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ON THE IMPACT OF ARABIC PHARMACOLOGICAL
KNOWLEDGE IN EUROPE:
THE EXAMPLE OF PS.-SERAPION'S
LIBER AGGREGATUS DE SIMPLICIBUS MEDICINIS

INTRODUCTION: LATE MEDIEVAL *MATERIA MEDICA* AND THE
IMPACT OF ARABIC PHARMACOLOGY

The history of Late Medieval pharmacology and pharmacotherapy is still to be written. Indeed, much has been done by recent scholarship, and we can now claim that we own a general portrait including some representative texts, a tentative overview of their reception, and a general idea of the data and the notions they conveyed. A good example of the actual standard reached by recent scholarship is represented by the studies devoted to Avicenna's *Liber canonis*. Thanks to the studies published, among others, by D. Jacquart¹, and, more recently, by J. Chandelier², we have better knowledge of the way in which the Arabic physician contributed to the development of medicine and pharmacology during the Late Middle Ages, and especially of the «Scholastic» medical debate that flourished in Italian and French universities between the late 13th

1. Cf. in particular D. Jacquart, F. Micheau, *La médecine arabe et l'Occident médiéval*, Paris 1990; D. Jacquart, *La science médicale occidentale entre deux renaissances (XII^e s.-XV^e s.)*, Aldershot 1997 (CSS 567); Ead., *La médecine médiévale dans le cadre parisien (XIV^e-XV^e siècle)*, Paris 1998. Cf. also the bibliography included in the collective volume *De l'homme, de la nature et du monde. Mélanges d'histoire des sciences médiévales offerts à Danielle Jacquart*, ed. N. Weill-Parot et al., Genève 2019 (École Pratique des Hautes Études, Sciences Historiques et Philologiques, V; Hautes Études Médiévales et Modernes, 113).

2. J. Chandelier, *Avicenne et la médecine en Italie. Le Canon dans les universités*, Paris 2017 (Sciences, Techniques et Civilisations du Moyen Âge à l'Aube des Lumières, 18).

and the 15th century³. In particular, the two scholars have rightly emphasized how several physicians belonging to the French and Italian Academic milieu, such as Gentile da Foligno or Jacques Despars, tirelessly commented upon Avicenna's *Liber canonis*, and struggled with issues stemming out of the work, such as the action of a natural substance *secundum formam specificam* or the way in which the powers and effects of a medical remedy could pass from *potentia* to *actum*⁴. On the other hand, and despite of the tireless efforts of several scholars, we still have a scarce knowledge of the translation that made Avicenna's *Liber canonis* accessible to Western medical culture (namely: the Arabic-Latin version produced by Gerard of Cremona), of its manuscript tradition (no complete list has been published yet, but we have reason to believe that the work is preserved in hundreds of manuscripts), and of the ways of its dissemination. The lack of this sort of information does not only prevent us from acquiring a deeper knowledge of Avicenna's contribution to the history of medicine, but, when combined with other «missing elements» (e.g., the reception of Rhazes' works, which we only know fragmentarily), also from putting together an all-encompassing history of medical and pharmacological culture. In that history *in spe*, the meaning of authors and texts will be better connected with the circumstances of their *Fortleben*, and their impact on the development of medicine measured in combination, or in comparison, with the one other leading personalities of the same branch of knowledge had, and evaluated with reference to specific cultural contexts. Further difficulties in this undertaking are caused by the necessity to map the dissemination of the information conveyed by an author and a text with the help of other texts depending upon them, or via the use of pieces or fragments of such information to be found in a variety of sources assembling data derived from multiple sources. Often, the texts mediating the dissemination of such information are anonymous, and/or deprived of a specific identity. Nevertheless, they act as major agents of dissemination and circulation of information, and cannot be neglected.

3. Cf. J. Chandelier, «Medicine and Philosophy», in *Encyclopedia of Medieval Philosophy. Philosophy between 500 and 1500*, ed. P. Lagerlund, Berlin 2011, 735-42.

4. Cf. Chandelier, *Avicenne et la médecine*, here 432-55.

In shorter terms, the history of Medieval medicine is still to be written because we still lack essential data about single authors and their works, about the dissemination of their literary output via other, often difficult to identify, texts, and, above all, about their effective impact on the development of the branch of knowledge they belong to. That impact we can only reconstruct when we combine all the kind of lacking data mentioned above, connect and compare them with what we know about the diffusion of other texts and the reputation of other authors, and relate them with a specific cultural contribution. Only when we will have answered those questions, we will be able to write a more complete and, above all, dynamic history of medieval medicine.

