Some Thoughts on the Development of Medieval Hippiatric Science in the Mediterranean Region

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Some Thoughts on the Development of Medieval Hippiatric Science in the Mediterranean Region

Since the publication of my book on science in Byzantium,¹ I am sometimes asked by colleagues, especially modernists, whether it is appropriate to speak of science in relation to the Middle Ages. Many researchers still assume that this historical period, sometimes described as premodern, was obscurantist, steeped in naïve beliefs, and could not have contributed to scientific development.

However, man has always been engaged in scientific endeavours; it could almost be one of mankind’s hallmarks. Science is part of humans’ innate curiosity, constantly seeking knowledge. The mastery of fire and, even more so, the possibility of making a fire—significantly, we often speak of the discovery/invention of fire—is the result of repeated observations, initiatives, risk-taking, failures, perseverance and repetition. All modern researchers are familiar with these processes. We must therefore consider that there always existed a scientific practice, even if people in earlier periods and the Byzantine era in particular did not comply with the same methodological criteria currently in use in scientific practice.²

It is indisputable that definitions of what is ‘scientific’ have changed considerably. For a medieval scholar, heir to Aristotelian epistemology, what was scientific was what could be demonstrated logically. Without being completely absent, the experimental approach as presented in the Aristotelian corpus—most extensively in the first chapter of the first book of Metaphysics (Metaphysica, A.1) and in the last chapter of the second book of the Posterior Analytics (Analytica posteriora, II.19)—is ambiguous.³

In his Aphorisms, Hippocrates describes experience as perilous (ἡ δὲ πεῖρα σφαλερή, Aphorismi, I, 1). The comments that medieval physicians wrote on this first aphorism are enlightening. Following Galen (Hippocratis de humoribus liber et Galeni in eum commentarius I, VII [519]), they reiterated that the medical art stands on ‘two

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² On this point and with previous bibliography, see Lazaris, A Companion (as footnote 1 above), 6–11.
³ As pointed out by P. Gregorić and F. Grgić, “Aristotle’s notion of experience plays an important role in his epistemology as the link between perception and memory on the one side, and higher cognitive capacities on the other side. However, Aristotle does not say much about it, and what he does say seems inconsistent” (P. Gregorić / F. Grgić, Aristotle’s Notion of Experience. Archiv für Geschichte der Philosophie 88 (2006), 1–30).

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legs’: experience (ἐμπειρία) and reason (λόγος). The notion of experience (which here includes acquired experience and experimentation, particularly pharmacological) is understood in two ways: either as empirical trial and error, legitimate for the historical founders of a science, such as Hippocrates, but unworthy of his successors, heirs to a ‘doctrine’, i.e. a set of principles verified through their implementation from generation to generation; or as experimentation carried out systematically, but with unreliable results, as these are subject to variations that are difficult to explain rationally.

I will not dwell on this controversy, whose ramifications extend beyond science to the historical period as a whole, namely the Middle Ages, or to monotheistic religions, particularly Christianity, and their role and place in the development (or not) of science. Yet, as has been demonstrated in several recently published books on medieval science, many Byzantine scholars contributed to the development of science in their time. Of course, and this is a fact that I am studying in a book in preparation, the practice of science in all periods depends not only on the intellectual tools available to scientists, but also on material tools. There is a close and inseparable link between the two. Solving a problem may require the creation of suitable tools, and conversely, a tool may then be used to provide evidence for certain theories.

If we assume that medieval people, with their technological and intellectual resources and their philosophical and theological ideas, contributed to the growth of science in their time, can we hypothesise that the Mediterranean region became a place of exchange and confrontation of cultures, which caused an intellectual dynamic that, in turn, accelerated the production of new knowledge?

Before I can answer this question, through a specific case study, I would like to make a few comments on the Mediterranean region in modern historiography, in order to better define the context of this study. The history of the Mediterranean, conceived as a coherent geographical and human entity, has gained prominence in the historiographic landscape since the publication of F. Braudel’s work on the Mediterranean world at the time of Philip II. Before him, other historians had approached the history of the Mediterranean by emphasising the human contacts fostered by the sea (e.g., H. Pirenne, Mahomet et Charlemagne. Paris 1937).

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5 Some of these are listed in S. Lazaris, Introduction, in Lazaris, A Companion (as footnote 1 above), especially n. 70.
6 F. Braudel, La Méditerranée et le monde méditerranéen à l’époque de Philippe II. Paris 1949 (there were three other editions: 1966, 1976, 1975. The 1966 edition was a significantly updated version). Before him, other historians had approached the history of the Mediterranean by emphasising the human contacts fostered by the sea (e.g., H. Pirenne, Mahomet et Charlemagne. Paris 1937).
7 La Méditerranée et le monde méditerranéen à l’époque de Philippe II served as a testing ground for Braudel’s idea that history involved a triple temporality: the longue durée of an “almost motionless” history, which concerns man’s relationship with his geographical environment; the ‘slowly paced’ time of the social history of groups and associations; and finally, the ‘rapid’ time of the history of
linked by the sea. Braudel was interested in what happened in the Mediterranean basin as a whole, that is to say, essentially, on its land and soil.

