. In the second manuscript, Princeton, MS Garrett no. 1G dating to the twelfth century CE, there are two endings to book 7 and books 8–14 are said to be taken from another model, not from the *Ǧawāmiʿ*[11]. In the third manuscript, Tehran, Mağles-e Šurā-ye Mellī, MS 6037, the first six books are almost the same as in the Princeton manuscript, whereas books 7-14 are said to have been translated by Abū l-Faraǧ

[7] The beginning of book 9 is missing which is consistent with the fact that the first folios of a manuscript are always the most exposed to the danger of going missing.

[8] *Ǧawāmiʿ* is the plural form of *ǧāmiʿ* but also used as singular.

[9] Cf. E. Wakelnig, *The Arabic Alexandrians' Summary of Galen's On the Therapeutic Method*, in: M. Havrda/R. J. Hankinson (eds.), *Galen's Epistemology: Experience, Reason, and Method in Ancient Medicine*, Cambridge 2022, 250–274.

[10] Istanbul, MS University Library A6158 contains *Ǧawāmiʿ* of 'Therapeutics to Glaucon' (foll. 3b–87b), 'On the Elements' (foll. 88a–106a), 'On Mixtures' (foll. 106a–135b), 'On the Natural Faculties' (foll. 136a–148b), 'On Diseases and Symptoms' (foll. 148b–212a), the 'Great Book on the Pulse' (foll. 212a–218a), 'On Affected Parts' (foll. 218b–296b), and the 'Method of Healing' (foll. 296b–301b).

For the mention of the seven books of 'Method of Healing's, cf. foll. 269b, 18–19: جوامع المقالة الأولى من كتاب جالينوس في حيلة البرء و هي سبع مقالات

[11] Cf. I. Garofalo, *Una nuova opera di Galeno: La Synopsis del De methodo medendi in versione araba*, in: Studi classici e orientali 47 (1990), 9–19, who refers to the manuscript as Garrett 1075. The manuscript is accessible online at URL: <https://catalog.princeton.edu/catalog/9948087443506421#view> (last access on December 29, 2024).

ibn al-Ṭayyib (d. 1043 CE) in the colophon at the end of the *Ǧawāmiᶜ*[12]. Oddly, book 7 of this alleged translation of Ibn al-Ṭayyib starts with a table of contents of all fourteen books of the 'Method of Healing', and the entire translation can also be found in Ibn al-Ṭayyib's commentary (*tafsīr*) to the 'Method of Healing' preserved in the Leiden manuscript, MS Or. 278 where it appears in lieu of the commentary to books 7-14. There, at the beginning of book 12, the text is not called a commentary but an excerpt or résumé (*istiṯmār*) by Ibn al-Ṭayyib. This can best be explained by the assumption that the text presented as Ibn al-Ṭayyib's translation of books 7-14 of the *Ǧawāmiᶜ* of the 'Method of Healing' in the Teheran manuscript but as his commentary to these very same books in the Leiden manuscript is, in fact, neither. It is probably Ibn al-Ṭayyib's résumé (*tamara*) of books 7-14 of the *Ǧawāmiᶜ*. We know that Ibn al-Ṭayyib produced two sets of exegetical writings to the sixteen books of the Galenic canon, namely commentaries (*tafāsīr*, sg. *tafsīr*) of Galen's originals as well as résumés (*ṯimār*, sg. *ṯamara*) of the *Ǧawāmiᶜ*, i.e. the Alexandrians' summaries of these very same works.[13] For the 'Method of Healing', there only seems to survive his commentary on books 1-6 and his résumé of the *Ǧawāmiᶜ* of books 7-14. Whether this is all that Ibn al-Ṭayyib composed as exegesis on the 'Method of Healing' or whether he commented on the complete Galenic original and resumed the *Ǧawāmiᶜ* in their entirety cannot be decided on the evidence we have so far. However, this indicates that there was some kind of caesura after the first six or seven books, at least in the exegetical and the *Ǧawāmiᶜ* tradition of the 'Method of Healing'. If we admit that the original Galenic works were studied together with their *Ǧawāmiᶜ* and their commentaries, such a caesura may have originated in the Arabic translation of the Galenic original and then have been transferred to the *Ǧawāmiᶜ* versions and the commentaries. Evidence that the Arabic versions of the original Galenic treatises were indeed studied with their corresponding *Ǧawāmiᶜ* comes from

[12] 'Translation (*naql*) of Abū l-Faraǧ ᶜAbdallāh b. al-Ṭayyib, the philosopher, from the beginning of the seventh book (*maqāla*) to the end of the fourteenth book'. For the Arabic text, cf. the edition of G. Bekir, *The Alexandrians' Summaries (Ǧawāmiᶜ) of Galen's 'Therapeutic Method'* (Islamic Medicine 101), Frankfurt am Main, forthcoming.

[13] Cf. E. Wakelnig, *Ibn al-Ṭayyib's Prolegomena to Medicine. The Introduction to his Commentary on Galen's 'On Sects'*, in: S. Schmidtke/O. Michaelis (eds.), *Religious and Intellectual Diversity in the Islamicate World and Beyond* (Islamic History and Civilization), Leiden, 2023, 513-551, 524-525.

another Princeton manuscript, MS New Series no. 1532[14], and dating to the mid-seventeenth century CE[15]. It gathers six Galenic works[16] each of which contains several books. Each book is immediately followed by the corresponding book in its *Ǧawāmiᶜ* version which indicates the close connection between the two sorts of Galenic texts. It thus seems plausible to assume that a division into two halves of the Arabic translation of Galen's 'Method of Healing' brought about the same division in the corresponding *Ǧawāmiᶜ* and the commentaries. If this were the case, the Arabic translation of the 'Method of Healing' would have been divided into two halves as was the translation of 'On the Usefulness of the Parts' and Ibn Rušd would then, according to Ibn Abī Uṣaybiᶜa, have commented on the second half, i.e. books 7 or 8–14. This sits well with Ibn Rušd's attested interest in fevers, as books 8–11 and parts of book 12 discuss different kinds of fever.

II. *Abū Muḥammad ibn Rušd's 'Book on the Method of Healing'*

Whereas Ibn Rušd's commentary on the second half of Galen's 'Method of Healing' is listed by Ibn Abī Uṣaybiᶜa, but hitherto lost to us, the 'Book on the Method of Healing' (*Maqāla fī ḥīlat al-burᵓ*) by his son Abū Muḥammad ᶜAbd Allāh is not only mentioned by the bio-bibliographer, but also survives. It does so in an Escorial manuscript, Árabe 884, that contains two of Ibn Rušd's commentaries (*talḫīṣ*) on Galenic works, four of Ibn Rušd's original medical treatises and two untitled treatises ascribed to his son Abū Muḥammad ᶜAbd Allāh, the first on the method of healing and the second on the intellect[17]. Ibn

[14] For a digital reproduction of the manuscript, cf. URL: <http:// arks.princeton.edu/ark:/88435/cz30pw240> (last access on December 29, 2024).

[15] The colophon that the scribe of the entire manuscript places at the end of the third treatise 'On the Pulse' (fol. 297a) gives the date Ǧumādā al-Ṯānī 1016 hiǧrī, i.e. May or June 1651 CE.

[16] Cf. E. Wakelnig, *Translation as Interpretation: Translating Galen's Polysemous Term* Physis *into Arabic*, in: Medieval Worlds 11 (2020), 60–116, 71.

[17] Cf. C. Burnett/M. Zonta, *Abū Muḥammad ᶜAbdallāh Ibn Rušd (Averroes Junior). On Whether the Active Intellect Unites with the Material Intellect whilst it is Clothed with the Body. A Critical Edition of the Three Extant Medieval Versions, together with an English Translation*, in: Archives d'histoire doctrinale et littéraire du Moyen Age 67 (2000), 295–335. Burnett and Zonta claim (ibid., 297) that the first of the two texts attributed to Abū Muḥammad ᶜAbdallāḥ "is the epitome of Book XIV of Galen's *Methodus medendi*", which is, as we shall see, not the case. The statement is, however, probably based on G. C. Anawati/P. Ghalioungui, *Medical Manuscripts of Averroes at El-Escorial*, Cairo 1986, 475, where, at the end of their English translation of the treatise, they claim that the "treatise is derived from *Methodus Medendi* of Galen (lib. XIV) and other works."

Abī Uṣaybiʿa's entry on Abū Muḥammad Ibn Rušd reads as follows[18]:

> "He is Abū Muḥammad ʿAbd Allāh ibn Abī al-Walīd Muḥammad ibn Aḥmad ibn Muḥammad ibn Rušd, excelling in the art of medicine, knowledgeable about it and praised for (his performance of) its actions. He used to come to al-Nāṣir and be his physician. Among the compositions of Abū Muḥammad ibn Rušd there is the 'Book (*maqāla*) on the Method of Healing'."

It is interesting that Ibn Abī Uṣaybiʿa insists on Abū Muḥammad's theoretical as well as practical medical skills. The information that Abū Muḥammad was the court physician of al-Nāṣir who can be identified with Muḥammad al-Nāṣir, the Almohad caliph in Marrakesh who ruled from 1199 to 1214 CE[19], provides a precise date for his being active. As the colophon to the second of Abū Muḥammad's treatises in the Escorial manuscript gives the 29th of Ǧumādā II in the year 637, i.e. the 26th of January 1240 as finishing date for the copying of both treatises in the city of Porchena[20], the manuscript copy was produced very close in time and place to Abū Muḥammad's. The fact that the copyist further refers to the preserved treatise on the method of healing as a *maqāla* at its end, makes its identification with the composition mentioned by Ibn Abī Uṣaybiʿa particularly probable.

Although Abū Muḥammad's treatises are preserved without title in the Escorial manuscript, the reader may receive a good and precise impression of their contents by the introductory phrases in which the author clearly states the aim (*ġaraḍ*) he pursues in each of his texts respectively. The aim of the 'Book on the Method of Healing' is thus according to its author the following[21]:

[18] Cf. Savage-Smith/Swain/van Gelder, *Literary History* (nt. 1), section 13.67, i.e. II.2, 999 (Arabic text) and III.2, 1124 (English translation). URL: <https://scholarly editions.brill.com/reader/urn:cts:arabicLit:0668IbnAbiUsaibia.Tabaqatalatibba.lhom-ed-ara1:13.67?right=lhom-tr-engl> (last access on December 28, 2024). The translation above is mine.

[19] Cf. Burnett/Zonta, *Abū Muḥammad* (nt. 17), 298.

[20] Cf. Escorial, MS Árabe 884, fol. 81a; and Burnett/Zonta, *Abū Muḥammad* (nt. 17), 306–307.

[21] Cf. the Arabic text in its two editions Ibn Rušd, *Rasāʾil Ibn Rushd al-ṭibbiyya (Les Traités médicaux d'Averroes)*, edd. G. C. Anawati/S. Zāyed, Cairo 1987, 433–438 (أ), 433, 3–7; *Averroes, Commentaria Averrois in Galenum*, ed. M. C. Vázquez de Benito, Madrid 1984, 271–275 (و), 271, 4–7; I indicate reading variants in the two editions as well as the manuscript reading where decipherable (ص):

الغرض في هذا القول أن نبين [نبين أ : تبيّن و] الطريقة الصناعيّة في حيلة البرء ، ما هي . ولمّا كان جمهور الأطبّاء ، القدماء منهم والحدث ، قد سلكوا في ذلك ظريقة أخرى مشهورة ، وهي طريقة جالينوس وسائر الأطبّاء ؛ رأيت أن أذكرها أوّلاً ، وأذكر أنّها ليست الطريقة الصناعيّة . ثمّ أذكر الطريقة التي وقفنا عليها واستنبطناها

> "The aim of this discourse (*qawl*) is that we clearly show the artful way (*al-ṭarīqa al-ṣināᶜīya*) with regard to the method of healing (*ḥīlat al-burᵓ*) – what it is. Since the majority of physicians, the ancient and the modern ones among them, have followed in that (i.e. the method of healing) another well-known way, which is the way of Galen and the other physicians, I think that I will first mention this latter way and recall that it is not the artful way. Then I will mention the way, at that we have arrived and that we have brought to light ..."

In explaining the aim of the treatise, Abū Muḥammad makes no reference to Galen and there is no indication that his mention of 'the method of healing' (*ḥīlat al-burᵓ*) is in any way related to the Galenic work with the same title. On the contrary, the cited passage gives the impression that *ḥīlat al-burᵓ* is a common expression for therapy and that it can be pursued in, at least, two different ways. However, the occurrence of the term in the first sentence is the only one in the entire treatise. Later on, Abū Muḥammad solely uses the expression 'way to healing' (*ṭarīqa li-l-burᵓ*)[22]. This is inconsistent with the assumption of *ḥīlat al-burᵓ* being a general term but suggests that it is particularly linked to Galen and his 'Method of Healing'. This suggestion is confirmed by the way in which Abū Muḥammad's father, Ibn Rušd expresses himself. When discussing medical practice in his 'General Principles of Medicine' (*Kullīyāt fī l-ṭibb*, and *Colliget* in Latin), Ibn Rušd uses the term 'method in removing disease' (*ḥīla fī izālat al-maraḍ*) in the general meaning of therapy, yet when he employs the expression 'the method of healing' (*ḥīlat al-burᵓ*) he explicitly refers to Galen's treatise (*ḥīlat al-burᵓ min kitāb Ǧālīnūs*)[23]. The one author who uses 'method of healing' (*ḥīlat al-burᵓ*) for therapy in general and whom I have come across, is Ibn al-Ṭayyib. In his commentary on 'On Sects' and his résumé of the *Ǧawāmiᶜ* of the same Galenic treatise, Ibn al-Ṭayyib divides medicine into theory and practice, and then subdivides practice into two parts one of which is *ḥīlat al-burᵓ*[24].

Cf. also the English translation by Anawati/Ghalioungui, *Medical Manuscripts* (nt. 17), 470 from which I have adapted some felicitous formulations (e.g. *ṣināᶜī* as 'artful').

[22] *Rasāᵓil Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 437, 16–17; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 274, 18–19.

[23] Ibn Rušd, *Kullīyāt fī l-ṭibb*, ed. M. ᶜĀ. al-Ǧābrī, Beirut 1999, 129, 4; 499, 5–7; and 499, 11.

[24] Cf. the division of medicine at the beginning of Ibn al-Ṭayyib's commentary on 'On Sects' (ed. in Wakelnig, *Ibn al-Ṭayyib's Prolegomena to Medicine* (nt. 13), 533):
والجزء العمليّ ينقسم إلى الحافظ للصحّة الموجودة والمعيد للصحّة المفقودة والقسم الأوّل يدعى تدبير الأصحاء والثاني حيلة البرء ... وحيلة البرء تتمّ باستعمال الأغذية والأدوية والعمل بالحديد.

And the division presented in Ibn al-Ṭayyib's résumé (*ṯamara*) of the *Ǧawāmiᶜ* of 'On Sects' and added on the title page of Paris, BnF, MS Arabe 2859 (R.

However, this usage of the term does not seem to have encountered wide diffusion but to have been peculiar to Ibn al-Ṭayyib. This may be explained by Ibn al-Ṭayyib being firmly rooted in the Late Antique philosophical and medical traditions in which the philosophical curriculum was ordered according to Aristotelian treatises and the medical one according to Galenic treatises. In this way the title of Galen's 'Method of Healing' became synonymous with its contents which is the practical part of medicine dealing with bringing back lost health[25]. However, the majority of Arabic authors presenting similar divisions of medicine use different terms for the second part of practical medicine, i.e. therapy, such as *mudāwāt al-marḍā*, *mudāwāt al-maraḍ*, *ʿilāǧ* or *muʿālaǧat al-marḍā*[26], whereas the Arabic term *ḥīlat al-burʾ* seems to have conjured Galen and his treatise. This can,

Hammerschmied/E. Wakelnig, *New Arabic Evidence on the Division of Medicine. A Text in the Margin of BnF, Ms Arabe 2859, the Alexandrian Summaries of Galen, Ibn al-Ṭayyib's Galenic Commentaries and Ḥunayn's* Masāʾil', in: Mélanges de l'Université Saint-Joseph 69 (2021-22), 183–215, 195):

والعمل ينقسم إلى حفظ الصحّة ويسمّى تدبير الاصحّاء وإلى ردّ الصحّة ويسمّى تدبير المرضى وحيلة البرء

Another author who uses *ḥīlat al-burʾ* at least once as well as *ḥīla* in combination with other terms is ʿAlī b. Riḍwān (d. 1061 CE). The occurrence of *ḥīlat al-burʾ* is found in a gloss to Ibn al-Ṭayyib's commentary on 'On Sects' that is ascribed to Ibn Riḍwān and stems, most probably, from the lost beginning of the latter's commentary on 'On Sects'. For the Arabic text and the English translation of the gloss, cf. Wakelnig, *Ibn al-Ṭayyib's Prolegomena*. In Ibn Riḍwān's treatise 'On the Prevention of Bodily Ills in Egypt', the term *ḥīla* figures in the title of the work, i.e. *Fī ḥīlat dafʿ maḍārr al-abdān fī miṣr* and in the subtitle of chapter 9, *Fī l-ḥīla al-kullīya fī ḥifẓ al-ṣiḥḥa wa-mudāwāt al-amrāḍ* (Ibn Riḍwān, *Medieval Islamic Medicine: Ibn Riḍwān's Treatise "On the Prevention of Bodily Ills in Egypt"*, translated by M. W. Dols, ed. A. S. Gamal, Berkeley–Los Angeles–London 1984, Arabic text, 1). Furthermore, at the beginning of chapter 9, Ibn Riḍwān states that the philosophers and physicians have made this *ḥīla* known to us by ordering (us) to imitate nature in its activities within the body, whereas at the end of the same chapter he mentions *al-ḥīla fī ḥifẓ al-aṣiḥḥāʾ wa-mudāwāt al-marḍā* (Arabic text, 21 and 24).

[25] The correspondence between the division of medicine and the canon of the sixteen Galenic books is, for example, well expressed by Yaḥyā al-Naḥwī (in his abridgements of these sixteen books in London, British Library, MS Arundel Or. 17, fol. 2b), who divides the sixteen books into four introductory ones and into twelve dealing with medical theory and practice. Concerning the latter, he says "One book considers that which preserves natural things, and it is the 'Book on the Regimen of the Healthy', and another one considers that which allays unnatural things, and it is the 'Book on the Method of Healing'." For the entire passage, cf. Wakelnig, *Translation* (nt. 16), 68.

[26] Cf. Ḥunayn Ibn Isḥāq, *al-Masāʾil fī l-ṭibb li-l-mutaʿallimīn*, edd. M. ʿA. Abū Rayyān/M. M. ʿArab/Ǧ. M. Mūsā, Cairo 1978, 75, 7; al-Maǧūsī, *Kāmil al-Ṣināʿa al-ṭibbīya*, Būlāq 1877, vol. 1, 14, 25–26; Ibn Sīnā, *al-Qānūn fī l-ṭibb*, annoted by M. A. al-Ḍannāwī, Beirut 1999, vol. 1, 15, 15; Ibn al-Nafīs, *al-Mūǧaz fī l-ṭibb*, ed. ʿA. al-ʿAzabāwī, Cairo 2008, 67, 2–3.

for example, be seen in a poem on *ḥīlat al-burʾ* by the renowned physician and poet Abū Bakr Muḥammd b. ʿAbd al-Malik b. Zuhr al-Ḥafīd who lived in al-Andalus during Abū Muḥammad's lifetime[27].

Abū Muḥammad's reference to Galen in the above quoted introductory passage remains the sole mention of the Greek doctor by name in the entire treatise. The way of healing pursued by Galen and other physicians, be they ancient or modern, is immediately characterised as the non-artful way and opposed to the artful way which Abū Muḥammad has adopted as his own and that is, as we shall see below, based on Aristotelian principles, especially analysis (*taḥlīl*) and synthesis (*tarkīb*).

Abū Muḥammad reduces the way of the physicians (*ṭarīqat al-aṭibbāʾ*) to the popular saying that opposites cure opposites and likes preserve likes. He claims that even if this principle has been followed for thousands of years and sometimes works, it does so by sheer accident[28]:

> "So let us start by mentioning the way of the physicians (*ṭarīqat al-aṭibbāʾ*) and we say that this way is built on the famous and widespread premise that the opposite is the cure of the opposite just as the like is the preserver of the like. ... People have followed this way for thousands of years. I say that this is not the artful way in bringing about health, and even if there is health through applying the opposite, this is by accident and not through the opposite insofar as it is an opposite."

[27] The poem is preserved in al-Ṣafadī, *al-Wāfī bi-l-wafayāt – Das biographische Lexikon des Ṣalāḥaddīn Ḫalīl ibn Aibak aṣ-Ṣafadī:* Teil 4 *Muḥammad ibn ʿUbaidallāh bis Muḥammd ibn Maḥmūd*, ed. S. Dedering (Bibliotheca Islamica 6d), Wiesbaden ²1974, 40, 13–15; and in Yāqūt al-Ḥamawī, *Muʿǧam al-udabāʾ – Iršād al-arīb ilā maʿrifat al-adīb*, ed. I. ʿAbbās, Beirut 1993, vol. 6, 2552, 7–9:

وقال في كتاب حيلة البُرء لجالينوس (ياقوت : + وأجاد) :

جِيلةُ البُرء صُنِّفت لعليلٍ ... يترجّى الحياةَ أو لعليلَه

فإذا جاءت المنيّةُ قالت ... حيلةُ البرء : ليس في البرء حيلَه

In later times (e.g. in the sixteenth/seventeenth century historian Aḥmad ibn Muḥammad al-Maqqarī al-Tilmisānī, *Nafḥ al-ṭīb min ġusn al-andalus al-raṭīb*, ed. I. ʿAbbās, Beirut 1988, vol. 2, 248, 12–13), the poem seems to have also circulated in a slightly different version, namely replacing the verb *ṣunnafat* with *ṣanʿa* which may have facilitated dissociation from Galen.

[28] *Rasāʾil Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 433, 12 – 434, 1; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 27, 8–15:

فلنبدأ بذكر طريقة الأطبّاء ، فنقول : إن هذه الطريقة مبنية على المقدمة المشهورة الذائعة ، وهي أن الضدّ شفاء الضدّ ، كما أن الشبيه حافظ للشبيه . ... وهذه الطريقة سلكها الناس منذ آلاف من السنين [السنين أ ، ص : السنوات و] ، وأنا أقول : إنّها ليست الطريقة الصناعيّة في إيجاد الصحّة ، وإن وجود [وجود أ ، ص : جود و] الصحّة عن استعمال الضدّ ، هو بالعرض ، وليس هو عن الضدّ ، بما هو ضدّ .

The principle that opposites cure opposites is already expressed in the Hippocratic corpus, e.g. in 'On Breaths'[29], and often cited by Galen, for example in his commentary on Hippocrates's 'Aphorisms'[30], in the 'Method of Healing' or in the 'Parts of Medicine', only surviving in Arabic. In the latter, Galen calls it "the general comprehensive knowledge preceding all knowledge about kinds of cures"[31]. In Ḥunayn's famous introductory medical text, the 'Questions on Medicine for Students' (*Masāʾil fī l-ṭibb li-l-mutaʿallimīn*), medical practice is defined by citing the twofold principle, namely as "preservation of the healthy, i.e. their health is caused by things similar to their proper conditions, and therapy of the diseased so that they are cured by things opposite to their diseases"[32]. Even Ibn Rušd, in his 'General Principles of Medicine', mentions opposites curing opposites approvingly[33]. However, already Galen explicitly cautions his readers against a too simplistic application of this fundamental principle, for example in his 'Method of Healing' XI.9 where he says[34]:

> "Anyway, since Hippocrates said that opposites are cures of opposites, what prevents you giving cold water to everyone with a fever as a routine? But you must not give it, nor is the general indicator of every treatment overturned at that time. Cold water is just one of the things that are cooling in action. There are, however, many other things that cool, as I said – some in terms of potency and some contingently. Of these, we use different ones at different times due to the combination of indicators which oppose each other. The method of choosing which of these is

[29] The Greek text reads (Hippocrate, *Des vents – De l'art*, ed. and translated by J. Jouanna, Paris 1988, 104, 10–11): Ἐνὶ δὲ συντόμῳ λόγῳ τὰ ἐναντία τῶν ἐναντίων ἐστὶν ἰήματα. Cf. ibid, 131, note 3 for further references.

[30] Galen comments on the principle in his commentary on Hippocrates's 'Aphorisms' on aphorism II, 22 which ends stating that "the cure of the remaining diseases are through the opposite" (Paris, Bibliothèque nationale de France, MS Arabe 2837, fol. 34a5–6):

وشفاء سائر الأمراض يكون بالمضادة ...

[31] Cf. Galen, *On the Parts of Medicine. On Cohesive Causes. On Regimen in Acute Diseases in Accordance with the Theories of Hippocrates. First edition of the Arabic Versions with English Translation* by M. Lyons, Berlin 1969, 46, 16–18:

... أنّ الأضداد هي شفاء لأضدادها فإنّ ذلك قد تبيّن أنّه هو العلم الشامل العامّ المتقدّم لجميع العلوم بأصناف الشفاء ...

[32] Ḥunayn ibn Isḥāq, *al-Masāʾil fī l-ṭibb*, edd. Abū Rayyān/ʿArab/Mūsā (nt. 26), 75, 5–7:

حفظ الأصحّاء صحّتهم التي تكون بالأشياء المشابهة للحال التي هم عليا ، ومداواة المرضى حتّى يبرأوا بالأشياء المضادة لأمراضهم .

[33] Cf. Ibn Rušd, *Kullīyāt fī l-ṭibb*, ed. al-Ǧābrī (nt. 23), 499, 16–17:

... فإنّ الضدّ كما قيل شفاء للضدّ .

[34] Galen, *Method of Medicine*, edd. and translated by I. Johnston/G. H. R. Horsley, Cambridge MA–London 2011, 153.

appropriate over the others on each occasion has been discussed." (trs. Johnston and Horsley)

Yet, correctly applied, the principle always remains true as Galen stresses further down (XI.12) saying[35]:

"It is not the case that because of this it is sometimes true that opposites are cures of opposites and sometimes false. This remains true at all times. It is impossible for those things contrary to nature to be cured by any other kind of cures. ... In this way, then, the brief statement that opposites are the cures of opposites is found to be very powerful. For the therapeutic method as a whole is confounded if deprived of this indicator: that all things contrary to nature are treated by those things opposite to themselves." (trs. Johnston and Horsley)

Abū Muḥammad's presentation of the principle and its application is thus, for argument's sake, voluntarily oversimplified and caricatural. When next turning to the explanation of the artful way of medical treatment, Abū Muḥammad proceeds by first likening natural to artificial things. The reason for doing so is that he understands health as being caused sometimes by nature alone and sometimes by art and nature together[36]. Likening natural things to artificial things thus ensures that the way of producing artificial things discussed in the following can be taken as a model of how health is brought about. The maker of artificial things is said to transfer them orderly from one defined step to the next until his aim is reached and the object made. The order according to which the maker proceeds is twofold, there is first the theoretical order which proceeds, in the way of analysis (*ṭarīq al-taḥlīl*), from the intended aim to the first step that must be undertaken to reach this aim, and secondly the order of action or actual making, which starts, in the way of synthesis (*ṭarīq al-tarkīb*), from this first theoretically identified step until the intended aim is reached by bringing forth the intended object. The application of analysis and synthesis results in the principle that the first in thought is last in action and the first in action is the last in thought[37]. This principle is used – even if not as explicitly formulated as by his commentators – by Aristotle, for example in his 'Metaphysics', 1032a32–b18 where he

[35] Ibid., 161–163.

[36] Cf. further down in *Rasāʾil Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 436, 2–3; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 273, 9–10:

... الأمور التي تكون مرّة عن الطبيعة ، ومرّة عن الصناعة والطبيعة ، وهي الأمور الصحيّة .

[37] Cf. *Rasāʾil Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 434, 5–20; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 271, 19 – 272, 13.

even illustrates it with the bringing about of health[38]:

> "... from art proceed the things of which the form is in the soul [of the maker]. ... health is the formula in the soul [of the physician], i.e. the science. The healthy subject, then, is produced as the result of the following train of thought: since health is this particular condition, another particular condition must be present to make a healthy subject, e.g. a uniform state of body, and if this is to be present, there must be heat; and the physician goes on thinking thus until he brings the matter to a final step which he himself can take. Then the process from this point onward, i.e. the process towards health, is called a 'making'. Therefore it follows that in a sense health comes from health and house from house, that with matter from that without matter; for the medical art and the building art are the form of health and of the house; ... Of production and movements one part is called thinking [*noēsis*] and the other making [*poiēsis*],—that which proceeds from the starting-point and the form is thinking, and that which proceeds from the final step of thinking is making. And each of the intermediate steps is taken in the same way." (tr. Ross, slightly adapted)

Aristotle here describes the twofold process of first mental deconstruction and then, accordingly, physical making: the process starts with the aim and end of the sought action, which is analysed and deconstructed so that the action's starting-point becomes clear. This mentally detected starting-point is the first step which has to be taken in the action of physically *under*taking the sought action. The Aristotelian commentators illustrate this process by using the analogy of building of a house, the aim and end of which is to give shelter with its roof. The house is mentally dissected into its parts, the roof being supported by the walls and the walls being grounded on the foundation. The foundation is the last and final step at which the mental analysis arrives and the first one from which the action of building a house starts[39]. Aristotle likens health and the medical art to a house

[38] W. D. Ross's translation in *The Complete Works of Aristotle. The Revised Oxford Translation*, ed. J. Barnes, Princeton [6]1995, vol. 2, 1630, has been slightly adapted according to Frede and Patzig's German translation in M. Frede/G. Patzig, *Aristoteles 'Metaphysik Z'. Text, Übersetzung und Kommentar*, Munich 1988, vol. 1, 81.

[39] One of the first Arabic medical authors, ʿAlī ibn Rabban al-Ṭabarī even outlines his medical manual 'Paradise of Wisdom' (*Firdaws al-ḥikma fī l-ṭibb*), completed in 850 CE, according to this principle which he attributes explicitly to Aristotle (ed. M. Z. al-Ṣiddīqī, Berlin 1928, 6, 11–20):

> "The philosopher has already also said that the first in thought is the last in action and the last in action the first in thought. That is like he who wants to build a house and first thinks about the wall and roof and then about the bricks, plaster and foundation. When he starts his actions, the first of his action is the foundation and its last the walls and the roof. The first thought

and the art of building. Health is a concept in the soul of the physician who analyses it in order to bring about health in a material subject, i.e. his patient. One of the greatest Aristotelian commentators and Abū Muḥammad's father, Ibn Rušd, explicitly speaks of analysis (*taḥlīl*), synthesis (*tarkīb*) and the principle that the first in action is the last in thought and vice versa when commenting on this very passage in his long commentary on the 'Metaphysics'[40]:

> "With his statement 'according to this, one mentions one thing always after the other until one finally gets to that very thing after which there can be no other', Aristotle wants to express the following: in that way one mentions one thing after the other according to the way of analysis (*ṭarīq al-taḥlīl*) which is the action of him who is knowledgeable in healing, I mean that without which no healing is completed. That is that he starts with the aim until he finally reaches the last in thought. Then Aristotle says: 'Then the motion which is caused by that is called 'action' which goes from healing until it arrives at some kind which is healing caused by healing and a house caused by a house' and means: Then the motion which starts with the last of the analysis and which is synthesis (*tarkīb*), is called 'action' which proceeds from health until it arrives at there being healing which is outside the soul but through the healing which is in the soul. He means that the starting-point of the existence of healing, which is in the soul, is opposite to the existence of health which is outside the soul.
>
> of him who thinks about medicine is the preservation of health … therefore I see that I start [my medical composition] with something at which the last thought of him who thinks about medicine finally arrives and make the discourse about things' principles precede, then let the discourse about their branches follow."

[40] The principle as such was not formulated by Aristotle but his commentators, cf. S. M. Stern, *"The First in Thought is the Last in Action": The History of a Saying Attributed to Aristotle*, in: Journal of Semitic Studies 7 (1962), 234–252.

The Aristotelian passage in Arabic and Ibn Rušd's commentary read as follows (*Averroès, Tafsir ma baʿd at-tabiʿat*, ed. M. Bouyges, Beirut 1938, vol. 2, 842, 1–10 and 847, 6 – 848, 3):

قال ارسطاطاليس

فأمّا البرء فالكلمة التي في النفس والعلم أيضاً ... إذ كان هذا برءاً فمضطر إن كان هذا برءا أن يكون قد كانت له طبيعة مختلفة فإن كان هذا فكانت حرارة وعلى هذا الحال يذكر شيئاً بعد شيء أبداً حتى ينتهي في هذا بعنيه الذي لا يمكن أن يصير شيئاً آخر بعده ثم أن الحركة التي من هذا تسمّى فعل الذي يذهب إلى البرء حتّى أنّه يعرض بنوع ما أن يكون البرء من برء البيت من بيت التي من غير عنصر التي لها عنصر فإنّ صناعة الطبّ وصناعة البناء هما صورة البرء وصورة البيت ...

التفسير

... وقوله وعلى هذا الحال يذكر شيئا بعد شيء أبداً حتى ينتهي في هذا بعينه الذي لا يمكن أن يصير شيئاً آخر بعده يريد وهكذا يذكر شيئاً بعد شيء على طريق التحليل الذي هو فعل الذي يدرى في البرء أعني ما لا يتمّ البرء إلّا به وذلك بأن يبتدي من الغاية إلى أن ينتهي إلى الأخير في الفكرة . ثم قال ثم إن الحركة التي من هذا تسمى فعل الذي يذهب إلى البرء حتى أنّه يعرض بنوع ما أن يكون البرء من برء البيت من بيت يريد ثم أن الحركة التي تبتدئ من الأخر في التحليل وهو التركيب تسمى الفعل الذاهب إلى البرء حتى أنّه يعرض أن يكون البرء الذي خارج النفس عن البرء الذي في النفس وإنّما أراد أن مبدا كون البرء الذي في النفس على مقابلة كون البرء الذي خارج النفس وهذا معنى القول بأنّ أوّل العمل آخر الفكرة وأول الفكرة آخر العمل .

This is the meaning of the saying that the first in action is the last in thought and the first in thought the last in action."

The assumption suggests itself that Abū Muḥammad was inspired by this Aristotelian passage and his father's commentary on it, and that the ultimate aim of his treatise was to establish a medical method based on Aristotle replacing Galen's. It is curious that in doing so, he almost completely avoids mentioning either Galen or Aristotle. Galen is referred to by name only in the opening passage discussed above, whereas Aristotle is cited twice as the sage or philosopher (*al-ḥakīm*), yet not in the context of the discussion of the artful way of healing[41]. It seems that Abū Muḥammad wanted to present the Aristotelian medical method, which he advanced as neutrally as possible, to give the impression that it is the method at which any thoroughly working physician, philosopher or scientist must arrive. It is also possible that the terms analysis, synthesis and the principle of the first in action as the last in thought were sufficiently linked to Aristotle in the intellectual tradition of Abū Muḥammad's time that there was no need to expatiate on this link.

However, had Abū Muḥammad wished to do so, he would have been able to base his artful way of medical therapy on Galen himself who starts his 'Art of Medicine' – or 'Small Art' (*al-ṣināᶜa al-ṣaġīra*) as it is also known in Arabic – with listing analysis, synthesis and definition as epistemological principles[42]:

"All teachings proceeding according to an order are pursued in three ways: one of them is according to the way of inversion (*al-ᶜaks*) and analysis (*al-taḥlīl*). It is establishing something which you intend and whose knowledge you search by imagining the aim of its completion, then you consider the next closest – and the next closest belongs to that without which the intended thing is neither established nor completed – until you finally arrive at its beginning.

The second is according to the way of synthesis (*al-tarkīb*) and it is the opposite of the first pursued one. It is starting with something at which you have finally arrived by the way of analysis and inversion, then you

[41] Cf. *Rasāʾil Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 435, 12 and 438, 7; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 272, 25 and 275, 2.

[42] Ǧālīnūs, *al-Ṣināᶜa al-ṣaġīra*, ed. M. S. Sālim, Cairo 1988, 1, 4 – 2, 5:
كلّ التعاليم التي تجري على ترتيب فإن المسالك فيها على ثلثة أنحاء : أحدها يكون على طريق العكس والتحليل . وهو أن تقيم الشيء الذي تقصد إليه وتلتمس علمه في وهمك على الغاية من تمامه ، ثم تنظر إلى الأقرب فالأقرب مما لا يقوم ذلك الشيء ولا يتمّ إلا به إلى أن تنتهي إلى أوّله . والثاني يكون على طريق التركيب ومضادّة المسلك الأوّل . وهو أن تبدأ من الشيء الذي كنت انتهيت إليه بطريق التحليل والعكس ، ثم ترجع إلى تلك الأشياء فتركب بعضها إلى بعض إلى أن تنتهي إلى آخرها . والثالث يكون بطريق تحليل الحدّ .وهو المسلك الذي نستعمله في كتابنا هذا .

return to those things and you put some of them upon others until you finally reach their end.
The third is by the way of analysis of the definition (*taḥlīl al-ḥadd*). It is the pursued one which we employ in this book of ours."

The Arabic version which I have translated here is even more explicit in the description of the analytical and synthetical way than the Greek original. Given that this passage occurs at the very beginning of the second treatise of Galen's sixteen canonical books, it is hard to imagine that the well-trained and well-read physician Abū Muḥammad was not aware of it. This may explain why he did not insist on citing Galen or Aristotle by name and even hinted at philosophers and physicians who had already implied the artful way[43]. In doing so, he could always pretend that he included Galen among these physicians if confronted with the above passage or similar ones, but he would not disclose the information that Galen was in accordance with Aristotle to people who were not aware of this. In this way he could stick with, what I consider, the polemic aim of his treatise, i.e. to discredit Galen.

Had he wished to do so, Abū Muḥammad could have even taken the principle of opposites curing opposites, which he scorned at the beginning of his treatise, as an example of analysis as does Galen in his 'Parts of Medicine'[44]:

"Let us assume that we intend to cure a hot disease and we do not know that in curing it we doubtlessly have to know first that opposites are the cure of their opposites. For it has already been made clear that this is the general comprehensive knowledge preceding all knowledge about kinds of cures. Then, after that, we have to know that the hot disease must be cured by cooling things. Then, after that, that the disease hot in the first degree, for example, must be cured by that which is cold in the first degree. Then, after that, we need to know the grades of degrees of the hot diseases and the grades of the cooling medications according to what we

[43] *Rasā'il Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 433, 7–9; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 271, 4–6:
ثمّ أذكر الطريقة التي وقفنا عليها واستنبطناها ، إن كان يستحقّ أن يسمّى مثل هذا استنباطاً . لكن إذا نظرنا إلى [نظرنا إلى آ ، ص : ـ و] ما ذهب منه على الناس منذ دهر طويل ، مع كثرة من وجد فيهم من الأطبّاء والمتفلسفين ان يستحقّ أن يسمّى استنباطاً .

[44] Galen, *On the Parts of Medicine*, ed. Lyons (nt. 31), 46, 15–24:
فلننزل مثلاً أنّا قصدنا لشفاء مرض حارّ فلا نعلم أنّا لا محالة نحتاج أوّلاً في شفائه أن نعلم أنّ الأضداد هي شفاء لأضدادها فإنّ ذلك قد تبيّن أنّه هو العلم الشامل العامّ المتقدّم لجميع العلوم بأصناف الشفاء ثمّ من بعد ذلك نحتاج أن نعلم أنّ المرض الحارّ إنّما ينبغي أن يشفى بالأشياء المبرّدة ثمّ من بعد ذلك أنّ المرض الحارّ في الدرجة الأولى مثلاً إنّما ينبغي أن يشفى بما هو بارد في الدرجة الأولى ثمّ من بعد ذلك نحتاج أن نعلم مراتب الأمراض الحارّة في الدرج ومراتب الأدوية المبرّدة على ما بيّنّا في كتبنا في الأدوية فقد يعلّم ذلك أنّ الإنسان من حيث ابتدأ بالقسمة فإنّه إذا سلك فيها سبيل الصواب إلى أن ينتهي إلى العلوم الأواخر التي تجري الأركان فإنّ القسمة تؤدّيه إلى العلوم التي تقدّم ذكرها .

have made clear in our books on remedies. One may learn from that that wherever man starts his division, when he pursues it in the right way until he finally reaches the last parts of knowledge which take the place of elements, the division will lead him to those parts of knowledge which we have already mentioned."

Although Galen here operates with the philosophical tool of division (*al-qisma*), particularly linked to Plato, instead of analysis, the result is similar in that the dividing process ultimately stops at the final and most elementary knowledgeable thing. Whether this passage was known to Abū Muḥammad or not is difficult to assess. Yet, in his 'Book on the Method of Healing' he was clearly not aiming at giving a faithful representation of Galen's therapeutic method.

As for Abū Muḥammad's two references to Aristotle, they both concern the agents in healing, i.e. nature and the physician, and their respective roles. According to the first reference Aristotle likens nature to the artificial things invented by the intellect and thus pictures her as devoid of any activity on her own. It is the divine power – and thus God – who causes nature to act. If her actions seem intelligent it is not because of her but because of God who acts through her. In this way any active role of nature in the healing process is implicitly refuted on the authority of Aristotle[45]:

"The Philosopher likens *nature* to the astonishing things which the intellect brings to light and which are things upon which their maker bestows order and synthesis (*niẓām wa-tarkīb*). If he bestows that upon them, bestowing a moving principle from outside, they move due to their essence according to necessary consequences (*talāzim*) to the aim which is sought like fishing nets and other astonishing things which the intellect brings to light. If the human intellect can do things like these astonishing things, how much more is the divine power able to do so."

The mention of fishing nets may remind readers well versed in the Aristotelian tradition of the problem discussed by Aristotle's commentators of how the heat of the sun can be transmitted to the earth if the space between them is filled by unchangeable ether. Alexander of Aphrodisias, for example, tries to explain this by the phenomenon of the torpedo fish whose electric discharge affects the fishermen's hands

[45] Cf. *Rasā'il Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 435, 12–17; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 272, 25 – 273, 4:
والحكيم يشبه الطبيعة بالأشياء العجيبة ، التي يستنبطها العقل ، وهي الأشياء التي يفيدها الصانع نظاماً وتركيباً . فإذا أفادها مع ذلك مفيد مبدأ حركة من خارج ، تحركت هي من ذاتها ، على جهة التلازم ، إلى الغاية التي قدر لها [لها أ ، ص في الهامش : ـ و] ، مثل حبالة الصائد وغير ذلك من الأمور العجيبة التي يستنبطها العقل . وإذا كان العقل الإنسانيّة يقدر على أشياء أمثال [أمثال و ، ص : مثل أ] هذه الأشياء العجيبة ، فالقوّة الإلاهيّة أحرى بذلك.

without changing the fishing net. The net transmits the shock to the fishermen without being itself in any way affected or involved[46]. Along the same lines, Abū Muḥammad seems to have understood nature as a passive medium by which God acts in the sublunar world.

However, to readers well versed in the Galenic tradition, reading this passage in the frame of a discussion of the correct method of healing may bring to mind the five causes that are listed at the beginning of the *Ǧawāmiʿ* of Galen's 'Method of Healing' among which nature takes a prominent place:

> "The principles of the way of the method of healing (*uṣūl al-ṭarīq li-ḥīlat al-burʾ*) are five, and these five are the causes of health. The first of them is matter, i.e. the four elements, [...] fire, water, air, and earth. The second of them is the agent. The first agent in the people's bodies is nature, and the second is nature's helper (*al-muʿāwin li-l-ṭabīʿa*), namely, the physician. For he wants to preserve health in the healthy through similar and suited things and to cure the bodies which have already deviated from health through things opposed to their illnesses. The third of those five causes is the instrument, and the instrument is the blending of those four natural qualities. [...] The fourth of those five causes is the form, and the form of the body is the composition of the body parts. [...] The fifth of those causes is the end which is intended by the joining of the body, namely, the activities[47]."

Although the precise relation between nature and the physician is not specified, the conjured image of the physician as nature's helper is completely different than the one of Abū Muḥammad's Aristotelian passage according to which a passive nature is set in motion by the divine power and only therefore proceeding orderly. We can thus interpret Abū Muḥammad's reference to Aristotle as a further broadside against Galen who generally concedes a lot of importance to nature, and even goes so far as to calling the demiurge 'Nature' at

[46] For a concise description of the problem and references to the relevant passages in Alexander and other commentators, cf. S. Finger/M. Piccolino, *The Shocking History of Electric Fishes: From Ancient Epochs to the Birth of Modern Neurophysiology*, Oxford 2011, 52–54. One of Alexander's passages is found at the beginning of his commentary on Aristotle's 'Meteorology' and as Ibn Rušd uses Alexander's commentary in his *Talḫīṣ* of the 'Meteorology', we may speculate that Ibn Rušd had, at least, parts of the commentary at his disposal and if so, Abū Muḥammad may have had access to it as well. Cf. P. Lettinck, *Aristotle's Meteorology and its Reception in the Arab World*, Leiden–Boston–Cologne 1999, 41 and 62.

[47] For the Arabic text and the context of the passage, cf. Wakelnig, *The Arabic Alexandrians' Summary* (nt. 9), 255–261.

times[48]. In particular, the seventeenth book of Galen's 'On the Usefulness of the Parts' is a eulogy of Nature understood as demiurgic Nature bringing about the sublunar world. Within the Arabic manuscript tradition of 'On the Usefulness of the Parts', there exist two translations of book 17, one which replaces mentions of demiurgic Nature with references to the one Creator and God, as does the rest of the translation, and one which keeps demiurgic Nature[49]. The Escorial manuscript, MS Arab. 850 already referred to above as it is made up of the second half of this voluminous Galenic work, i.e. book 9–17, contains only the translation of book 17 in which demiurgic Nature still figures. It is dated to the year 1145 CE and thus attests to an interest in 'On the Usefulness of the Parts' at the time and place of Abū Muḥammad's life. We may even speculate that Abū Muḥammad himself read the manuscript, opposed Galen's picturing Nature as creative principle and reduced nature, even the nature of each and every living being, to an absolutely passive entity. This sits well with his second reference to Aristotle, by which he wants to stress that an ignorant physician, who does not provide nature with the correct starting point when setting her in motion towards healing, will kill his patients more often than curing them[50]:

> "If the physician is ignorant of that order [i.e. the natural order of the steps in the healing process established by analysis and synthesis] and the end specific to it and provides nature with any starting-point, I mean that he cures a patient (?, lit. him) by anything, whatever thing there is, he may err with regard to the essence but get it right with regard to the accident(s). Such a physician rarely brings about health, whereas he often brings about death. It is not unlikely that this, I mean the ignorance of the (correct therapeutical) way is the reason or one of the reasons for Aristotle speaking (as he does) at the beginning of 'On Sense and Sense Perception' (*al-Ḥiss wa-l-maḥsūs*). Let us say about health and disease that most of those, who die, die through medicine."

[48] On the different meanings of nature in the Arabic translations of Galen, cf. Wakelnig, *Translation* (nt. 16).

[49] I'm currently preparing an edition and study of the two Arabic translations of book 17.

[50] Cf. *Rasāʾil Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 438, 2–8; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 274, 25 – 275, 3:

وإذا كان الطبيب جاهلاً بذلك النظام والغاية الخاصّة به ، وأفاد الطبيعة مبدأ ما ، أعني بأن عالجه بشيء ما ، أي شيء كان ؛ فإنّه يخطئ بالذات ويصيب بالعرض . وهذا الطبيب فوجود الصحّة عنه أقلى ، ووجود [ووجود أ : وجود و] الموت عنه أكثرى [أكثرى أ : أكبرى و] . وليس يبعد أن يكون هذا أعني الجهل بهذه الطريقة هو السبب أو هو أحد الأسباب في أن قال الحكيم في أوّل الحسّ والمحسوس . ولنقل في الصحّة والمرض إن أكثر من يموت إنّما يموت بالطبّ .

The extent of the Aristotelian reference is difficult to determine. It is not clear whether the last sentence is what Aristotle supposedly says at the beginning of 'On Sense and Sense Perception' or not[51]. As the sole extant textual witness to the Arabic version *al-Ḥiss wa-l-maḥsūs* survives in an acephalous manuscript and the beginning of the first book is missing[52], there is no way to know to which passage Abū Muḥammad refers. If the last sentence of the passage is not related to Aristotle, then the reference may well be to the following statement at the very beginning of 'On Sense and Sense Perception' (436a18–436b1) which reads in translation from the Greek[53]:

> "But it behoves the natural scientist to obtain also a clear view of the first principles of health and disease, inasmuch as neither health nor disease can exist in lifeless things. Indeed we may say of most physical inquirers, and of those physicians who study their art more philosophically, that while the former complete their works with a disquisition on medicine, the latter start from a consideration of nature." (tr. J. I. Beare)

If this is the Aristotelian statement to which Abū Muḥammad wants to refer, his intention is probably to present the ideal physician who approaches his art in a philosophical way and thus starts from natural science. The quotation would then well summarise Abū Muḥammad's position expressed in his 'Book on the Method of Healing': He takes sides in the long ongoing battle between philosophers and physicians and the respective merits of their professions, gives his preference to Aristotle and the Aristotelian tradition, while dismissing Galen and the Galen tradition.

About his reasons for doing that, we can only speculate. The admiration that his father, Ibn Rušd had for the divine Aristotle and that he probably passed to his son was most likely a determining factor. If Abū Muḥammad aimed at extending the 'Andalusian revolt'[54]

[51] This is how it has been translated by Anawati/Ghalioungui, *Medical Manuscripts* (nt. 17), 474: "and it is not far-fetched to believe that ignorance of this method is the cause, or one of the causes, why a certain physician in his *Book on Fever and Contagion* asserts that most of those who die, die from medicine."

[52] Cf. R. Hansberger, *The Arabic Adaptation of the* Parva Naturalia (Kitāb al-Ḥiss wa-l-maḥsūs) in: Studia graeco-arabica 4 (2014) 301–314, 301–302.

[53] Cf. *Rasā'il Ibn Rushd*, edd. Anawati/Zāyed (nt. 21), 438, 7; *Commentaria Averrois*, ed. Vázquez de Benito (nt. 21), 275, 2. J. I. Beare's translation in *The Complete Works of Aristotle*, ed. Barnes (nt. 38), vol. 1, 693.

