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IBN BĀJJA ON MEDICINE AND MEDICAL EXPERIENCE

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Abstract. This article lists the medical works written by Ibn Bājja, overviews those that have come down to us and studies the super-commentary of Galen's commentary to Hippocrates' *Aphorisms* (*Sharḥ fī al-Fuṣūl*). This text shows a deep influence of al-Fārābī, namely in a conception of medical experience which stems from the latter's construal of experience (*tajriba*) as the inductive process described by Aristotle in *Posterior Analytics* which brings the premises of demonstration. On this basis, Ibn Bājja advocated for a less scholastic, more empiric medicine, and his claim was echoed by Ibn Rushd. There are some similarities between Ibn Bājja's text and Ibn Rushd's *K. al-Kulliyyāt fī al-ṭibb* which suggest that the latter had read *Sharḥ fī al-Fuṣūl*. This work gives moreover some evidence that human dissection could have been performed during Ibn Bājja's time.

Résumé. Le présent article propose la liste des œuvres médicales composées par Ibn Bājja, donne une présentation synthétique de celles qui nous ont été transmises et étudie le métacommentaire au commentaire de Galien sur les *Aphorismes* d'Hippocrate (*Sharḥ fī al-Fuṣūl*). Ce texte montre une influence profonde d'al-Fārābī, en particulier dans sa conception de l'expérience médicale, qui remonte à la façon dont ce dernier construit l'expérience (*tajriba*) comme le procédé inductif, décrit par Aristote dans les *Seconds Analytiques*, produisant les prémisses de la démonstration. Sur cette base, Ibn Bājja défend la pertinence d'une médecine moins scolastique et plus empirique, une position dont Ibn Rushd se fera l'écho. Des similitudes entre le texte d'Ibn Bājja et le *K. al-Kulliyyāt fī al-ṭibb* d'Ibn Rushd suggèrent que celui-ci avait lu le *Sharḥ fī al-Fuṣūl*. Cette œuvre, en outre, pourrait bien attester que la dissection humaine était pratiquée à l'époque d'Ibn Bājja.

1. IBN BĀJJA AS A PHYSICIAN

In spite of the substantial progress made in the past twenty years in the study of Ibn Bājja's oeuvre, his medical works remain unedited and virtually unstudied.[1] The present paper aims to contribute to

[1] The present paper is a part of a wider project funded by the Spanish Ministry of Science, "La evolución de la ciencia en la sociedad de al-Andalus desde la Alta Edad Media al pre-Renacimiento y su repercusión en las culturas europeas y árabes (siglos X-XV)", ref.

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fill this gap by exploring Ibn Bājja's extant works on medicine and by analysing his super-commentary of Galen's commentary to Hippocrates' *Aphorisms* (*Sharḥ fī al-Fuṣūl*). My reason for starting with this tract is that is the most general of Ibn Bājja's medical works that have survived and therefore provides a framework within which we can understand better both the rest of his medical treatises and his conceptualization of medicine and medical experience.

The historical and biographical sources offer little information concerning Ibn Bājja's medical career in spite of the fact that medicine was one of his main activities. So far as I know, the most interesting story about his career as a physician appears in the *Futūḥāt Makkiyya* by the most famous mystic Ibn ʿArabī who tells the following anecdote: during a journey, Ibn Bājja (d. 533/1139) and Abū al-ʿAlāʾ Zuhr (d. 525/1130) came across a medicinal plant which the latter picked up, pounded with his hands and then offered to Ibn Bājja so that he could smell its scent; Ibn Bājja's nose started to bleed and he was unable to staunch the haemorrhage. Abū al-ʿAlāʾ Zuhr took another plant from the surrounding area and ordered an assistant to prepare a remedy, which stopped the bleeding immediately.[2] One should not waste time trying to check the veracity of the story, which symbolizes the contrast between two kinds of physician, the empiricist and the theoretician; but it highlights a couple of details which are fairly consistent with Ibn Bājja's biography[3] and intellectual profile. First, he seems to have been a rival of Abū al-ʿAlāʾ Zuhr, a member of one of the longest-established medical dynasties in al-Andalus and renowned for his professional skills; second, in spite of his mastery of medical science and pharmacology, Ibn Bājja could not equal Abū al-ʿAlāʾ Zuhr as a practitioner. Ibn al-ʿArabī's story reminds us of Ibn Rushd's sincere, albeit indirect, acknowledgement in *Kulliyyāt fī al-ṭibb* of Abū Marwān b. Zuhr's superiority in the field of practical

FFI 2008-00234 FILO. As far as Ibn Bājja is concerned, this project includes the edition, translation and study of his medical works, other texts on science, and the study of several aspects of his scientific thought. Within the framework of this project, I have also written a general survey of the physician-philosopher in al-Andalus entitled *Ética e ideología de la ciencia: el médico-filósofo en al-Andalus (ss. X-XII)* to be published by Fundación Ibn Ṭufayl (Almería, Spain). In this book I will edit Ibn Bājja's *Sharḥ fī al-Fuṣūl* and also provide a Spanish translation. Whereas the book studies the relationship between medicine and philosophy in al-Andalus in connection with the Levantine authors, and focussing specifically on Ibn Bājja and Ibn Rushd, the present paper aims to give a thorough analysis of Ibn Bājja's *Sharḥ fī al-Fuṣūl* which will then be summarized in the book.

[2] Miguel Asín Palacios, "Avempace botánico", *Al-Andalus*, 5 (1940): 225–99 (258). For further details about this story, see the forthcoming *Etica e ideología de la ciencia.*

[3] The most recent and complete bio-bibliographical synthesis of the author is Joaquín Lomba & José Miguel Puerta Vílchez, "Ibn Bāŷŷa. Abū Bakr", in Jorge Lirola & José Miguel Puerta Vílchez (eds.), *Biblioteca de al-Andalus* [quoted henceforth as BA] (Almería, 2009), vol. 2, pp. 624–61. See moreover the classical survey by Jamal al-Dīn al-ʿAlawī, *Muʾallafāt Ibn Bājja* (Beirut-Casablanca, 1983).

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medicine.[4] Now, even though Ibn Bājja was by no means the most renowned physician of his time, he must have been a good practitioner; first, in the story mentioned above, Ibn al-ʿArabī speaks of his fine reputation as a doctor; second, Ibn Abī Uṣaybiʿa and Ibn al-Qifṭī's biobibliographical repertoires of physicians and scientists note the envy that Ibn Bājja's professional success aroused among his contemporaries;[5] and third, some aspects of two of his medical works bear witness to his knowledge of practical medicine. One is a commentary of the most impressive collection of medical case-studies ever written in Arabic, al-Rāzī's *Ḥāwī* (*Kitāb Ikhtiṣār al-Ḥāwī li-al-Rāzī*); the other is a book on simples entitled *Kitāb al-Tajribatayn ʿalā adwiyat Ibn Wāfid*, written in cooperation with an otherwise unknown colleague named Sufyān al-Andalusī, in order to improve Ibn Wāfid's *Kitāb al-Adwiya al-mufrada*.[6] A great many quotations from this book have been preserved in a later source, Ibn al-Bayṭār's *K. al-Jāmiʿ*,[7] and though these excerpts are still to be studied in depth,[8] they bear witness to the fact that Ibn Bājja was a competent pharmacologist who was able to add a number of lines on his own *tajriba* (experience) to the work of an outstanding pharmacologist of the 11th century in al-Andalus; and that a true master of Arabic pharmacology in the 12–13th centuries, Ibn al-Bayṭār, held this work in high regard.

2. IBN BĀJJA'S MEDICAL TREATISES

Ibn Bājja's medical bibliography comprises the following titles:

I Lost works

i. *Kitāb al-Ikhtiṣār al-Ḥāwī li-al-Rāzī* ("A summary of al-Rāzī's Ḥāwī")

ii. *Kitāb al-Tajribatayn ʿalā adwiyat Ibn Wāfid* ("The two experiences on the treatise about simples by Ibn Wāfid").

iii. *Ṣināʿat al-ṭibb*[9] ("The art of medicine")

[4] Ibn Rushd, *K. al-Kulliyyāt fī al-ṭibb*, ed. José M. Fórneas Besteiro & Camilo Álvarez de Morales (Madrid, 1987), p. 227. As is well known, Abū Marwān b. Zuhr was the son of Abū al-ʿAlāʾ Zuhr.

[5] Joëlle Ricordel, "Ibn Bādjdja y la farmacología", in *Las raíces de la cultura europea. Ensayos en homenaje al profesor Joaquín Lomba*, coord. E. Burgos *et al.* (Zaragoza, 2004), pp. 241–54, pp. 241–2.

[6] The book seems to be a third hand compilation of the notes left by these two authors.

[7] See a full index of these quotations in Ana M. Cabo, "Aproximación descriptiva del *Kitāb al-Taŷribatayn* de Avempace y Sufyān al-Andalusī", *Anaquel de Estudios Árabes*, 15 (2004): 45–56, pp. 48 ff.

[8] See, nevertheless, two preliminary but very interesting approaches in Cabo, "Aproximación", esp. pp. 47–8, and Ricordel, "Ibn Badjdja", pp. 245 ff.

[9] So far as I know, no bibliography of Ibn Bājja includes this title although the author mentions it in *Tadbīr al-Mutawaḥḥid*, ed. Majid Fakhry, *Rasāʾil al-Ilāhiyya li-Ibn Bājja* (Beirut, 1968), p. 43.

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II Commentaries to Galen and/or Hippocrates extant in MS Ahlwardt 5060[10]

i. *Qawl fī al-Usṭuqusāt*, 79v-81v ("Discourse on *Elements*"; super-commentary on Galen's commentary of Hippocrates)[11]
ii. *Qawl fī al-Mīzāj* (a), 82r-83v ("Discourse on *Temperament*")[12]
iii. *Qawl fī al-Mīzāj* (b), 83v-84r
iv. *Sharḥ fī al-Fuṣūl*, 85r-90r. ("Discourse on *Aphorisms*"; super-commentary on Galen's commentary of Hippocrates work)[13]
v. *Taʿālīq fī al-Adwiyat al-mufrada*, 90v-97r ("Notes on Simple Drugs")[14]
vi. *Maqāla fī al-Ḥummayāt*, 98v-101v ("Chapter on *Fevers*")[15]

As is well known, Ibn Ṭufayl says that Ibn Bājja's writings are chaotic, sketchy and fragmentary because his hectic life prevented him from devoting enough time to them. The extant treatises on medicine are eloquent examples of Ibn Ṭufayl's criticism; none of them can be considered as complete, and all of them are difficult to understand due to the personal style of the author and the density of the philosophical materials that he uses to explain Galen and Hippocrates' words. Nonetheless, in spite of the problems they present, these commentaries are ambitious and thorough and, since the glosses of a few words on occasion span several folia, the full work was probably huge. Strangely, perhaps, there are few traces of these commentaries in later books and only three of them, *Taʿālīq fī al-Adwiyat al-mufrada*, *Qawl fī al-Usṭuqusāt* and *Qawl fī al-Mīzāj*, were recorded in the mediaeval lists of Ibn Bājja's works.[16] According to Ibn Ṭufayl, it is possible that most of these commentaries were never finished by Ibn Bājja, or least not revised: according to the wording of their texts as they have come down to us, it seems all the more probable that these were not written in Ibn Bājja's hand but came from the notes of some disciples who attended his lectures about Galen's books, or took dictations from the master as he answered the questions which

[10] On the editions and translations of the works by Galen mentioned henceforth, see R.J. Hankinson (ed.), *The Cambridge Companion to Galen* (Cambridge, 2008), pp. 391 ff; on their translations into Arabic, see Fuat Sezgin, *Geschichte des Arabischen Schrifttums. Band III: Medizin-Pharmazie-Zoologie-Tierheilkunde* (Leiden 1970) [quoted henceforth as GAS 3].

[11] *De Elementis ex Hippocrate*, Ar. *K. fī al-Usṭuqusāt ʿalā ray' Buqrāṭ* (Sezgin, GAS 3, pp. 86–7).

[12] *De Temperamentis*, Ar. *K. al-Mīzāj* (Sezgin GAS 3, pp. 87–8).

[13] *In Hippocratis Aphorismi*, Ar. *al-Fuṣūl* (Sezgin, GAS 3, 28–30).

[14] *De Simplicium Medicamentorum*, Ar. *K. fī al-Adwiya al-mufrada* (Sezgin GAS, 3, 109–10).

[15] *De Febrium Differentiis*, Ar. *K.* (*Asnāf*) *al-Ḥummayāt* (Sezgin, GAS 3 94–5).

[16] Al-ʿAlawī, *Muʾallafāt*, pp. 119–20. The source is Ibn Abī Uṣaybiʿa's '*Uyūn al-Anbā*', which mentions *Kalām ʿalā Shay' min K. al-Adwiya al-mufrada li-Jālīnūs, Kalām fī al-Usṭuqusāt* and *Qawl fī al-Mīzāj bi-mā huwa ṭibbī*.

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were posed to him. These treatises seem to be, therefore, texts addressed to a limited, select audience of followers who shared with the master certain keys that were not available to an external reader.