More recently, P. Horden and N. Purcell have studied the agricultural history of countries on the shores of the Mediterranean. While highlighting the influence of the ‘romantic’ legacy of Braudel’s vision of the Mediterranean, they propose a new approach to Mediterranean history. This is a kaleidoscopic vision of Mediterranean spaces, with microregions of extreme diversity, since people have responded differently to environmental givens, shaping their territories according to the complementary relationships of their ecological environments with the surrounding land. The ecological and anthropological continuum that the Mediterranean represents is established thanks to a formidable “connectivity,” a concept used by the authors to describe the constant interrelationships between highly varied fragmented areas. Thus, each Mediterranean site can only be understood if it is integrated into its network of more or less neighbouring micro-regions, in the “connectivity” of the whole Mediterranean, to borrow one of Horden and Purcell’s main ideas. Their vision of a shattered and fragmented Mediterranean is therefore opposed to that proposed by Fernand Braudel of a “centre/periphery” division.

Another historian interested in the Mediterranean is D. Abulafia. Unlike the previous scholars, he has chosen to focus his attention on what is happening on the surface or in the immediate vicinity of the vast body of water that defines the region. He also differs from his predecessors, particularly Braudel, in that he is interested in the actions of individuals and, even more so, of groups (ethnic, social and professional) in history. As a result, he resolutely places his narrative in human time and presents it from a human perspective. Abulafia’s history of the Mediterranean is thus firmly centred on the sea itself. Before being a region, the Mediterranean was a sea, an obvious fact that Braudel and his students tended to forget.

Despite their different points of view and approaches, for all these historians (and many others) the Mediterranean has played a role of primary importance in

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the history of human civilisation by allowing, for thousands of years, numerous opportunities for various populations to interact. These encounters have been beneficial in many ways and have greatly helped to stimulate curiosity about others, their habits and customs and to increase knowledge. As a thousand-year-old melting pot of diverse civilisations, the Mediterranean has never ceased to be the receptacle of a dense and fertile interweaving of peoples and cultures.

Its medieval past, which was stigmatised for so long in the name of political and religious rifts (see also above), is no exception to this rule and is increasingly marked by the significance of contacts and scientific and cultural exchanges. Placing the latter at the centre of historical considerations highlights the permanent circulation and permeability of different societies, in this case those of the medieval Mediterranean area. Different actors\(^\text{11}\) played an important role in the scientific-cultural transfers. Among them are the translators. Indeed, in the history of science, interactions between scholars can be seen, in particular, through translations (and/or bilingual works), which helped these scholars to better understand the knowledge of other cultures, but also to criticize it, to deepen it, to reject it as invalid or, on the contrary, to appropriate it. Translations of scientific treatises and their contribution to the transmission of scientific knowledge have experienced a great boom in recent decades and I do not intend to return to them in extenso in this chapter. My objective here, through the specific case of some hippiatric texts, is to highlight these intellectual exchanges and to verify whether, in this particular case, we can speak of a Mediterranean scientific métissage.\(^\text{12}\)

\(^{11}\) Generally speaking, any person, group or institution acting, voluntarily or involuntarily, with the aim of transferring a cultural good in geographical space, time and socio-cultural setting is defined as an actor.

\(^{12}\) The word métissage (mischeanetation) preserves in its very etymology the traces of its history: first used in Portuguese and then in Spanish, the mestizo (mixed blood, a term derived from the Latin mixtus) originally referred to the category of children of European-Indian unions. After the end of the colonial era, cultural métissage became a synonym for a multidimensional and pervasive cultural phenomena, and is now seen as inseparable from the construction and evolution of cultures.
1 Greek hippiatry: translations and inspiration for Arabs and Westerners

The Byzantine encyclopedia known as the Hippiatrica preserved important Greek texts on horse medicine. It consists of fragments of texts from seven authors: Anatolius of Berytus (4th C.), Apsyrtus of Clazomenae (4th C.), Eumelus (late 3rd or early 4th C.), Hierocles (4th C.), Hippocrates the hippiatrician (4th C.), Pelagonius (4th C.), and Theomnestus (4th C.). The treatises of these seven authors circulated independently of each other until they were brought together in the Hippiatrica. This work is therefore composed of extracts, mostly divided by subject, from texts that have now been lost. Other small treatises accompany the texts attributed to these authors, but they are of less importance and were considered so in the past given that there are not necessarily present in every recension of the Hippiatrica. This is how the Recentio prima (= A) of the Hippiatrica was born. These texts were probably assembled at the very beginning of the sixth century. The Recentio prima was not preserved.


15 Tiberius: among the agricultural writers. His work included treatments for both horses and cows; Julius Africanus: many excerpts from his work are found in one of the recensions of the Hippiatrica; Προγνώσεις και ιάσεις: this anonymous work relied on cautery and avoided “irrational remedies.”

16 Seventeen authors are mentioned in total, but aside from the seven authors already mentioned, the names of the authors are only linked to a few chapters every time. On the Hippiatrica, see A. McCabe, A Byzantine encyclopaedia of horse medicine. The sources, compilation, and transmission of the Hippiatrica. Oxford studies in Byzantium. Oxford / New York, N.Y. / Auckland 2007; S. Lazaris, Veterinary Medicine, in S. Lazaris (ed.), A Companion (as footnote 1 above), 404–428, especially 414–424.