[54] This is the term used by A. Sabra to describe "the well-known anti-Ptolemaic program of research that was conceived and defended by twelfth-century scholars in Muslim Spain", especially by al-Biṭrūǧī and Ibn Rušd and that aimed at rediscovering a postulated "perfect astronomy that antedated Aristotle, that Aristotle only hinted at in his writings, and that perished as a result of the triumph of Ptolemaic astronomy"

to the field of medicine, he faced a similar problem as his father had faced regarding astronomy, namely that Aristotle's works did not provide much material to reconstruct an Aristotelian medicine. This may explain why he composed a general presentation of medical principles without going into detail. With regard to Abū Muḥammad's opposition to Galen, we may further recall that he disapproved of the importance that the Greek physician had accorded to nature. The fact that matter had been a crucial principle for Galen may have further displeased Ibn Rušd's son, even if he were not necessarily aware that Galen had considered matter as preexistent and restricting the creative act of the demiurge. However, further research will hopefully shed more light on this remarkable push for Aristotle by Ibn Rušd, his family and time as well as on the question of the afterlife of Abū Muḥammad's treatise.[55]

Abstract

The first aim of the present contribution is to discuss the surviving information and material on Ibn Rušd's engagement with Galen's Θεραπευτικῆς μεθόδου or Μέθοδος θεραπευτική, *De Methodo Medendi*, i.e. 'On the Therapeutic Method' or 'Method of Healing', and in Arabic *Ḥīlat al-burʾ* or *al-Ḥīla li-l-burʾ*, which is unfortunately very sparse. The second aim is to study the short treatise on the 'Method of Healing', *Maqāla fī ḥīlat al-burʾ* by Ibn Rušd's son, Abū Muḥammad ʿAbd Allāh. It is not a commentary on the Galenic book, as often suggested in modern research literature but an almost polemic text which seeks to replace Galen's medical methodology with one based on Aristotelian principles.

(A. I. Sabra, *The Andalusian revolt against Ptolemaic astronomy: Averroes and al-Biṭrūjī*, in: id., *Optics, Astronomy and Logic. Studies in Arabic Science and Philosophy* (Variorum), Aldershot–Brookfield 1994, 133–153, 133 and 142).

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VISION AND MEDICINE: OPTICS IN THE MEDIEVAL ARABIC OPHTHALMOLOGICAL LITERATURE

MATTEO PIMPINELLI*

The formative age: the Galen-Ḥunayn paradigm

"[...] Hunain's book is immensely superior to the confusedly compiled ophthalmology of his teacher Yûhannâ b. Mâsawaih. Therefore we call it the *earliest existing text-book of ophthalmology.*"[1]

Undisputed authority in the field of medieval Arabic ophthalmology, the *Kitāb al-ᶜašr maqālāt fī al-ᶜayn* by Ḥunayn ibn Isḥāq (d. 260 AH/AD 873) is our starting point[2]; specifically, its third *maqāla* which is devoted exclusively to vision (*fī amr al-baṣar*)[3]. Key elements are addressed by Ḥunayn who deals with the visual spirit (*al-rūḥ al-basarī*), the 'schools of thought' on visual theory, and the main features of the visual process – its nature, its object of perception, the role of air. An in-depth analysis of the contents would be prohibitive[4]. Besides, what we need to emphasize for the purpose of the article is how deeply Ḥunayn's works impacted on the Arabic medical culture. His model of visual theory, grounded on Galen's (d. 216) tradition,

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[1] Max Meyerhof, *The Book of the Ten Treatises on the Eye, ascribed to Hunain ibn Ishâq (809-877 A.D.)*, (Cairo, 1928), p. XLV.

[2] Another important ophthalmological treatise written by Ḥunayn is the *Masāʾil fī al-ṭibb*. Organized in the form of question-answer, the *Masāʾil* sums up the concepts expounded in the *Kitāb al-ᶜašr maqālāt*. For an edition of the text and a French translation, see Paul Sbath, Max Meyerhof, *Le livres des Questions sur l'oeil de Honain Ibn Ishaq*, (Cairo, 1938).

[3] Meyerhof, *Book of the Ten Treatises*, pp. ed. 89-111 (trans. 20-39).

[4] For a comprehensive analysis of the third *maqāla* of Ḥunayn's *Kitāb al-ᶜašr maqālāt*, see Bruce Eastwood, "The Elements of Vision: The Micro-Cosmology of Galenic Visual Theory according to Ḥunayn ibn Isḥāq", *Transactions of the American Philosophical Society*, 72 (1982), pp. 1-59. See also, David Lindberg, *Theories of Vision from al-Kindi to Kepler*, (Chicago, 1976), pp. 33-42.

was indeed transmitted faithfully throughout the Middle Ages[5]. The unparalleled percentage of quotations from the *Kitāb al-ʿašr maqālāt* speaks for itself.

Ḥunayn's authority settled immediately, arguably during his lifetime. Let us consider Ṯābit ibn Qurra's (d. 288 AH/AD 901) *Al-Baṣar wa-l-baṣīra*[6]. His approach to visual theory is patently Galenic. In this regard, he declares his debt to Ḥunayn, whose ophthalmological works are indicated as reference textbooks for further examinations[7].

The comprehensiveness of Ḥunayn's treatises, as emphasized by Ṯābit ibn Qurra, perhaps explains why vision is dealt with cursorily in the ophthalmological works of the next generations. This conciseness characterizes, for instance, the celebrated *Taḏkira al-kaḥḥālīn* authored by ʿAlī b. ʿĪsā al-Kaḥḥāl (fl. first half 5th AH/AD 11th c.). Renowned masterpiece of the Arabic medical literature, the *Taḏkira* was the reference textbook for the ophthalmological practice throughout the Middle Ages, along with Ḥunayn's *Kitāb al-ʿašr maqālāt*. Julius Hirschberg (1843-1925) who provided the first translation of the *Taḏkira* into a European language[8], is quite explicit in this regard[9]. While medical issues are investigated thoroughly,

[5] There is no agreement as to whether Ḥunayn contributed to improve Galen's theories (Eastwood, "Elements of Vision", pp. 25, 27-28), or merely introduced them within the Arabic medical *milieu* (Lindberg, *Theories of Vision*, pp. 34, 41). An interesting article by Cooper examines the techniques adopted by Ḥunayn for the translation of the Galenic *corpus* into Arabic (Glen M. Cooper, *Ḥunayn ibn Isḥāq and the Creation of an Arabic Galen*, in *Brill's Companion to the Reception of Galen*, ed. Petros Bouras-Vallianatos and Barbara Zipser (Leiden, 2019), pp. 179-195).

[6] Ṯābit ibn Qurra, *Al-Baṣar wa-l-baṣīra*, ed. Muḥammad Rawās Qalʿağī and Muḥammad Ẓāfir al-Wafāʾī (Riyad, 1991). Ṯābit's authorship has been questioned: Hirschberg and Meyerhof maintain that the treatise is later (Julius Hirschberg, *The History of Ophthalmology*, trans. Frederick C. Blodi, 11 vol. (Bonn, 1982-2002), II, pp. 49-51; Meyerhof, *Book of the Ten Treatises*, p. XI). On the contrary, Qalʿağī and al-Wafāʾī support Ṯābit's authorship (Ṯābit, *Baṣar*, p. 19). Ibn Abī Uṣaybiʿa mentions *Al-Baṣar wa-l-baṣīra* within the list of Ṯābit's works – as no. 86 (Ibn Abī Uṣaybiʿa, *ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ*, ed. Emilie Savage-Smith and Simon Swain and Geert Jan van Gelder (Leiden, 2020), 10.3.14). In this regard, Hirschberg argues that Ibn Abī Uṣaybiʿa is overlapping two different persons (Hirschberg, *History*, II, p. 49, note 136).

[7] Ṯābit, *Baṣar*, p. 43.

[8] Julius Hirschberg, Eugen Mittwoch, Julius Lippert, *Die arabischen Augenärzte nach den Quellen bearbeitet*, 2 vol. (Leipzig, 1904-1905), I. An English translation was published by Casey A. Wood, *Memorandum Book of a Tenth-Century Oculist*, (Chicago, 1936).

[9] "Compared to the book by HUNAYN which we can evaluate reasonably well in its Latin translation, the book by ʿALI IBN ʿISAʾ constitutes a tremendous progress. In the following 800 years no other textbook of ophthalmology was its equal or

vision is addressed superficially[10]; furthermore, the focus is the anatomy of vision rather than the examination of the visual process. As regards contents, the description is entrenched within Galen's pneumatism as systematized by Ḥunayn. Probably, the ophthalmologists of the time did not delve into optics as they felt that they had nothing to add to what Ḥunayn had already established. Due to its pervasive influence, the *Taḏkira* contributed to strengthen the Galen-Ḥunayn paradigm which literally dominated the medical *milieu*[11].

6th-8th c. AH (12th-14th c. AD): the peak of medieval Arabic ophthalmology[12]

Throughout this unprecedented flourishing period, the established paradigms were regularly transmitted. Ḥunayn and ᶜAlī's authority remained solid as their works continued to guide the day-by-day medical practice[13]. As far as vision is concerned, a new element stood out: Aristotle's (d. 322 BCE) intromissionism, according to

surpassed it [...]. We have to wait until the beginning of the 18th century until we encounter better books on ophthalmology than the Tadhkira", Hirschberg, *History*, II, p. 58.

[10] ᶜAlī is criticized by al-Šāḏilī (d. 749 AH/AD 1349) since in the *Taḏkira* he does not even allude to the 'schools of thought' on visual theory ("*wa lam yakun ṣāḥib al-Taḏkira ᶜaraḍa bi-šayᵓ min iḫtilāf aṣḥāb al-ārāᵓ*", Ṣadaqa b. Ibrāhīm al-Šāḏilī, *Al-ᶜUmda al-kuḥliyya fī al-amrāḍ al-baṣariyya*, ed. Muḥammad Ẓāfir al-Wafāᵓī and ᶜAbd al-Qādir Ḥašān (Beirut, 2019), p. 54). On al-Šāḏilī's critique, see Hirschberg, *History*, II, p. 56, note 171. Likewise, a stunning paucity of information regarding optics characterizes the *Kitāb al-muntaḫab fī ᶜilm al-ᶜayn* authored by ᶜAmmār b. ᶜAlī al-Mawṣilī (fl. first half 5th AH/AD 11th c.). His account on vision consists in fact of a few lines which are integrated in the section on eye anatomy. See ᶜAmmār b. ᶜAlī al-Mawṣilī, *Al-Muntaḫab min ᶜilm al-ᶜayn wa-ᶜilāǧ-hā*, ed. Muḥammad Rawās Qalᶜaǧī and Muḥammad Ẓāfir al-Wafāᵓī (Riyad, 1991), p. 26. The *Muntaḫab* was translated into German by Hirschberg, Mittwoch, Lippert, *Die arabischen Augenärzte*, II, pp. 3-152 (English translation edited by Muḥammad Ẓāfir al-Wafāᵓī, *The Arabian Ophthalmologists*, (Riyad, 1993), pp. 61-183).

[11] "The predominant school of thought on the subject of vision was undoubtedly the Galenic, committed to another form of the extramission theory; this school was led by Hunain ibn Ishaq and ᶜAli ibn ᶜIsa and prevailed especially in medical circles", Lindberg, *Theories of Vision*, p. 33.

[12] Savage-Smith emphasizes that, "for reasons yet unknown, there was during the 6th/12th and 7th/13th centuries an unprecedented interest in composing Arabic treatises on ophthalmology", Emilie Savage-Smith, "Ṭibb", *EI²*, 12 vol. (Leiden, 1986-2004), X, p. 456. I have stretched this time span so as to include the 8th AH/AD 14th c. until al-Šāḏilī, whose encyclopedia is defined by Hirschberg as "the last Arabian textbook of ophthalmology" (Hirschberg, *History*, II, p. 93).

[13] Ibn Abī Uṣaybiᶜa defines ᶜAlī's *Taḏkira* as "indispensable for all those who practice the oculist's art" (Ibn Abī Uṣaybiᶜa, *ᶜUyūn al-anbāᵓ*, 10.50).

Avicenna's (d. 428 AH/AD 1037) version[14]. Galen's authority remained intact; by then, it had been firmly crystallized upon Ḥunayn and ʿAlī's works. Rather, Aristotle's intromissionism became a valid alternative to Galen's pneumatism[15].

In the 6th AH/AD 12th c., the process was still at its early stage. Muḥammad b. Qassūm b. Aslam al-Ġāfiqī (fl. 6th AH/AD 12th c.), for instance, perpetuates the former *status quo* unaltered. The seventh *bāb* of the second *maqāla* of his *Al-Muršid fī ṭibb al-ʿayn* dedicated to vision (*fī ṣifat ḥāssat al-baṣar*)[16], is unequivocally embedded within the Galen-Ḥunayn tradition. However, a new source is added within the list drafted by al-Ġāfiqī in the introduction. After Ḥunayn and ʿAlī, who are identified as his primary references[17], the Andalusian physician mentions Avicenna, then ʿAmmār b. ʿAlī al-Mawṣilī and Abū al-Qāsim al-Zahrāwī (d. after 400 AH/AD 1009). While no allusion to Aristotelian intromissionism is detectable, al-Ġāfiqī's work testifies that by the 6th AH/AD 12th c., Avicenna was already held as an authority in the medical field.

[14] For Aristotle's theory of vision, see Aristotle, *De anima*, trans. John Alexander Smith, in *The Works of Aristotle translated into English. Volume III*, ed. William David Ross (Oxford, 1931), B2.418a26-419b5; and Aristotle, *De sensu and De memoria*, ed. and trans. George Robert Thomson Ross (Cambridge, 1906), 437a25-438b10. For Avicenna's interpretation of Aristotelian intromissionism, see Fazlur Rahman, *Avicenna's De Anima. Being the Psychological Part of the Kitāb al-shifāʾ*, (London, 1959), pp. 91-162. Avicenna's text was translated into French by Ján Bakoš, *Psychologie d'Ibn Sīnā (Avicenne) d'après son oeuvre Aš-šifāʾ*, (Prague, 1956), pp. 63-114. See also, Avicenna, *ʿUyūn al-ḥikma: al-ṭabʿa al-ṭāniya*, ed. ʿAbd al-Raḥmān Badawī, (Kuwait-Beirut, 1980), pp. 36-38; and Fazlur Rahman, *Avicenna's Psychology*, (London, 1952), pp. 27-29.

[15] A parallelism between Galen and Aristotle's visual theories is established by Lindberg who argues that: "What is important about these passages from the *Liber canonis* [Avicenna's *Qānūn*] is that nothing in them suggest a departure from the Galenic theory of vision typically found in the medical tradition", Lindberg, *Theories of Vision*, p. 51. Nonetheless, it has to be emphasized that Avicenna's speculation was primarily directed at discrediting Galen's pneumatism as well as Euclid's geometrical optics, in order to present intromissionism as the only reliable theory (Lindberg, *Theories of Vision*, p. 52).

[16] Muḥammad b. Qassūm b. Aslam al-Ġāfiqī, *Al-Muršid fī ṭibb al-ʿayn*, ed. Muḥammad Rawās Qalʿağī and Muḥammad Ẓāfir al-Wafāʾī (Riyad, 1990), pp. 38-39. Some portions of the *Muršid* were translated into French by Max Meyerhof, *Al-Morchid fi 'l-kohhl*, (Barcelona, 1933).

[17] As far as Ḥunayn is concerned, al-Ġāfiqī read the *Kitāb al-ʿašr maqālāt* and the *Masāʾil fī al-ṭibb*. The former is called *Iṯnay ʿašar maqāla* – Ibn Abī Uṣaybiʿa mentions, instead, eleven *maqālāt* (Ibn Abī Uṣaybiʿa, *ʿUyūn al-anbāʾ*, 8.29.22); the latter is called *Al-Ḥuğğa wa-l-ğawāb*. As for ʿAlī, his *Taḏkira* is mentioned as *Al-Risāla*. For al-Ġāfiqī's list of sources, see al-Ġāfiqī, *Muršid*, pp. 2-3 (French translation in Meyerhof, *Morchid*, pp. 13-14). See also Hirschberg, *History*, II, p. 78.

By the 7th AH/AD 13th c., Aristotle's intromissionism was included definitively in the classification of the theories of vision as testified by the *Natīğat al-fikar fī ʿilāğ amrāḍ al-baṣar* written by Fatḥ al-Dīn al-Qaysī (d. 657 AH/AD 1258)[18]. Vision (*kayfiyyat al-ibṣār*) is addressed in the first *bāb*, following the traditional anatomical description of the eye molded on ʿAlī's pattern[19]. Aristotle's visual theory (*raʾy al-ṭabīʿiyyīn*) is presented as one of the three 'schools' (*ārāʾ*) along with Euclid's extramissionism (*raʾy al-riyāḍiyyīn*) and Galen's pneumatism[20]. Al-Qaysī does not express a preference for a theory over the others; his goal is to expound the alternatives. He suggests the reading of other medical textbooks for more thorough examinations – as Ṯābit and ʿAlī had already done[21].

In his voluminous *Al-Kāfī fī al-kuḥl*, Ḫalīfa b. Abī al-Maḥāsin (fl. second half 7th AH/AD 13th c.) deals with vision (*kayfiyyat al-ibṣār*) in the fourth *faṣl* of the first *ğumla*[22]. While the standard arrangement of the exposition is respected – eye anatomy followed by the description of the visual process – Ḫalīfa lists only two theories of vision rather than three[23]. His description is much lengthier and

[18] Fatḥ al-Dīn al-Qaysī, *Natīğat al-fikar fī ʿilāğ amrāḍ al-baṣar*, ed. Muḥammad Rawās Qalʿağī and Muḥammad Ẓāfir al-Wafāʾī (London, 1998).

[19] Al-Qaysī, *Natīğat al-fikar*, pp. 31-32.

[20] Ḥunayn had already proposed a threefold classification of the visual theories (Meyerhof, *Book of the Ten Treatises*, pp. ed. 103-104; trans. 31-32). However, his classification is still raw and presents some grey areas. Apart from Galen's pneumatism, the other two groups refer to:

> 1) An intromissionist theory, probably relating to Democritus's (d. ca. 370 BCE) theory of the εἴδωλα/*eidola* – the object sends 'something' towards the eye (*yarsilu šayʾan min-hu* [the object] *ilay-nā* [the eye]). According to Lindberg, Ḥunayn might well have been referring to Aristotle as well (Lindberg, *Theories of Vision*, p. 37).
>
> 2) An extramissionist theory, according to which the 'faculty of perception' (*quwwat al-ḥiss*) proceeds outwards until it embraces the visible object. Actually, Eastwood demonstrates that this is a transposition from Galen's dissertation on intromissionism (Eastwood, "Elements of Vision", p. 33).

[21] "*wa-li-kull min al-ārāʾ al-ṭalāṭa al-maḏkūra adala fī al-kutub al-ṭibbiyya ḫāriğaʾtan ʿan al-ṣināʿa al-ṭibbiyya*", al-Qaysī, *Natīğat al-fikar*, p. 32.

[22] Leclerc dates Ḫalīfa b. Abī al-Maḥāsin at the second half of the 7th AH/AD 13th c. (Lucien Leclerc, *Histoire de la médecine arabe*, 2 vol. (Paris, 1876), II, p. 146). His *Al-Kāfī fī al-kuḥl* was written probably between 1256-75 (John Barrett Kelly, "Ḫalīfa b. Abī 'l-Maḥāsin", *EI*², IV, p. 954). For the edition of the *Kāfī*, see Ḫalīfa b. Abī al-Maḥāsin, *Al-Kāfī fī al-kuḥl*, ed. Muḥammad Rawās Qalʿağī and Muḥammad Ẓāfir al-Wafāʾī (Rabat, 1990). Some portions of the work were translated by Hirschberg, Mittwoch, Lippert, *Die arabischen Augenärzte*, II, pp. 154-194 (English translation in al-Wafāʾī, *Arabian Ophthalmologists*, pp. 187-231).

[23] Ḫalīfa distinguishes between an unspecified form of extramissionism (*inbiʿāṯ al-šuʿāʿ*), and Aristotelian intromissionism (*inṭibāʿ al-mubṣarāt fī al-ğalīdiyya min*

detailed than al-Qaysī's. However, it is mainly composed of *verbatim* quotations from Ḥunayn's *Kitāb al-ʿašr maqālāt* and Avicenna's *Qānūn fī al-ṭibb* and *Kitāb al-šifāʾ*. Just like al-Qaysī, Ḫalīfa maintains a neutral viewpoint on the issue.

A peculiar case is the *Kašf al-rayn fī aḥwāl al-ʿayn* authored by Ibn al-Akfānī (d. 749 AH/AD 1348)[24]. Contrary to the trend observed in the former authors, Ibn al-Akfānī does not talk about vision, if we exclude a brief allusion in the second *faṣl* of the first *bāb* of the first *maqāla*, as usual devoted to eye anatomy[25].

Contemporary to Ibn al-Akfānī is Ṣadaqa b. Ibrāhīm al-Šāḏilī whose *Al-ʿUmda al-kuḥliyya fī al-amrāḍ al-baṣariyya* is considered the last great encyclopaedical work on ophthalmology produced during this flourishing period[26]. The fourth *faṣl* of the first *ǧumla* is devoted entirely to vision[27]. Differently from the physicians analyzed thus far, al-Šāḏilī supports one specific visual theory – namely, the third theory he mentions (*wa-huwa al-ḥaqq*). In this regard, he is somewhat confused as he includes Galen and Avicenna in the same 'school'. According to its description, the theory can be ascribed with the utmost certainty to Galen's speculation, for the air is identified as the instrument of vision (*al-hawāʾ al-muḥīṭ bi-nā iḏā kāna ṣāfiyy*^{an} *nayyir*^{an} *yaṣīru li-l-baṣar āla*). This is also coherent with the fact that the corresponding text, as a great extent of the fourth *faṣl*, is quoted *verbatim* from Ḥunayn's *Kitāb al-ʿašr maqālāt*[28]. Yet al-Šāḏilī claims that Avicenna supported this theory (*wa-huwa al-raʾy yamīlu ilay-hi al-šayḫ Abū ʿAlī al-Ḥusayn ibn Sīnā*). However, according to the intromissionism of Avicenna-Aristotle, the air is the medium for vision (*wāsiṭa*), not its instrument[29]. It is true that Galen was in-

ġayr inbiʿāṯ šuʿāʿ). This latter is supported by Avicenna (*wa-l-šayḫ yamīlu ilā al-raʾy al-ṯānī*). Oddly, there is no mention whatsoever of Euclidean geometrical optics. See Ḫalīfa, *Kāfī*, pp. 52-53.

[24] Ibn al-Akfānī, *Kašf al-rayn fī aḥwāl al-ʿayn*, ed. Muḥammad Rawās Qalʿaǧī and Muḥammad Ẓāfir al-Wafāʾī (Riyad, 1993). According to Hirschberg, Ibn al-Akfānī was not an oculist (Hirschberg, *History*, II, p. 92). Witkam, instead, defines him as "the last of the great Arab ophthalmologists", Jan Just Witkam, "Establishing the Stemma: Fact or Fiction?", *Manuscripts of the Middle East*, 3 (1988), p. 94.

[25] Ibn al-Akfānī, *Kašf*, pp. 8-14.

[26] See above, note 12.

[27] Al-Šāḏilī, *ʿUmda*, pp. 53-64.

[28] Meyerhof, *Book of the Ten Treatises*, pp. ed. 103-111 (trans. 31-39). Likewise, Hirschberg maintains that al-Šāḏilī supports Galen's pneumatism (Hirschberg, *History*, II, p. 173).

[29] Rahman, *Avicenna's De Anima*, p. 122.

fluenced by Aristotle's thought[30]; however, this overlapping is hardly explainable considering that al-Šāḏilī lived in the 8th AH/AD 14th c. By then, the identification and classification of the different 'schools' was firmly crystallized. Hopefully, further research will help clarify the issue. Another important source quoted *verbatim* is Ibn al-Nafīs (d. 687 AH/AD 1288)[31]. Al-Šāḏilī addresses his discussion on the weaknesses of the intromission theory, but with a different arrangement of the contents; rather than separating problems and solutions into two different sections, the topics are treated individually.

Ibn al-Nafīs: a different approach

Within this firmly grounded paradigm, the *Kitāb al-muhaḏḏab fī al-kuḥl al-muǧarrab* written by the celebrated Ibn al-Nafīs displays some unique characteristics. Vision, as dealt with in the second *fann* (pp. 78-100), is addressed differently[32]. Furthermore, some of its features might seem to suggest some kind of connection between this work and the *Kitāb nūr al-ʿuyūn wa-ǧāmiʿ al-funūn* (henceforth *NU*).

Divided into ten *fuṣūl*, the second *fann* is devoted exclusively to vision. Leaving aside the two introductory *fuṣūl* [33], let us focus on the third *faṣl* (pp. 82-85) which investigates the appropriate conditions for vision (*fī al-šurūṭ al-muttafaq ʿalay-hā fī al-ruʾya bi-l-ʿayn*). Here, Ibn al-Nafīs illustrates a geometrical proof complete with a diagram (p. 85), in order to corroborate his argument. The text is entrenched within the tradition of geometrical optics, namely Euclid's (4th/3rd c. BCE) *Optics* (Ar. *Al-Manāẓir*). Through the use of a specialized lexicon, basic concepts of Euclidean geometrical optics are introduced, such as the visual cone (*al-maḫrūṭ al-baṣarī*) and the

[30] Katerina Ierodiakonou, "On Galen's Theory of Vision", *Bulletin of the Institute of Classical Studies. Supplement*, 114 (2014), pp. 244-245.

[31] Ibn al-Nafīs, *Kitāb al-muhaḏḏab fī al-kuḥl al-muǧarrab*, ed. Muḥammad Rawās Qalʿaǧī and Muḥammad Ẓāfir al-Wafāʾī (Rabat, 1988), pp. 82-85, 96-98.

[32] According to Savage-Smith, "this treatise is of interest first of all because it is possibly the most thorough and complete of all medieval Arabic ophthalmological tracts, and secondly because it contains some original ideas and approaches introduced into the treatment of these diseases by a well-known medical theoretician" (Emilie Savage-Smith, "Ibn al-Nafīs's *Perfected Book on Ophthalmology* and his Treatment of Trachoma and Its Sequelae", *Journal for the History of Arabic Science*, 4 (1980), p. 151).

[33] The first *faṣl* discusses the definition of visual things (*fī taḥdīd al-ašyāʾ al-mubṣara*). The second *faṣl* (*fī tafsīr al-alfāẓ allatī aḵṭuru istiʿmālu-hā fī mā natakallamu fī-hi fī hāḏā al-fann*) is an interesting account on the technical words relating to the field of optics (*nūr, šuʿāʿ, muḍīʾ*). See Ibn al-Nafīs, *Muhaḏḏab*, pp. 78-82.

visual angle (*zāwiyat al-ruʾya*). Ibn al-Nafīs alludes to Definition 2 of Euclid's *Optics*[34], while the aforementioned demonstration and diagram refer to Proposition 53[35]. Given the uniqueness of this passage compared to all the works analyzed thus far, it would be tempting to link the *Kitāb al-muhaḏḏab* with *NU* (see below)[36]. Nonetheless, considering the absence of direct mentions of Ibn al-Nafīs within *NU* as well as the lack of biographical information regarding the author of *NU*, this can be just a suggestion.

The chapter continues by dealing with the theories of vision. In the fourth *faṣl* (pp. 86-88), Ibn al-Nafīs expounds two alternatives: the extramissionism maintained by the 'mathematicians' (*al-riyāḍiyyīn*) and the majority of the physicians (*aktar al-aṭibbāʾ*); and the Aristotelian intromissionism supported by the majority of the 'physicists' (*al-ṭabīʿiyyīn*). Both are further subdivided: intromissionism slightly differs with regard to the locus of the imprint[37]; extramissionism is divided into three groups. The second group refers undoubtedly to Galen's pneumatism, while the first and third groups

[34] For the edition of the Arabic version of Euclid's *Optics*, see Elaheh Kheirandish, *The Arabic Version of Euclid's Optics*, 2 vol. (New York, 1999), I, p. 3. For an English translation of the *Optics*, see Harry Edwin Burton, "The Optics of Euclid", *Journal of the Optical Society of America*, 35 (1945), p. 357; see also the French translation by Paul Ver Eecke, *L'Optique et la Catoptrique*, (Paris, 1959), p. 1.

[35] Burton, "Optics of Euclid", p. 371; Ver Eecke, *Optique*, p. 47. Proposition 53 in the Greek tradition corresponds to Proposition 59 in the Arabic tradition (Kheirandish, *Arabic Version*, I, p. 210).

[36] However, there are some differences between the two works, as in the case of the translation of 'visual rays'. In the *Kitāb al-muhaḏḏab*, they are rendered as *manāẓir*. This term is linked to the medical environment, and it is used by Ḥunayn (*inkisār al-manāẓir*) to translate the Greek ὄψεις/*opseis* (Meyerhof, *Book of the Ten Treatises*, p. ed. 109). The Arabic Galen presents the same use (Kheirandish, *Arabic Version*, II, p. 3, note 47). Throughout *NU*, instead, the word *šuʿāʿāt* is employed – more commonly the collective form *šuʿāʿ*; this term is linked to the Arabic tradition of Euclid's *Optics*. Sabra emphasizes that ὄψεις/*opseis* and ἀκτῖνες/*aktines* were used interchangeably to convey the idea of 'visual rays'. The latter was mostly used by the Greek authors on optics (Abdelhamid Ibrahim Sabra, "Manāẓir", *EI*^{2}, VI, p. 376).

[37] In this regard, Ibn al-Nafīs claims that the form (*al-šibḥ*) of the object does not 'fall' (*waqaʿa*) onto the crystalline lens, but onto the pneuma (*al-rūḥ*); then, the pneuma which in the seventh *faṣl* is defined as 'transporting pneuma' (*al-ruḥ al-muʾaddī*), brings the information to the brain (Ibn al-Nafīs, *Muhaḏḏab*, p. 92). Avicenna had already mentioned the transporting pneuma, though he had indicated the crystalline lens as the locus where the imprint of the visible object occurred (Rahman, *Avicenna's De Anima*, p. 151). See also Jon McGinnis, *New Light on Avicenna: Optics and its Role in Avicennan Theories of Vision, Cognition and Emanation*, in *Philosophical Psychology in Arabic Thought and the Latin Aristotelianism of the 13th Century*, ed. Luis Xavier López-Farjeat and Jörg Alejandro Tellkamp (Paris, 2013), p. 51.

are much trickier to identify. As far as the first group is concerned, Ibn al-Nafīs alludes to two visual cones (*maḫrūṭayn*). Despite a connection with Ptolemy's (2nd c.) binocular vision might be tempting[38], it would seem safe to link the description to Euclid's tradition[39]. As for the third group, its description is as indefinite as to forbid any valid suggestion[40]. The fifth *faṣl* (pp. 88-90) is devoted to denying the reliability of the evidence put forward by the supporters of the first 'school', i.e., extramissionism[41]. Its confutation is completed in the sixth *faṣl* (pp. 91-93). Then, Ibn al-Nafīs starts to illustrate the second 'school', i.e., instromissionism, whose description is completed in the seventh *faṣl* (pp. 93-95). Eventually, the eighth and ninth *fuṣūl* (pp. 96-98) are devoted to solving four 'doubts' (*šukūk*) which could undermine the reliability of intromissionism.

The Kitāb nūr al-ʿuyūn wa-ǧāmiʿ al-funūn: the second maqāla as a unicum

NU is an ophthalmological treatise written by a certain Abū Zakariyyā Yaḥyā b. Abī al-Raǧāʾ, possibly in the first decades of the 8th AH/AD 14th c.[42]. Conceived as a *summa* of the ophthalmological

[38] On Ptolemy's binocular vision, see A. Mark Smith, "Ptolemy's Theory of Visual Perception: An English Translation of the 'Optics' with Introduction and Commentary", *Transactions of the American Philosophical Society*, 86 (1996), pp. 82-90, 141-152. See also Ian Porteus Howard, Nicholas Wade, "Ptolemy's Contribution to the Geometry of Binocular Vision", *Perception*, 25 (1996), pp. 1189-1201. Despite the parallelism with the aforementioned Proposition 53 of Euclid's *Optics* is unquestionable, it is interesting to note that the same diagram can be found in Ptolemy's *Optics* as well. Furthermore, it is attached to Experiment II.1 which refers precisely to binocular vision (Smith, "Ptolemy's Theory", p. 84).

[39] While we can only speculate whether Ibn al-Nafīs knew Ptolemy's *Optics* or not, we do know that he was acquainted with Euclid's *Optics*. Furthermore, it is well-known that within medieval Arabic culture, Ptolemy's *Optics* was not as widespread as Euclid's (Abdelhamid Ibrahim Sabra, *The Optics of Ibn al-Haytham. Books I-III, On Direct Vision*, (London, 1989), p. lviii).

[40] "*wa-min al-qāʾilīn bi-ḫurūǧ al-šuʿāʿ man yaǧʿalu ḫurūǧᵃ-hu lā ʿalā hayʾat maḫrūṭayn, bal min kull ḥadaqa ḫaṭṭ mustaqīm, wa-yaltaqiyāni ʿalā saṭḥ al-baṣar, wa-yantaqilu ṭarafᵘ-hā ʿalā al-mubṣar bi-surʿaᵗⁱⁿ*", Ibn al-Nafīs, *Muhaḏḏab*, p. 87.

[41] The evidence they put forward are 'fairy tales': "*ammā aṣḥāb al-šuʿāʿ fa-ḥuǧaǧᵘ-hum kaṯīra, wa-kullᵘ-hā min al-ḫurāfāt*", Ibn al-Nafīs, *Muhaḏḏab*, p. 88.

[42] For the edition of *NU*, see Ṣalāḥ al-Dīn b. Yūsuf al-Kaḥḥāl al-Ḥamawī, *Kitāb nūr al-ʿuyūn wa-ǧāmiʿ al-funūn*, ed. Muḥammad Rawās Qalʿaǧī and Muḥammad Ẓāfir al-Wafāʾī (Riyad, 1987). The earliest mention of the work is provided in Ḥaǧǧī Ḫalīfa's *Kašf al-ẓunūn* (Ḥaǧǧī Ḫalīfa, *Kašf al-ẓunūn ʿan asāmī al-kutub wa-l-funūn*, ed. Gustav Flügel, 7 vol. (London, 1835-58), VI, p. 393). Hirschberg translated some sections of *NU* (Hirschberg, Mittwoch, Lippert, *Arabischen Augenärztze*, II, pp. 197-262; English translation in al-Wafāʾī, *Arabian Ophthalmologists*, pp. 235-302). For a

knowledge ammassed by the Arabs up to then[43], it deals extensively with all the major topics related to eye medicine. The work is structured into ten *maqālāt* which are further subdivided into *abwāb*. While it does not stand out in terms of originality[44], it preserves a great deal of information excerpted from the major authorities in the field, which are usually quoted *verbatim*. Its value as a 'bibliographical repository' is noteworthy. The focus of the present analysis will be the second *maqāla* (*al-maqāla al-ṯāniya*); subdivided into five *abwāb*, it deals with optics and theories of vision. The examination of the contents will be instrumental in demonstrating the uniqueness of the *maqāla* in the field of medieval Arabic ophthalmological literature[45].

Al-bāb al-awwal

It is by far the longest *bāb*. It starts by summarizing the 'schools of thought' (*maḏāhib*) regarding vision. The standard division into three groups is retained: the author mentions Euclid's extramissionism (*al-riyāḍiyyīn*), Galen's pneumatism (*man yarā bi-takayyuf al-hawāʾ al-ḥāriǧ*), and Aristotle's intromissionism (*al-ṭabīʿiyyīn*).

The description of the first *maḏhab*, which is the lengthiest, begins with a classification of the alternative extramissionist theories (pp. 54-55). The contents are derived from the Arabic version of Ps.-

general survey, see Hirschberg, *History*, II, pp. 86-88. The authorship of Abū Zakariyyā was established by Gregor Schoeler, "Der Verfasser der Augenheilkunde K. Nūr al-ʿuyūn und das Schema der 8 Präliminarien im 1. Kapitel des Werkes", *Der Islam*, 64 (1987), pp. 87-97.

[43] "C'est un de traités les plus complets que les Arabes nous aient laissés sur l'ophthalmologie", Leclerc, *Historie*, II, p. 205.

[44] The whole section on eye anatomy, for instance, is copied word for word from ʿAlī's *Taḏkira* (Julius Hirschberg, *Die Arabischen Lehrbücher der Augenheilkunde*, (Berlin, 1905), pp. 87-88).

[45] "Das zweite Buch des Lichts der Augen kennzeichnet den Verfasser als einen grossen Gelehrten. Ist er doch, soweit uns bekannt geworden, der einzige arabische Augenarzt gewesen, der es gewagt hat, in seinem Werk über praktische Augenheilkunde die Theorie des Sehens geometrisch darzustellen und mit Figuren auszustatten, von denen übrigens einige der Optik des Eukleides entstammen", Hirschberg, *Die arabischen Lehrbücher*, p. 89. As part of my PhD thesis, I have prepared a brand-new critical edition of the second *maqāla*, with an annotated translation. This was much-needed as the 1987 edition of the second *maqāla* is generally inaccurate, especially regarding the mathematical content of Euclidean geometrical optics, the understanding of diagrams, the identification of the textual sources. Furthermore, the editors did not consider three out of the seven manuscript witnesses of *NU* preserved to this day – Berlin, Staatsbibliothek zu Berlin, Orientabteilung, Ms. or. quart. 1141; Dublin, Chester Beatty Library, ms. Ar. 4921; Roma, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, ms. Or. 47.

Plutarch's *Placita philosophorum*[46]. Every theory is briefly presented, and the reference scholar(s) identified.

Euclid is the last author mentioned; its geometrical optics is thoroughly examined (pp. 55-69). The textual source for this section is the *Kitāb fī-hi al-manāẓir wa-l-marāyā al-muḥriqa ʿalā maḏhab Iqlīdis fī ʿilal al-baṣar* authored by Aḥmad ibn ʿĪsā (fl. 3rd AH/AD 9th c.)[47]. This is usually quoted *verbatim* throughout the section. 'Beneath' Aḥmad's text, it is possible to identify passages from al-Kindī's (d. ca. 256 AH/AD 870) *Taqwīm al-manāẓir* too[48]. The text begins by introducing the Definitions from Euclid's *Optics* (p. 55) through which the fundamentals of geometrical optics are addressed[49]. As in Aḥmad (fols. 5v-6r) and al-Kindī (p. 164), Definition 1 is omitted[50]. Following that, the exposition is organized according to the traditional mathematical method: enunciation of the proposition,

[46] Plutarchus, *Tutti i moralia*, ed. and trans. Emanuele Lelli and Giuliano Pisani (Milano, 2017), pp. 1734-1735. For the Arabic text, see Hans Daiber, *Aetius arabus*, (Wiesbaden, 1980), pp. 202-203. According to Daiber, the quotation in *NU* was arguably mediated through the *Al-Rawḍa al-ṭibbiyya* authored by ʿUbayd Allāh b. Ǧibrāʾīl b. Buḫtīšūʿ (5th AH/AD 11th c.) (Daiber, *Aetius arabus*, 84). For the Arabic text of the *Rawḍa*, see ʿUbayd Allāh b. Ǧibrāʾīl b. Buḫtīšūʿ, *ar-Raoudat at-tibbiyya (Le jardin médical) par Ubaîd-Allah Ben Gibraîl Ben Bakhtichoû*, ed. Paul Sbath (Cairo, 1927), pp. 69-70 (English translation in Max Meyerhof, "An Arabic Compendium of Medico-Philosophical Definitions", *Isis*, 10/2 (1928), pp. 347-348). The *Placita philosophorum* was translated into Arabic (*Kitāb al-ārāʾ al-ṭabīʿiyya*) by Qusṭā ibn Lūqā (d. ca. 300 AH/AD 912-13), early in the 3rd AH/AD 9th c. (Ibn al-Nadīm, *Kitāb al-fihrist*, ed. Gustav Flügel, 2 vol. (Leipzig, 1871-2), I, p. 254).

[47] Krause dates Aḥmad ibn ʿĪsā before 250 AH/AD 864 (Max Krause, "Stambuler Handschriften islamischer Mathematiker", *Quellen und Studien zur Geschichte der Mathematik, Astronomie und Physik*, 3 (1936), p. 513). However, he was arguably later than al-Kindī inasmuch as he drew on the latter's works. Rashed dates him at the 4th AH/AD 10th c. (Roshdi Rashed, "Le commentaire par al-Kindī de l'*Optique* d'Euclide: un traité jusqu'ici inconnu", *Arabic Sciences and Philosophy*, 7 (1997), p. 48, note 55). For a general survey on Aḥmad ibn ʿĪsā and a translation of some excerpts from the *Manāẓir* (quoted in *NU*), see Elaheh Kheirandish, "Footprints of 'Experiment' in Early Arabic Optics", *Early Science and Medicine*, 14 (2009), pp. 81-82, 90-98. A table of contents of the *Manāẓir* is provided in Sabra, *Optics*, p. lxiii, note 93. One of the two manuscript witnesses which preserve the *Manāẓir* – Istanbul, Süleymaniye Kütüphanesi, ms. Ragip Paşa 934 – is available online at: https://ketabpedia.com/تحميل/مخطوطة-المناظر-والمرايا-المحرقة-على-م/.

[48] Edition and French translation by Roshdi Rashed, *Oeuvres philosophiques et scientifiques d'al-Kindī*, 2 vol. (Leiden, 1997-8), I, pp. 161-335.

[49] Kheirandish, *Arabic Version*, I, pp. 2-3; Burton, "Optics of Euclid", p. 357; Ver Eecke, *Optique*, p. 1.

[50] The inner complexity which characterizes the textual transmission/tradition of the Definitions of Euclid's *Optics* is emphasized by Kheirandish, *Arabic Version*, II, p. xxxv.

followed by its demonstration by means of the deductive method mediated by a diagram [Figs. 1-2].

[Fig. 1]

Figs. 1-2: Dublin, Chester Beatty Library, ms. Ar. 4921, fols. 8v-9r

This pattern is applied in demonstration one (pp. 56-57), which can be found both in Aḥmad (fols. 7v-9r) and al-Kindī (pp. 166-169). This

is followed by an interesting textual passage, which is structured as a defense of extramissionism. This is excerpted entirely from Aḥmad's *Manāẓir* (fols. 9v-10v), and it is functional to introduce demonstrations two and three (pp. 58-60). These are meant to strengthen the reliability of extramissionism. Demonstration four (pp. 61-63) deals with reflection, an optical phenomenon which had been properly addressed since Antiquity[51]. The content is quite linear. Also, contrary to the other demonstrations, the manuscript tradition does not present significant ambiguities. Afterwards, optical illusions are examined. On the basis of width differences of the visual angles, demonstration five (pp. 63-64) aims at proving why a body submerged in water is seen bigger. Interestingly, the magnification of the object in water is paralleled with the so-called phenomenon of the 'moon illusion', "the perceptual illusion with the longest classical pedigree"[52]. Both phenomena are explained in terms of refraction, following a tradition which goes back to Ptolemy[53]. *NU* quotes *verbatim* from Aḥmad's *Manāẓir* (fols. 52v, 56v, 55v-56r)[54]; the latter derives his ideas most

[51] The demonstration of the equal angles of incidence and reflection has been traced back either to Archimedes (3rd c. BCE), according to some *scholia* in Ps.-Euclid's *Catoptrics* (Albert Lejeune, *Recherches sur la catoptrique grecque d'après les sources antiques et médiévales*, (Brussels, 1957), p. 53); or to Euclid (George Sarton, *Introduction to the History of Science*, 3 vol. (Baltimore, 1927-1948), I, p. 153). For an overview on this issue, see Carl Benjamin Boyer, "Aristotelian References to the Law of Reflection", *Isis*, 36 (1946), pp. 92-95. Abū Zakariyyā declares explicitly his debt to the ancient sources: "*naḥtağğu bi-ḥuğağ al-awā'il*", Ṣalāḥ al-Dīn, *Nūr al-ʿuyūn*, p. 61.

[52] Helen Elizabeth Ross, George Ross, "Did Ptolemy Understand the Moon Illusion?", *Perception*, 5 (1976), p. 376.

[53] In the *Almagest*, Ptolemy argues that refraction explains why stars are seen larger on the horizon. Furthermore, he compares such phenomenon with the magnification of the objects submerged in water, as in *NU* (Ross, Ross, "Did Ptolemy", p. 378). The same interpretation is supported by Aristotle (Aristotle, *Meteorologica*, trans. Erwin Wentworth Webster, in *The Works of Aristotle. Volume III*, B4.ch.3.373b), and by the lion's share of the scholars of Antiquity (Rashed, *Oeuvres philosophiques*, I, p. 126). This erroneous hypothesis is contested by Ptolemy himself in his *Optics*, where he provides different explanation (Ross, Ross, "Did Ptolemy", pp. 379-382). For a comprehensive survey on the issue of the 'moon illusion', with an analysis of Ibn al-Haytham's (d. 430 AH/AD 1039) principle of the size-distance, see Abdelhamid Ibrahim Sabra, *Psychology versus Mathematics: Ptolemy and Alhazen on the Moon Illusion*, in *Mathematics and its Applications to Science and Natural Philosophy in the Middle Ages*, ed. Edward Grant, *et al.* (Cambridge, 1987), pp. 217-247.

[54] The recent foliation of the manuscript is confused inasmuch as it does not consider that often times the *folios* are mixed in a random order (Rashed, *Oeuvres philosophiques*, I, p. 647).

likely from al-Kindī's *Al-Aǧrām al-ġāʾiṣa fī al-māʾ*[55]. We do not know whether Aḥmad knew Ptolemy; but we do know that, probably, al-Kindī did[56]. With all due cautiousness, it would seem founded to consider *NU* as a later testimony of this tradition. After the discussion on optical illusions, a 'general' (*ǧāmiᶜ*) diagram relating to the next three demonstrations is provided (pp. 65-67). The arrangement of the exposition proves once again that Aḥmad's *Manāẓir* is the actual source[57]. Eventually, two demonstrations complete with diagrams (pp. 67-69) conclude the account on Euclidean geometrical optics.

The description of the second *maḏhab* (p. 69) is as brief as unequivocal in the ideas conveyed. Its supporters argue that the outer air becomes the instrument of vision after being molded by the visual rays emitted from the eye. The allusion to Galen's pneumatism seems crystal-clear. By then, the physician from Pergamon was firmly established as the main authority of one of the three major visual theories, alongside Euclid and Aristotle[58]. The pervasiveness of this paradigm might explain the omission of Galen's name; his link with pneumatism was so tightly secured that Arabic authors might feel unnecessary to explicit his name. But what about the previous mention of Galen within the members of the first *maḏhab*? Does this entail an incongruity? Actually, the textual passages do not collide inasmuch as their focus is different. While the account in the first *maḏhab* on the second *maḏhab* refers to Galen's pneumatism, the other one in the

[55] Rashed, *Oeuvres philosophiques*, I, p. 127. The *Al-Aǧrām al-ġāʾiṣa fī al-māʾ* is mentioned in the *Fihrist* (Ibn al-Nadīm, *Fihrist*, I, p. 320), and in Ibn Abī Uṣaybiᶜa, *ᶜUyūn al-anbāʾ*, 10.1.14 (as no. 259).

[56] Arguably, al-Kindī knew the *Almagest*. His *Kitāb al-ṣināᶜa al-ᶜuẓmā*, for instance, deals with the first eight chapters of Book One of the *Almagest* (Franz Rosenthal, *Al-Kindī and Ptolemy*, in *Studi orientalistici in onore di Giorgio Levi Della Vida*, 2 vol. (Rome, 1956), II, pp. 436-456). Perhaps, he knew it indirectly through Theon of Alexandria's (4th c.) *Commentary on the Almagest* (Rashed, *Oeuvres philosophiques*, I, p. 126.). As far as Ptolemy's *Optics* is concerned, instead, there is no agreement whether al-Kindī knew it (Sabra, *Optics*, p. lviii), or not (Roshdi Rashed, *Geometrical Optics*, in *Encyclopedia of the History of Arabic Science*, ed. Roshdi Rashed, 3 vol. (London-New York, 1996), II, p. 309). According to Adamson, an indirect influence through Theon's mediation might be possible (Peter Adamson, "Vision, Light and Color in al-Kindī, Ptolemy and the Ancient Commentators", *Arabic Sciences and Philosophy*, 16 (2006), pp. 216-217).

[57] As in Aḥmad's *Manāẓir* (fol. 65), the Propositions are enunciated consecutively. In al-Kindī's *Taqwīm*, instead, the Propositions and their correspondent demonstrations are dealt with individually (Rashed, *Oeuvres philosophiques*, I, pp. 169, 171, 175, 179, 197). The demonstrations refer to Propositions 2, 3, 4, 6, and 13 (12 in the Greek tradition). See Kheirandish, *Arabic Version*, I, pp. 7, 9, 11, 17, 41; Burton, "Optics of Euclid", pp. 357-359; Ver Eecke, *Optique*, pp. 2-5, 9-10.

[58] Lindberg, *Theories of Vision*, p. 33.

first *maḏhab* alludes exclusively to the latter's geometrical demonstrations (*barāhīn handasiyya*), which were meant to prove the validity of extramissionism with regard to its geometrical methodology[59].

As for the third *maḏhab*, Aristotelian intromissionism is addressed (pp. 69-74). The section is quantitatively notable, although it does not reach the extent of the section on Euclidean geometrical optics. Essentially, the exposition is structured as a long quotation from Avicenna's *Kitāb al-šifāʾ* and *ʿUyūn al-ḥikma*[60]. The first textual unit is excerpted from the *Kitāb al-šifāʾ* (pp. 69-72). Interestingly, the selected passages focus on the confutation of extramissionism, rather than the description of intromissionism – at the exclusion of the very last sentence[61]. The second unit is derived from the *ʿUyūn al-ḥikma* (pp. 72-74). Likewise, the text centers on the confutation of extramissionism, which is provided by means of a geometrical demonstration complete with a diagram – which recalls Proposition 5 of Euclid's *Optics*[62]. It has to be emphasized that, apparently, the geometrical arrangement of this passage justified its inclusion in the exposition[63].

