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Rhyme and Remedy: The Structure and Possible Teaching Function of the Medical Urjuza Attributed to Ibn Tufayl

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Abstract

Possibly the longest didactic poem in Arabic, a medical work attributed to the Almohad court physician and philosopher Ibn Tufayl (d. 581/1185) has not received a complete critical edition. It survives in the library of the al-Qarawiyyin mosque in Fez, where manuscript 3158, the only known copy, is reported to transmit some 7,700 instructional verses covering conditions from the scalp to the foot. The absence of a table of contents, running heads, and an index makes systematic consultation difficult and may have contributed to the limited study of the poem. Inscribed on the UNESCO Memory of the World Register in 2025, the volume is described in the nomination dossier as comprising 148 folios in an Andalusi hand dated to the twelfth century, with the poem divided into seven maqalat. This review recovers the poem's architecture from a photographic record of 169 plates. Chapter units were identified from the enlarged display script of each chapter opening, philological markers in the verse, and the medical content. The result is a working inventory of at least 268 chapter units, grouped into fourteen analytical parts (the manuscript transmits seven maqalat); only 20 headings are attested in Arabic, and the detailed inventory is being prepared for a second article. Some headings carry ordinals, so the poem numbers some of its own chapters; whether numbering restarts at each maqala is unresolved. Three features organize the poem: a head-to-foot order declared in the prologue; a later sequence from prognostic semiology through wounds and poisons to venesection and cupping; and a recurring cause-sign-therapy progression in the chapters examined. The poem has no separate theoretical, anatomical, or pharmacological division, and neither its opening folio nor its closing formula names an author. The inventory and the declared order are findings; reading the architecture as a memorizable course in practical medicine is a hypothesis, since nothing in the manuscript yet shows such use. The traditional attribution rests on the bio-bibliographical tradition and on a reported endowment annotation naming the work and its author; examining that annotation and verifying the date of the copy remain necessary.

Categories: Other, Medical Education
Keywords: al-qarawiyyin, arabic didactic poetry, history of medicine, ibn tufayl, medical education, mnemonic learning, rajaz, sdg 4, urjuza

Introduction And Background

Manuscript origins and authorship

A medical poem reported to run to some 7,700 verses, from the diseases of the scalp to the protocols of phlebotomy and cupping, has been described as possibly the longest didactic poem in Arabic [1]. It survives in a single known copy, preserved in the library of the al-Qarawiyyin mosque in Fez under shelfmark 3158, but has not received a complete critical edition and remains comparatively little studied. It is associated with the Almohad court of Caliph Abu Ya'qub Yusuf in the later twelfth century through its traditional attribution to Ibn Tufayl, the prominent philosopher and state physician of that court [2-4]. The poem is attributed to him by tradition [5,6], though Renaud proposed Ibn al-Khatib instead, a suggestion that has not been widely accepted [1]. Ibn Tufayl's philosophical writings have received more attention than the medical poem attributed to him, whose organization and potential educational function remain insufficiently examined.

Arabic didactic verse in medical education

The employment of versified poetry (manzuma or urjuza) was an established pedagogical practice in medieval Arabic education, combining literary form with scientific instruction [7,8]. An urjuza is a poem in rajaz, a simple and flexible metre in which the two hemistichs of each verse rhyme. Instructors utilized the rajaz metre, favored for its rhythmic simplicity and structural predictability, to turn complex technical curricula into acoustically memorable sequences. This strategy facilitated rote memorization (hifz) in an era of limited manuscript accessibility, potentially supporting the oral transmission of medical knowledge. Furthermore, intrinsic metrical and rhyming constraints could help readers detect some omissions or

alterations when these disrupted the rhythm or rhyme. Ibn Sina's canonical 1,326-verse Urjuza fi al-tibb [9], which later circulated widely in medieval Europe as the Cantica [10], exemplifies this shared Mediterranean educational tradition alongside Latin equivalents such as the Regimen Sanitatis Salernitanum [11].

Structural rationale and review objective

Medical poems in this tradition generally served as preliminary texts: Ibn Sina's Urjuza is an introduction to the broader Canon [1]. The scale of the Fez poem, roughly five to six times as long, suggests a broader practical scope and raises the possibility of a relatively self-contained teaching text. Because a poem intended for memorization demands a learnable sequence, the internal order of so extensive a body of material may have been shaped to support learning. The poem is recorded in the survey of Andalusi and Maghribi medical poems by Forcada M [1], but, as far as the authors are aware, its internal organization has not been set out from the manuscript. Consequently, this study aims to recover the poem's sequential architecture to assess its possible pedagogical functions. The principal contribution is the reconstruction of that architecture: a working inventory of chapter units, grouped into analytical parts, together with the organizing principles visible in it. The pedagogical reading is a secondary, hypothetical interpretation of that architecture.

