

# AN ATTEMPTED RECONSTRUCTION OF THE LATE ALEXANDRIAN MEDICAL CURRICULUM

by

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HISTORIANS OF MEDICINE are a little perplexed about the “Museum, School, and Library” in ancient Alexandria. The names, at least, of eminent Hellenistic anatomists, physiologists and experimental pathologists of that period are known, and fragments from secondary sources on their achievements are available.<sup>1</sup> For centuries, Alexandria remained a great centre of learning, yet very little is known about the early Alexandrian medical curriculum.

Galen (c. A.D. 130–c. A.D. 200),<sup>2</sup> whose works provide the best source of information about his contemporaries and predecessors, studied anatomy in Pergamum, then at Smyrna, Corinth, and later in Alexandria, whence he returned to Pergamum to take up a post of physician to the gladiators.<sup>3</sup> Of all these schools, he singled out Alexandria, expressing unqualified admiration of its system for the teaching of osteology:

Now you should concern yourself with the study of bones; and be careful not to confine your study to books only. You should personally examine and investigate the characteristics of each and every human bone. This is a very simple matter in Alexandria, and accordingly, when the physicians there teach students about the bones, they join the teaching with a visual demonstration. You should be eager to visit Alexandria, if for no other reason than to attain this single purpose.<sup>4</sup>

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<sup>1</sup> A chronological study of the Alexandrian physicians and their sects, from 305 B.C. to A.D. 170, is given by Ch. Daremberg, *Histoire des sciences médicales, comprenant l'anatomie, la physiologie, la médecine, la chirurgie et les doctrines de pathologie générale*, Paris, J. B. Baillière, 1870, 2 vols., vol. 1, pp. 150–169. See also ‘The history of anatomy in antiquity’, in *Ancient medicine, selected papers of Ludwig Edelstein*, ed. by O. Temkin and C. L. Temkin, Baltimore, Johns Hopkins Press, 1967, pp. 247–301; R. Pfeiffer, *History of classical scholarship, from the beginnings to the end of the Hellenistic age*, Oxford, Oxford University Press, 1968, pp. 96–104; P. M. Fraser, *Ptolemaic Alexandria*, Oxford, Oxford University Press, 1972, 3 vols., vol. 1, pp. 312–376; vol. 2, pp. 467–551; V. Nutton, ‘Museums and medical schools in classical antiquity’, *History of Education*, 1975, 4(1): 3–15.

<sup>2</sup> J. Walsh, ‘Date of Galen’s birth’, *Ann. med. Hist.*, 1929, n.s. 1: 378–382; J. Walsh, ‘Refutation of Ilberg as to the date of Galen’s birth’, *ibid.*, 1932, n.s. 4: 126–146; J. Ilberg, ‘Wann ist Galenos geboren?’, *Sudhoffs Arch. Gesch. Med. Naturw.*, 1930, 23: 289–292.

<sup>3</sup> J. Ilberg, ‘Aus Galens Praxis: Ein Kulturbild aus der römischen Kaiserzeit’, *Neue Jahrbücher für das klassische Altertum*, 1905, 15: 276–312; J. Walsh, ‘Galen’s studies at the Alexandrian School’, *Ann. med. Hist.*, 1927, 9: 132–143; V. Nutton, ‘Galen and medical autobiography’, in *Proceedings of the Cambridge Philological Society*, 1972, 198(n.s. 18): 50–62; V. Nutton, ‘The chronology of Galen’s early career’, *Classical Quarterly*, 1973, 23(1): 158–171. See also other papers by Ilberg, Walsh and Temkin, pertinent to the same subject in the extensive bibliography of O. Temkin’s *Galenism: rise and decline of a medical philosophy*, Ithaca and London, Cornell University Press, 1973.

<sup>4</sup> *Fi ‘amal al-tashrīh*, the British Library, MS. Add. 23406, fols. 3b, l. 17–4a, l. 3; University of

Galen's account of a villager living on the outskirts of Alexandria shows, on the one hand, that the laity had adequate first-aid knowledge against venomous bites, and on the other, that the Alexandrian surgeons of his time successfully performed amputation of the finger.

During my sojourn in Alexandria, I saw a villager—in a place not far from the city—who was bitten by a snake in one of his fingers. He made a very tight ligature at the root of the finger, next to the metacarpus, and immediately made his way to the city to see a physician he had known and authorized him to amputate the whole finger at the metacarpal joint. By doing so, he had hoped that no harm would befall him; his hope was fulfilled, since he had wished to be saved without any further treatment.<sup>6</sup>

The earliest known coherent account of the late Alexandrian medical curriculum (sixth to seventh century A.D.)<sup>6</sup> comes from Ḥunayn Ibn Ishāq al-'Ibādī (Johannitius, d. A.H. 260/A.D. 873),<sup>7</sup> and less than two centuries later, from Abū al-Ḥasan 'Alī Ibn Riḍwān al-Miṣrī (d. A.H. 453/A.D. 1061).<sup>8</sup> This paper attempts to reconstruct the medical curriculum of the late Alexandrian period: the commentary is mainly from Ḥunayn's *Missive to 'Alī Ibn Yahyā on Galen's books*,<sup>9</sup> but partly from Ibn Riḍwān's

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California at Los Angeles, MS. Ar. 90, pp. 2, l. 24–3, l. 4; Charles Singer, *Galen On anatomical procedures: De anatomicis administrationibus, translation of the surviving books with introduction and notes*, London, Wellcome Historical Medical Museum, 1956, p. 3. (See also note 87 below.)

<sup>6</sup> *Fi ta'arruf 'ilal al-āḍi' al-bāḥina*, The Wellcome Institute for the History of Medicine, WMS. Or. 14a, fol. 79b, ll. 7–13; A. J. Brock, *Greek medicine, being extracts illustrative of medical writers from Hippocrates to Galen*, London and Toronto, J. M. Dent, 1929, p. 223. (See note 34 below.)

<sup>7</sup> For informative studies on the late Alexandrian medicine, see M. Meyerhof, *Von Alexandria nach Bagdad: Ein Beitrag zur Geschichte des philosophischen und medizinischen Unterrichts bei den Arabern*, Berlin, 1930, *Akad. d. Wiss. (Sber. Preuss. Akad. Wiss., phil.-hist. Kl., 1930, 23)*; M. Meyerhof, 'La fin de l'école d'Alexandrie d'après quelques auteurs arabes', *Archeion*, 1933, 15: 1–15; O. Temkin, 'Geschichte des Hippokratismus im ausgehenden Alterum', *Kylos*, 1932, 4: 1–80; O. Temkin, 'Studies on late Alexandrian medicine I. Alexandrian commentaries on Galen's *De sectis ad introducendos*', *Bull. Hist. Med.*, 1935, 3: 405–430; O. Temkin, 'Byzantine medicine: tradition and empiricism', *Dumbarton Oaks Papers*, 1962, 16: 97–115.

<sup>8</sup> C. Brockelmann, *Geschichte der arabischen Litteratur*, Leiden, E. J. Brill, 1943–1949, Band I, II (hereinafter *GAL*), I, 224; C. Brockelmann, *Supplementband*, Leiden, E. J. Brill, 1937–1942, Band I–III (hereinafter *S*), I, 366; F. Sezgin, *Geschichte des arabischen Schrifttums, Medizin–Pharmazie–Zoologie–Tierheilkunde Bis ca. 430 H.*, Leiden, E. J. Brill, 1970, Band III (hereinafter *GAS*), III, 247; M. Ullmann, *Die Medizin im Islam* (Handbuch der Orientalistik, 1 Abt., Ergänzungsband VI), Leiden and Cologne, E. J. Brill, 1970 (hereinafter Ullmann), p. 115; Ibn al-Nadīm's *Kitāb al-fihrist*, Leipzig, F. C. W. Vogel, 1871–1872, ed. G. Flügel, 2 vols. (hereinafter *Fihrist*), I, 294; *Ibn al-Qifṭī's Ta'rīḥ al-hukamā'*, Leipzig, Dieterich, 1903, ed. J. Lippert (hereinafter Qifṭī), p. 171; Ibn Abī Uṣaybī'a's *Uyūn al-anbā' fi ṭabaqāt al-a'ibbā'*, Cairo and Königsberg, al-Maṭba'a al-Wahbiyya, 1882–1884, ed. A. Müller, 2 vols. (hereinafter IAU), I, 184.

<sup>9</sup> *GAL*, I, 637; *S*, I, 886; Qifṭī, pp. 443–444; IAU, II, 99–105; Ullmann, p. 158. For Ibn Riḍwān's detailed bio-bibliography (published in Arabic with an English translation), see J. Schacht and M. Meyerhof, *The medico-philosophical controversy between Ibn Butlan of Baghdad and Ibn Riḍwān of Cairo, a contribution to the history of Greek learning among the Arabs*, Cairo, The Egyptian University (Faculty of Arts, publication no. 13), 1937. References will be given to its Arabic text.

<sup>10</sup> *Risālat Ḥunayn Ibn Ishāq ilā 'Alī Ibn Yahyā fi dhikr mā turjima min kutub Jālinūs bi-'ilmih wa bā'ḍ mā lam yutarjam* (Ḥunayn Ibn Ishāq's missive to 'Alī Ibn Yahyā on Galen's books which, so far as he [Ḥunayn] knows, have been translated, and some of those books which have not been translated). G. Bergsträsser, *Ḥunayn ibn Ishāq über die syrischen und arabischen Galen-übersetzungen (Abhandlungen für die Kunde des Morgenlandes, XVII, 2)*, Leipzig, 1925. All references are to the Arabic text in this work (hereinafter Ḥunayn). An invaluable commentary was published by M. Meyerhof, 'New light on Ḥunayn Ibn Ishāq and his period', *Isis*, 1926, 8(4): 685–724.

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*Useful book on the quality of medical education*<sup>10</sup>—from which the selected texts are presented here in translation.

ḤUNAYN'S *Missive to 'Alī Ibn Yaḥyā on Galen's books*

Ḥunayn was forty-eight years old when he completed the first draft of his *Missive*, and about eight years later he made certain additions to its text.<sup>11</sup> Further posthumous textual interpolations suggest that it was brought up to date, possibly by Abū al-Ḥasan 'Alī Ibn Yaḥyā al-Munajjim (d. A.H. 275/A.D. 888–889),<sup>12</sup> to whom it was addressed. The second book in Ḥunayn's *Missive* is Galen's *On the order of his books*.<sup>13</sup> Galen's own order was not strictly followed in the late School of Alexandria, as may be judged from Ḥunayn's statement at the end of his Alexandrian reading list of Galen's books: "Galen's opinion would have been against this order of reading his books; he had previously said that his books on anatomy ought to be read after his book *On sects*".<sup>14</sup> The validity of this assumption is substantiated by Arabic manuscripts of the so-called *Summaries and commentaries of Galen's sixteen books which were read in Alexandria*,<sup>15</sup> better known as the *Summaria Alexandrinorum*,<sup>16</sup> in which sixteen of

<sup>10</sup> *Al-Nāfi' fi kayfiyyat ta'lim šinā'at al-ṭibb*, see *GAL*, S, I, 886 (n. 22); A. J. Arberry, *The Chester Beatty Library. A handlist of the Arabic manuscripts*, Dublin, Emery Walker (Ireland), 1955–1966 (8 vols., the last is indexed by U. Lyons), vol. 5, p. 9. Ibn Abī Uṣaybi'a (IAU, II, 103, ll. 29–30) maintains that *al-Nāfi'* has three treatises. A suggestion by Dr. Lyons that it consists of two treatises only is convincing. See M. C. Lyons, 'The kitāb al-nāfi' of 'Alī Ibn Riḍwān', *Islamic Quarterly*, 1961, 6: 65–71. (See notes 45, 46 below.)

<sup>11</sup> Ḥunayn (p. 52, ll. 9–15) completed this book in 1167 (the years of Alexander), and made certain additions in March 1175. See also G. Bergsträsser, *Neue Materialien zu Ḥunayn ibn Ishāq's Galen-Bibliographie (Abhandlungen für die Kunde des Morgenlandes, XIX, 2)*, Leipzig, 1932, p. 82. The Alexandrian era is the Seleucid era, named after Seleucus Nicator (c. 358–281 B.C.) who entered Babylon on 3 April 311 B.C. (Babylonian calendar) or 7 October 312 (Macedonian calendar). Its Arabic name *tārīkh dhū al-qarnayn* (the era of the two-horned) seems to have suggested wrongly that it began with Alexander the Great (d. 323 B.C.) whose nickname is also *dhū al-qarnayn*. See *The cyclopaedia of India and of eastern and southern Asia*, 3rd ed., London, Bernard Quaritch, 1885, 3 vols.; *The Oxford classical dictionary*, 2nd ed., Oxford, Oxford University Press, 1973.

<sup>12</sup> *Fihrist*, I, 143; Qifṭī, pp. 117, ll. 19–20; 129, l. 1; 132, l. 2; IAU, I, 205–206; Meyerhof, op. cit., note 9 above, pp. 687, 714.

<sup>13</sup> *Fī marātib qirā'at kutubih* (Ḥunayn, p. 4, n. 2; *GAS*, III, 79, n. 2; Ullmann, p. 35, n. 2) = *De ordine librorum suorum*. See C. G. Kühn, *Claudii Galeni opera omnia*, Leipzig, C. Knobloch, 1821–1833, 20 vols. in 22 (hereinafter Kühn), XIX, 49–61; H. Diels, *Die Handschriften der antiken Ärzte . . . Im Auftrage der Akademischen Kommission. I. Teil: Hippokrates und Galenos* (Abh. Preuss. Akad. d. Wiss.), phil.-hist. Kl., Berlin, 1905 (hereinafter Diels), I, 109; English translation of extracts in Brock, op. cit., note 5 above, pp. 174–181.

<sup>14</sup> Ḥunayn, p. 19, ll. 1–3.