Ibn Bājja's commentaries are not strictly medical but philosophical or scientific, in the mediaeval sense of the term. Ibn Bājja tries to ascertain the true meanings of Galen's words and expressions inside the framework of the Aristotelian epistemology and natural philosophy in order to convey to the reader all the keys which are hidden in Galen's writings, this is, what he thinks Galen ought to have written if he had been fully consistent with Aristotle. Ibn Bājja's purpose was not to produce an intelligible text, but a complete one and, to this end, he filled his text with long interpolations of the kind that we find in his philosophical works and commentaries[17] at the expense of the clarity that a professional physician would expect from a medical text. Perhaps it was because of this peculiar style that these commentaries sank into oblivion, but they constitute nevertheless an interesting attempt to renew the medical discourse along the lines sketched already by al-Fārābī's criticisms of Galen, which are quoted, albeit indirectly, in *Sharḥ fī al-Fuṣūl*. Ibn Bājja, however, does not depart substantially from Galen's method and medical doctrines. Only in two instances does the author make major criticisms of Galen: in *Sharḥ fī al-Fuṣūl*, he complains that Galen did not give a satisfactory or full explanation of Hippocrates' aphorisms, and differs in several points of his commentary; however, these discrepancies do not imply serious criticisms of the purely medical content of the work. And, in *Taʿālīq fī al-Adwiyat al-mufrada*, he criticizes Galen's divergence from Dioscorides, though without questioning Galen's pharmacological tenets. The real departures from Galen's theory are scarce in the other treatises, although this question is still to be studied in all its aspects. Although these texts are incomplete, poorly copied and deal with a disparate range of topics, an overview of their materials suggests that they were written or dictated according to a particular plan:[18]

i. Of the six extant texts, two are epistemological in nature. *Sharḥ fī al-Fuṣūl*: deals with the parts of medicine and the meaning of the term *tajriba* ("experience") in both the medical and philosophical senses, as we will see below. *Taʿālīq fī al-Adwiyat*

[17] See for instance, a long digression about change and motion which appears in *Taʿālīq fī al-Adwiya al-mufrada* (91v–92r), or the explanation about premises in *Sharḥ fī al-Fuṣūl* which will be addressed below.

[18] It is beyond the scope of the present paper to describe the contents of each treatise or their codicological aspects in detail. I will just point out some salient features in order to give a broad idea of these texts within the frame of a general presentation of Ibn Bājja as a physician.

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al-mufrada deals with the epistemology of pharmacology, focusing on the differences between Galen's and Dioscorides' approaches to the subject. Ibn Bājja seems to take issue with what Touwaide calls Galen's "médico-centrisme" in pharmacology, in which the specialist focuses no longer on the pharmaceutical aspects of the drugs but on the process by which they act in the body and their constituent properties in the frame of Galen's physiological and psychological systems.[19] For Ibn Bājja, the aim of pharmacology should be the empirical study of substances in order to ascertain their medical properties; in other words, he seems to postulate a Dioscoridean pharmacology though subject to the strict rules of demonstration.[20]

ii. Three short tracts, *Qawl fī al-Usṭuqusāt* and the two versions of *Qawl fī al-Mīzāj*, deal with the physical fundamentals of medicine. The questions at issue are of the kind: "Are the elements self-subsistent (*qiwāmuhu bi-dhātihi*) as one says of the substances, or not, as one predicates from the accidents",[21] which implies a discussion between the atomist and the Aristotelian theories of matter. Or, "which kind of composition (*tarkīb*) makes up the liver?; is it a simple composition in which the constituents keep their essence (such as that which produces a ship)?; or a composition in which the constituents lose their essence to become something different (the composition from which verdigris appears)?[22] Ibn Bājja's references are essentially Aristotelian, particularly the sections of *History of Animals*, *Parts of Animals* and *On Generation and Corruption* which deal with temperament.

iii. *Maqāla fī al-Ḥummayāt* differs from the other texts. On the one hand, it addresses a purely medical subject; on the other, it takes the shape of a conventional summary. The initial lines suggest nevertheless that the aim of the work is to explain to an unknown (to us) addressee what putrid fevers are.[23]

The first two kinds of texts address the introductory matters that usually appear at the beginning of the Arabic-Islamic manuals of medicine, and the third deals with the subjects that one finds in the technical sections of these books. Beyond any doubt, Ibn Bājja's

[19] Ibn Bājja, *Taʿālīq fī al-Adwiya al-mufrada*, esp. fol. 93r ff; see Alain Touwaide, "La thérapeutique médicamenteuse de Dioscoride à Galien: du *pharmaco-centrisme* au *medico-centrisme*", in Armelle Debru (ed.), *Galen on Pharmacology: Philosophy, History and Medicine* (Leiden, 1997), pp. 255–82.

[20] Ibn Bājja, *Taʿālīq fī al-Adwiya al-mufrada*, fol. 93v, 16–24 and passim.

[21] Ibn Bājja, *Qawl fī al-Usṭuqusāt*, 79v–81r.

[22] Ibn Bājja, *Qawl fī al-Mīzāj* (b), 84r, 12 ff.

[23] Ibn Bājja, *Maqāla fī al-Ḥummayāt*, 98r, 3

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medical writings reflect on the one hand his systematic approach to the teaching of medicine to his disciples and followers, and on the other the new conception of medicine applied by the physicians-philosophers who, following al-Fārābī were more philosophers than physicians – the best examples of which are Ibn Sīnā's *Qānūn fī al-ṭibb* and Ibn Rushd's *Kulliyyāt fī al-ṭibb*. It is more doubtful that Ibn Bājja's medical treatises were the author's first attempts to write a full-fledged textbook of this kind, but we cannot rule out this possibility completely.

Ibn Bājja's medical treatises seem at first glance to bear little connection to either *Qānūn* or *Kulliyāt*. In common with his philosophical works, these texts present no textual evidence of the fact that the author had read Ibn Sīnā; neither the Galenic[24] commentaries of Ibn Rushd nor his *Kulliyyāt* bear great similarities to Ibn Bājja's medical works although they coincide suspiciously in many instances. Now, it is possible, if not probable, that Ibn Bājja was aware of the *Qānūn*[25] and that Ibn Rushd was thinking of Ibn Bājja's commentaries to Galen when he wrote his own commentaries and *K. al-Kulliyyāt*.[26] Whatever the case, Ibn Bājja's medical writings occupied a particular place between Ibn Sīnā and Ibn Rushd and were written by an indirect disciple of al-Fārābī who held the deep

[24] Ed. María de la Concepción Vázquez de Benito (*Commentaria Averrois in Galenum* [Madrid, 1984]). Ibn Rushd also wrote commentaries to *Elementis ex Hippocrate*, *De temperamentis* and *De Febrium Differentiis*.

[25] Unlike his philosophical works, there is textual and historical evidence that Ibn Sīnā's *Qānūn* had reached al-Andalus during the first decades of the 12th century or even earlier. On the one hand, Ibn Wāfid's treatises contain several quotations of Ibn Sīnā; on the other, A. Z. Iskandar discovered in a treatise by the Egyptian physician of the 6/12th century, Hibat Allāh b. Jumayʿ (see Emily Savage-Smith, "Medicine", in Roshdi Rashed (ed.), *Encyclopedia of the History of Arabic Science*, 3 vols [London-New York, 1996], vol. 3, pp. 903–62, pp. 925–6) the following story: a merchant brought Abū al-ʿAlāʾ Zuhr a good copy of the *Qānūn* from Iraq; the latter dismissed the treatise as a textbook for beginners, "because of the unusual terms and philosophical meanings which it contains"; see moreover Cristina Álvarez Millán, "Ibn Zuhr, Abū l-ʿAlāʾ", BA (Almería, 2009), vol. 6, pp. 340–50, p. 344.

[26] The resemblances between Ibn Rushd's and Ibn Bājja's commentaries to Galen are not sufficient to establish a clear connection between the two authors. Nevertheless, as is well known, the epitomes of Aristotle's works that Ibn Rushd wrote during his first epoch are clearly indebted to Ibn Bājja's commentaries; there are also a couple of coincidences which suggest that both Ibn Rushd and Maimonides were aware of Ibn Bājja's commentary of the *Aphorisms*: at the beginning of *K. al-Kulliyyāt fī al-ṭibb* (1–5; see below 4.5.), Ibn Rushd mentions al-Fārābī's divisions of medicine in much the same way as Ibn Bājja, and quotes Hippocrates' first aphorism to say that life is too short to attain certitude in the field of pharmacology but not in the deductive parts of medicine; likewise, Maimonides mentions al-Fārābī's division in commenting on the first aphorism (trans. of Ariel Bar-Sela & Hebbel E. Hoff, "Maimonides' interpretation of the first aphorism of Hippocrates", *Bulletin of the History of Medicine*, 37 (1963): 347–54, pp. 349–50; see moreover Sarah Stroumsa, "Al-Fārābī and Maimonides on medicine as a science", *Arabic Sciences and Philosophy*, 3 [1993]: 235–49).

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conviction that philosophy could improve medicine and that Galenism should be subsumed into Aristotelianism.

ʿAlawī divides Ibn Bājja's oeuvre into three epochs: first, the formative period in which he addressed mathematical disciplines and wrote his commentaries to al-Fārābī's logical works; a second period in which he commented on Aristotle's natural philosophy; a third in which he wrote his more personal works.[27] So far as I know, no source provides even the slightest evidence of the time or the circumstances under which the medical treatises were written; however, their contents give some valuable information:

i. The commentaries to Galen bear significant similarities to *Kalām fī al-Hay'a* and an epistle on mathematics addressed to Ibn al-Imām,[28] which are devoted to particularizing, for astronomy and mathematics, the lessons on scientific epistemology and method that Ibn Bājja extracted from al-Fārābī's works; *Sharḥ al-Fuṣūl*, as we will see below, is particularly indebted to them.
ii. The commentaries to *De Elementis* and *De Temperamentis* present implicit and explicit mentions of Aristotle's natural philosophy;[29] in some instances, there are striking similarities between them and Ibn Bājja's commentaries to Aristotle which are difficult to explain by the common origin of the materials.[30]

Thus, it would make sense to situate the medical works at a time when Ibn Bājja had already mastered the *Organon* via al-Fārābī and had begun his commentary to Aristotle's natural philosophy. Using ʿAlawī's periodization, this means of Ibn Bājja's second epoch.

[27] Al-ʿAlawī, *Mu'allafāt*, pp. 154 ff.
[28] Ibn Bājja, *Rasā'il Falsafiyya*, ed. al-ʿAlawī (Beirut-Casablanca, 1983), pp. 88 ff.
[29] The following commentaries of Ibn Bājja have come down to us: *Physics*, see Paul Lettink, *Aristotle's* Physics *and its Reception in the Arabic World with an Edition of the Unpublished parts of Ibn Bājja's Commentary on the* Physics (Leiden *et al.*, 1994), in which the author gives a full account of the book on the basis of the texts edited by Maʿṣūmī and Fakhry and edits some new fragments; *On Generation and Corruption*, ed., com. and Spanish trans. by Josep Puig Montada, *Avempace, Libro de la Generación y la corrupción* (Madrid, 1995); *Meteorology*, ed., com. and English trans. by P. Lettink, *Aristotle's* Meteorology *and its Reception in the Arab World* (Leiden *et al.*, 1998); biological treatises, extant in a book in which Ibn Bājja focused on *On the Parts of Animals* and *On the Generation of Animals*, ed. and comm. J. al-ʿImāratī, *Kitāb al-Ḥayawān li-Abī Bakr Ibn Bājja* (Casablanca, 2002).
[30] See, among other examples that can be gleaned from the texts: the examples of verdigris and oxymel given in *Qawl fī al-Mīzāj* (b) (84r, 15 and 26) which appear recurrently in Ibn Bājja's commentary to *Physics* (ed. Lettink, pp. 71–72, 89–91, 161 and passim); a passage of *Qawl fī al-Usṭuqusāt* (80r, 1-7) on the atomists closely resembles another passage from the commentary to *On Generation and Corruption* (ed. Puig Montada, p. 15, 1-4).

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3. IBN BĀJJA'S *SHARḤ FĪ AL-FUṢŪL*: THE TEXT AND THE CONTEXT

The text that has come down to us is devoted to the first aphorism of Hippocrates. However, the plural "*fuṣūl*" appears in the title, and the author makes a number of general considerations about the meaning of "aphorism"; he discusses the work of the *Aphorisms*' commentators and says that he intends to treat the text in much the same way as Galen and his other predecessors. So it would seem that Ibn Bājja actually wrote a longer commentary in which he glossed the other aphorisms. As explained earlier, there is neither direct nor indirect evidence to ascertain whether the rest of the work was lost or never written and, given the focal importance of the first aphorism, it may well be that Ibn Bājja lost interest in continuing the book once he had given his readership some essential guidelines about medicine and experience.

Ibn Bājja's *Sharḥ fī al-Fuṣūl* can be ascribed to two distinct traditions. First, it belongs to the Arabic scholarship devoted to glossing Hippocrates' *Aphorisms*, a book that was known in Islamic medicine together with Galen's commentary. The first aphorism, whose initial clauses may be considered as "the most frequently quoted words of world literature,[31] reads as follows in the Arabic translation of Ḥunayn ibn Isḥāq:[32]

(i.) *Al-ʿumr qaṣīr wa-al-ṣināʿa ṭawīla wa-al-waqt dayyiq wa-al-tajriba khaṭar wa-al-qaḍāʾ ʿasīr*

(ii.) *wa-qad yanbaghī laka allā yaqtaṣira ʿalā tawwaḥī fiʿl mā yanbaghī dūna an yakūna mā yafʿaluhu al-marīḍ wa-man yaḥḍuruhu kadhālika wa-al-ashyāʾ allātī min khārij.*

As Galen says at the beginning of his commentary, it is not clear whether this should be considered as one or two aphorisms. Galen

[31] Franz Rosenthal, "Life is short, art is long. Arabic commentaries on the first Hippocratic aphorism", *Bulletin of the History of Medicine*, 40 (1966): 226–45, p. 226, quoting E. Nachmanson. Rosenthal's paper is the best study of the significance of Hippocrates' first aphorism for Arabic medicine. See moreover Bar-Sela & Hoff, "Maimonides' interpretation", pp. 347–54, about Maimonides' commentary; more recently, Amal Abou Aly has added new interesting materials from Ibn al-Nafīs ("A few notes on Ḥunayn's translation and Ibn al-Nafīs Commentary on the First Book of the *Aphorisms*", *Arabic Sciences and Philosophy*, 10 (2000): 139–50, esp. pp. 146–9).