Review

This review proceeds in three movements. It first sets out the manuscript, the photographic record on which the analysis rests, and the procedure by which the chapter divisions were identified. It then reports the architecture that this procedure recovers. It finally considers what that architecture implies for the teaching of medicine in the medieval Islamic West, for the comparative history of didactic verse, and for the attribution of the poem. It is an analysis of a single manuscript and not a systematic review, so Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) reporting does not apply; it does not rest on a systematic survey of the literature. Secondary sources were chosen for their bearing on the poem's historical context, didactic verse, and memory, and are cited for background and comparison. The manuscript transmits a division of the poem into seven maqalat (sing. maqala, a book or treatise: the largest division of a work); the fourteen parts used below are the authors' own analytical groupings and are not to be confused with them. Observations from the photographic record are kept distinct from interpretation, which is marked as a hypothesis. The detailed inventory of chapter units will be the subject of a separate publication.

Source material and method

The work is preserved in the library of the al-Qarawiyyin mosque in Fez, which holds approximately 2,000 Arabic manuscripts [12]. The photographic record used here is labelled manuscript 3158; the UNESCO nomination dossier gives inventory number 1969 for the volume it describes [13]. The identification of the two numbers as designating the same volume has been taken from the dossier and has not been verified; the dating, physical description, and verse count below depend on this assumption. The volume was inscribed on the UNESCO Memory of the World Register in 2025 following a nomination submitted by Morocco. The dossier describes 148 folios measuring 29 by 21 cm in an Andalusi hand, containing some 7,700 verses of rajaz distributed over seven maqalat, each subdivided into chapters, and assigns the copy to the twelfth century [13] (unverified; see Limitations and Future Directions). The analysis below rests on a photographic record of the volume comprising 169 plates. A plate carries either a single page or a complete opening, so that the number of plates is not the number of pages: the reported 148 folios comprise 296 sides, whereas 169 plates that were all openings would comprise 338, and the modern pencil foliation, which counts leaves rather than plates, stands at 16 on plate 17 (Figure *1*). The exact correspondence between plates, pages, and folios has not been established, and plate numbers refer to the record, not to the codex. The same uncertainty bears on the verse count. At about twenty-five ruled lines per intact page (see Physical Layout and Chapter Headings), 296 sides hold at most about 7,400 lines and 338 sides about 8,400, before the lines given to chapter headings and the damaged areas are deducted; the figure of some 7,700 verses is therefore retained as the value reported in the dossier and not as a count made in this study. The codex has suffered severe damp and insect degradation and has undergone conservation by inlaying into modern support paper; some folios consist of fragmented horizontal bands reassembled within their mounts, so that the ordering of verses depends on codicological assessment as well as on earlier restoration decisions (Figure *1*). The outer margins carry dense, undated annotations in a later hand. No dated colophon closes the poem. Every plate of the record was examined for this study, page by page and in sequence; the volume itself was not consulted in the original.



FIGURE 1: An opening illustrating the material state of the codex.

Manuscript 3158, plate 17. The leaves have been inlaid into modern support paper; on the left-hand page, the text block has been fragmented into horizontal bands and reassembled within the mount, with substantial loss between them. A chapter heading in display script survives in the uppermost band, and the modern pencil foliation, reading 16, stands at the head of the same page. Reproduced under a licence granted by the Library of the al-Qarawiyyin Mosque.

Structural segmentation

An inventory of 268 chapter units was developed through a three-step procedure applied to the complete photographic record, plate by plate, with no sampling. First, a working segmentation draft was cross-referenced against the photographic plates to identify surviving display-script headings. Second, these units were corroborated using philological markers, primarily standard opening formulas and the recurrence of fixed expository sequences that signal new units in sections where original headings were damaged. Third, the identified segments were validated against their medical content to assess thematic coherence and check for possible lacunae or foliation errors. In practice, a unit was counted as new where a display-script heading survived or, where it did not, where an opening formula or the start of a fresh expository sequence (condition, causes, signs, treatment) coincided with a change of subject; a passage that resumed the same condition without any of these was treated as a continuation of the preceding unit. Cases meeting these criteria only in part were treated as ambiguous. Boundaries were established for all units except a small number in which deterioration or ambiguous transitions prevented precise delimitation; these cases were not recorded separately and have not been counted. What the inventory does record is that the subject of 15 units is itself uncertain; where such a unit falls within the extract of the inventory given in the Appendices, it is marked with a query (unit 7). Because headings lost to damage may have been missed, 268 is a minimum. The segmentation was not repeated by a second reader (see Limitations and Future Directions). The identification of the units should be distinguished from the transcription of their headings. Every plate was examined one by one for this purpose; an extract of the working inventory (Parts I and VII, 40 of the 268 units) is given in the Appendices to show the procedure, the plate references, and the distinction between attested and editorial entries, and the complete inventory is the subject of a second article. The plate on which a unit appears is established from the images for five units only (1 and 118 to 121); for the others, it is an estimate from the working pagination and is approximate, since the estimate for the last unit falls about fourteen plates short of the closing plate (169). Original Arabic headings were attested and transcribed for 20 units. For the 248 units without an attested heading, the titles are editorial descriptors, assigned from the content of each chapter and framed in the technical vocabulary of medieval Arabic medicine, and record what a chapter is about rather than what the copyist wrote. The inventory is therefore a finding aid and not an edition of the poem's headings, and it should not be read as the poem's original table of contents; the analysis below relies on the order of the units and the extent of the parts, not on any single editorial heading. To prevent inaccurate retrospective diagnosis, ambiguous medieval disease concepts were retained in transliteration rather than assigned direct modern medical equivalents.