In history of Medieval pharmacology and pharmacotherapy, the notion of «*Fortleben*», «reception», «circulation», and «impact» of authors, texts, and ideas communicated by them are strictly interrelated. The *Fortleben* of an author or a text can depend from modified redactions of the original version, the circulation of their content assured by derived writings, or even by anonymous collections including excerpts in combination with elements derived from other sources. All these forms of dissemination of content, together with their concrete medium of transmission (read: the manuscripts handing them over, seen in their form and structure, their chronological and geographical distribution in terms of production and readership), help describing the reception of an author and a text, and measuring their impact on the cultural background of a branch of knowledge like pharmacology and pharmacotherapy.

In this paper, I will try to exemplify the interaction between «*Fortleben*», «reception», «circulation», and «impact», and the necessity to take them all into account in order to offer a dynamic picture of the history of an author and a text and their contribution to the development of the branch of knowledge they belong to. My point of departure is represented by a specific phase of development in history of pharmacology and pharmacotherapy, namely the Arabic-Latin translations produced after 1250, with special reference to the writings mirroring the «encyclopedic trends» in Arabic collections of *medicamina simplicia* in Western culture. The example I have chosen is represented by the Latin version of Ibn-Wāfid's *Kitāb al-adwiya al-mufrada*, which went in Latin with the title *Liber aggregatus de simplicibus medicinis* and an attribution to «Serapion» (also «Sera-

pion the Younger», to distinguish it from the author of the *Breviarium sive practica*, Yūḥannā ibn Sarābyūn)⁵. More specifically, I will outline its presence, in form of manuscript transmission of the original texts, and of sources of inspiration of new writings, in Western medical culture. Before turning to this topic, let us summarize the main stages of development of Medieval pharmacology and pharmacotherapy, and the main questions that remain to be answered when trying to picture those stages.

MEDIEVAL MATERIA MEDICA: A HISTORY WITH MANY QUESTIONS

Medieval pharmacology and pharmacotherapy (the notion of *materia medica*, inherited from Dioscorides, may help to summarize the two branches of knowledge) have a complex and fascinating history⁶. After the first centuries of the Middle Ages had seen the disconnection of Western culture from Greek medicine, the development of a «therapeutical background» characterized by the production of the use of small texts – mostly collections of recipes – conveying fragments of the large legacy of Dioscorides, Galen, and Pliny, and the concentration of the transmission and the reception of those texts in monastic libraries, the last decades of the Eleventh century saw a decisive turn, as the Oriental pharmacological and pharmacotherapeutical lore, conveyed by some representative texts translated from Arabic into Latin, began to appear. This phase of renewal of Western scientific culture continued throughout the «long Twelfth century», and the textual output of this process consolidated within the medical background during the Thirteenth century, and contributed toward the progress of both academic and professional therapeutics. As for the branches of knowledge this

5. Ps.-Serapion, *Liber aggregatus de simplicibus medicinis*, Venetia 1479 (digitized version available on <https://www.digitale-sammlungen.de>, ad locum). German translation: Ps.-Serapio, *Eine große arabische Arzneimittellehre*, tr. J. Straberger-Schneider, Baden-Baden 2009.

6. Cf. on this subject I. Ventura, «Farmacologia e farmacoterapia nell'Alto Medioevo: trasmissione di testi, trasmissione di contenuti», in *La conoscenza scientifica nell'Alto Medioevo. Atti della Sessantasettesima Settimana di Studi Spoleto, 25 aprile - 1 maggio 2019*, forthcoming; T. Hunt, J. G. Mayer, I. Ventura, «Plants and Medicine», in *Cultural History of Plants*, ed. A. Touwaide, London 2020, in press.

paper is focusing upon, we may shortly recall the meaning of some translations produced by Constantine the African in Montecassino (especially the *Practica Pantegni* [the Latin translation of the *Kitāb al-Malakī* written by Ibn al-Abbas al-Majūsī]⁷, whose book II is devoted to *materia medica* and conveyed notion and principles of pharmacology as well as data concerning nature and effects of *medicamina simplicia*, and the *Liber de gradibus*, viz. the Latin version of Ibn al-Jazzār's *Kitāb al-i'timad al-adwiya al-mufrada*)⁸, of some Latin versions of Arabic manuals produced by Gerard of Cremona (apart from the above-mentioned *Liber canonis*, we may mention book VII of the Serapion's *Breviarium sive practica*, as well as book III of Rhazes' *Liber as Almansorem*), and, with all caveats depending from its limited diffusion, of Stephen of Antiochia's *Regalis dispositio*, a new, more faithful and qualitatively better rendering of al-Majūsī's *Kitāb* which never managed to replace the *Practica Pantegni*⁹. The picture I have just sketched is very incomplete, shows several uncertainties, and raises various questions. First of all, Constantine's translations still lack clarification with respect to their production and diffusion. The second book of the *Practica Pantegni* in its Latin form was, for instance, the result of a «patchwork» built up over decades, possibly without Constantine's participation, and consisting of three parts gathered together in various steps, viz. 1) a theoretical section

7. Further data concerning nature and therapeutical powers of natural substances were provided by the translation of Ibn al-Jazzār's *Viaticum*, and of Isaac Israeli's *De diaetis universalibus et particularibus*, all in *Opera omnia Ysaac*, Lugduni 1515.