Al-bāb al-ṯānī, al-ṯāliṯ, al-rābiʿ, al-ḫāmis

These complete the exposition on vision in *NU*. The approach is completely different in terms of thoroughness and accuracy. The topics are addressed cursorily, and the contents are presented superficially.

Al-bāb al-ṯānī (p. 75) mentions four elements which are said to be necessary in order to see. The author refers to:

- A healthy eye (*salīma min al-āfāt*).

[59] "*wa-Ǧālīnūs barhana bi-barāhīn handasiyya ʿalā ṣiḥḥat hāḏā al-raʾy fī kitābihi fī manāfiʿ al-aʿḍāʾ*", Ṣalāḥ al-Dīn, *Nūr al-ʿuyūn*, p. 55. This might be an allusion to the demonstrations in Book Ten of Galen's *De usu partium* (*Galen and the Usefulness of the Parts of the Body*, ed. Margaret Tallmadge May, 2 vol. (Ithaca, 1968-69), II, pp. 93-107).

[60] Rahman, *Avicenna's De Anima*, pp. 120-129 (French translation in Bakoš, *Psychologie d'Ibn Sīnā*, pp. 84-91). Avicenna, *ʿUyūn al-ḥikma*, pp. 36-38.

[61] The last sentence reads: "*ammā naḥnu fa-naẓunnu anna al-hawāʾ iḏā kāna šaffāfᵗᵘⁿ bi-l-fiʿl, wa-kānat al-alwān alwānᵃⁿ bi-l-fiʿl, wa-kāna al-baṣar salīmᵃⁿ, lam naḥtaǧǧ ilā wuǧūd šayʾ āḫar fī ḥuṣūl al-ibṣār*", Ṣalāḥ al-Dīn, *Nūr al-ʿuyūn*, p. 72.

[62] While there are some differences in the textual content, both explain the perception of dimensions in terms of width of the visual angle. For Proposition 5 of Euclid's *Optics*, see Kheirandish, *Arabic Version*, p. 15; Burton, "Optics of Euclid", p. 358; Ver Eecke, *Optique*, p. 4. A brief analysis of Avicenna's demonstration is provided in Lindberg, *Theories of Vision*, p. 50.

[63] "[...] *wa-rattaba ḏālika šakl handasī fa-li-hāḏā ḏakartu-hu hunā*", Ṣalāḥ al-Dīn, *Nūr al-ʿuyūn*, p. 72.

- The visible object to be appropriately distant (*ʿalā buʿd muʿtadil*).
- The eye to move appropriately (*ḥaraka muʿtadila*).
- The air to be clean and illuminated (*naqiyy*^{an} *muḍīʾ*^{an}).

Al-bāb al-tāliṯ (p. 76) deals with the magnification of objects in water, and the apparent bending of straight objects in water. The demonstration is based on the different level of density between air (rarer) and water (denser).

Al-bāb al-rābiʿ (pp. 76-77) investigates the reason why a near object is seen far away and a big object is seen small (*al-šayʾ al-qarīb yarā-hu baʿīd*^{an} *wa-l-šayʾ al-kabīr yarā-hu ṣaġīr*^{an}) though the eye is healthy. Also, it explains why transparent objects (*al-šaffāf*) 'return' to whiteness (*yarǧiʿu ilā al-bayāḍ*) when powdered – because of a qualitative alteration.

Al-bāb al-ḫāmis (pp. 77-79) deals with the visual spirit (*al-rūḥ al-bāṣir*). This is the most interesting section, not in terms of contents, but for the sources mentioned. At the beginning, there is an alleged quotation from Ḥunayn's *Kitāb al-ʿašr maqālāt* – called *Kitāb al-ʿayn*[64]. Actually, the passage is nowhere to be found in Meyerhof's edition. Then, there is a quotation from the *Imtiḥān al-kaḥḥālīn* authored by Ibn Aʿyan al-Baṣrī[65]. Finally, a reference to Porphyry (d. ca. 305) by means of a quotation from Nemesius's (4th/5th c.) *De natura hominis*[66].

Conclusive remarks

Based on an in-depth examination of the treatises, trends and patterns with regard to how optics is addressed within the ophthal-

[64] This is how al-Rāzī (d. 313-23 AH/AD 925-35) mentions Ḥunayn's *Kitāb al-ʿašr maqālāt* in his *Al-Ḥāwī fī al-ṭibb* (Meyerhof, *Book of the Ten Treatises*, p. XXIX).

[65] Nothing is known about this physician. His *Imtiḥān al-kaḥḥālīn* is mentioned in *NU* and in Ḫalīfa b. Abī al-Maḥāsin's *Kāfī* (Hirschberg, *History*, II, p. 82, note 242; see also Fuat Sezgin, *GAS*, 9 vol. (Leiden, 1967), III, p. 310). The editors of *NU* correct Ibn Aʿyan al-Baṣrī in Ibn Aʿyun [sic] al-Miṣrī, i.e., Aʿyan ibn Aʿyan (d. 385 AH/AD 995), distinguished oculist of the Fatimid age (Ibn Abī Uṣaybiʿa, *ʿUyūn al-anbāʾ*, 14.13). See Ṣalāḥ al-Dīn, *Nūr al-ʿuyūn*, p. 78. The editors claim that the *Imtiḥān al-kaḥḥālīn* was written by Aʿyan ibn Aʿyan (Ṣalāḥ al-Dīn, *Nūr al-ʿuyūn*, p. 655). In this regard, they refer to Ibn Abī Uṣaybiʿa, though the latter does not mention the *Imtiḥān al-kaḥḥālīn* among Aʿyan ibn Aʿyan's works. He cites, instead, a *Kunnāš* and the *Kitāb fī amrāḍ al-ʿayn wa-mudāwāt*^{i}*-hā*.

[66] Nemesius, *Sulla natura dell'uomo*, trans. Moreno Morani (Salerno, 1982), p. 60. Nemesius is confused with Ġrīġūriyūs, i.e., Gregory of Nyssa (4th c.), whom for centuries had been considered the author of the work (see Ibn al-Nadīm, *Fihrist*, I, p. 255).

mological literature of the Arabic Middle Ages have been identified. First and foremost, the paramount role of Ḥunayn ibn Isḥāq. Transmitting Galen's legacy into the Arabic medical culture, he was instrumental insofar as he systematized a paradigm which was faithfully carried on by the next-generations ophthalmologists[67]. His model settled almost instantly (Ṯābit). By the 5th AH/AD 11th c., it was firmly crystallized especially thanks to the work of ʿAlī b. ʿĪsā. In the 6th AH/AD 12th c., Aristotle's intromissionism started to acquire relevance by means of the integration of Avicenna within the primary sources in the field (al-Ġāfiqī). By the first half of the 7th AH/AD 13th c. (al-Qaysī), the process was in full swing. Until the end of the 8th AH/AD 14th c., the description of the visual process and the classification of visual theories became standardized as the major encyclopaedical works of the age testify (Ḫalīfa, Ibn al-Akfānī, al-Šāḏilī). Within this framework, Ibn al-Nafīs is somewhat different inasmuch as he addressed Euclidean geometrical optics, and provided an unconventional classification of the theories of vision.

All in all, despite minor differences, the approach to vision within the medieval Arabic ophthalmological literature remained unaltered. The established paradigms were respected and faithfully retained throughout the centuries. On the background of this uninterrupted tradition, the uniqueness of *NU* is crystal-clear. Its second *maqāla*, reserved exclusively to optics and visual theories, is unprecedented in terms of overall length, comprehensiveness and arrangement of the contents, reference textual sources. After a concise illustration of the three major *maḏāhib*, the exposition starts with an engaging account on the extramissionist theories of vision molded on the doxographical classification of Ps.-Plutarch's *Placita philosophorum*. Euclidean geometrical optics is dealt with extensively. This is singular, to say the least, insofar as sometimes Euclid is not even mentioned – as in Ḫalīfa's *Kāfī*. The contents for this section are excerpted entirely from the understudied *Manāẓir* by Aḥmad ibn ʿĪsā. Topics are accurately addressed by means of the mathematical method, which combines textual passages and diagrams. After a brief description of the second *maḏhab*, the other major unit deals with Aristotelian intromissionism, i.e., the third *maḏhab*. Here, the contents are derived for the most part from Avicenna's *Kitāb al-šifāʾ* and *ʿUyūn al-ḥikma*. Two elements emerge in this section: on the one hand, the author's perspective,

[67] In his textbook for the *muḥtasib*, Ibn al-Uḫuwwa (d. 729 AH/AD 1329) mentions Ḥunayn's *Kitāb al-ʿašr maqālāt* as the examination book for oculists (Ibn al-Uḫuwwa, *Kitāb al-maʿālim al-kurba fī aḥkām al-ḥisba*, ed. Muḥammad Maḥmūd Šaʿbān and Ṣadīq Aḥmad ʿĪsā al-Muṭīʿī (Cairo, 1976), p. 257).

which is oriented towards the confutation of extramissionism, rather than the description of intromissionism; on the other hand, the primacy of geometry as justifying the presence of the textual unit excerpted from the *ʿUyūn al-ḥikma*. Four brief *abwāb* complete the *maqāla*. While they do not present significant features in terms of contents, they are intriguing with regard to the textual sources mentioned herein – namely, in the fifth *bāb*.

Coherently with the encyclopaedical approach which characterizes the work, the range of topics dealt with the second *maqāla* of *NU* is quite broad. The author's goal is to be thorough and comprehensive in the exposition. His viewpoint is neutral throughout; especially regarding the alternatives on visual theory, he never takes sides, favoring an approach which is *super partes*. The lengthy section on Euclidean geometrical optics is the most intriguing element. While the latter is generally omitted, or barely mentioned, in the ophthalmological literature, *NU* reserves more than half of the second *maqāla* to it. Besides, the topics are dealt with exhaustively. If we exclude the case of Ibn al-Nafīs, whose allusion to Euclidean geometrical optics is brief anyway, this is totally unprecedented. This uniqueness is such so as to entail some kind of explanation. Perhaps, this peculiar inclination towards Euclidean geometrical optics might be explained as a reflex of Abū Zakariyyā's education. Undoubtedly, medicine was his primary concern. He studied to become a physician, he practiced ophthalmology, and his *NU* is primarily a medical work. The use of the threefold classification of the visual theories, rooted within the medieval Arabic medical culture, is exemplary in this regard. At the same time, his unique way of addressing optics, with a major attention reserved to Euclidean geometrical optics, might suggest that he was influenced by another *milieu*, arguably centred around Euclid's texts. As I have tried to demonstrate elsewhere, the Syrian *qāḍī* Ibn Wāṣil (d. 697 AH/AD 1297-8) might well have been instrumental in this regard[68]. As a matter of fact, geometry is pervasive throughout *NU*. We already saw how the inclusion of the textual passage excerpted from Avicenna's *ʿUyūn al-ḥikma* is justified with the geometrical arrangement of the content. The representation of the eye at the end of the first *maqāla* (p. 51) is guided by geometrical principles [Figs. 3-4].

[68] Matteo Pimpinelli, "Can Silence Be Evidence? A Preliminary Assessment on the Author of the *Kitāb Nūr al-ʿUyūn wa-Jāmiʿ al-Funūn*", *Mamlūk Studies Review*, 29 (2026), (forthcoming).

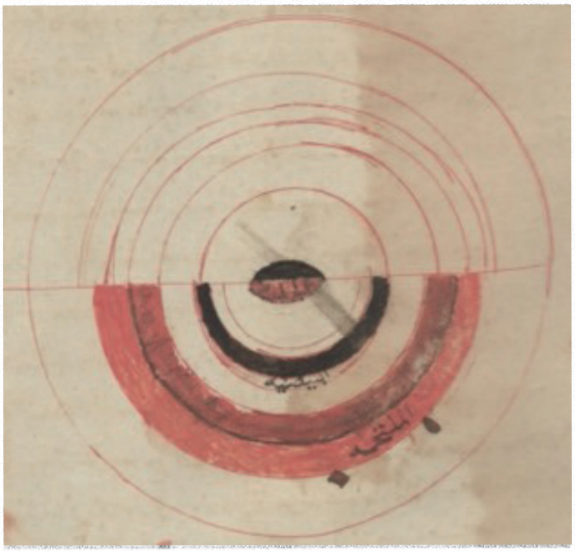

Fig. 3: Berlin, Staatsbibliothek zu Berlin, Orientabteilung, Ms. or. quart. 1141, fol. 14r

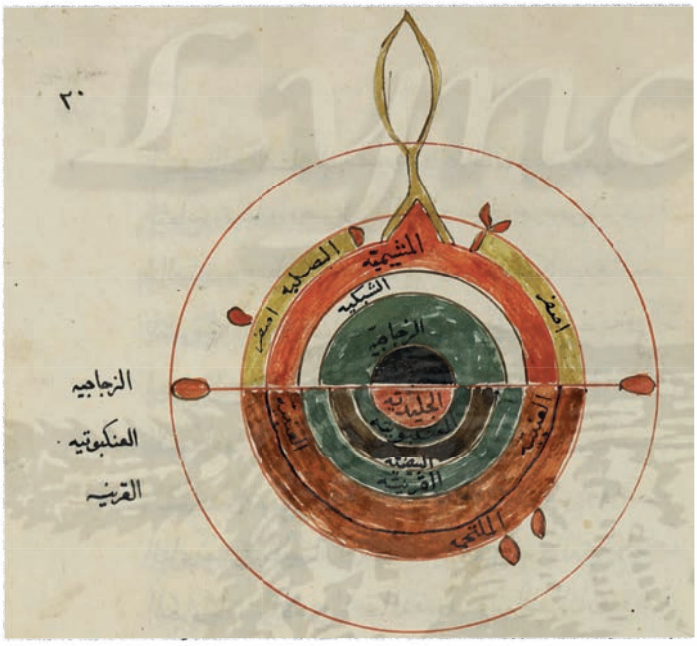

Fig. 4: Roma, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, ms. Or. 47, fol. 22r

Al-bāb al-rābiᶜ ᶜašar of the ninth *maqāla* (pp. 478, 480), mainly excerpted from Aḥmad ibn ᶜĪsā's *Manāẓir*, discusses the topics through the combined use of text and diagram [Fig. 5].

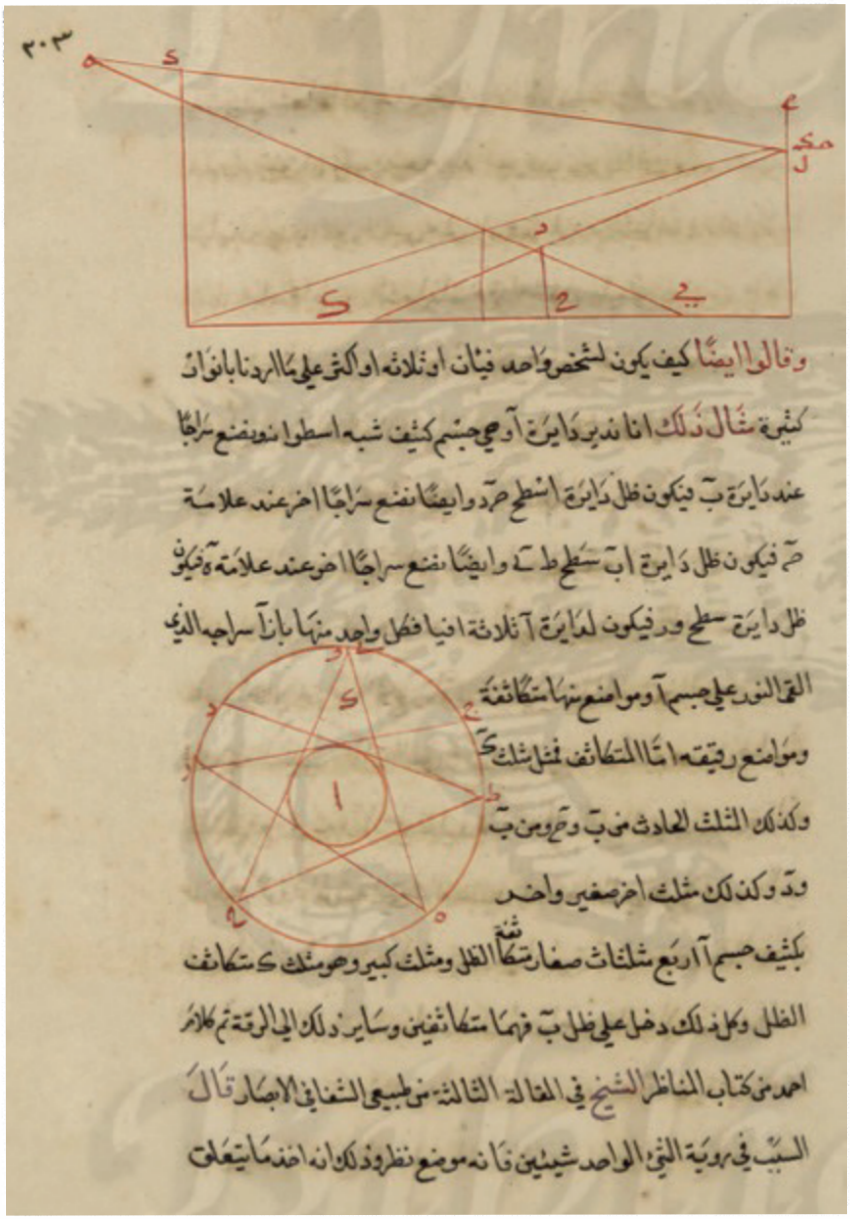

Fig. 5: Roma, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, ms. Or. 47, fol. 205r

The exposition on visual deficiencies (p. 493) is equipped with a geometrical representation which provides a visual summary of the textual contents [Fig. 6].

Fig. 6: Roma, Biblioteca dell'Accademia Nazionale dei Lincei e Corsiniana, ms. Or. 47, fol. 210v

While the relevance of *NU* within the field of medieval Arabic ophthalmology is not that significant, at least in terms of original contributions, the optical content as presented in the second *maqāla* is definitely characteristic insofar as it deserves to be appropriately emphasized as a unique approach to optics and visual theory within this field.

Abstract

Optics, that is, the science of vision as it was understood in Antiquity and the Middle Ages, is an important element in the ophthalmological literature of the Arabic Middle Ages. By means of a thorough analysis of the most representative and renowned ophthalmological works, the main features which shaped the approach to optics within this genre will be described, in the attempt at defining and contextualizing characteristic trends and paradigms. As far as the chronological framework is concerned, a time span extending from the 3rd AH/AD 9th to the middle of the 8th AH/AD 14th c will be considered. Within the group of works examined, major room will be reserved to the *Kitāb nūr al-ʿuyūn wa-ǧāmiʿ al-funūn*. In particular, the analysis will be centred on the second *maqāla*, which deals exclusively with optics and theories of vision. The uniqueness of this *maqāla* will be emphasized in terms of the contents provided, and as a reflex of its author's scholarly education.

AL-ASHRAF ᶜUMAR'S *TABṢIRA*. CHAPTER XXXVI: RAINFALLS, WINDS, AND AGRICULTURAL ACTIVITIES*

RAZIEH S. MOUSAVI** AND PETRA G. SCHMIDL***

1. Introduction

In 13th century Yemen, al-Ashraf ᶜUmar, the future Rasūlid sultan,[1] wrote the *Kitāb al-Tabṣira fī ᶜilm al-nujūm* ('Enlightenment in the science of the stars'), which is preserved in two manuscripts.[2] The treatise deals with astronomical, astrological, prognostic, and related issues, and hitherto defies a clear allocation to a genre of pre-modern scholarly literature such as, e.g., the *zīj*es or the introductions to astrology. Chapter xxxvi of the *Tabṣira* introduces simultaneously three topics: rains, agricultural activities, and winds.[3] These topics also occur in other chapters of al-Ashraf ᶜUmar's treatise, either centrally, as in his almanac (chapter xxxii),[4] or as a side note, e.g., in chapter xxxiv, providing three different prognostic practices, namely interpreting the sighting of rainbows, shooting stars, and of solar or lunar halos.[5] All these chapters cluster in the central part of the

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[1] Schmidl 2024a. The second author is conducting a long-term project on the *Tabṣira*, dedicated to examining its various chapters and themes and the intellectual profile of its author, al-Ashraf ᶜUmar. Further information on the project, including the studied chapters and ongoing parts are already available online at https://tabsira.hypotheses.org/ and will eventually be compiled into a printed volume.

[2] MS Oxford, Bodleian Library, Huntington 233 (henceforth: H); MS Paris, Bibliothèque nationale, arabe 2601.2 (henceforth: P).

[3] In P, however, only the paragraph on the winds is preserved (see the appendix).

[4] For Arabic text, English translation, and study, see Varisco 1994.

[5] For Arabic text, English translation, and study, see Schmidl 2022a.

Tabṣira. There is only one other focus of content of comparable size, located in the initial part of the work, concentrating on astrological basics.[6]

Besides the obvious, that the passing of time results in changing weather and influences agriculture efforts, were there other reasons in the author's worldview that integrated these three topics in chapter xxxvi? Especially, because other seemingly related subjects such as soil conditions and seeding materials are not included here? Do the contents of this chapter and its composition tell more, e.g., about the concept of environment it relies on or on the mechanisms to cope with regularities and irregularities in nature? While Daniel M. Varisco has previously addressed this chapter in passing when investigating in detail chapter xxxii, al-Ashraf ʿUmar's almanac,[7] the objective of this paper is to build upon his contributions by introducing additional thoughts and perspectives. By incorporating a broader range of primary and secondary sources, this paper aims to explore further key questions: Does al-Ashraf ʿUmar restrict himself in this chapter on rains, agricultural activities, and winds mainly to practical aspects of lexicographical descriptions? This is important especially with regard to his evidenced familiarity with the pre-modern Islamicate astronomical and astrological traditions and their meteorological relevance.[8] Amongst others, he refers to the *Kitāb al-Mudkhal ilā ṣināʿat aḥkām al-nujūm* ('The book of the introduction to the craft of astrology') by al-Qabīṣī (fl. late 10th century),[9] and makes use of the *Risāla al-thālitha fī al-asṭrunūmiyā* ('The third epistle on astronomy') by the Ikhwān al-Ṣafāʾ (the Brethren of Purity).[10]

Furthermore, this paper seeks to understand the role and significance of this chapter within the broader context of his extensive treatise and his objectives as a Yemeni prince. After discussing each of the three topics separately, a section is dedicated to investigating chapter xxxvi's relation to other chapters of the *Tabṣira*, and conclude with a discussion on why al-Ashraf ʿUmar might have chosen to discuss these three areas together, beyond their apparent connections, highlighting the significance of seasonal knowledge as the linking

[6] Schmidl 2020a, 225–228 [Arabic text], 228–232 [English translation].

[7] See Varisco 1994, esp. 105–127 for the section on meteorology, 156–202 for agriculture.

[8] For two recent studies on these traditions, see Hullmeine 2024; Borroni 2024.

[9] Chapter iv of the *Tabṣira* is very similar (nearly identical) to parts of Chapter iv of al-Qabīṣī's work. See Schmidl 2022b.

[10] See Schmidl 2023; Arabic text and English translation in Mimura & Ragep 2015. Moreover, chapter xxxvii of the *Tabṣira* gives two values for the longitude of Mecca, one of which attributed to the Brethren of Purity. See Schmidl 2022c.

theme behind a cluster of subjects collected and elaborated in the *Tabṣira*. To complement this analysis, a new, complete edition and English translation of the chapter is also provided.

2. Timings of Annual Rains

Al-Ashraf ʿUmar begins chapter xxxvi by describing the *wasmī*, a significant rain, along with the *walī* rains, which refer to all subsequent rains, and the times of the year when they occur. He also notes two specific dates when the possibility of heavy rain and flooding is greater (see Tab. 1). He had already addressed rain periods earlier and in more detail in his almanac (chapter xxxii), and this discussion appears to be a brief, schematic overview of that earlier treatment. Unlike the almanac, which uses the calendar as a framework for recording various phenomena, here the rain periods serve as key markers throughout the year. The timing of the rains is described with reference to the risings and settings of specific stars or star clusters, this is known as the *anwāʾ* system.[11] Tab. 1 attempts to capture the various factors discussed by al-Ashraf ʿUmar regarding the rains in chapter xxxvi. Hereby, in addition to the stellar indications, the intensity, duration, and impact of the rains, particularly on agricultural crops, are recorded.

Although the passage is concise, the term "Arabs" is mentioned five times in relation to their traditional expressions concerning the timing and quality of seasonal rains, as well as their star lore. This frequent reference to Arab knowledge is common in *anwāʾ* literature and may suggest that early scholars of the Islamicate world organised and adapted pre-Islamic Arabic folklore into their new cosmological framework.[12] While Islamicate literature records numerous names for rains and rain seasons,[13] al-Ashraf ʿUmar seems unconcerned with this literary detail, choosing instead to highlight only the most well-known names,[14] such as *wasmī*, which marks the year's first rain and is responsible for the initial growth of vegetation.[15]

[11] The term *anwāʾ* (singular *nawʾ*) lacks a consensus regarding its meaning and interpretation in the Islamicate tradition. Nevertheless, it is predominantly associated with rains or their timings. For a more detailed exploration of the history and meaning of *anwāʾ*, particularly in relation to the *Tabṣira*, see Schmidl 2024b, 42.

[12] Varisco 1991, esp. 28.

[13] Varisco 2022, 119–120, identifies at least nine distinct names for rain seasons in *anwāʾ* literature, though these were sometimes categorised differently and followed various sequences throughout the year.

[14] In exploring the fragmentary ethnographic traditions preserved among the Bedouins of the Arabian Peninsula, Varisco observes that these communities typically recognise only the rain periods that hold significance for them. Furthermore, the

Tab. 1: Annual time of rains according to al-Ashraf ᶜUmar (chapter xxxvi)

Rain Periods	Stellar Signs	Month	Day(s)	Designation
wasmī of Yemen (the spring rain)	1) Dawn setting of *al-ṣawāb* (the Southern Cross) 2) Rise of *Saᶜd al-suᶜūd* (lunar mansion 24)	*Shubāṭ* (February)	in the middle ten days	The first rain
walī	–	Every rain after *wasmī*		
–	Dawn rising of εζη UMa (?)	–	–	The last rain
–	Dawn rising of Canopus –dawn rising of δ UMa	*Tammūz* (July) 15th – *Āb* (August) 30th		The rainiest time; with occasional floods
The rain of the fifth	Dawn rising of ε UMa	Autumn (*al-kharīf*)		Decrease in rainfall; with light, non-continuous rains; possibility of sudden heavy rain, cold, damage to the crop

As Varisco has noted, the timing of rain in al-Ashraf ᶜUmar's chapter is not entirely consistent with his almanac (chapter xxxii); for instance, the rainiest period ends one month earlier in the latter.[16]

division of the year into various seasonal periods often varies arbitrarily between tribes and regions. See Varisco 1987, 265–266.

[15] *Wasmī* is the most renowned rain mentioned in Arabic almanacs. It was typically regarded as the first rainfall of the year following the hot summer days. The timing of this significant rain could vary across different regions. In Yemen and parts of North Africa, the *wasmī* rain was recognised in the spring, while in the Levant and most of the Arabian Peninsula, it was reported in the fall. As noted in the almanac (chapter xxxii), this rain period was often linked to the star cluster of the Pleiades. It is, however, curious that this connection is not mentioned here. There are still proverbs among the contemporary Bedouins across the Arabian Peninsula about the auspiciousness of the *wasmī* rain and its relationship to the annual appearance of the Pleiades. See Varisco 1987, 261–263; Varisco 2022, 119–122.

[16] Varisco 1994, 107. Following the dominant structure of Arabic texts on seasonal rainfall and the *anwāʾ* tradition, al-Ashraf ᶜUmar aligns his information with the Julian solar calendar, using Syriac month names, which were occasionally referred to as *Rūmī* (lit. Roman, i.e. Greek or Byzantine) in the Islamicate literature. Given that his work predates the Gregorian reform of the Christian calendar, it is important to remember that the dates he mentions require an addition of eight days to match the modern system. See, Varisco 1994, 63–64. Moreover, chapter xxvi of al-Ashraf ᶜUmar's text presents dates from various eras, spanning from 671/1272 to 677/1279,

Yemen, in general, was known to experience two rainy seasons, one major and one minor, which were also discussed in treatises concerned with the effects of monsoons and maritime seasons.[17] Further research is required to compare these textual accounts with historical rainfall data from Yemen's Indian Ocean coast to determine whether they reflect climate changes. This question becomes even more interesting when considering historical narratives that suggest the extent and intensity of the agricultural exploitation in the region under the Rasūlids.[18] While rainfall was generally welcomed for its role in refilling water supplies and irrigating fields, as emphasised in chapter xxxvi, bad rains were also a real concern. These adverse rains could occur at inopportune times, such as after the harvest when crops were stored in underground reservoirs, or they could be problematic due to their intensity, unwanted duration, or the presence of destructive winds.[19] On the other hand, good rains were highly valued in this region, including the belief that they played a role in the formation of pearls in oysters.[20]

The stylistic statements, along with the chronological and analogical methods of recording weather events, are not limited to al-Ashraf ʿUmar's text. The effort to regularise weather phenomena and recognise patterns has roots in ancient cultures. The connection between these phenomena and astral knowledge as a means of systematisation has already been emphasised.[21] Evidence from pre-Islamic poetry and rain prayers on stone inscriptions suggests that the idea of linking the timing of rains to the annual motions of specific stars as a manifestation of divine will was a pagan tradition.[22] Although the

where he specifically marks the start of the Arabic and Persian years as 1 Muḥarram 673/6 or 7 July 1274 and 1 Farwardīn 644 solar Hijra/7 January 1275. While Varisco (1994, 18–19) favours 1271, de Blois (*Taʾrīkh*, 1. Dates and Eras in the Islamic World, in EI², 262b) suggests the period between 1269–1272.

[17] Varisco 1994, 106.

[18] For example, for the narratives highlighting Rasūlids' prosperity through agricultural plans in Zabīd, a coastal city in Yemen, see Sadek, *Zabīd* in EI².

[19] Varisco 1994, 107–108.

[20] For the significance of this belief in the Gulf region, see Varisco 2022, 122.

[21] For instance, for classical and near-eastern societies, see Lehoux 2007; for Islamicate societies, see Varisco 1987.

[22] For stone inscriptions, see Al-Jallad 2016. For pre-Islamic Arabic poetry, see Sinai 2019, 27–30, esp. 29. For the reflection of these traditions in the Islamicate *anwāʾ* literature, see Varisco 1991, 21–25. Al-Azmeh 2014, 184–188, cautions that the associations between celestial bodies and natural phenomena in pre-Islamic Arabia were primarily sacred tools to determine the cyclical timing of rituals and divine presence, and should not be generalised to suggest the existence of a cosmic cult.

theological foundation of these practices was significantly changed by the spread of the Islamic faith, many practical aspects, such as the belief in astral indications for rain periods, continued to persist in Islamicate societies.[23] While stars and asterisms served as convenient memory aids for the public to expect and prepare for upcoming weather events, their imprecise nature and lack of adaptability to temporal and spatial changes have been subjects of considerable scholarly debate in the past. The eleventh-century Muslim polymath al-Bīrūnī, in his seminal work *Kitāb al-Āthār al-bāqiya ʿan al-qurūn al-khāliya* ('The book of the remaining vestiges of past centuries'), mainly known as *The chronology of ancient nations*, criticised the poems cited in *anwāʾ* treatises for being outdated with regard to celestial motions, even as he quotes several examples and acknowledges their original accuracy.[24] A few centuries earlier, the renowned astrologer Abū Maʿshar in Baghdad addressed a group of anti-astrology scholars who rejected any link between the annual motions of stars and seasonal changes and argued against their views.[25]

The methods of predicting weather phenomena are abundant and manifold in pre-modern societies which has led to various approaches to studying them in modern times. Predicting rain is one major task of weather forecasting that can be understood, as with other prognostic practices, as a procedure that interprets signs.[26] Most recently, the second author has treated this question from the viewpoint of the signs applied to predict the weather.[27] According to her, the methods can be divided into two major branches, one that relies on sub-lunar signs such as the behaviour of animals, and one that is based on supra-lunar signs, in particular the Sun and the Moon. While the former fell outside the celestial modellable motions, rendering their predictability more uncertain and ambiguous, the latter can be subdivided again into

[23] On the origin of *anwāʾ* in the Islamicate tradition, see Varisco 1991; see also n. 11. On the pre-Islamic practices of collective praying for rain, known in the Islamicate tradition as *istisqāʾ*, see Fahd, *Istisḳāʾ*, in EI². *Istisqāʾ* prayers, performed to request rain during times of drought, remain a common practice in Muslim countries today. For an example, see Varisco 2022, 122. Also, Varisco 1994, 159 observes that *istisqāʾ* in today's Yemen is mostly accompanied by sacrificing an animal. For a historiographical account on the various interpretations of rain-requesting rituals in contemporary Muslim societies, see Becker et al. 2024, 118–119.

[24] Al-Bīrūnī (Sachau) 1923, 336–341.

[25] Burnett 2002, 208.

[26] For more information, see Burnett 2021; Burnett 2004.

[27] Schmidl 2024b, 39–43.

two sections according to the role allotted to the celestial bodies.[28] In one tradition that can be characterised as astrological, the position of the Sun, Moon, and planets in relation to each other and to the zodiacal signs and other reference systems, inform about the weather, a link between sign and predication denoted 'alterreferential' by Knut Graw and Kelly E. Hayes.[29] In the other, that one might call the astronomical tradition and is employed by al-Ashraf ʿUmar in chapter xxxvi, the yearly motions here in particular of the Sun and Moon along the zodiacal circle serve as a time base; emphasis lies on the observation of their heavenly motions that help in explaining regularities and irregularities in nature such as weather periods, winds, and rain patterns, and in organising dependant activities such as agriculture, tax collecting, and seafaring, thereby integrating closely with calendrical systems.

The cited chapter is part of a volume dedicated to the comprehensive study of meteorological phenomena in the medieval world. In the introduction, Beate Fricke and Andreas Lammer highlight, with examples, how pre-modern understanding of weather was deeply intertwined within a broader cosmological framework. They emphasise that changes in one natural process could not be fully understood without considering its connections to others, whether visible or invisible.[30]

The connection between astral motions and weather phenomena, including rainfall, was common in ancient cultures and later also appeared in Islamicate sources.[31] To illustrate some of the traditions that influenced Islamicate scientific culture, Hesiod's *Works and Days* in Greek is particularly noteworthy. This stylistic approach was also adopted in Greek educational poems, frequently incorporating quasi-formulaic expressions.[32] An ancient public method for informing people about upcoming weather, known as *parapegmata*, involved tracking cyclical phenomena using a movable peg or pegs, often referencing established scientific authorities. These tools were typically used for public and administrative purposes, as evidenced by their presence as inscribed in stones. However, the notion of a direct causal link between astronomical events and meteorological phenom-

[28] Schmidl 2021, 537.

[29] Oral communication with Knut Graw May 2024; see also Graw & Hayes in press.

[30] Fricke & Lammer 2024, esp. 1–8.

[31] For some astro-meteorological knowledge in Sasanian and Syriac sources and their reflections into Islamicate astrological tradition, see Pingree 1975.

[32] For further information, see Zatta 2023; Taub 2003, 56–58.

ena implied by this method led to strong critical views.[33] Fragmentary knowledge of *parapegmata* can be also found in the Arabic textual tradition.[34]

In their effort to classify surviving medieval documents on weather prediction, Gerrit Bos and Charles Burnett proposed a classification system that distinguishes between four general categories based on different methodological approaches: 1) weather signs, such as lightning, comets, and specific animal behaviours; 2) tracking annual changes based on the rising and setting of celestial bodies, as witnessed in *parapegmata* and *anwāʾ* literature; 3) divination practices, like scapulimancy; 4) meteorological knowledge, considered the most scientific tradition, which is further divided into two subcategories: theoretical, rational explanations versus practical, rule-based methods.[35] According to this classification, al-Ashraf ʿUmar's chapter xxxvi would primarily fall into the second category, though elements of the first and third categories are also present in his other chapters.[36]

Al-Ashraf ʿUmar's focus on the *anwāʾ* tradition, in this chapter, when treating the annual rainfall plotting, highlights the importance of its connection to agricultural activities, which are discussed immediately afterwards. His avoidance of mentioning meteorological, divinatory, and non-astral signs raises questions about the theoretical considerations behind agricultural management in response to seasonal changes. Stellar indicators seem to be the most accessible and desirable for al-Ashraf ʿUmar's audience involved in agriculture, acting as a link between farming tasks and the timing of rain periods. His concise and distinct account of the different types of rain, in comparison to his almanac (chapter xxxii), suggests an intent to reframe

[33] In contrast to Aristotle, Geminos (fl. 1st century BCE), in his *Introduction to Astronomy*, offers detailed explanations rejecting such a causal connection. According to him, astronomical movements serve as indicators rather than direct causes of meteorological conditions. This perspective seems paradoxical to the inclusion of the *parapegmata* concept in his work. Ptolemy, in his *Phaseis*, also utilises *parapegmata* but advises caution when relying on earlier observations, emphasising the importance of considering geographical information to ensure their applicability. See Taub, 2003, 25–33.

[34] For instance, some materiel of Ptolemy's *Phaseis* is traceable in the Arabic tradition, both on the *parapegmata* concept and the influence of rising and setting of stars on the weather forecast. See Samsó 1976.

[35] Bos & Burnett 2000, 3–10.

[36] For divinatory methods, see chapter xxxiv (Schmidl 2022a), and for weather signs, see chapter xxxv (Schmidl 2024b).

the traditionally pastoral-focused *anwāʾ* tradition of the early Arabs into a chronology more suited to agricultural practices.[37]

3. A Chronology of Agricultural Activities

After introducing the annual occurrence of rains, al-Ashraf ʿUmar turns to agricultural activities, the times of planting and harvesting, entailing and influencing the times of tax collection. They have to happen at a specific period of the year and vary only slightly due to varying weather conditions. Although al-Ashraf ʿUmar provides more detailed and extensive information about agricultural activities and a wider variety of cereals, pulses, vegetables, etc. in his monograph on agriculture, entitled *Milḥ al-malāḥa* (?) *fī maʿrifat al-filāḥa* ('The flavour of elegance within the agricultural knowledge') as well as in the almanac of the *Tabṣira* (chapter xxxii), studied in-depth by Varisco,[38] chapter xxxvi is limited to only five major crops and some of their varieties: sorghum, wheat, barley, peas, and emmer (see Tab. 2). The reason for distinguishing these grains might be that they were the staple foods of the people.[39] The 13th-century pilgrim to Mecca, Ibn al-Mujāwir, who also passed through Yemen during his journey, mentioned the variety of these grains in the common people's diet and the different types of bread made from them.[40] The agricultural and horticultural significance in the 13th-century Islamicate period, in general, and specifically among the Rasūlids of Yemen, has been highlighted in previous studies.[41] The royal gardens were not only a part of the luxurious and elite life of the Rasūlid court but they also showed a keen interest in introducing new plants into Yemen, particularly from India and their eastern neighbours.[42]

[37] The pastoral bias inherent in the *anwāʾ* knowledge is noted by Varisco 1987, 264.

[38] For more information on *Milḥ al-malāḥa*, see Varisco 2010; also Schmidl 2020b, 171. As mentioned above, Varisco 1994 has studied the whole almanac (chapter xxxii) of the *Tabṣira*. For the agricultural part, see 156–202. References to related subjects are given in the translation notes of this study.

[39] Varisco 1994, 165 notes that sorghum was the dominant grain in Yemen. For the early history of sorghum in the Islamicate world, see Watson 1983, 9–14.

[40] Smith 2008, 12.

[41] For the orchard history and its royal significance in the Islamicate societies, especially in Andalusia, see Naficy et al., *Būstān* in EI^2; al-Shihabi et al., *Filāḥa* in EI^2. For the Rasūlids, see Varisco 1994, 156–157, 164, 181.

[42] Varisco 1994, 156–157; Watson 1983, 117–119 explains that although economic and political reasons inspired interest in new crops, cultural motivation, including what he referred to as a "love of plants", also played a significant role. For a recent informative discussion on "invasive science" in relation to the openness to new species in landscapes, see Fall 2021.

Al-Ashraf ʿUmar's text is not the only agricultural treatise written during this period; the interest of other courtiers in this field is evident from the surviving works.[43] As historical studies emphasise, it was not only the plants themselves that were transferred to new locations but also the knowledge and cultural elements associated with them.[44] The presence of biodiversity in one region can indicate the complexity of pharmacological knowledge and the dietary practices of a region's inhabitants.[45] One of the key factors in the acclimatisation of plants, especially tropical ones, was creating suitable soil moisture conditions, which required the development of artificial irrigation systems along with the knowledge of rainfall patterns. Irrigation machinery not only enabled agriculture in larger areas but also made crop cultivations more resilient to weather fluctuations.[46] Yemen had a history of agriculture linked to state-controlled water management structures even before Islam.[47] Another advantage of advancing irrigation technology was the ability to extend the use of arable land and reduce fallow periods.[48] Al-Ashraf ʿUmar's text also references the existence of spring and winter planting seasons.

In addition to the designated times for planting and harvesting crops, another important point stressed, in this text, is the consideration of the various climatic regions within Yemen. Historical records related to tax collection indicate that, along with ports that paid commercial taxes, agricultural lands were categorised into coastal and highland areas, so that tax-collecting timing and amounts could be adjusted according to their environmental and weather character-

[43] For Rasūlids' agricultural texts, see Varisco 1989. An updated version is published online in 2011 at http://www.filaha.org/medieval_agricultural.html (accessed on 16 August 2024).

[44] For an overarching study on the diffusion of crops in the early Islamicate world, see Watson 1983, esp. 91–98, 129–136. Watson's theory of "green revolution" in the early Islamicate economy, though widely accepted today, has stimulated numerous critical and responsive studies, primarily questioning the regional evidence, detailed information, and aspects of his methodology. For a critical perspective, see Decker 2009. For an overview of criticisms, see Davies 2023.

[45] Decker 2024, 471–472.

[46] Watson 1983, 103–111.

[47] For a recent study on the rain-fed and irrigated agriculture of South Arabian kingdom of Himyar in the sixth century CE and the possible impact of climatic and environmental changes on their decline, see Haldon & Fleitmann 2024. For a comprehensive study of the history of water engineering and management in Yemen, see Hehmeyer 2019, particularly Part II, entitled "The city of Zabid (founded 820 CE) and its agricultural hinterland before the first Ottoman conquest in 1539".

[48] Watson 1983, 103–111.

istics.[49] The Rasūlids had a systematic tax administration, inherited mostly from the Ayyubids of Egypt.[50] Agricultural and irrigation matters were managed by those in power. The need for a task calendar to schedule farm activities was emphasised as early as in the *Filāḥa al-Nabaṭiyya* ('Nabatean agriculture') by Ibn Waḥshiyya (c. 10th century).[51] Like al-Ashraf ʿUmar's almanac (chapter xxxii), this treatise organised activities on a month-by-month basis. However, in chapter xxxvi of the *Tabṣira*, the emphasis shifts, implying that activities dictate the timing. For al-Ashraf ʿUmar, the initial planting period was referred to as "The Ten Select Days" at the end of April and the beginning of May. Varisco suggests that limiting this period to ten days was most likely rooted in theories and tradition.[52] It is plausible that scheduling the sequence of planting different crops across various regions was practised more flexibly (see Tab. 2).

Al-Ashraf ʿUmar's agricultural knowledge, while continuing the tradition of earlier Arabic texts on agriculture, is much more limited in scope compared to the encyclopaedic nature of the *filāḥa* literature, which was so broad that they even included magic and talismans, as attested in the *Filāḥa al-Nabaṭiyya*.[53] The author of the *Tabṣira* does not even use the term *filāḥa*, instead referring separately to farming (*zirāʿa*) and harvesting (*ḥiṣād*) practices.[54] The legal and tax issues related to agricultural works may have led to a certain degree of rationalisation in the documented knowledge.[55] In contrast to the section

[49] These three fiscal regions are explained in Varisco 1994, 159.

[50] Frantz-Murphy 1986. Cited also in Varisco 1994, 159.

[51] Several candidates have already been identified for sourcing in the *Filāḥa al-Nabaṭiyya*. On agricultural knowledge there is a strong similarity to the fifth-century treatise by Vindanius Anatolius of Beirut. See further discussions in Hämeen-Anttila 2006, 52–61. Fahd 2002 has explored specific examples from Ibn Waḥshiyya's task calendar, highlighting their similarities to the agricultural knowledge in *Geoponica*.

[52] Varisco 1994, 158–159.

[53] Varisco 1994, 158–159 has also underlined this point in al-Ashraf ʿUmar's agricultural knowledge. For a discussion on the magical notes in the *Filāḥa al-Nabaṭiyya*, see Hämeen-Anttila 2006, 7-8, 88, 183–193.

[54] On the usage of the term *zarʿ* vs. *filāḥa* in the Islamicate agricultural literature, see al-Shihabi et al., *Filāḥa* in EI^2.

[55] Morony 2002, xv–xxvii also stresses that the translated agricultural knowledge from neighbouring cultures during the early Islamicate centuries may have contributed to the development of a theoretical and rational foundation for this discipline.

Tab. 2: Agricultural activities in chapter xxxvi of al-Ashraf ʿUmar's *Tabṣira*

Activity	Time
Respective planting of: 1) red sorghum in the mountains and (other) cold locations, 2) white sorghum called *shurayjī* (?) in temperate regions, and 3) white sorghum called *raʾīsī* in the valleys and other hot regions	Within "The Ten Select Days", i.e., five of Nīsān (April) plus five of *Ayyār* (May)
First planting of sorghum, harvesting of winter crop in the cold regions	*Ādhār* (March) 15th
Last planting of sorghum in the hot regions in the valleys, first planting of wheat	*Ayyār* (May) 28th
Respective planting of: 1) wheat and barley, 2) Ethiopian wheat and *wasnī* (wheat) together in the temperate regions, 3) *wasnī* in the valleys and hot places, and emmer and *julubbān* (green pea)	"The Last Ten (Select) Days" of *Ḥazīrān* (June)
Last planting of wheat	Mid *Tammūz* (July)
Parching for the early cropping in the mountains	Rising of the star γ UMa
First harvest of wheat and barley	Mid *Aylūl* (September) / the Sun enters Libra
First harvest of sorghum	Mid *Tishrīn al-awwal* (October) / the Sun in Scorpio
Planting early spring wheat in extremely cold regions	"The Days of the Old Woman", i.e., at the rising of *Saʿd al-akhbiya* (lunar mansion 25)
First planting of winter crop	Mid *Kānūn al-awwal* (December)

on rain, where the timing was primarily determined by the rising and setting of stars, this section on agricultural activities is predominantly set to Syriac months (i.e., [Eastern] Roman), although knowledge of the *anwāʾ* still appears (see Tab. 2). In the Islamicate literature, there was a close connection between *anwāʾ* and agriculture. One of the earliest Arabic botanical dictionaries was written by Abū Ḥanīfa al-Dīnawarī (d. before 290/903), who had a strong interest in recording the Bedouins' oral knowledge of plant names; he also authored a significant work on *anwāʾ*. Although both books are written in an

encyclopaedic style,[56] they emphasise the importance of local knowledge in chronology and agriculture and their relevance.

Nevertheless, the brief text of chapter xxxvi does not help us understand how the specialisation and market-oriented nature of agriculture, which was a prominent feature in the early thirteenth-century Islamicate world, are reflected in al-Ashraf ʿUmar's work. Varisco has previously underlined that Yemen's cash crops are absent from their surviving almanacs.[57] Nonetheless, the focus of the *Tabṣira*'s chapter xxxvi on sorghum and its varieties—a valuable grain and staple food in Yemen, with even its stalks used as camel fodder[58]— might reflect the author's courtly concerns.

4. The Winds

In the concluding section of chapter xxxvi, al-Ashraf ʿUmar introduces the winds and their respective directions, described according to the cardinal points rather than by the risings and settings of stars, as is common in folk astronomical traditions. This part of the text is even more theoretical and traditional in tone in comparison to the previous discussions on rain and agriculture. Al-Ashraf ʿUmar not only enumerates various winds traditionally recognised by name, but also references a Qurʾānic verse to emphasise the destructive potential of wind as ordained by God. Additionally, he acknowledges at the outset that the types and names of the winds are far more numerous than the fourteen well-known ones he mentions.

Knowledge about winds is dispersed across various surviving sources from the Islamicate world, including *anwāʾ* texts, lexicographical works, poetry, and meteorological treatises. These sources provide a plethora of names used to classify winds based on their effects, characteristics, and directions, often without regard for geographical constraints.[59] In addition to listing wind categories, both in chapter xxxvi and in his almanac (chapter xxxii),[60] al-Ashraf ʿUmar includes a graphic representation of the winds in the former. Despite

[56] Bauer 1988, 61.

[57] Varisco 1994, 157. On the concept of cash crops and a high demand for them across Islamicate societies by the first half of the thirteenth century, see Liedl & Feldbauer 2017, 112–115.

[58] Varisco 1994, 167.

[59] Forcada, *Rīḥ* in EI^2.

[60] See Varisco 1994, 111–117, for a detailed study of the winds in al-Ashraf ʿUmar's almanac (chapter xxxii). Chapter xxxiii of the *Tabṣira* also includes descriptions of three winds: the *khamsīn* wind and 'The Pollinating Winds' (*al-riyāḥ al-lawāqiḥ*) not occurring in chapter xxxvi, while the *samūm* does in the diagram. See section 5 in the present study.

many of the names and directions being consistent between the two systems, there is no reference to the diagram within the text,[61] and no effort seems to have been made to harmonise them thoroughly. In fact, they appear to be contradictory at certain points. As illustrated in Tab. 3, the textual information is selective and based on multiple criteria compared to the diagram. However, the most significant difference is the twelve divisions in the wind diagram versus al-Ashraf ʿUmar's explicit mention of fourteen types of winds. This discrepancy could be explained when considering the similarities between this chapter, even in its wording, and the discussion of the winds by the Ikhwān al-Ṣafāʾ.[62] While al-Ashraf ʿUmar's borrowing lacks the detailed meteorological focus of his source, the resemblance is hard to deny. Like the Ikhwān, six main wind directions are considered in the *Tabṣira*: four corresponding to the cardinal points, plus updraught and downdraught winds,[63] which are understandably absent in his two-dimensional diagram that only shows the cardinal winds and eight non-cardinal (*nakbāʾ*) ones (see Tab. 3).[64] Al-Ashraf ʿUmar agrees with the Ikhwān in naming the upward and downward winds, but in ignoring to name the eight secondary winds, he deviates from them and provides more details in his text and diagram. Nonetheless, the slight difference between twelve and fourteen types of winds is not well-supported in the *Tabṣira*, as the *ṣarṣar* wind, described as a downdraught wind, occupies the position of the southwest-by-south wind (referred to as right-to-the-south wind in the *Tabṣira*).[65]

As noted earlier (see Introduction), al-Ashraf ʿUmar's reliance on the work of the Ikhwān is not without precedent. However, it is worth noting that their discussion of the winds does not include any visual representations. Wind diagrams, particularly in the form of a wind compass or the more commonly known wind-rose, were prevalent in

[61] There is an additional sentence at the end of the text and before the diagram in P, reading as "this is its detailed table (*jadwalu-hā bi-l-tafṣīl*)".