Physical layout and chapter headings

The manuscript is formatted in two columns, assigning one hemistich to each column, so that a single ruled

line contains one complete verse (Figure 2). The line pitch is consistent throughout, and an intact page carries about twenty-five ruled lines; the lines given to chapter headings carry no verse. The manuscript lacks standard global navigational aids, such as a table of contents, running heads, or a marginal index. Instead, chapter divisions are indicated locally by an enlarged, non-rubricated Maghribi display script (Figure 2). The standard chapter opening uses the formula bab fi ("chapter on"; باب في), as in the first heading of the poem, bab fi da' al-tha'lab (باب في داء الثعلب). Some headings carry an ordinal in the numbered formula al-bab al-N, as four consecutive chapters of the digestive section do (Figure 3). Heading formatting also varies by section, with the toxicological division employing a shorter, unnumbered formula (fi-man shariba).



FIGURE 2: A page carrying a chapter heading in display script.

Fez, al-Qarawiyyin manuscript 3158, plate 2, right-hand page. The first chapter heading of the poem, bab fi da' al-tha'lab, stands on the second ruled line, executed in a markedly larger and heavier script than the surrounding verse. The two-column arrangement of hemistichs is visible, with one complete verse per ruled line, and the damage to the edges of the written area is typical of the codex throughout. Reproduced under a licence granted by the Library of the al-Qarawiyyin Mosque.



FIGURE 3: Four consecutive chapter headings showing the transmitted enumeration.

Manuscript 3158, digestive section. From the top: al-bab al-rabi wa-l-ishrun: al-shahwa al-kalbiyya (24: canine appetite, plate 68, right-hand page); al-khamis wa-l-ishrun: shiddat al-atash (25: intense thirst, plate 69, right-hand page); al-sadis wa-l-ishrun: al-simn wa-l-hazl (26: obesity and emaciation, plate 69, left-hand page); al-sabi wa-l-ishrun: al-hadm wa-ilajuh (27: digestion and its treatment, plate 70, right-hand page). Each is built the same way: al-bab in display script, the ordinal in a smaller module, then the subject in display script again. These four stand at positions 118 to 121 of the inventory. Reproduced under a licence granted by the Library of the al-Qarawiyyin Mosque.

The four ordinals identified, 24 to 27, stand at positions 118 to 121 of the inventory. They show that the poem numbers at least some of its own chapters and that the series to which they belong does not begin at the start of the poem. If the numbering began at 1 with the first chapter of that series, the series would open at position 95 of the inventory, at the passage from the mouth to the throat (Part V). That is compatible with the third maqala in [13], which begins with the throat, but the series would then run on through the chest and into the digestive chapters, which [13] assigns to the fourth maqala. Three explanations are possible: the numbering runs across more than one maqala; the boundaries given in the nomination summary do not coincide with those of the poem; or the inventory, which is a minimum, omits chapters in this stretch (an omission of some fifteen would bring the opening of the series to the beginning of the digestive section, at position 110). A single sequence of four cannot decide between them, and it is not claimed here that the enumeration restarts at each maqala. Collating the ordinals against the original will settle the point.

Manuscript structure and scope

The transmitted division of the work, as summarised in the nomination dossier [13], is into seven maqalat, each subdivided into chapters: diseases of the head; diseases of the face; diseases of the throat, chest, and respiratory organs; diseases of the digestive tract, intestines, and abdomen; renal and urinary diseases; occasional and pathological fevers; and afflictions reaching the body from outside, treated under toxicology. That sequence is itself a descent from the head, followed by a turn to general and then to external disease. The summary does not mention several subjects that the inventory records, notably the joints, prognostic semiology, wounds and tumours, and operative technique, so that how these are distributed across the seven maqalat is unresolved. Neither the summary nor the sequence of chapters recovered here contains a division for theory, anatomy, regimen, hygiene, or simple and compound drugs: as far as the record shows, no part is devoted to them. Whether such knowledge is embedded within individual disease chapters has not been examined here, so that the observation concerns the poem's organization and not the absence of that knowledge.