[32] Galen *arabus*, *Tafsīr Jālīnūs li-Fuṣūl Abuqrāṭ*, MS BNP Ar. 2837, 1r., 3–5; *In Hipp. Aph. Comm.*, ed. Kuhn, XVIIb, 345. Ḥunayn's version may be translated as: "life is short, art long, the moment narrow, experience dangerous and judgment difficult; sometimes it may be desirable that you do not confine yourself to performing immediately what ought to be done without taking into account how the patient and who accompanies him act and the external circumstances". W. H. S. Jone's translation for Loeb Classical Library (*Hippocrates. Vol. IV* [Harvard, 1931], p. 99) says: "Life is short, art long, opportunity fleeting, experiment treacherous, judgement difficult. The physician must be ready, not only to do his duty himself, but also to secure the cooperation of the patient, of the attendants, and of the externals".

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concludes that it contains two parts, the second of which may be subdivided further, into two smaller parts: one addressed to the physician ("the physician must be ready, not only to do his duty himself" and another to the person who reads or judges the treatise ("but also to secure the cooperation of the patient, of the attendants, and of the externals").[33] Ibn Bājja wants nevertheless to present an all-embracing interpretation of the aphorism which is fairly original in many instances. According to him and to the Arabic and Jewish physicians who interpreted the aphorism following Galen, the gist of its first part can be described as follows: life is too short and medicine (or any other science) too complicated to be learnt on one's own;[34] the good physician is therefore one who has a solid theoretical background and a sound training that guides his practice; he must only prescribe treatments that are warranted by the authority of precedent physicians, for otherwise the risk for the patient would be too great.[35] Underlying this notion is the famous argument between the Dogmatists (theoretically-biased physicians) and Empiricists which pervaded all ancient medicine until Galen – a dogmatist who in fact was not so dogmatic – synthesized the two methods and established a new canon for medicine.[36]

Equally, Ibn Bājja's *Sharḥ* may be placed into an Andalusī context since two other commentaries were made by Andalusians during the 6/12th century, two Jewish physician-philosophers who wrote in exile in Egypt: The first is Yūsuf ibn Aḥmad b. Ḥasdāy, a Saragossan compatriot and friend of Ibn Bājja, who belonged to a well-known family of physician-philosophers.[37] The second is the famous Maimonides, who

[33] I follow Juan A. López Férez, "Acerca del comentario de Galeno a los aforismos hipocráticos", in J. A. López Férez (ed.), *Galeno: obra, pensamiento e influencia* (Madrid, 1991), pp. 161–203, p. 162, *apud In Hipp. Aph. Comm.*, ed. Kuhn, XVIIb, 348.

[34] It is implied in this statement that empiricism means to neglect the knowledge which is transmitted through learning as well as knowledge deduced by means of reasoning.

[35] I have summarized some salient aspects of the commentaries of Ibn Bājja, Ibn Abī Ṣādiq, 'Abd al-Laṭīf al-Baghdādī (according to Rosenthal, "Life is short", pp. 232–5 and 237–40) and the commentary of Maimonides (Bar-Sela & Hoff, "Maimonides' interpretation", pp. 349 ff). These commentaries differ from each other in many instances, but it is beyond the scope of the present paper to analyse these variations in detail. Nonetheless in dealing with Ibn Bājja's text I will indicate the places where he departs from Ibn Abī Ṣādiq's commentary.

[36] See A. López Férez, "Aforismos", in Carlos García Gual *et al.* (ed.), *Tratados hipocráticos* (Madrid, 1983), pp. 211–97, p. 230, and Wesley D. Smith, *The Hippocratic Tradition* (Ithaca-London, 1979; electronic version, 2002, www.bium.univ-paris5.fr/amn/Hippo2.pdf), pp. 129–30, 208 and 239 (both on the basis of K. Deichgräber, *Die Griechische Empirikerschule* [Berlin, 1930]): the Empiricists said that *Aphorisms* agreed with their methods, but Galen considered it from the outset as a book written by a dogmatist.

[37] On him and his family, see Ángel C. Lopez "Ibn Ḥasdāy, Abū Ŷa'far", BA (Almería, 2004), vol. 3, pp. 309–10. His friendship with Ibn Bājja is attested by a letter that Ibn Bājja wrote to him. Among several references to scientific issues (mathematics, astronomy, music, physics), this letter contains a well-known paragraph in which Ibn Bājja explains his scientific and philosophical training (Ibn Bājja, *Rasā'il Falsafiyya*, pp. 77 ff).

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wrote a commentary (*Sharḥ Fuṣūl Abuqrāṭ*) which has come down to us.[38] Since Yūsuf ibn Aḥmad b. Ḥasdāy and Ibn Bājja received their intellectual education in the cradle of Andalusī philosophy, the Saragossan circles of the late 11th century, and since Maimonides was well acquainted with Ibn Bājja's works, it seems that these commentaries may well have been the result of a reflection made by the Andalusī physician-philosopher on the grounds of Aristotelian philosophy. Be that as it may, it is worth noting that Ibn Bājja's commentary, like that of Maimonides, is far from being a manifesto in favour of a theoretical medicine that dismisses the importance of practice. Quite the contrary, it is an attempt to frame medical practice within the larger context of the sense that "experience" takes in Aristotelian philosophy. The author relies on two major sources: on the one hand, the commentary written in ca. 460/1067-8 by an alleged disciple of Ibn Sīnā, Ibn Abī Ṣādiq, which was one of most popular commentaries of the *Aphorisms* in Islamic medicine;[39] on the other, and as we will see in the next section, al-Fārābī's works.

4. BETWEEN AL-FĀRĀBĪ'S LOGIC AND MEDICINE

4.1. *The term* faṣl

Galen's commentary to Hippocrates' *Aphorisms* is a complex work in which the author analyses the text at great length and from several perspectives, particularly medical and philological.[40] Ibn Bājja approaches Galen's commentary in much the same way as Galen had approached Hippocrates, tackling the work from the perspective of his own concerns which are, in this case, the terminological precision and methodological consistency advocated by his *maître à penser*, al-Fārābī. The influence of the latter's texts on logic in Ibn Bājja can be traced from the outset. The commentary is preceded by a prologue in which Ibn Bājja notes that Galen and other commentators before him discussed the text of the *Aphorisms* in detail and that Galen criticized the conclusions of his predecessors, rearranged the words of several aphorisms, changed their order, identified some of them as spurious, gave alternative readings in many instances, and

[38] On this commentary, see Rosenthal, "Life is short", pp. 236–7, the bibliography quoted here and most particularly Bar-Sela & Hoff, "Maimonides' interpretation", which gives a translation into English of the first aphorism; see also the recent translation into Spanish by Lola Ferre, *Maimónides. Obras médicas, III: El comentario a los aforismos de Hipócrates* (Córdoba, 2004).

[39] Rosenthal, "Life is short", p. 232. On the author, see Lutz Richter-Bernburg, "Ebn Abī Ṣādeq", *Encyclopaedia Iranica*, electronic ed. www.iranica.com (printed ed., 7, 663).

[40] For a survey of the matters addressed by Galen in his commentary, see López Férez, "Acerca del comentario", pp. 163 ff.

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so on.[41] In considering these philological, medical and philosophical problems at the beginning of the commentary, Ibn Bājja deals with the problem of the underlying structure of an aphorism, which automatically poses the question of what an aphorism is:[42]

Our object in this discourse is the commentary of what Hippocrates affirmed in his book entitled *Aphorisms* [*fuṣūl*]. This treatise has come down to us together with the commentary of Galen, yet what the latter states is not enough so as to understand what Hippocrates says.

He employs the plural "aphorisms" since "aphorism" [*faṣl*] signifies a unified phrase which is made up by two other phrases, each of them is one in end and is a *faṣl*. The "aphorism" is a complete phrase, be it one or more than one, which is possible to be considered as a definition of a phrase composed of several complete phrases.

Since any phrase is directed towards a purpose, and the issue towards which one aims may be divided into other issues which may be likewise considered as a purpose which is intended by means of phrases, these phrases directed towards this purpose are a *faṣl*, [yet] these phrases are also *fuṣūl* and differ from each other according to the divisions of the ultimate purpose.

The issues into which [the major purpose] is divided are their "major aphorisms", and we name all those that lie under them "minor aphorisms". The more these major purposes differ from one another, the more complete is the name "aphorism" that may be given to any of these phrases. The title of the book signifies that it is composed of phrases whose purposes differ from one another, and the more clear that difference is, the worthier of the name "aphorism" is any phrase which intends this purpose.

The definition of aphorism (*faṣl*) as a phrase ("major aphorism") unified by a common, albeit multifaceted, purpose (*gharad*) made up by two or more phrases that may be subdivided into several phrases of lesser degrees of generality ("minor aphorisms"), fits the structure of a proposition composed by subject and predicate unified by the fact that they express a definition, in which one may distinguish other elements, the five predicables of Porphyry, which gradually, and also in descending degree of generality convey all the nuances of a term according to the "Porphyrian table".[43] Needless to say, Ibn Bājja learnt this structure in al-Fārābī's epitome of Porphyry's *Eisagoge* and in other commentaries of this kind. The

[41] López Férez, *ibid*., pp. 179–92.

[42] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 85a, 1–14. The Arabic text of the excerpts from *Sharḥ fī al-Fuṣūl* which are translated in the body of the present paper will be given as an appendix.

[43] On the Porphyrian table in Arabic-Islamic philosophy, see Miklós Maróth, "Taṣawwur and Taṣdīq", in *Knowledge and the Sciences in Medieval Philosophy. Proceedings of the VIII International Congress of Medieval Philosophy* (Helsinki, 1990), 2, pp. 265–74, pp. 268–73; and *Die Araber und die Antike Wissenschaftstheorie* (Leiden *et al*., 1994), passim.

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term *faṣl*, which in the Arabic *Eisagoge* means differentia (*diaphora*), provides Ibn Bājja with the key-concept with which he understands *faṣl* as *aphorismos*. He draws a forced parallelism between, on the one hand, the predicable (*diaphora*) which allows us to distinguish among the elements comprised in a genus and to formulate together with the genus a definition of a term; and, on the other, the complex phrase (*aphorismos*) which is different from other phrases because one can recognize it as a unit of meaning. The true *diaphora* that makes a phrase an *aphorismos* is its purpose. In one collection of the notes that Ibn Bājja wrote to al-Fārābī's introductory treatises on logic, the author refers to the initial words of the latter's commentary to *Eisagoge*[44] in an obscure sentence which may be translated as follows:[45] "the *faṣl* is the *faṣl* of what is intended absolutely". Though we lack the context necessary to ascertain the real meaning of the sentence, there is no doubt that Ibn Bājja believes here that what produces unity of sense in a *faṣl*, be it a section or an aphorism, is some intention. His notes to al-Fārābī's short commentary to *On Interpretation* provide further clarification with reference to complete phrases: "the complete phrase (*al-qawl al-tamm*) is the phrase composed with some deliberate purpose (*gharad maqṣūd*) and it is long or short according to the amplitude or brevity of the subject."[46] So a *faṣl*, thus considered, is an intermediary step between a *faṣl* understood as *diaphora* and a third and most common meaning of this word, "section" or "chapter": an extremely abridged chapter which is longer than a simple proposition.

4.2. *The main purpose of the Aphorisms and the parts of medicine*[47]

Some lines further down, Ibn Bājja says that the main purpose of the book is no other than the main purpose of medicine, that is, to set the rules for achieving health.[48] This purpose is considered in the

[44] These initial words are: *qaṣadnā fī hādha al-kitāb iḥṣā' al-ashyā' allātī ʿanhā tu'talafu al-qaḍāyā wa-ilayhā tanqasimu* ("our purpose in this book is the enumeration of the things of which judgements are composed and into which they are divided"; ed. and trans. D. M. Dunlop, "Al-Fārābī's *Eisagoge*" *The Islamic Quarterly*, 3 (1956): 117–38, pp. 118 and 127).

[45] Ibn Bājja, *[Taʿālīq] K. Īsāghūjī*, ed. Fakhry, *Taʿālīq Ibn Bājja ʿalā Manṭiq al-Fārābī* (Beirut, 1994), p. 26, 5–6: *al-faṣl huwa faṣl al-qāṣid min haythu huwa qāṣid*. The trouble with this collection of notes is that they do not only gloss al-Fārābī's *Eisagoge* but contain materials taken from other works (*al-Fuṣūl al-Khamsa*, "the five sections" and *Risāla Ṣudira bihā al-Kitāb*). It is therefore possible that Ibn Bājja is alluding to the "sections" that al-Fārābī devoted to logic and is comparing them to Hippocrates' aphorisms.

[46] Ibn Bājja, *[Taʿālīq] K. al-ʿIbāra*, ed. Fakhry, *Taʿālīq*, p. 146, 18–19. On the meaning of "complete phrase" in that context, see F. W. Zimmermann, *Al-Fārābī's Commentary and Short Treatise on Aristotle's De Interpretatione* (Oxford, 1981), introd., lvi and trans., p. 226.

[47] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, fol 85a, 26–86a, 7.

[48] Note that Ibn Bājja synthesizes the two-tier formulation which is usual in the Islamic manuals – preservation of health and elimination of disease.