<sup>15</sup> For Arabic manuscripts of *Jawāmi' al-kutub al-sittat 'ashar li-Jālnūs allatī kānat tuḡra' bi-l-Iskandarīyya* = *Jawāmi' al-Iskandarāniyyin*, see *Catalogus codicum manuscriptorum orientalium qui in Museo Britannico asservantur, pars secunda, codices arabicos amplectens*, London, British Museum, 1846–1871 (hereinafter *British Museum Catal.*), vol. 2, pp. 629–630 (n. 1356); H. Ritter and R. Walzer, *Arabische Übersetzungen griechischer Ärzte in Stambuler Bibliotheken (Sitzungsberichte der Preuss. Akad. d. Wiss., phil.-hist. Kl., 1934, 26, pp. 820–825)*; A. Dietrich, *Medicinalia Arabica. Studien über arabische medizinische Handschriften in türkischen und syrischen Bibliotheken (Abh. Akad. d. Wiss. in Göttingen, phil.-hist. Kl., Dritte Folge, Nr. 66)*, Göttingen, 1966, pp. 33–38; Abdol Hossein Haeri, *A catalogue of the manuscripts in the parliament library (Persian, Arabic, and Turkish)*, Teheran, Majlis-i Shūrā-yi Millī, 1350/1972, vol. 19, pp. 21–29.

<sup>16</sup> A detailed index of the titles of the books in *Jawāmi' al-Iskandarāniyyin* (appearing in MS Manisa, Kitapsaray 1759, fol. 2a/b), followed by the opening passages of the books contained in this particular manuscript are given by Dietrich, op. cit., note 15 above, pp. 33–38; see also *Fihrist*, I, 289–290; *GAS*, III, 140–150.

Galen's books appear in a fixed order: I. *On sects*;<sup>17</sup> II. *On the art of physic*;<sup>18</sup> III. *On the pulse, to Teuthras*;<sup>19</sup> IV. *To Glaucon, on therapy*;<sup>20</sup> V. *On the elements according to Hippocrates*;<sup>21</sup> VI. *On the temperament*;<sup>22</sup> VII. *On the natural faculties*;<sup>23</sup> VIII. *On minor anatomy*<sup>24</sup> (1. *On anatomy of the bones*;<sup>25</sup> 2. *On anatomy of the muscles*;<sup>26</sup> 3. *On anatomy of the nerves*;<sup>27</sup> 4. *On anatomy of the veins*, and 5. *On anatomy of the arteries*);<sup>28</sup> IX. *On diseases and symptoms*<sup>29</sup> (1. *On the types of diseases*;<sup>30</sup> 2. *On the causes of diseases*;<sup>31</sup> 3. *On the types of symptoms*;<sup>32</sup> and 4. *On the causes of symptoms*);<sup>33</sup> X. *On the diagnosis of diseases of internal organs*;<sup>34</sup> XI. *On the pulse*<sup>35</sup> (1. *On the types*

<sup>17</sup> *Fī al-fīraq* = *Fī fīraq al-ḥibb li-l-muṭā'allimīn* (Ḥunayn, p. 4, n. 3; *GAS*, III, 79, n. 3; Ullmann, p. 38, n. 1) = *De sectis ad eos, qui introducuntur* (Kühn, I, 64–105; Diels, I, 60).

<sup>18</sup> *Fī al-ṣinā'a al-ṭibbiyya* = *Fī al-ṣinā'a al-ṣaghīra* (Minor book on the art; cf. note 43 below; Ḥunayn, p. 5, n. 4; *GAS*, III, 80, n. 4; Ullmann, p. 45, n. 38) = *Ars medica* = *Ars parva* = *Microtegni* (Kühn, I, 305–412; Diels, I, 61; N. Culpeper, *Galens Art of physick . . . Translated . . . and largely commented on; together with convenient medicines for all particular distempers . . .*, London, P. Cole, 1652).

<sup>19</sup> *Fī al-nabḍ ilā Ṭūthrun wa ilā sā'ir al-muṭā'allimīn* = *al-Nabḍ al-ṣaghīr* (Ḥunayn, p. 6, n. 5; *GAS*, III, 81, n. 5; Ullmann, p. 44, n. 32) = *De pulsibus libellus ad tirones* (Kühn, VIII, 453–492; Diels, I, 86; incomplete English translation in W. H. Broadbent's *The pulse*, London, Cassell, 1890, pp. 6–11).

<sup>20</sup> *Ilā Ighlūqun fī mudāwāt al-amrād* = *Ilā Ighlūqun fī al-ta'attī li-shifā' al-amrād* = *Ilā Ighlūqun* (Ḥunayn, p. 6, n. 6; *GAS*, III, 82, n. 6; Ullmann, p. 45, n. 40) = *Ad Glauconem de methodo medendi* (Kühn, XI, 1–146; Diels, I, 93).

<sup>21</sup> *Fī al-ustuqussāt 'alā ra'yī Buqrāt* = *Fī al-ustuqussāt* = *Fī al-anāshīr* (Ḥunayn, p. 9, n. 11; *GAS*, III, 86, n. 11; Ullmann, p. 38, n. 4) = *De elementis ex Hippocrate* (Kühn, I, 413–508; Diels, I, 63).

<sup>22</sup> *Fī al-mizāj* = *Fī al-mizājāt* = *Fī al-amzīja* (Ḥunayn, p. 10, n. 12; *GAS*, III, 87, n. 12); Ullmann, p. 39, n. 5) = *De temperamentis* (Kühn, I, 509–694; Diels, I, 64).

<sup>23</sup> *Fī al-quwā al-ṭabī'iyya*. Ḥunayn (p. 11, ll. 2–4) writes that he was seventeen years old when he translated this book, the second in his long list of translated works, from Greek into Syriac for Jibrā'il Ibn Bukhtīshū'. (Ḥunayn, p. 10, n. 13; *GAS*, III, 88, n. 13; Ullmann, p. 40, n. 11) = *De naturalibus facultatibus* (Kühn, II, 1–214; Diels, I, 65; A. J. Brock, *Galen 'On the natural faculties', with an English translation*, London and Cambridge, Mass., Loeb Classical Library, 1928; English translation of extracts in Brock, op. cit., note 5 above, pp. 151–153).

<sup>24</sup> *Fī al-tashrīḥ al-ṣaghīr* = *Fī al-tashrīḥ ilā al-muṭā'allimīn* (Ḥunayn, p. 8, ll. 18–19; *GAS*, III, 83–85, ns. 7–10; Ullmann, p. 40, n. 13) = *De anatomia libri quinque*. (See notes 25–28 below.)

<sup>25</sup> *Fī tashrīḥ al-izām* = *Fī al-izām* (Ḥunayn, p. 7, n. 7) = *De ossibus ad tirones* (Kühn, II, 732–778; Diels, I, 67; English transl., Charles Singer, 'Galen's elementary course on bones', *Proc. R. Soc. Med. (sect. hist. med.)*, 1952, 45: 767–776).

<sup>26</sup> *Fī tashrīḥ al-aḍāl* = *Fī al-aḍāl* (Ḥunayn, p. 8, n. 8) = *De musculorum dissectione ad tirones* (Kühn, XVIII B, 926–1026; Diels, I, 108; English transl., C. M. Goss, 'On the anatomy of muscles for beginners by Galen of Pergamon', *Anatomical Record*, 1963, 145: 477–501).

<sup>27</sup> *Fī tashrīḥ al-aṣāb* = *Fī al-aṣāb* (Ḥunayn, p. 9, n. 9) = *De nervorum dissectione* (Kühn, II, 831–856; Diels, I, 67; English transl., C. M. Goss, 'On anatomy of nerves by Galen of Pergamon', *Amer. J. Anat.*, 1966, 118: 327–335).

<sup>28</sup> *Fī tashrīḥ al-urūq ghayr al-ḍawārib wa al-urūq al-ḍawārib* = *Fī al-urūq* (Ḥunayn, p. 9, n. 10) = *De venarum arteriarumque dissectione* (Kühn, II, 779–830; Diels, I, 67; English transl., C. M. Goss, 'On anatomy of veins and arteries by Galen of Pergamos', *Anatomical Record*, 1961, 141: 355–366).

<sup>29</sup> *Fī al-ilal wa al-ā'rād* (Ḥunayn, p. 11, n. 14; *GAS*, III, 89, n. 14; Ullmann, p. 42, n. 22) = *De morborum causis et symptomatibus libri sex* = *De accidenti et morbo*.

<sup>30</sup> *Fī aṣnāf al-amrād* (Ḥunayn, p. 11, l. 19) = *De morborum differentiis* (Kühn, VI, 836–880; Diels, I, 78).

<sup>31</sup> *Fī asbāb al-amrād* (Ḥunayn, p. 11, l. 22) = *De causis morborum* (Kühn, VII, 1–41; Diels, I, 78).

<sup>32</sup> *Fī aṣnāf al-ā'rād* (Ḥunayn, p. 12, l. 3) = *De symptomatum differentiis* (Kühn, VII, 42–84; Diels, I, 79).

<sup>33</sup> *Fī asbāb al-ā'rād* (Ḥunayn, p. 12, ll. 4–5) = *De symptomatum causis* (Kühn, VII, 85–272; Diels, I, 79).

<sup>34</sup> *Fī ta'arruf 'ilal al-ā'ḍā' al-bāḥīna* = *al-ā'ḍā' al-ā'līma* = *al-Mawāḍi' al-ā'līma* (Ḥunayn, p. 12, n. 15; *GAS*, III, 90, n. 15; Ullmann, p. 41, n. 21) = *De locis affectis* (Kühn, VIII, 1–452; Diels, I, 85).

<sup>35</sup> *Fī al-nabḍ* = *Fī al-nabḍ al-kabīr* = *Fī nabḍ al-urūq* (Ḥunayn, p. 13, n. 16; *GAS*, III, 91, n. 16; Ullmann, p. 43, n. 31).

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of the pulse,<sup>36</sup> 2. On recognition of the pulse,<sup>37</sup> 3. On the causes of the pulse,<sup>38</sup> and 4. On prognosis from the pulse);<sup>39</sup> XII. On the types of fevers;<sup>40</sup> XIII. On crisis;<sup>41</sup> XIV. On critical days;<sup>42</sup> XV. On the method of healing;<sup>43</sup> and XVI. On the method of the preservation of health.<sup>44</sup>

Adequate information is revealed in Ḥunayn's *Missive* about the contents of Galen's books and the Alexandrian order of reading them. Nevertheless, he fails to give details of any successive stages of the medical curriculum in the Alexandrian School. Further, he mentions fifteen books, not sixteen, thus omitting *On the method of the preservation of health*, which he gives later, but not as the final Alexandrian textbook.

IBN RIDWĀN'S *Useful book on the quality of medical education*

Among the extensive bibliography attributed to Ibn Riḍwān is his *Useful book*, which reflects a lively interest in medical education. This book is preserved jointly in MS Ṭibb 483 (Dār al-Kutub al-Miṣriyya, Cairo),<sup>45</sup> and MS 4026 (Chester Beatty Library, Dublin),<sup>46</sup> and one long extract from it is quoted by Ibn Abī Uṣaybi'a.<sup>47</sup>

<sup>36</sup> *Fī aṣnāf al-nabḍ* (Ḥunayn, p. 13, ll. 10–22) = *De differentia pulsuum* (Kühn, VIII, 493–765; Diels, I, 87).

<sup>37</sup> *Fī ta'arruf al-nabḍ* (Ḥunayn, p. 14, ll. 1–4) = *De dignoscendis pulsibus* (Kühn, VIII, 766–961; Diels, I, 87).

<sup>38</sup> *Fī asbāb al-nabḍ* (Ḥunayn, p. 14, ll. 4–8) = *De causis pulsuum* (Kühn, IX, 1–204; Diels, I, 88).

<sup>39</sup> *Fī taqdīmat al-ma'rifa min al-nabḍ* (Ḥunayn, p. 14, ll. 8–11) = *De praesagitione ex pulsu* (Kühn, IX, 205–430; Diels, I, 88).

<sup>40</sup> *Fī aṣnāf al-ḥummayāt* = *al-Ḥummayāt* (Ḥunayn, p. 15, n. 17; *GAS*, III, 94, n. 17; Ullmann, p. 42, n. 24) = *De februm differentiis* (Kühn, VII, 273–405; Diels, I, 80).

<sup>41</sup> *Fī al-buḥrān* (Ḥunayn, p. 15, n. 18; *GAS*, III, 95, n. 18; Ullmann, p. 43, n. 29) = *De crisibus* (Kühn, IX, 550–768; Diels, I, 89).

<sup>42</sup> *Fī ayyām al-buḥrān* (Ḥunayn, p. 16, n. 19; *GAS*, III, 96, n. 19; Ullmann, p. 43, n. 30) = *De diebus decretoriis* (Kühn, IX, 769–941; Diels, I, 90).

<sup>43</sup> *Fī ḥilat al-bur'* = *al-Ṣinā'a al-kabīra* (Major book on the art; cf. note 18 above; Ḥunayn, p. 16, n. 20; *GAS*, III, 96, n. 20; Ullmann, p. 45, n. 39) = *De methodo medendi* = *Ars magna* = *Megategni* (Kühn, X, 1–1021; Diels, I, 91).

<sup>44</sup> *Fī al-ḥila li-ḥifẓ al-ṣiḥḥa* = *Ḥifẓ al-ṣiḥḥa* = *Fī tadbīr al-aṣiḥḥā* (Ḥunayn, p. 39, n. 84; *GAS*, III, 122, n. 69; Ullmann, p. 46, n. 44) = *De sanitate tuenda* (Kühn, VI, 1–452; Diels, I, 75; R. M. Green, *A translation of Galen's Hygiene (De sanitate tuenda), with an introduction by H. E. Sigerist*, Springfield, Ill., Charles C Thomas, 1951).

<sup>45</sup> MS. Ṭibb 483 has two large lacunae. The first (between pp. 40/41) commences a few lines after the beginning of chapter eight (Treatise I), and ends a few lines after the beginning of chapter two (Treatise II), thus are missing from the text: most of chapter eight (Treatise I), chapter one (Treatise II), and a short section at the beginning of chapter two (Treatise II). The second gap (in Treatise II), between pp. 48/49, starts a few lines before the end of chapter two and continues a few lines after the beginning of chapter three (the last chapter). It is written in clear *naskh*; pp. 1–80; 215 × 160 mm. (165 × 100); 19 lines; catchwords; undated (12/18th century); owners' entries (p. 1) dated 1196/[1781–1782], 1243/[1827]; many scribal errors; owner's stamp (p. 1).