Within this frame, the segmentation procedure identified 268 chapter units, grouped here into fourteen parts by the organ, region, or class of disorder treated (Table *1*). The parts were defined after the segmentation, by placing a boundary wherever the organ or class of disorder changed along the sequence of units. They are analytical groupings imposed by the authors, not divisions made by the poem or its copyist, and no claim is made that they reflect an intended plan; the seven maqalat are the only transmitted divisions. The grouping is strictly sequential, so that it maps the poem's order as well as its contents, and it is offered as a finding aid rather than as a transmitted articulation: its boundaries have not been collated against those of the maqalat, and a part such as the fifth, which runs from the ear to the throat, is likely to span two of them. Establishing where the maqala divisions fall is a task for collation against the original, for which the transmitted chapter ordinals are the instrument: a restart in enumeration may indicate a boundary, but requires corroboration from the text and the material sequence. Table *1* also gives the approximate extent of each part in leaves, taken from the working pagination of the inventory (146 leaves in the fourteen parts; two further leaves carry the prologue, making 148 in all). That pagination was counted on the photographic images; it was not reconstructed from the dossier or from the modern pencil foliation,

which does not run in step with the plates, and the leaves of each part are derived from its first and last working page. Because the correspondence between plates, pages, and folios has not been established, the agreement of the total with the 148 folios of the dossier is not an independent confirmation, and the extents, and the percentages derived from them, are provisional. Extent measures how much of the poem a part occupies far better than the number of units does, because the units are editorial and unequal in length. The 20 headings attested in Arabic are listed in Table *2*. An extract of the working inventory (Parts I and VII) is given in the Appendices. A detailed analytical table of contents of all 268 identified units is in preparation for a second article, distinguishing attested Arabic headings from editorial descriptors.

Part	Chapters	Contents	Leaves
I	1-9	Scalp and hair	3
II	10-32	Head, brain and nervous system	16
III	33-47	Face and visible skin	4
IV	48-74	Eye and eyelids	10
V	75-98	Ear, nose, mouth, teeth, tongue, throat	14
VI	99-109	Chest and thoracic organs	10
VII	110-140	Digestive tract and abdominal viscera	24
VIII	141-167	Renal, urinary, genital and gynaecological disorders	18
IX	168-170	Limbs and joints	3
X	171-189	Fevers and acute general disease	12
XI	190-201	Prognostic semiology and the crisis	8
XII	202-224	Skin, wounds, tumours and trauma	10
XIII	225-265	Poisons, bites and stings	12
XIV	266-268	Operative and evacuative technique	2

TABLE 1: The fourteen parts into which the poem's chapters are grouped here, with their ranges and approximate extent.

Original table compiled by the authors from the working inventory of the photographic record of manuscript 3158. The fourteen parts total 146 leaves, counted on the working pagination of the images; two further leaves carry the prologue and belong to none of the parts, giving 148 leaves in all, a figure equal to the 148 folios described in the UNESCO nomination dossier [13]. The leaf counts are provisional.

Unit	Arabic heading (as transcribed)	English rendering
1	باب في داء الثعلب	Fox disease (alopecia areata)
2	باب في تساقط الشعر	Hair loss
3	باب في إنبات الشعر	Hair growth
11	باب في الشقيقة وأنواعها وعلاجها	Migraines, their types and treatment
13	باب في البرسام الحار	Hot barsam
14	باب في البرسام البارد	Cold barsam
23	باب في الماليخوليا	Melancholia
82	باب في الطنين في الأذن	Ringing in the ear
118	الباب الرابع والعشرون الشهوة الكلبية	Canine appetite (bulimia)
119	الباب الخامس والعشرون شدة العطش	Intense thirst
120	الباب السادس والعشرون السمن والهزل	Obesity and emaciation
121	الباب السابع والعشرون الهضم	Digestion
140	باب في الباسور	Haemorrhoids
141	باب في وجع الكلية	Kidney pain
148	باب في الدم في البول وأنواعه وعلاجه	Blood in the urine, its types and treatment
164	باب في العقم	Infertility
165	باب في تكرار الإجهاض	Frequent miscarriages
168	باب في عرق النسا ووجع الورك	Sciatica and hip pain
170	باب في النقرس وعلاجه	Gout and its treatment
224	باب في وجع الظهر	Back pain

TABLE 2: The 20 chapter headings attested in Arabic (out of 268 units) in the working inventory.

Transcriptions are those of the working inventory and remain to be checked against the plates in the full inventory. English renderings are the authors' own.

Anatomical progression

Parts I through IX follow a capite ad calcem (head-to-heel) descending order, a familiar convention of Greek and Arabic medical compendia [8]. This trajectory is explicitly declared in the prologue on the opening folio (Figure *4*): yakunu bi-l-ra'si btida'u al-dhikri, thumma bi-l-rijli ntiha'u al-amri (يكون بالرأس ابتداء الذكر ثم بالرجل انتهاء الأمر; "the account begins with the head, and the matter ends with the foot"). The declaration shows a deliberate plan of order. Because the same convention is common in medieval compendia, it does not in itself show that the poem was designed for sequential teaching or memorization. The head-to-foot order governs the first nine parts; the parts that follow turn to general disease.