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framework of the three-tier division of medicine established by al-Fārābī in his critical commentary to Galen entitled *Risāla fī Aʿḍāʾ al-insān* ("epistle on the parts [organs] of the human body"),[49] where the author not only aims to restructure medicine but also to redirect some Galenic doctrines towards Aristotelianism.[50] According to this division, medicine, as an operative art (*ṣināʿa fāʿila*), comprises three elements:

i. the issues in which medicine acts (*al-umūr allātī fīhā yafʿalu*): its substrate, the human body
ii. the issues for which it acts (*al-umūr allātī ʿanhā yafʿalu*): the end that medicine must achieve in that substrate, preservation of health and elimination of disease
iii. the issues by means of which and from which it acts (*al-umūr allātī bihā wa-ʿanhā yafʿalu*): therapy and its various means

These elements are considered as the main parts of medicine, and they are further subdivided into seven parts that a physician must necessarily know:[51]

i. *al-umūr allātī fīhā yafʿalu* (in which)	i. human body (anatomy, temperament and so on)
ii. *al-umūr allātī ʿanhā yafʿalu* (for which)	ii. (ii.i.) kinds of healthy states (in general and in each organ) iii. (ii.ii) kinds of disease (in general and in each organ) iv. (ii.iii) symptoms and all that they entail (diagnosis, prognosis and so on)
iii. *al-umūr allātī bihā wa-ʿanhā yafʿalu* (by means of which)	v. (iii.i) foods, drugs and the rest of therapeutic means

[49] Al-Fārābī, *Risāla fī Aʿḍāʾ al-insān*, ed. ʿAbd al-Raḥmān Badawī *Rasāʾil Falsafiyya li-al-Kindī wa-al-Fārābī wa-Ibn Bājja wa-Ibn ʿAdī* (s.l., 1980), p. 51, 7–12. Ibn Bājja mentions neither the author nor the work.

[50] *Risāla fī Aʿḍāʾ al-Insān* appears as a section of a longer tract entitled *Risāla li-al-Fārābī fī al-radd ʿalā Jālīnūs fī mā nāqaḍa fīhi Arisṭūṭālīs li-aʿḍāʾ al-insān* ("epistle on the refutation of Galen in which he contradicted Aristotle on the purpose of the organs [parts] of human body"). The work (or collection of short tracts) contains still another section named *Risāla li-al-Fārābī fī aʿḍāʾ al-ḥayawān wa-afʿālihā wa-quwāhā* ("epistle on the organs [parts] of animals, their functions and their capacities"). This work has probably not been studied in the detail that it deserves but the reader will find an interesting approach in Lutz Richter-Bernburg, "Abū Bakr al-Rāzī and al-Fārābī on medicine and authority", in Peter Adamson (ed.), *In the Age of al Fārābī: Arabic Philosophy in the Fourth/Tenth Century*, (London, 2008), pp. 119–30, which also contains the main bibliography. I will return to these texts in *Ética e ideología de la ciencia*.

[51] *Ibid*., p. 53, i.f. – p. 54, 9. See also Ibn Rushd (*K. al-Kulliyāt fī al-ṭibb*, pp. 2–3), and Maimonides (commentary to Hippocrates' first aphorism, English trans. cit., 349–350), who specifies further al-Fārābī's text.

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vi. (iii.ii) rules of the actions by which health is preserved (according to Ibn Rushd, exercise, bath, diet and so on)
vii. rules of the actions by which disease is eliminated (according to Ibn Rushd, the various treatments for specific diseases)

For Ibn Bājja, the three-tier division is an essential principle of order to understand not only the *Aphorisms* but also Hippocrates' entire oeuvre. He says that the *Aphorisms* are devoted to the second part of medicine,[52] and considers moreover that Hippocrates establishes here the "most general rules" of this second part in such a way that the book contains the "major aphorisms" and that the "minor aphorisms" are explained in the other works that Hippocrates wrote.[53] Ibn Bājja classifies Hippocrates' books according to the three-tier division:

i. *al-umūr allātī fīhā yafʿalu* (in which)	*Ṭabīʿat al-insān* (*On the Nature of Man*)
ii. *al-umūr allātī ʿanhā yafʿalu* (for which)	*Abīdhīmiyā* (*Epidemics*)
	al-Amrāḍ al-ḥādda (*On acute diseases*)
	al-Kasr wa-al-khalʿ (*On Fracture and Dislocation*)
	Taqdimatu al-maʿrifa (*Presentation of the Knowledge*)
	Fī al-Qurūḥ (*On Ulcers*)
iii. *al-umūr allātī bihā wa-ʿanhā yafʿalu* (by means of which)	*K. Qāṭyaṭriyūn* (*On Surgery*)[54]

The implicit gist of this Farabian reconsideration of the structure of the *Aphorisms* and Hippocrates' oeuvre is that not only these two elements, but medicine as a whole, must be embedded in a

[52] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 85v, 6–9. He says specifically (*ibid*., fol. 85v, 1–5) that the book contains materials about therapy (*ṣināʿa mubrīʾa*), prognosis (*ṣināʿa istidlāliyya*) and the "discipline that studies the classes of health and disease"; the book does not contain materials about anatomy (*ṣināʿa fī manāfiʿ al-aʿḍāʾ* and *tashrīḥ*) or about the rest of medical disciplines. Note that the materials about therapy mentioned by the author would correspond to the third part.

[53] Ibn Bājja, *ibid*., 85r, 19–25.

[54] Ibn Bājja stresses that he has found no general rules regarding the third part in all the books by Hippocrates that he has read, with the exception of *K. Qāṭyaṭriyūn*.

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classification scheme which, on the one hand, differentiates between general and particular elements; and, on the other, does justice to the complexity of the matter and its condition as a theoretico-practical discipline, so that it may be reliably presented and properly taught. As is well known, Ibn Rushd does this in his *Kulliyyāt fī al-ṭibb* where he expounds the general rules of medicine according to al-Fārābī's seven-tier classification.

4.3. *Art* (ṣināʿa)*, experience* (tajriba) *and auctoritas* (maqbūl/mashhūr)

The gloss of "life is short, art long" is particularly lengthy and dense but it can be reduced to two points which are briefly and straightforwardly explained by Ibn Bājja's immediate predecessor and his immediate successor. The former, Ibn Abī Ṣādiq,[55] says in his commentary that "art"[56] in that context means not just medicine but any other discipline, and that the arts cannot be mastered unless one learns everything that has been produced by one's predecessors. In this regard, Ibn Bājja points out that one must specify that art does not refer to a purely abstract discipline, for otherwise we should reverse the terms of "life is short, art long". Ibn Bājja's successor, Ibn Rushd,[57] says in *Kulliyyāt* that these words apply to the search for knowledge in the empirical parts of medicine, namely pharmacology,[58] but not to the theoretical part (*al-ṭibb al-qiyāsī* or "deductive medicine"). Ibn Bājja's purpose in this section would be to prove beyond any reasonable doubt that any discipline in which empirical data intervene requires many years of study, in contrast to purely abstract and deductive disciplines (for example, mathematics) in which, once the student or the scholar has become acquainted with the proper premises, he can automatically produce a correct syllogism. All these issues are summarized in the following fragment from the text:[59]

> 2. Experience, then, is what requires a long time and if we compare life with the time taken to attain cognitions by means of empirical methods, it may be said that life is short and art long. Now, once the premises are attained, the time in which one discovers a middle term so as to compose a syllogism is really short; therefore, human life is really long compared to it.

Ibn Bājja's argumentation stems from the Aristotelian/Farabian assumption that: first, there are purely theoretical arts such as

[55] Rosenthal, "Life is short", p. 233.
[56] Henceforth "art" (*ṣināʿa*) should be understood in its general sense of "discipline".
[57] Ibn Rushd, *K. al-Kulliyāt fī al-ṭibb*, p. 4.
[58] For Ibn Rushd (*K. al-Kulliyāt fī al-ṭibb*, p. 3), empirical medicine means first and foremost pharmacological therapy in his time.
[59] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 86v, 12–15.

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geometry which are developed through syllogistic reasoning, and practical-empirical disciplines such as medicine in which syllogistic reasoning is an auxiliary tool that permits the accomplishment of a particular end (in medicine, preserving and restoring health);[60] second, that there are mixed disciplines such as astronomy and optics in which syllogistic reasoning proceeds on the basis of empirical premises; third, that these three kinds of discipline interrelate with each other according to a complex network of bonds of coordination and subordination.[61]

On this basis, Ibn Bājja explains "life is short, art long" in detail, focusing on two main questions:[62] first, the relationship between time and art; second, what is experience and what is the role it plays in the different kinds of disciplines. As regards the first, he distinguishes between two kinds of relation between time and art: on the one hand, art exists in time (lit. "the existence of the art accompanies time", *yusāwiqu wujūduhā al-zamāna*); on the other, the fact that one must devote some time to acquiring an art (*iqtināʿ al-ṣināʿa* or "acquisition of the art"). As the second aspect is the more important, he proceeds to analyze the ways by which an art is mastered: deduction (*al-iqtināʿ bi-al-qiyās*) and acquisition via "*taʿammudu al-iḥsās bi-juzʾiyyātihā*.[63] This latter expression, which can be translated as "the purpose to sense the particulars (of a given art)" is equated immediately with experience (*tajriba*):[64]

3. Experience is man's purpose to sense particulars of an issue, which conveys to him, on the basis of such perceptions, some knowledge.

[60] This distinction between syllogistic and non-syllogistic is explained in al-Fārābī's introductory work on logic known as *Risāla Ṣudira bihi*, and was commented by Ibn Bājja in his notes to al-Fārābī's logic (see Miquel Forcada, "Ibn Bājja and the classification of the sciences in al-Andalus", *Arabic Sciences and Philosophy*, 16 (2006): 287–307, pp. 298 ff and the references given there).

[61] On the problematic of mixed and subordinate sciences according to Aristotle, see, respectively, James G. Lennox, "Aristotle, Galileo and mixed sciences", in William A. Wallace (ed.), *Reinterpreting Galileo. Studies in Philosophy and the History of Philosophy* (Washington, 1986), 29–51 and Richard D. McKirahan, "Aristotle's subordinate sciences", *British Journal for the History of Sciences*, 11 (1978): 197–220. On these questions in al-Fārābī, see an overview by Gerhard Endress, "Mathematics and philosophy in Medieval Islam", in A.I. Sabra and J.P. Hogendijk (eds.), *The Enterprise of Science in Islam. New Perspectives* (Cambridge Mss.-London, 2003), pp. 121–76, pp. 139–40), on the basis of *K. al-Burhān*, ed. Fakhry, *Al-Manṭiq ʿinda al-Fārābī. Kitāb al-Burhān wa-Kitāb Sharāʾiṭ al-Yaqīn maʿa Taʿālīq Ibn Bājja ʿan al-Burhān* (Beirut, 1987), pp. 59 ff. I will study Ibn Bājja's understanding of these issues in a paper on the premises of scientific thinking according to his works on logic and natural science.

[62] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 86r, 7 ff.

[63] Ibn Bājja, *ibid*., 86v, 2–4. Ibn Bājja specifies next that the cognitions thus obtained (by means of experience) may be either theoretical or practical.

[64] Ibn Bājja, *ibid*., 86v, 6–7.

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Some lines further down, the author specifies that this knowledge is universal:[65]

4. Experience is said generally or specifically and when it is said generally it signifies the purpose to sense particular instances of some issue so as to obtain a universal judgment from the singular elements brought about by either human will or by nature.

Ibn Bājja's definition of experience reproduces al-Fārābī's definition in *K. al-Burhān* and *K. al-Mūsīqā al-Kabīr*, where *tajriba* does not render *empeiria* but *epagôgê*, the inductive process described in Aristotle's *Posterior Analytics* (II.19) which allows us to discover the first principles of a demonstrative syllogism (*archai*).[66] How this "experience" yields knowledge is explained as follows (in italics the lines that inspired Ibn Bājja; cf. texts 3 and 4 above, and 5 below):[67]

[Knowledge] occurring by "experience" consists of universal premises that this way of ascertaining, which derives from our purpose to sense particulars of them – regardless of their being few or many – makes us know for sure. Indeed, "experience" means that we examine particular [instances] of universal premises, *i.e.*, that we consider attentively what is predicated of [the latter] in each of the former, and also that we pursue [our investigation] in the totality of or in most of [these particular instances], until the necessary certitude of knowledge is attained by us.

In this context, *tajriba* is a second way of obtaining indisputable first principles, the other being some kind of natural awareness of essential truths such as "the whole is greater than the part".[68] On the basis of this Farabian approach to *tajriba*, Ibn Bājja considers

[65] Ibn Bājja, *ibid*., 88r, 20–22.

[66] On al-Fārābī's understanding of *tajriba*, see J. L. Janssens, "'Experience' (*tajriba*) in classical Arabic philosophy (al-Fārābī -Avicenna)", *Quaestio*, 4 (2004): 45–62, pp. 47–52 (and I am very grateful to Prof. Janssens for informing me of the existence of his article); on the problematic of *tajriba/epagôgê* and induction which is beyond the scope of this paper, see: Miriam Galston, *Opinion and Knowledge in Fārābī's understanding of Aristotle's Philosophy*, unpublished Ph.D. (Chicago, 1973), pp. 225–30 passim; Joep Lameer "*Al-Fārābī and Aristotelian Syllogistics. Greek Theory and Islamic Practice* (Leiden *et al*., 1994), pp. 143–73 (particularly, 169–73); see moreover R. Jim Hankinson, "Art and experience: Greek philosophy and the status of medicine", *Quaestio*, 4 (2004): 3–24, pp. 5–7.