17 Just like the Geoponica, the production of the Hippiatrica had for a long time been placed during the reign of Constantine VII. K. Krumbacher in the first edition of his work on the history of Byzantine literature had even suggested that Hierocles had written these two works at the time of the emperor Constantine VII. His idea had the advantage of explaining the many common passages between the
To this date, we only know four recensions (= M, B, D and RV 3, a-b), to which can be added two ‘new’ works coming from the *Hippiatrica*. These are the *Epitome*, which dates roughly to the same period as the *Recentio prima* and Hierocles’ recomposed work, from a later date, and which I call for convenience “Hierocles recomposed.” The text of the *Epitome* is known in eleven copies\(^{18}\) of five recensions (= HIG, S, QZF, Jj and RV 2),\(^{19}\) which have reached us through nine manuscripts, among which two are illustrated.\(^{20}\) The “Hierocles recomposed” is preserved in four manuscripts and divided in two families (= I, [X]\(^{21}\) and RV 1).\(^{22}\)

Indeed, at first, the *Hippiatrica* was epitomized.\(^{23}\) This process resulted in the creation of a summarised text, an *Epitome*,\(^{24}\) according to the title in one of the manuscripts, which reproduced this text: *Vatican, Biblioteca Apostolica Vaticana, Pal. gr. 365, f. 204r*: Ἰατρικὸν ἐν ἐπιτόμῳ ἄριστον περὶ ἵππων κατ’ ἐκλογὴν ἔχον κεφάλαια διάφορα (“excellent medical epitome on horses, containing different chapters selected”).\(^{25}\) Thereafter, we witness the opposite phenomenon of that which had prevailed in the production of the *Hippiatrica*. While the latter was based on the use

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\(^{18}\) Until recently we only knew 10 copies preserved in eight manuscripts, but I have discovered a new copy (= j) for which I will publish a codicological notice.

\(^{19}\) See Lazaris, Art et science (as footnote 17 above), 9–35 and 135.

\(^{20}\) Leiden, Bibliotheek der Rijksuniversiteit, Voss. gr. Q. 50, middle of the fourteenth century and Paris, Bibliothèque nationale de France, gr. 2244, fol. 1–74 and 90–195, late fourteenth century. On these manuscripts and their illustration, see Lazaris, Art et science (as footnote 17 above), 41–61.

\(^{21}\) The *Paris, Bibliothèque nationale de France, gr. 2419, fol. 159r–v (= [X]) only contains Hierocles’ introduction to his second book. His siglum is between brackets to indicate that philologists have not yet confirmed the historical accuracy of this piece of evidence.

\(^{22}\) On the various manuscripts, see Lazaris, Art et science (as footnote 17 above), 150–151.


\(^{24}\) Let us mention that this *Epitome* includes practical indications, which are not found anywhere in the *Hippiatrica*. Furthermore, this *Epitome* is not a summary, *stricto sensu*, of the hippiatric collection, but picks up several passages of the latter. The writer(s) of the epitome genuinely sorted the data derived from the *Hippiatrica*, since everything relating to the field of zootechny and of hippology has been excluded and does not offer, for each topic, the views of various authors.

\(^{25}\) Yet, this notion of summary does not appear in the titles of all the manuscripts, far from it (see Lazaris, Art et science (as footnote 17 above), 24, n. 80).
of extracts borrowed from the original writings of several hippiatrists (see above), the “Hierocles recomposed” is based on another principle: extracts attributed to this author from the Hippiatrica were selected and compiled in the form of two books as if they had been the original and fully-fledged work of Hierocles.26

Without going into further detail, we can see the evolution of these hippiatric treatises in Byzantium: first as individual texts, then gathered into a collection, from which an epitome and an attempt to recreate the original text of one of the main authors of the Hippiatrica are derived. These literary ‘adventures’ reveal a Byzantine interest in these texts. Hippiatric knowledge was therefore most probably transmitted orally, but also, and above all, in writing. Indeed, as pointed out by R. McKitterick, the book was by far the most important method of exchanging knowledge in the medieval worlds.27 It was the primary way of conveying information and scholarship from place to place, and from generation to generation. Therefore, the written word has been vital to the continuity and development of scientific thought over the years.

Translation is a first and highly important step in the transmission of learning from one culture to another. Thus, Apsyrtus’ treatise of Clazomenae was translated into Latin at a very early stage. Indeed, Vegetius (4th–5th C.), refers to it but also mentions that he only uses Latin authors (Mulomedicina, Prol., 1,6 ed. E. LOMMATZSCH, P. Vegeti Renati, Digestorum artis mulomedicinae libri (accedit Gargilii Martialis De curis boum fragmentum). Bibliotheca Teubneriana. Lipsiae 1903). Conversely, Pelagonius’ treatise was translated from Latin into Greek and forms part of the Hippiatrica (on this translation, see above, n. 14). Incidentally, some preserved fragments of Apsyrtus of Clazomenae in the Hippiatrica suggest that he either included passages from a previously existing translation of Columella’s De Re Rustica or translated them himself. Finally, we should mention that fragments of Vegetius’ Mulomedicina are quoted in the Hippiatrica, which implies a translation from Latin into Greek.28

Eventually, in later years, the horse-care manual of Theomnestos was translated into Arabic.29 This translation was attributed in a colophon to Ḫunayn ibn Ishāq

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26 The reason for choosing Hierocles among the seven authors whose work was the foundation of the constitution of the Hippiatrica is unknown. It may because of his general reliability and his eloquence. Ironically, his trustworthiness is due to the fact that Hierocles plagiarised Apsyrtus, one of the most brilliant hippiatrists in antiquity. And regarding his eloquence, it probably came from his real training as a lawyer (in the prologue of the first book of his treatise, he alludes twice to the tribunal), but harbouring a true passion for horses (A.-M. DOYEN-HIGUET, Les prologues de Hiéroclès: deux fleurs de rhétorique dans la Collection d’hippiatrie grecque. Les Études classiques 70 (2002), 27–51).