<sup>46</sup> The late Professor Arberry (Arberry, op. cit., note 10 above, vol. 5, p. 9) gave the following description: "Fols. 37; 178 × 130 mm.; good scholar's *naskh*; undated (8/14th century)". A closer study of MS. 4026 has revealed two large gaps in the text: the first (in Treatise I, between fols. 1b/2a) covers most of chapter one, all of chapter two, and the first section of chapter three; the second gap (also in Treatise I, between fols. 3b/4a) is in the last section of chapter three, all of chapter four, and most of chapter five. Additions to Arberry's description of MS. 4026: an owner's entry by Muḥammad Ibn Khalīl (fol. 38b) is dated 1236/[1820–1821]; marginal insets and corrections by the same copyist; titles of chapters are not clear; catchwords; words deleted (fols. 4b, 12a); passages deleted (fols. 9b, 25a, 36a); a note at the bottom of fol. 37b reads: "This [book] has a third treatise, according to

Ibn Riḍwān was particularly interested in the Alexandrian medical curriculum, to which he devoted a whole chapter, discussing the didactic purpose and position in the curriculum of each of the books of the *Summaria*.<sup>48</sup> Further, according to Ibn Abi Uṣaybi'a, Ibn Riḍwān wrote commentaries on six of Galen's books: *On sects; On the art of physic; On the pulse, to Teuthras; To Glaucon, on therapy; On the elements according to Hippocrates; and On the temperament* (only in part), which are in fact the first six items of the *Summaria*. Ibn Abi Uṣaybi'a asserts: "Of Galen's sixteen books, Ibn Riḍwān wrote commentaries on those which I have mentioned only".<sup>49</sup> In a treatise addressed to his adversary Ibn Buṭlān of Baghdad (d. c. A.H. 458/c. A.D. 1066),<sup>50</sup> Ibn Riḍwān refers indirectly to Galen's book *That the excellent physician is a philosopher*,<sup>51</sup> and reserves the title of "physician-philosopher" for one who studies medicine and philosophy to the limits of perfection, covering such subjects as logic, mathematics, physics, and metaphysics; whereas, a "practitioner" is one educated in medical subjects who probably also knows some logic and physics.<sup>52</sup> Before embarking on his medical career, Ibn Riḍwān made preliminary enquiries and was advised to study Hunayn's *Questions on medicine*.<sup>53</sup> He attended classes in Egypt at which this book was read before teachers who made no comment whatever on the text, and probably would have been unable to detect any mistakes made by their students. Teachers, he adds, knew nothing of the contents of Hippocrates and Galen; they were only aware of the titles of their books which existed in Egyptian libraries.<sup>54</sup> Ibn Riḍwān considered studying medicine in Iraq; although this wish was not fulfilled, he had no regrets later when he read confused and unmethodical commentaries written by Iraqi doctors.<sup>55</sup>

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[Ibn Abi Uṣaybi'a's] *Ṭabaqāt al-aṭibbā'*". Professor Arberry had prepared an incomplete handwritten tentative edition based on the Cairo and Chester Beatty manuscripts, in which some variant readings are inset and the two gaps of MS. Ṭibb 483 are indicated. This copy was passed on to me through the courtesy of Dr. Vivian Nutton (Selwyn College, Cambridge) and Dr. M. C. Lyons (Pembroke College, Cambridge). It should be noted, however, that chapter one (Treatise I) is altogether missing from Professor Arberry's tentative edition. References to extracts from the text of Ibn Riḍwān's *Useful book* will be made, whenever possible, to my own microfilm copies of MS. Ṭibb 483, MS. 4026, and to Professor Arberry's tentative edition (hereinafter MS. Arberry): pp. 1–35; 250 × 200 mm. (195 × 155); beautiful clear *naskh*; 23–28 lines; variant readings (pp. 1–4) and on some other pages; chapter one (Treatise I) is missing.

<sup>47</sup> IAU, I, 105, l. 32–108, l. 17.

<sup>48</sup> See pp. 248–252.

<sup>49</sup> IAU, II, 103, ll. 23–28.

<sup>50</sup> *GAL*, I, 636; *S*, I, 885; Qiftī (p. 294, l. 18) fixes the date of Ibn Buṭlān's death (which is probably wrong) at A.H. 444/A.D. 1052–1053. Ibn Abi Uṣaybi'a (IAU, I, 243, ll. 18–23) writes that Ibn Buṭlān's autograph of *Da'wat al-aṭibbā'* (Call to physicians) was signed by the author and dated A.H. 450/A.D. 1058–1059, and adds (IAU, I, 243, ll. 12–16) that Ibn Buṭlān completed one of his works in A.H. 455/A.D. 1063. Kh. al-Ziriklī (*al-A'lām: qāmūs tarājim li-ash-har al-rijāl wa al-nisā' min al-'arab wa al-mustāribīn wa al-mustashriqīn*, 2nd ed., Cairo, Kūstā Tsūmās, 1954–1959, 10 vols., vol. 8, p. 69) gives the date of Ibn Buṭlān's death A.H. 458/A.D. 1066.

<sup>51</sup> *Fi anna al-ṭabīb al-fāḍil faylasūf* (Hunayn, p. 44, n. 103; Ullmann, p. 38, n. 2) = *Quod optimus medicus sit quoque philosophus* (Kühn, I, 53–63; Diels, I, 59).

<sup>52</sup> Schacht and Meyerhof, op. cit., note 8 above, p. 40, ll. 10–16.

<sup>53</sup> *Al-Masā'il fi al-ṭibb li-l-muta'allimīn* = *al-Masā'il fi al-ṭibb* = *al-Madkhal ilā shi'ar al-ṭibb* = *al-Madkhal fi al-ṭibb* (Introduction to medicine). *GAL*, I, 224 (ns. 1,2); *S*, I, 367 (ns. 1,2); *GAS*, III, 249 (n. 1); Ullmann, p. 118; IAU, I, 197, l. 24.

<sup>54</sup> MS. Ṭibb 483, pp. 3, l. 1–4, l. 1.

<sup>55</sup> MS. Ṭibb 483, p. 4, ll. 4–6; p. 5, ll. 3–6.

### *An attempted reconstruction of the late Alexandrian medical curriculum*

Disillusioned by the inadequacy of the teaching methods of his time, he decided upon self-education. He happened to read Galen's *On the opinions of Hippocrates and Plato*,<sup>56</sup> and concluded that it was advisable to postpone studying medicine proper until he had had a basic grounding in geometry and logic. Geometry, according to Ibn Riḍwān, offered a good training in the demonstrative (scientific) method which served to eliminate sophistry from statements, and the rules of logic were necessary for arriving at the right conclusions.<sup>57</sup>

#### CAUSES OF THE DECLINE OF MEDICINE

The decline of medicine, in Ibn Riḍwān's opinion, was partly due to the popularity of poor-quality compendia, summaries and commentaries compiled by later writers.<sup>58</sup> Students chose to accompany a doctor and to read contemporary works, rather than to pursue a course in medicine according to the method of Hippocrates and Galen. In Egypt it was easy to earn a living as a practitioner; hence the popularity of the art, which was taken up by so many unsuitable people that the laity failed to distinguish between quacks and capable doctors.<sup>59</sup> On the history of compendia, he writes:

In the time of Oribasius,<sup>60</sup> when kingdoms became dominated by Christianity, Oribasius thought of reviving the art [of physic] and compiled his popular *Compendium*<sup>61</sup> for the laity, thus familiarizing the Christian kings with [the contents of] medicine. Paul [of Aegina]<sup>62</sup> followed his path, and when their successors saw these two compendia, they have continued until the present time to compile their own. Even Abū Bakr al-Rāzī ordered every physician to compile a compendium for himself! Accordingly, medical books became abundant, and each doctor acquired a compendium for his own use.<sup>63</sup>

In this particular passage Ibn Riḍwān refers to one of Rhazes' (d. A.H. 313/A.D. 925)<sup>64</sup> aphorisms which I now quote in full with the relevant passage in italics, from his book *The guide or aphorisms*:

If you are concerned in the art and it is your desire, so far as is possible, not to miss or neglect anything of it, you should endeavour to collect books on medicine. Further, *compile a book for*

<sup>56</sup> *Fī ārā' Buqrāṭ wa Flāṭīn* (Hunayn, p. 26, n. 46; *GAS*, III, 105, n. 37; Ullmann, p. 40, n. 12) = *De placitis Hippocratis et Platonis* (Kühn, V, 181–805; Diels, I, 74).

<sup>57</sup> MS. Ṭibb 483, p. 4, ll. 7–14.

<sup>58</sup> MS. Ṭibb 483, p. 9, ll. 6–10; *ibid.*, p. 10, ll. 5–7; MS. Arberry, p. 2, ll. 8–10, ll. 19–20.

<sup>59</sup> MS. Ṭibb, 483, p. 9, ll. 12–15; MS. Arberry, p. 2, ll. 11–13.

<sup>60</sup> Died in A.D. 403, nicknamed *ṣāhib al-kanānīsh* (the author of compendia). See Qifṭī, p. 56; IAU, I, 103; G. Sarton, *Introduction to the history of science*, Baltimore, Williams & Wilkins, 1927, vol. 1, p. 372; *GAS*, III, 152; Ullmann, p. 83.

<sup>61</sup> The plural form, *kanānīsh*, is given in MS. Ṭibb 483 (and MS. Arberry). Oribasius' *al-Kunnāsh*, one of the most popular sources of Arabic medicine, has not survived in Arabic manuscripts. Many extracts from it, however, are preserved in Rhazes' *al-Ḥāwī fī al-ṭibb* (Continens). Bussemaker and Ch. Daremberg, *Oeuvres d'Oribase, texte grec, en grande partie inédit, collationné sur les manuscrits, traduit pour la première fois en français; avec une introduction, des notes . . .*, Paris, Imprimerie Nationale, 1851–1876, 6 vols.

<sup>62</sup> Lived in Alexandria shortly before the Arab conquest (A.D. 641). *Fihrist*, I, 293; Qifṭī, p. 261; IAU, I, 103; Sarton, *op. cit.*, note 60 above, vol. 1, p. 479; F. Adams, *The seven books of Paulus Aegineta, translated from the Greek with a commentary . . .*, London, Sydenham Society, 1844–1847, 3 vols.; *GAS*, III, 168–170; Ullmann, p. 86.

<sup>63</sup> MS. Ṭibb 483, pp. 8, l. 18–9, l. 6; MS. Arberry, p. 2, ll. 5–8.

<sup>64</sup> *GAL*, I, 267; *S*, I, 417; *GAS*, III, 274; Ullmann, p. 128.

*yourself*, in which you should mention for each species of illness, whatever has been neglected or overlooked by other authors, whether this may be rules for the preservation of health, or a definition [of a disease], its cause, classification, symptoms, treatment, predisposition to disease, prognostic signs, and precautionary measures. This would be a great treasure, a rich library, a book that would serve as an *aide-mémoire*, accessible to you for any knowledge you would want from it, Allah willing!<sup>65</sup>

Rhazes' aphorism was misinterpreted: what he actually meant was that each physician should compile a commonplace book for his own use, along the lines of his private notes *Continens*<sup>66</sup> which was never intended for publication.<sup>67</sup>

Further, Ibn Riḍwān attacks the sect of the Methodists, whose systems of classification and therapy are reflected in compendia:

Galen wrote commentaries in order to bring the medical works of Hippocrates to perfection. His abstracts and commentaries have left nothing out. Consequently, later books are superfluous; and to transcribe or to reflect on their contents would hinder students from studying medicine. Studied closely, later compendia and similar works represent the doctrine of the Methodists whose art was rejected by Galen, when he informed us of their harmful influence on medicine. According to their tradition, the Methodists described each disease, saying that it ought to be treated with a special [group of] drugs. This is precisely what is done by the compilers of compendia, which are—therefore—as harmful to medicine as the doctrine of the Methodists. Summaries and commentaries of Galen's books are not self-sufficient, and should not replace his books. Summaries fail to encompass all Galen's ideas, while commentaries increase the length of the art, and distract [students] from studying, since, of necessity, these would have to be read for verification together with their [original] medical works.<sup>68, 69</sup>

Ibn Riḍwān's criticism of commentaries is inconsistent with the fact that his bibliography includes, among other items: commentaries on six of Galen's works,<sup>70</sup> *Interpretation of the treatise of Pythagoras the sage "On virtue"*, *Interpretation of the medical nomos [law] of Hippocrates*, and *Interpretation of the commandments of Hippocrates known by the [title] "Order in medicine"*.<sup>71</sup>

Another cause for the decline of medical prestige in Egypt was the adulteration of drugs, which Ibn Riḍwān illustrates by reporting a demonstration, where the subject,

<sup>65</sup> Rhazes' *K. al-Murshid aw al-fuṣūl* (The guide or aphorisms), with texts selected from his medical writings, ed. with an introduction by A. Z. Iskandar, *Revue de l'Institut des manuscrits arabes* [Numéro spécial consacré au livre de Rhazès: 'Le guide ou Aphorismes'], 1961, 7(1): 124–125 (n. 377).

<sup>66</sup> *Kitābu'l Ḥāwī fi'l-ṭibb* (*Continens of Rhazes*), an encyclopaedia of medicine, by Abū Bakr Muḥammad b. Zakarīyyā ar-Rāzī (d. A.H. 313/A.D. 925), the Dā'iratu-l-Ma'ārif-il-Osmania, Hyderabad-Deccan, Osmania Oriental Publications Bureau, 1955–1971, 23 vols.

<sup>67</sup> A. Z. Iskandar, "The medical bibliography of al-Rāzī", in *Essays on Islamic philosophy and science*, ed. by G. F. Hourani, Albany, State University of New York Press, 1975, pp. 41–46. (This paper, from which all references and other scholarly apparatus have been excluded, is an abstract of a book entitled *New light on al-Rāzī's medical bibliography* which is being prepared for publication.)

<sup>68</sup> Ibn Riḍwān is justified in this statement. Arabic commentaries of which the text is *mamzūj* (mixed) are difficult to read, or indeed to edit, without constantly consulting the original text on which the commentary was written. Invariably, commentators quote only one section of a passage from the original text, merely writing: "the passage which begins with . . .", and follow on immediately with a commentary.

<sup>69</sup> MS. Ṭibb 483, p. 31, ll. 2–18; MS. Arberry, p. 10, ll. 3–10.