[62] Baffioni (ed. and trans.) 2013, 209–211 (Arabic text), 199–200 (English translation).

[63] Al-Bīrūnī addresses the inconsistency in *anwāʾ* texts regarding the number of wind directions, noting the preference for the model with four winds as the more commonly accepted approach over the one with six winds. He then illustrates both systems within a single diagram, depicting them as two concentric circles. His six-wind model includes two additional oblique diameters in the direction of winter and summer risings and settings of the Sun. See al-Bīrūnī (Sachau) 1923, 339–341.

[64] It is also possible if one alternatively translates "from top to bottom" in the context of the diagram's position within the text. This visual approach would be consistent with the case of the *ṣarṣar* wind, located at the top right of the wind-rose.

[65] Note that Varisco 1994, 112 has modernised the directional references differently.

ancient literature and later in the Islamicate texts. One of the most renowned wind-roses was that of Aristotle, which arranged his twelve winds according to the observer's horizon.[66] While some of his followers viewed wind directions as linear, others considered the zone of the winds. These two approaches can be inferred from the diagrams in H and P, which otherwise are similar in many respects.[67] In H, the two main lines for the four cardinal directions are drawn parallel and perpendicular to the dimensions of the folio, while in P, there seems to be an effort to align the north and south wind (triangular) zones with the top and bottom edges of the reader's view by rotating the lines accordingly.[68]

In contrast to the Ikhwān and the dominant *anwāʾ* tradition, al-Ashraf ʿUmar's chapter does not include any cosmic markers for the winds.[69] More interestingly, there is no direct reference to the winds as

[66] Some Greek followers of Aristotle regarded his wind-rose as a geographical map, linked to a gazetteer. This approach reached its peak in Ptolemy's *Geography*, where the directions of the winds are linked to his mathematically projected map of the inhabited world. For further information, see Bowen 2020, esp. 3–8. For another pre-Islamic well-received wind-rose, see Isidore, bishop of Seville (560–636)'s text and diagram in Isidore of Seville (Faith & Kendall) 2016, 162–168 (English translation), 234–238 (commentary).

[67] For information of the manuscripts, see n. 2. P contains two errors in the reading of wind names (*qabūr* instead of *qabūl*; *al-ṣarṣar* instead of *al-baḥr* [?]). For the *baḥr* wind, see n. 49 in the appendix. Although both manuscripts use different colours for their diagrams, the choices for black-inked winds are not consistent between them. Additionally, the three circles in P's wind-rose are double-lined, with a larger inner circle, though blank like that of H. It is noteworthy that al-Bīrūnī's wind diagram, for example, has no free space at the intersection point of the diameters at the centre of his wind-rose. See al-Bīrūnī (Sachau) 1923, 341. In Greek and Latin tradition, the inner circle of the wind-rose was sometimes filled with certain inscriptions or a human head. See for instance, Isidore of Seville's wind-rose in the form of a twelve-petaled flower around a human head in Isidore of Seville (Kendall & Faith) 2016, 164 (diagram), 236 (commentary).

[68] As if we rotate the diagram of the manuscript H (see Appendix) 15 degrees clockwise.

[69] The Ikhwān al-Ṣafāʾ discuss the direction of the fourteen winds immediately after stressing the significance of the twenty-eight lunar mansions and their influence on the air. See Baffioni (ed. and trans.) 2013, 206–208 (Arabic text), 197–199 (English translation). Al-Bīrūnī's account of *anwāʾ* tradition includes a close connection between rains, winds, and lunar mansions, each spanned 13 degrees along the zodiac. See al-Bīrūnī (Sachau) 1923, 339–340. Al-Masʿūdī (de Goeje) 1893, 17 begins his discussion of the winds by mentioning two distinct approaches to naming and determining the direction of the four main winds. In the first system, the north and south directions are identified in relation to the Pole Star (α UMi–*judayy al-farqadayn*) and Canopus (*suhayl*), rather than the cardinal directions. However, the second system, attributed to the Arabs and others, relies on the literal meanings of the winds, imagining a person facing east (towards the *qabūl*/*ṣabā* wind), with their back to the

bringers of rain; instead, the chapter highlights the disastrous aspect of the winds by recalling the fate of the people of ᶜĀd, who were punished by divine wrath, along with other Qurʾānic terms for destructive winds. Although there is a mention of the *janūb* wind blowing as a sign of harvest time, no other agricultural significance is attributed to the winds in this chapter. The importance of winds in agricultural tradition, however, extended beyond their role in bringing rain. For instance, the *Filāḥa al-Nabaṭiyya* warns of the diseases that winds can carry to farmers by passing over undesirable lands, crops, and swamps. It advises farmers to build their huts on hills and elevated locations to benefit from healthy winds, among other advantages.[70]

Unlike the *Tabṣira*'s chapter xxxvi, in many Arabic texts, the term *maṭlaᶜ* (rising), commonly used to refer to the rising points of heavenly bodies, was also applied to wind gates.[71] This term made its way into Islamic legal texts due to the importance of the *qibla* (the direction to the Kaᶜba in Mecca) for Muslim societies and its influence on geographical and navigational works. These texts often linked wind patterns with the direction of the Kaᶜba, leading to various interpretations.[72] Wind associations in historical texts vary considerably, with some linking winds to the walls or corners of the Kaᶜba, while others relate them to its directional orientation.[73] In al-Ashraf ᶜUmar's present chapter, the only apparent link between winds and the *qibla* is positioning of the *qibla* chapter immediately after the one on winds.[74] Although both chapters include diagrams divided into

west (*dabūr* wind), their left side to the north (*shamāl*), and their right side to the south (*janūb*). See the explanation in Varisco 1994, 111–112 regarding the *Yamanī* winds in the *Tabṣira* according to this approach without using al-Masᶜūdī's text. For further examples, see Schmidl 1999.

[70] Fahd 2002, 172–173.

[71] King, *al-Maṭlaᶜ* in EI².

[72] David A. King has studied this tradition in depth. For a brief introduction along with interesting examples of such maps and diagrams, see King 1999; King & Lorch 1992.

[73] Some sources even connect the rectangular shape of the Kaᶜba with astronomical alignments and wind directions, contributing to the broader genre of "sacred geography". This literature focuses on the Kaᶜba and divides surrounding cities based on their positions and *qibla* orientation relative to Mecca. It integrates not only wind directions but also astronomical events such as sunrises and sunsets. See King 1999; King & Lorch 1992; King, *al-Maṭlaᶜ* in EI². Also, Schmidl 1999; Schmidl 2022c.

[74] Only a few surviving examples of *qibla* schemes include orientation by the winds, e.g., in the eleventh chapter of the *Tuḥfat al-rāghib wa-turfat al-ṭālib fī tasyīr al-nayyirayn wa-ḥarakāt al-kawākib* ('The book of the curiosity of the demanding and the rarity of the requesting on the revolutions of the two luminaries and the motions of

twelve sections—one for winds and the other for place-names around the Kaʿba to determine their *qiblas*—al-Ashraf ʿUmar does not explicitly mention any further connection.[75]

Regarding meteorological knowledge, chapter xxxvi is concise, merely mentioning in passing, seemingly following the Ikhwān, that wind is generated by the motion of air. Although this is a simple explanation, it touches on a significant topic in pre-modern meteorology.[76]

As noted in the *Tabṣira*, winds were particularly important for sea navigation.[77] Surviving texts by Muslim navigators, especially those by Ibn al-Mājid and al-Mahrī (c. 16th century), reveal that sailors in the Indian Ocean recognised four cardinal winds and their related divisions.[78] These works show that the basic principles of ocean navigation at the time were based on understanding the cycles of waves, tides, and winds. Notably, the monsoon season in the Indian Ocean was understood as having close relation to the timing of specific winds and their astral markers.[79] However, al-Ashraf ʿUmar's mention of the closure of sea travel due to the meeting of opposing winds relies on calendrical indicators rather than astronomical signs.[80]

the planets') written in the second half of the 13th century by Muḥammad b. Abī Bakr al-Fārisī (d. 1278–79 [?]), who was closely related to the court of the second Rasūlid sultan, al-Muẓaffar Yūsuf (d. 1295), the father of al-Ashraf ʿUmar. His instructions how to orient oneself regarding the cardinal winds are based on wind schemes that define the limits of the winds again by the rising and setting of stars and asterisms. See Schmidl 2007, 342–358 (Arabic text and German translation).

[75] This could be comprehended as common knowledge that did not require explicit reference. For a similar observation for *qibla* schemes, see Schmidl 2022c, 92, n. 63.

[76] According to Aristotle, wind is not just moving air but a dry exhalation that the Sun's heat dissolves from the earth. This concept generated much debate among later scholars. Al-Kindī described wind as air heated by the Sun and moving towards cooler areas, where it becomes compressed. Ibn Sīnā aligned with Aristotle in asserting that wind consists of dry, smoky exhalation, but he also offered a different explanation. For a review of some of these theories within the Islamicate tradition, see Lettinck 1999, 22–23.

[77] For sailing seasons and navigation knowledge in the *Tabṣira*'s almanac (chapter xxxii), see Varisco 1994, 220–231.

[78] The common tradition of wind-rose (compass rose) in the Islamicate tradition was based on 32 divisions, called *khann* ('rhumb') according to the coordinates of certain stars, also related to the wind directions. For further information, see Grosset-Grange & Rouquette 1996, 207–208; Salimi & Staples 2019, 400–401.

[79] For instance, see the *ʿAjā'ib al-Hind* from the tenth century in Shafiq 2013, 92–94.

[80] In maritime literature, the time of the sea travel closure is usually from early June to mid August, earlier than the timing mentioned in the *Tabṣira*. See Grosset-Grange & Rouquette 1996, 231; Salimi & Staples 2019, 453. The closed season was assigned to the strength of the southwest monsoon (*kaws* wind) which is mentioned in

This paper echoes Varisco's perspective that since most of the wind names and related knowledge in the *Tabṣira* are not locally updated, they are unlikely to be of practical use to farmers, except for perhaps the most prominent names.[81] Moreover, Varisco's anthropological research in the Arab Gulf shows that while many of these wind names and their astral markers still exist within local communities, they are now rarely used as seasonal indicators, particularly during the crucial fishing season.[82] The present study shows that, while there are significant similarities between the textual and graphic information on winds in the *Tabṣira* and the Ikhwān's accounts, this comparison also highlights the malleability of this knowledge as it circulated within the Islamicate world.[83]

Tab. 3: The winds in chapter xxxvi of al-Ashraf ʿUmar's *Tabṣira*

Diagram (starts from the east point, continues counter-clockwise)			
Direction	Name	Alternative	Measure
SE by E	*samūm*	-	non-cardinal
E	*ṣabā*	*qabūl*	cardinal
NE by E	*ʿāsif*	-	non-cardinal
NE by N	-	*ṣabā*	non-cardinal
N	*shamāl*	-	cardinal
NW by N	*ʿaqīm*	-	non-cardinal
NW by W	*ʿāsif*		non-cardinal
W	*dabūr*	-	cardinal
SW by W	*baḥr* (?)	-	non-cardinal
SW by S	*ṣarṣar*	-	non-cardinal
S	*janūb*		cardinal
SE by S	*nakbāʾ*	-	non-cardinal
Text (the order of the winds within the text is followed here as much as possible)			
Direction	Name	Alternative	Measure / Quality
E	*ṣabā*	*qabūl*	cardinal
W	*dabūr*	-	cardinal
S	*yamanī*	*janūb*	cardinal; called *barām*

al-Ashraf ʿUmar's almanac (chapter xxxii) as *dīmānī*. This wind was said to blow along the coast of Africa from September to November (Varisco 1994, 114). It is noteworthy that while the *ʿAjāʾib al-Hind* contains valuable information on the history of Indian Ocean navigation, it only briefly mentions the closure period. See Shafiq 2013, 93.

[81] Varisco 1994, 112.

[82] Varisco 2022, 86–90.

[83] For illustrative examples, see n. 32 & 33 in the translation notes in the appendix.

			(*mirām/marām*?) among farmers (as harvest marker); blows from *Tishrīn al-awwal* (October) and becomes stronger from *Tishrīn al-thānī* (November) 6th
N	*jirbiyāʾ*	*shamāl*	cardinal
up-draught	*zawābiʿ*	-	-
down-draught	*ṣarṣar*	-	-
-	*sawāhik*	-	intense wind
-	*rāmisā dhāriyāt ṣarṣar*	-	winds that are watered by dust
	ʿawāṣif zaʿāziʿ	-	cold, sterile winds; the winds of (divine) punishment
-	*nasīm*	-	good, soft, and gentle wind
between east and north	*ʿāṣif* (pl. *ʿawāṣif*)	-	their abundance is from *Tishrīn al-thānī* (November) 23rd, when they coincide with *baḥr* (?) and *janūb* winds, causing the "closure of the sea"

5. A Cluster of Knowledge

Chapter xxxvi of the *Tabṣira* is embedded in chapters, that contribute to a cluster of very specific and well-established knowledge, starting in chapter xxx with timekeeping by the lunar mansions, sidetracked by chapter xxxi on elections, then moving into an almanac in chapter xxxii, complemented by a glossary to the almanac in chapter xxxiii, turning into prognostic practices by means of celestial and atmospheric phenomena in chapter xxxiv, then delving into weather forecasting and price prediction in chapter xxxv, next incorporating a terrestrial viewpoint in chapter xxxvii on *qibla* directions, and finally focusing on more almanac related material in chapters xxxviii and xxxix. In the following, some of the significant points in the adjacent chapters are mentioned to support this paper's suggestion regarding their epistemological links in the form of a cluster of knowledge in al-Ashraf ʿUmar's agenda.

Chapter xxxii, an almanac, extensively deals with rains, agricultural activities, and winds. Varisco, who edited, translated and studied this text carefully in 1994, lays the focus of his study on the Arabic sources. This chapter is grounded in its Yemeni context.

Chapter xxxiii, as specified in its heading, is closely related to chapter xxxii and explain terms used in it. It touches therefore all three topics dealt with, rain, agricultural activities, and winds. Of the three

different rains it explains, only the *wasmī* rain also appears in chapter xxxvi:

مطر الربيع هو أوّل مطر يقع في الشام فيسمّونه الوسمي عندهم أي أوّل مطر يسم الأرض وهو باليمن يقع في أيّام حصاد الغلّة في غير أوقات المطر في بعض أيّام .

> "The Spring Rain" (*maṭar al-rabīᶜ*), the first rain that falls in Syria, where it is called *al-wasmī* among them, this being the first rain that marks the ground. In Yemen in some years this occurs during the days of the crop harvest outside the times for rain.[84]

Many important subjects related to agriculture mentioned in chapter xxxiii, including the time when the dates turning yellow or the pasturing time of the horses, do not occur in chapter xxxvi. Two of three winds are neither mentioned in chapter xxxvi:

الرياح البوارح هي الريح الصيفية وهي ريح السموم تأتي من الشمال أوّلها من وقت طلوع الثريّا معـ[ـه] إلى وقت طلوع الجبهة معه أيضاً لكلّ منزل وغرة وبارح فأوّلها في السادس عشر من أيّار تشتدّ في أواخره وآخرها في السابع عشر من آب.

> The *Bawāriḥ* winds, a summer wind, which is the *samūm* wind coming from the north, its beginning is from the time of the rising of the Pleiades with it until the time of the rising of *al-jabha* also with (dawn). Every lunar station (*manzil*) (between these) has heat (*waghra*) and oppressive wind (*bāriḥ*). Its beginning is at sixteenth of *Ayyār*, intensifying by its last (days), and its end is at the seventeenth of Āb.[85]

Chapter xxxiv introduces three different prognostic practices that differ, obviously, not only by the phenomena they rely on, but also in their predictions. As signs of the future, the first interprets the occurrence of a rainbow in one of the (Eastern) Roman, or Syriac months, the second relates the appearance of shooting stars with the zodiacal signs, and the third uses the sighting of halos around the Sun or Moon. In the predictions, rain figures most prominently in the first practice, where its amount is specified several times, while the second only twice mentions the lack of rain, and the third plenty of it only once. Although no concrete agricultural activities feature, the rainbow prognostics refer very generally to plenty of crops, increasing beasts, and reducing sheep.[86]

[84] H, fol. 110a, 4–5. English translation by the authors.
[85] H, fol. 111b, 4–7. English translation by the authors.
[86] This chapter has been studied in Schmidl 2022a.

In chapter xxxv, al-Ashraf ʿUmar merges two prognostic practices, forecasting weather and predicting prices, both times by astrological means. The first sentence states:

قال ابن نوبخت إذا أردت عزز الماء والمطر فانظر عند نزول الشمس أوّل درجة من برج الثور فإن كانت الزهرة وعطارد شرقيين دلّ على توقّف الأمطار وإن كانا غربيين دلّ على كثرة الأمطار.

> Ibn Nawbakht 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.[87]

That the Sun does not serve as a time base as in chapter xxxvi, becomes even more clear in the statements that follow in chapter xxxv interpreting the position of the Sun, Moon, and planets to learn about the quantity and quality of rain, e.g., Venus and Jupiter indicating abundance of rain, and Saturn pointing to "destructive, not constructive rain that people are drowned in".[88] Once again agricultural activities and winds do not appear.

Chapter xxxvii includes two page-filling circular schemes, different to the wind scheme in chapter xxxvi. The one in the final part relates lunar mansions, zodiacal signs, seasons, and cardinal directions, while the one in the initial part presents a *qibla* scheme. As mentioned above, this procedure, widely preserved in the pre-modern Islamicate sources, allows finding the direction towards the Kaʿba in Mecca from different localities by simple and approximate means, mainly by making use of the rising, culminating, or setting of stars and groups of stars to position oneself towards the Kaʿba in Mecca, as in the *Tabṣira*.[89]

Chapter xxxviii provides twelve paragraphs, one for each of the (Eastern) Roman months. A first look on the text shows material that deals in the beginning with topics also to be found in almanacs, as in chapter xxxii, e.g., the solar position in the zodiac, rains and winds. The final part of each paragraph includes elections, an astrological practice that informs if a moment in time is appropriate or inappropriate for an activity.[90]

Chapter xxxix comprises two parts, the second unrelated to the topic discussed here, a table that lists for every day of the lunar month,

[87] This chapter has been studied in Schmidl 2024b. For the Arabic and English translation of the quoted passage, see 56–57.

[88] Schmidl 2024b, 60–61.

[89] This chapter has been studied in Schmidl 2022c.

[90] H, fol. 117b–119a.

i.e., the lunar phases, if bloodletting will cause an illness, when the Moon is waxing, and stop it when it is waning. The first part consists of four paragraphs, one for each season, and is organised, as far as one can tell after a brief sifting, parallel to chapter xxxviii, beginning with basic astronomical and calendrical data and continuing with elections.[91]

6. Conclusion

Inspecting the above accounts in conjunction with the topics discussed in chapter xxxvi—namely, rains, agricultural activities, and winds—we can further appreciate the rationale for merging these subjects into a single chapter. As we saw, the section on rain within this chapter requires a clear distinction between the description of rain and its prediction. Forecasting rain can be considered a central theme within what Arabic sources refer to as "the science of atmospheric phenomena" (*ʿilm aḥdāth al-jaww*), sometimes also called "the science of rain" (*ʿilm fī l-maṭar* [or: *fī l-amṭār*]) or, more broadly, "the science of celestial effects" (*ʿilm al-āthār al-ʿulwiyya*). This approach reveals three intertwined traditions, which are also reflected in the *Tabṣira*'s treatment of rains: one interpreting sublunar signs, as seen in chapter xxxiv, and two relying on supra-lunar signs. In the first case, the Sun, Moon, and stars *dictate* their yearly rhythm, primarily in chapters xxxii and xxxiii, as well as chapter xxxviii. In the second case, not only the Sun, Moon, and planets but also various astronomical-astrological reference points and systems—such as the vernal equinox or the houses—are linked to weather forecasting, as explored in chapter xxxv. These different epistemological layers in dealing with natural phenomena are also apparent when discussing agricultural activities, albeit less distinctly. Regarding winds, the separation becomes even more pronounced, possibly due to the uncertain and irregular nature of the phenomenon, which leads to the exclusion of predictive tools.

Furthermore, the discussion of the winds in this chapter appears to be more supplementary, theoretical, and rooted in a different method of reasoning and structure. This feature may relate to the interconnection between this part and the subsequent chapter on *qibla* directions and geographical divisions in the Islamicate tradition. Although winds are briefly mentioned as important factors in agriculture, the relative independence of the wind section in chapter xxxvi could also explain why P includes only this part of the chapter. Despite these observa-

[91] For a study on this chapter, see Schmidl 2012.

tions, it cannot be ruled out that the inclusion of these three subjects in a single chapter might just be the result of copying from a source that had already integrated these three topics. As the preface of al-Ashraf ʿUmar's *Tabṣira* indicates, the author's goal seems to have been to assemble a collection of existing works, either as *topos* or, as the final result suggests, a *vade mecum* probably designed to assist users with administrative and state duties.[92]

By closely examining the content of the adjacent chapters surrounding chapter xxxvi, it is proposed here that the subjects covered belong to a broader epistemic framework. This network of themes reflects a scientific endeavour to connect the regularity and predictability of astral motions in the supra-lunar realm with the relatively chaotic atmospheric phenomena beneath the sphere of the Moon, extending further to the terrestrial realm, its spatial organisation, cultivation cycles, and the well-being of living creatures. The significance of the Moon, its phases, and its role in inspiring and guiding this cluster of knowledge cannot be overstated. Drawing on the work of Daniel M. Varisco, this interconnected cluster of themes is referred to here as "seasonal knowledge." Although the Islamicate scientific tradition inherited the concept of four seasons based on equinoctial and solstitial points from other cultures, as articulated by Ibn Qutayba in the ninth century, the Arabs had a more complex understanding of seasonal periods, adapted to local environmental changes and astral indicators visible above their horizon.[93]

This nuanced understanding of seasonal models, which could not be fully addressed by calendar calculators, gave rise to a rich body of literature in the Islamicate world, with the *anwāʾ* genre at its core. The arrangement of material in the *Tabṣira* exemplifies this cluster of knowledge. Among all the chapters within this compilation, chapter xxxvi stands out by clearly embodying this epistemic value, serving as a meeting point for three interconnected subjects—showcasing the intricate dependence of knowledge on stars, calendars, weather patterns including rains and winds, and agricultural processes and practices. As cited above, Beate Fricke and Andreas Lammer eloquently emphasised the interconnection of broader concepts in understanding meteorological phenomena in the Medieval world. Building on this, the present study on al-Ashraf ʿUmar's *Tabṣira* shows that beyond meteorological discussions, weather events, environmental features, and aspects of health and nutrition were deeply

[92] Schmidl 2020b, 188.

[93] For an English translation of this passage along with comments, see Varisco 2022, 95–96.

embedded in a more complex cosmological framework. This framework extended beyond philosophical literacy and was integral to the worldview of the time. It was aimed here to further underline that recognising this intricate perspective of the connexion between heavenly and earthly changes, intertwined with religious doctrines concerning divine will, is vital for studies examining the interactions between societies and environmental changes, as well as their resilience and responses to natural hazards within the context of an Islamicate society in the pre-modern world.

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Appendix: Arabic Text and English Translation

The following part presents the Arabic text and facing English translation of chapter xxxvi in al-Ashraf ʿUmar's *Kitāb al-Tabṣira fī ʿilm al-nujūm* (fol. 115a,17–116a,24 in manuscript H: Oxford, Bodleian Library, Huntington 233; manuscript P: Paris, Bibliothèque nationale de France, arabe 2601.2. The latter only comprises the second part, H, 116a,3–24, in P,118b,5–119b [after the wind scheme] but provides subsequent to it an additional part in P,119b,2–120a,3). Folios of H are given in angular brackets < >, paragraphs numbered in square brackets [ ]. In the Arabic text *hamza*, *madda*, *shadda*, and diacritical points have been silently added. In H, the caption of the chapter and some words at the beginning of paragraphs 5, 9, 10, 12 and 13 are written in red. In the English translation, words in parentheses ( ) have been inserted to assist the flow of the text.

[١] البـــاب السادس والثلثون في معرفة أوقات الأمطار وأوقات الزراعة ومعرفة مهابّ الرياح وأسمائها وأصنافها .

[٢] أمّا أوقات الأمطار فإنّ أوّل وقت وقوع المطر مع نوء سقوط أنجم الصواب مع طلوع الفجر وذلك في العشر الوسطا من شباط ويسمّى مطر الربيع ووسمي اليمني وكلّ مطر يقع بعد الوسمي يقال له مطر الولي ∴ وآخر أوقات المطر المعهود إنّه مع طلوع الثلثة الأخرى من بنات نعش الكبرى مع الفجر لأنّ نجوم الصواب مخالفة لبنات نعش . أوّل أوقات المطر مع سقوط أنجم الصواب مع الفجر وبنات نعش أوقاتها مع طلوعها مع الفجر .

[٣] ونهاية غزر[1] الأمطار ما بين طلوع سهيل وهو في الخامس عشر من تمّوز وبين طلوع الرابع من بنات نعش وطلوعه في الثلثين من آب فالعرب تقول « إذا طلع سهيل فإيـ[ـئـ]ـس [؟] بسيل <H,115b> بعد سيل » وذلك لتواتر الغزر[2] العظيم ما بينه وبين طلوع الرابع . وتقول العرب « إذا صفّت الأربعة وكي الزرع[3] على ما معه » وعرف الشارح مربّعه يزيد نصفا الأربعة حين بيانها كلّها وقت الفجر وذلك قريب من طلوع الخامس .

[٤] فحينئذ قد خفت الأمطار بل يقع وقت طلوع الخامس المطر الغزير وليس مديم كإدامته في أوقات طلوع الأربعة بل يرتفع سرعةً [؟] بمشيئة الله عزّ وجلّ .

[1] Or عزز ? Cf. Schmidl 2024a, 56 reading عزّ and عزز and translating "abundance" and "abundant", respectively, also H,114b writing عز and عزز, respectively.

[2] See n. 1 (Arabic text).

[3] H corrects الزارع to الزراع or vice versa (?).

[1] The thirty-sixth chapter on the knowledge of the times of the rains and the times of farming, and (on) the knowledge of the directions of the winds, their names, and their kinds.

[2] As for the times of rains, the first time for the occurrence of rain is at the *nawʾ* of the setting of the stars of (the constellation) *al-ṣawāb* at the break of dawn.[1] This occurs in the middle ten days of *Shubāṭ* (February), and is called "The Spring Rain" (*maṭar al-rabīʿ*) and "The *Wasmī* (Rain)" of Yemen. To every rain that falls after the *Wasmī* (Rain) is said "The *Walī* Rain".∴ The end of the periods of the usual rain (occurs) with the rising of the three last (stars) in Ursa Major (εζη UMa) at (the break of) dawn,[2] because the stars of (the constellation) *al-ṣawāb* are opposite to Ursa Major.[3] The first periods (of the usual rain occur) with the setting of *al-ṣawāb* at (the break of) dawn, (while) the periods (of the usual rain occur) with the rising of Ursa Major at (the break of) dawn.[4]

[3] The limit of abundant rain is (in the period) that is between the rising of Canopus (*suhayl*; α Carinae) (at the break of dawn)[5] – it is at the fifteenth of *Tammūz* (July) – and the rising of the fourth (star) in Ursa Major (δ UMa) (at the break of dawn); its rising is at the thirtieth of *Āb* (August). The Arabs say: "When Canopus rises, despair of flood <H,115b> after flood".[6] This is due to the persistence of the great abundance (of rain in the period) that is between (the rise of Canopus) and the rise of the fourth (star [δ UMa]).[7] The Arabs say: "When the four (stars [αβδγ UMa]) are lined up, the (young standing) crop is tied to whatever is with it".[8] The commentator knows the square (of Ursa Major);[9] half of (its) four (stars) increases (at the moment) when they all become distinguishable (at) the time of dawn. This is close to the rise of the fifth (star [ε UMa]).

[4] At that time, the rain has diminished. Instead, sometimes the abundant rain falls (together with) the rising of the fifth (star [ε UMa]).[10] It is not as continuous rains, as it is with the rising of the four (stars [αβγδ UMa]). Instead, it increases its speed (as) God's will, Powerful and Majestic.

فالعرب تقول « مطرة الخامس تردّ الخريف تاعس » . وتريد العرب بقولها « وكي الزرع[4] على ما معه » وذلك لما يتخوّفونه من شدّة الغزر[5] ووقوع البرد وشدّة الهواء العاصف في وقت المطر فيصرع[6] الزرع على وجه الأرض فيتلف وينكسر ويضعف سنابله غاية إذ هذا الوقت وقت ظهورها . وما قد ظهر منها سقط لشدّة الهواء والعواصف في وقت المطر . والمعهود إنّما بقي بعد طلوع الخامس إلا أمطار خفيفة غير مديمة ولا غزيرة بل كأمطار أوّل السنة كما تقدّم ذكرها في شباط مع طلوع سعد السعود و سمّته العرب سعد السعود لتيمّنها به لما يعهدونه من المطر وقت طلوعه .

[٥] وأمّا أوقات الزراعة فاعلم إنّ أوّل أوقات زراعة الذرة والبرّ والشعير والعتر والعلس والحصاد لذلك وزراعة القياض وحصاده في الأعمال الجبلية والمخلافية ومعظم ذلك في العشر المختارة وهي خمس من نيسان وخمس من أيّار . وسمّيت مختارة للزراعة فيها زراعة الذرة البيضاء المسمّاة بالـ [ـشـ] ـريجي[7] [؟] في المواضع المعتدلة ، وقبلها بالرئيسي في الأودية والمواضع الحارّة . فأوّل زراعة المواضع الباردة في منتصف آذار في خامس عشر منه مع وقت وحصاد القياض وآخر زراعة المواضع الحـ[ـا]رّة في الأودية في أواخر أيّار في الثامن[8] والعشرين منه مع أوّل زراعة البرّ.

[4] H writes الزراع .

[5] See n. 1 (Arabic text).

[6] H writes فيصرح .

[7] H writes مالب نحى .

[8] H writes الثالث .

The Arabs say: "The rain of the fifth (star [ε UMa]) makes the autumn miserable".[11] (Concerning what) the Arabs want by their saying "The (young standing) crop is tied to whatever is with it". This is because they fear for the intensity of the abundant (rain), the occurrence of cold, and the intensity of stormy weather (*al-hawāʾ al-ʿāṣif*) at the time of (this) rain.[12] The (young standing) crop is thrown down on the earth's surface,[13] while their ears become ruined, broken, and weaken to a great extent, since this time is the time of their appearance. What (already) has appeared from them falls due to the intensity of the weather and the stormy winds (*al-ʿawāṣif*) at the time of (this) rain.[14] The well-known (issue) is that after the rise of the fifth (star [ε UMa]) only remains light, non-continuous rain, (but) not abundant (rains).[15] Instead (it is), as previously mentioned, rather like the rains at the beginning of the year in the (month) *Shubāṭ* (February, that comes) with the rise of (the lunar mansion) *Saʿd al-suʿūd* (at the break of dawn). The Arabs call it *Saʿd al-suʿūd* (lit. the "Luck of Lucks") due to the auspiciousness (of this mansion), on account of the rain that they (usually) receive at the time of its rising.

[5] As for the farming times. Know that the first times for planting sorghum,[16] wheat,[17] barley, (sweet) pea,[18] and emmer,[19] as well as (those) for harvesting them, for planting winter crop and harvesting it in the mountain and highland districts, most of these (agricultural activities) are in "The Ten Select (Days)",[20] which are five (days) of *Nīsān* (April) and five (days) of *Ayyār* (May). They are called "(The Ten) Select (Days)" because of the farming in this (time), namely, the planting of white sorghum called *shurayjī* (?) in temperate regions.[21] Before that, the planting of red sorghum in the mountains and (other) cold regions,[22] and after that, the planting of white sorghum called *raʾīsī* in the valleys and (other) hot regions.[23] The first planting (of sorghum) in the cold regions is in the middle of *Ādhār* (March), on its fifteenth (day and together) with the harvesting of the winter crop. The last planting (of sorghum) in the hot regions in the valleys is at the end of *Ayyār* (May), on its twenty-eighth (day and together) with the first planting of wheat.[24]

[٦] ومختار أوقات زراعة البرّ والشعير العشرة الأيّام الأخرى من حزيران فيها زراعة البرّ الحبشي والوسني معاً في المواضع المعتدلة وقبلها زراعة البرّ العربي والشعير وأوّل الحبشي في الجبال والمواضع الباردة جدّاً وبعدها يزرع الوسني في الأودية والمواضع الحارّة والعلس والعتر أيضاً وهو الجلبان وأوّل زراعة البرّ في الثامن والعشرين من أيّار وآخر زراعته[9] في منتصف تمّوز .

[٧] وأمّا وجود الفريك فأوّل وجوده من طلوع ثالث بنات نعش في الجبال من المقادم [انت] ـه [ى] .

[٨] وأوّل حصاد البرّ والشعير من منتصف أيلول أوّلاً فأوّلاً وأوّل حصاد الذرة من منتصف تشرين الأوّل أوّلاً فأوّلاً ومختار أوقات زراعة الدثاء في مواضعه في أيّام العجوز يوم نوء طلوع سعد الأخبية في المواضع الباردة جداً وبعدها آخر زراعته وذلك إذا تأخّر المطر .

[٩] وأوقات الحصاد أوّل حصاد البرّ <H,116a> والشعير منذ حلول الشمس أوّل الميزان أوّلاً فأوّلاً على حكم توالي مزارعه كما تقدّم ذكره وأوّل حصاد الذرة منذ حلول الشمس العقرب أوّلاً فأوّلاً على حكم زراعتها كما تقدّم ذكرها وأوّل زراعة القياض من نصف كانون الأوّل وأوّل حصاده مع أوّل زراعة الذرة في نصف آذار .

[9] H corrects زارعته .

[6] The select times for planting wheat and barley are the last ten days of *Ḥazīrān* (June). At (this time) the planting of Ethiopian wheat and *wasnī* (wheat occurs) together in the temperate regions.[25] Before that is the planting of Arabic wheat and barley and the first (planting) of Ethiopian wheat in the mountains and extremely cold regions.[26] After that, the *wasnī* (wheat) is planted in the valleys and the hot places, as well as emmer and pea, which is *julubbān* (green pea).[27] The first planting of wheat is on the twenty-eighth (day) of *Ayyār* (May), its last planting in the middle of *Tammūz* (July).

[7] As for the existence of parching, it exists first amongst the early cropping in the mountains (in the period) from the rising of the third (star) in Ursa Major (γ UMa) – e(nd).[28]

[8] The first harvest of wheat and barley, step by step, is (in the period starting) from the middle of *Aylūl* (September); the first harvest of sorghum, step by step, is (in the period starting) from the middle of *Tishrīn al-awwal* (October). The select times for planting early spring wheat in its regions is during "The Days of the Old Woman" (*ayyām al-ʿajūz*),[29] (i.e.) at the *nawʾ* for the rising of (the lunar mansion) *Saʿd al-akhbiya* in extremely cold regions. After that is the end of its planting, when the rain is delayed.

[9] The harvesting times. The first harvest of wheat <H,116a> and barley, step by step, is since the halt of the Sun in the first (degree) of Libra according to the sequence of planting, as previously mentioned. The first harvest of sorghum, step by step, is since the halt of the Sun in Scorpio, according to its (sequence of) planting, as previously mentioned. The first planting of winter crop is from mid *Kānūn al-awwal* (December), and its first harvest, together with the first planting of sorghum is in mid *Ādhār* (March).

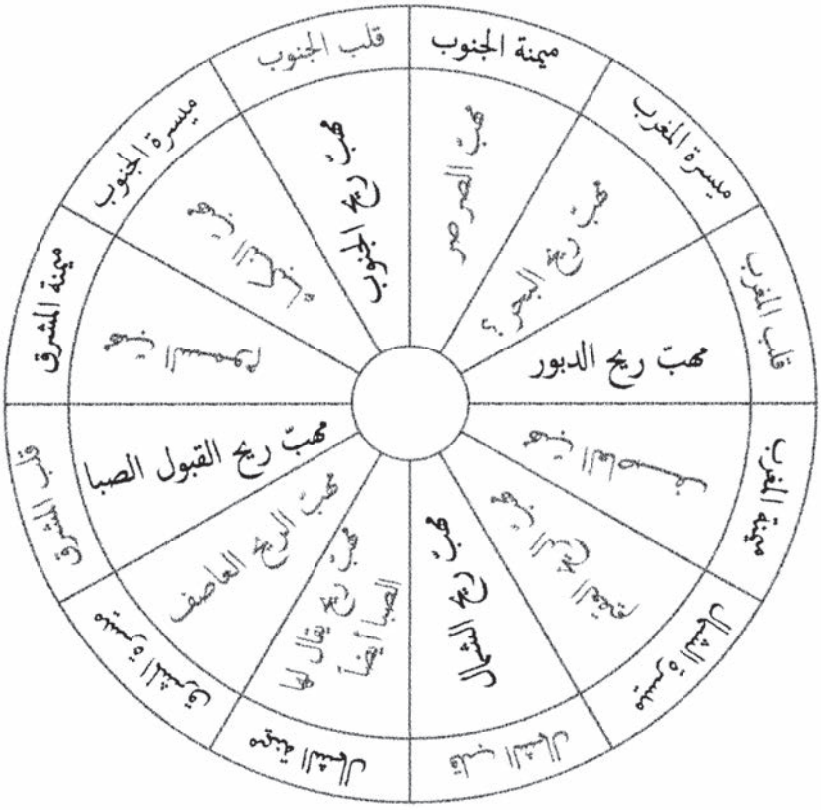
[١٠] وأمّا مهابّ الرياح وأسمائها وأصنافها وتصاريفها وجهاتها اعلم أيّدك الله أنّ الرياح كثيرة التصاريف في الجهات ولكنّ جملتها أربعة عشر نوعاً المعروف منها عند جمهور الناس أربع وهي · الصبا · والدبور · والجربياء · واليمني · وذلك الهواء إذا تموج من المشرق إلى المغرب سمّي ذلك التموج ريح الصبا والقبول أيضاً . وإذا تموج من المغرب إلى المشرق سمّي ذلك التموج الدبور . وإذا تموج من الجنوب إلى الشمال سمّي ذلك التموج اليمني[10] والجنوب أيضاً . وإذا تموج من الشمال إلى الجنوب سمّي[11] ذلك التموج الجربياء[12] وريح الشمال .

[١١] وأمّا ما كان بين هذه الجهات فيسمّى الريح النكباء وهي ثمانية أنواع . وأمّا التي تهبّ من أسفل إلى فوق فمنها يكون الزوابع . وأمّا التي تهبّ من فوق إلى أسفل فمنها كانت ريح الصرصر التي أهلكت عاداً ثمانية أيّام بلياليها كما قال الله عزّ وجلّ ﴿ سَخَّرَهَا عَلَيْهِمْ سَبْعَ لَيَالٍ وَثَمَٰنِيَةَ أَيَّامٍ حُسُومًا فَتَرَى ٱلْقَوْمَ فِيهَا صَرْعَىٰ ﴾ ويقال للريح الشدّة[13] السواهك والتي تسقى بالتراب الرامسات والذاريات[14] والصرصر ويقال للريح الباردة العقيم وهي ريح العذاب ومنها العواصف والزعازع[15] . والنسيم الريح الطيّبة الليّنة اللطيفة ∴ ومهبّ ريح العاصف ما بين المشرق والشمال وكلّ ريح من ناحية المغرب يقال لها الدبور .

[10] H writes (؟) السمى .
[11] H repeats.
[12] H writes الجربيا .
[13] P writes الشديدة .
[14] H writes والذازيات .
[15] H writes والرعازع .

[10] As for the directions of the winds, their names, their kinds, their changes, and their directions. Know, may God support you, that the winds are (subject to) many directions, but in their total, there are fourteen kinds, of which four are known to the general people, namely the *ṣabā*,[30] the *dabūr*,[31] the *jirbiyāʾ*,[32] and the *Yamanī*.[33] When the air flows from east to west, that flow is called the wind *ṣabā* and the *qabūl* as well.[34] When it flows from west to east, that flow is called the *dabūr*. If it flows from south to north, that flow is called the *Yamanī* and the south (wind; *al-janūb*) as well. If it flows from north to south, this flow is called the *jirbiyāʾ* and the north (wind; *al-shamāl*) (as well).[35]

[11] As for what is between these directions, it is called non-cardinal (*nakbāʾ*) wind,[36] and it is of eight kinds. Among those that blow up-draught is the *zawābiʿ* (winds).[37] Among those that blow down-draught, is the *ṣarṣar* wind that destroyed ʿĀd during eight days and nights, as God Powerful and Majestic says: "He let loose on them for seven nights and eight successive days: you might have seen them lying [dead as though they had been hollow trunks of palm-trees]".[38] To the intense wind is said *sawāhik*.[39] Those (winds) that are imbibed with dust are the *rāmisāt*,[40] the *dhāriyāt*,[41] and the *ṣarṣar*.[42] Among the cold, sterile winds,[43] i.e., the winds of punishment, are the *ʿawāṣif* (winds) and the *zaʿāziʿ* (winds).[44] The *nasīm*[45] is the good, soft, and gentle wind. The *ʿāṣif* (wind)[46] blows between east and north, and every wind from the west is called *dabūr*.[47]



[١٢] ووقت مهبّ ريح الجنوب من تشرين الأوّل وقويها[16] [؟] منذ السادس من تشرين[17] الثاني وتسمّى عند الزارعين[18] برام يقولون « إذا هرّت برام زكى الطعام » وذلك نهاية خضرته [؟] وأوّل بنّيته [؟] .

[١٣] وأمّا انغلاق البحر وكثرة العواصف فيه فمنذ الثالث والعشرين من تشرين الثاني وذلك لاتّفاق ريح الجنوب بريح البحر فتضطرب الريح بعضها ببعض غير آخذة[19] إلى[20] جهة واحدة فلا تمشي سفينة فيه على سوية والله أعلم .

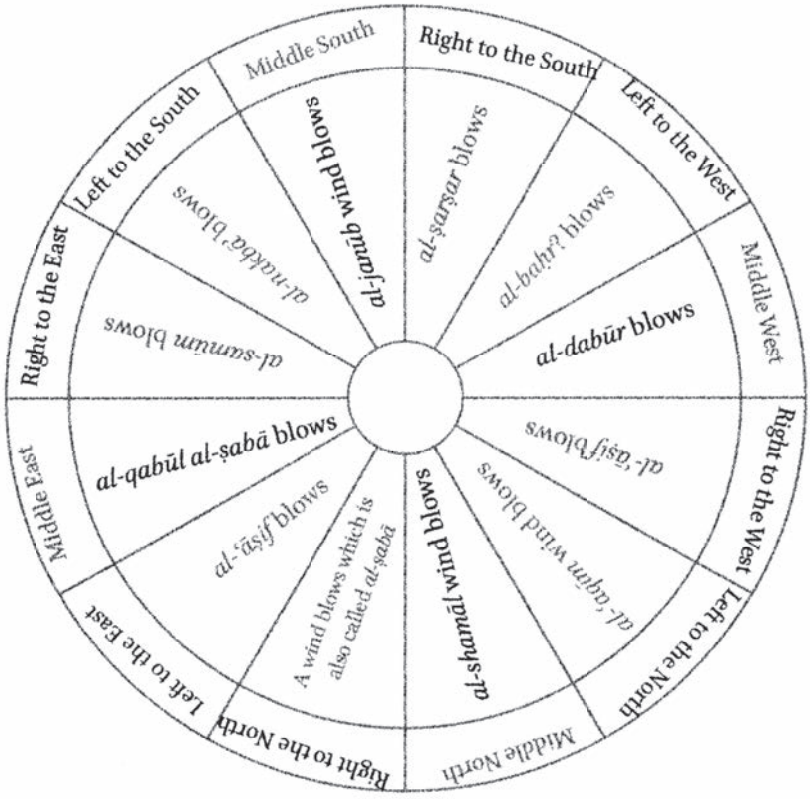
[16] P writes قومها .

[17] H rather writes شدسن .

[18] Or الزراعين ?

[19] H writes اخذه .

[20] H repeats.



[12] The time of the blowing of the *janūb* wind is from *Tishrīn al-awwal* (October). (The wind) becomes stronger since the sixth (day) of *Tishrīn al-thānī* (November). Among the farmers, it is called "*barām*". They say: "When the *barām* (wind) howls, the sorghum (lit. "the food") thrives".[48] That is the limit of its green and the beginning of its brown (colour).

[13] As for the closure of the sea and the abundance of storms (*al-ʿawāṣif*) in (this period). It is since the twenty-third (day) of *Tishrīn al-thānī* (November). This is because of the concurrence of the wind *janūb* with the onshore wind (lit. "wind of the sea"; *rīḥ al-baḥr* [?]).[49] The winds disturb each other, not taking one direction, so that a ship cannot move in it on a straight line. And God knows best.

Translation notes:

[1] I.e., the Southern Cross (αβγδ Cru). See Neuhäuser et al. forthcoming.

[2] The constellation *banāt naᶜsh al-kubrā* is considered to consist of three stars forming "The Daughters" (εζη UMa) and four "The Bier" (αβγδ UMa; cf. Kunitzsch 1961, 48, n. 55); cf. also, Varisco 1994, 242, n. 4: "the bier of Ursa Major [...] constitute an important marker for the autumn season in Yemeni folklore". For the sake of simplicity, *banāt naᶜsh al-kubrā* is referred to as Ursa Major in this translation.

[3] For the constellation *al-ṣawāb*, see n. 1 (English translation); for the constellation *banāt naᶜsh al-kubrā*, see n. 2 (English translation).

[4] For the constellation *banāt naᶜsh al-kubrā*, see n. 2 (English translation).

[5] For the constellation *banāt naᶜsh al-kubrā*, see n. 2 (English translation); in chapter xxxii, al-Ashraf ᶜUmar numbers the stars in this constellation (Varisco 1994, 98 and passim); concerning "it is at the fifteenth of Tammūz", see Varisco 1994, 107, which mistranslates "on 25 Tammūz".

[6] For a list of the Yemeni variants of this proverb, see Varisco 1994, 241, n. 27.

[7] For the identification of the fourth star in Ursa Maior, see n. 5 (English translation).

[8] For an explanation of the agricultural activity described in the proverb, see Varisco 1994, 242, n. 4; for the constellation *banāt naᶜsh al-kubrā*, see n. 2 (English translation).

[9] For "the square", see n. 2 (English translation). The term *shāriḥ* (commentator) is translated in Varisco 1994, 107, as "poet", probably considering it a misspelling of *shāᶜir*.

[10] For the identification of the fifth star in Ursa Maior, see n. 5 (English translation).

[11] Varisco 1994, 107 translates: "At the rain of the fifth star the autumn returns to greenery."; for the identification of the fifth star in Ursa Maior, see n. 5 (English translation).

[12] For the term الهواء العاصف – "the stormy weather", Varisco 1994, 113 and 115 describes it as "a violent or intense blowing" and "twisting gusts", respectively.

[13] Varisco 1994, 107 translates it as "[t]he wind roars over the ground".

[14] For the term العواصف – "the stormy winds", see n. 12 (English translation).

[15] For the identification of the fifth star in Ursa Maior, see n. 5 (English translation).

[16] For الذرة – "sorghum" and its varieties in al-Ashraf ᶜUmar's almanac (chapter xxxii), see Varisco 1994, 165–174.

[17] For البرّ – "wheat" and its varieties in al-Ashraf ᶜUmar's almanac (chapter xxxii), see Varisco 1994, 175–179.

[18] For العتر – "(sweet) pea", see Varisco 1994, 181.

[19] For العلس – "emmer" as a variety of tetraploid wheat, see Varisco 1994, 176.

[20] For القياض – "winter crop", see Varisco 1994, 178; for الأعمال الجبلية والمخلافية – "mountain and highland districts", its first term, أعمال , is used in Rasūlid texts to indicate recognised productive districts that were taxed; its third, المخلافية , refers to the southern highland region often called Mikhlāf Jaᶜfar. The information is taken from an oral communication with Daniel M. Varisco; العشر المختارة – "The Ten Select (Days)" are definded in chapter xxxiii of the *Tabṣira*, see also Varisco 1994, 163–164.

[21] The reading and translation of شريجي – "shurayjī", a variety of white sorghum known for having grains that were harder than those of another variety, follows Varisco 1994, 163, 173. The term is ambiguous in H. It can also be read as *surayjī*.

[22] For الذرة الحمراء – "red sorghum", see Varisco 1994, 168–169.

[23] For the white sorghum variety, called رنيسي – "raʾīsī", see Varisco 1994, 171.

[24] The manuscript reads "twenty-third". However, given the accompanying clarification that refers to it as the "end of *Ayyār*", along with a subsequent reference to the first planting of wheat occurring on the twenty-eighth of the month, this paper argues that the mention of the twenty-third is likely a common scribal error, resulting from confusion between the Arabic written formats for three and eight.

[25] For البرّ الحبشي – "Ethiopian wheat", known as having a quality between that of Arabic and *wasnī* varieties, see Varisco 1994, 177; for الوسني – "wasnī (wheat)", as the best variety of wheat, described as being red with thick grains, see Varisco 1994, 179.

[26] For البرّ العربي – "Arabic wheat", a variety of white wheat with small ears, typically cultivated in the mountains, see Varisco 1994, 176.

[27] For الجلبّان – "green pea", identified in al-Ashraf ᶜUmar's almanac (chapter xxxii) as *al-ᶜatar al-akhḍar*, see Varisco 1994, 183.