29 The Arabic version was edited and translated into German by S. Saker (S. SAKER, Die Pferdeheilkunde des Theomnest von Nikopolis: ein Handbuch für den praktischen Tierarzt im arabischen Sprachraum des Frühmittelalters. Akademie der Wissenschaften und der Literatur Mainz. Veröffentlich-
(808–873), one of the most famous translators of Greek into Arabic. It is thought he worked from an almost complete copy of Theomnestus’ original treatise, rather than from the fragments preserved in the *Hippiatrica*. This translation is precious because it contains information that was not preserved in the *Hippiatrica*. As mentioned earlier, we only have excerpts from Theomnestus’ book interspersed with excerpts from other texts on horse care and medicine.

Besides the shortcomings of the Greek text that this translation can help to overcome, it played an important role in the development of hippiatry in the Muslim world. It was used by Muḥammad ibn Yaʿqūb ibn Ghālib ibn ‘Ali al-Khattalī (c. middle of the 9th c.), known as Ibn Akhī Ḥīzām, who wrote an significant work on horse medicine in the middle of the ninth century for Caliph al-Mutawakkil (r. 847-861). Ibn al-ʿAwwām (d. 1158) used Ibn Akhi Ḥīzām’s book as a source when he compiled his book on agriculture in Seville in the twelfth century. It was also used as a source by Ibn al-Mundhir, known as al-Bayṭar, (d. 1340/1), when writing his book on horsemanship and veterinary medicine for the Mamluk Sultan Ibn Qalāwūn (r. 1293-1294, 1299-1309, 1310-1341). Other parallels with Theomnestus are found in Tāj al-Dīn’s (d. 1307) book on veterinary medicine in the thirteenth century. The influence of the
translation from Baghdad to al-Andalus is therefore self-evident, which shows the Arabs’ interest in hippiatric knowledge.\footnote{As we shall see further, this hippiatric text was probably not the only one to be translated into Arabic.}


His name is primarily linked with the translation, from Arabic into Latin, of a work of veterinary medicine ascribed to Hippocrates (Liber de curationibus infirmitatum equorum quem translativ de lingua arabica in latinam Magister Moyses de Palermo).

The work begins with Sapientissimus Ipocras medicus Indie fecit librum istum, ordinavit enim in hoc libro curam animalium irrationabilium, sicut sunt equi, muli, bordoni, asini, et aliorum animalium irrationabilium ... G. Björck has shown that passages from Moses’ translation occur in Ibn al-‘Awwām’s Kitāb al-filāḥa, where they are attributed to Hippocrates the hippiatrician. This proves at least the existence of an Arabic
work under Hippocrates’ name, and such a work must have been the source of Moses’
translation. In all likelihood, this is the text of the Epitome attributed in some Greek
manuscripts to Hippocrates. This translation was known and used throughout the
Middle Ages. Guillaume de Villiers (see further) was aware of it and used it.

Apart from these translations of hippiatric texts (from Greek into Arabic and Latin,
from Latin into Greek or from Arabic into Latin), there are also translations from Greek
into Latin that were produced at a later date than the one mentioned above for the text
of Apsyrtus used by Vegetius. One of the earliest late medieval translators was Bar-
tholomew of Messina, a translator of philosophical and medical texts. He was active
at the Sicilian court of King Manfred (r. 1258–1266). According to G. Björck, Manfred
had the Epitome translated from Greek into Latin by Bartholomew of Messina. Also
according to G. Björck, Bartholomew in addition translated, or at least was involved in
the translation of, Hierocles’ work. According to K.-D. Fischer, “what he was transla-
ted must have been in fact extracts from Hierocles reassembled from the compilation
of the Hippiatrika.” In fact, it is what I call the “Hierocles recomposed” (cf. supra).

According to A. McCabe, “there seems no reason to doubt the attribution of the
translation to Bartholomew, since the incipit follows the formula with which he
prefaced all of his known translations of Greek philosophical and medical texts.”