FIGURE 4: The opening folio. Manuscript 3158, plate 1.

The poem begins with the basmala, a hamdala, and a blessing on the Prophet, and passes within a dozen verses to the statement of its subject, manner, and order, which appears in the lower third of the page. Neither a title nor an author's name appears. An annotation runs down the outer margin in a smaller, later hand, and an oval stamp appears at the foot of the leaf.

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Subsequent thematic architecture

Following the anatomical descent, Parts X through XIV shift focus. Part X addresses systemic diseases, primarily fevers, transitioning from localized to generalized conditions. Part XI focuses on clinical signs, including the consistency of matter, crisis recognition and resolution, critical days, and uroscopy and coproscopy. Part XII covers skin lesions, wounds, tumours, and trauma. Part XIII provides an extensive treatment of poisons, bites, and stings. Part XIV, the shortest, covers venesection and cupping, followed in the inventory by a final chapter on scabies; the placement of that chapter at the end of the poem, after the chapter on leprosy that closes Part XIII, is unexplained and may point to a segmentation or ordering problem. With that exception, the sequence can be read as a progression from the description of disorders to prognostic interpretation and practical intervention.

Chapter design

In the five chapters examined in detail (qulanj, melancholia, haemoptysis, uterine prolapse, and scorpion sting), the structure recurs: condition, humoral causes, signs, varieties ranked by gravity, prognosis, and treatment. For instance, the chapter on qulanj (intestinal obstruction) details causes (e.g., retained flatus, phlegmatic accumulation), clinical presentation (e.g., severe vomiting, distension), and specific therapies

based on aetiology (e.g., enemas, venesection) (plate 84). The ranking of varieties incorporates prognostic reasoning within the nosology. The template is therefore an observation from five selected chapters: it has not been quantified across the 268 units, and its consistency throughout the poem is not established. The case-framed headings of the toxicological Part XIII (41 units, about 15% of the total), such as those on drinking a given substance, introduce a different structure; the chapter on scorpion sting, in the same part, follows the template. If it holds across the poem, this recurring template of cause, sign, variety, and therapy may have supported memorization.

Structural irregularities

Four headings recur in exactly the same wording and several others in near-identical form. Their wording and the plates on which they appear will be given in the full inventory. The duplications are unresolved: they may be authorial repetition, copyist error, or the displacement of leaves, and collation against the original may help distinguish these possibilities. A second irregularity is one of scale. The part that stands at the foot of the anatomical sequence holds only three units, two of them given to sciatica, the disorder and its treatment, and the third to gout, which shows that a chapter is a unit of exposition and not a unit of disease. Limbs and joints occupy only about three leaves in all; whether that reflects the design of the poem, a lacuna, or displaced leaves cannot be decided from the photographs.

Authorship and attribution

Examination of both ends of the poem in the photographic record yielded no authorship ascription. The opening folio (Figure *4*) carries the standard invocations and a statement of subject, but neither a title nor an author's name. The closing text on plate 169 (Figure *5*) states only that the diwan is completed and gives no author, copyist, date, or place. In its own text, the poem is anonymous.

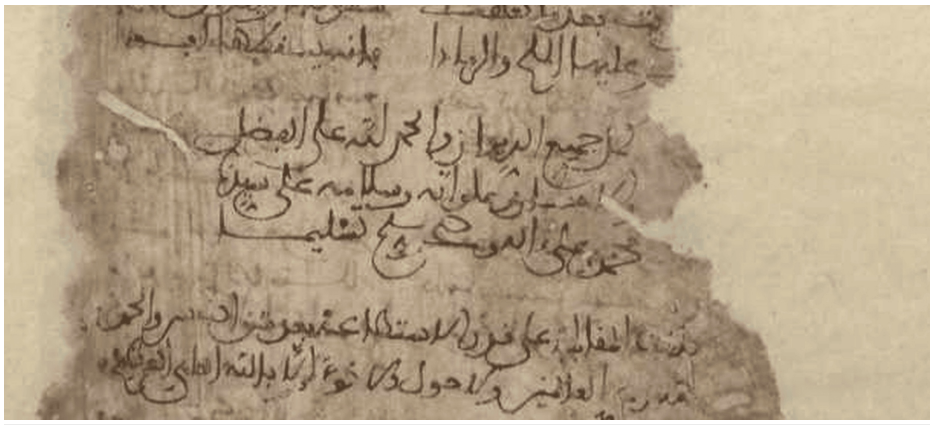


FIGURE 5: The final page. Manuscript 3158, plate 169.

The closing formula, kamula jami'u al-diwani idh dhaka wa-l-hamdu li-llahi ala al-fadli, is followed by a blessing on the Prophet. The formula names the work only as al-diwan and gives neither an author, copyist, date, nor place.