[28] For الفريك – "parching", see Varisco 1994, 166 with n. 16, where he explains that *farīk* was the term used for the practice in the highlands, while *jahīsh* was the coastal term; for المقادم – "early cropping", see Varisco 1994, 177; for the identification of the third star in Ursa Maior see n. 5 (English translation).

[29] For الدثاء – "early spring wheat", see Varisco 1994, 176–177; أيّام العجوز – "The Days of the Old Woman" are defined in chapter xxxiii of the *Tabṣira*. See also Varisco 1994, 124–126; Lane 1961 under (ᶜ–j–z).

[30] For الصبا – "the ṣabā" in al-Ashraf ᶜUmar's almanac (chapter xxxii), see Varisco 1994, 116. See also Forcada, *Rīḥ* in EI^2.

[31] For الدبور – "the dabūr", see Varisco 1994, 111–112, 117; Forcada, *Rīḥ* in EI^2.

[32] For الجربياء – "the jirbiyāʾ" in al-Ashraf ᶜUmar's almanac (chapter xxxii), see Varisco 1994, 117, 111 with n. 11. In the Ikhwān al-Ṣafāʾ's work, it is recorded as الجربيّ – "al-jirbī". See Baffioni (ed. and trans.) 2013, 210 (Arabic text), 200 (English translation) with n. 41 and 42. As also quoted in the latter, Lane 1863–1893, 2: 403 (under *j-r-b*) mentions that *jirbiyāʾ* was one of the four *nakbāʾ* winds that blows in the north-west direction. This information is in conflict with both *Tabṣira* and the Ikhwān's. Al-Masᶜūdī (de Goeje) 1893, 17 identifies *al-jirbī* as one of the four cardinal winds, but not before cautioning his audience about the scholarly disagreements regarding these winds and their directions.

[33] Although this wind can be unequivocally read as اليمني – *Yamanī* in P, the term appears in H without dots and unclear. In the Ikhwān al-Ṣafāʾ's work, this wind is recorded as التيمي – "*al-taymī*". However, it is also reported that an earlier edition by Friedrich Dieterici prefers *Yamanī*. See Baffioni (ed. and trans.) 2013, 210 (Arabic text), 200 (English translation) with n. 41. *Al-taym* might refer to the name of a Qurashī clan, Banū Taym, from which Abū Bakr, the first caliph after the Prophet, originated (see Athamina, *Abū Bakr* in EI^3). Nevertheless, naming the south wind in this way could not be geographically relevant in Yemen, which might explain its obscurity in the *Tabṣira*. Interestingly, al-Masᶜūdī (de Goeje) 1893, 17 refers to this wind as the one blowing from the *qibla* direction.

[34] For الجنوب – "the south (wind)", see Varisco 1994, 114-115; Forcada, *Rīḥ* in EI^2.

[35] For الشمال – "the north (wind)" see Varisco 1994, 117; Forcada, *Rīḥ* in EI^2.

[36] For الريح النكباء – "the nakbāʾ (non-cardinal) wind" in chapter xxxii of *Tabṣira*, Varisco 1994, 112, n. 15.

[37] For الزوابع – "the zawābiᶜ (winds)", see Varisco 1994 115, describing them as "troublesome storms"; another possible reading might be الروابع denoting the four stars in "The Greater (constellation of the) Daughters of the Bier (?)" (αβγδ UMa; see n. 2, English translation), "an important marker for the autumn season in Yemeni folklore" (Varisco 1994, 107, n. 4).

[38] Qurʾān, sūra 69, verse 7 (English translation by Dawood 1956); the reference to ʿĀd and the *ṣarṣar* wind in the previous verse 6; for ريح الصرصر – "the ṣarṣar wind", see Varisco 1994, 112 with n. 12. The *ṣarṣar* wind is mentioned twice more in the Qurʾān (sūra 41, verse 16; sūra 54, verse 19).

[39] For السواهك – "the sawāhik", plural form of *sayhak*, referring to a wind that raises dust, see al-Zabīdī 1994, 13: 587–588; see also Lane 1863–1893, 4: 1452–1453 (under *s-h-k*).

[40] الرامسات – "the rāmisāt" might be related to "the roughness of the sea, sometimes indicated in almanacs as *rāmis* or *rawāmis*". See Varisco 1994, 234. Moreover, *rāmis* (pl. also *rawāmis*) was used in the meaning of a strong wind that could move soil from one region to a region further away and erase the traces. See al-Zabīdī 1994, 8: 312.

[41] الذاريات – "al-dhāriyāt" is the name of the fifty-first sūra of the Qurʾān, meaning "The Scatterers". The sūra begins with an oath to "the dust-scattering winds" (English translation by Dawood 1956). "The dhāriyāt" may also be related to *dhāri*, "the common dialect term for 'sowing' in Yemen today" (Varisco 1994, 70).

[42] For الصرصر – "the ṣarṣar" see n. 38 (English translation).

[43] The term العقيم ("sterile" or "blighting"; the latter from the English translation by Dawood 1956) emerges also in the Qurʾān to describe the wind for the punishment of ʿĀd (sūra 51, verse 41). Likewise, the role of the fertilising winds (*lawāqiḥ*) in rainfall is mentioned in the Qurʾān (sūra 15, verse 22): "We let loose the fertilising winds and bring down water from the sky for you to drink" (English translation by Dawood 1956). For the usage of *lawāqiḥ* as pollenating winds in Rasūlid almanacs, see Varisco 1994, 115.

[44] For العواصف – "the ʿawāṣif (winds)", plural noun for *ʿāṣif*, see n. 12 (English translation). For الزعازع – "the zaʿāziʿ (winds)", see Varisco 1994, 113.

[45] According to Lane 1863–1893, 8: 3033 (under *n-s-m*), النسيم – "nasīm" is "a gentle wind; a gentle gale: a breeze" or "a wind from which comes a weak breath", among other definitions. See also Ibn Manẓūr 1990, 12: 573–577 (under *n-s-m* & *n-sh-m*).

[46] For the *ʿāṣif* wind, see n. 12 and n. 44 (English translation).

[47] For the *dabūr*, see n. 31 (English translation).

[48] Considering that there is no clear explanation of the term *barām* in lexicological sources, Varisco 1994, 115–116 favours the reading *mirām/marām* and translates "When the south wind made a noise, the sorghum dried up." Nonetheless, P can be clearly read as *b–rām*, while H can also be read as *b–zām*.

[49] Note that this southern onshore wind seems to be mentioned in the diagram as ريح البحر – *rīḥ al-baḥr*. However, the diagrams' text is not very clear here, and it could also be read as *al-buṣr* or *al-baṣr*. Varisco 1994, 112 (with n. 13) has read the wind in the diagram differently as *al-ṣirr*, relating it to the *ṣarṣar* wind. P also records it as *ṣarṣar*. See also n. 67 of the article.

Abstract

This article presents a detailed study of Chapter xxxvi of the *Kitāb al-Tabṣira fī ʿilm al-nujūm* ('Enlightenment in the Science of the Stars') by al-Ashraf ʿUmar, the future Rasūlid sultan of 13th-century Yemen. The chapter simultaneously addresses three interrelated topics: rains, agricultural activities, and winds. Beyond the apparent connections between weather patterns and agriculture, this study explores the deeper reasoning behind the

integration of these topics. We analyse similarities and differences with other chapters of the *Tabṣira* and other sources from the Islamicate period to contextualise al-Ashraf ʿUmar's approach. Notably, the similarities with the winds' knowledge found in the Ikhwān al-Ṣafāʾ's *Epistles* are discussed, although al-Ashraf ʿUmar refuses to fully adopt their philosophical and meteorological frameworks. By considering chapter xxxvi within a cluster of interconnected knowledge, this study aims to deepen our understanding of how pre-modern societies perceived the complex relationships between natural phenomena, cosmological frameworks, and seasonal knowledge. This approach seeks to provide a clearer view of how celestial predictability was linked to terrestrial events, calling for a broader examination of the scientific traditions of the Islamicate world. It highlights the importance of recognising the intertwining of natural, astral, and religious perspectives in shaping the environmental understanding of the past societies. Moreover, the authors provide a new edition and English translation of the chapter to complement this analysis.

PROPHETIE UND GESETZ: AVICENNA UND DIE PLATONISCHEN *NOMOI*

CARL EHRIG-EGGERT*

1) Einleitung: Die Avicenna-Interpretation von Leo Strauss
2) Die Strauss-Interpretation von Georges Tamer
3) Der Text
4) Einordnung des Textes
5) Zwischenergebnis
6) al-Fārābī
7) Avicenna: Theologie und Logik
8) Weiterführende Überlegungen: Yaḥyā b. ʿAdī und Maimonides
9) Zusammenfassung
10) Bibliographie

1) Einleitung: Die Avicenna-Interpretation von Leo Strauss

Der deutsch-amerikanische Philosophiehistoriker und Sozialphilosoph Leo Strauss (1899-1973)[1] ist, jedenfalls in Europa, vor allem als prominenter Vordenker der amerikanischen Neu-Konservativen („Neo-Cons") bekannt geworden. Seine ursprünglichen Interessen galten jedoch der politischen Philosophie im Judentum und im Islam. Nach seinen eigenen Worten war für ihn der Schlüsseltext dafür eine Passage in Avicenna's *Risāla fī aqsām al-ʿulūm al-ʿaqlīya*[2], die er wie folgt übersetzte:

„Was hiervon mit dem Königtum zusammenhängt, das ist enthalten in dem Buch des Plato und des Aristoteles über den Staat; was hiervon mit der *Prophetie* und dem *religiösen Gesetz* zusammenhängt,

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[1] Die (vor allem amerikanische) Literatur über Strauss ist unübersehbar. Zu seiner Interpretation der klassischen politischen Philosophie ist z.B. zu nennen ein von T. W. Burns herausgegebener Sammelband: Burns 2015.

[2] Strauss übersetzte nach der Ausgabe Constantinopel 1298, S. 73f. und der Handschrift Gotha A 1158, fol. 159. Mir selbst liegt folgende Ausgabe vor: Ibn Sīnā: *Tisʿ rasāʾil fī l-ḥikma wa-ṭ-ṭabīʿīyāt.* Kairo 1326/1908. Repr. Frankfurt: IGAIW 1999. S. 105-118: *Risāla fī aqsām al-ʿulūm al-ʿaqlīya*, S. 108; für weitere Übersetzungen vgl. *inter alia* Anawati 1977 und Mimoune 1984.

ist enthalten in den beiden Büchern dieser beiden über die *Gesetze* … Dieser Teil der praktischen Philosophie (nämlich die Politik) hat zum Gegenstand das Vorhandensein der Prophetie und die Angewiesenheit des Menschengeschlechts hinsichtlich seines Vorhandenseins, seines Bestands und seiner Fortpflanzung auf das religiöse Gesetz. Die Politik behandelt sowohl die allen religiösen Gesetzen gemeinsamen als auch die den einzelnen religiösen Gesetzen, je nach Volk und Zeitalter eigentümlichen Charaktere; sie behandelt den Unterschied zwischen der göttlichen Prophetie und allen nichtigen Prätentionen".[3] Die Herausgeber von Strauss' *Gesammelten Schriften*, W. und H. Meier haben in ihrer Einleitung darauf hingewiesen, dass diese Passage für Strauss' Denken eminent wichtig geworden ist[4], und Strauss selbst stellte sie abgekürzt seinem letzten Werk voran: „ … the treatment of prophecy and the Divine law is contained in … the *Laws*.' Avicenna, *On the Division of the rational Sciences*."[5]

In diesem für ihn grundlegenden Text variiert Strauss vielfach seine These: „In den *Nomoi*, in denen Plato die ‚göttlichen Gesetze' der griechischen Vorzeit … in wahrhaft ‚göttliche' Gesetze umwandelt bzw. als wahrhaft göttliche Gesetze wiedererkennt, steht Platon der Welt des offenbarten Gesetzes unzweifelhaft am nächsten. In dieser nicht durch die Offenbarung geleiteten Annäherung an die Offenbarung erfassen wir die ungläubige philosophische Grundlegung des Offenbarungsglaubens in ihrem Ursprung."[6] Dass eine „philosophische Grundlegung" der „Offenbarung" sinnvoll ist bzw. letztere der ersteren sogar bedarf, ist natürlich eine kühne These. Es ist aber nicht ausgeschlossen, dass Strauss dies durchaus ironisch versteht.

Strauss ordnet seinen „umfassenden" Ansatz generell in eine Kritik – oder besser – eine Abrechnung mit der Aufklärung ein, die sich der Grundierung der platonischen These nicht mehr bewußt sei und fährt fort: „Die Annäherung Platons an die Offenbarung liefert den mittel-

[3] Strauss 1935, S. 111/Repr. S. 112.

[4] H. Meier in: Strauss 1935, S. XVIIIf. Von Strauss' *Gesammelten Schriften* sind bislang sechs Bände erschienen, von denen hier nur die ersten beiden von Interesse sind. Band 1 ist betitelt: *Die Religionskritik Spinoza und zugehörige Schriften*. Hrsg. Wiebke und Heinrich Meier. Stuttgart/Weimar 1996 (3. Auflage Stuttgart/Weimar 2013); Band 2: *Philosophie und Gesetz. Frühe Schriften*. Hrsg. Wiebke und Heinrich Meier. Stuttgart/Weimar 1997 (3. Auflage Stuttgart/Weimar 2013); vgl. zu den Intentionen der Herausgeber Meier 1996: Diese Schrift Meiers versteht sich als generelle Einführung in das Denken von Strauss, ist m.E. zwar eine sorgfältige Darstellung, vor allem aber eine Apologie von dessen Werk. Sie kann daher für die vorliegende Fragestellung außer Betracht bleiben.

[5] Strauss 1975, S. 1.

[6] Strauss 1935, S. 64f./Repr. S. 64.

alterlichen Denkern den *Ansatz*, von dem aus sie die Offenbarung philosophisch verstehen können. Aber wenn sie nicht durch Platon an der Offenbarung irrewerden sollten, so mußte die Platonische Philosophie an einer prinzipiellen *Aporie* kranken, die erst durch Offenbarung behoben worden war. Die radikale Interpretation der Lehre der islamischen Aristoteliker und ihrer jüdischen Schüler setzt also voraus die Interpretation der Platonischen *Nomoi* mit Rücksicht darauf, daß die *Nomoi* auf die Offenbarung *hinweisen*, aber *nur* hinweisen. Der nächste Schritt ist die Untersuchung der Modifikationen, welche die Platonische Politik im hellenistische Zeitalter erfährt; in dieser Epoche vollzieht sich nämlich die Überführung des Begriffs des Philosophen-Königs in den des Propheten".[7] Einer der Folgen dieser Gedanken ist dann der, dass „die höchste Fähigkeit, die den Propheten auszeichnet, eben die Fähigkeit zu unmittelbarer, nicht auf Schlüssen und Beweisen beruhender Erkenntnis" ist.[8]

Hier soll nicht überprüft werden, ob diese Interpretation für die *Nomoi* selbst zutrifft, sondern die Frage ist hier, ob es für die politische Philosophie Avicennas und al-Fārābīs zutrifft, dass die politische Wissenschaft der Offenbarungsreligion bedarf bzw. letztere die erstere erst begründe.

Vorweggenommen sei, dass dies m.E. nicht der Fall ist. Zwar ist es auf jeden Fall ein Verdienst von Strauss, darauf hingewiesen zu haben, dass im Zentrum der islamischen Philosophie die Politik steht: Die *falāsifa* haben die platonische Frage ernst genommen, aber auch vertieft und insofern radikalisiert, als sie nämlich auch nach den Erkenntnisbedingungen des Propheten gefragt haben. Dies soll im Folgenden dargelegt werden, denn es ergibt sich, dass, im Gegensatz zu Strauss' Darlegungen, der Prophet die ihm zukommende Aufgabe nicht erfüllen kann, da es unmöglich ist, dass ihm ein (Voraus-) Wissen der *particularia* bzw. *singularia* zukommt (s.u).

2) Die Strauss-Interpretation von Georges Tamer

Zunächst sei jedoch ein Blick auf eine neuere Darstellung der Strauss'schen Interpretation geworfen: Georges Tamer hat in seinem Buch *Islamische Philosophie und die Krise der Moderne. Das Verhältnis von Leo Strauss zu Alfarabi, Avicenna und Averroes* eine sorgfältige Darstellung von Strauss' Ansatz formuliert und ihn bei aller Kritik auch verteidigt.[9] Dass die „Krise der Moderne", wie Strauss sie

[7] Strauss 1935, S. 64f./Repr. S. 64.
[8] Strauss 1935, S. 103f./Repr. S. 103f.
[9] Tamer 2001

nennt, auch für Tamer ein Fakt ist, muss hier allerdings unberücksichtigt bleiben.

Tamer referiert ausführlich Strauss' „Schlüsselstelle" bei Avicenna, ihren Kontext, zeichnet seinen Gedankenweg nach und formuliert auch Kritik.[10] Unter dem Titel „Fund und Wandel" beleuchtet er Strauss' „Entdeckung" der Avicenna-Stelle, um dann über die Kapitel „Früchte des Wandels", „Krise und Prophetie", „Vernunft", „Religion und soziale Ordnung" zum abschließenden Kapitel „Leo Strauss, Alfarabi und der Primat der politischen Philosophie" zu gelangen. Diese sehr sorgfältige Darstellung hat den Nachteil, dass eine Distanzierung von Strauss kaum zu erkennen ist. Erst am Ende seines Buches fragt Tamer, ob der Strauss'sche Ansatz, den dieser ja apodiktisch formulierte, heute überhaupt gültig sein könne: Der Grund dafür sei, dass L. Strauss im eigentliche Sinne kein Philosophiehistoriker, sondern – in einem sehr emphatischen Sinne – „nur" ein Philosoph[11], für den es allerdings nur eine Frage gibt – „the all-important question which is coeval with philosophy although the philosophers do not frequently pronounce it – the question *quid est deus*."[12]

Tamers Buch ist ein sorgfältiges Werk über Leo Strauss so wie über die politische Philosophie der arabischen Philosophen, vor allem von al-Fārābī. Der enge Anschluss an Strauss verhindert jedoch auch, dass er sich mit anderen Ansätzen auseinandersetzt, z.B. mit dem von M. Galston, den er nur *en passant* erwähnt (vgl. dazu unten).[13]

3) Der Text

Bei der Passage, die Strauss so wichtig wurde, handelt es sich um eine Stelle aus Ibn Sīnā's *Risāla fī aqsām al-ʿulūm al-ʿaqlīya*. Die Übersetzung ist im wesentlichen korrekt, aber auch ergänzungsbedürftig, und Tamer selbst formuliert daher eine etwas abweichende Übersetzung: „Was davon mit dem Königtum (*mulk*) zusammenhängt, das ist in dem Buch des Plato und des Aristoteles über die Politik (*siyāsah*) enthalten; was hiervon mit der Prophetie (*nubūwah*) und dem *religiösen Gesetz* (*šarīʿah*) zusammenhängt, das ist in zwei Büchern über die Gesetze (*nawāmīs*) enthalten. Die Philosophen wollen mit dem Wort *nāmūs* nicht dasselbe [sagen], was die Menge

[10] Tamer 2001, S. 59ff.

[11] Tamer 2001, S. 286

[12] Strauss, *The City and the Man*. Chicago 1964, S. 241; zitiert nach Tamer 2001, S. 127.

[13] Tamer 2001, S. 146, S. 270f.

damit meint, nämlich List und Betrug. Der *nāmūs* ist für sie hingegen der rechte Lebensweg (*sunnah*) und das beständige, aufgestellte Ideal sowie das Herabkommen der Offenbarung (*waḥy*). Ebenso nennen die Araber den mit der Offenbarung herabkommenden Engel *nāmūs*. Dieser Teil der praktischen Philosophie läßt die Existenz der Prophetie und das Bedürfnis des Menschengeschlechts nach ihr hinsichtlich seiner Existenz, seines Bestandes und seiner Veränderung erkennen. Ein Teil der Philosophie handelt des weiteren von der Erkenntnis der allgemeinen, allen religiösen Gesetzen (*šarāʾīᶜ*) gemeinsamen, wie auch die den einzelnen religiösen Gesetzen, je nach Volk und Zeitalter eigentümlichen Begriffen. Er läßt den Unterschied zwischen der göttlichen Prophetie und allen nichtigen Prätentionen erkennen."[14]

Diese Passage ist in neuerer Zeit u.a. auch von J.W. Morris übersetzt und ausführlich diskutiert worden.[15] Morris bemerkt dazu: „Given the vital significance of the many issues raised in this brief – indeed, almost hidden – description, Avicenna's silence about this unnamed science is truly astonishing. Though the structure of the treatise leads the reader to expect an outline of each of three branches of practical wisdom, they are not mentioned again."[16] Morris ist insofern beizustimmen, als die fragliche Wissenschaft in der Tat „unnamed" ist, aber die Verfahren einer praktischen Philosophie werden von Avicenna doch beschrieben, und zwar in Schriften zur Logik (s.u.)

4) Einordnung des Textes

Zum einen handelt es sich bei dieser kurzen Schrift um eine der bei den Arabern beliebten Wissenschaftssystematiken: Avicenna unterteilt die Wissenschaften in theoretische und praktische (mit weiteren Einteilungen): Erstere (*al-qism al-naẓarī*) zielen darauf ab, Sicherheit (*al-iᶜtiqād al-yaqīnī*, S. 104) über die Dinge zur erwerben, die nicht vom Menschen abhängen. Politik und Staatskunde, die nach dem Menschen in der Gemeinschaft fragen, gehören zur praktischen Wissenschaft (*al-qism al-ᶜamalī*, S. 107) und deren Ziel sei es, eine

[14] Tamer 2001, S. 63f.

[15] Morris 1992, S. 167ff. Morris' Studie ist insofern unausgewogen, als er sich auf die Rolle dieser „Wissenschaft" (in Auseinandersetzung mit al-Fārābī) fokussiert, erkenntnistheoretische Probleme aber außer Acht lässt. Bemerkenswert ist sein Hinweis (allerdings ohne Beleg) auf Faḫraddīn al-Rāzī – dieser habe Avicenna kritisiert, da dessen Beschreibung des Prophetentums nichts spezifisch Islamisches enthalte (S. 164).

[16] Morris 1992, S. 170.

korrekte Meinung über das zu erwerben, was zum Handeln des Menschen gehöre, also das „Gute". Die von L. Strauss so hervorgehobene Passage (hier S. 108) gehört also zur „praktischen Wissenschaft" und damit gelten auch für sie die Methoden deren Erkenntnisgewinnung. Ibn Sīnā behandelt dies nicht in dieser Schrift, wohl aber ganz ausführlich in anderen Schriften (s.u.). Er ist der Ansicht, dass zu einer Wissenschaft auch ihre *episteme* – modern gesprochen: eine Reflexion über ihre Erkenntnisgewinnung gehöre, was Strauss ganz außer Acht lässt.

Zum andern zieht hier Ibn Sīnā offensichtlich ein pseudo-platonisches *K. an-Nawāmīs* heran. Als dieses ist ein 1974 von A. Badawi publiziertes *K. an-Nawāmīs*[17] vorgeschlagen worden[18], aber dies ist zweifelhaft: So ist z.B. in diesem Text das Gesetz allumfassend[19], während für Avicenna der Gesetzgeber nicht alle Fragen lösen kann, die sich für das Individuum und die Gemeinschaft stellen – gerade deshalb wird ja der *fiqh* benötigt.[20] Dies ist auch eine These von Plato selbst: „Sollte daher einmal ein Mensch unter besonderer göttlicher Fügung geboren werden, welchem von Natur die Fähigkeit einwohnte, jenen Grundsatz zu erfassen (und festzuhalten), so würde es für ihn keines ihrer herrschenden Gesetze bedürfen. Denn kein Gesetz und keine Ordnung steht höher als die Einsicht, und es ist nicht recht, dass die Vernunft die Untertanin oder Sklavin von irgend Etwas sei, sondern vielmehr dass sie über Alles herrsche, wenn anders ihr Wesen doch eben die Wahrheit und Freiheit leibhaftig ist. So aber – denn solche Menschen gibt es nun einmal nicht oder doch höchst wenige – müssen wir uns an das Zweite halten, nämlich an Ordnung und Gesetz, die freilich nicht (wie die wahre Vernunft) alle, so doch die meisten Fälle ins Auge fassen und in Betracht ziehen."[21]

Zu diesem Werk hat G. Tamer ausführliche Bemerkungen gemacht[22], die sich wie folgt zusammenfassen lassen: Die Tatsache, dass Avicennas Hinweis ein nichtplatonisches Buch der *Gesetze* betreffe, müsse zu einer differenzierten Auffassung des ganzen für Strauss enorm wichtig gewordenen Sachverhalts führen. Avicenna habe zwar offensichtlich dieses *K. an-Nawāmīs* für platonisch gehalten, das

[17] *K. an-Nawāmīs li-Aflāṭūn*, in: Badawi 1974, S. 97-234.

[18] vgl. Pines 1975, S. 236f; Tamer 2001, passim.

[19] *K. an-Nawāmīs li-Aflāṭūn*, S. 200,3ff.; vgl. Tamer 2001, S. 291ff.

[20] Ibn Sīnā, *aš-Šifāʾ*, *Ilāhīyāt* X, S. 454.

[21] Plato, *Nomoi* IX, 875c-d; vgl. V 739 A-E; Platos Formulierung ist natürlich dialektisch zu verstehen, denn er plädiert ja nur in Ermangelung des „Ersteren" für das „Zweite".

[22] vgl. Tamer 2001, S. 64ff, S. 290ff.

„platonische" Denken, von dem er so Kenntnis genommen habe und für die Behandlung der Prophetie und der religiösen Gesetze für geeignet hielt, sei jedoch nicht identisch mit „platonischer Philosophie".

5) Zwischenergebnis

Die von Strauss (und modifiziert auch von G. Tamer) präsentierte Interpretation ist aus drei Gründen nicht angemessen: Sie verfehlt zum einen die Intentionen Avicennas in der *R. Aqsām al-ʿulūm al-ʿaqlīya*, präsentiert somit nicht Avicennas „politische" Philosophie, und lässt vor allem dessen epistemologische Positionen ganz außer Acht. Meine Kritik daran soll im Folgenden unter drei Aspekte formuliert werden:

a) Eine „generell historische": Beide Autoren, Strauss und Tamer, verkennen, dass sie einem apologetischen Fehlschluss erliegen: Ob Plato tatsächlich die *Nomoi* geschrieben hat, da sie einer Begründung durch die Offenbarung bedürfe, mag hier offen bleiben. Die Pointe bei Platos jüdischen und muslimischen Auslegern ist aber, dass es einer solchen Auslegung gar nicht bedurfte, insofern als Religion und Wissenschaft getrennte Wissensgebiete waren und ihre je eigene Funktion und Dignität hatten. Eine Diastase zwischen beiden, wie sie in der „Neuzeit" vorliegt, ist für die Antike und das Mittelalter nicht zu konstatieren.

b) Daher liegt der Verdacht nahe, dass für Strauss und Tamer die These, dass die politische Wissenschaft einer Begründung durch Offenbarung bedürfe, eher ein apologetischer und unangemessener Versuch ist, die Offenbarung für die Neuzeit zu retten. Darüber hinaus verkennt dieser Versuch gerade dadurch, dass er die beiden Bereiche trennt, dass dies bis zum Mittelalter nicht so war.

c) Dennoch ist der Ansatz von Leo Strauss ernst zu nehmen: Er wurde in einer Zeit formuliert, in der versucht wurde, politische Philosophie neu zu begründen. Beleg dafür ist z.B., dass Hannah Arendt, Strauss' etwas jüngere Antipodin, versuchte, angeregt durch Martin Heidegger, das Politische öffentlich neu zu denken und zwar gerade im Anschluss an Platon. Von der gleichen Diagnose wie H. Arendt ausgehend, nämlich der „Philosophievergessenheit" der Politik, kommt L. Strauss zu einem entgegengesetzten Schluss, insofern er „dekadenztheoretisch" fordert, zu (einem angeblichen) Plato zurückzukehren bzw. dessen Position zu verschärfen, da der vollkommene Staat nur durch den Propheten verwirklicht werden könne. Die hier – im Anschluss an H. Blohm[23] – vorgenommene Charakterisierung des

[23] Vgl. Bluhm 1999.

Konfliktfeldes macht auch klar, dass die Wahrnehmung des Politischen als Aufgabe der Philosophie nicht nur ein historisches Phänomen, z.B. für die islamische Philosophie, ist, sondern immer auch aktuell gilt.

6) al-Fārābī

In einem Buch über al-Fārābī's politische Philosophie hat Miriam Gaston *inter alia* die epistemologischen Probleme thematisiert, die sich für den „Philosophen-König" ergeben, und zwar ausgehend von al-Fārābī's Kommentar zu den aristotelischen *Topiken*.[24]

Hier bleiben nun einige Fragen offen, ausgehend von al-Fārābī's *Taḥṣīl as-saᶜāda*: al-Fārābī erörtert dort die Frage, was in einer bestimmten Situation gut für die Gemeinschaft ist, oder besser: Wie erkennen wir politische *intelligibilia* in dieser Situation.[25] Das entspricht Aristoteles' berühmter Feststellung in der *Nikomachischen Ethik*, dass es kein allgemein Gutes gebe, sondern lediglich ein einzelnes konkretes Gute, wie z.B. in der Medizin.[26] So sah sich al-Fārābī mit der Frage konfrontiert, wie der „Philosophen-König" zu den Schlussfolgerungen für eine gegebene Situation, also für ein „Einzelnes" kommt. Der Schlüssel dafür ist „deliberation" (*rawīya*)[27], die von al-Fārābī in einer Reihe von Stellen beschrieben wird, z.B. in seinem *Abrégé* der platonischen *Nomoi*.[28] Galston beschreibt dies als „the royal craft of the supreme ruler. ... which consists of universal rules, i.e. the universals of political science, and an experimental faculty, i.e. practical wisdom or prudence".[29] Zunächst ist Galston zu dem Schluss gekommen, dass al-Fārābī in seinen Schriften zur politischen Philosophie keine einheitliche Lösung für das Problem bietet, wie aus Einzelurteilen allgemein gültige Schlüsse gezogen werden können.[30] In eine späteren Arbeit hat sie dann auf ein instruktive Passage in Fārābī's *Kitāb al-Mūsīqī al-kabīr* hingewiesen:

[24] Galston 1990.

[25] al-Fārābī, *Taḥṣīl as-saᶜāda*, S. 68,3ff.

[26] Vgl. zu den logischen Problemen von Einzelurteilen in der Medizin Galston 1990, S. 123. Eine ausführliche Reflexion über den logischen Status von Aussagen über die Einzelaussagen und die Möglichkeit, auch bei diesen zu induktiven Schlüssen kommen zu können, findet sich, am Beispiel der Medizin, m.E. zum ersten Mal bei Averroes: Mit Hilfe der von al-Fārābī verwendeten Termini *tağriba* und *istiqrāʾ* (s.o.) unterstellt er, dass eine solche Induktion möglich ist, wenn von „wesentlichen" Prädikaten ausgegangen wird: vgl. Ehrig-Eggert 2022, S. 244ff.

[27] Galston 1990, S. 111ff.

[28] al-Fārābī, *Nawāmīs*, S. 3,10-14.

[29] Galston 1990, S. 123.

[30] Galston 198; Galston 1990.

Dort befasst sich dieser (ausgehend von Aristoteles' *Analytica Posteriora*) ausführlich mit der Frage, wie „empirische" Erkenntnis möglich ist und unterscheidet dabei zwischen „natürlicher" Erkenntnis und einer solchen, die eine intellektuelle Aktivität erfordert.[31] Er unterscheidet zwischen *taǧrība* (Erfahrung) und *istiqrāʾ*, also der Induktion aus diesen Erfahrungen.[32] Nach der Darstellung von Black gibt es bei Avicenna aber durchaus auch die Möglichkeit, aus Einzelerfahrungen zur Erkenntnis von *universalia* zu gelangen.[33]

Damit ist in etwa die epistemologische Front eröffnet, die die Differenz zwischen „Prophet" und „König" markiert und nicht einfach zu beschreiben ist. al-Fārābī hat auch auf einen weiteren Unterschied von „König" und „Prophet" hingewiesen: Sie richten sich nicht nur an ein unterschiedliches „Publikum"[34], sondern es liegt auch ein Unterschied im Erkennntnisziel vor: Das der „Wissenschaft" habe die Erkenntnis der „Substanz" zum Ziel, das der „Politik" erstrebe ein „allgemeines „Urteil", basierend auf einem dialektischen Urteil.[35] Grundlegend für al- Fārābī ist dabei sein *K. al-Ǧadal*.

Auch L. Strauss hat sich natürlich mit den Positionen al-Fārābī's befasst. Hervorgehoben sei hier seine ausführliche Rezension[36] von dessen *Compendium Legum Platonis/Talḫīṣ Nawāmīs Aflāṭūn*.[37] Strauss charakterisiert es im Unterschied zu dessen *Philosophy of Plato, its parts and the ranks of its parts, from its beginnings to its end*[38] wie folgt: „The *Philosophy of Plato* presents Plato's philosophy whereas the *Summary* [i.e. *Talḫīṣ Nawāmīs Aflāṭūn*] presents his [Plato's? al-Fārābī's?] art of *kalām*".[39] Die hier vorliegende Zweideutigkeit ist wohl durchaus intendiert, denn anschließend zitiert Strauss in Übersetzung eine Passage daraus (S. 39,3-7), in der al-Fārābī ausführt, dass der Gesetzgeber wie ein Imker sei, der sich um seine Bienenvölker kümmere. Dann moniert Strauss aber, dass auf die Frage „Do the beekepers take care of every single bee?" al-Fārābī keine Antwort habe.[40] Ob diese Frage die eines „platonischen" *kalām* sein kann, sei dahingestellt – sie ist auf jeden Falle eine der *falāsifa*,

[31] al-Fārābī, *K. al-Mūsīqī al-kabīr*, S. 92ff.; vgl. Galston 2019, S. 124ff.
[32] Vgl. Galston 2019, S. 127ff; Ehrig-Eggert 2022, S. 232f.
[33] *al-Išarāt wa-t-Tanbīhāt*, S. 56ff; vgl. Black 2006, S. 44.
[34] Vgl. Lameer 1994, S. 259ff.
[35] Galston 1991, S. 79ff.
[36] Strauss 1957/1999.
[37] al-Fārābī: *Compendium Legum/Talḫīṣ Nawāmīs Aflāṭūn*.
[38] al-Fārābī: *Falsafat Aflāṭūn wa-aǧzāʾuhā wa-marātib aǧzāʾihā min auwalihā ilā aḫirihā/De platonis philosophia*.
[39] Strauss 1957/1999, S. 325.
[40] Strauss 1957/1999, S. 333.

die sie negativ beantworten (s.u.). Ist dies aber auch ein Beispiel für die „interprétation musulmane de la philosophie grecque chez Leo Strauss"?[41]

7) Avicenna: Theologie und Logik

Avicenna baut – bei allen Differenzen – auf al-Fārābī auf, auch wenn ihre Ziele unterschiedlich sind – jenem gehe es um den vollkommenen Staat, diesem um den tugendhaften Menschen.[42] Dies soll hier – ausgehend von zwei Schriften – vertieft werden:

al-Ilāhīyāt

Avicenna hat sein „Gesellschaftsmodell" u.a. in den *Ilāhīyāt* vorgestellt: Dieses Werk, eine „Theologie", bietet in Aufbau und Inhalt jedoch wenig „Metaphysik und „Theologie", sondern widmet sich ausführlich im ersten Teil den „Prolegomena" der Philosophie bzw. Theologie und ihrer Sprache und Kategorien, wie etwa „Substanz" und „Akzidenz". Dieses Erbe der Antike erklärt natürlich auch die Rezeption und Popularität Avicennas im lateinischen Okzident.

Erst der zweite Teil berührt am Ende die philosophische Gotteslehre (Buch VIII-X) und ganz am Ende des Buches (X, 2-5)[43] nennt Avicenna die „praktischen" Fragen der Religion. Nur hier kann, wenn überhaupt, von einem „islamischen" Werk gesprochen werden, da er hier die Begriffe „Kalifat" und „Imamat" thematisiert. Grundlegend ist für Avicenna die Funktion der Religion, die zuallererst die Aufgabe habe, den sozialen Frieden zu sichern (S. 441f). Dem dient dann auch der „Glaube", der dazu bestimmt sei, Gehorsam gegenüber dem Gesetz durchzusetzen (S. 442). Avicenna folgert daraus, dass es in einem Staatswesen auf praktische Erfahrung und Urteilskraft ankomme – der Weise (*aʿlam*) habe sich dem mit besserem Urteilsvermögen (*aʿqal*) unterzuorden (S. 452). Das wichtigste Attribut des Gesetzgebers sei gerechtes Gesetz zu garantieren (*muʿaddil*).[44]

Avicenna sieht die Religion als eine Funktion der Gesellschaft, als ein regulatives Prinzip für das Staatswesen. Im Vordergrund steht daher die Systematik der Erkenntnismöglichkeiten des Menschen als soziales Wesen. Dies wird aber nicht hier thematisiert, sondern in aller Breite in einem Werk zur Logik, dem *K. al-Išārāt wa-t-tanbīhāt*.

[41] Vgl. Brague 1989.
[42] Galston 1979, S. 577.
[43] Ibn Sīnā, *as-Šifāʾ*. *Ilāhīyāt* X.
[44] Vgl. Galston 1979, S. 564ff.

al-Išārāt wa-t-tanbīhāt

In einem langen Abschnitt diskutiert Avicenna u.a. Aussagen, die eine „Zustimmung heischen" (*maʾḫūḏāt*).[45] Diese haben einen besonderen Charakter, da eine Zustimmung zu ihnen nicht zwingend ist, insofern sie z.B. auf Konventionen oder auf einem religiösen Gesetz beruhen. Sie zeichnen sich dadurch aus, dass ihnen keine Sicherheit (*yaqīn*) zukommt, wie dies bereits von al-Fārābī formuliert wurde.[46] Es handelt sich um „Erfahrungen" und diese, wie auch Aussagen von religiösen Instanzen, haben einen wissenschaftstheoretisch anderen Charakter als wissenschaftliche oder dialektische Aussagen.

Es geht Avicenna hier aber auch um Urteile, die sich aus dem „gesunden Menschenverstand" ergeben, wie etwa Dankbarkeit gegenüber Eltern und Wohltätern, Ablehnung von Lügen und Diebstahl und – was für eine islamische Stellungnahme besonders bemerkenswert ist – eine Ablehnung des „hässlichen Schlachtens der Tiere" (*qabḥ ḏabḥ al-ḥayawān*).[47]

In einem weiten Schritt muss der Staatsmann von solchen allgemein akzeptierten (*mašhūrāt*) Urteilen ausgehen, um die „Menge" durch ein *qiyās ǧadalī* zu überzeugen.[48] Dafür bedarf es der *ars invendiendi* der richtigen Topoi.

Es geht also dabei um Urteile aus Erfahrung, d.h. häufiger Beobachtung. Avicenna klassifiziert hier Arten von menschlichen Urteilen, nicht aber göttlichen und „prophetischen". Wie sieht es mit diesen aus?

Hier stellt sich die Frage genau anders herum: Wie gelangt Gott von seinem „Allwissen", das ja nicht bestritten wird, zu einer Erkenntnis der *singularia*?[49]

Das Problem des göttlichen (Voraus-)Wissens stellte sich schon in der antiken Philosophie (z.B. bei Iamblich). Die Fragestellung wird dann in der islamischen Philosophie differenziert und weiterentwi-

[45] *al-Išārāt wa-t-tanbīhāt*, S. 55ff; vgl. die Übersetzungen bei Goichon 1951/1999. S. 173ff und Inati 1984. S. 118ff.

[46] Black 2006, S. 43ff.

[47] *al-Išārāt wa-t-tanbīhāt*, S. 58ff.

[48] *as-Šifāʾ. al-Ǧadal*, S. 25, 16ff.; 95,4ff.

[49] In der Sekundärliteratur wird nicht immer zwischen *particularia* (*ǧuzʾīyāt* u.a., d.h. Teilmengen) und *singularia* (*šaḫṣīyāt* u.a., d.h. Einzelinstanzen) unterschieden. In der Nachfolge der spätantiken Kommentarliteratur war dies jedoch durchaus üblich (wenn auch nicht durchgehend), z.B. bei al-Fārābī und Yaḥyā b. ʿAdī. Auch Avicenna unterscheidet hier: vgl. *as-Šifāʾ, al-Qiyās* S. 45,8; 47,44 usw.; vgl. Ehrig-Eggert 1990, S. 98ff.

ckelt, und es lässt sich feststellen, dass die Positionen der *falāsifa* hier sehr detailliert waren: [50]

Für al-Fārābī, der das Problem an mehreren Stellen aufwirft, ist eine klare Stellungnahme m.E. nicht auszumachen[51], wohl aber für seinen „Schüler" Yaḥyā b. ʿAdī: Dieser hat in seiner Abhandlung über die „Natur des Möglichen"[52] diese Frage positiv beantwortet und die Meinung vertreten, dass Gott zumindest um die *particularia* wisse, deren Formen er sich aneigne (*yuḥaṣṣilu ṣuwarahū*).[53] In einer anderen (späteren?) Abhandlung geht er einen Schritt weiter und stellt diese Frage auch für die menschliche Erkenntnis[54]: Sein Schlüsselbegriff hier ist *ṭabīʿa*, hier als Terminus für die intellektuelle Operation zu verstehen, durch welche die *singularia* zu einer „Klasse" zusammengefasst werden – ähnlich wie *istiqrāʾ* im Gegensatz zu *taǧriba* bei al-Fārābī (s.o.).[55]

Die fragliche Passage Avicennas, die L. Strauss so geprägt hat, findet sich in einer kurzen Abhandlung, die im wesentlichen das Ziel hat, die Wissenschaften anhand ihrer Ziele und Erkenntnismöglichkeiten zu klassifizieren. Hier finden sich detaillierte Stellungnahmen zu dieser Frage: Er unterstellt nämlich, dass Gott auch die Einzeldinge *singularia* nur in einer „allgemeinen Weise" wisse[56]. Daraus folgt, dass auch der Mensch, und damit auch ein Prophet, die Einzeldinge nur in dieser Weise wissen kann.[57] Dies ist eine Position, die in Nuancen für alle *falāsifa* gilt.

Ein weiterer Aspekt ist die enge Verknüpfung der Erkenntnistheorie mit der Modallogik, die Avicenna systematisch vollzieht. Die Deutung seiner Modallogik ist allerdings bis heute umstritten, und dies liegt vor allem an unterschiedlichen Grundannahmen in der Forschung. Bezieht sie sich auf eine „statistische" Interpretation der Modaloperatoren, oder auf eine „mögliche" (bzw. „unmögliche") Verbindung von Subjekt und Prädikat? So können z.B. „dialekti-

[50] Vgl. den von T. Rudavsky herausgegebenen Sammelband: Rudavsky 1985.

[51] Vgl. z.B. die differierenden Interpretationen von Marmura 1985 und Leaman 1986.

[52] Ehrig-Eggert 1990.

[53] Vgl. Ehrig-Eggert 1990, S. 53f.

[54] Yaḥyā b. ʿAdī, *Maqāla fī Tabyīn wuǧūd al-umūr al-ʿāmma;* vgl. die Übersetzung von Rashed 2004, S. 161-171.

[55] Vgl. Ehrig-Eggert 1994; Ehrig-Eggert 2008, S. 55ff; Ehrig-Eggert 2022, S. 237f.

[56] Vgl. ausführlich Marmura 1962, Marmura 1985, Black 2005 und Adamson 2005, Adamson 2007. Eine konträre Interpretation bei Acar 2004.

[57] Adamson 2005, p. 273: „Even humans know particulars only in universal way".

sche" Aussagen als solche interpretiert werden, ob ein bestimmter Sachverhalt vorliegt oder nicht.[58]

Fazit zu Avicenna: Weder in der Theologie noch in der Erkenntnistheorie ist bei ihm Platz für „prophetische" Aussagen. Die Interpretation von Strauss trifft also insofern nicht den Kern der Sache bei Avicenna, als es bei diesem keine Lösung für die Erkenntnis der *singularia* durch den Propheten gibt. Für al-Fārābī und Avicenna ist Strauss' Zuspitzung aber dennoch hilfreich: Bei beiden wird die Frage nach der (göttlichen) Erkenntnis der *singularia* und *particularia* zwar aufgeworfen, für die erstere aber *strictu sensu* negativ beantwortet.

8) Weiterführende Überlegungen: Yaḥyā b. ᶜAdī und Maimonides

Dass hier ein Problem vorliegt, wurde von zwei Autoren erkannt, nämlich Yaḥyā b. ᶜAdī und Maimonides:

Yaḥyā b. ᶜAdī, der christliche Schüler al-Fārābī's, hat zur Lösung eines dogmatischen Problems, nämlich des der Trinität, ein neues terminologisches Instrumentarium entwickelt: In der Inkarnation wird Gott eins mit der Natur (*ṭabīᶜa*) des Menschen, welche allen Menschen zukommt: „For Yahya b. Adi the term *taṣawwur* preserves the Farabian idea of intellectually grasping an essence, so as to have a certain knowledge of it. He adds that this is a distinctively *divine* activity, for … the essence is precisely the notion in so far it has *divine* existence. And he shows that this divine activity is possible for man, because in the incarnation God (in the second person of the Trinity: God as knowing), has become united to our shared human nature".[59]

Unter diesen Voraussetzungen ist es also möglich, dass Gott mittels *taṣawwur* die Formen erkennt und damit auch die Essenzen der *particularia*. Eine Einzelerkenntnis der *singularia* ist aber auch ihm nicht möglich. Hier liegt also nur ein zusätzliches, christliches Argument für die Erkenntnis der *particularia* durch Gott vor.

Auch Maimonides hat das Problem erkannt, aber ganz anders „gelöst": Im zweiten Buch des *Dux perplexorum* (II, 36-38) nennt er die Schnittstelle, die der Erkenntnis durch den Propheten zukommt, und beschreibt sie als *faiḍ min Allāh*[60]. Dies ist zwar eine „Lösung",

[58] Vgl. zu dieser Diskussion aus jüngster Zeit z.B. Thom 2003, S. 65-91; im Widerspruch dazu Street 2012. Diese beiden Beiträge leiden daran, dass sie die Verbindung der Modallogik zur Wissenschaftspraxis, z.B. in der Medizin, zu sehr außer Acht lassen; vgl. dazu z.B. bei Averroes Ehrig-Eggert 2022, S. 245ff.

[59] Ehrig-Eggert 2008, S. 60; vgl. Endress 2015; Ebied 2023.

[60] Mūsā b. Maimūn, *Dalālat al-ḥā'irīn*, S. 404. Sh. Pines übersetzt als „divine overflow": Maimondes, *The Guide of the Perplexed*, S. 369.

aber sie markiert einen Bruch mit der logischen Terminologie durch einen Terminus, der sich auch bei Avicenna findet und dort in der Tat ein „Überfließen" bezeichnet.[61] Die Engführung dieses „Überfließens" von Gott auf den Propheten ist vermutlich eine „Neuerung" durch Maimonides, bedeutet aber, dass auch für ihn eine Lösung mit Hilfe der tradierten Terminologie der Logik nicht möglich war. M. Galston hat die Tatsache hervorgehoben, dass die Gleichsetzung von „König" und „Prophet" für al-Fārābī's „Schüler" Maimonides, obwohl dieser sich stark an al-Fārābī orientierte, nicht gilt.[62] Nach ihrer Auslegung vermeidet Maimonides diese Gleichsetzung, da „König" und „Prophet" von verschiedenen epistemologischen Voraussetzungen ausgehen: „The difference between theoretical perfection and prophecy is the difference between discursive reasoning that begins from theoretical perfection and intuitive knowledge that grasps conclusions immediately." Eine Brücke zwischen diesen beiden Erkenntnisarten ist nicht möglich.[63]

Dass das vorliegende Dilemma nicht auflösbar ist, hat vielleicht schon Sokrates erkannt: Nach der Darstellung Xenophons – wie Platon ein Schüler Sokrates' – war er zwar der Auffassung, dass es die „Herrschenden und Könige" auszeichne, dass sie wissen, wie zu regieren sei, dass sie aber die Details nicht kennen.[64]

9) Zusammenfassung

Der Ansatz von Leo Strauss, die neuzeitliche Philosophie mit Hilfe eines vermeintlichen Diktums von Avicenna zu diskreditieren, ist zu hinterfragen, stand aber hier nicht zur Debatte. Gravierender ist m.E. die Tatsache, dass diese Instrumentalisierung Avicennas und al-Fārābī's für die eigene Interpretation deren ja sehr viel subtilere Ausführungen zur politischen Philosophie in Summe damit ganz ausblendet. Der Reichtum der Überlegungen der *falāsifa* zeigt sich ja auch an deren Überlegungen zur Möglichkeit eines göttlichen und prophetischen Wissens auch der *singularia*. Deren Negation schließt aber Strauss' Folgerung aus, dass philosophisch „die höchste Fähigkeit, die den Propheten auszeichnet, eben die Fähigkeit zu unmittelbarer, nicht auf Schlüssen und Beweisen beruhender Erkenntnis" (s.o) ist. Dies erschließt sich aber erst dann, wenn man sich nicht, wie Strauss sich als später Epigone Platos und „Dekadenztheoreti-

[61] Vgl. Goichon 1938/1999, S. 291.
[62] Galston 1978, S. 205; vgl. Blohm 1999, S. 920f.
[63] Galston 1978, S. 217f.
[64] Xenophon, *Memorabilia* III 9 (S. 228f).

ker" (Blohm) versteht, sondern sich in einem „Schleier des Nichtwissens" auf ein ernsthaftes Gespräch mit den mittelalterlichen islamischen Autoren und deren Fragestellungen einlässt.[65]

10) Epilog: Avicenna und Jorge Luis Borges

Der argentinische Schriftsteller Jorge Luis Borges (1899-1986) hat sich nicht nur mit Averroes befasst, z.B. in *La busca de Averroes* (*Averroes' Suche*), sondern sich auch von der Priorität des Denkens vor dem Wissen, wie sie Avicenna formuliert, sehr anschaulich inspirieren lassen: In einer seiner Kurzgeschichten hat der Protagonist, Ireneo Funes, in Folge eines Unfalls die Fähigkeit verloren, Allgemeinbegriffe zu bilden, und vermag nur noch die jeweiligen Einzelerfahrungen zu speichern: „Er war ... zu allgemeinen platonischen Ideen so gut wie nicht imstande. ... Ich vermute allerdings, dass er zum Denken nicht sehr begabt war. Denken heißt Unterschiede vergessen, heißt verallgemeinern, abstrahieren. In der vollgestopften Welt von Funes gab es nichts als Einzelheiten, fast unmittelbarer Art."[66]

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al-Fārābī: *Falsafat Aflāṭūn wa-aǧzāʾuhā wa-marātib aǧzāʾihā min auwalihā ilā aḫirihā / De platonis philosophia* Eds. Franz Rosenthal; Richard Walzer. London 1943.