[67] Al-Fārābī, *K. al-Burhān*, p. 24, 17–20. I reproduce Janssens' excellent translation ("Experience", pp. 51–2). See a similar approach to the question in al-Fārābī's *K. Mūsīqā al-Kabīr*, ed. G.A. Khashaba & M.A. Ḥafnī (Cairo, 1967), pp. 92–100, esp. p. 96.

[68] On this, see Al-Fārābī, *K. al-Burhān*, p. 23, 2–10. He names these cognitions *al-muqaddamāt al-ulā al-ṭabī'a fī al-insān*, "first premises which are imprinted in human being". This question is beyond the scope of this paper, yet the reader will find enough references to it and to the other three kinds of premises in Galston, *Opinion and Knowledge*, pp. 109–58, Deborah L. Black, *Logic and Aristotle's Rhetoric and Poetics in Medieval Arabic Philosophy*, (Leiden *et al*., 1990), pp. 94–102 and Philippe Vallat, *Farabi et l'École d'Alexandrie. Des prémisses de la connaissance à la philosophie politique* (Paris, 2004), passim. On Ibn Bājja and the premises of science, see my forthcoming paper.

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experience in medicine and mixed sciences such as astronomy, optics, music and physics as a way, on the one hand, to obtain the premises from which a syllogism may be composed, and, on the other, to acquire an art.

As is well known, al-Fārābī says that there are four classes of indemonstrable premises: given by the tradition (*maqbūlāt*), commonly accepted (*mashhūrāt*), sense perceptions (*maḥsūsāt*) and primary intelligibles (*maʿqūlāt uwal*).[69] As is also well known, only this last class of premises would be, in principle, valid in science inasmuch as they are the only cognitions from which one may draw indisputable and universal conclusions, yet al-Fārābī relaxes the strict requisites of certitude so as to fit the conclusions which bear only approximate certitude into the framework of science and demonstrative syllogisms.[70] This can be seen in his *K. al-Mūsīqā al-kabīr*, where the author deals with the premises of music, the discovery of which is compared to that of medicine and astronomy: given that these three disciplines are subordinate (music to arithmetic, astronomy to geometry and medicine to physics) and not purely abstract (music and astronomy are syllogistic-mixed sciences and medicine is non-syllogistic and practical), they find their premises either in the superior discipline to which they are bound, or in experience. Experience, in turn, may be of two kinds: personal experience, or the accumulated experience of one's predecessors, *i.e.* what is commonly accepted by the scientific community on the basis of, in principle, actual, albeit ancient experience:[71]

> The position of affairs in these things (experience in music) is the same as that of the sciences that draw most of their principles from the experience in sensibles, such as astronomy, and, to a great extent, optics and medicine. This latter discipline takes most of its principles from physics and most others from the experience in sensibles, such as what comes from the experience in that which is perceived in dissection or in simple drugs. Likewise, most of the principles of the astronomy reach the investigator through perception by means of observation and instruments. Just as the investigator in astronomy and medicine is not obliged to perform the dissection and the observation himself, but it suffices that both operations are done in his presence and that he should observe directly what appears, it is not necessary

[69] See for instance, al-Fārābī, *al-Fuṣūl al-Khamsa*, ed. D. M. Dunlop, "Al-Farabi's introductory sections on logic", *The Islamic Quarterly*, 2 (1955): 264–82, p. 267, 3–15, and *K. al-Jadal* (epitome of *Topics*), ed. Rafiq al-ʿAjam (Beirut, 1986), 18 ff.

[70] On this question see the recent and thorough analysis by D.L. Black, "Knowledge (*ʿilm*) and certitude (*yaqīn*) in al-Fārābī's epistemology", *Arabic Sciences and Philosophy*, 16 (2006): 11–45; see moreover Galston, *Opinion and Knowledge*, pp. 210 ff.

[71] Al-Fārābī, *K. al-Mūsīqā al-Kabīr*, pp. 101–2. On the other hand, it is all the more probable that Ibn Bājja knew both books: his notes to al-Fārābī's *K. al-Burhān*, (*Taʿālīq al-Burhān*, ed. Fakhry, pp. 152 ff) prove his awareness of *K. al-Jadal*; as a skilled musician, he would almost certainly have read the most famous *K. al-Mūsīqā al-Kabīr*, which, as the historical sources attest, was well known in al-Andalus.

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that the investigator on [theoretical music] plays musical instruments himself.
It suffices to him that others play before him while he hears and analyses. This is better because, if he cannot find what [he wants], either because of the inability of the player to make him perceive it, or because he is too hard of hearing to perceive a great part of it [the music]), he is in a position which is similar to that of the investigator in medicine and astronomy, when it is not possible that some other dissects or observes before him, either because of the lack of skill of the performer, the lack of the instruments, or the inability of the senses to apprehend it.

In this case, he (the scholar who studies theoretical music) takes what is commonly accepted (*mashhūr*) among those that have performed the same and have perceived it, and this is what Aristotle did in many issues regarding animals and plants in the natural sciences, or what the majority of physicians do in medicine, for they employ what is commonly accepted among anatomists or those who are experienced in drugs. The same is done by the majority of astronomers, who quote the observations of their predecessors.

Al-Fārābī particularizes for the cases of medicine, astronomy and music the abstract considerations about commonly accepted premises that he makes in other works and most particularly in *K. al-Jadal*. There is, however, a contradiction between the two approaches: in the works on logic, *al-mashhūrāt* are the specific premises of dialectics and reflect what is well known among a wide range of individuals, namely among those who belong to the learned circles, yet it does not matter whether one knows the reason for this agreement or not because

the philosophers, the wise, the masters of arts, [particularly] the most skilled of them, draw their opinions from syllogism or experience; nevertheless, the dialectic premises must not be taken inasmuch as they are grasped by means of syllogism or experience but insofar as they are the opinion of these men.[72]

For this reason, commonly accepted premises – which are difficult to differentiate from the premises given by tradition since both are transmitted knowledge – share features with sense perceptions and primary intelligibles in spite of being neither[73] and may be valid for a scientific syllogism inasmuch as they express an opinion on which a large number of physicians, astronomers and so on have agreed. In *Kitāb al-Mūsīqā al-Kabīr*, al-Fārābī explains why one has to trust the opinions of earlier scientists by putting on an equal footing what is commonly accepted and one's own experience. He ignores

[72] Al-Fārābī, *K. al-Jadal*, p. 66, 17–20.
[73] For a study of the tenuous borders that separate commonly accepted premises from the other premises, see Galston, *Opinion and Knowledge*, pp. 123 ff.

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the caveat expressed above,[74] thereby equating experiential data with what is given by tradition (*tajriba* with *maqbūlāt*) and assuming what a true scientist could never accept. Ibn Bājja, who was well acquainted with al-Fārābī's comments on the four premises of the syllogism,[75] tries to disentangle the contradictions of his source in the following lines of *Sharḥ fī al-Fuṣūl*:[76]

5. i. The syllogism is composed of cognitions whose knowledge precedes in human being [the conclusion of the syllogism]. These cognitions may come from a previous syllogism or not, but if they are yielded by a syllogism, this latter must be composed from other cognitions [of these two kinds] and so on until we reach cognitions which do not come from a syllogism.

ii. The issues which are known with no need for syllogisms are four: sense perceptions (*maḥsūsāt*), given by the tradition (*maqbūla*; sic., in sing.), [cognitions] which are obtained from the objects of perception towards which sense perception has been directed (*al-ḥāṣila ʿan maḥsūsātin yataʿammadu bihā al-iḥsāsū*), and primary intelligibles (*maʿqūlāt uwal*).

iii. The arts are generally composed of the second and third class, according to the order in which we have listed them, yet there are arts which are composed from the first only and some others such as medicine which are composed from the three. As for what is composed from what is given by the tradition, this must be rejected [in science]. The arts[77] which are named syllogistic in the sense that they operate by means of syllogism may have parts which come from syllogism and other parts that do not. The majority of the principles of [the parts] which are not yielded by syllogism are of the first or second or third classes.

In §ii, instead of commonly accepted premises, Ibn Bājja gives the premises "which are obtained out of the objects of perception towards which sense perception has been directed", *i.e.*, the cognitions yielded by an experience understood in the Farabian sense of Aristotelian *epagôgê*. Since, as we have seen already, this is only a part of the epistemic content of what al-Fārābī understands as "commonly accepted" cognitions, Ibn Bājja (to some extent) challenges the appeal to

[74] See the text of *K. al-Jadal*: "Nevertheless, the dialectic premises must not be taken inasmuch as they are grasped by means of syllogism or experience but insofar as they are the opinion of these men": *i.e.*, what is commonly accepted is not fitting for science but only for dialectics.

[75] See his notes to al-Fārābī's *K. al-Burhān* (*Taʿālīq al-Burhān*, ed. Fakhry, pp. 152–4), in which he deals with the premises given by the tradition (*maqbūlāt*), commonly accepted (*mashhūrāt*) and primary intelligibles (*maʿqūlāt uwal*).

[76] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 86v, 10–18.

[77] Note that the text might have been deturpated by the copyist from this point onwards; this is suggested by the fact that there is no reference to primary intelligibles. Nevertheless, I prefer not to give alternative readings and translate the wording of the manuscript as it stands.

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authority. Leaving no room for doubt, he stresses that there is no basis for grounding science in the knowledge that stems from the premises given by tradition (§ ii).[78] Otherwise said, it would seem that Ibn Bājja is asserting that one has to verify for oneself the validity of the experiential data conveyed by scientific tradition, at least to the extent that this is possible for a single human being and so far as the demands of the scientific discourse for coherence require it. In this latter regard it is worth noting that Ibn Bājja's argumentation takes for granted that a great deal of commonly accepted knowledge is valid, particularly if it comes from Aristotle, for otherwise scientists would be burdened with the absurd mission of rebuilding their own discipline over and over again. This understanding and use of experience will be illustrated below with an example drawn from Ibn Bājja and Ibn Rushd (see 4.5.).

The cognitions obtained by means of *tajriba* therefore deserve their own place in the rank of syllogistic premises and it would seem that Ibn Bājja considers that they yield a degree of certitude similar to that of the self-evident truths (primary intelligibles).[79] As Galston noted,[80] al-Fārābī ranks sense perceptions above generally accepted opinions and second to primary intelligibles in the scale of the certitude that each premise may produce; so we may think Ibn Bājja has just given shape to this idea by confining commonly accepted knowledge to the field of dialectics[81] and laying stress on a process of *tajriba* understood as *epagôgê*, in which the perception of particular instances is the pathway to the attainment of more certain knowledge. In doing so, he not only gives epistemological consistency to al-Fārābī's texts but is himself consistent with Aristotle (science only deals with universals yet these universals are a by-product of induction), and Galen (the Empiricist school is to blame because he cannot draw general conclusions from the observed phenomena, while the Dogmatic school often draws quite groundless conclusions).

Ibn Bājja says next that medicine has recourse to sense perception, experience, and what is given by tradition, although the latter premises ought to be rejected. This passage, besides being a description of the epistemological grounds of the medicine of his time, contains a subtle criticism of the scholasticism of physicians which will be made clearer some lines further down:[82]

[78] It is worth noting in this regard that Ibn Bājja (*T. al-Burhān*, p. 153, 5–7) said that the premises *maqbūlāt* were those of religion (see moreover Galston, *Opinion and Knowledge*, p. 124 on al-Fārābī on this question).

[79] It is possible that the author makes no further comments about primary intelligibles because he takes for granted that they are common to all arts.

[80] Galston, *Opinion and Knowledge*, pp. 122–3.

[81] Note that when he deals with *mashhūr* premises (*T. al-Burhān*, p. 149, 20 ff), he treats them as premises of dialectic. Nevertheless, dialectic reasoning plays an important role in scientific research, as we will see below (5).

[82] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 87v, 6–11.

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6. The principles in medicine are taken from what one comes to know through experience. There were in ancient times some people who confined themselves to what they learned through sense perception and there emerged among them an empirical art [of medicine], but this happens rarely in our time. It seems that there are some people who are not content with what it is drawn from experience until some other experiences this and employs it as a principle of knowledge. It also happens that if there are conclusions which follow from that [experience], they are obtained by means of sense perception, [in techniques] such as applying cupping glasses, phlebotomy and others of similar or different kind.

Echoing the old procedures of the empirical physicians of Galen's era, the author complains that the physicians of his own time neglect the empiricism demanded by medicine; some physicians, who would willingly accept new experiential knowledge, do not dare to take the first step. The few attempts to go beyond what has been bequeathed appear in minor operations which do not substantially improve medical sciences and techniques, but it is interesting that Ibn Bājja refers to some kind of medical experience which is not confined to pharmacology and states that, although few in number, there actually exist some "empirical" physicians. Here we find what we can call the "real medical experience", the professional work of the physician which is the matter that is given form by experience taken in its epistemological sense.[83]

Ibn Bājja's understanding of experience in medicine as explained in *Sharḥ fī al-Fuṣūl* does not differ substantially from Galen because both authors follow Aristotle's scientific method.[84] As is well known, Galen also sees experience (what he calls "qualified experience"), as a source of scientific knowledge provided that it takes place under a set of conditions that ensure that the data and notions drawn from

[83] As is well known, there are several works in which Islamic physicians recorded hundreds of case-studies. Some recent studies shed light on this material: C. Álvarez de Millán, "Graeco-Roman case histories and their influence on Islamic clinical accounts", *Social History of Medicine*, 12 (1999): 19–43 and "The case history in Medieval Islamic medical literature: the *Tajārib* and *Mujarrabāt* as source", *Medical History*, 54 (2010): 95–118, which addresses several Andalusī authors, and Peter A. Pormann, "Medical methodology and hospital practice: the case of fourth-tenth century Baghdad" (*In the Age of al Fārābī*, pp. 95–118).