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According to the UNESCO nomination dossier, the first leaf carries an endowment annotation (tahbis) of the Saadian sultan Ahmad al-Mansur naming both the work and its author [13]. The photographic record used here opens with the first page of the poem, down whose outer margin a note in a later hand stands beside an oval stamp; whether this is the annotation described in the dossier has not been established, and reading the annotation on the original is the next step. The traditional attribution should therefore be assessed through the reported paratext, which would be substantially later than the proposed twelfth-century composition, alongside the bio-bibliographical tradition [6,12,14]. These sources are cited here for the existence of that tradition; their exact wording on Ibn Tufayl's medical poem has not been examined for this study, and they require comparison with the physical manuscript rather than reliance on the structure of the poem alone.

In sum, three kinds of evidence bear on the attribution: the reported endowment annotation, which would be late and has not been verified; the bio-bibliographical tradition, whose wording on this poem was not examined here; and the poem itself, which is anonymous. The attribution therefore rests on external testimony. Structural analysis cannot settle authorship. Inferring an author from the shape of a text and then interpreting that text in light of the attribution would be circular. The organization is compatible with practical medical instruction but does not establish the author's professional role or institutional setting. Renaud questioned the attribution to Ibn Tufayl and proposed Ibn al-Khatib instead [1]. Ibn al-Khatib died in 776/1374 [6], whereas the UNESCO nomination dossier assigns the surviving copy to the twelfth century

[13]. If independently confirmed, that dating would exclude Ibn al-Khatib's authorship; it does not, by itself, identify Ibn Tufayl as the author. The traditional attribution is retained here provisionally, pending comparison of the manuscript's material features, endowment annotation, and external testimony. Any pedagogical interpretation of the poem, discussed below, remains a hypothesis that can be evaluated independently of the attribution.

Possible pedagogical function

A versified compendium may be read as no more than a mnemonic digest in which prose knowledge is compressed for retention. The preceding sections report what the photographic record shows; this section interprets it, and each statement in it is a hypothesis. Structural analysis suggests that this description may be inadequate for the poem under study, although structure cannot show how the poem was used. Comparison with prose compendia is of limited help, as features like head-to-heel ordering and numbered chapters are not peculiar to verse [8]. By comparison with Ibn Sina's Urjuza, an introduction to his prose Canon [1,10], the Fez poem is roughly five to six times longer and may have served as a relatively self-contained, memorizable clinical corpus. A systematic comparison with the other Andalusi and Maghribi medical poems surveyed by Forcada [1] is needed and lies beyond this study. The chapters of the Fez poem are mainly self-contained: a unit ordinarily carries what is needed to recognize, assess, and treat one condition, without cross-reference to another. The exceptions are few and visible, as where a disorder and its treatment occupy successive chapters. The proportions of the poem must be read with care, and no comparison with the proportions of prose compendia is attempted here. By number of units, poisons, bites, and stings come first with 41 chapters, against three for limbs and joints. By extent, however, and provisionally (see Table *1*), they occupy about 12 of 148 leaves, some 8% of the poem, against about 16% for the digestive tract (24 leaves) and 12% for the renal, urinary, and genital part (18 leaves). The toxicological chapters are numerous because they are short (about 0.3 leaf each, against about 0.5 overall) and, in a section whose headings are unnumbered, because the segmentation depends most on the reader's judgment. Unit counts therefore overstate the weight of poisons, and the proportions do not support an inference about curricular emphasis. The nomination summary does assign one of the seven maqalat to afflictions reaching the body from outside [13], which concerns the poem's own articulation, but it does not say how much of the poem that maqala occupies.

The architecture is consistent with a broad course in practical medicine and may presuppose readers already familiar with medical doctrine. There is no separate division for theory, anatomy, regimen or hygiene, or simple and compound drugs; this concerns the poem's organization only, since such knowledge may be embedded within individual disease chapters. What the poem teaches is how to name a condition, how to judge its outcome, and how to treat it. This organization suggests that theoretical instruction may have been supplied elsewhere, but does not establish the intended readership or a specific stage in a documented curriculum. Other functions fit the same structure equally well: a versified reference work for a practising physician, a compendium composed for a patron or for the court, or a display of the author's command of the art in a prestigious form. Dense annotation in a later hand runs down the outer margins. It might indicate a copy in use rather than a copy on a shelf, but such notes may equally be ownership marks, reading notes, corrections, or later scholarly comment, and these are unread and undated; their presence does not show educational use. Whether this poem can serve as a primary source for the history of medical teaching remains to be tested against the glosses, the first leaf, and the wider record of teaching at al-Qarawiyyin.