<sup>70</sup> See note 49 above.

<sup>71</sup> *Tafsiṛ maqālat al-ḥakīm Fithāghūras fī al-faḍīla*, *Tafsiṛ nāmūs al-ṭibb li-Buqrāṭ*, and *Tafsiṛ waṣīyyat Buqrāṭ al-ma'rūfa bi-tarṭīb al-ṭibb*. IAU, II, 104, ll. 4–7; Schacht and Meyerhof, op. cit., note 8 above, p. 10 (ns. 23, 27–28). The work *Tarṭīb al-ṭibb* (Order in medicine), attributed to Hippocrates, is unknown today.

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a cock, died from the administration of a theriac:

I have also witnessed a very strange demonstration! A pretender of medicine collected [certain] drugs from which he prepared the theriac of Andromachus, and when it was fermented, he announced to some people that he had prepared a magnificent theriac which possessed such and such virtues. He said that a [demonstration] would justify [his] claim! Then he ordered two cocks to be brought, incited a serpent to bite each at the same place, and administered his own theriac to one, which died, but not the other, which survived.<sup>73</sup>

Ibn Riḍwān adds that the cause of death was drug adulteration and the use of ineffective substitutes, not the serpent's poison.<sup>73</sup> The idea of a "control" is not without interest, but it could be argued that the death might have occurred from most of the poison being injected into the first cock, since it would appear that only one serpent was used.

Ibn Riḍwān's instructions on medical education are centred on theory, with very little attention to practice:

I divide the teaching of medicine into two sections: one is theory, this is to be studied either in the books of Hippocrates or Galen, not in any other books, but if you wish, it would be more perfect to consult the books of Hippocrates and Galen together; the other is practice, I mean the study of restoration of fractured bones, luxation, incision, stitches, cautery, perforation, ophthalmology, and all other surgical procedures.<sup>74</sup> . . . Since it has proved superfluous, harmful, and wasteful to consult any of the existing compendia, summaries and commentaries, then it would be right to restrict reading only to the works of Hippocrates, and subsequently to those of Galen, whose statements involve demonstrative proof together with dialectical arguments and the like, all of which can be discerned through the art of logic.<sup>75</sup>

### RECOMMENDATIONS ON THE PERSONAL QUALITIES OF STUDENTS OF MEDICINE

Ibn Riḍwān warns prospective students against embarking on a medical career unless they have a sincere desire for practice. They should keep away from this profession if they wish merely to earn a living and to enjoy the company of the wealthy. He refers to two of Galen's books, *On the method of healing*, where, in Treatise I, Galen lists the vices of charlatans, and *On examining the skill of physicians*,<sup>76</sup> which was intended for distinguishing between genuine doctors and impostors. He quotes from *On the method of healing*, but not from *On examining the skill of physicians*; his extracts from the former book, however, happen to resemble certain passages in the Arabic version of *On examining the skill of physicians*. A student who had decided upon a medical career was to submit himself voluntarily to the test: either by a process of self-assessment, or by soliciting the opinion of an examiner. In addition to certain

<sup>73</sup> MS. Ṭibb 483, pp. 15, l. 18–16, l. 6; MS. Arberry, p. 4, ll. 23–26. For a better account in which several cocks and vipers (*afā'i*) are used, see Lutz Richter-Bernburg, *Eine arabische Version der pseudogalenischen Schrift "De theriaca ad Pisonem"* (Diss.), Göttingen, 1969, p. 12 [Arabic text].

<sup>74</sup> MS. Ṭibb 483, p. 16, ll. 6–11; MS. Arberry, pp. 4, l. 26–5, l. 3.

<sup>75</sup> MS. Ṭibb 483, p. 37, ll. 7–13; MS. 4026, fols. 5b, l. 16–6a, l. 4; MS. Arberry, p. 12, ll. 15–17.

<sup>76</sup> MS. Ṭibb 483, p. 32, ll. 4–9; MS. Arberry, p. 10, ll. 12–15.

<sup>77</sup> *Fī miḥnat afdāl al-aṭibbā'* = *Fī al-miḥna allatī yu'rafu bihā afdāl al-aṭibbā'* = *Fī al-miḥna allatī bihā ya'rīf al-insān afdāl al-aṭibbā'* (Ḥunayn, p. 46, n. 112; Dietrich, op. cit., note 15 above, p. 190, n. 90; *GAS*, III, 125, n. 88; Ullmann, p. 52, n. 70; exists in two Arabic manuscripts: 3813 *jīm* [Maktabat al-Baladiyya, Alexandria], and 1120 [Bursa Haraçcioğlu, Turkey]; a critical edition with an English translation, introduction, and commentary is presently in preparation) = *De medico examinando* (lost in Greek).

moral and intellectual qualities, a student of medicine would need patience for transcribing manuscripts. This, it could be assumed, was the usual way of building up a private library.

[Treatise I], chapter six: on preliminaries necessary to medical education.<sup>77</sup> [Those who wish to study] the art of medicine are of two types.

The first desire to earn money; this group is unfit to receive education. If [such people] happen to earn money by any means, they will turn to a life of ease. Some of them mix with the wealthy, wait by day at the doorsteps to greet them, and visit them in the evening to have dinner; they are humorous companions who part after having had large tankards of drink, and so on; all this was enumerated by Galen in the first treatise of *On the method of healing*. Without being called, some make rounds which last all day long and part of the night, visiting the laity and examining patients; some wear the acknowledged medical gown and stay in a surgery by the road; and some contrive other devices, just any method to earn whatever they need.

The other type desire to acquire all that is good of the art. They are fit for education, and will not miss [the opportunity] to earn the money they need, as I shall explain at the end of this treatise. If the first type were to be questioned about what attracted them to the medical profession, they would have people imagine that their purpose was [to achieve] all that was good for the art. For this reason, Galen wrote a book clarifying [the method of] examining physicians, so that the genuine may be distinguished from the false. You should choose which of these two [types] you wish to be: a genuine physician, or a false impostor among people! Should you desire to be genuine, put yourself to the test, or ask someone to examine you. If you prove fit, then begin to receive education; but if unfit, do not toil after the unattainable.

First things to be examined are your intelligence, understanding, humility, chastity, and your patience to endure the toil of transcription. For, if you are keen and intelligent, and possess adequate modesty, chastity, and patience to endure the toil of transcription and learning, unashamed to receive education from anybody inferior to you, there is hope that you may achieve all that is good for the art; but if you do not possess these [qualities], then there is no hope of any achievement.

Before you begin to receive education, you should commence by training yourself in arithmetic and geometry, then in the art of logic. But do not study any one of these subjects profoundly, like [a specialist] who devotes a lifetime to one [subject]. Study diligently until you can cope with problems which may confront you. And should you study the art of logic, beware not to slip into the delirium of opposition; I mean do not oppose everybody you meet; abide by the principles of each science and art. Do not seek conclusions from one science, if such conclusions should be reached from another science. For example, you can use the science of demonstration in investigating geometrical matters, yet it would be impossible to use demonstration in investigating geometrical postulates.

If you are in a place where this art [of logic] is not emphasized, and the people are unaware of its genuine status, you should not reveal your knowledge;<sup>78</sup> and should you happen to live in a place whose people deliberate on this art, beware not to boast of your knowledge; whatever you reveal should be acceptable to and approved by your colleagues. And when you have learned that [logic] is useful, be tolerant to others; let their ignorance not depress you, and having gained mastery over these things, then dedicate your lifetime to the art of physic.<sup>79</sup>

#### DETAILS OF THE LATE ALEXANDRIAN MEDICAL CURRICULUM

Treatise I, chapter eight, of Ibn Riḍwān's *Useful book on the quality of medical education* provides a reading list consisting of four books on logic and twenty on medicine, the two main subjects in the late Alexandrian curriculum which was drawn up by renowned teachers who feared the art of physic was in danger of total collapse.

<sup>77</sup> Another English translation of chapter six (in part) was published by Lyons, op. cit., note 10 above, pp. 67–68.

<sup>78</sup> The passage "where . . . knowledge" is missing from MS. Ṭibb 483.

<sup>79</sup> MS. Ṭibb 483, pp. 34, l. 1–36, l. 5; MS. 4026, fols. 4a, l. 7–5a, l. 12; MS. Arberry, pp. 11, l. 5–12, l. 2.

*An attempted reconstruction of the late Alexandrian medical curriculum*

Medical education continued in Alexandria until the time of the Umayyad Caliph ‘Umar Ibn ‘Abd al-‘Azīz (A.H. 99–101/A.D. 717–720),<sup>80</sup> when new medical centres had to be established elsewhere. The new centres remained confused and unsettled until the Abbasid Caliph al-Ma‘mūn (A.H. 198–218/A.D. 813–833)<sup>81</sup> revived learning and reinstated medicine and philosophy.

Unlike Galen, Hippocrates—according to Ibn Riḏwān—deliberately refrained from giving any details about the order of reading his books so that students should resort to oral education from instructors.<sup>82</sup> Ibn Riḏwān, therefore, appropriately wrote a treatise *On the method of Hippocrates in medical education*,<sup>83</sup> and in the *Useful book*, Treatise I, chapter four, he wrote *On the purpose and educational trend in the books of Hippocrates*.<sup>84</sup> Alexandrian teachers (whose names are not known at present) chose the first four of Aristotle’s (384–322 B.C.) books on logic (the *Organon*), and four of Hippocrates’, to encourage gifted students to read more of their works. Similarly, sixteen of Galen’s books were chosen, to be studied in seven consecutive grades. Although the purpose of each book is only briefly stated by Ibn Riḏwān, he deserves credit for writing on medical education in the Alexandrian School and specifying its “seven grades”, for shedding light on the books of Hippocrates, Aristotle and Galen which formed the main part of the curriculum, and for writing on “necessary (compulsory) and unnecessary (optional) subjects”<sup>85</sup> preliminary to medical education proper.

The first of the seven grades offered an introductory course. Its four books provide material on such subjects as: the three medical sects, general accounts of theory and practice, the pulse, and the principles of therapy as applied to common disease. This was the only stage of education available for students with limited means, who were merely employed as assistants to fully educated physicians. They specialized in “particular medical procedures” (surgery) and practised under supervision. Doctors had to know about the work of their assistants, in case they themselves were forced by circumstances to do manual work.

The four books allotted to the second grade deal with the “naturals”: the elements, the temperaments, the faculties, the organs, etc. Ibn Riḏwān does not disclose any significant information on the last book in this collection, entitled *On minor anatomy* or *On anatomy for students*. Hunayn, however, sums up his opinion of this Alexandrian “aggregate of treatises” in his account of Galen’s *On anatomy of the muscles*, as follows: Galen wrote four separate treatises—*On anatomy of the bones*, *On anatomy of the muscles*, *On anatomy of the nerves*, and *On anatomy of the veins and arteries*. These four treatises were assembled by the Alexandrians, as if they formed one book, which they called *On anatomy for students*,<sup>86</sup> probably in order to distinguish it from Galen’s

<sup>80</sup> *The encyclopaedia of Islam*, Leiden, E. J. Brill (London, Luzac), 1913–1934, 4 vols., and *Supplement*, 1938 (hereinafter *EI*), vol. 4, p. 998.

<sup>81</sup> *Ibid.*, vol. 3, p. 221.

<sup>82</sup> MS. Ṭibb 483, pp. 16, l. 19–17, l. 4; MS. Arberrry, p. 5, ll. 9–11.

<sup>83</sup> *Maqāla fī madh-hab Buqrāṭ fī ta’līm al-ṭibb*. IAU, II, 104, l. 1; Schacht and Meyerhof, op. cit., note 8 above, p. 10 (n. 20), lost in Arabic.

<sup>84</sup> *Fī aghrād kutub Buqrāṭ wa naḥw ta’līmih*, MS. Ṭibb 483, pp. 16, l. 18–22, l. 18; MS. Arberrry, pp. 5, l. 7–7, l. 8.

<sup>85</sup> The Arabic terms used are *ḍarūrt* and *laysa bi-ḍarūrt* (MS. 4026, fol. 12b, ll. 15–16; MS. Arberrry, p. 17, ll. 11–12).

<sup>86</sup> Hunayn, pp. 7–9 (ns. 7–10).

major work *On anatomical procedures*.<sup>87</sup> Ḥunayn points to some title-differences in the Greek manuscripts of Galen's *On anatomy of the veins and arteries*, for which, he remarks, the Alexandrians are responsible. Further, he sheds light on the origin of his own Arabic translation of it, which seems to have descended from versions modified by the Alexandrians. He writes:

According to Galen, his book *On anatomy of the veins and arteries* is one treatise in which he describes the arteries and veins. He wrote it for students and addressed it to Antisthenes. The Alexandrians divided it into two treatises: one *On anatomy of the veins* and one *On anatomy of the arteries*.<sup>88</sup>

Ḥunayn's statement is supported by Arabic manuscripts of *On anatomy of the veins and arteries*,<sup>89</sup> and consequently Galen's four treatises on anatomy have come to exist in some Arabic manuscripts under the controversial title *Galen's five treatises on anatomy*.<sup>90</sup>

Grades three to six inclusive dealt with disease, its causes, symptoms, diagnosis, prognosis and therapy.

The third grade had one book *On diseases and symptoms*, another "aggregate of treatises", on which Ḥunayn is more informative than Ibn Riḍwān. Ḥunayn explains that Galen originally wrote four separate works: *On the types of diseases*, *On the causes of diseases*, *On the types of symptoms*, and *On the causes of symptoms*. Again, these were later assembled by the Alexandrians into one book which had to be read before Galen's *On the method of healing*. Sergius of Resania (d. A.D. 536)<sup>91</sup> twice translated *On diseases and symptoms* from Greek into Syriac. His first translation, made while he was still without adequate experience in the Greek literary style of the Alexandrians, was less accurate than his second rendering. Instead of the general comprehensive title, *On diseases*, chosen by the Alexandrians for these four assembled works, the Syriac version was entitled *On diseases and symptoms*. Later in life, Ḥunayn translated *On diseases and symptoms* from Greek into Syriac for Bukhtīshūc Ibn Jibrā'il (d. A.H. 256/A.D. 870),<sup>92</sup> and Ḥubaysh rendered it into Arabic for Abū al-Ḥasan

<sup>87</sup> *Fī 'amal al-tashrīḥ* = *Fī 'ilāj al-tashrīḥ* = *al-Tashrīḥ al-kabir* (Ḥunayn, p. 19, n. 21; *GAS*, III, 98, n. 21; Ullmann, p. 54, n. 78) = *De anatomicis administrationibus* (Kühn, II, 215–731; Diels, I, 66). For details, see my paper 'Bibliographical studies in medical and scientific Arabic works: Galen's *Fī 'amal al-tashrīḥ* (On anatomical procedures), the Alexandrian book entitled *Fī al-tashrīḥ ilā al-muta'allimīn* (On anatomy for students), and Rhazes' *al-Kāfi fī al-ḥibb* (The sufficient book on medicine)', to be published in *Oriens*, following the 1974 (23–24) volumes.