[65] Schleier des Nichtwissens „(*veil of ignorance*)" ist die Formulierung eines anderen prominenten Repräsentanten der politischen Philosophie in den USA, John Rawls, in seinem Werk *A Theory of Justice* (1971; deutsch: *Eine Theorie der Gerechtigkeit,* 1975). Er bezeichnet damit den methodischen Ansatz, bei der Suche nach dem Wesen der Gerechtigkeit zunächst von allen kontingenten Bedingungen abzusehen. Die Anregung, dies auch als Kritik an dem Ansatz von L. Strauss aufzunehmen, verdanke ich unserem Enkel und Rawls-Leser Luis Eggert: Strauss habe in seiner Interpretation der *falāsifa* vom „neuzeitlichen" Denken und dessen Themen, wie z.B. der „Krise der Neuzeit" in der Tat nicht abgesehen.

[66] J.L. Borges: *Das unerbittliche Gedächtnis.* In: Erzählungen 1935-1944. München 1981. S. 173-182; spanisch: „Éste era ... casi incapaz de ideas generales, platónicas ... Sospecho ... que no era muy capaz de pensar. Pensar es olvidar diferencias, es generalizar, abstraer. El el abarrotado mundo de Funes no habia sino detalles, casi inmediatos" (J.L. Borges: *Funes el memorioso.* In: Obras completas 1923-1949. Barcelona 1989. S. 485-490). Zu Borges' „Auseinandersetzung" mit Averroes vgl. Endress 2004, S. 230f.

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Abstract

Leo Strauss (1899-1973) was a renowned German-American historian of philosophy and influential representative of the political philosophy of the „Neo-Conservatives" in the USA. However, his academic work began with publications on medieval political philosophy in Judaism and Islam. For him, the decisive starting point for their interpretation was a passage in Avicenna, which he translated as follows: „The treatment of prophecy and the Divine law is contained in the [Platonic] Laws."

The aim of my remarks is to refute this interpretation: It presupposes that a prophet qua prophet knows all *singularia* (individual events and things) and *particularia* (their „classes"). However, this contradicts the position of all representatives of political philosophy in Islam, stating that such knowledge is impossible for God and the prophets.

In contrast to this interpretation, it must be emphasized that for all classical representatives of political philosophy in Islam, the key to *intelligibilia*, i.e. what is meaningful and feasible for the community in a particular political situation, cannot be revelation, but the search for generally valid judgments based on rational considerations. This is also the reason for the long and careful considerations in Avicenna, but also in al-Fārābī, about the logical and scientific-theoretical status of such judgments.

Two non-Muslim but Arabic-writing thinkers shared this position, but were also able to offer an additional solution that included theological considerations: The Christian Yaḥyā b. ʿAdī on the basis of his doctrine of God and the Jew Maimonides on the basis of formulations in Islamic mysticism.

This fundamental assumption by L. Strauss, which is criticized here, is therefore untenable, but it shows e contrario that the basis for classical political philosophy in Islam is understanding based on rational considerations.

FROM KHORASAN TO CAIRO: A THIRTEENTH-CENTURY MODAL MAP

OWEN WRIGHT*

Transliteration

In general, transliteration is consistent according to language, with the exception of technical terms, for which a single form is preferred to avoid confusion. Given the chronology of their appearance, preference has been given to transliterating the names of the modes, including the Arabic ones, according to Persian norms. In contrast, Arabic titles of Persian treatises are transliterated according to Arabic norms, and likewise Arabic phrases within them.

Dates

Unless marked *h* (*hijrī*) or *š* (*hijrī šamsī*), all dates are CE.

Textual types

Knowledge of modal practice in the art music of the Islamic Middle East during the thirteenth and early fourteenth centuries has been derived primarily from the first three texts of what has come to be known as the Systematist school of theory. They have the attraction of being generally precise and clear, and, crucially, they offer intervallic analyses and specifications of pitch sets for a substantial number of modes, whereas other, more curt and opaque texts of the same period avoid this territory and consequently convey less information about modal structure. The marked contrast between the two types, which extends also to aspects of nomenclature and taxonomy, rather than being explained in terms of conceptualizations and analytical approaches conditioned by different intellectual environments, has been related to their geographical distribution and hence seen as indicating a rent in the very fabric of the art-music idiom they engage with, a view perhaps expressed most clearly and succinctly by Amir Ḥosayn Purjavādi, who speaks straightforwardly

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of a Khorasani tradition different from that represented in the first Systematist texts.[1]

What follows is an attempt to re-examine this conclusion. In bringing these two bodies of texts together in what is hoped to be productive dialogue, it attempts to assess the extent to which they might be talking in different ways about what is essentially the same modal repertoire, if with minor local variations, as against revealing significant differences that correlate with their places of origin: the earliest Systematist texts are by theorists who were active in major cities in Iraq and Western Iran, whereas the others are associated with cultural centres further east, spread over an area broadly identifiable as Khorasan, stretching from Eastern Iran into Afghanistan and Central Asia, but also having prolongations into South Asia.

Significant differences between the two groups, of greater or lesser relevance to their modal coverage, are indeed immediately apparent: of language, topics addressed, and approach. The first is significant only to the extent that it can be read against the geographical divide: the Systematist tradition, which continues until the end of the fifteenth century, begins with two foundation texts in Arabic but thereafter is expressed in both Persian and Arabic, while what are termed here, for convenience, the Khorasani texts, are all in Persian. More important is to note that when referring to the modes, the former sometimes go into considerable detail, whereas the latter may define the nature of the relationships between them, generally of derivation, but do not describe their intervallic composition. Their concern is, rather, with grouping them, noting, or creating, cosmological associations, specifying suitable times of performance, and advising musicians how they should behave and how they should use them in socially appropriate ways. They are concise in expression, and their comparative extreme brevity is accounted for above all by the fact that they contain none of the extensive material on intervallic analysis, scales, transpositions, and tunings that is so characteristic of Systematist writings. They lack, in short, a detailed descriptive apparatus, in the absence of which interpretation becomes hazardous. The consequence is a further risk, for given the necessity of relying on information quarried from Systematist texts, the temptation to meld the two accounts is liable to generate a possibly fictitious uniformity that blurs and conceals differences.

[1] In *'al-muḫtaṣar al-mufīd fī bayān al-mūsīqī wa uṣūl aḥkāmih'*, ma'āref 13/1, 1375/1996: 49-58. The point is made more forcibly later, by referring to a fundamental difference (*eḫtelāf-e asāsi*) between the two.

There are also temporal ramifications to be taken into account. The earliest Systematist text, the *kitāb al-adwār*,[2] by Ṣafī al-Dīn ᶜAbd al-Muᵓmin b. Yūsuf b. Fāḫir al-Urmawī al-Baġdādī (d. 1294) (henceforth al-Urmawī), was written in Baghdad around the middle of the thirteenth century,[3] and his later and more extensive treatise, *al-risāla al-šarafiyya*,[4] was followed, at the beginning of the fourteenth century, by the third major Systematist text, the chapter on music in the *durrat al-tāj fī ġurrat al-dub(b)āj* (henceforth *durrat al-tāj*),[5] a Persian-language encyclopædia by Qoṭb al-Din Maḥmud Širāzi (1236-1311) (henceforth Širāzi). All three works overlap and are closely related, with Širāzi's account of the modes being the fullest. Together, they provide essential terms of reference for the interpretation of the Khorasani texts.

Between these, the ties are much looser; direct indebtedness is not always evident; and they are also more difficult to pin down chronologically. They can be said to begin with the treatise by Moḥammad b. Maḥmud b. Moḥammad Nayšāburi (henceforth Nayšāburi), which is likely to antedate al-Urmawī's *kitāb al-adwār*, but by how much is uncertain; and it also looks back to an earlier text in a way that the *kitāb al-adwār* does not. The only surviving manuscript is dated 1264, and although the work may have been written during the first half of the thirteenth century it has been argued that it is a century older.[6] It is followed by a text by a contemporary of

[2] Manuscripts of this much copied text exist in numerous libraries. A facsimile of one in Istanbul, Nuruosmaniye MS 3653, is in Publications of the Institute for the history of Arabic-Islamic science, series C, 29, Frankfurt, 1986; ed. Hāšim Muḥammad al-Rajab, Baghdad: manšūrāt wazārat al-ṯaqāfa wa-'l-iᶜlām, 1980; ed. Ġaṭṭās ᶜAbd al-Malik Ḫašaba and Maḥmūd Aḥmad al-Ḥifnī, Cairo, 1986; tr., together with a commentary, in Rodolphe D'Erlanger, *La musique arabe*, III, Paris: Geuthner, 1938, pp. 185-565.

[3] 1252 has been suggested. Of unknown date is an earlier and in significant respects different version of this work, entitled *kitāb al-adwār fī al-taᵓlīf*, Istanbul, MS Fatih 3662. For biographical information on al-Urmawī, see the article by Eckhard Neubauer in *Encyclopedia of Islam (New Version)* s.v. Ṣafī al-Dīn al-Urmawī.

[4] Facsimile of Istanbul, Süleymaniye MS Ahmet III 3460, in Publications of the Institute for the history of Arabic-Islamic science, series C, 29, Frankfurt, 1986; ed. Hāšim Muḥammad al-Rajab, Baghdad, 1982, ed. Fazlı Arslan, *Safiyyüddîn-i Urmevî ve Şerefiyye risâlesi*, Ankara: Atatürk Kültür Merkezi Başkanlığı, 2007; tr. in D'Erlanger, *La musique arabe*, III, pp. 3-182.

[5] British Library MSS. Add. 7694 and India office Library 2219 and 2220; ed. Sayyed Moḥammad Maškut and Naṣr Allāh Taqwā, Tehran: 1939-46; *resāla-ye musiqi az dorrat al-tāj*, Tehran: farhangestān-e honar, 1387š/2008.

[6] Untitled, it is referred to generically as *resāla-ye musiqi*. The author, characterized in the prefatory remarks as a marvel of the age, the master from

al-Urmawī and Širāzī, ʿAlāʾ Monajjem Boḫāri (?1226/7-after 1292), a chapter in a work entitled *ašjār o aṣmār* ('trees and fruits'),[7] and by further treatises from later periods that will be referred to on occasion but not examined in detail.

There are, in addition, links between Nayšāburi's treatise and the earlier Persian poetic tradition, at least as far as the nomenclature of the modes is concerned. He identifies a principal set of twelve, the names of which are to be found scattered through the works of various poets, from Manučehri (fl. 1030-40) on.[8] Half of them are referred to repeatedly, a reasonably secure indication that they were standard features of the musical as well as the literary landscape,[9] and in only two cases are mode name cited that do not appear in Nayšāburi's text: Anvari (1126-89) mentions *zangula*, and Neẓāmi (1141-1209), who refers in *Ḫosraw va Širin* to no fewer than eight in the context of a musical competition where each successive song is in a different mode, includes among them *ḥeṣāri*. They are not, though, unknown: both appear repeatedly in later texts.

Neẓāmi's total of eight names had, though, been exceeded at least a century before in a Persian prose work, the *qābus-nāma* by Kay Kāʾus (1021-87), whose mode list consists entirely of names familiar from Nayšāburi and/or from Systematist texts. This clearly points to time depth, although continuity of identity is less readily guaranteed: to what extent the modal properties associated with these names at the time of Kay Kāʾus would have been familiar to Nayšāburi cannot be ascertained, except perhaps in the case of *rāst*, for which we have the even earlier evidence of Ibn Sinā (980-1037), demonstrating that at

Khorasan (*ostād ʿajab al-zamān bal ostād-e ḫorāsān*), has been identified by some scholars with a twelfth-century figure. See Amir Ḥosayn Purjavādi, '*resāla-ye musiqi-ye Moḥammad b. Maḥmud b. Moḥammad Nayšāburi*', maʿārif 12/1 & 2, 1374š/1995: 32-70, with an edition of the text and a facsimile; and Mehrdad Fallahzade, *Persian writing on music. A study of Persian musical literature from 1000 to 1500 AD*, Uppsala: Uppsala Universitet, 2005, pp. 110-5, with a translation, and a facsimile of the manuscript at pp. 249-51. See also pp. 202-3.

[7] The text of the chapter is edited and its contents analysed in Sajjād Nikfahm-Ḫubravān and Saʿid Kordmāfi, '*musiqi dar* ašjār o aṣmār-*e ʿAlāʾ Monajjem Boḫāri. taṣḥiḥ-e enteqādi va šarḥ-e matn*', māhur 70, 1394/2016: 39-86. See also Fallahzade, *Persian writing on music*, pp. 98-100.

[8] They are tabulated in Purjavādi, '*resāla-ye musiqi-ye Moḥammad b. Maḥmud b. Moḥammad Nayšāburi*'.

[9] To Nayšāburi's *eṣfahān* correspond in the poetry *ṣefāhān* and *sepāhān*. The mode names that occur least frequently are *māda* and *nahāvand* (twice each), and *busalik* and *moḫālef-e rāst* (once each), although this low rating is of doubtful significance: *moḫālef-e rāst*, for example, might have been prosodically harder to digest.

least its fundamental tetrachord had remained unchanged.[10] However, in another three cases where a name may tentatively be identified in Ibn Sinā's text, even if the readings are by no means secure,[11] there seems to be no continuity of structure, and in general the picture of the modes that can be extracted from Ibn Sinā's account[12] is markedly different from that provided some two and a half centuries later by al-Urmawī.

This is enough to suggest that it will be no easy matter, if indeed possible at all, to go beyond an inventory of names and outline a topography of the modal landscape with which Nayšāburi and Boḫāri were familiar. What they have to say will need to be fleshed out by calling upon the more precise accounts offered by al-Urmawī and Širāzī, but at the same time it will be necessary not to lapse into the lazy posture of assuming that what Nayšāburi and Boḫāri refer to as mode *x* will match exactly the definition offered for it by the Systematist theorists. The route in will therefore need to be through remarks in the Khorasani texts, made from various perspectives, that shed useful light on modal identities and categories, and, more importantly if rather fitfully, on relationships and derivations, for it is above all these that provide a means of assessing the extent of Systematist-Khorasani identity or non-identity.

Kay Kā'us

Among earlier texts, it is specifically in the *qābus-nāma* by Kay Kā'us that such information is to be found. Writing in the late eleventh century, he offers general instructions to musicians concerning social proprieties, emphasizing restraint and discretion in appearance and behaviour. Beyond this, his advice concerns the need to vary choice of repertoire to take account of the type of audience, beginning with occasions when monarchs are present, which require performing a royal melody (*dastān-e ḫosravāni*),[13] a category for

[10] Despite an insignificant change of name: Ibn Sinā calls it *mustaqīm*, a literal translation of *rāst*, to fit the Arabic of his text.

[11] They are *navā* (although an alternative reading is *ray*), *eṣfahān*, and either *salmak* (with the reading *salmakī*) or, possibly, *busalik* (with the reading *salīkī*).

[12] They are described at the end of the chapter on music in the *kitāb al-šifā'*. For an edition and analysis of the text see Owen Wright, 'Die melodischen Modi bei Ibn Sīnā und die Entwicklung der Modalpraxis von Ibn al-Munaǧǧim bis zu Ṣafī al-Dīn al-Urmawī', *Zeitschrift für Geschichte der Arabisch-Islamischen Wissenschaften* 16, 2004/2005, 224-308.

[13] These terms occur elsewhere, but without shedding much light on their meaning here. For Ibn Zayla (d. 1048), *dastānāt* seems to refer to a form or category, and *ḫosravāni* for al-Tīfāši (580h-651h/1184-1253) is a modal designation used in al-

which no further characterization is given. Styles that are heavy (*gerān*) are suitable for the old and serious dignitaries; those that are lively (*sabok*) for the young; and the two are best performed alternately—the first indication in a Persian text of how performances might be structured. At this point the vocabulary for 'mode' consists of the synonyms *rāh* and *ṭariq* ('way, path'), not *parda*, although this term does appear later in the chapter, as do various mode names.

How to assess the audience is refined further by appealing to complexion and the four temperaments, the musician being exhorted to adjust the repertoire according to the category to which the audience belongs. Thus for those who are of a ruddy complexion and sanguine (*sorḫ-e ruy va damavi*) one should play mainly on the lower string (*bam*); for those who are pale faced and bilious (*zard-e ruy va ṣafrāni*) one should play mainly on the upper string (*zir*); for those who are white-skinned, fat, and phlegmatic (*safid-e post va farba va marṭub*)[14] one should play mainly on the lower string; and for those who are dark, thin, and melancholic[15] (*siyāh-guna va naḥif va sawdāʾi*) one should play mainly on the *sehtāra*, the meaning of which term is not immediately clear. The obvious assumption would be a reference to the *setār*, a long-necked lute, but the structure of the passage points towards the symmetrical reappearance here of *zir*, so that we have an unexpected change of tack. That the text is not corrupt, though, is indicated by the inclusion of virtually the identical word in the equivalent passage of Nayšāburi's treatise, where the context (*dar pardahā-ye tiz ... va dar āhang-e sehtā*) suggests not an instrument but a type of melody, even if the phrase structure is syntactically the same as before, following the instruction to: 'play mostly on *x*' (*bištar bar* x *zan*).[16] That it may be, rather, a reference to a particular mode is suggested by a considerably later text, where it appears, in the form *sehtār*, as one of the modes forming the *āvāz* group.[17]

Andalus. For Kay Kāʾus, the phrase may refer to the Sasanian musician Bārbad, on whom see the entry in *Encyclopedia Iranica*.

[14] 'Humid', or 'humoral' would be a more direct translation of *marṭub*, but in this context it corresponds among the humours to phlegm.

[15] Melancholy being associated with black bile.

[16] It is in any case quite unclear how the *setār* could have been thought appropriate for emaciated dark-skinned melancholics: one string for each characteristic hardly seems a convincing explanation. Further, a reference to three strings would fit ill with a context in which only two are named.

[17] Purjavādi, '*al-muḫtaṣar al-mufīd*'. This acephalic text is included within a manuscript of mixed contents seemingly written between 750h/1349 and 812h/1409-10 and is more likely to belong to the later part of this date range. However, there is

The chapter concludes with further advice about behaviour, with an emphasis on discretion, but precedes this by setting out the order in which the modes, now termed *parda*, should be performed. There are, though, differences between manuscripts as to the precise contents of the list. The oldest has:

rāst, *māda*,[18] *ʿerāq*, *ʿoššāq*, *zirafgand*, *busalik*, *sepāhān*, *navā*, *gozāšta*, and *rāhavi*[19]

Among these ten we already have eight of Nayšāburi's *parda* set, while of the remaining two, *zirafgand* and *gozāšta*, the former is one of al-Urmawī's equivalent *šadd* set and is also evidently related to Nayšāburi's *zirafganda-ye bozorg*, and the latter might conceivably be related to *gavāšt*, which is one of al-Urmawī's second set of six modes. To be investigated later, when other relevant data have been assembled, is the question whether this order has structural implications.

Nayšāburi

The humoral concerns of Kay Kāʾus are echoed by Nayšāburi, at least to the extent that he refers at the end of his treatise to modes and styles deemed appropriate to the different physical traits (mainly of skin colour) of the audience, with four types being distinguished. He also takes up, if again in a rather different way, the theme of order of performance, giving a detailed specification of which modes are appropriate for the various stages of the cycle of day and night. Of more immediate interest in the present context, however, are his remarks on the structure of various modes and the relationships between them. Although evidently meant to be both comprehensible

no trace of either *sehtār* or *panjtār*, also included among the *āvāz* names, during the three centuries between *al-muḫtaṣar al-mufīd* and the *qābus-nāma*, which gives rise to the suspicion, already voiced by Purjavādi, that we are confronted here with variants of *segāh* and *panjgāh* respectively, mode names first recorded by Širāzi and common thereafter. If so, this would push the origins of *segāh* as a named modal entity back to the eleventh century.

[18] The text as given in Fallahzade, *Persian writing on music*, p. 64, has *bāda*, presumably derived, at whatever stage, from a copyist's misreading.

[19] The Yusofi edition (ʿOnṣor al-Maʿāli Kay Kāʾus b. Eskandar b. Qābus b. Vašmgir, ketāb-e naṣiḥat-nāma maʿruf beh Qābus-nāma, ed. Ġolām-Ḥosayn Yusofi, Tehran, 1345š/1967, p. 196) and likewise Purjavādi, '*resāla-ye musiqi-ye Moḥammad b. Maḥmud b. Moḥammad Nayšāburi*', have *basta* in place of *gozāšta*. Others mentioned in later manuscripts include, among the stock common to Nayšāburi and al-Urmawī, *ḥosaynī* and *salmak*. In later texts *rahāvi* tends to replace *rāhavi*, but for consistency the former will be retained throughout.

and informative, they nevertheless assume prior knowledge without which they remain bafflingly opaque as descriptions of structure. As a result, the safest starting point is to consider what they say about relationships, frequently ones of derivation, beginning with the order of presentation of the twelve *parda* modes, in itself a hierarchy of sorts, at least with regard to the preeminent status of the first mode:

rāst, *moḫālef-e rāst*, *ʿerāq*, *moḫālefak*, *ḥosayni*, *rāhavi*, *eṣfahān*, *māda*, *busalik*, *navā*, *nahāvand*, and *ʿoššāq*

We are informed, indeed, that *rāst* is the king (*šāh*) among modes, the one from which all others are derived. This is, evidently, a routine metaphor of status, but one that might be taken as building upon the meaning of the word *rāst* ('straight', exactly rendered by Ibn Sinā's *mustaqīm*) the implication that its pitch set was regarded as in some sense normative, so that other modes were derived from it or seen in relation to it, either straightforwardly making use of it although with different modal emphases or retaining part of it but also deviating from it at certain points.

Allied with status is the idea of temporal origin. This appears also in other texts, where *rāst* is referred to as the mother mode, and as a natural extension of this we find various theories proposed for the evolutionary growth of the *parda* set. Nayšāburi's is the earliest of these to be recorded, and it also includes an account of the genesis of a secondary set of six. For him, the process began with a primary set of seven modes (cosmologically related to the heavenly bodies) that already existed at the time of Bārbad, the legendary Sasanian court musician, and it was extended to, or divided up and rearranged as, twelve by his pupil Saʿidi, thus anchoring the canonical *parda* modes in the pre-Islamic Persian past. He adds that later masters created a further six, and these, attested for the first time in Nayšāburi's treatise as a set, are gathered together under the rubric *šoʿba* ('branch'), the term itself affirming their secondary, derived status. Each one is considered to be an offshoot of[20] two of the *parda* set, as shown in fig. 1 (next page).

How is not explained, although one might think that the cryptic remark with which the chapter ends, namely that each two *parda* modes were opened from five positions (*har dō parda-rā az panj jāy begošādand*) could somehow be relevant. But nothing is said about which elements were selected from the source modes or the ways in which they were combined. This question will be explored later,

[20] The relationship is expressed by the verb *ḫāstan (az)* 'to arise (from)'.

ḥosayni	+	*māda*	→	*zirkaš*
moḫālefak	+	*rāhavi*	→	*basta*
navā	+	*ᶜošš̄āq*	→	*ᶜozzāl*
eṣfahān	+	*busalik*	→	*negārin*
ᶜerāq	+	*nahāvand*	→	*ḥejāzi*
rāst	+	*moḫālef-e rāst*	→	*sepehri*

[Figure 1]

but despite the scheme being rather too neat to be trusted in its entirety, it may be presumed that it is not wholly arbitrary, and that in some cases at least there were structural similarities to underpin the connections proposed. There follows the interesting observation that there is nothing beyond these two sets, and that subsequent efforts to go further were unsuccessful.[21] Yet as this is preceded by various remarks on individual modes, some of which are extraneous to them, there evidently had been successful innovations, and the claim should be read, rather, as an oblique way of showing that by the early thirteenth century, if not before, not only the larger group of *parda* modes but also the secondary set of six had acquired a degree of exclusivity: Nayšāburi is, on occasion, quite emphatic in asserting that a certain mode is not a member.[22]

bāng

There follows a rather obscure chapter on *bāng*, an enigmatic term for which no explanation is provided.[23] It opens with the bald statement that music consists of eighteen *bāng* (*bedānke ᶜelm-e musiqi hajdah bāng ast*) and, from its general meaning of 'voice, sound, cry', one might think that, like *āvāz*, it could refer also to a mode, so that, in parallel with Nayšāburi's initial definition of music (*ᶜelm-e musiqi*) as a 'noble science' that has twelve *parda*s, the eighteen could refer to the twelve *parda* + six *šoᶜba* modes. That this cannot be the case,

[21] This material is reviewed in Alexander Dzhumajev, 'From parda to maqām: a problem of the origin of the regional systems', in Jürgen Elsner and Gisa Jähnichen (eds.), *Regionale maqām-Traditionen in Geschichte und Gegenwart (Materialien der 2. Arbeitstagung der Study Group "maqām" des International Council for Traditional Music vom 23. bis 28. März 1992 in Gosen bei Berlin)*, vol. 1, Berlin, 1992 [pub. 1994], pp.145-62.

[22] In the case of *bozorg* he is keen to point out that it is neither a member of the set of twelve *parda* modes nor a member of the set of six *šoᶜba* modes, which might be read as hinting at differences of opinion as to its status. For al-Urmawī it is one of the set of twelve.

[23] Without further specification, its general meaning is unhelpfully vague, but nothing more precise is offered by music theorists, and there is no hint of a technical sense among the literary materials assembled in Dehkhoda.

however, is made clear by the immediately following list that informs us, as shown in fig. 2, how many *bāng* each of the twelve *parda* modes has.

2	1½	1	½
rāst	*ʿerāq*	*navā*	*ʿoššāq*
moḫālef-e rāst	*moḫālefak*	*rāhavi*	
māda	*busalik*	*eṣfahān*	
	nahāvand	*ḥosayni*	

[Figure 2]

The sum of these, however, is not the expected eighteen but sixteen and a half, suggesting that the text has suffered in transmission (or, however improbable, that the remaining one and a half are located elsewhere).

Unfortunately, the organization of the text prohibits an editorial salvage attempt. The groups are listed in descending order of size, with the one *nim* ('half') *bāng* mode, *ʿoššāq*, in last place, after the one-*bāng* group, so that to think of an emendation here, restoring a hypothetical original *dō* ('two') *bāng*, one would have to propose in addition a re-ordering, placing *ʿoššāq* in the first group. Failing *dō bāng*, one might consider a subsequent rephrasing of *yak bāng o nim* ('one and a half *bāng*'), but this would presume a change of word order as well as omission and, as before, re-ordering.[24] To be contemplated, however, is the possibility of the omission of *o nim* ('and a half') elsewhere. The text as it stands proceeds:

... busalik yak bāng o nim navā yak bāng nahāvand yak bāng o nim rahāvi yak bāng eṣfahān yak bāng ...

which suggests either that the order has been disturbed, with *navā* now preceding rather than following *nahāvand*, or, more simply and preferably, that there is a lapsus, the correct reading being *navā yak bāng o nim*.[25] Theoretically, it would also be possible for the same omission to have taken place after both *rāhavi yak bāng* and *eṣfahān yak bāng*, leaving only *ḥosayni* in the one-*bāng* category and reaching the target of eighteen, but while the suggested emendation to the text

[24] The manuscript has a gap before *nim*, but not quite big enough to insert *yak bāng o*. Rather than indicating an omission, it is typical of the layout of this passage, in which gaps sometimes occur not between one entry and the next but, disconcertingly, between the mode name and the following *bāng* specification, suggesting that the scribe may not have been very familiar with the subject matter.

[25] The possibility of dittography, resulting in *nahāvand yak bāng o nim* in place of an original *nahāvand yak bāng*, may be excluded.

for *navā* is perfectly reasonable, the other two, while not unreasonable, are fundamentally expressions of wish-fulfilment. In any event, even if attained, eighteen would remain merely the fortuitous total of *bāng* in these twelve modes, and without relating *bāng* to a particular scale of measurement it tells us little. It indicates, for example, the existence of a significant gap between the *rāst* group and *ʿoššāq*, but of what order is not vouchsafed: what a single *bāng* might consist of is nowhere stated.

To be assumed, though, if the sense 'mode' must be excluded, is that *bāng* is to be located somewhere within the territory of interval, scale, and range. Among these, the possibility of one specific interval being meant may also be excluded, as there appears to be no interval size x for which a total of $18x$ would be meaningful. That it refers, rather, to aspects of scale as manifested in the diatonic fretting of Central Asian long-necked lutes has been suggested by Eckhard Neubauer.[26] The contemporary Uzbek *dutar*, for example, has 14 frets with a compass (on one string) of two octaves, the two strings together, tuned a fourth apart, yielding a total of 18 notes. As the fretting yields steps of whole tone (T) and semitone (S), in the ascending order T T S T T T S in each octave,[27] this suggests that *bāng* might refer generically to a step of either size. However, the modes of the two *bāng* category would then contain one of the sequences TT, TS, and ST, and those of the one and a half category TS and/or ST, thus rendering otiose the distinction between the two categories. Further, the existence of a half *bāng* category excludes the possibility of it referring specifically to S, while if it referred specifically to T the total of 18 would no longer fit, even if two separate S were summed as T. To go back to an earlier Khorasani model, however, the more complex fretting of the *ṭunbūr ḫurāsānī*, as described by al-Fārābī,[28] can readily accommodate Neubauer's

[26] 'Music in the Islamic environment', in C.E. Bosworth and M.S. Asimov (eds.), *History of civilizations of Central Asia. Volume IV: The age of achievement: A.D. 750 to the end of the fifteenth Century. Part two: The achievements*, Paris: UNESCO, 2000, pp. 594-603.

[27] Abdulwali Abdurashidov, 'The tanbur - vehicle of the shashmakom lad system', in Jürgen Elsner and Gisa Jähnichen (eds.), *Regionale maqām-Traditionen in Geschichte und Gegenwart (Materialien der 2. Arbeitstagung der Study Group "maqām" des International Council for Traditional Music vom 23. bis 28. März 1992 in Gosen bei Berlin)*, 2, Berlin, 1992 [pub. 1994], pp. 5-19.

[28] *kitāb al-mūsīqī al-kabīr* (ed. Ġaṭṭās 'Abd al-Malik Ḫašaba; rev. and intro. Maḥmūd Aḥmad al-Ḥifnī), Cairo: dār al-kitāb al-ʿarabī li-l-ṭibāʿa wa-'l-našr, 1967, pp. 700-21; tr. in Rodolphe D'Erlanger, *La musique arabe*, I, Paris: Geuthner, 1930, pp. 242-9.

hypothesis that the eighteen *bāng* were mapped across the double octave. They would, though, need to include both T and S[29] with, for example, a fretting disposition such as T S S S T S S S T in each. If *bāng* is then understood as optimally referencing a whole tone, the two-*bāng* modes (ignoring any intermediate fret) would contain TT (<TSS, SST) the one and a half *bāng* modes TS or ST, and the *nim bāng* of *ᶜoššāq* would refer to S, at which point we face in even more acute form the problem of information deficit.

A further difficulty raised by the absence of any reference to interval sizes is that there is no way of ascertaining from the text whether neutral intervals were present or not. If they were, being produced by extra frets or by adjusting fret positions, one might extend the above argument to reach the conclusion that *bāng* embraced not just T and S but also a neutral second (and then, notionally, perhaps even intervals larger than T). The result would be to diminish the potential information yield of Nayšāburi's *bāng* specifications even further. If they were not, one might well wish to adduce their absence in support of the case for Khorasani particularism, and to this might be added that al-Fārābī's detailed account of equivalences between the fretting of the *ᶜūd* and that of the *ṭunbūr ḫurāsānī*, where whole tones are described as having two internal frets, yielding a division into two limmas and a comma, could be read as an attempt to circumvent differences. On the other hand, neutral intervals do figure prominently in the account of modal structures offered by Ibn Sīnā,[30] who spent his formative years in Bukhara. This suggests that they are unlikely to have disappeared from the Khorasani modal corpus with which Nayšāburi was familiar.

Another interpretative area to explore is the supposition that *bāng* refers not to one specific interval but more elastically to the area within which the characteristic element of a mode was articulated. On the premise that we are dealing with range, and that no more esoteric parameter was involved, it would certainly be possible to think of *bāng* as relating to the octave,[31] with the modes then having ranges of two octaves down to a half, if *ᶜoššāq* must be left unchanged. As a

[29] Expressed by Neubauer ('Music in the Islamic environment', p. 596) as 'it seems that Nīshāpūrī meant the 18 steps of the double octave, including major and minor thirds and sixths.'

[30] Owen Wright, 'Die melodischen Modi bei Ibn Sīnā und die Entwicklung der Modalpraxis von Ibn al-Munaǧǧim bis zu Ṣafī al-Dīn al-Urmawī', *Zeitschrift für Geschichte der Arabisch-Islamischen Wissenschaften* 16, 2004/2005, 224-308.

[31] The conclusion arrived at in Nikfahm-Ḫubravān and Kordmāfi, '*musiqi dar* ašjār o aṣmār'. Also possible is that the span of a *bāng* was conceived of as a heptachord, but still with two *bāng* effectively equivalent to a double octave.

solution this is attractive, but again not problem-free. A particular difficulty is raised by the description of *moḫālef-e rāst*: like *rāst*, it is in the two-*bāng* category and consequently should have a range of two octaves, but it is said (a) to derive from the upper part (*bālā*) of *rāst* and (b) to occur in three positions in relation to *rāst*. For (a), to avoid the possibility that the two might not overlap fully and therefore have a combined range of perhaps three octaves, one would have either to posit a strange scenario in which the 'upper part' was understood as referring to the second octave of *rāst* (which was, presumably, identical with the first), with the implication that the lower octave of *moḫālef-e rāst* was different from the upper, or, more likely, assume that the reference is to the upper segment of a single octave (4 – 1′ or 5 – 1′), with the implication that *moḫālef-e rāst* was coincident with or closely related to *rāst* in this area but differed in the lower, thereby justifying the epithet *moḫālef* ('disagreeing, opposing'). This might be feasible, but (b) is less easy to dispose of: it is difficult to see how the positioning of *moḫālef-e rāst* at the topmost of the three positions could be accounted for without its two-octave range extension resulting in a combined span that was unrealistically wide.

An alternative hypothesis that circumvents this difficulty is that *bāng* should rather be understood in relation to a lesser range, normally a fourth or fifth. Two of the four modes in the one-*bāng* group, *eṣfahān* and *ḥosayni*, might fit this value: their characteristic elements, as presented by Systematist theorists, span a fourth and a fifth respectively. A third mode, too, *rāhavi*, has a core element with a restricted range, this time spanning a major third, so that all three could be though to fit this interpretation.[32] Rather more problematic, however, is the remaining mode, *navā*. One might again think of a characteristic tetrachord, but it is likely that the text is defective here and that in place of *navā yak bāng* it should read *navā yak bāng o nim*, placing *navā* in the 1½ group, and there is nothing in the Systematist descriptions to suggest an entity or prominent zone somewhere between tetrachord (or pentachord) and octave. In any case, the 1½ group is already problematic: *nahāvand* could be related to a span of a little less than an octave,[33] but in Systematist texts *busalik* refers to a tetrachord element and *ʿerāq* either to a tetrachord element or to one with the span of a neutral third, which would make them both

[32] Both al-Urmawī and Širāzi recognize this *rāhavi* element, which Širāzi indicates as the prominent segment of what he calls *rāhavi-ye tamām*. Its position, or indeed presence, in al-Urmawī's *rāhavi* octave is less certain.

[33] For Širāzi, *nahāvand* is an alternative name for *zangula*, the pitch set of which in the composition by al-Urmawī that he notates is /1 2 3- 4 5- 6 7♭/.

candidates (along with *moḫālefak*) for membership of the one-*bāng* group. Alternatively, they could both reference structures spanning an octave (or more) that ought to belong to the two-*bāng* group, which, in contrast, contains in *māda* a mode that may well have had a more restricted range. To such uncertainties may be added the more obvious stumbling block of the isolated and difficult to understand half-*bāng* category to which *ᶜošš̄āq* is assigned, even though the text later refers to a second half *bāng*, discussed below. There remains, in addition, the still unresolved problem of the lack of arithmetical fit, for which there is no better solution than to appeal to scribal error(s) and assume lacunae in the text to account for a reduction of one a half from an original sum of eighteen.

This hypothesis thus appears to provide only partial answers, and in the absence of supporting evidence it must be regarded as less than compelling.[34] Further evidence is, though, forthcoming, albeit not before the fifteenth century, in a treatise by Ḫiżır ibn ᶜAbdullāh,[35] followed in early seventeenth century by the further testimony of Darviš ᶜAli.[36] Both employ the term *bāng* and Darviš ᶜAli also speaks, in parallel to Nayšāburi's statement that music (*ᶜelm-e musiqi*) consists of eighteen *bāng*, of the *ᶜelm-e adwār* having eighteen *bāng* distributed among the twelve *maqāmāt* (= the twelve *parda* modes).[37] Darviš ᶜAli refers in addition to a certain Mawlānā Ḥosayn, who provides a yet further version, according to which the total was thirty-six, but shared out equally, three *bāng* to each *parda*—doubtless a regularization of the more unequal distributions to which both Darviš ᶜAli and Ḫiżır ibn ᶜAbdullāh bear witness alongside Nayšāburi. The example chosen by Mawlānā Ḥosayn is *ḥosayni*, for which he gives a registral stratification, (a) low (*pasti*), (b) *ḥosayni* itself, and (c) high (*balandi*), with (a) associated with (the note) *dōgāh* = a, (b) with (the

[34] It is not surprising, therefore, to find that it is rejected in Nikfahm-Ḫubravān and Kordmāfi, '*musiqi dar* ašjār o aṣmār', on the reasonable grounds that a mode made up of a half *bāng* would be too small to function effectively as an autonomous entity.

[35] Ḫiżır b. ᶜAbdallāh, *kitāb al-adwār*, MS. British Library Or. 11091, text ed. in M. Sadreddin Özçimi, 'Hızır bin Abdullah ve Kitâbü'l-edvâr' (Yüksek Lisans Tezi), Istanbul: Marmara Üniversitesi (Sosyal Bilimler Enstitüsü, İlâhiyat Fakültesi), 1989.

[36] In his *resāla-ye musiqi*, Tashkent State University of Oriental Studies, MSS 468/1 and 7005.

[37] Angelika Jung, *Quellen der traditionellen Kunstmusik der Usbeken und Tadschiken Mittelasiens. Untersuchung zur Entstehung und Entwicklung des šašmaqām* (Beiträge zur Ethnomusikologie 23), Hamburg: Verlag der Musikalienhandlung Karl Dieter Wagner, 1989, pp. 102-3.

note) *ḥosayni* = e′, and (c) with (the note) *moḥayyer* = a′, and Angelika Jung is surely justified in seeing here a reference not to three octaves but to tetrachord/pentachord segments making up a total range of one and a half octaves. A slightly different possibility (or emphasis) would be to regard the three notes specified for *ḥosayni* as central and prominent within a zone, possibly e or f+ - **a** - c′ for (a), c′ - **e′** - g′ for (b), and e′ or f+′ - **a′** - c″ for (c).

For his part, Ḫiżır ibn ᶜAbdullāh merely offers the curt observation that there are no more than eighteen *bāng*, with examples again drawn exclusively from the twelve *maqām* modes. That the formulations of Nayšāburi, Ḫiżır ibn ᶜAbdullāh, and Darviš ᶜAli are independent is shown by the difference in the category sizes. The most straightforward is that of Nayšāburi, who has just four: 2 *bāng*, 1½, 1, and ½, as shown in fig. 2, whereas Ḫiżır ibn ᶜAbdullāh reduces this to three: 2, 1, and ½, but complicates matter by adding in most cases a second element, called *parda*, either a whole or a half, as shown in fig. 3:

2+1 *parda*	2+½	1+1	1+½	½+1	½
zirafgand	*rāst*	*rāhavi*	*busalik*	*zangula*	*ᶜošš̄āq*
	bozorg	*ḥosayni*	*ᶜerāq*		*navā*
		eṣfahān[38]			

[Figure 3]

This yields a total of 12½ *bāng* (+ 7 *parda*), but even if both the omitted *ḥejāzi* and *eṣfahān* were assumed to belong to the 2 *bāng* category, the total would still be some way short of 18.

Darviš ᶜAli reduces the *bāng* categories further, to just one or two but, like Ḫiżır ibn ᶜAbdullāh, he adds in some cases a second element, a half *āvāz*, presumably equivalent to Ḫiżır ibn ᶜAbdullāh's half *parda*. Unfortunately, his list is again incomplete, missing *navā* and *rāhavi*, but it would hit the target of 18 *bāng* if one of the two were assumed to belong to the 2 (or 2 + ½) category and the other not, although exactly what the relevance of the extra half *āvāz* might be is not immediately clear, and likewise with the extra *parda* or half *parda* in Ḫiżır ibn ᶜAbdullāh's versions. In any case, the additional *āvāz* or *parda* only match intermittently and, as may be expected, given the gap of two centuries between them, their two sets exhibit as many differences as similarities. This might readily be explained by the contrasting trajectories of the *maqām* modes over this period and in

[38] The text has just *eṣfahān bir perde*. Assumed is the omission of *bir bāng ve*, although other possibilities would yield 2 + 1′.

different localities, but Darviš ᶜAli fails to supply definitions which would allow this supposition to be tested.

Between Nayšāburi and Ḫiżır ibn ᶜAbdullāh we also have an extensive gap. The membership of the *parda/maqām* set has changed somewhat, and the *bāng* totals do not match consistently; indeed, the only modes upon which they agree are *rāst* (2), *ᶜoššāq* (½), and three with one *bāng* apiece, *eṣfahān*, *ḥosayni*, and *rāhavi*. Ḫiżır ibn ᶜAbdullāh at least gives individual definitions, but as they are rather conservative, being almost always couched as octave scales, there seems no obvious way to relate them to the *bāng* categories. For example, he regards *rāst* as having two *bāng* and *ᶜoššāq* a half, but defines them as:

rāst	/1	2	3-	4	5	6	7-	1′/
ᶜoššāq	/1	2	3	4	5	6	7-	1′/

Yet another *bāng* list, in an anonymous and probably seventeenth-century text, appears to support the argument that something more substantial than a single interval is needed to make sense of the half *bāng* category. It gives, on the authority of Ptolemy the Wise (!), a set proceeding in half steps from 2 (*ḥosayni*, *navā*, and *ᶜerāq*) down to a half (now populated by no fewer than six modes, and therefore the most common category).[39] Given the temporal proximity of the later accounts the lack of agreement between them is somewhat surprising, much less so that between them and Nayšāburi: there may have been changes in the proportions of various modes or, just as likely, in perceptions of their defining characteristics. It is important to note, however, that in none of these texts is a definition of *bāng* provided, and it may be sensible to conclude that it was less a precise and stable unit of measurement than a conventional (and vacillating) label by which relative range differences and/or prominent segments could at least be placed in some form of hierarchical order. That these could be quite variable is indicated by later fifteenth-century authorities such as al-Lāḏiqī and Tirevi, but neither includes a *bāng* categorization, and their accounts do not provide sufficient purchase for any one interpretation.

[39] Amir Hoseyn Pourjavady, 'The musical codex of Amir Khān Gorji (c. 1108/1697)', PhD dissertation, University of California, Los Angeles, 2005, p. 187.

Other categorizations

After Nayšāburi's cryptic *bāng* specifications, it is something of a relief to turn to his rather more productive comments on individual modes that point to relationships and derivations. But they, too, are not always easy to understand, and will be taken into consideration in the course of the case-by-case discussion below. They are followed, in the next chapter, by the specification of appropriate performance times for the individual *parda* modes over the twenty-four hours cycle, beginning at dawn, as shown in fig. 4. For the *šoʿba* modes, the comment is added that each is to be played at the same time as the *parda* with which it is associated—presumably the first of the two from which it is said to be derived:

dawn	sun up	morning	midday	afternoon	sunset
māda	*rāst*	*ʿerāq*	*rāst*	*busalik*	*ʿošš̤āq*
evening prayer	sleep		midnight	night	daybreak
navā	*moḫālefak*	*eṣfahān*	*ʿerāq* *moḫālefak* *nahāvand*	*eṣfahān* *nahāvand*	*rāhavi* *ḥosayni*

[Figure 4]

In his brief final chapter, Nayšāburi presents yet another form of categorization by reverting to a topic explored by Kay Kāʾus, that of matching music to listener. Nayšāburi articulates it in a manner sufficiently similar, even if the order and specifications differ somewhat, to point to a common conceptual framework, one whereby four audience types are distinguished by skin colour and other physical characteristics, as shown in fig. 5 (next page). Perhaps surprisingly, there is no reference to the four humours.

For Nayšāburi's category 1, both writers recommend *bam*, to be understood not just as the lowest notes produced on the *bam* string, but the low register in general, in contrast to *tiz*, the high register,[40] with Nayšāburi giving the example of *moḫālefak* 'and the like'; for his category 2, he indicates the opposite (*moḫālef*), i.e. the high register, and suggests *moḫālef-e rāst* and *ʿerāq* as suitable choices to perform—whereas Kay Kāʾus had again referred to the low register, *bam*; for his category 3, Nayšāburi again recommends performing in high-register modes (*dar pardahā-ye tiz*) and, echoing Kay Kāʾus'

[40] Expressed by Nayšāburi as 'one must let them listen on *bam*' (*u rā samāʿ dar bam bāyad kard*).

Nayšāburi 1	white skinned and stout (*safid-e post … va laḥmāni*)
Kay Kāʾus (3)	white skinned and fat (*safid-e post va farba*)
Nayšāburi 2	of a ruddy complexion, with red hair and blue eyes (*sorḫ-e ruy va sorḫ-e muy va azraq-e čašm*)
Kay Kāʾus (1)	of a ruddy complexion (*sorḫ-e ruy*)
Nayšāburi 3	dark-skinned but verging on yellowish (*siyāh rang … ke bā zardi mizanad*)
Kay Kāʾus (4)	dark-skinned and thin (*siyāh guna va naḥif*)
Nayšāburi 4	brown-skinned and handsome (*gandom gun va ḫub ṣurat*)
Kay Kāʾus (2)	pale faced (*zard-e ruy*)

[Figure 5]

final cryptic instruction, in the tones of *setā* (*dar āhang-e setā*), possibly, as suggested above, to be regarded as a mode; and for category 4 he retreats to the generic notion of performing what is suitable (*be-movāfaqat-e ān*), whereas Kay Kāʾus (but in relation to a different skin colour) makes an association with the *zir* string.

Boḫāri

Before turning to Nayšāburi's material on relationships and derivations, we may consider the second text, by ʿAlāʾ Monajjem Boḫāri (?1226/7-after 1292), the brief chapter on music (headed the 'third fruit of the fifth branch of the fifth tree') in his *ašjār o aṣmār* ('trees and fruits'). Given that the emphasis of this work is on astrology, it is hardly surprising to find that the modes are be treated from a cosmological perspective in this chapter, but after both Nayšāburi and al-Urmawī had recognized what by the middle of the thirteenth century must have been the widely accepted primacy of the set of twelve modes, with its obvious potential for cosmological agency through association with the signs of the zodiac, it is still a little unexpected to find Boḫāri clinging to the notion, relegated by Nayšāburi to the Sasanian past, of there being seven basic modes (*parda*).

It is, nevertheless, eminently explicable. For an astrologer, there would be the strong attraction of the correspondences that could be established with the seven heavenly bodies, and those he proposes are shown in fig. 6, which also includes in the right-hand column a second set of seven, this time of derived (*farʿ*) modes, one produced (*taḫrij*) from each *parda*.

Saturn	*navā*	+	*ḥosayni*
Jupiter	*busalik*	+	*gozāšta*
Mars	*rāst*	+	*ʿoššāq*
Sun	*ʿerāq*	+	*eṣfahān*
Venus	*negārin*	+	*zirafganda-ye bozorg*
Mercury	*zirafganda-ye ḫord*[41]	+	*nahāvand*
Moon	*rāhavi*	+	*basta*

[Figure 6]

We are then informed that beyond these basic (*aṣl*) fourteen, a total that seems unique to Boḫāri, there are a number of others[42] that are characterized as delicate (*nāzok*): six are named, *nawruzak*, *moḫālef*, *ḥejāz*, *sāzgari*, *māda*, and *sepehri*, but to this category also belong the upper registers (*tizi*) of the basic modes, seemingly viewed as separable entities, and combinations of all these (*ān če az tarkibāt-e in hama ḫizad*),[43] to which is added that in these 'tight' modes (*pardahā-ye tang*) composition presents difficulties unless one of the basic fourteen is combined with them. To be presumed is that compositional possibilities in them were constrained by limitations of range and/or restrictions on melodic movement. The notion of difficulty is also central to his final remark, touching on the quite different but perennial theme of ancients (*motaqaddemān*) vs. moderns (*motaʾaḫḫerān*). Contrasting their styles, he comments that both strive to produce pleasing (*ḫōš āyanda*) compositions, but whereas those of the former are also easy and natural (*āsān va maṭbuʿ*), recent ones are characterized by being difficult and complex (*došvāri va moškel*).

Derivations and identifications

These interestingly varied accounts, with their derivational strings, sets of associations, and scattered further remarks, provide the raw material for any attempt to sketch an outline of the state of affairs during the century preceding the appearance of al-Urmawī's *kitāb al-*

[41] 'Little *zirafganda*', corresponding to *zirafganda-ye bozorg*, and presumably to be equated with simple *zirafgand* in other sources. Purjavadi, '*resāla-ye musiqi-ye Moḥammad b. Maḥmud b. Moḥammad Nayšāburi*', p. 50, quotes a line attributed to Mawlānā Jamāl al-Din Moḥammad Balḫi in which this term appears, again juxtaposed to *zir(afganda-ye) bozorg*.