Comparative historical perspectives

Verse served medical teaching in several traditions before print. In the Ayurvedic tradition, the foundational Charaka Samhita and Sushruta Samhita carry their doctrine in metrical shlokas alongside prose exposition, with verse serving the fidelity of transmission from teacher to pupil [15]. Similarly, in the Chinese tradition, the rhymed mnemonic, or gejue, served to fix diagnostic and pharmacological material in memory: Li Shizhen's sixteenth-century treatise on the pulse, the Binhu maixue, sets out its matter in verse and metre for that purpose [16]. In medieval Latin Europe, the Regimen Sanitatis Salernitanum, associated with Salerno and composed in leonine hexameters, carried its precepts of health across the continent in a form that could be recited [17]. These examples suggest that versification could support the retention and transmission of medical knowledge across different traditions, without implying identical teaching practices or equivalent learning outcomes.

Verse and memory

Having considered possible teaching uses and parallels in other traditions, it remains to ask why verse might have helped. The psychology of memory offers a rationale, though not a demonstration, for the efficiency of a versified compendium in clinical training. The retention of long metrical texts has been studied in the oral traditions that transmit them, where metre, rhyme, and formula operate together as a system of multiple and mutually reinforcing retrieval cues: the form constrains the words that can occupy a given position, so that a wrong word fails to fit and the right one is cued by the constraint itself [18]. What is to be committed to memory must also be taken in, and verbal material is rehearsed within a phonological store of narrow capacity, which favours matter already divided into short, phonologically predictable units [19]. Verse supplies that division at both stages, during encoding and recall. Read in this light, the Fez poem may be understood as a text shaped in part for retention, with several potentially supportive features: the fixed

intra-chapter template, the order declared in the prologue, and the transmitted ordinals. The argument is one of plausibility: no experimental evidence bears on this poem, and none is claimed for it.

Limitations and future directions

The analysis rests on a photographic record rather than on the volume in hand. Every plate was examined, and the record runs without interruption from the first page of the poem to the last, but the images have not been checked leaf by leaf against the codex, so a leaf passed over by the photographic campaign would leave no trace in them. The relation between plates, pages, and folios has not been established (169 plates; 148 folios according to [13]), and neither has the verse count, which the layout allows to be at most about 7,400 to 8,400, depending on the page count, against the reported 7,700 verses. The identification of the shelfmark 3158 of the record and the inventory number 1969 of the dossier as designating the same volume is assumed from [13]. The codicological description of the volume [13] has likewise not been verified against the original, and the fourteen parts proposed here have not been collated against the seven transmitted maqalat. The 268 chapter units were identified from the record, with boundaries uncertain in a small number of cases that were not counted (the subject of 15 further units is uncertain); 268 is a minimum, and the segmentation was made without an independent second reader and has not been reviewed by a specialist in Arabic codicology. Only 20 original Arabic headings were attested and transcribed; the remaining titles are editorial descriptors. This distinction concerns the wording of headings, not the extent of textual examination. The recurring chapter template has been described from five chapters and has not been quantified. The plate references are established for five units only and are otherwise approximate, and the leaf counts in Table *1* rest on a working pagination whose correspondence with the plates and with the dossier's folios has not been established. The transmitted ordinals are known from a single sequence of four, which leaves their relation to the poem as a whole, and the question of whether the numbering restarts at each maqala, undetermined. The twelfth-century date of the copy has not been tested against the script and the support of the volume; it carries weight in the argument above, since a securely established twelfth-century date would exclude a fourteenth-century author, and its independent verification is a priority. The pedagogical interpretation is based on textual organization; no direct evidence presented here establishes classroom use, a defined student population, or learning outcomes.

Four lines of investigation involving the original could address important outstanding questions. Counting the verses and reconciling plates, pages, and folios would fix the size of the poem and test the identity of the volume with inventory number 1969. Collating the transmitted ordinals against the chapter sequence could help locate maqala divisions, assess possible lacunae, and clarify the original chapter count. This requires philological and codicological assessment, because breaks in numbering may also reflect damage, copying errors, or displaced leaves. Examining the first leaf could establish the wording and date of the reported endowment annotation and its bearing on title and authorship. Studying the marginal annotations could help distinguish hands, constrain their dates, and assess possible patterns of use. An independent re-segmentation of a sample of the plates by a second reader, ideally a specialist in Arabic philology or codicology, would also test the reproducibility of the inventory. Beyond the volume itself, the poem asks to be situated within the longer history of medical teaching at al-Qarawiyyin, which has been linked to the earliest documented medical degree [20], and compared systematically with the other medical poems of the Islamic West.

Conclusions

The absence of a navigational framework makes this extensive medical poem difficult to consult and may have contributed to its limited study. Identifying its broad architecture provides a basis for further textual and historical analysis. Two kinds of conclusions should be kept apart. Directly supported by the photographic record are the working inventory of at least 268 chapter units, grouped by the authors into fourteen analytical parts; the head-to-foot order declared in the prologue; the later sequence from prognostic signs to wounds, poisons, and venesection; and the absence of a separate theoretical, anatomical, or pharmacological division.