<sup>88</sup> Ḥunayn, p. 9 (n. 10), ll. 7–10.

<sup>89</sup> *Fihrist-i Kitābkhāna-i Markazī-yi Dānishgāh-i Tīhrān, mujallad 13, nuskhahā-yi khaṭṭī, shumārahā-yi 4014–4579. Niḡārish-i* M.T. Daneche-Pajouh, Teheran, 1340/[1961], pp. 3090–3091. These two works exist in a composite volume (MS. 4111, ns. 2–3), and occupy folios 58a–63a and 63a–67a, respectively. See also S. A. K. Ghori et al., *A catalogue of Arabic and Persian medical manuscripts in the library of [the] Institute of History of Medicine and Medical Research*, New Delhi, Delhi Press, [1969?], vol. 1, pp. 54–55 (MMS. 1044). (See also note 90 below.)

<sup>90</sup> W. Ahlwardt, *Die Handschriften-Verzeichnisse der königlichen Bibliothek zu Berlin. Verzeichniss der arabischen Handschriften*, Berlin, A. Asher, 1887–1899, 10 Bände, vol. 5, p. 502, MS. 6233, II, fols. 14b–93. (See also Ullmann, p. 40, n. 13), *De anatomia libri quinque*.)

<sup>91</sup> Qiftī, p. 175, ll. 4–5; IAU, I, 109, ll. 25–26; Sarton, op cit., note 60 above, vol. 1, p. 423; *GAS*, III, 177; Ullmann, p. 100.

<sup>92</sup> Physician to the Caliph al-Mutawakkil (A.H. 232–247/A.D. 847–861). Qiftī, p. 102; IAU, I, 138; *GAS*, III, 243; Ullmann, p. 109.

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‘Alī Ibn Yaḥyā al-Munajjim,<sup>93</sup> preserving the Syriac modified title equivalent to *On diseases and symptoms*.<sup>94</sup> According to Ibn Riḏwān, the main purpose of Galen’s *On the types of diseases*, *On the causes of diseases*, *On the types of symptoms*, and *On the causes of symptoms* was to offer a training in the application of reasoning to medicine.

The fourth grade had two books on clinical examination and diagnosis: *On the diagnosis of diseases of internal organs* and *On the pulse*. Ḥunayn writes in detail on the purpose of *On the pulse* which Galen wrote in four separate books, each of four treatises: *On the types of the pulse*, *On recognition of the pulse*, *On the causes of the pulse*, and *On prognosis from the pulse*. Galen stated that the first treatise of *On the types of the pulse* offered a summary of its four treatises. The Alexandrians were mistaken in applying this statement, by way of generalization, to his three other books on the pulse, and consequently in Ḥunayn’s time many Greek manuscripts of *On the pulse* (and its commentaries) comprised only four treatises, the first of each of its four books, thought to serve as an abstract of *On the pulse*. Sergius of Resania fell—to some extent—into the same error, and produced a Syriac translation of seven treatises (treatise one of each of the first three books, and the four treatises of Book IV). Ayyūb al-Ruhāwī (Job of Edessa)<sup>95</sup> translated seven treatises into Syriac for Jibrā’il Ibn Bukhtīshū‘ (d. c. A.H. 213/c. A.D. 828–829).<sup>96</sup> Further, Ḥunayn translated all sixteen treatises into Syriac for his teacher, Yūḥannā Ibn Māsawayh (Mesuē, d. A.H. 243/A.D. 857),<sup>97</sup> and later made an Arabic translation of the first treatise for Muḥammad Ibn Mūsā. Ḥubaysh used Ḥunayn’s Syriac version in translating the remaining fifteen treatises into Arabic.<sup>98</sup>

The fifth grade, on clinical diagnosis and prognosis, had three books: *On the types of fevers*, which was Ḥunayn’s first published translation from Greek into Syriac before reaching the age of seventeen,<sup>99</sup> *On crisis*, and *On critical days*.

The sixth grade dealt with therapy according to *On the method of healing*, and the final grade was devoted to hygiene in *On the method of the preservation of health*.

Ibn Riḏwān attempted to justify the wisdom behind the choice of Galen’s sixteen books, by mentioning certain elementary treatises and citing the titles of Galen’s more advanced works which eventually had to be consulted by interested students. In Treatise II, chapter one, without specifying any particular source, Ibn Riḏwān quotes from Galen on certain introductory subjects, being preliminary to the main medical subjects (see p. 253 ff.). Introductory subjects were “unnecessary”, such as grammar and language (literary subjects), and “necessary”, namely: logic, physics, mathematics (including astrology), and the compounding of drugs. Language and grammar could be studied from any concise book for beginners. Although eloquence enhanced a

<sup>93</sup> See note 12 above.

<sup>94</sup> Ḥunayn, p. 11 (n. 14).

<sup>95</sup> IAU, I, 170, 204; GAS, III, 230; Ullmann, p. 101.

<sup>96</sup> Physician to the caliphs Hārūn al-Rashīd (A.H. 170–193/A.D. 786–809), al-Amin (A.H. 193–198/A.D. 809–813) and al-Ma’mūn; son of Bukhtīshū‘ Ibn Jurjīs (d. A.H. 185/A.D. 801). Qifṭī, p. 132; IAU, I, 127; GAS, III, 226; Ullmann, p. 109.

<sup>97</sup> Physician to the caliphs from al-Ma’mūn to al-Mutawakkil. *Fihrist*, I, 295; Qifṭī, p. 380; IAU, I, 175; GAL, I, 266; GAS, III, 231; Ullmann, p. 112.

<sup>98</sup> Ḥunayn, pp. 13–15 (n. 16).

<sup>99</sup> Ḥunayn, p. 15 (n. 17), ll. 16–18. (See note 23 above.)

doctor, all that was required of a medical student was to comprehend conversation and written material. Advanced linguistic studies were an unwarranted waste of time. Logic was to be studied as an introductory and main subject, in some depth, since true knowledge could be discovered only by logical deduction. It was also necessary to study the different opinions and judgements in the main topics of physics. Mathematics and other necessary subjects developed a demonstrative method of thinking, which ultimately resulted in the love of truth. Further, doctors had an everyday use for mathematics, varying from the weighing of drugs to the realization of the morphology of organs in health and sickness. Standard books on mathematics were recommended, but advanced works were to be avoided. Knowledge of the virtues of foods and drugs was necessary, in view of the adulteration of drugs which was common practice in Ibn Riḏwān's time. Hygienic and therapeutic diets were prescribed and supervised by doctors. Ibn Riḏwān allowed for a modicum of astrology, providing that it did not distract from the "main medical subjects". His source of ethical conduct was the practical branch of philosophy.<sup>100</sup> On the whole, the education of physicians, he says, should be along the lines of Galen's *That the excellent physician is a philosopher*. After summing up the qualities of the "physician-philosopher" who is competent to write books, Ibn Riḏwān concludes that capable physicians are rarely found, while many professional assistants who merely practise "particular medical procedures" call themselves physicians and imagine they have reached a degree of excellence which entitles them to write books. He condemns compilers: they simply borrow from earlier works; and authors, if they write inferior books abounding in errors.

The following is a translation of two consecutive chapters from Ibn Riḏwān's *Useful book on the quality of medical education*: first, he discusses the main medical subjects (see p. 244ff), then other introductory subjects (see p. 253ff).

[Treatise I], chapter eight, on the Alexandrians having confined themselves to twenty books, four by Hippocrates and sixteen by Galen, some were commentaries, all were assembled for the purpose of education:

When kings ceased to further the desire for [medical] education, compendia and similar works became popular. It was the opinion of the most eminent Alexandrian physicians that a continuation of that attitude would have led to the extinction of the art, and thus the contribution of Hippocrates and Galen who established medicine would have been annihilated. They requested the Christian kings to preserve education in Alexandria, and asked for the principal books on logic to be taught, I mean: [Aristotle's] *Categories*,<sup>101</sup> *De interpretatione*,<sup>102</sup> *Syllogism*,<sup>103</sup> and

<sup>100</sup> In his classification of sciences, Ibn Sinā (Avicenna, d. A.H. 428/A.D. 1037) mentions "theoretical and practical philosophy" and outlines the purpose of each branch. See *Ibn Sinā, al-Shifā, la logique. I. l'isagoge (al-madkhal), préface de T. Hussein, texte établi par I. Madkour et al.*, Cairo, Publication du Ministère de l'Instruction Publique (culture générale) à l'occasion du Millénaire d'Avicenne, 1952, pp. 12, ll. 3–10; 14, ll. 11–16.

<sup>101</sup> *Qāṭiḡhūrīyās = al-Maqūlāt (Fihrist, I, 248, ll. 20–28; Qiftī, p. 35, ll. 1–15; ʿAbdurrahmān Badawī, Organon Aristotelis in versione Arabica antiqua, Cairo, Maktabat al-Nahḏa, 1948–1952, 3 vols., vol. 1, pp. 1–55; for other Arabic editions of the Organon, see ʿAbdurrahmān Badawī, La transmission de la philosophie grecque au monde arabe, Paris, J. Vrin, 1968, pp. 74–80) = Categoriae (W. D. Ross, ed., The works of Aristotle, Oxford, Oxford University Press, 1908–1931, 11 vols., vol. 1, pp. 1a–15b, translated by E. M. Edghill).*

<sup>102</sup> *Bārtarmīnyās = al-ʿIbāra (Fihrist, I, 249, ll. 1–5; Qiftī, pp. 35, l. 16–36, l. 3; Badawī, op. cit., note 101 above, vol. 1, pp. 57–99) = Peri hermenias (Ross, op. cit., note 101 above, vol. 1, pp. 16a–23b, translated by E. M. Edghill).*

<sup>103</sup> *Anūlūstīqā al-awwal = Tahllil al-qiyās (Fihrist, I, 249, ll. 6–10; Qiftī, p. 36, ll. 4–10; Badawī, op. cit., note 101 above, vol. 1, pp. 101–306) = Analytica priora (Ross, op. cit., note 101 above, vol. 1, pp. 24a–70b, translated by A. J. Jenkinson).*

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*Demonstration*,<sup>104</sup> and twenty books on medicine. This [request] was easily [granted] by the kings of that [Christian] faith, and the teaching in Alexandria continued until the time of ‘Umar Ibn ‘Abd<sup>106</sup> al-‘Aziz, may God have mercy on him! Before he assumed the caliphate, at his advice and persuasion, when he was a prince, some [Alexandrian] teachers became Muslim. When ‘Umar was proclaimed Caliph, education was transferred to Antioch and Haran, and became scattered in places and remained confused until the time of al-Ma‘mūn who favoured eminent people and revived learning. Had it not been for that [action], all the ancient sciences of medicine, logic, and philosophy would have become extinct and totally forgotten. Places which, at one time, were the most specialized in learning, I mean: Rome, Athens, parts of Asia Minor, and many other places, have forgotten the sciences.

The most eminent physicians of Alexandria confined [medical courses] to four of the books of Hippocrates: *Aphorisms*,<sup>106</sup> *Prognostic*,<sup>107</sup> *Regimen in acute diseases*,<sup>108</sup> and *Airs, waters, and places*.<sup>109</sup> If the naturally gifted and resolved students, those eager for learning, were to consult these [four] books, they would desire to read the remaining books of Hippocrates, on account of his great wisdom in medicine. [Aristotle’s] four books on logic were chosen for a similar purpose: that is, having consulted them, eager students would be tempted to consult the remaining books on logic, as well as other books on philosophy. With this in view, the Alexandrians also chose sixteen of Galen’s books which they placed in seven successive grades.

The first grade was introductory to medicine. Students who obtained this grade were able to practise the profession of “particular medical procedures”, and were able to enjoy [practising] medicine. If they were going to dedicate their lifetime to studies, they would receive further education; if not, the uses of therapy would still have almost been disclosed to them; and so, if needy, they would be able to treat patients and earn a living by putting into practice whatever they might have understood. All the books of this grade were four. The first, *On sects*, provides therapeutic rules according to the opinion of the Empiricists, and also the opinion of the Dogmatists. All the contents of medicine are attainable through Empiricism and Syllogism. Where the two [sects] agree proves true; where they disagree, the [disputed] matter should be examined: if it requires a method of reasoning, then the rules of Syllogism should be applied; but if it requires an empirical method, then it should be dealt with by Empiricism. The second book, *On the art of physic*, provides general accounts of all the theory and practice of medicine. The third—a small book *On the pulse*, [to Teuthras]—provides all that students are required to know about diagnosis from the pulse, which should prove useful in therapy. The fourth book is entitled

<sup>104</sup> *Anūlūqtā al-thānī=al Burhān (Fihrist, I, 249, ll. 11–14; Qiftī, p. 36, ll. 11–16; Badawī, op. cit., note 101 above, vol. 2, pp. 307–465)=Analytica posteriora (Ross, op. cit., note 101 above, vol. 1, pp. 71a–100b, translated by G. R. G. Mure).*

<sup>106</sup> Beginning of the first gap in MS. Ṭibb 483 (see note 45 above).

<sup>108</sup> *Al-Fuṣūl: The aphorisms of Hippocrates, translated into Arabic by Honain Ben Ishak . . .*, Arabic ed. J. Tylter, Calcutta, Education Press, 1832; É. Littré, *Oeuvres complètes d’Hippocrate, traduction nouvelle avec le texte grec en regard, collationné . . . accompagnée d’une introduction, de commentaires médicaux, de variantes et de notes philologiques . . .*, Paris, J. B. Baillière, 1839–1861, 10 vols., vol. 4, pp. 396–609; F. Adams, *The genuine works of Hippocrates, translated from the Greek, with a preliminary discourse and annotations*, London, Sydenham Society, 1849, 2 vols., vol. 2, pp. 683–774; W. H. S. Jones, *Hippocrates, with an English translation* (vol. 3 by E. T. Withington), London, New York and Cambridge (Mass.), Loeb Classical Library, 1923–1953, 4 vols., vol. 4, pp. 97–221.