[42] The term here is *āvāz*, but it is used generically rather than to refer to a particular category, in parallel with his use elsewhere of the phrase *āvāzhā-ye aṣl*.

[43] Nikfahm-Ḫubravān and Kordmāfi, '*musiqi dar* ašjār o aṣmār', appropriately draw parallels here with the notion of possible new combinations mentioned by al-Urmawī and explored in some detail by Širāzi.

adwār and, more particularly, to detect the presence of features that might distinguish a more specifically Khorasani set of norms from those seen in the Systematist literature. One immediate difference to be noted is that whereas one of the ways al-Urmawī articulates pitch sets is by specifying fret positions on a short-necked lute, Nayšāburi, and possibly also Kay Kāʾus, reflects a regional preference for long-necked lutes, so that instead of four, only two strings are referred to, *bam* and *zir*,[44] normally tuned, presumably, a fourth apart.[45] By analogy with al-Urmawī's analysis of intervals, but adjusting his limma + limma + comma theorization of the whole tone to reflect the presence of neutral intervals, the following fretting may be assumed (with - indicating a lowering by approximately a quartertone):

zir 4 4♯=5♭ 5- 5 6♭ 6- 6 7♭ 7 1-′ 1′ 2♭′ 2-′ 2′ 3♭′ 3-′ 3′ 4′ . . .
bam 1 2♭ 2- 2 3♭ 3- 3 4

continuing in the same way into, and probably through, the 4′ - 4″ octave. This allows, as a first step, the representation of the normative *rāst* scale as:

1 2 3- 4 5 6- 7♭ 1′ 2′ 3-′ 4′ . . .

again potentially extending further into and through the second octave on the *zir* string. With regard to the mode *rāst*, however, both its normal range (beyond what might be gleaned from its two-*bāng* categorization) and its position within the general scale remain unspecified.[46] Nor is any indication given of features of prominence or melodic contour that might characterize it and consequently help with the interpretation of the several remarks, summarized in abstract form in fig. 7 (next page), concerning derivational chains, of some of which it is the head.

[44] As noted by William Sumits ('The evolution of the maqām tradition in Central Asia: from the theory of 12 maqām to the practice of shashmaqām', PhD thesis, University of London, 2011, p. 20). Neither refers to the *maṭlaṭ* and *maṭnā* strings, the two that come between *bam* and *zir* on the *ʿūd*.

[45] But it should be borne in mind that for al-Fārābī the most common tuning for the *ṭunbūr ḫurāsānī* was at the whole tone. Others are mentioned, including the fourth and the minor third, which he calls the Bukhara tuning (D'Erlanger, *La musique arabe*, I, p. 253, a reading preferable to that of the Ḫašaba edition, which has (p. 735) *taswiyat al-najjārī*).

[46] Nikfahm-Ḫubravān and Kordmāfī, '*musiqi dar* ašjār o aṣmār', propose for it a total compass of two octaves—a perfectly reasonable assumption—but placed in the lower area of a more expansive general scale.

rāst → *moḫālef-e rāst*	the upper part of *rāst* → *moḫālef-e rāst*
moḫālef-e rāst → *zirafganda-ye bozorg*	the upper part of *rāst* → *ᶜošš̄āq*
ᶜerāq → *moḫālefak*	*ᶜerāq* from the fourth (?) → *eṣfahān*
moḫālefak → *eṣfahān*[47]	*ᶜerāq* + *moḫālefak* → *rāhavi*
the upper part of *rāhavi* → *ḥosayni*	
the lower part of *rāst* → *māda*	*māda* → *navā*
navā → *nahāvand*	the lower part of *nahāvand* → *busalik*

[Figure 7]

Although the formulation of these chains is sometimes obscure and occasionally imprecise, Nayšāburi creates through them a web of relationships that connect the various modes of the *parda* set. As fig. 7 shows, he provides explicit linkages for the first four in his mode list but thereafter mainly refers to parts, relative positions, and combinations, whereby at least partial connections are proposed. The first derivation seems straightforward, but it is still not clear whether the identification of *moḫālef-e rāst* with the upper part of *rāst*, assuming *rāst* to begin from 1, relates to the area above 4, that above 1′, or even, theoretically, something higher. Nor is it clear whether *moḫālef-e rāst* was a mode that used only the notes of the *rāst* scale or added or substituted others, although a particularly close relationship, and hence minimal differentiation, is suggested by the fact that it is the first mode to be introduced after *rāst* itself.

In the search for likely answers, we need at this point to seek help from al-Urmawī and, especially, Širāzi. Of the two, it is, in fact, only the latter who mentions *moḫālef-e rāst*, but not as an independent entity: he includes it as an alternative designation for *eṣfahān-e aṣl*, defined as /1 2 3- 4 4♯ 5/, with 1 and 5 both indicated as prominent. This allows a ready identification with the upper pentachord of the *rāst* octave, so that in relation to the fretting proposed above, if the *rāst* octave is placed, arbitrarily, to begin from 1, the open *bam*

[47] These two derivations of *eṣfahān* are presented as competing views, rather than as complementary.

string,[48] we have, indicating prominent notes in bold, the following relationship:

rāst	1	2	3-	**4**	5	6-	7♭	(7)	1′[49]
						↓			
moḫālef-e rāst				**4**	5	6-	7♭	7	**1′**

However, Širāzi's version goes no further, and since we may assume that for Nayšāburi *moḫālef-e rāst* had the same dimensions as *rāst* and hence was more extensive, we are left with a missing remainder, presumably a tetrachord, its position as well as its identity unknown. The most conservative conclusion, but surely the most likely, is that the same /1 2 3- 4/ tetrachord was involved, with the contrary or opposing sense of the term *moḫālef* then relating to the positional switch if it was above, or simply to the contrastive modal emphasis on the upper pentachord if it was below (and then with the possibility that the relative weakness of the tetrachord was such that Širāzi could ignore it or even be unaware of its existence). In favour of the upper position being perhaps the more likely could be adduced al-Urmawī's comment in the early version of the *kitāb al-adwār* concerning the tendency for modes with a pitch set statable as 1 – 1′ to develop a 4 – 4′ offshoot, exemplified by *rāst* and what he calls *tīzī* ('high register') *rāst*. Nevertheless, both higher and lower options will be included in what follows, represented by the notation (1 2 3-) [**4** 5 6- 7♭ 7 **1′**] (2′ 3-′ 4′), the square brackets enclosing the prominent segment, curved brackets the additional or even optional ones.

Nayšāburi also introduces further names: *moḫālef-e rāst*, he says, is called *nayšābura* and *negārin*. It is unclear in such cases—and there will be others—whether we are confronted simply by alternative names for the same entity, each one possibly particular to a certain geographical area, or by variants sufficiently close that the distinctions between them could be ignored. Ample evidence that what is perceived to be the same modal entity may have different names is provided not only by Širāzi but also by later theorists: particularly

[48] The alphanumerical notation supplied by al-Urmawī also begins from 1, but the corresponding fretting he supplies begins not from the *bam* but from the *maṭlaṭ*, the second string of the *'ūd*, tuned a fourth higher (*kitāb al-adwār*, ed. Hāšim Muḥammad al-Rajab, Baghdad: manšūrāt wazārat al-ṭaqāfa wa-'l-i'lām, 1980, p. 82 (cycle 40), p. 98).

[49] The bracketed 7 does not form part of the definition of *rāst*, but there is evidence to suggest that it might have been available as an optional addition (see Owen Wright, *The modal system of Arab and Persian music, A.D.1250-1300* (London Oriental Series, 28), Oxford: Oxford University Press, 1978, pp. 174-5.)

explicit is the fourteenth-century *al-muḫtaṣar al-mufīd*, which, when listing the *parda* modes, equates *moḫālefak* with *zirafgand*, *moḫālef-e rāst* with *eṣfahān*, and *nahāvand* with *zangula*, and among the *āvāz* group gives alternative names for *basta*.[50] Similarly, in the fifteenth-century *majalla fī al-mūsīqā* by al-Širwānī, *šahnāz* is equated with *zirafgand*;[51] and we are also informed that names may be regionally specific: the fourteenth-century *kanz al-tuḥaf* by Kāšāni reports that *moḫālef* was the name used in Iraq for *eṣfahān*, and that *nahāvand* was the name used in Bukhara for *zangula*.[52] However, not every such equation will represent regional naming preferences for the same mode: for Nayšāburi *moḫālef-e rāst* and *eṣfahān* are different entities, so that the collocations in the *kanz al-tuḥaf* and *al-muḫtaṣar al-mufīd* may signal a later development bringing the two closer together.

Nayšāburi notes, further, that *moḫālef-e rāst* is played in three positions: low (*pasti*), mid-range (*ruy-e āhang*), and high (*tizi*), on reaching which it is called *zirafgan*. There is no continuation referring to the other two positions; rather, the section ends with a seemingly unrelated and disconcerting remark to the effect that when they play the mode *rāst* they sing *salmak* (*čun parda-ye rāst benavāzand salmak ḫʸānand*). There is just one other statement concerning *moḫālef-e rāst*, namely that *zirafganda-ye bozorg* ('great *zirafganda*') is derived from it. This, in turn, is contrasted quite straightforwardly by Boḫāri with *zirafganda-ye ḫord* ('small *zirafganda*'), but to complicate matters Širāzi offers a whole range of names for the basic modal entity /1 2- 3♭ 3-/ that al-Urmawī calls *zirafgand*: his first choice is *zirafgand-e kučak* (synonymous with Boḫāri's *zirafganda-ye ḫord*), but to this he adds *zirafgand* and *kučak* separately, and also *moḫālefak*.[53] However, in the course of the following attempts to tease out relationships between modes, the labels *kučak*, *zirafgan*, *zirafganda*, *zirafganda-ye ḫord* and *zirafgand-e kučak* will, to avoid clutter and simplify matters,

[50] Purjavādi, '*al-muḫtaṣar al-mufīd*'. The names are *panjtār* and *ᶜaširān*, the latter an emendation of '*.rān*, which one would assume rather to be a slip or misreading of *ᶜerāq*, with this correction presumably discounted because *ᶜerāq* is not a member of the *āvāz* group. However, for Širāzi, *basta* = *eṣfahānak*, which, as he describes it, is quite unrelated to the later accounts of *'aširān*, whereas its pitch set does closely resemble that of *ᶜerāq*. It would not, though, offer any support to the notion that *panjtār* might be identified with *panjgāh*.

[51] Topkapı Sarayı Kütüphanesi MS. Ahmet III no. 3449, facsimile in Publications of the Institute for the history of Arabic-Islamic science, series C, 29, Frankfurt, 1986, p. 134. For al-Urmawī there was identity of pitch set but not of modal configuration.

[52] British Library MS. Or. 2361, fol. 258.

[53] The reading in British Library MS. Add. 7694 is *moḫālef*, but the *moḫālefak* of India Office MSS. 2219 and 2220 is surely preferable.

be dispensed with, deemed insignificant variants or equivalents of *zirafgand*, while to *zirafganda-ye bozorg* will be preferred al-Urmawī's simple *bozorg*. As a final complication, it needs to be noted that in addition to the basic entity /1 2- 3♭ 3-/, al-Urmawī uses *zirafgand* as a label for /1 2- 3♭ 3- 4♯ 5/, and although it is probably the former that is more frequently being referred to, *zirafgand* will be notated henceforth as /1 2- 3♭ 3- (4♯ 5)/.

Of the extra names included by Nayšāburi, neither al-Urmawī nor Širāzi mentions *nayšābura* and *negārin*, although they reappear in later texts; and they are similarly silent concerning *sepehri* and *sāzgāri*, two modes that, according to Nayšāburi, are related to *bozorg*. The only information he gives about the latter is that it equates to the upper register (*tiz*) of the former and is the same as *bozorg*, but this at least suggests that whatever other position it might inhabit, *bozorg* could appear in the high register. For *sepehri* he is a little more forthcoming:[54] it is a *šoʿba* derived from *rāst* and *moḫālef-e rāst*, which leads to the tentative conclusion that its upper register might well overlap not just with *sāzgāri* and *bozorg* but also with that of *moḫālef-e rāst* itself, a connection strengthened by the derivation of *bozorg* from *moḫālef-e rāst*.[55]

As well as for *bozorg*, al-Urmawī and Širāzi provide definitions for *zirafgand*, *salmak*, and *šahnāz*, all of which appear in this tangle of connections. They do not provide exact fits for the equations implied by Nayšāburi, since their pitch sets differ in significant respects from that of *rāst* and hence, we may assume, also that of *moḫālef-e rāst*, with one or other of which a link is mooted for them, yet it still possible to detect, depending on certain assumptions, a pattern of linking relationships. Širāzi's account of *salmak*, which incorporates and extends that of al-Urmawī, is particularly complex. He describes it as a compound, with a particular modal progression in the first part centred on the fourth above the initial pitch and a change of pitch set in the second part. It can, though, be displayed without grave distortion in the form of ascending and descending scales, with the ascending one beginning from 4, the open *zir* string, or from 1′.[56]

[54] Including telling us that it is performed in Anatolia (*rum*).

[55] A closeness between these two is confirmed in *al-muḫtaṣar al-mufīd*. For *bozorg*, al-Urmawī also provides an octave form within which 4 5- 6 7♭ 7 1′ is split into tetrachord (4 - 7♭, notated from 1) + (medial disjunctive) whole tone, with a tetrachord added above. This may be disregarded as an artificial entity created to fill a theoretical gap.

[56] To begin from 5 would also be possible. The pitches listed by al-Urmawī correspond to 7♭ 1′ 2′ 3-′ 4′ 5-′, and hence to Širāzi's version beginning from 1′

However, there can be no guarantee that Nayšāburi, who relates *salmak* to *rāst*, would have recognized it in quite this guise, even though the lower tetrachord, whether in ascent or descent, is the *rāst* /1 2 3- 4/ element, and the pitch set of the whole second part differs from it only at one point.

These conjectural identifications and relative positions are assembled in ex. 1, with the less secure ones being set in italic. In the case of *sepehri*, there are two, one of which relies upon the connection to *moḫālef-e rāst*, the other upon that to *bozorg*, which, although derived from *moḫālef-e rāst* according to Nayšāburi, is rather dissimilar as portrayed by the Systematists.

Three possible positions are given for *moḫālef-e rāst*, at 1, 4, and 1′, and if *zirafgand* is aligned with the highest, as prescribed by Nayšāburi, no extra fret is required:[57]

rāst		1	2	3-		**4**	5	6-	7♭	1′															
moḫālef-e rāst	(1	2	3-)	[**4**	5	6-	7♭	7	**1′**]	(2-′	3♭′	4′)	or:	(1′	2′	….									
				(4	5	6-)	[**7♭**		1′	2-′	3♭′	3′	**4′**]		(5′	6-′	7♭′)								
zirafgand									1′	2-′	3♭′	3-′		(4♯′	5′)										
bozorg									**1′**	2-′		3′	4′	4♯′	**5′**[58]										
sepehri						*4*	*5*	*6-*	*7♭*	*1′*	*2-′*	*3♭′*	*3′*	*4′*											
or:						*4*	*5*	*6-*	*7♭*	*1′*	*2-′*		*3′*	*4′*	*4♯′*	*5′*									
sāzgāri										*1′*	*2-′*		*3′*	*4′*	*4♯′*	*5′*									
salmak						4	5	6-	**7♭**	1-′		2′		3′	↴										
				3♭		4	5-	6♭	7♭	1-′		2′		3′	↵										
or:											1′	2		3-′	**4′**	5-′	6′	7**♭**′	↴						
									7♭	1′	2-′		3♭′		**4′**	5-′	6′	7**♭**′	↵						

[Example 1]

The most that can be claimed for this tentative conflation is that it does not conflict in any serious way with Nayšāburi's text. In addition, it can be said to have the modest practical merit of showing how these various modes might have been realized using fewer than the full complement of frets: counting from 4 (= the open *zir* string), the frets for 4♯, 6, 2♭′, 6♭′, and any above 1″ would not be called upon, and likewise 5- and 6♭ if the higher position for *salmak* is preferred. Combined with this would be the advantage for the

[57] Whereas if the highest position began at 7♭, and *zirafgand* also, then an extra fret would be required. Beginning from 1′, it repeats the position an octave below, which may well be the original, as it results in the omission of the open *zir* string note, which its name suggests as a characteristic feature.

[58] That there is a close relationship between *moḫālef-e rāst* and *bozorg* is noted in *al-muḫtaṣar al-mufīd*.

instrumental performer of using mainly the central area on the neck of the instrument: in relation to a potential two octave span (4 to 4″), use of the lowest tetrachord is confined to just two modes and the highest tetrachord is avoided completely, resulting also in a quite manageable vocal range. Such economy of resources would provide a parallel to al-Urmawī's presentation of transpositions that similarly reduce the number of frets required, and for once can be regarded as a sideways glance away from theoretical extrapolations towards reflecting the economies of practice.[59] Finally, and equally important, the disposition of resources suggested in ex. 1 would facilitate modulations by requiring, apart from adjustments to the range, only a small number of pitch changes. It would be reasonable to see these as implicit in Nayšāburi's various derivational steps, but rather more direct is the evidence provided on the one hand by the open-ended combinatorial possibilities explored by Širāzi, and on the other by the composition by al-Urmawī that he notates, the former suggesting, and the latter confirming, that modal proximity in modulation was a standard feature of composition, one embodying a significant aesthetic principle.

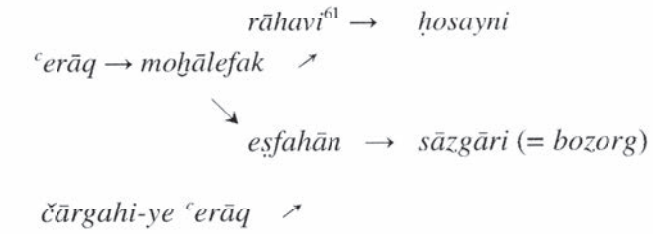
Further problems arise from the conflicting views reported by Nayšāburi about the origins of *eṣfahān*, which lead into another tangle of relationships. Some people, he states, regard it as being derived from *čārgahi-ye ʿerāq*, while others regard it as being derived from *moḫālefak*,[60] a view that is later stated to be universally held, while *moḫālefak* in turn is said to be derived from *ʿerāq*. Here, further details are supplied: the upper register (*tizi*) of *ʿerāq* is brought (*āvardand*) to the lower register (*pasti*), and it is then called *moḫālefak*; and when *moḫālefak* is attached (*bečasbānidand*), its (presumably referring again to *ʿerāq*) higher part (*zir*) is brought together (*āvardand*) with the lower (*bam*), and from it derives *rāhavi*, which, he notes below, is also called *rāvi*. Nayšāburi adds that when *rāhavi* is performed (*besāḫtand*), its upper register (*tizi*) becomes *ḥosayni*, and a yet further connection is provided by the observation that from *eṣfahān* is derived *sāzgāri*, which is *bozorg*—at which point not only *eṣfahān*, *rāhavi*, and *ḥosayni* remain unknown quantities, but also *ʿerāq* and *čārgahi-ye ʿerāq*, so that we have just a faint thread that leads towards *bozorg* and the modes linked together in fig. 6,

[59] In the chapter *fī tašāruk ai-naġam* of the *kitāb al-adwār*. This conclusion runs counter to that in Wright, *The modal system*, p. 271, where it is cavalierly dismissed as 'just another academic pastime.'

[60] As noted above, the two are later regarded as equivalent by Kāšāni.

passing in one route through *moḫālefak* (which seems to be Nayšāburi's preference among the various synonyms for *zirafgand*).

From this thicket we may begin by abstracting a bald outline of derivational relationships:



As before, for any attempt at greater specificity it is to the definitions supplied by al-Urmawī and Širāzi that we must turn, and assuming the pitch set of *sāzgāri* to be the same as that of *bozorg* we can, except for *čārgahi-ye ᶜerāq*, identify in fig. 8 the relevant characteristic nuclear elements, but without attempting to assign to them any relative pitch position:

ᶜerāq	/1	2-		3-/			and/or
	/1	2-		3-	4/		
eṣfahān		/2		3-	4	4♯	5/
eṣfahān-e aṣl	/1	2		3-	4	4♯	5/
ḥosayni	/1	2-	3♭		4		5/
moḫālefak	/1	2-	3♭	3-		(4♯	5)/
rāhavi	/1	2-	3♭		3/		
sāzgāri	/1	2-			3 4	4♯	5/

[Figure 8]

Quite clear from Nayšāburi's text, however, is that at least *ᶜerāq* and *rāhavi* had a wider range, so that consideration also needs to be given to the more extended definitions, shown in fig. 9, that are given by al-Urmawī and Širāzi for four of the above. As before, pitch sets are displayed from 1, with the partial exception of *eṣfahān*, for which there are overlapping versions. The indications of prominence, of both individual notes and the segments they enclose, are taken from Širāzi's versions:

[61] The variant form *rāvi* appears nowhere else. It is possibly a scribal error and may be ignored.

ʿerāq	1	2-		3-	[**4**	5-		**6-**]	7♭	1′ [62]		
eṣfahān	1		2	3-	[**4**		5	6-	7♭	7	**1′**] [63]	
			2	3-	4	[**5**		6-	7♭	7	**1′**]	2′[64]
ḥosayni	1	2-	3♭		[**4**	5-	6♭		7♭		**1′**][65]	
rāhavi	1	2-		3-	4	5-	6♭		7♭		1′	
rāhavi-ye tamām	**1**	2-		3	[**4**	5-	6♭	**6**][66]				

[Figure 9]

In the light of the lines of derivation given above, an immediate question concerns the relative pitch position of *ʿerāq*: could it have been placed at 3-, so that its prominent nuclear element would be [**6-** 7♭ **1′**]? This possibility is supported by the fact that it would again minimize the number of fret positions required: *ʿerāq* would use the *rāst* pitch set with the sole addition of 2-′. However, in al-Urmawī's transposition table *ʿerāq* is aligned with *rāst*, imply a 1 – 1′ octave, or 4 – 4′ (although this would require an additional fret at 1-′), or even 1′ - 1″. It is the first of these that will adopted here, the consequence being the assumption that (*zirafgand* =) *moḫālefak*, placed in the high register, from 1′, in fig. 7, could also appear from 4.

Equipped with this information (and its associated problems), we may tackle the upper line of connections, *ʿerāq* → *moḫālefak* → *rāhavi* → *ḥosayni*, with ex. 2 setting out a possible progression:

ʿerāq	1	2-	3-	[**4**	5-		**6-**]	7♭		1′	
					↓						
moḫālefak				4	5-	6♭	6-		(7	1′)	
					↓						
rāhavi-ye tamām	**1**	2-	3	[**4**	5-	6♭	**6**]				
rāhavi	1	2-	3-	4	5-	6♭		7♭		1′	
					↓						
ḥosayni				**4**	5-	6♭		7♭		**1′**	

[Example 2]

[62] Al-Urmawī adds 7, but this is probably a device to distinguish the notation from that of another mode.

[63] Al-Urmawī's version.

[64] Širāzi's version. Comparison of the two suggests that the core of *eṣfahān* was the common area of the two conjunct tetrachords, from 2 to 1′.

[65] Širāzi also list a variant in which the 4 - 1′ pentachord appears as 1 – 5.

[66] The first version is al-Urmawī's. However, the 3- 4 5- 6♭ area does not match exactly the fundamental /1 2- 3♭ 3/ *rāhavi* element, which appears from 4 in Širāzi's version and is marked as prominent, suggesting that this second version, entitled 'complete/full *rāhavi*' is likely to provide the more reliable account.

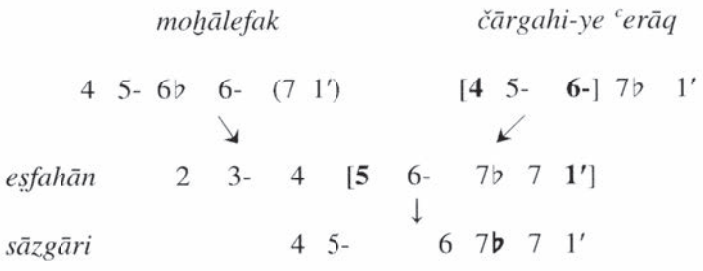
It relies on Nayšāburi's remark about bringing down the upper register of *ʿerāq* to the lower being understood as placing it in the lower octave so that it aligns with the lower register of *moḫālefak*; on the attaching of *moḫālefak* being a reference to the overlapping area within which 6♭ is included; and hence on what appears to be a slightly varied repetition in the text actually representing the next step, so that the higher part refers to the area above 4 (*zir*) after this inclusion, and the lower to that below, the two together facilitating the transition to *rāhavi*. None of these can be affirmed with confidence; all could be challenged. Rather less tentative, however, is the proposition that the selection of only the characteristic pentachord of *ḥosayni* reflects the equation with the upper part of *rāhavi*,[67] exact in the case of al-Urmawī's version, but also not too distant in the case of Širāzi's *rāhavi-ye tamām*, which in turn represents a perhaps smoother transition from *moḫālefak*. The match between the upper part of *rāhavi* and *ḥosayni* (in contrast to the lack of fit there would be in the lower) is, incidentally, a useful confirmation that the *tiz* or *bālā* vs. *pest* or *šib* contrast does indeed relate to high/low pitch and not the reverse, as it would have done if these terms had been thought of in relation to the strings on a long-necked lute, of which, when played, the physically higher part is the lower-pitched nut end.

There remain to be considered the derivations *moḫālefak* → *eṣfahān* → *sāzgāri* and, complementary to these, *čārgahi-ye ʿerāq* → *eṣfahān*. However, it is not clear what exactly is to be understood by *čārgahi*. Assuming it to be an orthographic variation of *čahārgāh*,[68] three possibilities might be entertained: it can be construed as the upper segment of *ʿerāq*, beginning from the fourth; as referring to the complete *ʿerāq* octave transposed to a fourth above its normal position; or even, in a more adventurous conjecture, to a combination of the nuclear element of *ʿerāq* with another element, tetrachord or pentachord, from the fourth, as, for example, in [**1′** 2-′ **3-′**] 4′ 5′ 6-′ 7♭′, thus anticipating a type of modal development explored by Širāzi. However, if we take into consideration the transition to *eṣfahān*, it is fairly clear that the most likely option is the first, the pitch set of which aligns itself even more closely with

[67] Although Širāzi notes a variant with a tetrachord above, both he and al-Urmawī have a version with a tetrachord below, the pitch set of which differs from the *rāhavi* octave only in substituting 3♭ for 3-.

[68] The reduction *čahār* > *čār* is common enough, but *gāh* > *gah* is not, and the final *-i* is unaccounted for. An identification with the mode *čahārgāh* as described by Širāzi should be discounted.

eṣfahān than does *moḫālefak*. In ex. 3, the two are juxtaposed as potential co-contributors:



[Example 3]

We thus have 4 and (possibly) 1′ in all four, and 5-, 6-, 7♭, and (possibly) 7 in three of the four to provide coherence to the sequence, although it must be conceded that none of the derivational steps, considered individually, appears particularly robust: the last one is, indeed, rather weak, as it relies on combining excision with shifting the /1 2- 3 4/ tetrachord from 2 to 4; and if one had to suggest a possible source mode for *eṣfahān*, *moḫālef-e rāst* would surely be a more likely candidate than *moḫālefak*.

The remaining strings of derivations can be summarized as:

rāst → *māda* → *navā* → *naḥāvand* → *busalik*
rāst → *ᶜoššāq*

Clustered in this area are four modes that for al-Urmawī and Širāzi are devoid of neutral intervals: in the order in which they are listed here, *māda*, *navā*, *busalik*, and *ᶜoššāq*. Assuming that Nayšāburi knew them in the same form, it would be reasonable for him, given that he never mentions fret positions, to describe them as derivations from *rāst*, referring, as a first step, to the unexpressed substitution of /1 2 3 4/ for /1 2 3- 4/. Indeed, that such substitution or even the equivalence of these two entities might on occasion have been permitted is suggested by the array of variant forms adduced by Širāzi for *gardāniyā*, presented as a disjunct octave in which both the upper and lower tetrachords may be indifferently /1 2 3- 4/ or /1 2 3 4/.[69] The latter, according to the Systematist definitions, would serve as the basic element of *ᶜoššāq*, and its diatonic extensions, /2 3 4 5/ and /3 4 5 6/, would likewise serve for *navā* and *busalik* respectively. However, nothing of the kind is apparent from Nayšāburi's account, and although in one or two cases it is possible to interpret his text as

[69] Wright, *The modal system*, pp. 68-9.

allowing a glimpse of the Systematist descriptions of these modes, in others it would require an unsatisfactory degree of manipulation.

He begins with *rāst* → *māda*. For this, he proposes a derivation from the lowest register (*šibtar*) of *rāst*, which may be assumed to be 1 2 3- 4 5 … . What would appear to be involved in this case is not a switch from 3- to 3 but omission: *māda*, or *māya*, as the Systematists prefer, is the only transilient mode recorded by al-Urmawī and Širāzi, the latter's version expressible as **2** 4 5 **6**, the former's as 2 4 5 7♭ 1′, but as Nayšāburi assigns *māda* to the expansive two-*bāng* category his conception of it may well have been closer to al-Urmawī's, reflecting a division into two parallel conjunct /1 3♭ 4/ elements.[70]

We then have *māda* → *navā*, a progression that involves the reverse process of filling in, resulting in 2 3 4 5 6, the Systematist *navā* pentachord, or 2 3 4 5 6 7♭ 1′ (2′), the *navā* octave. However, if Nayšāburi's characterization of *navā* as being particularly 'narrow' (*tang*)[71] relates to range, the pentachord version is the more likely, and the implication might even be that the melody remained largely confined to the 2 - 5 tetrachord. In support of this interpretation, we may recall (fig. 2) that for Nayšāburi *navā* consists of one *bāng* as against the two of *māda*. That both *bāng* and *tang* should refer to range may be thought problematic, but it could be that they do so in different ways, one quantitative, referring to some form of measurement that can be expressed numerically, the other qualitative, referring to constraints imposed upon melodic movement, an interpretation that would be consonant with Boḫāri's reference to *tang* modes which require another to be combined with them to facilitate composition. But even if *tang* is set aside as imprecise or not well understood, *bāng* still remains problematic, as the mapping of *bāng* = range onto the data available appears, at least initially, inconsistent: all three of *rāst*, *moḫālef-e rāst*, and *māda* have two *bāng*, yet *moḫālef-e rāst* and *māda* are said to be derived from the upper and lower parts of *rāst* respectively, and how these statements might be reconciled is not immediately obvious.

Indeed, the term *bāng* now makes a reappearance and, as might be anticipated, is no guarantee of greater clarity: we are now told that *navā* has the same *bāng* (*ham bāngi bāšad*) as *māda* in the course of

[70] Širāzi, though, is adamant that in al-Urmawī's compositions, as in the best-known others, *māya* did not go beyond the limits of his own version, with the range of a fifth.

[71] This comes in the time assignments (fig. 3), where the reason given for performing *navā* at the time of the evening prayer is that there is nothing 'tighter' (*dar ᶜelm-e musiqi tang-tar az parda-ye navā nabāšad*).

the melody (*dar rafti-ye āhang*).[72] In this context one might venture to interpret the phrase as meaning that, whatever its range, it occupied the same register as *māda*, overlapping with it. Matters are, though, further complicated by the continuation, which speaks of opening 'that half *bāng*' (*ān nim bāng*)[73]—except that no half *bāng* has been referred to: the only mode stated to consist of a half *bāng* is *ʿoššaq*, which thus far has received no further mention and is surely not relevant to this passage. If anything, the deictic force of the remark might relate it to a reduced area of overlap between *māda* and *navā*.

The half *bāng* in question provides a transition to *nahāvand*, concerning which we are told that its upper register extends to *moḫālefak* (*bā moḫālefak kašad*), that is, presumably, overlaps with it. At this point we at last reach the final item of information for this string, namely that *busalik* derives (*ḫizad*) from the lower part (*šib*) of *nahāvand*. Not mentioned by al-Urmawī, *nahāvand* is referred to by Širāzi as an alternative name for *zangula*, an equivalence confirmed elsewhere and supported by them being mutually exclusive in name lists. It is a mode for which al-Urmawī's standard octave format is particularly inappropriate: as emerges clearly from the composition by him that Širāzi notates, the melody oscillates around a prominent central note. But even with the luxury of this insight into the compositional exploitation of modal resources, no convincing derivational relationship between the Systematist understandings of *zangula/nahāvand* and *busalik* suggests itself. The latter relates to the tetrachord /1 2♭ 3♭ 4/, and while the complete theoretical 'lower part' of the former, /1 2 3- 4/, can at least be set aside, because of the non-appearance of 1 in the notation, in favour of the appreciably closer /2 3- 4 5-/ (= /1 2- 3♭ 4-/), it is still not close enough to convince.[74]

[72] Purjavādi, '*resāla-ye musiqi*', and Nikfahm-Ḫubravān and Kordmāfi, '*musiqi dar ašjār o aṣmār*', read *dar ruy-e āhang*, which seems to mean in mid-register, whereas *māda* and hence, presumably, *navā* too, originate in the low register. However, the reading *rafti* instead of *ruy* (with dots supplied in the manuscript for *f* and *ṭ*) seems secure.

[73] In the light of this reference, Purjavādi ('*resāla-ye musiqi*') suggests in relation to *ham bāngi* that *ham* might be a copyist's error for *nim*. But as neither mode consists of a half *bāng*, no greater clarity would ensue. It is tempting to conjecture that the reference might be to the area 2 - 4, within which the lowering of 3 to 3- effected the transition to *nahāvand*.

[74] Starting from 3- would yield the even closer /1 2- 3♭ 4/ if al-Urmawī's 6- were substituted for Širāzi's 6, but we are no longer still in the 'lower part'.

ᶜošš̄āq

The last item to be included in this complex area is the separate derivation of the remaining mode, *ᶜošš̄āq*, from *rāst*. This would initially appear to be straightforward, involving the substitution of /1 2 3 4/ for /1 2 3- 4/ to arrive at the *ᶜošš̄āq* tetrachord according to the Systematist theorists (and thence at their octave scale formulation). But, as a final irony, it become increasingly less straightforward as the picture is filled in by various supplementary remarks; indeed, far more is said about *ᶜošš̄āq* than any other mode, and the result is thoroughly to confuse. The several statements, some more pellucid than others, form a compact block, but what they do not appear to provide is a coherent, cumulative series from which any clear picture emerges.

In the order in which they occur, they are:

1. *ᶜošš̄āq* derives (*ḫizad*) from the upper part (*bālā*) of *rāst*.
2. For when the melody proceeds on the string (*ke čun abrišam-rā āvāz bar kaši*), as it progresses in the mode *rāst* (*dar rafti-ye*[75] *āhang-e rāst*) it becomes *ᶜošš̄āq*.
3. Between *rāst* and *ᶜošš̄āq* there is no more than a half *bāng* (*nim bāng biš nist*).
4. Another half *bāng* comes (*ḫizad*) from *bam*.
5. Everyone should be familiar with this half *bāng* (*har kerā bāyad ke in nim bang-rā bedānad*).
6. Every melody that is sung[76] lower in the throat (*har āvāzi ke past-tar dar ḥalq belarzānand*) will be in accord with *zir* (*be movāfeq-e zir šavad*).
7. A half *zir* and a half *bam* is a complete *ᶜošš̄āq* (*ᶜošš̄āqi-ye tamām*).
8. This is the mode *ᶜošš̄āq* and it is not known to be anything else.

Regarding (1), as *ᶜošš̄āq* is listed as a half-*bāng* mode one would expect it to remain within the 4 – 1′ range of the upper part of *rāst* (but not necessarily to employ the same pitch set). In (2), an explication of (1), the derivation is the same, but its particulars are couched in opaque terms. The term *abrišam* might imply the pitch set and/or range performed on the string, with the melodic progression presumably upwards. But the terms in which the relationship is expressed do not occur elsewhere, and there is no hint of any accompanying change from 4 5 6- 7♭ 1′ to 4 5 6 7♭ 1′, as in the

[75] Both Purjavādi and Nikfahm-Ḫubravān and Kordmāfī have *dar ruy-e*, but although there are no dots, the consonantal ductus is the same as in *rafti* (fn. 47).

[76] Literally 'that they make vibrate'.

Systematist version. With (3) we encounter, once more, the half *bāng*, but while repeating that *ʿoššāq* is a half-*bāng* mode would not be unexpected, a cryptic mention of a half *bāng* between *rāst* and *ʿoššāq* decidedly is. It can hardly be a reference to the difference in their ranges, as this would require recalibrating *ʿoššāq* as a mode of one and a half *bāng*. Possibilities to consider are that it concerns a gap of some kind, to be discounted because it runs counter to both (1) and (2), or that it provides at last a recognition of the area of overlap that is qualitatively differentiated, 5 6- 7♭ versus 5 6 7♭, and this would at least be consonant with the half *bāng* in question being on the *zir* string, which is implied by (4) speaking of another half *bāng* on the *bam*. This, to pursue the same line of thought, could refer to the parallel differentiation in the lower tetrachord, with 3- 4 in *rāst* and 3 4 in *ʿoššāq*, except that given the reference in (1) to derivation from the upper part of *rāst* there would seem to be no compelling reason to refer to the lower. Yet the necessity of knowing the half *bāng* on the *bam* is insisted on in (5), albeit in terms that suggest that such knowledge was by no means universal, in other words that there was no unanimity with regard to defining *ʿoššāq*. With this might be associated (8), interpretable as asserting one view and dismissing others. A yet further descriptive approach is followed in (6), which refers to an even lower vocal range, presumably not just below the half *bāng* on the *bam* but even below the open *bam* string note, that will correspond to the equivalent notes an octave higher on the *zir* string. Rather than a simple contradiction of (1), this could be regarded as confirmation that a mode was not tied to any one octave, with the natural range of the singer's voice being a determining factor. However, it once more raises the question why a matter that was presumably of general relevance should be raised specifically in relation to one mode. Not wholly obvious in sense, also, is the reference in (7) to a half *zir* and a half *bam*. Taken literally, the pitch resources of half of each string, combined, would serve for most if not all modes, and not just *ʿoššāq*, so that the expression might be thought to be shorthand for a half *bāng* on each string, except that the arithmetic would once again be faulty. It does, though, suggest that in a normal instrumental realization *ʿoššāq* straddled the two strings, although if it ventured into the low register, it is difficult to see how it could be described as derived from the upper part of *rāst*, especially as it would need to go down right to 1 to produce the *ʿoššāq* pitch set. If, on the other hand, it avoided the low register, a hypothetical octave core could have been performed across the strings thus:

zir	7♭	1′	2′	3♭′	4′	
bam	4	5	6	7♭		

This would conform with the half *zir* and half *bam* statement. But, once again, there is no mention of this type of distribution for any other mode and, accordingly, no obvious reason why it should be referred to specifically for *ʿošš̄āq* unless it were an unusual feature. Yet it is difficult to see how it could be: the pitch sets of other modes could equally be split between the two strings and in some cases doubtless were; and at this pitch position the original *bam* notes of *ʿošš̄āq* could equally well be performed on the *zir* string.

Derivational schemes

In suggesting, in ex. 4, a possible derivational scheme for *busalik*, *māda*, *nahāvand*, and *navā* as well as *ʿošš̄āq*, the arbitrary position assigned to the *rāst* octave in ex. 1 has been retained. The result is, again, distinctly conjectural. Yet despite its evident uncertainty and, doubtless, fallibility, the hypothetical modal landscape sketched above in exs. 1-3, and now added to in ex. 4 (next page), lays out the various lines of derivation in ways that, it is hoped, at least respect Nayšāburi's text. It may also be claimed that they are coherent and credible in the sense that they accord with the trend, attested at various periods, whether conceptually and programmatically in the theoretical literature or by recording compositional creativity in notated form, to juxtapose modes that are minimally differentiated rather than dramatically contrasted in pitch content. They are, in this respect, reminiscent of both the lists of modulatory pairs provided by Širāzi and the large-scale modulatory schemas of sixteenth-century theorists,[77] and they can also be compared, to give a parallel rather closer in time to Nayšāburi, with what we know of the compositional practice of al-Urmawī:

In the light of such commonalities, it would be reasonable to expect that similar patterns of structural propinquity would be exhibited by the various linkages and sequences proposed by both Nayšāburi and Boḫāri in tabulating further derivations, cosmological pairings, time apportionments, and orders of presentation. Of derivations there are two sets: one, provided by Nayšāburi, generates the set of six *šoʿba* modes, each one from a *parda* pair; the other is Boḫāri's set of

[77] Explored in Sumits, 'The evolution of the maqām tradition in Central Asia', and Owen Wright, *Music theory in the Safavid age. The* taqsīm al-naġamāt wa-bayān al-daraj wa-'l-šu'ab wa-'l-maqāmāt, Abingdon and New York: Routledge, 2019.

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moḫālefak					4	5-	6♭	6-		(7	1′)
rāhavi-ye tamām	**1**	2-		3	[**4**	5-	6♭		**6**]		
rāhavi	1	2-	3-		4	5-	6♭		7♭	1′	
					↓						
basta	1	2-	3-		[**4**	5-	6♭	**6-**]			

In al-Urmawī's account of *gavāšt* two further notes are added to complete the octave, but they fail to appear in the composition in this mode that he notates, the compass of which is from 3- to 6-, emphasizing therefore the area defined by Širāzi as prominent. As a statement of relationships, Nayšāburi's formula, *moḫālefak* + *rāhavi* → *basta*, makes perfect sense, combining identity in the lower tetrachord between *rāhavi* and *basta* with identity in the 4 – 6- segment between *moḫālefak* and *basta*.

The remaining triads of two *parda* modes → one *šoʿba* mode as propounded by Nayšāburi may be briefly surveyed in their order of occurrence. In the first, *zirkaš* may be assumed to correspond to Širāzi's *zirkaš ḥosayni*, an offshoot of *ḥosayni*, to which it adds one note. To this derivation *māda* would of itself contribute nothing: its presence here may be attributed to it not having a productive slot elsewhere, whereas transposed to 4 alongside *ḥosayni* and *zirkaš* it is safely parked and (in the form recognized by Širāzi) inconspicuous:

ḥosayni	**4**	5-	6♭		7♭	**1′**
māda	**4**		6♭		7♭	**1′**
				↓		
zirkaš	**4**	5-	6♭	6	7♭	**1′**

In the second, for *ʿozzāl* we again have a description by Širāzi. One could regard *navā*, like *māda* previously, as a sleeping partner, as although one could certainly envisage a derivation from it, the tetrachord structure indicates that *ʿoššāq* would be a better fit. In any case, the relationship between the pitch sets of all three is close. 1 cannot be discounted as a possible position for *ʿozzāl*, but 4 would seem to be more likely:

navā	2	3	4		5	(6	7♭	1′	2′)
ʿoššāq			4		5	6	7♭	1′	
			↓						
ʿozzāl			**4**	-5		6	7♭	**1′**	

For *negārin*, in the next group, we need to rely on Nayšāburi's identification of it with *moḫālef-e rāst*, which yields a pitch set that largely overlaps with *eṣfahān*, so that it is *busalik* this time that just

makes up the number: it has nothing extra to contribute but at least avoids jarring contrasts:

busalik	2	3♭		4	5	6♭		7♭		1′	2′
eṣfahān	2		3-	4	[**5**		6-	7♭	7	**1′**]	
				↓							
negārin				*4*	*5*		*6-*	*7♭*	*7*	*1′*	

In the next group, however, it may be that both source modes could be thought of as having a rôle to play, depending on which version of *ḥejāzi* is preferred: the upper one, to which *ʿerāq* is much the closer, is recorded by al-Urmawī; the lower, to which *nahāvand* is identical in the upper tetrachord, is recorded by both Širāzi and al-Urmawī:[79]

ḥejāzi	1		2-		3-	4	5-	6-	7♭		1′
ʿerāq	1		2-		3-	[**4**	5-	**6-**]	7♭	(7)	1′
						↓					
nahāvand	(1)			2	3-	**4**	5-		6	7♭	(7′ 1′)
						↑					
ḥejāzi	1		2-	3♭		[**4**	5-		6	**7♭**]	1′

The final triad simply restates a derivational sequence already set out by Nayšāburi and discussed above:

rāst	1	2	3-	**4**	5	6-	7♭		1′						
moḫālef-e rāst	(1	2	3-)	[**4**	5	6-	7♭	7	**1′**]	(2	3-′	4)			
				(4	5	6-)	[**7♭**		1′	2-′	3♭′	3′	**4′**]	(5′	6-′ 7♭′)
							↓								
sepehri				*4*	*5*	*6-*	*7♭*		*1′*	*2-′*	*3♭′*	*3′*	*4′*		
				4	*5*	*6-*	*7♭*		*1′*	*2-′*		*3′*	*4′*	*4♯′*	*5′*

This account of the emergence of the six *šoʿba* modes could possibly reflect, at least in some cases, processes of modal development which Nayšāburi personally witnessed or to which he may even have actively contributed. Whatever their date, however, it is clear that his perception of the derivational relationships that could account for them, even if artificially tidied up, relies upon notions of structural propinquity, and foreshadows Širāzi's richer account of the generative mechanisms involved.

It might be anticipated that the derivational relationships between the seven pairs of modes that Boḫāri aligns with the heavenly bodies would follow a similar logic. As noted, one of them, *rāhavi* → *basta*, aligns itself with Nayšāburi's account; and in the cases of *navā* →

[79] For further details, see Wright, *The modal system*, p. 66-7.

ḥosayni, *rāst* → *ᶜošš̄āq*, and *ᶜerāq* → *eṣfahān*, the tetrachords align so that one of the internal pitches is shared (and if we yield to the temptation to think that *ᶜerāq* might have been transposed to 3-, we will have an almost perfect overlap with *eṣfahān*):

ᶜerāq			3-	4	5	**[6-**	7♭		**1′]**	2-′	3-′
eṣfahān	2	3-	4	**[5**	6-	7♭	7		**1′]**		

With the others, however, the match becomes progressively less close. There is a partial but hardly persuasive overlap between *negārin* and *(zirafganda-ye) bozorg*:

negārin			*4*	*5*	*6-*	*7♭*	*7*	*1′*
(zirafganda-ye) bozorg		4	5-	6♭	6-		(7	1′)

and only the first two pitches of *zirafgand(a-ye ḫord)* are replicated in *nahāvand*:

zirafgand(a-ye ḫord)					4	5-	6♭	6-		
nahāvand	(1)	2	3-	**4**	5-		6	7♭	(7	1′)

while whatever astrological conjunction there might be between *busalik* and *gozāšta* is not reflected in the text: all we know of *gozāšta* is that it is equated with *basta*, which already has a slot assigned to it, being paired with *rāhavi*. There are, though, various divergences between manuscripts in this area, and it is reasonable to suspect scribal error at this point.

A further group assembled by Boḫāri is that of the delicate (*nāzok*) modes, of which six are named, although there is nothing to suggest, despite the number, that they were regarded as a set. They are, in any case, yoked together with the upper register (*tizi*) of the basic modes (*āvāzhā-ye aṣl*)—not further defined—and combinations of all of them (*ān če az tarkibāt-e in hama ḫizad*). The general characterization of this whole category is that it consists of 'narrow' modes (*pardahā-ye tang*). He comments on them further when referring to difficult (*moškel*) compositions, saying that mastery of narrow and delicate modes (*pardahā-ye tang va āvāzhā-ye nāzok*) has to be acquired through assiduous practice (*kaṯrat esteᶜmāl*) on instruments, as if difficulties of vocal intonation had to be resolved by being checked against the precision of the fretting.

One of the six names, *nawruzak*, is not attested elsewhere, but may be assumed to relate to *nawruz* as described by Systematist theorists and hence to be based upon, and possibly restricted to, the /1 2- 3♭ 4/ tetrachord. Of the others, however, *moḫālef*, *ḥejāzi*, *sāzgari*, *māda*, and *sepehri*, only *sāzgari* and *māda* (in one of its forms) could be

thought of as having a narrow range. For *ḥejāzi*, one might assume that only [**4** 5- 6 **7♭**], the prominent segment according to Širāzi, was intended, and likewise only the upper pentachord for each of *sepehri* and *moḫālef*, if the latter is identified with *moḫālef-e rāst*. But whatever the precise understanding, the most interesting aspect is not whether there was a particular thread connecting these six at the structural level, which seems unlikely, despite some obvious similarities and overlaps, but that, together with the more general indications that follow, they point to another dimension of flexibility, the enlargement of the creative potential of this class of modes and of the equivalent upper segments of others by the addition to them of another mode as a necessary reinforcement of compositional resources, echoing, in short, and possibly extending even further, the combinatorial potential of basic elements that had been recognized and explored at some length by Širāzi.[80]

Orders

Among other forms of arrangement, by far the most common, indeed universal, is the listing of names, whether organized in sets or not. We may begin with Nayšāburi and the larger of the two groups he recognizes, the *parda* modes. Taking the versions proposed above, they are presented, in ex. 5 (*next* page), in the order in which he lists them. It strongly suggests that the arrangement is not random, or according to some extra-musical criterion, but has a clear, if not rigid, structural logic.

Beginning, inevitably, with *rāst*, clearly established as the principal member of the group, it moves to the one most closely related to it and then to one requiring just one change, and the smallest possible, in each tetrachord. There is then a smooth transition to three modes which include all or most of the 4 5- 6♭ 7♭ (7) 1′ pentachord, and with one exception the remaining six have 2 4 5 7♭ 1′ as a common framework, with four of them being the modes lacking neutral intervals. It is perhaps also worth noting that only one change in each tetrachord would be needed to return from the final mode, *ʿoššāq*, to the first, making the whole set, to anticipate al-Urmawī's terminology, a form of cyclical progression—one, indeed, that is satisfyingly congruent with, even if it cannot provide proof for, the assumption of propinquity, or even sometimes identity, between the forms of these

[80] A point made by Nikfahm-Ḫubravān and Kordmāfi, '*musiqi dar* ašjār o aṣmār', who draw parallels here with the notion of possible new combinations mentioned by al-Urmawī and explored in some detail by Širāzi.