8. On Constantine the African, cf. the collective volume *Constantine the African and Ali ibn al Abbas al-Mağusi. The Pantegni and its Related Texts*, ed. C. S. F. Burnett and D. Jacquart, Leiden - Köln - New York 1994 (Studies in Ancient Medicine, 10), and F. Newton, E. Kwakkel, F. E. Glaze, *Medicine at Montecassino. Constantin the African and the Oldest Manuscript of His Pantegni*, Turnhout 2019 (Speculum sanitatis, 1). On the second book of the *Practica Pantegni*, cf. I. Ventura, «Lo sviluppo della farmacopea salernitana ed il ruolo del *Corpus Constantinianum*. Per una *mise au point*», *Medicina nei secoli. Arte e Scienza*, 30/2 (2018), 641-86. M. Green currently prepares an extensive study on Constantine's *Schriften corpus* and its *Fortleben* during the Middle Ages.

9. Cf. C. Burnett, «Simon of Genoa's Use of the *Breviarium* of Stephen, the Disciple of Philosophy», in *Simon of Genoa's Medical Lexicon*, ed. B. Zipser, Berlin - New York 2013 (digital version: <https://www.degruyter.com/view/booktoc/product/247622?rskey=SPYkcc&result=1>), 67-78 and Id., «Stephen, the Disciple of Philosophy, and the Exchange of Medical Learning in Antioch», *Crusades*, 5 (2006), 113-29.

De probanda medicina which is the equivalent of the first part of the corresponding book of al-Majūsī's *Kitāb*, 2) a *De simplici medicina*, a collection of properties of *medicamina simplicia* that corresponds in its content – but not in its form – to the text translated by Stephen of Antiochia in his *Regalis dispositio*, and may have originated in the second part of the original book of the *Kitāb*, and 3) a *Liber de gradibus* which is nothing else but ibn al-Jazzār's work. Some uncertainties dwell around the *Liber de gradibus*, too, for we do not know which Arabic text Constantine translated, and how he transformed it. This doubt is raised by a comparison between Constantine's *Liber* and a later – and less successful – translation of the same *I'timad*, the *Liber fiduciae de simplicibus medicinis* completed by Stephen of Saragossa in 1233 in Spain, which displays a larger version of the text. As for the translations of Serapion's and Rhazes' works by Gerard of Cremona, our knowledge is even scarcer. We generally know that those texts were successful, especially in Academic milieu, but we cannot «quantify» their success in terms of number of manuscript copies and their geographic and chronological distribution. We know, for instance, that a gap of several decades separates the completion of some of Gerard's translations and the first witnesses of their diffusion¹⁰; the same slowness in affirming themselves can be noticed in case of Constantine's translations, too. We cannot assess the size of their reputation, as we have only a general overview of their presence in medical academic curricula (this is the case of Rhazes' *Liber ad Almansorem*¹¹) and of their use in medical writings produced between the 13th and the 14th century. Such a general overview does not shed any light on the specific case represented by the pharmacological and pharmacotherapeutical sections, though. Hence, we may presuppose their availability, their diffusion, and their *meaning* in medical culture in general terms, but we cannot assess their *impact* with specific reference to pharmacology and pharmacotherapy, nor specify the same *impact* in terms of transmission and re-use of data originally derived from Rhazes' or Serapion's accounts in other works or written contexts. To my knowledge, for

10. Cf. D. Jacquart, «Des traductions au fil de la plume et à la chaîne? Le cas de Gérard de Crémone», *Cahiers d'études hispaniques médiévales*, 41/1 (2018), 111-23.

11. M. McVaugh, «Why Rhazes?», in *The Impact of Arabic Sources on Divination and the Practical Sciences in Europe and Asia (Erlangen, 21-23 janvier 2014)* = *Micrologus. Nature, Sciences and Medieval Societies*, 24 (2016), 43-72.

instance, Rhazes' or Serapion's entries on *medicamina simplicia* are not featured in any Late Medieval herbals or collections of medical remedies, but nothing can be affirmed for certain.