[84] Galen's method and the role which experience plays in it has been the object of a wide number of studies. Thorough references to the main issues addressed in the present paper and their most salient bibliography may be found in the following titles: R. Jim Hankinson "Art and experience" quoted above and "Epistemology", *The Cambridge Companion to Galen*, pp. 157–83; other chapters of this latter book such as "Methodology" by Tim Tieleman (pp. 49–65) will provide further insights; on "qualified experience" in general and on pharmacology in particular, see Philip J. Van der Eijk, "Galen's use of the concept of 'qualified experience' in his dietetic and pharmacological works" (*Galen on Pharmacology*, pp. 35–57); Peter A. Pormann, "Medical Methodology and Hospital Practice" (esp. pp. 95–9 and 112–18) gives a most interesting synthesis of the question and studies the echo of Galen's position in Islamic medicine (namely al-Rāzī).

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this experience have a universal value. The only difference lies in the emphasis that Ibn Bājja (and Ibn Rushd and all the scholars who followed al-Fārābī) placed on a sound teaching of the philosopher's method and the assumption that medicine was a science subordinated to physics, *i.e.*, the physician was subordinated to the philosopher.[85]

4.4. *The corollaries: the narrowness of time, the difficulty of judgment, the teaching of medicine, the danger of experience and human dissection*

As we have seen, the crux of *Sharḥ fī al-Fuṣūl* is that gaining experience takes a considerable amount of time, particularly if experience is a prerequisite for the mastering of a science. The other elements of Hippocrates' first aphorism will be glossed from this perspective, fairly often in tune with Ibn Abī Ṣādiq's interpretation and in disagreement with Galen who gave a medical meaning to these clauses. Hence, where Galen says that "the moment is narrow" because the state of either the body or the disease may vary in a short period of time,[86] Ibn Bājja,[87] focussing on medicine, expands on Ibn Abī Ṣādiq's commentary which refers "narrowness" to the process of learning any art whatsoever.[88] Ibn Bājja's argumentation runs as follows:[89]

7. i. "Moment" may refer to medicine either insofar as it encompasses several medical operations or insofar as one seeks medical knowledge by means of syllogism or the perception of medical issues. On the whole, a moment is "medical" if it contains a medical part, be it referred to action or knowledge or to what is entailed in them. Since we must understand the meaning of this clause according to the precedent [lines of the work], [the moment] must be related to the art of experience, and related to it insofar as one acquires [that experience during this moment].

ii. The most common sense of "moment" refers to time inasmuch as it is related to something which is occurring (ex. the moment of war, the moment of midday), [this is] to something whose time corresponds to its [actual] existence. The time that corresponds to the existence of the parts of [the art] which is being acquired is found in the syllogistic arts insofar as they are

[85] On the subordination of medicine according to the Aristotelian physicians-philosophers, see the general remarks and the bibliography (Gutas, Stroumsa, Freudenthal and Richter-Bernburg) given by Richter-Bernburg, "Abū Bakr al-Rāzī and al-Fārābī", p. 119, n. 3; further insights will appear in my forthcoming *Ética e ideología de la ciencia*".

[86] Galen, *In Hipp. Aph. Comm.*, ed. Kuhn, XVIIb, 346–7.

[87] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 87v, 18–88r, 19.

[88] See Rosenthal, "Life is short", p. 23: "By 'narrowness of time' he means the time for instruction which becomes narrow, for man is bothered as long as he lives by necessary or unnecessary matters which intervene between him and instruction. The time for instruction becomes therefore narrow".

[89] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 87v, 26–88r, 3.

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syllogistic (the time in which the syllogism is composed), or in the arts of experience and in the syllogistic arts inasmuch as they are arts of the experience (the time in which the particular instances are sensed). It is clear that "moment" in the purely syllogistic arts is by no means "narrow", for it lasts as much as the idea.[90]

In §i, the author differentiates between the time devoted to medical operations that must be performed in the patient and the time spent in learning and mastering medicine via syllogism or via scrutinizing the particular instances as conveyed by sense-perception; at the end of this section, in accordance with Ibn Abī Ṣādiq's construal and the earlier parts of the work, he applies "narrowness" to learning; in §ii he overlooks the particularity of medicine so as to address the empirical training of all kind of "experiential" disciplines. Since it could take seconds for a trained mind to construct a syllogism, Hippocrates meant that time is narrow when one has to deal with the particular and changeable instances. Afterwards, Ibn Bājja refers to the multifarious circumstances that surround a particular medical case as the trees that hide the forest of true knowledge; one must not be misled by these particular instances but must filter them so as to obtain a sound judgement both about the particular patient under treatment and the medicine as a science. He says:[91]

8. You must aspire to reduce as much as possible the parts of the art [of medicine] which are acquired by this [empirical] method, until there is no part left that could be acquired by means of syllogism acquired through experience, [medicine] thereby becoming a syllogistic art and a "short discipline" that one may teach and learn orally with the exception of these premises. Perhaps its understanding [of such a medicine] would be easier and closer inasmuch as [these states] rarely occur and because it [this medicine] would be characterized by the lack of these states.

We must be able [to establish] a medical art in which we could deduce even a single part of it by means of syllogism, even if this part of the art would be deduced from another art by means of experience. For in these arts [syllogistic arts] the judgment is closer, easier, and faster than in the others depending on the extension of this [deductive] part; since it would be possible for us to deduce this part with no need for the cooperation from the patient, those who accompany him and the surrounding circumstances, which hinder or even prevent from encompassing the states of it [the art; the states which are truly relevant for the art of medicine thus understood]. By the same token, it there were more than one part in this case, we could determine their soundness without sensing their particular instances; and they could be taught orally and the method for deducing it could be explained in a

[90] Lit.: *yamtaddu bi-imtidādi al-fikra fīhi*: the time one takes to solve some problem.
[91] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 89v, 11–22.

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book. For this reason, you must aspire to an art in which it is possible to deduce in this fashion.

Ibn Bājja announces in this way a reform of medical learning which tends towards the systematization of medicine to make it as theoretical a science as possible. Of course, an idea was to a great extent put into practice by Ibn Rushd in the Almohad court during the second half of the 12th century when he wrote *K. al-Kulliyyāt fī al-ṭibb*.[92] As is well known, this book was complemented by another one devoted to *al-umūr al-juz'iyya*, "the particularities" of the treatment of diseases and, since Ibn Rushd could not write it, he requested his friend Abū Marwān b. Zuhr to do so.[93] The complementarity of Ibn Rushd and Abū Marwān b. Zuhr shows, in much the same way as the passage of Ibn Bājja translated above, that the Aristotelian physician-philosopher of al-Andalus was well aware of limits of the formalization of medicine; and that, on the other hand, he had assumed that without this formalization, there could be no sound training for professional physicians.

One of the most interesting parts of the commentary appears in the gloss of "experience is dangerous" where Ibn Bājja,[94] like Ibn Abī Ṣādiq,[95] distinguishes between a general (qualified) and a specific (unqualified) sense of experience:[96]

9. i. As for "the experience is dangerous", it seems that "experience" in this place is employed in its specific meaning. Experience is said generally or specifically and when it is said generally it signifies the purpose to sense particular instances of some issue so as to obtain a universal judgment out of the singular elements brought about by either human will or nature.

ii. It may be said specifically on the purpose of the perception of the particular instances of the issue which has been produced by human will or of that which the human being produces in some way. This is the most known meaning of experience.

The specific meaning of experience includes medical acts such as phlebotomy, cauterization or sudden cooling by means of fresh

[92] Further insights on this question, which is inspired by al-Fārābī, will appear in the forthcoming *Ética e ideología de la ciencia*. Most of the studies that deal with Ibn Rushd's medicine speak of this deductive approach, for instance, the recent article by Floréal Sanagustin, "Le statut de la raison dans le *K. al-Kulliyyāt fī al-Ṭibb* (*Colliget*)", in A. Bazzana *et al.* (eds.), *Averroès et l'averroïsme. Un itinéraire historique du Haut Atlas à Paris et à Padoue* (Lyon, 2005), pp. 145–54.

[93] Roger Arnaldez & Albert Z. Iskandar, "Ibn Rushd", *Dictionary of Scientific Biography* (New York, 1975), 7b. It seems however, that Ibn Rushd profited a preexistent treatise, *K. al-Taysīr* by Abū Marwān b. Zuhr. Although we will speak of the latter immediately (4.5.), we must say that he was probably the most experienced physician of his time.

[94] Ibn Bājja, *Sharḥ fī al-Fuṣūl*, 88r, 19–88v, 8.

[95] Rosenthal, "Life is Short", p. 233.

[96] Ibn Bājja, *ibid*., 88r, 19–24.

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water, which entail a risk for the patient if they are not performed properly. The general meaning consists of the process described above of obtaining empirical knowledge, which entails no danger for the most of the time, even if one dares to dissect human corpses:[97]

10. About the experience considered in its general sense, it cannot be said that all of it entails danger. The dissection of human corpses (*tashrīḥ al-mawtā*), o my God!, is in no way dangerous, except by accident and on some occasions.

Hence, *Sharḥ fī al-Fuṣūl* contains the first explicit, albeit indirect, mention of the fact that human dissection was possibly practiced during Ibn Bājja's time (although weak, the best extant evidence that I know of). Another reference of this kind appears in Ibn Bājja's *K. al-Ḥayawān*:[98]

As for the observation of that [the hidden parts of the body through dissection] in irrational animals, it is easy, possible and frequent in the majority of religions and countries, except what it is said about India. As for the [dissection] of a human being, the religious laws [*al-sharā'i'*] do not accept it in principle and it is unnatural, yet it is possible that one performs observations in the killed [*qatlā*], and especially in the sliced [body][99] of an enemy. The investigator in zoology [. . .].[100] I have myself observed this in the human [body], and others apart from me have observed the same.

In order to ascertain as far as possible whether human dissections were performed or not, we must compare and collate the two texts. There seems to be no doubt that Ibn Bājja and other physicians he knew dissected animal bodies[101] and that they possessed empirical knowledge of human anatomy gained through observation of people who had been killed, particularly men who died during the frequent fights of that time.[102] It is also clear that human dissection was not strictly unlawful although it could not be performed in the open. In *K. al-Ḥayawān*, Ibn Bājja says that it is an unnatural practice, but, on the other hand, he admits in *Sharḥ fī al-Fuṣūl* that a human corpse may be dissected without major hindrances, for only under some unspecified but apparently unlikely conditions, it might be considered as "dangerous". It is possible, therefore, that Ibn Bājja or other physicians of his acquaintance had performed human dissections in spite of the caveats expressed in *K. al-Ḥayawān*, and it is worth stressing

[97] Ibn Bājja, *ibid*., 88v, 5–6.
[98] Ibn Bājja, *K. al-Ḥayawān*, 193, 9–13.
[99] Conjectural translation. I read *sharīḥa* instead of *sharī'a* which makes no sense here.
[100] It seems that the copyist missed some words here.
[101] Remember that Ibn Ṭufayl, a physician-philosopher who was well aware of Ibn Bājja's works, mentioned in the middle of the 6/12th century a case of animal dissection in his most famous *Risāla Ḥayy b. Yaqẓān*.
[102] However, we know hardly anything about this empirical knowledge because Ibn Bājja's *K. al-Ḥayawān* is interrupted shortly after this digression about dissection.

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that the misgivings regarding the practice appear in a book on natural philosophy (thereby addressed to a readership that may not have included physicians) rather than in a book on medicine which extols empirical knowledge.

The fact that Ibn Bājja dissected human corpses would be perfectly consistent with the situation of Islamic medicine in the Middle Ages insightfully described by Savage-Smith.[103] Although it is probable that legal and non-legal scholars had reached a sort of implicit consensus that this practice could not be carried out, as witnessed by the reluctances expressed by a physician-philosopher of note like Ibn al-Nafīs[104] and in the excerpt of Ibn Bājja's *K. al-Ḥayawān* translated above, it was not explicitly forbidden by Muslim law.[105] Second, in spite of the caveats already mentioned, the Islamic authors were well aware that Galen had placed strong emphasis on the importance of dissection (animal and human) for both physicians and philosophers.[106] Third, one of the major obstacles to human dissection might have been, as Savage-Smith puts it,[107] "the general human perplexity over the relationship between the bodily frame and the soul and, along with it, a desire not to do anything which disturbs the soul of the deceased", which may have caused "the Muslim belief that the resurrected body would in paradise be sensible to physical pleasures, as it had on earth, (to contribute) to a general belief that the earthly physical body should therefore remain intact prior to natural decomposition". These beliefs were unlikely to impress a physician-philosopher who was shaped by the rationalistic spirits of Galen and Aristotle and thought of a purely immaterial afterlife. Fourth, it should be remembered that Ibn Bājja had been brought up in a highly philosophized environment (Saragossa, under the Banū Hūd dynasty) where a great many physicians-philosophers flourished during the 5/11th century.[108] It is difficult to believe that these scholars, most of them driven by the Platonic imperative that

[103] E. Savage-Smith, "Attitudes toward dissection in Medieval Islam", *Journal of the History of Medicine and Allied Sciences*, 50 (1995): 67–110; as far as I know, this paper remains the best reference on this issue.

[104] *Ibid*., 99 ff.

[105] *Ibid*., 69 ff. Note moreover that al-Fārābī (*Risāla fī Aʿḍā' al-insān*, p. 61, 11–20) says that human dissections should be performed so as to establish whether Galen or Aristotle was right on some particular question, but they are very difficult to carry out.

[106] Savage-Smith, "Attitudes toward dissection", p. 90.