43 Björck, Griechische Pferdeheilkunde (as footnote 33 above).
44 Lazaris, Art et science (as footnote 17 above), 27–28, especially n. 80.
45 Manfred, Frederick’s (r. 1220–1250) natural son, was crowned in Mainz as emperor of the Holy
Roman Empire as well as King of Sicily and Jerusalem. He succeeded to the Norman throne in 1258
and shared his father’s scientific interests. After his father’s death, he edited the former’s famous
treatise on falconry, De arte venandi cum avibus. Just like his father, Manfred gathered scholars and
translators to help him pursue these scientific interests.
46 G. Björck, Apsyrtus, Julius Africanus et l’hippiatrie grecque. Uppsala Universitets Årsskrift, 4
Uppsala 1944, 38. The Latin text of the Epitome had already been edited from a single manuscript
Thesis). However, the editor did not realise that he had a Latin translation of the Epitome before him.
47 Björck, Apsyrtus, Julius Africanus (as footnote 46 above), 38.
48 K.-D. Fischer, ‘A horse! a horse! my kingdom for a horse’. Versions of Greek Horse Medicine
in Medieval Italy. Medizinhistorisches Journal 34 (1999), 123–138, especially 134. On this idea, see G.
Björck, Le Parisinus grec 2244 et l’art vétérinaire grec. Revue des Études grecques 48 (1935), 502–524,
especially 509–510. This hypothesis has been taken up by many other researchers since then (see
Fischer, A horse (as footnote 48 above), n. 34).
49 As all the Greek manuscripts that have preserved this text are later in date (14th–15th centuries,
see Lazaris, Art et science (as footnote 17 above), 134–135), Bartholomew of Messina must have had
access to one (or more) earlier manuscript(s) and it would be interesting to compare the version of his
text with the Greek text of ‘Hierocles recomposed’.
50 McCabe, A Byzantine encyclopaedia (as footnote 16 above), 239. On this translation, see also
Poule-Drieux, Pratique de l’hippiatrie (as footnote 41 above), 25–26; S. Lazaris, Contribution à
l’étude de l’hippiatrie grecque et de sa transmission à l’Occident (XIIIe–XVe siècles), in M.-C. Amou-
retti / F. Sigaut (ed.), Traditions agronomiques européennes. Élaboration et transmission depuis
However, in a recent careful study, P. Beullens has shown that this attribution is more complex than we think.\(^{51}\)

Boniface of Calabria is a translator of the same period.\(^{52}\) He is known from a work entitled *Tesoro dei cavalli* attributed to him in certain manuscripts. This treatise differs little from that of Lorenzo Rusio (see below). The two texts vary only in the prologue and in certain therapeutic practices. Moreover, as D. Trolli writes, “la maggior parte dei manoscritti che ce la conservano contengono anche altre opere (latine e volgari) dello stesso autore, configurandosi così come una sorta di ‘opera omnia’ di Bonifacio: alcuni opuscoli di medicina e di alchimia e il volgarizzamento di un compendio degli *Hippiatrica* ... che si cela sotto il titolo *Pratica* (o *Trattato*) *dei morbi naturali e accidentali, segni e cure de’ cavalli tratta dai libri di Ippocrate (e) de Damasceno.”\(^{53}\) Finally, in almost all the manuscripts that have preserved these texts, there is a biographical notice in which it is stated that Boniface was a Greek from Calabria who lived at the time of Charles I of Anjou (r. 1266–1282), who held him in high esteem, to the point that he was made a Knight and Master of his farms and that he offered him the fiefdom of Gerace.\(^{54}\) It also states that the *Tesoro dei cavalli* was translated by the Dominican “Antonio da Pera mastro in teologia ...” (who probably died after 16 April 1440).

According to Y. Poulle-Drieux, the *Tesoro dei cavalli* is the Italian translation of Lorenzo Rusio’s hippiatric work produced by Antonio da Pera “d’un soi-disant traité composé en grec par un certain Boniface de Gérace”.\(^{55}\) D. Trolli maintains, however,
that the information in the biographical note concerning the translation by Antonio da Pera does not refer to the *Tesoro dei cavalli*, but to the *Pratica dei morbi naturali e accidentali, segni e cure de’ cavalli tratta dai libri di Ippocrate (e) de Damasceno*,\(^{56}\) which was in fact the translation of a Greek hippiatric work. According to him, Boniface, who knew Greek, had prepared this treatise which Antonio da Perra translated in the fifteenth century. His comment is supported by the information that Boniface lived at the time of Charles I of Anjou. It seems difficult to assume that Boniface could have consulted and subsequently translated Lorenzo Rusio’s work (composed between 1288 and 1307).

## 2 Towards a medieval and Mediterranean hippiatric science?

Thus, we see that the hippiatric texts were translated, copied, quoted and used throughout the Mediterranean world. As outlined above, for both Arabs and Westerners, there was clearly a desire to appropriate Greek hippiatric knowledge. Similarly, the Byzantines, but to a lesser extent and only in late antiquity, were interested in some Latin hippiatric texts. This appropriation in turn became the driving force behind the production of new knowledge. It resulted in a profound intellectual effervescence in the Mediterranean basin. Through the concrete cases of Greek hippiatric texts translated into Arabic and Latin (and also into vernacular languages),\(^{57}\) we can see how a ‘simple’ translation can become the lever of a more profound influence.

Indeed, translation is a crucial step in the transmission of knowledge from one culture to another. Producing a translated version of a text is a far more complex undertaking than simply switching from one language to another: the text is entirely re-written, with terminology changes or choices, intentional omissions or additions,
and accidental errors. As U. Eco wrote, “translation is always a shift, not between two languages but between two cultures – or two encyclopaedias. A translator must take into account rules that are not strictly linguistic but, broadly speaking, cultural.”

Translation was a fundamental aspect of the scientific process, and it became a self-perpetuating activity. The production of a new text stimulated new research in the field, which would then lead to more and better translations.