The lack of information we experience with reference to dissemination, reception, use, and impact of the Arabic-Latin writings on *materia medica*, both in the *longue durée* and in specific chronological, geographical, and cultural contexts and in their literary output represents a serious hindrance, if we aim to substantiate the general opinion according to which the main contribution of Arabic pharmacology and pharmacotherapy to the development of the same branches of knowledge in Western culture can be identified in 1) the transfer of knowledge concerning long forgotten natural substances, especially the ones of Oriental origin, whose unavailability during the first centuries of the Middle Ages had caused their disappearance from the therapeutical array and from medical texts, as well as previously unknown ones, whose diffusion was due to the development, at the same time, of a commercial network around the Mediterranean and to their presence in pharmacotherapeutical collections of Arabic origin¹²; 2) the (re-)assimilation on larger scale of the Galenic pharmacological system, based on the notions of «quality» (cold, warm, dry, humid) and «degree», and on the distinction between «primary qualities» (the ones associated with the internal *complexio* of the natural object and its parts) and «secondary qualities» (viz., the therapeutical effects upon the human body), to which some «tertiary qualities» (namely, the effects on specific organs or parts of the body) were linked¹³. This system allowed physicians to identify nature and therapeutical effects of the substances, as well as to classify them according to their similar *complexio* and powers. At the same time, the introduction of the notions of *complexio*, «quality», and «degree», and of the rational and experimental criteria to determine them and, generally speaking, to acquire knowledge about them, were matter of conjecture and debate during the Late Middle Ages, and gave the *materia medica* a decisive theoretical turn; 3) the development of a theoretical background in pharmacology and pharmacy, represented, for example, by the accounts on experimental and rational determi-

12. Cf. Z. Amar, E. Lev, *Arabian Drugs in Early Medieval Mediterranean Medicine*, Edinburgh 2017.

13. Cf. P. E. Pormann, «The Formation of Arabic Pharmacology between Tradition and Innovation», *Annals of Science*, 68/4 (2001) 493-515, esp. 500-9.

nation of *complexio* and powers and on their strategies (for instance, the meaning of taste, smell, and color for the rational interpretation of the *complexio*, which connected the medical discourse with the domain of natural philosophy), or the introduction and the perfection of a «theory of compound medicine» which attempted to create and use a rational strategy to determine their *complexio* and power. This theory permeated the pharmaceutical writings Arnald of Villa Nova wrote on the basis of his translation of Al-Kindī's *De gradibus*, and, generally speaking, the literary output of the first generation of Montpellier *magistri medicinae* (we may recall, for example, that Bernard de Gordon wrote a short treatise *De gradibus* where he outlines the theory and the notion of «degree»)¹⁴.

Now, given the scarce information we have about the reception and the impact of each Arabic author and text in the progress of Medieval pharmacology and pharmacotherapy, it is difficult to ascertain the role played by each of them, and to evaluate the positions taken and the opinions championed by Latin authors who employed them correctly. As for the transfer of knowledge about natural substances, it is not only our lack of documentation that prevents us to link more closely the development of a commercial network, as well as the acknowledgment of the existence, with the new value attributed to those substances because of their «(re)discovery» in Arabic-Latin texts; it is also – and, perhaps, especially – our difficulty in evaluating the role played by each text textual witness that complicates our work. If we wish to provide a concrete example of such a difficulty, we may recall the case of drugs like camphor or musk, whose incorporation into the array of simple remedies can be related to the increase of commerce with the Middle East and with their mention in the Arabic-Latin translations of collections of properties of *medicamina simplicia*. Traditionally, the starting point for the «discovery» of camphor and musk is located, at least as far as the tex-

14. Edition: J. Pagel, «Ueber die Graden der Arzneien, nach einer bisher ungedruckten Schrift des Bernhard von Gordon», *Pharmazeutische Post*, 28 (1895), 65–67, 131–33, 142–44, 180–82, 221–25, 257–62. Cf. on this text M. McVaugh, *The Medieval Theory of Compound Medicines*, Diss. Princeton 1965; Id., «Chemical Medicine in the Medical Writings of Arnald of Villanova», in *Actes de la «II Trobada Internacional d'Estudis sobre Arnau de Vilanova»*, ed. J. Perarnau i Espelt, Barcelona 2005, 239–67; Id., «Determining a Drug's Properties: Medieval Experimental Protocols», *Bulletin of the History of Medicine*, 91/2 (2017), 183–209.

tual tradition is concerned, in their mention in the collections of properties of *medicamina simplicia* translated from the Arabic, its *terminus post quem* placed in Constantine's translation of ibn al-Jazzār's *Liber de gradibus*. The substances are not described, however, only by Constantine, but also by Avicenna in the *Liber canonis*, and in Pseudo-Serapion's *Liber aggregatus de simplicibus medicinis*. Now, the intriguing – and still unanswered – question is: How large was the impact on the *longue durée* and in specific chronological, geographical, and cultural contexts of each text, and how far stretched the role of each of them as reference-source used in order to acquire knowledge and establish use of those substances? We know, for example, that Constantine's *Liber* was used in Salerno, for example by *Platearius*, the author of the famous collection *Circa instans*, but the extension of its influence on the Salernitan author seems to have been limited to the assessment of the quality and the degree of camphor and – to some certain extent – musk, but did not involve the medical prescriptions. Other Salernitan texts, such as the *Liber iste*, do not seem, at least with respect to the two natural substances and to the versions of the text I was able to consult, to have derived any data from Constantine's translation¹⁵. *Platearius*' *Circa instans* brought, on the other hand, the Galenic system to a perfection, both by quoting qualities and degrees systematically at the beginning of each entry – thus assessing the *complexio* of each natural substance clearly and unmistakably – and by adding explicit information on the secondary qualities, which are often, if not always, omitted by Constantine. Although we cannot corroborate our hypothesis with a precise count of the manuscripts preserving both works and with an accurate overview of their chronological and geographical distribution, we can argue that the «publication» of the *Circa instans* gradually eclipsed Constantine's *Liber de gradibus*, and that the impact of both the Galenic classification system firstly handed over in system-