<sup>107</sup> *Taqdīm al-ma‘rifā*: Littré, op. cit., note 106 above, vol. 2, pp. 94–191; Adams, op. cit., note 106 above, vol. 1, pp. 223–270; Jones, op. cit., note 106 above, vol. 2, pp. 1–55; an Arabic edition with a commentary and a short table comparing Ḥunayn’s Arabic terminology against Ibn Wāḍiḥ al-Ya‘qūbī’s by M. Klamroth, ‘Ueber die Auszüge aus griechischen Schriftstellern bei al-Ja‘qūbī’, *Zt. dtsh. Morgenländ. Gesell.*, 1886, 40: 189–233.

<sup>109</sup> *Tadbīr al-amrāq al-hādda=al-amrāq al-hādda*: Littré, op. cit., note 106 above, vol. 2, pp. 192–529; Adams, op. cit., note 106 above, vol. 1, pp. 271–336; Jones, op. cit., note 106 above, vol. 2, pp. 57–125; *Kitāb tadbīr al-amrāq al-hādda li-Buqrāṭ (Hippocrates: Regimen in acute diseases)*, edited and translated with introduction, notes and glossary by M. C. Lyons, Cambridge, Arabic Technical and Scientific Texts, 1966, vol. 1.

<sup>109</sup> *Al-Ahwiya wa al-miyāh wa al-buldān*: Littré, op. cit., note 106 above, vol. 2, pp. 1–93; Adams, op. cit., note 106 above, vol. 1, pp. 179–222; Jones, op. cit., note 106 above, vol. 1, pp. 65–137; *Kitāb Buqrāṭ fīl-amrāq al-bilādiyya (Hippocrates: On endemic diseases; airs, waters and places)*, edited and translated with introduction, notes and glossary by J. N. Mattock and M. C. Lyons, Cambridge, Arabic Technical and Scientific Texts, 1969, vol. 5.

To *Glaucon*, [on therapy]—in two treatises—on how to bring about recovery from disease. Those whose profession is [merely] to practise the “particular medical procedures” will find it necessary to know about the virtues of foods and drugs and to practise surgery personally. They will, of necessity, have to consult some relevant books named by Galen, like his *On the art of physic*,<sup>110</sup> or to learn whatever they may need through oral instruction and observation. In this way, the first grade comprised four<sup>111</sup> treatises, persuasive in medical education, and students would have appreciated the wonders of medicine and enjoyed practising it. It was also meant to serve as a memorandum to the complete physician on all that he had understood of the art.

The second grade had four books. The first, *On the elements* [according to Hippocrates], provides information on the [processes of] rapid alteration in the body and in all the things it needs, and the tendency of these towards transformation. For example, the proximate elements of the body are the homogeneous organs, I mean the bones, the nerves, the arteries, the veins, membranes, flesh, fat, and other [organs]. The [constituent] elements of these organs are the humours: blood, bile, black-bile, and phlegm; and the [constituent] elements of the humours are the distant elements, I mean: fire, air, earth, and water. These four are at the origin of generation, they are at the end of decomposition, and are subject to alteration and transformation. This is the first book, suitable for beginners who desire to practise medicine. The second book, *On the temperament*, provides information on the types of the temperament, outlines whatever may be foretold from each temperament, and shows how each may be recognized in illness. The third book, *On the natural faculties*, provides information on the faculties by which nature governs the body, the causes and diagnostic signs of each faculty. The fourth, *On minor anatomy*, in five treatises which were written separately by Galen, but were [later] assembled in one book by the Alexandrians. It provides information on the homogeneous organs, their number, and all that is required to be known about them. Twelve treatises in all exist in the books of this grade: *On the elements* [according to Hippocrates], one treatise; *On the temperament*, three treatises; *On the natural faculties*, three treatises; and *On minor anatomy*, five treatises. All these books provide information on the natural matters, I mean the constituents of the body. If a lover of learning examines these books, he should wish also to read all that concerns the nature of constitution. For example, the book *On the temperament* should arouse interest in Galen's treatises *On the good constitution*,<sup>112</sup> *On the most excellent constitution*,<sup>113</sup> and *On the uneven dyscrasia*;<sup>114</sup> while his book *On the natural faculties* should arouse interest in *On the semen*,<sup>115</sup> *On the opinions of Hippocrates and Plato*, and *On the uses of organs*,<sup>116</sup> all of which were written by Galen on the faculties, the spirits, and the actions. Galen's book *On minor anatomy* arouses interest in his book *On anatomical procedures*, and so on.

The third grade had one book only, *On diseases and symptoms*, in six treatises. Galen wrote separate treatises, but the Alexandrians assembled them in one book. It provides information on the diagnosis of diseases, their causes, and symptoms. In Galen's opinion, its [treatises] bear richly upon medicine, and treat of Reasoning which is the major principle of this book. If studied properly and well understood, this book will disclose all the minor and major mysteries of the art of medicine.

The fourth grade had two books. The first, *On the diagnosis of diseases of internal organs*, is in six treatises. It is a source book on the diagnosis of illnesses which affect internal organs, the

<sup>110</sup> Literally, *al-Ṣinā'a al-ṣaḡhira* (Minor book on the art), MS. 4026, fol. 8b, ll. 16–17; MS. Arberry, p. 14, l. 21. (See note 18 above.)

<sup>111</sup> MS. 4026 (fol. 9a, l. 1) and MS. Arberry (p. 14, l. 22) give “five” instead of “four”, a scribal error in the Chester Beatty manuscript. Ibn Abī Uṣaybi'a (IAU, I, 106, l. 20) gives the correct reading “four”.

<sup>112</sup> *Fī kḥiṣb al-badan* (Ḥunayn, p. 28, n. 51; GAS, III, 108, n. 42; Ullmann, p. 40, n. 9) = *De bono habitu* (Kühn, IV, 750–756; Diels, I, 71).

<sup>113</sup> *Fī afdāl hay'āt al-badan* (Ḥunayn, p. 28, n. 50; GAS, III, 108, n. 41; Ullmann, p. 39, n. 8) = *De optima corporis nostri constitutione* (Kühn, IV, 737–749; Diels, I, 71).

<sup>114</sup> *Fī sūr al-mizāj al-mukhtalif* (Ḥunayn, p. 29, n. 52; GAS, III, 108, n. 43; Ullmann, p. 39, n. 7) = *De inaequali intemperie* (Kühn, VII, 733–752; Diels, I, 83).

<sup>115</sup> *Fī al-maniyy* (Ḥunayn, p. 32, n. 62; GAS, III, 113, n. 50; Ullmann, p. 41, n. 20) = *De semine* (Kühn, IV, 512–651; Diels, I, 70).

<sup>116</sup> *Fī manāfi' al-āḡā'* (Ḥunayn, p. 27, n. 49; GAS, III, 106, n. 40; Ullmann, p. 41, n. 15) = *De usu partium corporis humani* (Kühn, III, 1–939; IV, 1–366; Diels, I, 68; English translation of extracts in Brock, op. cit., note 5 above, pp. 153–160; M. T. May, *Galen: On the usefulness of the parts of the body* “*De usu partium*”, Ithaca and London, Cornell University Press, 1968, 2 vols.).

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diseases of which cannot be inspected visually, since internal organs are hidden away from the senses. Diagnosis requires the presence of certain symptoms which accompany disease. Should advanced symptoms appear, they undoubtedly indicate that a certain organ is affected by such and such disease. One example is pleurisy, which is due to inflammation of the pleura. The symptoms which indicate pleurisy are tightness of the chest, a shooting pain, fever, and coughs, all of which when combined together indicate a hot inflammation affecting the pleura. Galen did not write a book on the diagnosis of diseases of external organs because such diseases ought to be inspected visually, and it should be sufficient for students to make their diagnosis from visual and manual examination only. The second, a large book *On the pulse*, is in sixteen treatises. Its first four treatises provide information on the types of the pulse, together with particulars about each type; the next four treatises give knowledge about recognizing each type by feeling the pulse; the next four treatises define the causes of each type of the pulse; and the last four treatises provide information on the benefit of recognizing each type of the pulse, a subject of great use in diagnosis and in assessing the severity of disease in relation to the patient's strength, and so on. The fifth grade had three books. The first, *On [the types of] fevers*, is in two treatises. It provides information on the nature and diagnosis of each type of fever. The second, *On crisis*, is in three treatises. It provides information on the periods of disease, so that patients may receive appropriate treatment during each period. Further, it informs one of the progress of disease and the patient's condition: how and with what [remedies] will each recover? The third, *On critical days*, is on the significance, causes, and signs of critical days.

The sixth grade had one book, *On the method of healing*, in fourteen treatises. It provides therapeutic rules for each illness, according to the opinion of the Dogmatists. If one consults this book one will find it necessary to consult Galen's *On materia medica*,<sup>117</sup> and *On the compounding of drugs*,<sup>118</sup> I mean: *On the compounding of drugs according to genera*,<sup>119</sup> *On the compounding of*

<sup>117</sup> *Fi al-adwiya al-mufrada* = *Fi al-adwiya al-basifa* (Ḥunayn, p. 29, n. 53; *GAS*, III, 109, n. 44; Ullmann, p. 47, n. 49) = *De simplicium medicamentorum temperamentis et facultatibus* (Kühn, XI, 379–892; XII, 1–377; Diels, I, 96; English translation of extracts in Brock, op. cit., note 5 above, pp. 191–195).

<sup>118</sup> Galen's *Fi tarkib al-adwiya*, which Ḥunayn (p. 36, n. 79) translated from Greek into Syriac for Yūḥannā Ibn Māsawayh during the caliphate of al-Mutawakkil, and which Ḥubaysh later rendered into Arabic from Ḥunayn's Syriac version, is in seventeen treatises. Seven treatises are entitled *Fi tarkib al-adwiya 'alā al-jumal wa al-ajnās* = *Qāṭājānis* (On the compounding of drugs according to genera), and the "remaining" ten treatises, Ḥunayn adds, are called *Fi tarkib al-adwiya bi-ḥasab al-mawāḍi' al-ālīma* = *al-Mayāmīr* (On the compounding of drugs according to affected places). In the text of the *Useful book*, Ibn Riḍwān, like Ḥunayn, mentions *Qāṭājānis*, first, then *al-Mayāmīr*. Ibn al-Nadīm (*Fihrist*, I, 290, ll. 27–28) and al-Qifī (p. 131, ll. 7–8) mention the seventeen treatises of *On the compounding of drugs* without reference to any "parts" of this major work. In Ibn Abī Uṣaybi'a's time (IAU, I, 98, ll. 14–19), *On the compounding of drugs* existed in two separate books: *Qāṭājānis*, seven treatises (Book I), and *al-Mayāmīr*, ten treatises (Book II), possibly, Ibn Abī Uṣaybi'a adds, this division of the text was started by the Alexandrians. A complete Arabic manuscript of *al-Mayāmīr* (Book II, according to Ḥunayn) exists in Saray Aḥmad III, Istanbul, MS. 2079, I (of which microfilms 1153–1154 are extant in Maḥad al-Makḥṭūḡāt al-'Arabiyya, Cairo) and purports to be Ḥunayn's translation. It gives the following account in the opening passage (p. 3, ll. 2–9): "The beginning of Treatise I of *On the compounding of drugs according to affected places*. Galen says: I have previously explained in the book *On the method of healing* that the appropriate treatment is never indicated by the illness itself; this may be indicated by the patient's temperament, and to a greater extent, by the nature of the affected member of the body. In the same book, I have also explained briefly and concisely, the way in which men can make compounded drugs from simples; and in the seven treatises which precede this treatise of mine, I have explained all the rules of the science of the compounding of drugs, with clarity and at length". These seven treatises cannot have been anything else but the seven treatises of *Qāṭājānis*. Ḥunayn's statement about the order of *Qāṭājānis* and *al-Mayāmīr* in *On the compounding of drugs* is derived directly from Galen. It should be noted, however, that the order of Galen's two books is reversed in Kühn's edition: the *De compositione medicamentorum secundum locos* (= *al-Mayāmīr*) takes the first place (Kühn, XII, 378–1007; XIII, 1–361) and the *De compositione medicamentorum per genera* (= *Qāṭājānis*) takes the second place (Kühn, XIII, 362–1058). This reversed order is preserved by Diels (I, 97–98), Sezgin (*GAS*, III, 118, n. 64) and Ullmann (p. 48, n. 50).

<sup>119</sup> Ibn Riḍwān's text gives *Qāṭājānis* = *Fi tarkib al-adwiya 'alā al-jumal wa al-ajnās* (*GAS*, III, 118–120, n. 64, II; Ullmann, pp. 48–49, n. 50b) = *De compositione medicamentorum per genera* (Kühn, XIII, 362–1058; Diels, I, 98).

drugs according to affected places,<sup>120</sup> *On confections*,<sup>121</sup> and other similar books.

The seventh grade had one book, *On the method of the preservation of health*, in six treatises. It provides information on the preservation of the health of bodies with different constitutions. If one examines this book, one will find it necessary to examine such books as *On [the virtues of] food*,<sup>122</sup> *On the good and bad [kinds of] humour*,<sup>123</sup> *On the attenuating regimen*,<sup>124</sup> and books on the conditions suitable for physical exercise, such as Galen's *Physical exercise with the small ball*,<sup>125</sup> and similar books.

Galen's sixteen books to which the Alexandrians confined their commentaries call on the reader to consult all his other books by which the art of physic was brought to a completion. For example, *On the organ of smell*<sup>126</sup> is related to the same grade as *On the causes of respiration*<sup>127</sup> and *On difficult respiration*,<sup>128</sup> also *On the use of the pulse*,<sup>129</sup> *On the movement of the chest and lungs*,<sup>130</sup> *On the voice*,<sup>131</sup> *On the movement of the muscles*,<sup>132</sup> *On difficult and obscure movement*,<sup>133</sup> *On the recurrence of fevers [and their combined attacks]*,<sup>134</sup> *On the periods of disease*,<sup>135</sup> as well as his other books, treatises, and missives, each of which must be consulted because it is related to one or more books used in the seven grades.