Moreover, all these translations, which we have briefly outlined, influenced several other authors. We have seen this in particular with the Arabic translation of the text of Theomnestus (see above, pp. 397–398). We observe the same phenomenon in the West where texts translated into Latin and vernacular languages influenced, directly or indirectly, several authors covering a period of about three centuries (13th–15th). The first of these authors could be Giordano Ruffo di Calabria (or Jordanus Ruf[f]us). Ruffo was a member of a noble Norman family by the name of Rufo. Giordano Ruffo certainly held an important position with Frederick II, King of Sicily, but it

59 Gutas, Greek thought (as footnote 35 above), 110.
61 On the transmission and development of science at the court of Frederick II, see C. H. HASKINS,
is difficult to know more about his role and position in the court of Frederick II. It is very likely that he composed his treatise, *De medicina equorum* or *Hippiatria*, after Frederick’s death. According to Y. Poule-Drieux, Giordano Ruffo probably knew the *Hippiatrica*, which is denied both by D. Trolli and by K.-D. Fischer. Indeed, it is difficult to detect precisely what the author’s sources were. In the present state of our knowledge, it is more prudent to put forward the hypothesis of an episodic and indirect influence of Greek sources. His Latin text flourished in the West and was translated into several vernacular languages.

Pietro de’ Crescenzi (1230/33-1320/21) was the author of a treatise dedicated to Charles II of Naples, on agricultural management (*Ruralium commodorum libri XII* or *De agricultura*), written between 1304 and 1309. The author was inspired by Latin and Greek agronomists and hippiatrists. His work was a great success and was very quickly translated into several languages, including French.

Lorenzo Rusio, the veterinary author active in Rome, dedicated his hippiatric work (*Hippiatria sive marescalia*) to Cardinal Napoleone Orsini (*†*1342). It must

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62 This treatise was edited several times (see MONTINARO, La tradizione (as footnote 60 above), 33–35).

63 Cf. FISCHER, A horse (as footnote 48 above), n. 18.

64 DRIEUX, Pratique de l’hippiatrie (as footnote 41 above), 17. Long before Y. Poule-Drieux, C. F. Heusinger wrote that “Jordanus Ruffus pouvoit avoir connaissance des hippiatres grecs; mais en comparant son ouvrage avec les helenistiques on ne pourra guère prouver, qu’il en fait usage ; les hippiatres grecs connoissent plus de maladies que lui, et quelques maladies communes et générales sont mieux décrites par eux que par Jordanus” (HEUSINGER, Recherches (as footnote 60 above), 42).

65 TROLLI, Studi su antichi (as footnote 38 above), 25–26; FISCHER, A horse (as footnote 48 above), 130–131 (on the different arguments, see the discussion in MONTINARO, La tradizione (as footnote 60 above), 23–26).


therefore have been composed between 1288 (the year of his elevation to the cardinalate) and 1307 (the year of his final departure from Italy to France). Among his sources, the author mentions the names of a certain Hippocrates and a certain Galen. Most likely behind these two authors is the *Epitome*, a text sometimes attributed to these two Greek physicians (see above, n. 24). There are at least four versions of this work: in Latin, Italian, French and Flemish dialect.

The *Cirurgie des chevaux* is another text, also derived from Greek sources. It is an anonymous French treatise preserved in a single manuscript from the fourteenth century, when it was probably written. This work consists of eighty-four chapters. According to Y. Poulle-Drieux, its author was inspired (for chapters 8–59) by Hierocles’ text and the *Hippiatrica*. As B. Prévot suggests, these sources may have been used, but only in a fragmentary way. For his other chapters, the author used the chapter *De equo* from Albertus Magnus’ *De animalibus*.

Finally, two other authors mention a certain Hippocrates as a source, which could be Hippocrates the hippiatrician or simply the *Epitome* (it should be noted that the *Epitome* is repeatedly presented in Greek tradition as the work of Hippocrates). The first is Juan Álvarez de Salamiella, who wrote a treatise in the late fourteenth or early fifteenth century entitled *de menescalia et de albeyteria et fisica de las bestias*. The second is Guillaume de Villiers who compiled a hippiatric treatise in French (most likely in Normandy) in the middle of the fifteenth century. Guillaume de Villiers does not hesitate to use magical practices (what he calls “chermes”) as a remedy to cure horses.

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68 See Trolli, Studi su antichi (as footnote 38 above), 69–70.
69 Aurigemma, La Mascalcia (as footnote 67 above).
70 This treatise was partly transcribed (Pouille-Drieux, L’hippiatrie (as footnote 55), 119–121) and edited (Prévot / Ribémont, Le cheval en France (as footnote 38 above), 363–404 with a glossary on pages 405–428). See also Prévot, Le cheval (as footnote 60).
71 Pouille-Drieux, L’hippiatrie (as footnote 55), 45); Prévot / Ribémont, Le cheval en France (as footnote 38 above), 354. Hierocles is mentioned by the author at the end of the work: “Heraclez, qui cognuit les chevaux...”. On how Hierocles’ name was distorted in the Western tradition, see for example Björck, Apsyrtus, Julius Africanus (as footnote 46 above), 38.
73 This text is unpublished. Y. Pouille-Drieux (Pouille-Drieux, L’hippiatrie (as footnote 55), 123–148) transcribed it partially from the three manuscripts that preserve the text. B. Prévot and B. Ribémont have announced a critical edition (Prévot / Ribémont, Le cheval en France (as footnote 38 above), n. 68).
Finally, let us mention the work of Manuel Díez. Even if it is not directly inspired by Greek veterinarians, as Y. Poulle-Drieux pointed out, he used, among others, the work of Lorenzo Rusio who was inspired by Greek authors (see above). He collected the material for his hippiatric treatises, entitled *Llibre de cavalls* and *Tractat de les mules*, both written c. 1424–1436 (very soon reunited in the *Llibre de la menescalia*), as one of the heads of the royal house during and after the first Italic campaign of King Alfonso V of Aragon for the conquest of Naples (1420–1423). The original text, only partially published (*Tractat de les mules*, from few manuscripts), was written in Catalan and then translated into Neapolitan (*Libro de’ cavalli*, c. 1488), French (*Livre de chevalz*, c. 1495), and Castilian (*Libro de albeitería*, 1495). The set was printed in Catalan (1515 and 1523) and in Castilian (1495-1545), and the minor work on the mules, in a new Castilian translation, still appeared in print in the second half of the sixteenth century (1564).