15. The two versions of the entry *Camphora* can be read in E. Müller, *Der Traktat «Liber iste» (die sogenannten Glossae Platearii) aus dem Breslauer Codex Salernitanus*, Diss. Berlin 1942, 35 and in *Opera Mesue*, Venetia, 1495, f. 252rb-va. This last version shows some connections with the *Circa instans*, and may be the result of an update of the text of the *Liber iste* achieved with the help of the collection attributed to *Platearius*. The situation is different for the *muscus*, as Constantine's *Liber*, the *Circa instans* and the two redactions of the *Liber iste* only show sporadic points in common.

atic fashion by Ibn al-Jazzār's work and of the information it conveyed about «new drugs» was later assured by the vast dissemination and reception of Platearius' collection of properties of *medicamina simplicia* (which, by the way, is today handed over by at least 250 manuscripts in Latin, French, Italian, English, German, Dutch, Serbian, Czech, Gaelic/Irish, and Hebrew)¹⁶.

Even more difficult to assess is the influence of book II of Avicenna's *Liber canonicus*, which is quoted for example in Vincent of Beauvais' *Speculum naturale* together with Constantine's *Liber* and *Practica Pantegni*, and of the *Dioscorides alphabeticus*¹⁷, and used in 13th and 14th century collections of properties of *medicamina simplicia* such as Manfredus de Monte Imperiali's *Tractatus de herbis* or Matthaeus Sylvaticus' *Liber pandectarum medicinae* to enlarge the spectrum of natural substances and their uses. The same goes in case of Pseudo-Serapion's *Liber aggregatus*, which was used to update the information on *materia medica* and, because of its structure based on the «conflation» of excerpts derived from Dioscorides and Galen, to form the bulk and the structure for new collections.

As for the question of the Arabic influence on Western (re-)assimilation of the Galenic system, we may only remark that the notion of primary quality, degree, and secondary quality did not completely disappear from the High Medieval horizon, for more or less extended traces of them could be found in Oribasius' corpus and in the works featuring it as a source¹⁸. Of course, the impact this system could achieve after being conveyed by the Arabic-Latin translations was wider. Nevertheless, we have to be prudent before affirming tout court that this system was only received via Arabic-Latin works, and perhaps resolve to reconstruct the history of Galenic pharmacology from an evolutive perspective. The impact of the Galenic system achieved by Latin translations of Arabic works

16. On Platearius' *Circa instans*, cf. I. Ventura, «Il *Circa instans* attribuito a Platearius: trasmissione manoscritta, redazioni, criteri di costruzione di un'edizione critica», *Revue d'histoire des textes*, n.s. 10 (2015), 249-362, and Ead., «Medieval Pharmacy and Arabic Heritage: the Salernitan Collection *Circa instans*», in *The Impact of Arabic Sources*, 339-401. I am currently preparing a critical edition of the work.

17. Vincentius Belvacensis, *Speculum naturale*, Douaci 1624 (repr. Graz 1964), XIX,93. Cf. the reference in the online database SourcEncyMe [www.sourcenyme.irht.cnrs.fr], ad locum; consulted December 4th, 2019).