The interpretation of these features as supporting teaching and memorization is hypothetical. The recurrent chapter pattern, described from the chapters examined and not quantified, is consistent with that reading, but the declared order is also a familiar convention of medieval compendia, and the marginal annotations are unread. The poem can therefore be regarded as a potential resource for practical medical education. This concerns the affordances of its structure rather than demonstrated classroom use or learning effectiveness. The detailed analytical inventory being prepared for a second article, together with further manuscript collation, should permit closer assessment of this hypothesis. Its historical value does not depend on a definitive resolution of authorship.

Appendices

Unit	Part	English rendering	Status	Working page	Plate
1	I	Fox disease (alopecia areata)	Attested	3	2 (established)

2	I	Hair loss	Attested	3	approx. 2-5
3	I	Hair growth	Attested	4	approx. 3-6
4	I	What prevents premature greying	Editorial descriptor	4	approx. 3-6
5	I	Alopecia, identified as lichen	Editorial descriptor	4	approx. 3-6
6	I	Head sores	Editorial descriptor	4	approx. 3-6
7	I	Martyrdom (?)	Editorial descriptor	5	approx. 4-7
8	I	Scabies and ringworm	Editorial descriptor	5	approx. 4-7
9	I	Lice on the head and body	Editorial descriptor	5	approx. 4-7
110	VII	The stomach, its disorders and their treatment	Editorial descriptor	60	approx. 61-64
111	VII	Fainting and vomiting	Editorial descriptor	61	approx. 62-65
112	VII	Indigestion, loss of appetite, and their treatment	Editorial descriptor	63	approx. 64-67
113	VII	Hiccups, their causes and treatment	Editorial descriptor	63	approx. 64-67
114	VII	Milk and congealed blood in the stomach	Editorial descriptor	64	approx. 65-68
115	VII	Heartache and its treatment	Editorial descriptor	64	approx. 65-68
116	VII	Hiccups	Editorial descriptor	64	approx. 65-68
117	VII	Eating disorder	Editorial descriptor	65	approx. 66-69
118	VII	Canine appetite (bulimia)	Attested	66	68 (established)
119	VII	Intense thirst	Attested	67	69 (established)
120	VII	Obesity and emaciation	Attested	67	69 (established)
121	VII	Digestion — not diarrhoea	Attested	68	70 (established)
122	VII	Stomach diseases	Editorial descriptor	69	approx. 70-73
123	VII	Intestinal disorder	Editorial descriptor	69	approx. 70-73
124	VII	Jaundice	Editorial descriptor	70	approx. 71-74
125	VII	Liver weakness	Editorial descriptor	71	approx. 72-75
126	VII	Liver cirrhosis	Editorial descriptor	73	approx. 74-77
127	VII	Liver calcification	Editorial descriptor	74	approx. 75-78
128	VII	Liver abscess	Editorial descriptor	74	approx. 75-78
129	VII	Blood discharge from the liver	Editorial descriptor	75	approx. 76-79
130	VII	Liver blockage and pain	Editorial descriptor	76	approx. 77-80
131	VII	Ascites	Editorial descriptor	76	approx. 77-80
132	VII	Jaundice and its treatment	Editorial descriptor	77	approx. 78-81
133	VII	Black jaundice	Editorial descriptor	79	approx. 80-83
134	VII	The spleen and its treatment	Editorial descriptor	79	approx. 80-83
135	VII	Colic and its treatment	Editorial descriptor	80	approx. 81-84
136	VII	Colic known as ileus	Editorial descriptor	80	approx. 81-84
137	VII	Flatulence and its treatment	Editorial descriptor	81	approx. 82-85
138	VII	Occasional colic in the colon	Editorial descriptor	81	approx. 82-85
139	VII	Snakes, worms, and pumpkin seeds	Editorial descriptor	82	approx. 84-87
140	VII	Haemorrhoids	Attested	83	approx. 85-88

TABLE 3: Extract of the working inventory of the chapter units of manuscript 3158 (Part I, units 1-9, and Part VII, units 110-140; 40 of the 268 units).

Unit numbers follow the working inventory of the photographic record (169 plates), which comprises 268 units in fourteen parts; this extract gives Part I and Part VII in full. Status: only entries marked “Attested” reproduce a heading from the manuscript (20 of the 268 units; here, units 1, 2, 3, 118-121, and 140); all other entries are editorial descriptors of what the chapter is about, not transcriptions of the copyist’s headings, and the extract must not be read as an original table of contents. The Arabic headings of the attested units are given in Table 2. Working page: page number of the working pagination counted on the images; it is not a folio number of the codex. Plate: established from the images for units 1 and 118-121 only; otherwise, an estimate from the working pagination whose uncertainty accumulates (the estimate for the last unit, 268, falls about fourteen plates short of the closing plate, 169). A query mark indicates that the subject of the unit is uncertain, not its boundary (15 units in the whole inventory; only unit 7 in this extract). The number of uncertain boundaries was not recorded separately.

Additional Information

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