Therefore, the various Western authors succinctly mentioned in this brief inventory, and without any claim to exhaustiveness, were most likely not familiar with the Greek texts themselves but rather with the translations mentioned above. These various translations were therefore the basis for developing, extending and reworking Greek hippiatric ideas and passing them on to future generations, particularly through scientific education. In the examples we have just seen, we are not witnessing a simple reception, *stricto sensu*, of Greek hippiatric texts, but rather a phenomenon of appropriation, which contributed to the development of scientific thought both among Arabs and among Westerners. Moreover, the translations in question were often not the work of an individual, but part of a collective effort that served a greater cause.

Nevertheless, can we speak of a Mediterranean hippiatric science? Even if caution must be exercised in this particular case, the answer could be positive, because these translations not only prevented a compartmentalization of hippiatric knowledge from one culture to another, but also provoked an intellectual effervescence throughout the Medi-
terranean region. But is this argument sufficient to speak of Mediterranean hippiatric science? Certainly, in spite of these translations and the influences that the translations had on the work of other hippiatrists both Arab and Western, the direct ‘return’ of their book production to Byzantium is limited.

Admittedly, A. McCabe has shown that the tenth-century re-edition of the Hippiatrica mentions oriental materia medica, such as ambergris and galangal, which were apparently not present in the original work of the hippiatrists whose texts were used for the composition of the Hippiatrica. Thus, there was enrichment due to contacts with other cultures, and the Byzantine editor of the re-edition of the Hippiatrica (recension B) did not hesitate to add new medical material. However, despite these additions, the ‘return’ to Byzantium was only partial and indirect. It is true that no new Byzantine hippiatric treatise appeared after the end of late antiquity in which Arabic and Latin hippiatric knowledge could have been added. However, no Byzantine translation of one or more of these new Arabic and/or Latin texts was undertaken. In the Byzantine recensions of the Hippiatrica, the knowledge produced among


79 Moreover, very often, these medical additions were due to travelers-merchants. They introduced Mediterranean cultures not only to unknown substances, but also to new texts and instruments. These innovations would then complete the knowledge that was already acquired and would help scholars to question that same knowledge. See for example D. Jacoby, Commercial exchange across the Mediterranean Byzantium, the Crusader Levant, Egypt and Italy. Variorum collected studies series, CS836. Aldershot / Burlington (Vt.) 2005; J. Goldberg, Trade and institutions in the medieval Mediterranean. The Geniza merchants and their business world. Cambridge / New York, N.Y. 2015.

80 For a summary, see Lazaris, Veterinary (as footnote 16 above).

81 The only translations into Greek are from late antiquity. As has been pointed out, Apsyrtus may have translated or had available to him a translation from Latin of Columela’s De Re Rustica. Similarly, the Latin text of Pelagonius was translated into Greek, at the latest, at the time of the constitution of the Hippiatrica, which is situated at the beginning of the sixth century (see above, p. 395). Finally, it is very likely that a translation of Vegetius’ Mulomedicina was used by the compiler of the Hippiatrica. Unrelated to the Hippiatric texts, on translations into Greek in the Byzantine world, see, lastly, and with previous bibliography A. Kaldellis, Catalogue of Translations into Byzantine Greek from texts in any other language, 300–1453 AD. 2018 (version III) [on-line: https://www.academia.edu/36711128/Kaldellis_Catalogue_of_Translations_into_Byzantine_Greek_version_III_]; R. Forrai, Translations from other Languages into Greek: Latin, in S. Papaioannou (ed.), The Oxford handbook of Byzantine literature. New York, N.Y. 2021, 180–188; P. Ubierna, Translations from other Languages into Greek: Syriac, in S. Papaioannou (ed.), The Oxford handbook of Byzantine literature. New York, N.Y. 2021, 189–195; C. Messis / S. Papaioannou, Translations from other Languages into Greek: Arabic, in S. Papaioannou (ed.), The Oxford handbook of Byzantine literature. New York, N.Y. 2021, 195–218; A. Kaldellis, Translations into Greek in the Byzantine Period, in D. Gutas / C. Burnett / U. Vagelpohl
Arab and Western scholars in the field of hippiatry appears only in a very incomplete and indirect way. Intellectual collaboration in the field of hippiatry was therefore not comprehensive, and one cannot claim to witness a cross-cultural transmission with an integration of hippiatric knowledge.