18. Cf. Ventura, «Farmacologia e farmacoterapia» cit.

must be assessed, for example, by taking into account the reception of Galen's works as well, and especially his *De simplicium medicamentorum facultatibus*, written in eleven books around 196 AD, and consisting of two main parts, the first of which (books I-V) introduced the reader to the theoretical principles of pharmacology, whereas the second (books VI-XI) offered descriptions of nature and therapeutical properties of *medicamina simplicia* derived from the vegetal, the animal, and the mineral world arranged according to the alphabetical order. The assimilation of this work in Western culture was a complex one: Almost unknown during the first centuries of the Middle Ages (some traces of it in Latin can be found, for instance, in Gargilius Martialis' *Medicinae ex oleribus et pomis*), when the main – and, perhaps, the only – form to access its content was represented by Oribasius' writings (especially the second book of the *Synopsis* and the second book of the *Euporiston*), the first part of the text (books I-V, to which an anonymous translator added a first Latin version of book VI) was rendered into Latin by Gerard of Cremona. Its success was remarkable – 54 manuscripts known so far – but slow, as the first, sporadic witnesses of its use can be dated back 1240–1250¹⁹. This incomplete version was read and used together with, and possibly as integration of, Avicenna's account on pharmacology, and, later, in opposition to the discussion of the principles of the same branch of knowledge set up by Averroes in his *Colliget*, as the quotations from the works in works like Peter of Abano's *Conciliator* and Dino del Garbo's *Expositio super secundum Canonem Avicennae* show. Less successful (only 9 manuscripts identified so far) was, on the other hand, the second, and this time complete, Greek-Latin translation of Galen's *De simplicium medicamentorum facultatibus*, completed around 1317 by Niccolò da Reggio, and known to Matthaeus Sylvaticus, or to Stephen Arlandi, author of the *Viridarium*, a commentary upon the *Antidotarium Nicolai*. Thus, when speaking of the «affirmation of the Galenic systems mediated by Arabic pharmacol-

19. On the reception of Galen's *De simplicium medicamentorum facultatibus* in the Latin Middle Ages, cf. I. Ventura, «Galenic Pharmacology in the Middle Ages: Galen's *On the Capacities of Simple Drugs* and its Reception between the Sixth and the Fourteenth Century», in *Brill's Companion to the Reception of Galen*, ed. P. Bouras-Vallianatos and B. Zipser, Leiden - Boston, 2019, 393-433; Ead., «Galen's *Simple Drugs* and Its Medieval Readers: Some Notes on the Reception of Galen's Pharmacology», forthcoming.

ogy», we must carefully trace the extent and the limits of this assessment, and explore the interactions between Galen's work and the Arabic authors conveying its content. In particular, it must be compared with Avicenna's adaptation, which made some aspect of the Galenic theory easier to grasp on one side, but added some elements that did not originally belong to it²⁰.

If the history of the reception of Arabic pharmacology and pharmacotherapy in Latin before 1250 still await further researches to answer several questions and to precise the impact of the various texts and of the data handed over by them (and, needless to say, to clarify the ways in which the same texts stratified, got connected, or replaced each other), the translations produced after 1250 have attracted even less attention. In actual facts, translators like Arnald of Villa Nova and his nephew Armengaud Blasii, who rendered into Latin – the first – works like Abū l-Salt's *De simplicibus*, Al-Kindī's *De gradibus*, and Avicenna's *De viribus cordis* – the second, Avicenna's *Cantica* and the commentary devoted to the text by Averroes²¹, or Faraj ibn Salim, who undertook the translation of the monumental *Kitāb al-Hāwī* written by Rhazes as a part of the translating program promoted by Charles I of Anjou²², have attracted the attention of several scholars. Nevertheless, even in this case, we are far from having achieved a satisfactory knowledge of these translations and of their influence on Latin medical and pharmacological culture. The same can be said for the text that «revolutionized» the Scholastic medicine, namely Averroes' *Colliget*, a work translated by Bonacosa in Padua in 1285²³. This text can be easily considered as a «turning

20. McVaugh, «Determining a Drug's Properties».

21. On Arnald's translations of Abu l-Salt, cf. *Translatio libri Albuzele de simplicibus*, ed. J. Martínez Gázquez et al., Barcelona 2004 (AVOMO XVII); on Armengaud, cf. G. Dumas, *Santé et société à Montpellier à la fin du Moyen Âge*, Leiden - Boston 2015 (The Medieval Mediterranean, 102), with further literature.

22. Cf. J. Dunbabin, *The French in the Kingdom of Sicily, 1266-1305*, Cambridge 2011, esp. 228-34, and K.-D. Fischer, U. Weisser, «Das Vorwort zur lateinischen Übersetzung von Rhazes' *Liber continens*», *Medizinhistorisches Journal*, 21 (1986), 211-41.

23. Arnaldus de Villanova. *Aphorismi de gradibus*, ed. M. McVaugh, Granada - Barcelona 1975 (AVOMO II); Y. Tzivi Langermann, «Another Andalusian Revolt? Ibn Rushd's Critique of Al-Kindi's *Pharmacological Computus*», in *The Enterprise of Science in Islam. New Perspectives*, ed. J. P. Hogendijk and A. I. Sabra, Cambridge, Mass. 2003, 351-72; J. Chandelier, «Averroes on Medicine», in *Interpreting Averroes. Critical Essays*, ed. P. A. Adamson and M. Di Giovanni, Cambridge 2019, 158-76.

point» for the history of Medieval pharmacology, as Averroes radically transformed the theoretical framework and content of this branch of knowledge (and, generally speaking, of the medical science on the whole, especially with respect to the relationship between theoretical and practical medicine). With respect to pharmacology, he did that by starting from a close scrutiny of the difference made by Galen between food and drug and their action on the human body, and only later moving to the definition of primary and secondary qualities; he finally concluded his account with a discussion about the experimental and rational criteria to determine their *complexio* and properties. In other words, his innovation on the field of pharmacology consisted in reversing the sequence of topics by putting the criteria used to establish the *complexio* at the end of the account, and in stressing a specific aspect of Galen's theory, namely the different action performed in the body by food and drugs.