The Alexandrians, therefore, adopted a good method by which the art of physic was revived, and they should be praised by posterity, physician and philosopher alike.<sup>136</sup>

End of Treatise I of the *Useful book*.<sup>137</sup>

<sup>120</sup> Ibn Riḍwān's text gives *al-Mayāmīr = Fī tarkīb al-adwiya bi-ḥasab al-marwāḍi' al-ālīma* (GAS, III, 118–120, n. 64, I; Ullmann, pp. 48–49, n. 50a) = *De compositione medicamentorum secundum locos* (Kühn, XII, 378–1007; XIII, 1–361; Diels, I, 97).

<sup>121</sup> *Fī al-ma'jūnāt*. Galen's book *Fī al-adwiya al-muqābila li al-adwā'* (On antidotes) is composed of two treatises: *Fī al-tiryāq* (On theriac) and *Fī al-ma'jūnāt* (On confections). *Fī al-adwiya al-muqābila li al-adwā'* (Ḥunayn, p. 38, n. 81; GAS, III, 121, n. 66; Ullmann, p. 49, n. 53) = *De antidotis* (Kühn, XIV, 1–209; Diels, I, 99).

<sup>122</sup> *Fī quwā al-aghḍhiya = Fī al-aghḍhiya = Fī al-aḥ'ima* (Ḥunayn, p. 35, n. 74; GAS, III, 117, n. 60; Ullmann, p. 47, n. 45) = *De alimentorum facultatibus* (Kühn, VI, 453–748; Diels, I, 76).

<sup>123</sup> *Fī al-kīmūs = Fī al-kīmūsayn = Fī jawḍat al-kīmūs wa radā'atih = Fī al-kīmūs al-jayyid wa al-radī'* (Ḥunayn, p. 36, n. 76; GAS, III, 118, n. 62; Ullmann, p. 47, n. 46) = *De probis pravisque alimentorum succis* (Kühn, VI, 749–815; Diels, I, 77).

<sup>124</sup> *Fī al-tadbīr al-mulaffif* (Ḥunayn, p. 36, n. 75; GAS, III, 117, n. 61; Ullmann, p. 47 n. 47) = *De victu attenuante* (Diels, I, 125).

<sup>125</sup> *Fī al-riyāḍa bi al-kura al-ṣaḡhira* (Ḥunayn, p. 39, n. 86; GAS III, 136, n. 143) = *De parvae pilae exercitio* (Kühn, V, 899–910; Diels, I, 74).

<sup>126</sup> *Fī ālat al-shamm* (Ḥunayn, p. 27, n. 48; GAS, III, 106, n. 39) = *De instrumento odoratus* (Kühn, II, 857–886; Diels, I, 68).

<sup>127</sup> *Fī 'ilal al-tanaffus* (Ḥunayn, p. 24, n. 37; GAS, III, 102, n. 29; Ullmann, p. 55, n. 81) = *De causis respirationis* (Kühn, IV, 465–469; Diels, I, 70).

<sup>128</sup> *Fī radā'at al-tanaffus = Fī sūr al-tanaffus* (Ḥunayn, p. 34, n. 68; GAS, III, 114, n. 54; Ullmann, p. 44, n. 33) = *De difficultate respirationis* (Kühn, VII, 753–960; Diels, I, 84).

<sup>129</sup> *Fī al-ḥāja ilā al-nabḍ = Fī manṣa'at al-nabḍ* (Ḥunayn, p. 25, n. 41; GAS, III, 104, n. 32; Ullmann, p. 41, n. 16) = *De usu pulsuum* (Kühn, V, 149–180; Diels, I, 73).

<sup>130</sup> *Fī ḥarakat al-ṣadr wa al-rī'a* (Ḥunayn, p. 23, n. 36; GAS, III, 134, n. 137; Ullmann, p. 55, n. 82) = *De motu thoracis et pulmonis* (Diels, I, 143).

<sup>131</sup> *Fī al-ṣawt* (Ḥunayn, p. 24, n. 38; GAS, III, 103, n. 30; Ullmann, p. 54, n. 79) = *De voce et anhelitu* (Diels, I, 147), pseudo-Galenic; the original work is lost.

<sup>132</sup> *Fī ḥarakat al-aḥāl* (Ḥunayn, p. 25, n. 39; GAS, III, 103, n. 31; Ullmann, p. 41, n. 18) = *De motu musculorum* (Kühn, IV, 367–464; Diels, I, 69).

<sup>133</sup> *Fī al-ḥarakāt al-mu'taṣa al-majhūla* (Ḥunayn, p. 27, n. 47; GAS, III, 106, n. 38; Ullmann, p. 55, n. 85) = *De motibus manifestis et obscuris* (Diels, I, 143).

<sup>134</sup> *Fī adwār al-ḥummayāt wa tarākibihā* (Ḥunayn, p. 32, n. 65; GAS, III, 114, n. 53; Ullmann, p. 42, n. 25) = *Adversus eos, qui de typis scripserunt* (Kühn, VII, 475–512; Diels, I, 82).

<sup>135</sup> *Fī awqāt al-amrād = Fī azmān al-amrād* (Ḥunayn, p. 30, n. 55; GAS, III, 110, n. 45; Ullmann, p. 42, n. 23) = *De morborum temporibus* (Kühn, VII, 406–439; Diels, I, 81).

<sup>136</sup> According to Ibn Abī Uṣaybī'a (IAU, I, 108, ll. 16–17) the passage "by which . . . alike" reads: "for inducing students to study medicine profoundly, by way of consulting all Galen's books diligently".

<sup>137</sup> MS. 4026, fols. 7b, l. 2–12a, l. 6; MS. Arberry, pp. 13, l. 18–16, l. 19.

*An attempted reconstruction of the late Alexandrian medical curriculum*

It is understandable that Arabic manuscripts of the voluminous *Summaria* should have only some of Galen's sixteen books. The British Library MS Add. 23407 has the first eight works; Manisa Kitapsaray (Turkey) MS 1759 comprises the first nine books; and the largest Arabic version so far known, housed in Majlis-i Shūrā-yi Milli (Teheran) MS 6037 has fourteen books; those missing are the first and ninth.<sup>138</sup> The fact that, for one reason or another, the Alexandrians did not include Galen's *On anatomical procedures* in the *Summaria* marks the beginning of a decline in medicine before it was handed over to the Arabs, and probably resulted in the poor status of anatomy in medieval Arabic curricula.

With regard to introductory subjects (see p. 247), the full text is as follows:

[Treatise II], chapter one, on the causes which have led into error authors of books after [the time of] Galen.

The eminent Galen informed us in his books that beginners seeking education in order to understand and benefit fully from the art of physic should have an introductory training in literary subjects, sciences, and many arts: some are necessary for medicine, such as logic; and some are unnecessary, such as grammar.

In this book I shall explain the extent to which physicians will need each literary and art subject. I shall also show that, on account of their ignorance and the total loss of knowledge about [the evaluation of each subject], Galen's successors made errors in their books and committed serious mistakes which inflicted great harm on medicine.

Among these [subjects] are language and grammar, on which one concise book for beginners should suffice. If a student of medicine acquires sufficient [knowledge] of these two [subjects] to comprehend and distinguish between subjective and predicative statements, he will be able to understand oral communication and the books of our predecessors. Since it is evident that language and grammar are required, neither for the preservation of health nor for therapy, a physician, therefore, should be unconcerned whether he makes grammatical mistakes. Profound studies in these subjects distract from learning medicine. Accordingly, unlike a student of language, a medical student is not required to learn these two [subjects] to the limits of perfection. If he comprehends and understands the context of statements, he will be able to study medicine, whether or not he happens to be eloquent; but upon my life, it would be better if he were eloquent!

Among the [arts] are arithmetic, numerals, measurement, geometry, the compounding [of drugs], and astrology, [all of] which offer a training of the intellect and familiarize students with [the science of] demonstration and truth. Students of medicine should be among the shrewdest and most intelligent, people who have the greatest passion for truth and demonstration.

Furthermore, these arts have a [practical] use in medicine: arithmetic and numerals are used in calculating the weights of drugs and in all other processes requiring calculation. For example, if a drug happens to be hot in the second degree, and another is hot in the third degree, then if they are mixed in equal quantities, the compounded drug would be hot in a degree of two and a half. This is because we add two to three and divide by two, that is two and a half.

Measurement and geometry acquaint [students] with the morphology of organs, their conjunction, and the cavities [of the body], and all that is necessary for the development of organs. Such [information] is also useful in the treatment of tumour, ulcer, and similar diseases. For example, a rounded ulcer would have to be more extended than ulcers of other shapes which were thought to have the same size.

Growth must be induced within an ulcer, before nature can bring about healing. The art of the compounding of drugs facilitates the mixing of appropriate simples, and thus health is preserved by [administering] drugs congenial to the condition\* of the temperament, and disease is treated by applying drugs which oppose the condition\* of the temperament.

The science of astrology enables students to ascertain the rising and setting of the "fixed stars", the intensity of increase or decrease of heat, the blowing of wind, rainfall, and river-floods.

\*The Arabic words "*ka'l-alhān*" and "*fabi'l-alhān*" (which appear in MS 4026, fol. 13b, ll. 14, 15) are corrupt forms of "*ka'l-hān*" and "*fabi'l-hān*".

<sup>138</sup> See note 15 above.

Hippocrates wrote with clarity on seasons, how each begins in relation to the rising of the “fixed stars”. Further, in *On critical days*, and in his other books, Galen wrote that knowledge about the movement of the sun, the moon, and the five “perplexed planets”—Saturn, Jupiter, Mars, Venus, and Mercury—is very useful in learning about critical days and the condition of crisis, whether it would be benign or fatal, complete or incomplete.

In my opinion, profound studies in these sciences would distract from thorough studies in useful medical subjects. One concise book on each [of the mathematical and astrological subjects] should suffice, such as *Addition and subtraction*,<sup>139</sup> the book: *Arithmetica*,<sup>140</sup> Euclid’s book: *Elements of geometry*,<sup>141</sup> and Ptolemy’s [Manual] tables and his book: *Tetrabiblos*.<sup>142</sup> These books should be sufficient; but to study profoundly in order to understand such books as the *Conics*<sup>143</sup> and *Almagest*,<sup>144</sup> or to practise astronomical observation would take a long time, would be very difficult, and would distract from studying medicine.

The art of logic is necessary for students who seek perfection in medicine. By logic, truth can be distinguished from falsehood, and virtue from vice; and by deduction, all that is required to be known can be discovered. Accordingly, students must study logic in some depth; the same should apply to physics, for they cannot afford to ignore knowledge about generation and

<sup>139</sup> *Al-Jam‘ wa al-tafrīq*: al-Khwārisimī? (d. after A.H. 232/A.D. 846; *GAL*, S I, 381); Abū Kāmil Shujā‘ Ibn Aslam Ibn Muḥammad Ibn Shujā‘ al-Ḥāsib al-Miṣrī? (d. c. A.H. 318/A.D. 930–931; *Fihrist*, I, 281, l. 16; *GAL*, S I, 390); Aḥmad Ibn Muḥammad al-Ḥāsib? [*SIC*] (*Fihrist*, I, 282, l. 8); Sanad Ibn ‘Alī al-Yahūdī? (ibid., I, 275, l. 5); and Sinān Ibn al-Faṭḥ? (ibid., I, 281, l. 20).

<sup>140</sup> *Kitāb al-arithmāṭīq*. Pythagoras wrote *Arithmetica* (Qifṭī, p. 259, l. 3; IAU, I, 43, l. 6); Diophantus of Alexandria (fl. A.D. 250) wrote *Arithmetica* (*Fihrist*, I, 295, l. 23, mentions *Kitāb Diūfanṭas fī al-masā’il al-‘adadiyya*; Sarton, op. cit., note 60 above, vol. 1, p. 336); the first treatise in *Rasā’il ikhwān al-ṣafā’* (probably written A.H. 350–375/A.D. 961–986) is entitled *al-Arithmāṭīq ay al-risāla munbā‘a ‘an al-‘adad* (University of California at Los Angeles, MS. Ar. 77, fol. 6b; Bombay ed., 1888, 4 vols., etc.); al-Kindī (d. c. A.H. 256/c. A.D. 870) wrote *al-Madkhal ilā al-arithmāṭīq* (Introduction to *Arithmetica*), see *Fihrist*, I, 256, l. 18; Qifṭī, p. 369, l. 18.

<sup>141</sup> *Kitāb Iqlīdīs fī uṣūl al-handasa*. See *Fihrist*, I, 265, l. 20; Qifṭī, p. 62, ll. 15–16. Naṣir al-Dīn al-Ṭūsī’s (d. A.H. 672/A.D. 1274) Arabic version of Euclid’s *Elements of geometry* is called *Taḥrīr Iqlīdīs*; exists in many manuscripts: *British Museum Catal.*, vol. 2, p. 618 (n. 1334); O. Loth, *A catalogue of the Arabic manuscripts in the library of the India Office*, London, Stephen Austin, 1877, vol. 1, p. 214 (n. 736).

<sup>142</sup> *Zij wa kitāb al-arba‘a li-Baṭlīmūs*. See *Fihrist*, I, 268, l. 5. The *Tetrabiblos* is also known by the title *Quadripartitum*, in Arabic *al-Arba‘ maqālāt li-Baṭlīmūs* (Dār al-Kutub al-Miṣriyya, MS. 1054, *miqāt*), and *Arba‘at kutub li-Baṭlīmūs fī al-qaḍā’ ‘alā dalā’il al-nujūm* (Dār al-Kutub al-Miṣriyya, MS. 123, *miqāt*). See P. Kunitzsch, *Fihris al-makḥṣūṭāt al-muṣawwara, Jāmi‘at al-Duwal al-‘Arabiyya, Ma‘had al-Makḥṣūṭāt al-‘Arabiyya*, Cairo, Maṭba‘at al-Sunna al-Muḥammadiyya, 1958, vol. 3, *al-‘ulūm*, section 1, *al-falak, al-tanjīm*, and *al-miqāt*, pp. 6–7 (ns. 5, 6). Ibn Riḍwān wrote a commentary entitled: *Sharḥ al-maqālāt al-arba‘ li-Baṭlīmūs* (MS. 2742, Maktabat ‘Alī Amīrī), see Kunitzsch, *Fihris*, op. cit., p. 71 (n. 140); J. Wilson, *The Tetrabiblos, or Quadripartite of Ptolemy being four books relative to the starry influences. Translated from the copy of Leo Allatius . . .*, London, William Hughes, [1820?]; J. M. Ashmand, *Ptolemy’s Tetrabiblos, or Quadripartite . . . Newly translated from the Greek paraphrase of Proclus . . .*, London, Davis and Dickson, 1822.