However, these cross-community exchanges are more complex to identify than they might seem. As mentioned above a ‘simple’ translation involves much more than the transcription into another language of the content of the original text. This is even more apparent in the case of the acquisition of scientific instruments. Thus, the transmission to the West of the astrolabe, an instrument for measuring geographical positions and the height of the stars, cannot be reduced to a material transmission, as it also implies the transmission of abstract facts, such as mathematical imagination and the experience of the body. This intertwining of the material and the immaterial is even more visible in the case of the game of chess, which was transferred from India (5th C.) to Western Europe (11th C.) via the Muslim world. It is obvious that one could not just transmit the material object alone, but also the rules of the game. This is why the game of chess naturally underwent, not only in its rules but also in its components, a long and complex adaptation. This can be seen in the metamorphosis of the vizier into a queen, of the elephant into a dolphin and then into a bishop, of the chariot into a tower and so on. Another example is provided by M. Ouerfelli’s study of the diffusion of sugar in the Mediterranean. In this case, transmission has an abstract dimension that goes much further than the simple act of disseminating a commodity within the Mediterranean economy. Material transmission is strongly linked to the transmission of knowledge, particularly concerning the qualities, uses and production techniques of sugar. This is also one of the conclusions of P. Bouras Vallianatos in his recent study on sugar-based medicinal recipes.

Moreover, as Bouras Vallianatos points out “The earliest reference to a sugar-based potion in a medical context in Byzantine literature is found in a manual on

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85 The act of translation changes a text in many ways, ranging from errors in copying to intentional editing and rearrangement. With each new language a work is received in, even with each individual translation, the work itself will change, as well as and how it is viewed, understood, and used. This is not a matter of inaccuracy or misinterpretation, but of real developments in philosophical and scientific thought. The best and most used translations were not made by exactly transliterating individual words in a one-to-one correspondence; rather, it was necessary for the translator to understand the meaning of the text and completely re-write it in the new language.


Some Thoughts on the Development of Medieval Hippiatric Science

horse medicine, called the *Hippiatrica.* Unquestionably, therefore, the Byzantines took advantage of some of the new discoveries and inserted them into hippiatric writings and, more specifically, into their Byzantine recensions. There were some improvements in the latter, but these were very patchy compared to the progress made by the Arabs and Westerners. It should be noted that this opening, at least for the specific example of sugar as a pharmacological ingredient, took place at a time when Byzantine science was undergoing an unprecedented expansion and a certain openness towards other cultures. Indeed, the recipe belongs to recension B of the *Hippiatrica*, whose earliest testimonial, *Berlin, Staatsbibliothek zu Berlin-Preußischer Kulturbesitz, Phillipps 1538 (olim gr. 134)*, dates from the tenth century and is related to the imperial scriptorium of Constantine VII (r. 913-959). This is a period marked by a scientific-cultural revival under the influence of the Macedonian dynasty, which could explain, at least in part, this open-mindedness towards discovering other cultures.

However, one must wait for the thirteenth century to be able to speak of a genuine Mediterranean scientific métissage. From then on, in the West, the two-way relationship model (Arabic-Greek, Greek-Latin, etc.) was abandoned. Instead, there was a proliferation of Mediterranean hippiatric knowledge as a whole, which meant that a real craze for hippiatry was revived. This can be seen in the systematic copying of manuscripts, marginal commentaries, new translations and new treatises, some of which have been listed above. The centre of gravity of this new intellectual peak in hippiatry was now concentrated mainly in southern Italy and Sicily. Indeed, Sicily and Southern Italy had become ideal places for making Greek learning available to the Latin Middle Ages. First, they had numerous Greek works kept for the most part in Basilian monasteries. Some of these works might have been there since late antiquity, or they were acquired through trade with the Byzantine Empire. Second and most importantly, one must never forget the constant presence in Sicily and Southern Italy

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89 Bouras-Vallianatos, Cross-cultural (as footnote 82 above). For the text, see Oder / Hoppe, Corpus hippiatricorum Graecorum (t. 1), 386 (*Hippiatrica Berolinensia*, CXXIX, 8). See also Oder / Hoppe, Corpus hippiatricorum Graecorum (t. 2), 273 (*Excerpta Lugdunensia*, 5).

90 On this manuscript, see Lazaris, Art et science (as footnote 17 above), 32–33, 39–40, 133.


of groups of native speakers of Greek. Some have survived to this day in the regions of Reggio di Calabria and in the Terra d’Otranto. In the twelfth and thirteenth centuries, three (if not more) languages and ethnic communities coexisted in the Norman kingdom of Sicily and Southern Italy, which explains why the chancellery used to issue its orders and documents in Latin, Greek and Arabic; as stated above, some people, like Frederick II, were fluent in all three languages.

We can therefore ascertain that these intellectual interactions around hippiatric texts provoked cross-cultural connections, with varying degrees of success from one civilization to another, which prevented an inward-looking attitude and allowed for a deeper and shared knowledge. There was therefore a real métissage (on this term, see above, n. 12) and not a cultural hegemony of one culture over all others, through translations and reciprocal influences, and in this sense there was a Mediterranean hippiatric science. The medieval Mediterranean as an area of scientific and cultural contacts, as a space for meetings between scholars, hybridisation of knowledge and cultural convergence between Jews, Christians (Catholic and Orthodox) and Muslims did indeed exist, and hippiatric science, despite certain reservations about Byzantium, is evidence of this phenomenon. We can therefore speak of a Mediterranean perspective on the history of hippiatric medieval science. Through the migration of hippiatric knowledge, its appropriation by one culture from another and the many different readings, translations, commentaries and new works produced as a result of these intellectual processes, we can finally cease to belittle the Mediterranean Middle Ages as a poor, even barren, period and area in terms of scientific achievements.