Furthermore, several scholars have rightly emphasized the «originality of Averroes' approach to pharmacology», especially with reference to his theory of the «primary quantity» (viz., the minimal quantity of a medication that has to be administered in order to achieve its effect) and of the «mathematical progress» in degrees which opposed Al-Kindī's «geometrical» one», affirming that the difference between temperate and not-temperate natural substances increased only by one unity, and not by doubling itself. Now, both the general approach and the theoretical framework of pharmacology and the innovative opinions on specific subjects have let scholars to acknowledge Averroes' originality, but we still lack evidence of the use made of this work in Academic milieus and of the reception of the revolutionary image of pharmacology he provided. Surely, the number of manuscripts preserving the work in its complete form, as well as in excerpts or compendia, is high²⁴, and the evidence of its presence in Academic milieu good, but we still need more studies on the ways in which Scholastic medicine coped with the revolutionary approach to pharmacology shown by Averroes. And we still need further research to comprehend how the texts I have just mentioned were disseminated throughout Late Medieval cultural contexts and libraries, how they interacted with each other

24. The DARE database (www.dare.uni-koeln.de, ad locum; accessed November 30th, 2019) lists 70 manuscripts preserving the work.

by replacing one another on libraries shelves and/or pushing older or less famous works aside, how (and if) they monopolized specific segments of the «medical book market». In practice, we still need further research to change our picture from a simple sequence of authors and texts to a dynamic representation of the impact of works and the content they delivered.

Now, if we must admit that the picture I have just shown of the development of pharmacology and pharmacotherapy *ante* 1250 is incomplete, the one representing the evolution during the second half of the 13th century is even more vague. The reasons of the fragmentary nature of the representation can be found in the multiplication of initiatives in several cultural centers situated in Spain (Murcia, but perhaps also Lerida), Southern France (Montpellier) and Italy (Naples, Padua), in the variety of works translated (especially recent ones, like the *Colliget*), and, we may add, in the difficulty these texts had to show a wider intellectual horizon and to affirm themselves within the academic curricula that were taking shape during these decades. Generally speaking, it is known that, with the exception of Averroes' *Colliget*, the works dealing with *materia medica* translated after 1250 were not successful, and failed to replace the older ones that had already set foot on the field of Academic and professional pharmacology. In order to prove whether that is true, and to provide an example of the ways in which we can assess the «impact» of a work, we will later turn our attention to the *Liber aggregatus de simplicibus medicinis* attributed to the Ps.-Serapion. Surely, as D. Jacquart pointed out, all these translating initiatives have one characteristic in common, namely their attention to the «practical side» of medicine and pharmacotherapy. With the exception of Averroes' *Colliget* and Al-Kindī's *De gradibus*, they lack a profound theoretical background, and mostly provide practical information, such as descriptions of simple remedies and their properties and uses, excerpts dealing with them extracted from the «leading authorities» on *materia medica*, and instructions on their correct selection, preparation, and administration. The monumental *Hāwī* or *Continens*, for instance, can be seen as a giant handbook of clinics and therapeutics, completed by 3 books (XXI-XXIII) containing 836 chapters on simple remedies arranged – at least in the edition printed in 1529 – according to the arabic alphabet, by one book (XXIV) describing the external appearance and the techniques of

use of simple remedies, and providing a list of synonyms, by a *regimen sanitatis* (book XXV) integrated by a small manual of therapeutics, and by a lexicon giving the Latin and Arabic names of simple remedies perhaps added by the Latin translators. The *Hāwī* was not a successful work: M. Witt, who has studied its manuscript tradition closely, has identified only 16 copies so far²⁵. Perhaps, its exceptional extension that required several volumes to be copied in full (the dedication copy, the manuscript Paris, BnF, lat. 6912, consists of five large tomes, the one preserved at the University Library of Bologna with the shelf-mark 2222-2224 [Fрати 1091] and maybe belonging to the abbey of San Salvatore is composed of two large and lavishly decorated folio volumes), as well as its peculiar and not easily accessible form – the work is arranged as a *practica a capite ad calcem*, but each chapter is *de facto* a collection of recipes and therapeutical strategies stemming out of Rhazes' own experience and cultural background) and its late arrival in Western medical culture did not contribute to its success.