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early draft of the *kitāb al-adwār*), is supplied by Ibn Qāḍī Baᶜlabakka, a Syrian doctor, who divides it into two subgroups, 'hot' and 'cold', depending on their therapeutic value in helping to restore humoral equilibrium.[82] As fig. 10 shows, there are evident differences in mem-

al-Tīfāšī	al-Urmawī (early version)	Nayšāburī	Ibn Qāḍī Baᶜlabakka cold	hot
rāst	*rāst*	*rāst*	*rāst*	
		moḫālef-e rāst		
ᶜerāq	*ᶜerāq*	*ᶜerāq*	*ᶜerāq*	
eṣfahān	*eṣfahān*			*eṣfahān*
zirafgand	*zirafgand*	*moḫālefak*		*zirafgand*
				zangula
ḥosayni	*bozorg*	*ḥosayni*		*bozorg*
rāhavi	*rāhavi*	*rāhavi*		*rāhavi*
navā	*ḥosayni*	*eṣfahān*		*ḥosayni*
māya	*ḥejāzi*	*māda*	*māya*	
māya abusalik	*ᶜoššāq*	*busalik*	*busalik*	
ᶜoššāq	*zangula*	*navā*	*navā*	
zirafgand bozorg	*navā*	*nahāvand*		
ḥosayni bozorg	*busalik*	*ᶜoššāq*	*ᶜoššāq*	

[Figure 10]

bership, but they are less radical than they appear at first sight: *zirafgand* equates with Nayšāburi's *moḫālefak*, and al-Tifāšī's *zirafgand bozorg* with *bozorg* elsewhere, which is not, though, a member of the *parda* set for Nayšāburi. Unusual in al-Tifāšī's list is *māya abusalik*, presumably a compound including elements of *busalik*, which does not appear as a separate entity; and the inclusion of a *ḥosayni bozorg* in addition to *ḥosayni*, no doubt representing a version of *ḥosayni* containing more than its basic pentachord.[83] Unusual about al-Urmawī's list is its preference for *ḥejāzi* over *māda/māya* in the others, while Nayšāburi is equally isolated in his inclusion of *moḫālef-e rāst* and *nahāvand*, the latter, though, possibly to be equated with *zangula*.

The order in the early version of al-Urmawī's *kitāb al-adwār* and the very similar one used by Ibn Qāḍī Baᶜlabakka may reflect an

[82] Eckhard Neubauer, 'Arabische Anleitungen zur Musiktherapie', *Zeitschrift für Geschichte der Arabisch-Islamischen Wissenschaften* 6, 1990 [pub. 1991]: 227-72.

[83] Cf., in addition to the octave scale recorded by al-Urmawī, the variant listed by Širāzi in which the *busalik* tetrachord /1 2♭ 3♭ 4/ is added above the *ḥosayni* pentachord.

Eastern Arab consensus differing in some respects from the Egyptian, assuming that al-Tifāšī's version represents the latter. They are all initially identical but then diverge, with al-Tifāšī's *ḥosayni bozorg* replaced by *zangula*, and towards the end the order also varies. Compared with Nayšāburi, there are once more changes to the order, and insignificant substitutions of equivalent names (*zirafgand* for *moḫālefak* and *zangula* for *nahāvand*), the only important matter being the omission of *moḫālef-e rāst*, which makes way for *bozorg*. The impact of these differences upon the structural logic of the arrangement is, however, negligible, with *rāst*, *ʿerāq*, *zirafgand*, and *rāhavi* all appearing in the same order, if not contiguously, and all the modes without neutral intervals again concentrated in the final third. What is surprising, then, is less the degree of difference between these various orders than the radical change introduced by al-Urmawī in the final version of the *kitāb al-adwār*, as shown in fig. 11 (next page), which also includes, as a further term of comparison, the order in *al-muḫtaṣar al-mufīd*. In al-Urmawī's new order, *ʿoššāq*, *navā*, and *busalik*, which formerly congregated towards the end, are now promoted to the head of the list, and *rāst* is demoted to fourth place, followed, as before, by *ʿerāq*, *eṣfahān*, *zirafgand*, and *bozorg*, with the final places now occupied by *ḥosayni* and, less unexpectedly, the newcomer, *ḥejāzi*.

There are thus still internal structural connections, at least within these various zones, and the large-scale changes to the order relate it to that employed in the one chapter where al-Urmawī engages with a thematic area given greater prominence by both Kay Kāʾus and Nayšāburi, the selection of modes according to their suitability to different audiences and their potential effects upon them, although instead of the previous four groups we now have three (and there is, accordingly, no reference to the four humours). Yet for all the similarities to the new organization of the *parda* list (*šudūd* in al-Urmawī's terminology) the distribution is not identical, except in the first group, which consists of *ʿoššāq*, *navā*, and *busalik*. The second, predictably, includes *rāst*, *ʿerāq*, and *eṣfahān*, but unexpectedly adds *nawruz*, one of the secondary set of six; and the third is made up of the remainder, with the exception of *ḥejāzi*, possibly a further indication of its uncertain status, only recently promoted and not yet firmly established, or even, given that al-Urmawī gives two versions of it, not yet having arrived at a finally agreed structure.

al-Urmawī (early version)	Nayšāburī	*al-muḫtaṣar al-mufīd*	al-Urmawī (final version)
			ᶜoššāq
			navā
			busalik
rāst	*rāst*	*rāst*	*rāst*
	moḫālef-e rāst		
ᶜerāq	*ᶜerāq*	*ᶜerāq*	*ᶜerāq*
eṣfahān			*eṣfahān*
zirafgand	*moḫālefak*	*moḫālefak*	*zirafgand*
		moḫālef-e rāst	
bozorg			*bozorg*
			zangula
rāhavi	*ḥosayni*	*rāhavi*	*rāhavi*
ḥosayni	*rāhavi*	*ḥosayni*	*ḥosayni*
	eṣfahān	*nahāvand*	
ḥejāzi	*māda*	*bozorg*	*ḥejāzi*
ᶜoššāq	*busalik*	*ᶜoššāq*	
zangula	*navā*	*māya*	
navā	*nahāvand*	*busalik*	
busalik	*ᶜoššāq*	*navā*	

[Figure 11]

Both al-Tīfāšī and Ibn Qāḍī Baᶜlabakka join Nayšāburi in sticking to *māda/māya*, and later Arabic texts from beyond the Systematist fold may be variously close to or distant from al-Urmawī. For example, of the two examined by Amnon Shiloah, one of which is attributed to Ibn al-Akfānī (d. 749/1348),[84] one replicates al-Urmawī's revised version while the other is closer to that in his early draft, although with a different order in the second half and, again, retention of *māya*.[85] The list order in *al-muḫtaṣar al-mufīd* is, for the first half of the set, close to Nayšāburi's but thereafter goes its own way while seeming to retain a similar level of structural logic. It agrees with al-Urmawī in including *bozorg* but disagrees in its omission of *eṣfahān*; it agrees with everyone except al-Urmawī in preferring *māya* to

[84] 'Deux textes arabes inédits sur la musique', *Yuval* 1, 1968: 221-48.

[85] Interestingly, al-Urmawī makes an additional comment in this first version of the *kitab al-adwār* to the effect that each one of the twelve has a higher-register equivalent termed *tāzī* (*ṭabaqa tuqābiluhā yuᶜabbirūn ᶜanhā bi-'l-tāzī fa-yaqūlūn rast wa-tāzī rast*).

ḥejāzi; and it hints at an awareness of disagreements about membership by the final affirmation that its own list is the correct one.

Where this later text shows greater independence is in its account of the second group of modes, where it follows al-Urmawī in using the *āvāz* label in preference to Nayšāburi's *šoʿba* but disagrees with both in increasing the membership from six to eight. Also using the *āvāz* label, but still with six, is the text attributed to Ibn al-Akfānī, which agrees with al-Urmawī with the sole exception of retaining *ḥejāzi* and not including *māya*. As fig. 12 shows, Nayšāburi and al-Urmawī have not a single item in common; *al-muḫtaṣar al-mufīd* shares two items with Nayšāburi and three (or possibly four, if *gozāšta* is deemed equivalent to *gavāšt*) with al-Urmawī; and al-Tīfāšī, with just one unique item, has three in common with al-Urmawī but is unexpectedly closer overall to *al-muḫtaṣar al-mufīd*, sharing with it *ḥeṣār(i)*. Structural linkages that appear sporadically between contiguous modes with Nayšāburi and in *al-muḫtaṣar al-mufīd* are not echoed in the Ibn al-Akfānī text.

Nayšāburi	*al-Urmawī*	*Ibn al-Akfānī*	*al-Tīfāšī*	*al-muḫtaṣar al-mufīd*
zirkaš	*gavāšt*	*salmak*	*nawruz*	*salmak*
basta	*gardāniyā*	*ḥejāzi*	*ḥejāzi*	*gardānida*
ʿozzāl	*salmak*	*šahnāz*	*gavāšta*[86]	*gozāšta*
negārin	*nawruz*	*nawruz*	*gardāniyā*	*nawruz*
ḥejāzi	*māya*	*gardāniyā*	*ḥeṣāri*	*ḥeṣār*
sepehri	*šahnāz*	*gavāšt*	*k.n.dah bīr*[87]	*ḥejāzi*
				sehtār[88]
				basta

[Figure 12]

Overall, there is a surprisingly high level of disagreement about the order in which the modes are listed, and al-Urmawī breaks ranks with all the others by adopting a purely quantitative arrangement, proceeding from modes he can describe as octave scales through those with a span of two conjunct tetrachords down to one that consists of a particular melodic movement on the notes of *zirafgand/moḫālefak*, spanning a neutral third.

A further form of organization offered by Nayšāburi is that of the recommended performance times for the modes, set out over the twenty-four hours from dawn, as displayed in fig. 3. This is not

[86] Al-Ṭanjī has *karāštah*, readily accounted for as a corruption of *gavāšta*.
[87] This bears no obvious resemblance to a known mode name.
[88] This may possibly be a variant, or a corruption, of *segāh*.

entirely linear, as *rāst*, *ʿerāq*, *moḫālefak* and *esfahān* are allotted two discontinuous slots each, widely separated in the case of *ʿerāq*, one in the morning, the other at midnight. Nevertheless, it follows a rather similar logic to the previous orders in that structurally related modes are juxtaposed: it begins with *māda*, *rāst*, and *ʿerāq*, and continues with *busalik*, *ʿoššāq*, and *navā*, modes without neutral intervals; and it is worth noting that these six constitute Ibn Qādī Baʿlabakka's hot group, which, however, he recommended for performance at night. The greater number in Nayšāburi's arrangement are spread through the night, with *esfahān* and *nahāvand* preceding the last slot, to which are assigned *rāhavi* and *ḥosayni*, all four members of Ibn Qāḍī Baʿlabakka's cold group, recommended for daytime performance: again, the logic is to reverse an imbalance and restore equilibrium.

We have, finally, the earliest list of all, the ten mode names given by Kay Kāʾus, beginning, as might be expected, with *rāst*. They do not, however, function in the same way as an inventory of the members of a set but rather constitute a recommended order of performance, to which the question of possible structural connections is even more relevant. In the event, some of the transitions between them do not conform to the norms observed in series of modulations listed later, as they contain more than the average number of changes to the pitch set—one might have expected, rather, *rāst* to be juxtaposed to *ʿerāq* or *ʿoššāq*, *gozāšta* to *zirafgand*. This need not, though, occasion surprise, given the time gap between Kay Kāʾus and the later texts. The conventions of modulatory appropriateness could change and, crucially, the morphology of individual modes cannot always have been as stable as the names attached to them; indeed, there are cases for which we have documentation of significant change over time, so that there is every likelihood, for some modes at least, that what Kay Kāʾus was familiar with in the eleventh century did not coincide with the thirteenth-century Systematist versions relied upon here.

Evidence

Such potential variations and consequent uncertainties regarding the reliability of data echo those surrounding the core question of the extent to which the material to hand provides evidence of marked regional differentiation or, on the contrary, sits comfortably within the presumption of a broad continuity of modal structures and practices stretching from Cairo to Bokhara, one resulting from the diffusion of an amalgam of various cultural inputs, including a significant Persian contribution. Such continuity does not, though, presuppose uniformity: there would inevitably be local inflections, innovations,

and variations between individual musicians; and certain preferences could cohere to form a recognizably regional coloration without undermining overall cohesion.

One might anticipate, in parallel, variations of approach as well as of detail in the theoretical literature, although not, perhaps, anything like the extreme contrasts between the Systematist and the Persian non-Systematist texts, with the latter, even if not wholly consistent among themselves, having Khorasani connections in common, something, it may be supposed, that is unlikely to be mere chance. What is at stake, then, beyond the contrasts of writing style and the theoretical preconceptions that lie behind them, with whatever distinctions of intellectual formation they might imply, is whether it is possibly to detect through them, already in the thirteenth century if not before, differences of substance sufficiently pronounced to support the hypothesis of a distinctively eastern or specifically Khorasani set of practices and related concepts at some remove from those reflected in the Systematist literature, differences that provide evidence to justify what otherwise might seem a fundamentally ideology-driven emphasis on Khorasani particularism as a causative factor leading to the separate development of the Central Asian and in particular Uzbek/Tajik traditions that in their recent forms have been monumentalized in the notated twentieth-century *šašmakam* repertoire.[89]

We may begin by approaching this from an oblique angle, briefly considering what is said about the repertoire of rhythmic cycles. Immediately striking in the early Systematist literature is the contrast between an absence of references to regional associations for modes and the very sharp ethnic distinction drawn by al-Urmawī concerning the rhythmic cycles. He begins with the proclamation that for Arab musicians there are six well-known cycles (*adwār al-ḍurūb al-mašhūra ʿind arbāb hāḏih al-ṣināʿa min al-ʿarab sitta*); notes in the course of his account of the individual cycles a difference of nomenclature, namely that *ṯaqīl al-ramal*, a cycle of twenty-four time units, is called by all non-Arabs (*sāʾir al-ʿajam*, referring mainly to Persians) *ḍarb al-aṣl*, and adds that most of their compositions are in this cycle; and concludes by noting that they also have a cycle of twenty time units called *al-ḍarb al-fāḫitī*, if with the comment that

[89] We find, for example, in A. Dżumajew, 'Traktat o muzyce Muhammada Niszapuriego unikatowy zabytek średniowiecznej kultury wschodu', *Muzyka* 3, 1990: 45-55, the suggestion that Nayšāburī's text contains material relevant for research on the origin of the Central Asian twelve-*parda* system.

there are few compositions in it.[90] Apart from implying a degree of rhythmic impoverishment beyond the Arab sphere, there is here a fundamental emphasis on a line of cleavage, although exactly how it might be projected onto the mid thirteenth-century cultural map is by no means clear.[91] Its existence, though, is confirmed from the other side of the divide by Boḫāri, who at the same time counters the notion of impoverishment by recognizing seven basic cycles, each with a derivate. Although this is no doubt an artificial construct, created to mirror his grouping of the basic modes, it does hint at a substantial level of diversity and difference, and even if his discussion is insufficiently informative to provide an exact account of the structure of these cycles—it can hardly be compared to al-Urmawī's for clarity and precision—it includes names that do not occur among those listed by al-Urmawī and Širāzi.

If, then, Khorasani rhythmic norms were in some respects distinct, albeit in ways that are only indistinctly visible, one might wish to hypothesize the existence of similarly significant variations among the corpus of modes. Unfortunately, given the allusive nature of most of Nayšāburi's remarks, and the absence of descriptive material from Boḫāri's treatise, there are no precise formulations of pitch sets to compare with Systematist accounts. Of more immediate significance, however, is that there is no reference, whether in Systematist or Khorasani texts, to any such regional differences of modal practice: it is only the names that may vary. Two, three, or four names may be encountered for what is, according to the sources, a single entity, and there are occasional pairs of names that are noted as region-specific but without, it seems, coding a distinct local variant. We are left, then, as a first indication, with what the distribution of names tells us: which ones only occur in one group of texts as against another; how they are organized, that is, ordered in various lists; and, especially, which ones are members of a given category.

Leaving aside the various name equations,[92] and excluding the more extensive repertoire of mode names, familiar from later texts but

[90] *kitāb al-adwār*, ed. Hāšim Muḥammad al-Rajab, pp. 143-53.

[91] For details on these cycles, and the additional ones described by Širāzi, see Eckhard Neubauer, 'Quṭb al-Dīn Shīrāzī (d. 1311) on musical metres (īqāᶜ)', *Zeitschrift für Geschichte der Arabisch-Islamischen Wissenschaften* 18, 2008/2009, 357-71.

[92] Including among these *gavāšt* and *gozāšta* and, with equal hesitation, *nawruz* and *nawruzak*, the former often cited, the latter, it seems, only once. The various equivalences are listed in Appendix 2.

for which the sole early source is Širāzi,[93] those that occur only in Khorasani texts or only in Systematist texts are relatively few. Al-Urmawī mentions *moḥayyer ḥosayni* and *nahoft-e ḥejāzi*, to which one could add, for al-Tīfāšī, *māya abusalik* and *ḥosayni bozorg*; and Nayšāburi and Boḫāri cite *negārin*, *sāzgāri* and *sepehri*, to which one could add, for *al-muḫtaṣar al-mufīd*, *sehtār* and *panjtār*. Some of these reappear in later texts, but with the exception of the last two, if equated with *segāh* and *panjgāh*, only sporadically, and it is important to note that most of them seem, at this period, to be peripheral: only *negārin* and *sepehri*, in Nayšāburi's codification, manage to be included as members of the significant *šoʿba* group, but it is a status that later texts will deny them. A certain fluidity in the constitution of the major set of twelve and, especially, the fundamental contrast between Nayšāburi and al-Urmawī regarding membership of the secondary set of six, demonstrate clearly that there were different regional configurations of the mode stock, but what they do not give is any indication of there having been more than marginal differences in the constitution of the stock itself.

A similar conclusion might be arrived at from the early Persian musicological literature produced in South Asia. Reflecting the cultural proximity of the Delhi Sultanate to Khorasan, most of the mode names it refers to are also found in Khorasani texts. They appear not only in the works of Amir Khusraw (1253-1325) but also in other fourteenth-century texts where we have the familiar framework of the standard sets of twelve and six, with others derived from them. The names mentioned include a number that suggest an alignment with the corpus of modes described by Nayšāburi: *basta*, *moḫālefak*, *moḫālef-e rāst*, *nahāvand*, *negārini*, *sāzgari*, *sepehr*, none of which is mentioned by al-Urmawī (although only *negārini*, *sāzgari*, and *sepehr* fail to be mentioned by Širāzi). To these connections can be added the reference in one text to the concept of *bāng*, while another cites *bāḫarz*, a mode name (and another Khorasani toponym) included in some manuscripts of the *qābus-nāma*. Moreover, the links between modes that are mentioned have a familiar ring: they concern relationships of similarity or derivation—between *moḫālef-e rāst* and *rāst*, *zirafgand* and *bozorg*, *rāhavi* and *ḥosayni*, *sāzgari* and *ʿeraq*, *busalik* and *navā*,

[93] Širāzi mentions some eleven further names, including the important group of 'number' modes that includes *segāh* and *panjgāh*, others that also occur regularly in later texts, both Systematist and non-Systematist, and various unnamed compound possibilities.

and *nahāvand* and *ʿoššāq*,[94] the first three of which echo Nayšāburi. The remaining three, however, do not, and while, from a Systematist perspective, there is a logical link between *busalik* and *navā*, the proposed relationships between *sāzgari* and *ʿeraq* and *nahāvand* and *ʿoššāq* are unexpected, not easily explained, and, as evidence, not compelling. The Khorasani connection, although evidently strong, is nevertheless not exclusive, for the South Asian mode lists also include *moḥayyer* and *ḥejāzi*, neither of which is mentioned by Nayšāburi or Boḫāri but both of which are familiar presences in the Systematist literature. The South Asian texts thus confirm Khorasani links, but not a clear east-west divide.

It rather seems, on the evidence considered so far, that most modes, if not always the names thereof, were trans-regional common property. Differing group allocations may point to perceptions of hierarchy that could reflect varying degrees of popularity, and they could conceivably play out in the organization of performance sequences, but there is hardly anything in the Khorasani texts specific to the structure of a given mode that cannot readily be reconciled with the Systematist description. Indeed, what few indications there are point positively in that direction. They consist of the implications of similarity inherent in Nayšāburi's $a \rightarrow b$ derivation formula and the explicit statements of similarity made in *al-muḫtaṣar al-mufīd*. The latter juxtapose pairs of modes said to be close to one another (*nazdik* or *qarib*): *rāst* and *ʿerāq*; *navā* and *ḥosayni*; *māya* and *busalik*, and for all three the Systematist definitions make perfect sense, as they also do for the following statement that *moḫālefak* (based on /1 2- 3♭ 3-/) and *ʿoššāq* (based on /1 2 3 4/) have nothing in common (both are regarded as isolates (*monfared*)). Further, the upper register of *ʿerāq* is said to resemble (*mānad*) *moḫālefak*[95]—despite its being isolate—and there is in fact a considerable degree of overlap between the two in how the Systematist literature describes them. Not everything is as straightforward, however: we are also told that the upper register (*tiz*)

[94] For details and a general discussion of this material see William Rees Hofmann. 'Singing sufis in text: Indo-Persian music and Sufi poetics ca. 1250-1600', PhD thesis, SOAS, University of London, 2021, pp. 64-9, 113-5.

[95] The edition of the text gives 'the upper register of *ʿerāq* which is *nimruz* resembles *moḫālefak*' (*tizi-ye ʿerāq <ke> nimruz bāšad moḫālefak mānad*). Presumably a scribal error, *nimruz* may stand for *nayruz* or *niriz*, which in later texts has a pitch set that overlaps with, but is not identical to, that of the upper register of *ʿerāq*, and certainly reinforces the notion of resemblance:

ʿerāq	1	2-		3-	[**4**		5-		**6-**]	7♭	(7) 1′
niriz					4			5	6-		7 1′
moḫālefak					4		5-	6♭	6-		(7 1′)

of *rāst* resembles *ʿerāq* and that its lower register (*bam*) resembles *ʿoššāq*, and while the latter might have something to do with *ʿoššāq* having a restricted range, for the former it is difficult to see why the lower register was excluded, unless the point of the remark was to allude to the wider pitch range of *rāst*. There is also the fourth pair of modes said to be close to one another, *moḫālef-e rāst* and *bozorg* (concurring with Nayšāburi, who proposes the derivation *moḫālef-e rāst* → *bozorg*): for this to work in terms of the Systematist descriptions one would need to assume a relative pitch arrangement such as that proposed in ex. 1, which is not immediately convincing as a demonstration of a close relationship. Nevertheless, most of these structure-related comments are congruent with the assumption that within the common pool of mode names the great majority of the modal entities to which they were attached were, in all probability, if not identical across the hypothetical Khorasani/non-Khorasani divide, then at least closely similar, mutually recognized, and transferable along with compositions in them.

This provides some degree of justification for importing Systematist definitions into Nayšāburi's account as an investigative tool, even if doing so of itself proves nothing; and considered individually they cannot contribute towards demonstrating the presence or absence of regional distinctions. Nevertheless, Nayšāburi's statements of propinquity, together with the various derivational schemes that imply some form of structural relationship, provide a laboratory in which to test their relevance, in the sense of gauging the extent to which injecting them into such schemes produces results that conform to expectations based upon modulatory and derivational norms encountered elsewhere. For the various derivation pairs, it can be claimed that the results are generally satisfactory, if one considers so a move that requires, as a crude measure, not more than one pitch change per tetrachord. Equally, when the various linkages are assembled into blocks, as in exs. 1-4 and the subsequent derivational triads and pairs, they produce, in the main, similarly satisfactory conjunctions, in other words they accord with the supposition that the modal repertoire of thirteenth-century art music was broadly uniform, that *busalik* or *eṣfahān* as performed in Bokhara would be readily identified as such by a musician from Shiraz, Baghdad, or even Cairo. To this could be objected that the result was, up to a point, a foregone conclusion, since on the occasions when various versions or pitch positions could be hypothesized, given the not always explicit nature of Nayšāburi's text, the one that better accorded with it was chosen, but while this is undoubtedly true, it is unlikely that the effect of

choosing ostensibly less favourable options would have sufficed to invalidate the general conclusion: it would simply have made the picture untidier.

The supposition of uniformity could also draw support from al-Tīfāšī's testimony. As noted, he draws a clear distinction between the style world of al-Andalus and the Maghrib and that of the Eastern Arab region. He is, however, at pains to point out that the eastern modal vocabulary and, by implication, the corpus of modes to which it relates, consists of Persian imports, and at no point does he refer to the existence of a second stylistic cleavage positioned somewhere further east, a silence interpretable as pointing to the probable existence of a broad area of modal practice marked, if not by complete uniformity, at least by the lack of any significant internal divisions. The same conclusion is suggested by a further witness familiar with Cairene norms, the Mamluk historian al-ᶜUmarī (1301-49), volume X of whose *masālik al-abṣār fī mamālik al-amṣār* is devoted to music.[96] Although largely derived from the *kitāb al-aġānī*, it contains additional material giving some insight into contemporary repertoire and the relative popularity of individual modes and rhythmic cycles. Striking about the latter is that the only names relatable to the 'Arab' cycles analysed by al-Urmawī are *ṯaqīl* and *muḫammas*; they appear alongside *turkī* and the Persian *fāḫita*, while by far the most frequently mentioned designation is another eastern import: *ḫurāsānī*. The representation of the modes (for which al-ᶜUmarī uses an older term, *anġām*) is fuller, and largely coincident with the Systematist mode stock, with only one, *nigārī*, reminiscent of the specifically Khorasani names.

Unlike al-Tīfāšī, al-ᶜUmarī regards the replacement modal terminology not as referencing the importation of new modal entities but as new bottles for old wine. He arrives at this conclusion, interestingly, after an investigative process that involves consulting two expert witnesses from Transoxiana: there is here a clear inference of uniformity between the norms of Khorasan and those of Mamluk Damascus and Cairo. It is hardly surprising, therefore, that al-'Umarī should make no mention of regional differences: the Persian-influenced nomenclature familiar from the treatises of Nayšāburi and al-Urmawī, already established in Baghdad, is now, it seems, at home in Cairo too, and this diffusion westwards also tallies with what we know of the history of al-Urmawī's own compositions, transmitted by

[96] Facsimile in Publications of the Institute for the history of Arabic-Islamic science, series C, 46,10, Frankfurt, 1988.

his pupils, one of whom, Kutayla, went to Cairo to teach the slave singing-girls of al-Nāṣir (who reigned, with interruptions, from 1293 to 1341, most of al-ʿUmarī's lifespan).[97]

The resulting rather cosy picture of diffusion and uniformity is rudely disturbed, however, by the first treatise to give a detailed account of modal and rhythmic practice in Cairo. By another contemporary, Ibn Kurr (1282-1357),[98] it provides not just names but descriptions, set, however, within an analytical framework quite unrelated to the Systematist one, thereby making comparison less than straightforward. For the modes, the initial impression it gives is of a quite unfamiliar landscape, if partly because of the different methods being used to survey it: different class terms are employed; the familiar group of twelve is absent; and 'Persian' (*ʿajam*) views of modal derivations are repeatedly and summarily rejected. The names, however, still suggest overlap with the Systematist mode stock: the members of al-Urmawī's *šadd* and *āvāz* sets are all present, as is Širāzi's series of 'number' modes (extended, indeed, to include *šašgāh* and *haftgāh*). Of the names specific to the Khorasani texts the only ones to appear are *nigāri* and *sāzgari*, while the three novel names included by Ibn Kurr, *ʿukbarī*, *ṣaʿīdī*, and *ramal*, doubtless represent an Arab input.[99]

That is, in itself, neither unexpected nor necessarily a significant indication of regional particularism, especially when set against the level of commonality elsewhere. However, the picture changes when we move from the names to how they are described, even if, in several instances, we encounter a degree of overlap, as with the identifications of *raʾs al-hank* (Ibn Kurr's equivalent for *rāst*) and *zangula* with the pitch set /1 2 3- 4/, of *nayruz* with the pitch set /1 2- 3♭ 4/, and of *zīlakand* (= *zirafgand*) and *šahnāz* with the pitch set /1 2- 3♭ 3-/. There are further cases where similarities can readily be detected, but in others resemblances are much harder to find, and at the extreme we find, for example, that his descriptions of *busalik* and *navā* are quite unrelated to al-Urmawī's, that *ʿoššāq* is identified not with /1 2 3 4/ but with /1 2 3- 3/, and that *māyāh* (= *māya*) is reduced to just two

[97] Al-ʿUmarī, *masālik al-abṣār*, p. 332.

[98] In full, Abū ʿAbdallāh Šams al-Dīn Muḥammad b. ʿĪsā b. Ḥasan b. Kurr al-Baġdādī. For the treatise, see Owen Wright, *Music theory in Mamluk Cairo. The* ġāyat al-maṭlūb fī ʿilm al-anġām wa-'l-ḍurūb *by Ibn Kurr*, Farnham: Ashgate, 2014.

[99] The first two are toponyms, the first referencing a town in Iraq, the second Upper Egypt, while *ramal* is a mode name still current in the North Africa.

pitches.[100] Some names only occur in combinations, with modes being described as concatenations of elements that are reminiscent conceptually of Širāzi's modulatory couplings, but without being related to them. Even making allowance for the differences in descriptive technique, the outlines of the modal system that can be disengaged from Ibn Kurr's occasionally cryptic definitions can only be brought, at best, into partial alignment with the Systematist portrayal, and when account is also taken of the contrasts between their respective descriptions of the rhythmic modes, it seems clear that although the nuclear elements and combinatory procedures employed by Cairene musicians closely matched those current in the Persianate world, the outcomes were not always so readily relatable.

Conclusion

It cannot be denied that there is much about what has been proposed here that is conjectural and uncertain, and the arguments may not be particularly persuasive. There is a recognition of a distinctive coloration to the norms of the Mamluk court-music idiom, contrasted with the presumption of a greater degree of uniformity elsewhere, without, however, the capacity to demonstrate it fully. The source texts do, though, provide negative evidence of a supporting nature, for in contrast to the *persistent* indications of regionally varied preferences in the domain of rhythm, nothing has come to light during this investigation that would indicate a recognition of significant regional differences in modal practice between Khorasan, Western Persia, and Systematist Baghdad. Variations in nomenclature and taxonomy are certainly apparent, and a reference to a mode in only one or two texts might well mean that it did not enjoy wide currency, but beyond that the only indication of regional specificities, tellingly, is when we are told that a given mode is called *x* in one place and *y* in another: it is never suggested that *x* and *y* might be identifiably distinct manifestations rather than alternative labels for the same entity.

Nevertheless, to point to an absence of evidence is not to deny that local variations must have existed, despite the levelling effects of the mobility of musicians. The question is whether they can be related in a productive way to political history, as instances of a fissiparous trend encouraged by a multiplicity of short-lived centres of patronage, or whether they simply reflect a constant (that is, a constantly shifting) condition, the inevitable creative mutations and adjustments that occur

[100] For a fuller discussion of Ibn Kurr's descriptions, see Wright, *Music theory in Mamluk Cairo*.

locally within an overarching Great Tradition. During the ninth- to tenth-century heyday of the Abbasid Caliphate it would be reasonable to speak of the diffusion of Baghdad norms (themselves a multi-cultural amalgam), but the occasional insights afforded by Ibn al-Ṭaḥḥān (d. after 1057) also reveal its limits by pointing to perceived differences between regions: the awareness in Cairo of Baghdadi peculiarities of performance, or of Persian features of style and technique,[101] although at the same time with the implication that they did not fall outside the bounds of acceptability. Indications of transfer not being unidirectional are provided by Ibn Sanāʾ al-Mulk (1155-1212), who writes of the popularity in Egypt of the Andalusi *muwaššaḥ* song form,[102] but otherwise the flow is predominantly westward: even after the extinction of the Abbasid Caliphate in 1258 we hear of the impact of al-Urmawī's compositions as far away as Cairo; and for his contemporary al-Tīfāšī it was the diffusion of Persian modes that was significant: what information there is about specific differences tends to concern more the domain of rhythm. Significant developments were to take place in both, but the surviving documentation for the twelfth and thirteenth centuries is inadequate to track them or to show whether they proceeded differently in different areas of the Eastern Arab and Persianate worlds.[103] It is certainly the case that the various Khorasani texts surveyed here present an approach to categorization that in certain respects is distinct from that of their Systematist counterparts, yet they contain nothing to indicate that the modal repertoire was similarly differentiated beyond the presence of a few names that occur only in one group of texts or another. Accordingly, as between Khorasan and the early Systematist heartland of Western Persia and Iraq, the case for a significant regional divide in modal practice during this period lacks substance.

Where it appears stronger, at least when we approach the mid fourteenth century, is along the Mamluk-Īlkhanid fault line separating

[101] *ḥāwī al-funūn wa-salwat al-maḥzūn*, facsimile in Publications of the Institute for the history of Arabic-Islamic science, series C, 52, Frankfurt, 1990, pp. 204-5.

[102] Dwight F. Reynolds, 'Musical aspects of Ibn Sanāʾ al-Mulk's *Dār al-Ṭirāz*', in E. Emery (ed.), Muwashshah*: Proceedings of the Conference on Arabic and Hebrew Strophic Poetry and its Romance Parallels, School of Oriental and African Studies, London, 8-10 October 2004*, London: School of Oriental and African Studies, 2006, pp. 211-27.

[103] For a detailed account of patronage, centres of musical activity, and the movements of musicians from the tenth to fifteenth centuries, with exhaustive bibliographical coverage of sources, see Eckhard Neubauer, 'Die urbane Kunstmusik im Islam. Eine historische Übersicht', *Zeitschrift für Geschichte der arabisch-islamischen Wissenschaften*, 20-21, 2014: 303-98, at pp. 340-54, 361-8.

Egypt and Syria from areas to the east. Here the evidence of Ibn Kurr is crucial. Although significant points of resemblance are to be found beyond the modal nomenclature itself, there is a stubborn residue of instances in which his accounts cannot be aligned with those of the Systematist theorists, even taking account of the fact that he is dealing with kernel elements and is entirely unconcerned with al-Urmawī's tidy array of octave structures. It is, though, by no means clear how this can best be interpreted. Assuming such disjunction to be a continuation of the thirteenth-century state of affairs, it suggests that the wholesale adoption of Persian norms as reported by al-Tīfāši may be suspect, and it would certainly reinforce doubts about the rather glib and unconvincing terminological equations put forward by al-ᶜUmarī. It would suggest a continuing east-west gap separating off Mamluk practice in certain respects—albeit one that could certainly be bridged to allow transfers of repertoire—but without any indication as to whether it was narrowing or widening. Alternatively, if we assume a broad uniformity of modal practice during the thirteenth century extending from Khorasan to Cairo, it follows that Ibn Kurr is witness to the beginnings of a fourteenth-century separation.

Similar problems recur in relation to the interpretation of theoretical texts of the later fourteenth and fifteenth centuries, which cannot be attempted here. We have a continuing production of descriptively explicit, if often derivative, Systematist treatises down to the end of the fifteenth century and, alongside them, others, whether in Arabic, Persian, or Turkish, that either follow the cryptic and laconic approach of Nayšāburi and Boḫāri or contain descriptive content that differs from the Systematist one in significant respects. Any assessment of developments during this period would thus have to entertain a possible understanding of the textual legacy as in accord with, on the one hand, the maintenance or emergence of distinct regional profiles and, on the other, the maintenance or diffusion of prestige standards associated above all with ᶜAbd al-Qāder Marāġi (d. 1435), whose career spanned Baghdad, Samarkand and Herat, who was the dominant court musician, composer, and theorist under Timur and his successors, and whose son and grandson would transmit his articulation of Systematist theory and, presumably, his practice to the Ottoman court. Where Marāġi recognizes the existence of a line of cleavage is not to the west of Khorasan but to the east: he refers to an East Asian four-stringed lute on which the Turks (of Central Asia)

performed diatonic modes, termed *kök*, of which there was a basic set of nine[104] (from a total of 360).

However, to revert to the thirteenth century and to the original question—thus setting aside the factor of Mamluk particularism—the conclusion would have to be that there is insufficient evidence, beyond incidental differences of ordering and categorization, to justify assuming the existence of a Khorasani modal corpus substantially distinct from that current in western Persian and Iraq. References to entities seemingly peculiar to the area are too few to outweigh the indications of alignment with the modal structures described in Systematist texts of the period. It follows that the developments leading to the emergence of a separate Khorasani/Central Asian tradition or bundle of traditions probably began somewhat later, and only gathered pace after the collapse of the Timurid cultural ascendency.

[104] Their names are listed in his *šarḥ al-adwār (bā matn-e adwār wa-zawā'id al-fawā'id)*, ed. Taqi Bineš, markaz-e našr-e dānešgāhi, Tehran, 1370š/1992, p. 356. See Eckhard Neubauer, 'Die urbane Kunstmusik im Islam. Eine historische Übersicht', *Zeitschrift für Geschichte der arabisch-islamischen Wissenschaften* 20-21, 2014, 303-98, at pp. 364-5.

Appendix 1. A list of modes mentioned in both Khorasani and Systematist sources, with definitions largely based on the accounts of al-Urmawī and Širāzi. Prominent notes are indicated in bold and prominent segments are placed within square brackets. Secondary, optional, or merely theoretical additions are placed within curved brackets. In some cases there is more than one version, or two possible pitch positions are proposed. The more doubtful versions are in italic.

| | | |

bozorg **1′** 2-′ ...
↳ → ... 3′ 4′ 4♯′ **5′**
salmak 4 5 6- **7♭** 1-′ 2′ 3′↴
3♭ 4 5- 6♭ 7♭ 1-′ 2′ 3′↵
1′ 2′ 3-′ **4′** 5-′ 6′ 7♭′↴
7♭ 1′ 2-′ 3♭′ **4′** 5-′ 6′ 7♭′↵

Modes mentioned only in Khorasani texts for which possible pitch sets may be ventured:

negārin 4 5 6- 7♭ 7 1′
nayšābura/
negārin **1′** 2-′ 3′ 4′ 4♯′ **5′**
sāzgāri *4* *5-* *6* *7♭* *7* *1′*
1′ *2-′* *3′* *4′* *4♯′* *5′*
sepehri *4* *5* *6-* *7♭* *1′* *2-′* *3♭′* *3′* *4′*
4 *5* *6-* *7♭* *1′* *2-′* *3′* *4′* *4♯′* *5′*

Modes mentioned only in Khorasani texts for which there is insufficient information to suggest a possible pitch set:

bāḫarz, *panjtār*, and *sehtār*

Mode mentioned in a text from South Asia and described in Systematist texts:

moḥayyer (ḥosayni) [**1** 2- **3♭** 4 **5**] 6- 7♭ **1′**

Mode mentioned by Neẓāmi, al-Tīfāšī, and *al-muḫtaṣar al-mufid* and described by Širāzi:

ḥeṣār[i] [**1** 2- **3♭** 3- **4♯** **5**] (6-)
1 2- **3♭** [**4** 5- 6♭ 6- 7 **1′**]

Mode mentioned only by al-Tīfāšī:

māya busalik *2* *3♭* *4* *5* *6♭* *7♭* *1′* *2′*

Appendix 2. A list of the scattered references to name equivalences, some multiple.

basta = *gavāšt* (al-Ṣafadī)
basta = *eṣfahānak* = *gavāšt* (Širāzi)
basta = *panjtār* = *?ᶜerāq* (*al-muḫtaṣar al-mufīd*)
bozorg = *sāzgāri* (Nayšāburi)
eṣfahān = *moḫālef* (in Iraq) (*kanz al-tuḥaf*)
eṣfahān = *moḫālef-e rāst* (*al-muḫtaṣar al-mufīd*)
eṣfahān-i aṣl = *moḫālef-e rāst* (Širāzi)
eṣfahānak = *basta* = *gavāšt* (Širāzi)
eṣfahānak = *gavāšt* (*šarḥ-e adwār*)
gavāšt = *basta* = *eṣfahānak* (Širāzi)
gavāšt = *basta* (al-Ṣafadī)
gavāšt = *eṣfahānak* (*šarḥ-e adwār*)
kučak = *moḫālefak* = *zirafgand/zirafgand-e kučak* (Širāzi)
moḫālef (in Iraq) = *eṣfahān* (*kanz al-tuḥaf*)
moḫālef-e rāst = *eṣfahān* (*al-muḫtaṣar al-mufīd*)
moḫālef-e rāst = *nayšābura* (Nayšāburi)
moḫālef-e rāst = *negārin* (Nayšāburi)
moḫālefak = *kučak/zirafgand/zirafgand-e kučak* (Širāzi, *al-muḫtaṣar al-mufīd*)
nahāvand = *zangūla* (Širāzi, *al-muḫtaṣar al-mufīd*)
nayšābura = *moḫālef-e rāst* (Nayšāburi)
negārin = *moḫālef-e rāst* (Nayšāburi)
rāhavi = *mazmūm* (previously) (al-Urmawī)
šahnāz = *zirafgand* (al-Širwānī)
sāzgāri = *bozorg* (Nayšāburi)
zangūla = *nahāvand* (Širāzi, *al-muḫtaṣar al-mufīd*, *kanz al-tuḥaf* (in Bukhara))
zirafgand/zirafgand-e kučak/zirafganda-ye ḫord = *kučak* = *moḫālefak* (Širāzi)
zirafgand = *šahnāz* (al-Širwānī)

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As is well-known, medieval Persia is famous for its many outstanding thinkers. Avicenna (d. 428/1037), Naṣīr al-Dīn al-Ṭūsī (d. 672/1274), Quṭb al-Dīn al-Rāzī (d. 766/1364), and Mīr Dāmād (d. 1041/1631) are notable examples. Most of them excelled in one or more fields of traditional Islamic learning (*ᶜulūm naqliyya*) as well as in various parts of logic, philosophy or the sciences (*ᶜulūm ᶜaqliyya*). Among later thinkers, the one who stands out as the founder of what came to be known as 'transcendental philosophy' (*ḥikma mutaᶜāliya*) is Ṣadr al-Dīn al-Shīrāzī, commonly referred to as Mullā Ṣadrā (d. 1045/1635-36). Mullā Ṣadrā's unique and highly original combination of philosophy, theology, 'illuminationalism' (*ishrāq*, a philosophical model invented by Shihāb al-Dīn al-Suhrawardī (d. 587/1191)), and Islamic mysticism found its most eloquent expression in his (Arabic) magnum opus, the *Kitāb al-Asfār al-arbaᶜa* ('The Four Journeys').

Among Ṣadrā's many original ideas, his theory of the primacy of existence (*aṣālat al-wujūd*) over essence stands out and is opposed to the traditional view of the primacy of essence over existence (*aṣālat al-māhiyya*, e.g. in Avicenna). Another fundamental aspect of Mullā Ṣadrā's philosophy is that, in his understanding, the true believer is, eo ipso, also a philosopher and vice versa.

In his lifetime, Mullā Ṣadrā's philosophy did not find much resonance. It was mainly in the nineteenth century, notably in the work of Mullā Hādī Sabzawārī (d. 1250 sh/1873) and later, in the twentieth century, most eminently in the writings of Sayyid Muḥammad Ḥusayn Ṭabāṭabāᵓī (d. 1360 sh/1981), that people seriously engaged with his ideas. Today, Mullā Ṣadrā is much studied in Iran, and there is even a research institute in Tehran carrying his name. Outside Iran, Mullā Ṣadrā is mainly studied among the Shīᶜite scholars of Iraq.

Among Mullā Ṣadrā's many writings, the *Kitāb al-Mashāᶜir* is a relatively brief work on ontology and theology in the 'transcendental' sense—two subjects that are, of course, inseparable. Originally written in Arabic, the work was translated into Persian in the nineteenth century by Prince Badīᶜ al-Mulk Mīrzā ᶜImād al-Dawla (d. after 1306/1888), who provided his translation also with a commentary, titling his work *ᶜImād al-ḥikma*. As was the case for the *Asfār*, most of the commentaries on the *Kitāb al-Mashāᶜir* date from the nineteenth century. Among Western scholars, Henry Corbin was the first to publish a bilingual Arabic-Persian edition of the *Kitāb al-Mashāᶜir*, accompanied by a detailed French introduction and an annotated French

translation (*Le Livre des Pénétrations Métaphysiques*. Avec la version persane de Badi' ol-Molk 'Emâdoddawleh. Tehran, 1964). Since then, two more Western, bi-lingual English-Arabic editions have been produced, the first by Parviz Morewedge (*The Metaphysics of Mullā Ṣadrā*. New York NY, 1992) and the second by Seyyed Hossein Nasr, in cooperation with Ibrahim Kalin (*Mullā Ṣadrā–Metaphysical Penetrations*. Provo UT, 2014). Finally, there is a Chinese translation by Abul Qasim Maping (Tehran, 2005). The present translation is thus the third to appear in a Western language and the first one in German.

The work starts with a short introduction to Mullā Ṣadrā's metaphysics, preceded by a brief note on his life and works (pp. 1-17). What is most striking about this introduction is not its brevity but instead that the *Mashāʿir* is only referenced in it once (p. 7, note 10). Even if it is true that the viewpoints that this work contains may also be identified in the *Asfār*, it would have been helpful to accompany references to the *Asfār* (five times) insofar as possible with references to parallel passages in the *Mashāʿir*. More generally, it would have helped if the translator had given a succinct sketch of how the argument unfolds, but maybe the fairly detailed Table of Contents (pp v-vii) was meant to take on that role.

On a different note, the transliterations from Arabic in the introduction are often problematic: *ḥikmat mutaʿāliya* instead of *ḥikma mutaʿāliya* (p. 1); *ḥikmat ilāhiya* instead of *ḥikma ilāhiyya* (p. 2); *al-ḥaqīqa al-wujūd* instead of *ḥaqīqat al-wujūd* (p. 5); *māhiya* instead of *māhiyya* (p. 5); *mafhum* instead of *mafhūm* (p. 5); *wujūd muqayad* instead of *wujūd muqayyad* (p. 6); *ḥudūr ishrāqī* instead of *ḥuḍūr ishrāqī* (p. 7); *fard ʿamm* instead of *fard ʿāmm* (p. 7); *waḥda shakhsiyya* instead of *waḥda shakhṣiyya* (p. 13); *al-huwiya al-ghaybiya* instead of *al-huwiyya al-ghaybiyya* (p. 13); *ghayb al-muṭlaq* instead of *al-ghayb al-muṭlaq* (p. 13); *al-dhāt al-aḥadiya* instead of *al-dhāt al-aḥadiyya* (p. 13); *fayd al-muqaddas* instead of *al-fayḍ al-muqaddas* or *fayḍ muqaddas* (p. 13); *tashkik al-khaṣṣ/al-ʿamm* instead of *al-tashkīk al-khāṣṣ/al-ʿāmm* (p. 14); *mujarradat* instead of *mujarradāt* (p. 15).

The translation (pp. 21-93) is said to be [exclusively] based on the edition of the Arabic text by Henri Corbin (p. 17). It would appear, however, that the translator frequently follows the oftentimes interpretative rendering of the Arabic of Corbin's French translation, e.g.:

1 – *al-quwā al-qābila lil-istikmāl* (*Mashāʿir* ed. Corbin p. 2 # 1 = "the faculties receptive/capable of perfection". Pietsch translates: "die Fähigkeiten ... die in der Lage sind, stufenweise die Vollkommenheit zu erlangen" (p. 21 #1). Compare this with Corbin's "les facultés susceptibles d'atteindre graduellement à la perfection" (French transl., p. 87 # 1). There is no 'gradually' in the Arabic.

2 – *inna ḥaqīqat kulli shayʾ huwa wujūduhu alladhī yatarattabu bihi ʿalayhi āthāruhu wa-aḥkāmuhu* (*Mashāʿir* ed. Corbin p. 9 # 16) = "The reality of each thing is its existence, through which its effects and properties are determined". Pietsch translates: "Die Wirklichkeit eines jeden Dinges ist sein eigentlicher Akt des Seins, aus dem sich die Wirkungen und Wirksam-

keiten ergeben" (p. 28 # 16). Compare with this, Corbin's "La réalité de chaque chose, c'est son acte même d'être duquel résultent les effets et les efficiences que l'on attend de cette chose" (French transl., p. 91 # 16). There is no reason to suppose that Mullā Ṣadrā repeats himself here with 'effets' and a quite similar 'efficiences'. The Arabic *aḥkām*, which Corbin renders as 'efficiences', is more likely to mean 'properties' here, 'property' having little in common with 'efficience'.

3 – *kull(u) māhiyya imkāniyya* (*Mashāʿir* ed. Corbin p. 18 # 38) = "every essence grounded in possibility". Pietsch translates "... jede zufällige Wesenheit" (p. 37 # 38). Compare with this Corbin's "chaque quiddité contingente" (French transl., p. 124 # 38). *Imkān* does not denote chance because chance events are 'unusual', and that is not the same as the being possible of the existence of some essence in some state. While Corbin correctly translates "quiddité contingente", it appears that Pietsch misinterpreted 'contingent' in terms of 'zufällig'.

4 – A major borrowing from Corbin is Pietsch's translation of the Arabic *maʿshar* as 'Durchdringung' (French 'pénétration') in the title of the work and throughout the text. Corbin devotes some space to explaining his reasons for choosing this translation in the introduction to his French translation (pp. 42-44). Let it suffice to say that he understands 'pénétration' as 'lieu de pénétration' ('the place of penetration or entering' [one's 'inner temple' of consciousness and understanding]). Pietsch does not explain this subtle disctinction, so it remains unclear what 'Durchdringung' exactly means. In this connection, I would like to draw attention to Parviz Morewedge's translation of *maʿshar* as 'prehension'. Although he does not explain the concept anywhere, he must have used it in the sense in which Alfred North Whitehead (d. 1947) introduced the term (nevertheless, Whitehead is mentioned in another context on pp. 7-8 of the introduction to Morewedge's translation, which would seem to support my conjecture). Whitehead's 'prehensions' offer a profound mechanism for understanding how entities relate not only to concrete realities but also to abstract possibilities, archetypes, and symbols, and the latter two are prominent notions in Mullā Ṣadrā's ontology and metaphysics. I do not know if anyone has explored Whitehead's 'prehension' in relation to Mullā Ṣadrā's understanding of the universe, but doing so might produce some interesting results.

Pietsch did not include any annotations, so readers are often left to their own devices to understand this densely written philosophical text. Nevertheless, this does not diminish the importance of this translation for its German readership, a readership that will undoubtedly want to delve deeper into the universe of Mullā Ṣadrā's philosophical discourse and thought.

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