<sup>143</sup> *Al-Makhrūṭāt*. Apollonius of Perga (d. early second century B.C.) is the author of *Conics* (*Fihrist*, I, 266, l. 29). Arabic manuscripts of sections from this book and its abridgements are catalogued in: *Bibliothecae Bodleianae codicum manuscriptorum orientarium . . . catalogus . . .* a Joanne Uri confectus, pars prima, Oxford, 1787, p. 205, n. 943 (MS. Marsh 667); Loth, op. cit., note 141 above, vol. 1, p. 218 (n. 745); P. Voorhoeve, *Handlist of Arabic manuscripts in the library of the University of Leiden and other collections in the Netherlands (Bibl. Univ. Leidensis, codices manuscripti, 7)*, Leiden, Excelsior, 1957, pp. 179–180 (MSS. Or. 513 I; Or. 1024 V). A book entitled *Makhrūṭāt Blinūs* (Apollonius’ *Conics*) appears in the bibliography of Banū Mūsā, whose names are mentioned in Ḥunayn’s *Missive*, and for whom he translated many works. See *Fihrist*, I, 271, ll. 17–18; Qifṭī, p. 316, l. 10.

<sup>144</sup> Ptolemy’s *al-Majisṭī*=*Kitāb Baṭlīmūs fī al-ta‘ālim al-ma‘rūf bi’l-Majisṭī*=*Kitāb Baṭlīmūs al-mansūb ilā al-ta‘ālim*. See *Fihrist*, I, 267, l. 25; Qifṭī, p. 95, l. 20. This book exists (in part) in the British Library, in a manuscript dated 3 Sha‘bān 615/25 October 1218 (*British Museum Catal.*, vol. 2, p. 187, n. 390, MS. Add. 7475 Rich.); al-Ṭūsī’s Arabic edition of Ptolemy’s *Almagest* is entitled *Taḥrīr al-majisṭī*, which exists in several manuscripts: *British Museum Catal.*, vol. 2, p. 620 (n. 1338); ibid., vol. 2, p. 745 (n. 1656); Loth, op. cit., note 141 above, pp. 215–216 (ns. 741, 742).

### *An attempted reconstruction of the late Alexandrian medical curriculum*

corruption, transformation, the faculties, actions, and uses, as well as the varied judgements passed in each of these [topics].

Furthermore, [the conduct of] physicians must combine the virtues of ethics, a subject which requires the practical branch of philosophy.

If what we have described is acceptable, then Galen is justified in his [book] *That the excellent physician is a philosopher*.

Physicians should learn also about the virtues of foods and drugs, and all the other substances used for the preservation of health and in therapy. It is insufficient to know only about the virtues of simples; physicians must, of necessity, excel in the compounding of foods and drugs. Knowledge about the culinary art is necessary in order to prescribe foods suitable for patients in any illness; and knowledge about drugs is necessary so that physicians may not receive drugs different from those they order. I do not say that physicians should be cooks, or collectors of drugs, or pharmacists; I say that they cannot afford to be ignorant of such necessary and instrumental subjects, as for example, cookery, drug-collecting, and pharmacy. And likewise, physicians need to carry out incision, perforation, excision, cautery, blood-letting, and similar practices, all of which represent skills which are instrumental to their profession. It would be good if physicians were to familiarize themselves thoroughly with all these skills, in case they would have to make use of any one skill personally. Disease may occur suddenly; physicians may find it difficult to call whoever is needed amongst those [professional assistants], and they may have to handle the matter personally. In giving orders regarding any of these [practices] a physician acts in his own capacity, but in making use of any one skill personally, he is being merely like an instrument. This should not be unacceptable, because duties are manifold. A physician acting in his own capacity represents a great king, ranking highly in the centre of his kingdom. His governors are delegated to act on his behalf, following his orders, and performing whatever duties are entrusted to them. Likewise, a physician gives orders to each of his professional assistants, who [in this way] perform usefully on patients. Hippocrates and Galen commanded the professional assistants to obey doctors' instructions, as slaves obey their master, or subjects their king. But if they perform disobediently, physicians must avoid them as much as possible.

It is evidently difficult for one person to combine all [the qualities] which I mentioned, and consequently, the "physician-philosopher" is rarely found in any city or at any time. The less he possesses of the qualities I mentioned, the lower will be his standard beneath perfection in the art. Judging from what I have said, people tend to call themselves physician-philosophers, yet they are in the profession of blood-letting, or ophthalmology, or making incision, or administering enemas. The same applies to many pharmacists and collectors of drugs; and many who practise some of these professions collectively have become conceited, imagining that they are excellent physicians, and have rashly embarked upon writing books. It is disgraceful and bad for an author to present previously investigated material from a book written by one of his predecessors. It is more disgraceful and much worse for a later author to write material inferior to that of his predecessors. Further, it is extremely disgraceful and worst of all when later authors make mistakes and include sophistry in their books. This is the condition of many books written after the time of Galen, as I shall show later. People act in this way for many reasons, such as the love of fame and a lasting memory, pursuit of a reputation and authority, in order to earn money by deceiving the wealthy, as al-Rāzī and others did in the rhetorical introductory notes to many of their books, where they would write: "I dedicate this book to you so that you may have lasting fame, and that you may make use of it". This is an extraordinary trick! Further, many authors are unaware of their own ignorance! They imagine themselves to be excellent; indeed, they are very remote from excellence! I have seen many persons of this type: their self-conceit, imbecility, and vainglory are beyond description. I often wondered and laughed at them! I met one who liked to be called [by the title] "eminent physician". He used to give orders; if disobeyed or contradicted by any one, he would rave bitterly. His condition was very far from that of a physician who understood the art of physic, or even a small portion of it, let alone other matters. Many people represent this type of person, while eminent men are very rare indeed; hence the statement by one of the Ancients: "Talking to one person who understands you is well worth a speech before ten thousand men". I, therefore, shall not mention any further recollections about those people, and shall bring this chapter to an end.

I say: Primarily, an author on medicine should have had an introductory discipline and training in the literary and scientific subjects which I mentioned earlier; then, he should have investigated and understood the books of Hippocrates and Galen. In this way he would have become an excellent physician and a complete philosopher. Further, he should deliberate! If he has found a useful method, let him write on whatever subject he selects, and thus as I have explained, he

would be safeguarded against sophistry and blunders, particularly if he were to interpret and weigh the meaning of his own statements against the rules of the art of logic. All authors on medicine after Galen have failed to acknowledge these [rules]; and consequently, their works are full of sophistry. None of them, particularly modern authors, has been safeguarded against mistakes and blunders. Their books are erroneous, very incorrect, and are full of mistakes. In order to confirm my statements, I shall give examples from the books of the most celebrated physicians who were thought by people to have completed [their studies] in the art of medicine: Ḥunayn and Muḥammad al-Rāzī. I shall provide examples from their statements which will enable you to understand the status of other authors. Pay full attention and listen to what will come.<sup>146</sup>

The last two chapters in the *Useful book* consist of belligerent criticism: “the second chapter is on errors and mistakes made by Ḥunayn in his works; these errors are injurious to the art of medicine”,<sup>146</sup> and “the third chapter is on Muḥammad al-Rāzī who thought that he had understood [the contents of] Galen’s books, but he was mistaken in his opinion”.<sup>147</sup>

Ibn Riḏwān does not disclose any information on the source of his material about the seven grades, and the textbooks of the main and introductory medical subjects. Were these extracted directly from an Arabic translation of an earlier Alexandrian curriculum, or indirectly from a secondary source? Further, his account of the “necessary and unnecessary subjects” is based on a statement by Galen; nevertheless, the textbooks of this introductory course of medical education could not have been entirely drawn out of an Alexandrian curriculum, since—at least—one book, *Addition and subtraction*, was probably written in, or after, the ninth century A.D.

It is hoped that this paper, though based on an eleventh-century book, will encourage further research in Galen’s works where, very frequently, he stresses the importance of certain books and sets an order for reading them, not necessarily along the lines of *On the order of his books*. It would be interesting to know how closely the Alexandrians followed, or departed from, Galen’s developing views on the order of reading his books.

#### SUMMARY

The history of third-century B.C. Alexandrian medicine is uncertain, and relies on fragmentary and secondary sources. An assessment of the late Alexandrian medical curriculum (sixth to seventh century A.D.) has been based here on a study of Ḥunayn’s (Johannitius) *Missive* and of the Egyptian Ibn Riḏwān’s *Useful book*. The latter work sheds new light on the medical curriculum of this period. The decline in the teaching of anatomy is clearly reflected in the medical curriculum. Ibn Riḏwān attributes this decline principally to the popularity of poor-quality compendia, and the prevalence of summaries and commentaries, all of which replaced the books of Hippocrates and Galen. The adulteration of drugs, he adds, damaged the prestige of medicine. His recommendations on the personal qualities of students of medicine include a sincere

<sup>146</sup> MS. 4026, fols. 12b, l. 11–16b, l. 12; MS. Arberry, pp. 17, l. 8–20, l. 10.

<sup>146</sup> Treatise II (chapter two): MS. Ṭibb 483, pp. 41, l. 1–48, l. 19 (gaps at the beginning and end); MS. 4026, fols. 16b, l. 12–23b, l. 2; MS. Arberry, pp. 20, l. 11–25, l. 9.

<sup>147</sup> Treatise II (chapter three): MS. Ṭibb 483, pp. 49, l. 1–79, l. 20 (gap at the beginning); MS. 4026, fols. 23b, l. 3–37b, l. 10; MS. Arberry, pp. 25, l. 10–35, l. 6.

### *An attempted reconstruction of the late Alexandrian medical curriculum*

desire for practice, moral and intellectual qualities, and patience for transcribing manuscripts. Around A.D. 717, the Alexandrian teachers sought new centres for the teaching of medicine in Antioch and Haran. Ibn Riḏwān probes the curriculum deeply and gives the titles of textbooks on logic, medicine proper and mathematics (including astrology).

The following summary of what might have been a medical curriculum in the late Alexandrian period may serve as a conclusion:

#### THE SCHOOL OF ALEXANDRIA, MEDICAL CURRICULUM (SIXTH TO SEVENTH CENTURY A.D.)

[A schematic representation, on the authority of Ibn Riḏwān.]

#### I. PREPARATORY (*Introductory*) COURSES

##### 1. Optional (unnecessary) subjects:

*Language and grammar*

Books: to be studied from any concise book for beginners; profound linguistic studies are not recommended.

Purpose: students should be trained in order to understand oral communication and written material, and to comprehend and distinguish between subjective and predicative statements.

##### 2. Compulsory (necessary) subjects:

*Logic* (textbooks are mentioned under *Main courses*), *physics*, *arithmetic*, *numerals*, *measurement*, *geometry*, *the compounding of drugs*, *astrology*, and *ethics* (the practical branch of philosophy is the source of ethical conduct).

Books: *Arithmetica*, Euclid's *Elements of geometry*, Ptolemy's *Manual tables*, and Ptolemy's *Tetrabiblos* (Apollonius' *Conics* and Ptolemy's *Almagest* are not recommended at this stage); for books on the compounding of drugs, consult Galen's *On the method of healing: On materia medica: On the compounding of drugs according to genera: On the compounding of drugs according to affected places: and On confections* (being the second treatise of *On antidotes*). Purpose: the main purpose of this preparatory course is to offer a training of the intellect, training in the demonstrative (scientific) method, and to foster the love of truth. Further, students will learn about certain practical applications of some mathematical subjects, and other subjects on the virtues of foods and drugs.

#### II. MAIN COURSES

##### 1. *Logic* (to be studied in some depth)

Books: Aristotle's *Categories; De interpretatione; Syllogism; and Demonstration*. Purpose: the rules of logic are necessary for arriving at the right conclusions and enable students to distinguish between virtue and vice, truth and falsehood; true knowledge can be discovered by logical deduction; Aristotle's four books have been chosen with a view that they will tempt students to consult other books on logic and philosophy.

2. *Medicine proper*

Books: (a) Hippocrates' *Aphorisms*; *Prognostic*; *Regimen in acute diseases*; and *Airs, waters, and places*.

(b) Sixteen of Galen's books are to be studied in seven consecutive grades:

Grade 1. *On sects*; *On the art of physic*; *On the pulse, to Teuthras*; and *To Glaucon, on therapy*.

Purpose: this is an introductory course, but it is the last stage of medical education for students with limited means who wish to become assistants to complete physicians and who will specialize in "particular medical procedures" (surgery); the books of this grade serve also as a memorandum to complete physicians.

Grade 2. *On the elements according to Hippocrates*; *On the temperament*; *On the natural faculties*; and *On minor anatomy*.

Purpose: these four books are intended to acquaint students with the elements, the temperaments, the faculties, the organs, etc. [i.e. the naturals].

Grade 3. *On diseases and symptoms*.

Grade 4. *On the diagnosis of diseases of internal organs*; and *On the pulse*.

Grade 5. *On the types of fevers*; *On crisis*; and *On critical days*.

Grade 6. *On the method of healing*.

Purpose: the books of grades three to six inclusive are intended to acquaint students with disease [i.e. the contra-naturals]; *On diseases and symptoms* offers a training in the application of reasoning to medicine.

Grade 7. *On the method of the preservation of health*.

Purpose: instruction in the principles of hygiene; twenty books on medicine have been chosen from the works of Hippocrates and Galen, so that interested students may be encouraged to read more of their works.

*Guiding literature on medical education in general:*

Galen's works, particularly *On the order of his books* and *That the excellent physician is a philosopher*.

*Criteria on which the selection of students is based:*

Intellectual abilities; moral principles and standards; and financial considerations.