[107] *Ibid*., pp. 106 and 108.

[108] Although much has been written on the mathematical, medical and philosophical achievements of the Saragossan scholars, little justice has been done to the contribution of the physicians-philosophers of the 11th c. and the beginning of the 12th. A specific chapter will be devoted to them in my forthcoming study of the physicians-philosophers of al-Andalus: Ibn al-Kattānī, Abū al-Ḥakam al-Kirmānī, Marwān b. Janāḥ, Menaḥem b. al-Fawwāl, Thābit al-Jurjānī, Ḥasdāy b. Yūsuf b. Ḥasdāy, Abū Jaʿfar b. Ḥasdāy, and first and foremost, Ibn Bājja.

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human beings must imitate God "through the knowledge of the truth and the doing of good" so as to obtain spiritual perfection in life and afterlife,[109] would have renounced the opportunity to find out more about the human body even at the cost of an unpleasant experience. It makes some sense, therefore, that Ibn Bājja's words "the dissection of human corpses is in no way dangerous, except by accident and in some occasions" may allude to actual, albeit sporadic,[110] dissections performed by him or by other physicians of his time; similarly it makes sense that, after a period of strict religiosity during the first half of the 6/12th century under the Almoravids, the practice of human and even animal dissection had been banished from medical training, as Ibn Rushd said, but was now resumed in a new scientific context: the Almohad court, which, for several reasons, fostered philosophic speculation.[111]

4.5. *Ibn Rushd and Abū Marwān b. Zuhr on actual and inherited experience*

A glance at Ibn Rushd's *K. al-Kulliyyāt fī al-ṭibb* may shed further light on the complex issues which Ibn Bājja addresses abstractly. The passage of Ibn Bājja translated above (text n. 6) recalls a similar complaint in the medical text-book of Ibn Rushd:[112]

Since the expert in the art [of medicine], in his capacity as an expert in this art, cannot know its principles but needs to be an expert in another art, he must take these principles of his own art [medicine] as they are commonly accepted [*mashhūr*] [in another art], and most particularly in the case of [the arts] whose parts he cannot come to know with certainty such as pharmacological experience [*tajribat al-adwiya*]. With respect to the mastering of this part of the art [the empirical part of medicine], Hippocrates considered that "life is short…"; as regards the deductive part, there is no shortness [of time] at all, and this is [unfortunately] the case of most of the parts of the body observed in a dissection,[113] for this art has fallen into oblivion.

[109] Though this question lies beyond the scope of the present paper, the reader may consult Lawrence W. Berman, "The political interpretation of the maxim: the purpose of philosophy is the imitation of God", *Studia Islamica*, 15 (1961): 53–61 and the works that Ibn Bājja wrote in his last epoch (namely *Tadbīr al-Mutawaḥḥid* and *Risālat al-Wadā'*), which gives a clear insight into what is meant here, the imperative of intellectual perfection.

[110] Remember in this regard the texts of *Sharḥ fī al-Fuṣūl* translated in 4.3., which refer to the fact that empirical research in medicine was rare.

[111] Though this question is beyond the scope of the present paper, the reader will find some useful references in M. Forcada, "Síntesis y contexto de las ciencias de los antiguos en época almohade", in P. Cressier, M. Fierro & L. Molina (eds.), *Los almohades: problemas y perspectivas*, 2 vols. (Madrid, 2005), vol. 2, pp. 1091–135.

[112] Ibn Rushd, *K. al-Kulliyyāt fī al-ṭibb*, p. 4, 1–10.

[113] *"Kathīr min al- a'ḍā' al-mushāhada bi-al-tashrīḥ"*.

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On the one hand, Ibn Rushd insists on his assumption, mentioned above, that medical experience is confined within the limits of pharmacology, but on the other he says that anatomy, which should be learned in practice, has by the middle of the 6/12th century become a mere "deductive discipline".[114] Therefore, anatomy is easy to learn because the student cannot but memorize old text-books on the basis of which he may prompt speculation if he is intelligent enough, but by no means attain full proficiency.[115]

Ibn Rushd says moreover that one must accept *mashhūr* in pharmacology, but this claim must be taken cum *grano salis* because he does not really hold that the opinion of scholarly authorities should be followed blindly, not even that of Aristotle. In his *Summary of the Almagest*, he casts doubt on Ptolemaic astronomy for several reasons, not the least being that most of its premises are not certain knowledge but belong to the category of what it is commonly accepted;[116] in addition, a good deal of Ibn Rushd's reflections on astronomy address the problematic of hypothesizing on the basis of what is commonly accepted among astronomers in spite of the fact that this may lead to wrong conclusions, as well as the need to perform long term observations (a task that exceeds the capacity of one man) in order to produce planetary models which do not contradict Aristotle's physics.[117] What Ibn Rushd's approach to *mashhūr* knowledge in *K. al-Kulliyyāt* implies (in much the same way as in Ibn Bājja's *Sharḥ fī al-Fuṣūl)* is that former experience and conclusions reached by others must be reviewed and critically scrutinized according either to one own's experience, to the rules of reasoning, or to both at the same time. Ibn Rushd proceeds in this way in *K. al-Kulliyyāt* when he tackles

[114] It is possible nevertheless that the situation would have been different some decades before, as we will see below.

[115] A good example is the heart according to Abū Marwān b. Zuhr, the outstanding physician of the epoch in al-Andalus. Whereas Rabie Abdel-Halim ("Pericardial pathology 900 years ago: A study and translations from an Arabic medical textbook", *Saudi Medical Journal*, 28 (2007): 323–5, p. 325) says that the description of pericardial pathology extant in *K. al-Taysīr* stems from post-mortem dissection of human corpses, Rosa Kuhne, Cristina Álvarez Millán & Expiración García Sánchez ("Ibn Zuhr, Abū Marwān", BA [Almería, 2009], vol. 6, pp. 352–68, p. 365), say that this is, at least, doubtful and that Ibn Zuhr's innovations may well have been the result of his deductions from anatomical text-books, as when Ibn al-Nafīs discovered pulmonary circulation.

[116] J. Lay, "L'*Abrégé de l'Almageste*: un inédit d'Averroès en version hebraïque", *Arabic Sciences and Philosophy*, 6 (1996): 23–61, p. 52. Note that the *Summary of the Almagest* was deeply influenced by Ibn Bājja's *Kalām fī al-Hay'a* as my forthcoming edition of the latter text will show (see a preliminary approach to the issue in M. Forcada, "La ciencia en Averroes", *Averroes y los averroísmos. Actas del III Congreso Nacional de Filosofía Medieval*, coord. J. Ayala (Zaragoza, 1999), pp. 49–102, pp. 75–6 passim.

[117] Forcada, "La ciencia", p. 96. Ibn Rushd found that the main difficulty of shaping planetary models different from those of Plolemy was the fact that he had to perform new planetary observations for which he had no time. In this regard it is interesting that Ibn Bājja speaks of the difficulty of astronomical observations in *Sharḥ fī al-Fuṣūl* (87r, 1 ff) and mentions them as another example of the fact that "life is short, art long".

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the contradictory opinions of Galen and Aristotle.[118] In a section devoted to discerning who was right about the question of whether "woman's sperm" contributes (as Galen held) to the conception of the embryo or not (as Aristotle claimed),[119] Ibn Rushd says that he asked several women if they had become pregnant only after a fully satisfactory relation; since most of them answered that they conceived quite often without pleasure, therefore without expelling her sperm, he concluded with Aristotle, against Galen, that feminine sperm takes no part in the very moment of conceiving a child.[120] Three other points should be taken into account here. The first is that, although Ibn Rushd relies on Aristotle's authority, he by no means takes for granted that the latter is right: he says that the fact that woman's sperm does not contribute to generation follows from senses and syllogism and that the empirical verification of this fact began when he heard that Aristotle had "seen" (but not verified) that women could conceive without ejaculating. Since that moment, "I did not cease to pursue the "sensorial perception" of this (*lam azal ataʿammadu ḥiss dhālika*) until I found that the experience was right (*fa-wajadtu al-tajriba ṣaḥīḥa*)".[121] The second point of interest is that this empirical verification is complemented by a logical verification of sorts, a *reductio ad absurdum* which stems from an experiential argument drawn from, Ibn Bājja: if feminine sperm could generate, a woman could conceive without masculine contribution. The third is that this particular case study stems not only from the reading (or hearing) of Aristotle's works but from Ibn Bājja's *K. al-Ḥayawān*, where the author resolves the dilemma in

[118] As is well known, following al-Fārābī, Ibn Rushd, devoted long sections of *Kitāb al-Kulliyyāt fī al-ṭibb* to contrast the medical doctrines of Galen and Aristotle. See on this issue: J. Christoph Bürgel, "Averroes 'contra Galenum': das Kapitel von der Atmung im Colliget des Averroes als ein Zeugnis mittelalterlich-islamischer Kritik an Galen", *Nachrichten der Akademie der Wissenschaften in Göttingen. I. Philologisch-Historische Klasse*, 9 (1967): 263–340; Gerrit Bos & Resianne Fontaine, "Medico-philosophical controversies in Nathan B. Yoe'el Falaquera's *Sefer Ṣori ha-Guf*", *Jewish Quarterly Review*, 90 (1999): 27–60; L. Richter-Bernburg, "Medicina Ancilla Philosophiae", in Lawrence I. Conrad (ed.), *The World of Ibn Ṭufayl: Interdisciplinary Perspectives on Ḥāyy b. Yaqẓān* (Leiden, 1996), pp. 90–113; and "Abū Bakr al-Rāzī and al-Fārābī" of the same author.

[119] For a modern study of this question, see Sophia M. Connell, "Aristotle and Galen on sex difference and reproduction: a new approach to an ancient rivalry", *Studies in History and Philosophy of Science*, 31 (2000): 405–27, pp. 410 ff, and Danielle Jacquart & C. Thomasset, *Sexuality and Medicine in the Middle Ages* (Oxford, 1988), pp. 66–74 and 194–5; see moreover Remke Kruk, "Ibn Bājja's Commentary on Aristotle's *De Animalibus*", in Gerhard Endress and Remke Kruk (eds.), *The Ancient Tradition in Christian and Islamic Helenism* (Leiden, 1997), pp. 165–79, esp. pp. 171–5, and the bibliography mentioned here.

[120] Ibn Rushd, *K. al-Kulliyyāt fī al-ṭibb*, pp. 61–2.

[121] *Ibid*., p. 62, 1–2. Note that the author employs al-Fārābī/Ibn Bājja's definition of *tajriba*.

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favor of Aristotle on the basis of what may be observed in males' experience.[122]

It is inconceivable that the male contributes the matter and the female the agent (...). Let us examine, firstly, all the aspects of this question: it is possible that [one thinks that] the female contributes the principle of motion in some way or not possible, after [knowing] what has been recorded from observation? [The first thing] is that the female only gives birth if she has been covered by a male. The second is that if the male covers without delivering semen, the female does not become pregnant, as it is observed fairly often and most particularly in human beings. The third is what might be observed in women, particularly when the coitus is long; they may expel the humidity that exists in them, but if the man does not ejaculate, and I mean that it is possible that the man expels nothing in them, [they do not conceive]; this is fairly clear in those who have frequent sexual intercourse but practice *coitus interruptus*."

Ibn Bājja is thus the forerunner in al-Andalus of a new approach to medicine which paradoxically aims to remain faithful to Galen and Aristotle. This approach rests to a large extent on the conception of experience as painstaking research on the data furnished by the senses which leads to the certitude, or the approximate certitude, that this is the case or not. This "epagogical" experience is valid at either the theoretical or the practical level. As regards the first, the fact that Ibn Bājja poses questions such as the very nature of organs (see above 2.) shows how closely medical research could be connected to natural philosophy (physics), in which its theoretical part is subsumed, and also how far medical experience could furnish new premises to natural philosophy; indeed, in *On senses* (436a-b) Aristotle had said that a fully educated philosopher had to study the principles of medicine.[123] As for the practical level, the insistence on focusing one's attention on the particular instances may have something to do with the momentum of surgery and anatomy by the middle of the 6/12th century. It suffices to recall Abū Marwān b. Zuhr's experiment of tracheotomy in a goat,[124] or his description of pericardial pathology quoted above, to realize that within a few years of Ibn Bājja's death "the fear of experience" had diminished considerably in al-Andalus. This point deserves some further attention since Abū Marwān (d. 557/1161-2) was trained inside a dynasty of physicians

[122] Ibn Bājja, *K. al-Ḥayawān*, p. 149, §5. The text appears to be deturpated in some parts. See another translation of this text in Kruk, "Ibn Bājja's Commentary on Aristotle's *De Animalibus*", pp. 173–4.

[123] See Elinor Lieber, "Galen: physician as philosopher. Maimonides: philosopher as physician", *Bulletin of the History of Medicine*, 53 (1979): 268–85, pp. 270–1, and moreover 278–9, where it is said that al-Fārābī learned medicine for this reason.

[124] See Kuhne, Álvarez Millán & García Sánchez, "Ibn Zuhr, Abū Marwān", and the references given here.

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who excelled in empirical medicine[125] and was drawn to philosophy (unlike his father Abū al-ʿAlāʾ Zuhr), had a good relationship with Ibn Rushd and may have met Ibn Bājja during his youth. It is thus possible that the emphasis laid on experience by the "physician-philosophers who were more philosophers than physicians" of that time encouraged him to experiment in surgery, to revitalize the "art of dissection/anatomy" and to perform procedures that others would not.[126]

5. CONCLUSION

Two points that deserve further consideration will bring this paper to its conclusion. The first point is to do with al-Fārābī's understanding of Aristotle's *Posterior Analytics* which, according to Galston,[127] was much the same as that of Barnes.[128] This controversial interpretation proposes that a scientific demonstration (*apodeixis*) does not aim to discover what has been discovered by other means, but rather to expound it clearly and teach it properly. For al-Fārābī[129] a demonstration would serve for these two purposes and for monitoring the backward analysis needed to solve a dilemma, *i.e.*, for discovering the right solution while rejecting a wrong but nonetheless plausible answer. This backward analysis, which provides the necessary premises from which a necessary conclusion follows, is particularly useful in sciences where the subject matter is not abstract.[130] From optics onwards, the subject matter is connected with materiality in many ways and, since this hinders our comprehension, mistakes are more

[125] Abū al-ʿAlāʾ Zuhr, his father wrote a book entitled *K. al-Mujarrabat fī al-ṭibb*, "the book of medical experiences" (ed. Cristina Álvarez Millán [Madrid, 1994]; see also C. Álvarez Millán, Ibn Zuhr, "Abū al-ʿAlāʾ Zuhr", BA [Almería, 2009], vol. 6, pp. 340–50).

[126] See above n. 114 and consider, moreover, the general survey of the problematic of medieval surgery in Emily Savage-Smith, "The practice of surgery in Islamic lands: myth and reality", *Social History of Medicine*, 13 (2000): 307–21.

[127] Galston, *Opinion and Knowledge*, pp. 210–54; see moreover M. Galston, "Al-Fārābī on Aristotle's theory of demonstration", in Parviz Morewedge (ed.), *Islamic Philosophy and Mysticism* (New York, 1981), pp. 23–34.

[128] Jonathan Barnes, "Aristotle's theory of demonstration", *Phronesis*, 14 (1969): 123–52; revised version in J. Barnes, M. Schofield & R. Sorabji (eds.), *Articles on Aristotle I: Science* (London, 1974), 65–87; see moreover J. Barnes, *Aristotle's Posterior Analytics* (Oxford, 1994), introd., pp. xviii–xx. As is well known, this paper provoked a lively debate which still continues.

[129] Galston, *Opinion and Knowledge*, pp. 230–6.

[130] In much the same way, Ibn Bājja says that the assent (*taṣdīq*) to the fact that our concept of a thing represents this thing as it is in the extramental world stems from the solution of a problem that posits two contradictory extremes; he describes, moreover, the mental process that brings a demonstration as a "movement of the soul" which starts in a dilemma that poses two related alternatives (*naqīḍatāni murtabaṭāni*) about a subject (see, respectively, *Taʿālīq al-Burhān*, 109, 4–110, 5 and 119, 10–120, 5).

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probable. Against this setting, scientific inquiry, the quest for the unknown, results from classes of reasoning other than demonstrative reasoning:[131] inductive reasoning of a scientific kind, the "epagogical" *tajriba* addressed above, which provides universals and definitions that are, in turn, primary principles of demonstration; and dialectical reasoning, which assists the scientist in the task of distinguishing the true from the false by training him to posit opposing arguments to any proposition. Although the discussion of the role of *apodeixis* in Aristotle and al-Fārābī goes far beyond the scope of the present paper, it is useful to recall that most of the aspects that have been seen above bear out to a great extent the Barnes/Galston approach to Aristotle/al-Fārābī's theory of demonstration, at least for the case of medical and natural sciences (or the medical sciences insofar as they are a part of the natural sciences). The scientific discovery appears from an inductive process which yields conclusions that are universal principles of instruction and learning, and premises of apodictic demonstrations. In this process the scientist is assisted by a dialectical reasoning on the basis of which he starts a preliminary discussion of the conclusions that may be drawn, by means of syllogisms which are not apodictic demonstrations, from the data provided by sense perception or of the contradictory conclusions reached as well by other authors. The apodictic demonstration appears at that point as an essential procedure for checking the veracity and accuracy of a conclusion, but it does not intervene in the act of discovery. Hence, the scientist has to look for these premises and then present them in an orderly fashion so as to facilitate their learning, their use in further research and, in the case of an applied science like medicine, their application in the reasoning by which a physician deduces what must be done with a specific patient. This was achieved by Ibn Rushd in *K. al-Kulliyyāt*, following al-Fārābī and Ibn Bājja: he structured all that he considered could be universal premises of medicine according to the order established by al-Fārābī so as to impart sound knowledge to the students of medicine.

The second point is the consequence of the philosophical reconsideration of medical experience achieved by Ibn Bājja, which strongly influenced Ibn Rushd. There is little evidence that the stress laid by these authors on experience prompted the evolution of empirical medicine into an experimental medicine in which "experience" emerges under controlled and manipulated conditions. But the evidence is not insignificant. On the other hand, this emphasis on experience, as conveyed by the Latin translation of Ibn Rushd's *Kitāb al-Kulliyāt*, was one of the reasons why the medicine of Medieval Europe began to be less scholastic and more empirical, *i.e.*, more

[131] Galston, *Opinion and Knowledge*, pp. 225–43.

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scientific.[132] To some extent, this meant the "beginning of the beginning" of a new era, and one of its roots is Ibn Bājja's *Sharḥ fī al-Fuṣūl*.

Final note: I wish to thank the anonymous referees of ASP for their helpful remarks that have helped to improve this article.

APPENDIX: Texts from Ibn Bājja's *Sharḥ fī al-Fuṣūl*

1. قصدنا بهذا القول شرح ما أثبته أبقراط الطبيب في كتابه المسمّى بالفصول. وهذا الكتاب إنما وقع إلينا فصّه مقروناً به تفسير جالينوس الطبيب له لكن ليس فيما أثبته كفاية في فهم ما أثبته أبقراط.

قوله الفصول أخرجه مخرج الجمع والفصل يدلّ به على قول مرتبط مؤتلف من قولين كل واحد منهما واحد بالغاية فإن كل واحد منهما فصل والفصل هو قول تامّ إما واحد أو أكثر من واحد أمكن أن يجعل حدّ قول مركّب من أقوال تامّة.

وكلّ قول قصد به نحو غرض[1] ما وكان ذلك الأمر المغرض[2] إليه ينقسم إلى أمور يمكن أيضاً أن تجعل غرضا[3] يقصد نحوه[4] بأقوال فإن تلك الأقوال المقصودة[5] بها نحو ذلك الغرض[6] فصل وتلك الأقاويل فصول وهذه الأقاويل تختلف بحسب انقسام الغرض الأخير إليها.

فإن الأمور التي ينقسم إليها هي فصوله العظمى وما كان تحت هذه فكلّها تسمّى فصول[7] صغرى وكلّما كانت الأغراض[8] العظمى أشدّ تبايناً كان اسم الفصل على كلّ واحد من أقوالها أكمل[9]. فعنوان هذا الكتاب إذن يدلّ على أنه مؤتلف من أقوال متباينة الأغراض[10] وكلما كان التباين في الأغراض[11] أظهر كان القول الذي قصد به ذلك الغرض أحقّ باسم الفصل.

[132] See on this question Danielle Jacquart & Françoise Micheau, *La médecine arabe et l'occident médiéval* (Paris, 1990), pp. 182–5, and Michael McVaugh, "The nature and limits of medical certitude at early fourteenth-century Montpellier", *Osiris*, 6 (1990): 62–84, pp. 69 passim.

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1 عرض – 2 معرض – 3 عرضا – 4 نحوها — 5 المقصود — 6 العرض — 7 فصولا – 8 الأعراض

– 9 Conjectural reading – 10 الأعراض — 11 الأعراض

2. والتجربة إذن هي التي تحتاج إلى طول الزمان فإذا قيس العمر إلى زمان تحصيل المعلومات بطريق التجربة أمكن أن يكون يقال إن العمر قصير والصناعة طويلة فأما إذا حصّلت المقدّمات معلومة فإن الزمان الذي فيه يتطلّب الحدّ الأوسط لتأليف القياس قصير جدّاً فالعمر بالإضافة إليه طويل جدّاً.

3. التجربة هي تعمّد الإنسان للإحساس بجزئيات أمر ما ليحصّل له عن ذلك الإحساس علم ما.

4. والتجربة يقال بعموم وبخصوص فإذا قيلت على العموم دلّت على تعمّد الإحساس بجزئيات أمر تحصّل منه قضية كلّية وجدت تلك الأشخاص عن إرادة الإنسان أو وجدت عن الطبيعة.

5. ولما كان القياس إنما يؤلّف من معلومات تقدّم الإنسان علمها[1] قبل وتلك المعلومات إما عن قياس وإما لا عن قياس فإن كانت عن قياس لزم أن يكون القياس عن معلومات أخرى[2] وكذلك إلى أن ننتهي[3] إلى معلومات لا عن القياس.

والأمور المعلومة لا عن القياس أربعة منها محسوسات ومقبولة وحاصلة عن محسوسات يتعمّد الإحساس بها ومعقولات أول.

الصنائع إنما تؤلّف على الأكثر من الثاني والثالث بحسب ترتيبنا فمن الصنائع ما يؤلّف عن الأوّل فقط وما يؤلّف عن الثلاثة كما عرض لصناعة الطبّ فأما ما أُلّف[4] عن المقبولات فمطرح. فالصنائع التي يقال قياسية من جهة ما فعلها القياس إما أن تكون أجزاؤها عن قياس وإما لا عن قياس فإن كانت لا عن قياس فجلّ[5] مبادئها الضرب الأوّل أو الثاني أو الثالث.

1 فعلها 2 – أخر 3 — ينتهي 4 – ولف – 5 Conjectural reading

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6. وصناعة الطبّ فإن مبادئها ممّا يوقف عليها بالتجربة وقد كان في القديم من يقتصر على ما يتعلّمه منها على الإحساس فقط فنشأ عند أولئك صناعة تجريبية وهذا في زماننا قليل جدّاً ويشبه أن يكون من الناس من لم يقتصر على ما يستخرج بالتجربة قبل أحد ما جرّب ويستعمله مبادئ للمعرفة. واتّفق إن كانت النتائج اللازمة عنها إذا وجدت وقف عليها بالحسّ كتعليق المحاجم والفصد من خلاف وأشباه ذلك.

7. فإن الوقت قد يكون طبّياً بأن يحتوي على عمل من أعمال الطبّ وقد يكون طبّياً بأن يلتمس فيه علم طبّ إما بالقياس أو بالإحساس لشيء طبّي. وبالجملة فإنما يكون الوقت طبّياً بأن يحتوي على جزء طبّي إما بفعل أو علم أو ما يعدّ معهما. فإن نحن جعلنا هذا القول تابعاً لما تقدّم فيجب أن يكون منسوباً إلى صناعة التجربة[1] التي تقدّم ذكرها وإليها من جهة ما يقتنى.

والوقت في المشهور إنما يدلّ على الزمان من حيث هو منسوب إلى شيء ما بالفعل – وكذلك وقت الحرب ووقت الظهر– أي زمانه المنطبق على وجوده. والزمان المنطبق على وجود أجزاء الاقتناء هو إما في القياسية من حيث هي قياسية– فالزمان المساوق لتأليف القياس– وإما في التجريبية وفي القياسية من حيث هي تجريبية– والزمان المنطبق على الإحساس بجزئياتها وبيّن أن القياسية من حيث هي قياسية فوقتها ليس ضيّقاً عنها إذ إنما يمتدّ بامتداد الفكرة فيه.

1 التجريبية

8. وواجب أن تروم تقليل وجود أجزاء الصناعة المقتناة بهذه الجهة على غاية ما يمكن حتى لا يكون فيها جزء واحد أن يقتنى بالقياس فيقتنى بالتجربة فتكون تلك إذًا هي الصناعة القياسية وتكون أقصر الصنائع ويمكن أن تعلّم وتتعلّم بقول إلا تلك المقدّمات وعسى أن يكون الوقوف عليها سهلاً أو قريباً و[1] لا تكاد تقع هذه كلها فيه بل تختصّ بعدم هذه الأحوال.

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وبالواجب [أن نحن قدرنا على][2] صناعة طبّيةً يمكن أن نستنبط منها ولو جزءاً واحداً بالقياس وإن كان ذلك الجزء من الصناعة يستنبط من صناعة أخرى بالتجربة فإن تلك الصناعات أقرب وأسهل قضاءً وأقلّ زماناً من الأخرى بمقدار ذلك الجزء إذ كان يمكن أن نستنبط هذا الجزء دون أن نحتاج فيه إلى معاونة المريض ومن يحضره والأشياء التي من خارج التي تصعب أو تمتنع أن تحصر أحوالها. وكذلك إن كانت فيها أجزاء أكثر من واحد لزم ذلك فيها وأمكن أن نوقف على صحّتها دون أن نحسّ جزئياتها وتتعلّم في قول وتكتب في كتاب جهة استنباطها فيجب على هذا أن تكون حرصاً على صناعة يمكن أن يستنبط بهذا الجهة.

1 أو- Sic 2

9. وقوله والتجربة خطر يشبه أن تكون التجربة ها هنا استعملها بخصوص والتجربة يقال بعموم وبخصوص فإذا قيلت على العموم دلّت على تعمّد الإحساس بجزئيات[1] أمر تحصّل منه قضية كلّية وجدت تلك الأشخاص عن إرادة الإنسان أو وجدت عن الطبيعة. وقد يقال بخصوص على الإحساس بجزئيات الأمور التي تحدث عن إرادة الإنسان أو يحدثها الإنسان بوجه ما وهذا هو الأشهر من دلالة التجربة.

1 لجزئيات

10. فأما التجربة على العموم فليس يقال فيها إن جميعها خطر فإن تشريح الموتى ليس خطراً بجهة من الجهات اللهمّ إلا بالعرض وفي وقت ما.

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