The representation of the – perhaps less successful – Arabic latin pharmacological translations can be completed with some few more examples. The *Liber aggregatus de simplicibus medicinis* attributed to the «Ps.-Serapion» (now acknowledged as a Latin version of the *Kitāb al-adwiyā al-mufrada* written by Ibn Wāfid), and translated by Abraham of Tortosa (Abraham ben Šem Tob), either alone or in collaboration with Simon of Genoa, is a collection of properties of *medicamina simplicia* structured according to their origin (vegetal, animal, mineral) and to their *complexio*, and consisting of excerpts concerning each remedy derived from Dioscorides, Galen, and several other sources. Finally, Abulcasis' *Liber servitoris* (originally book 28 of the *Tašrif*), translated by the same Abraham of Tortosa and Simon of Genoa, is a «manual of instructions» on the right way to prepare and administer simple remedies. In many cases, this text was associated in manuscripts with the *Liber aggregatus* and/or with the manual of practical medicine written by Serapion (Ibn Sarābiyūn), the *Breviarium sive Practica*, forming small miscellanies that probably tried to associate works attributed at that time to the same author

25. M. Witt, «The Manuscript Tradition of al-Razi's *Kitāb al-Hāwī* (Rhazes, *Liber continens*)», talk given at 1st International Prof. Dr. Fuat Sezgin Symposium for the History of Science in Islam (June 14, 2019).

(the *Liber servitoris* being sometimes associated with «Serapion» rather than to Abulcasis).

The sole exception to this apparently bleak panorama is represented by a singular corpus of works attributed to a Johannes Mesue jr. or «Ps.-Mesue»²⁶. This corpus consists of 4 texts, the first of which, the *Canones universales*, explains in 6 *distinctiones* the type of action, as well as the rules of collection, preparation, and administration, of purgative medicaments. The second text of the corpus – which can be considered as a «practical» integration of the theoretical background displayed in the *Canones*, and is indeed often considered by scribes as a «second book» of a larger *De simplicibus medicinis* – bears the title *De consolatione simplicium medicinarum*, and offers a description of 57 purgative medicaments divided into 2 classes, the «harmless», which can be employed safely, and the «harmful» ones, whose use should be strictly controlled. Having outlined the basic principles and the main ingredients of a therapeutic based on purgation, the Ps.-Mesue moves to the compound medicines. The third text of the corpus, the *Antidotarium sive Grabadin*, is a collection of *medicamina composita* arranged according to 12 classes, each of which describes a specific type (*electuarium, unguentum, oleum*) of compound. The theoretical background on which the text is based is not clearly explained by the Ps.-Mesue, but is outlined by its first commentator, the bolognese *magister medicinae* Christophorus de Honestis. He offers some interesting remarks, affirming 1) that the collection includes *medicamina solutiva et non solutiva*, thus providing a further type of classification of the compound remedies; 2) that the function of preparations can be different, for it may be used either for preservation and restoration of health, or for the *actum curationis* (the therapeutical action), and therefore to heal, or, finally, «*pro modo curationis qui debetur corporibus egris solum in medicina solutiva*», an ambiguous sentence which can be interpreted as «a special therapeutical strategies exclusively based on purgation that must be applied to ill bodies», therefore implying that purgation is a therapy in itself; and 3) that purgation can be performed by different types of medical remedies and related to various secondary qualities

26. On Ps.-Mesue's *Schriftencorpus*, cf. I. Ventura, «Les mélanges de médecine autour du Pseudo-Mésué: un corpus de textes et ses contextes de lecture», *Micrologus*, 27 (2019), 87–165.

(*medicamina attractiva, solutiva, lubricativa*), thus explaining the variety of compound remedies included in the collection²⁷. The fourth part, the *Practica sive Grabadin*, is somehow the most puzzling one: Structured in form of a *practica a capite ad calcem* (from head to toe), it provides for each illness a number of recipes attributed to various authoritative physicians. The text is incomplete, and was later integrated by two *Additiones* attributed to Peter of Abano and Francis of Piedimonte. It raises many questions, and still needs further research. We do not know, for instance, which connections the text has with the rest of the corpus, whether it has the same origin, or should be attributed to another author, which are its sources and from which cultural context it should be referred to.

The issue of the origin and the connection to a specific phase of Western and Eastern medicine does not only involve the *Practica*, but, generally speaking, the whole corpus. The Ps.-Mesue's *Schriftencorpus* is considered to be a translation of an Arabic original, but neither the author could be identified with one of the physicians bearing the name «Māsawaih», nor an Arabic base-text for the supposed Latin version has ever been discovered. Even the traces of «Arabisms» featured by the text cannot point to any specific translating style. Thus, we hesitate between speaking of «reception» of an Arabic source in Western medical culture or of «elaboration» of data and information originated from Arabic medicine and pharmacy in the West. Whatever the origin may be, the *Opera Mesue* was a huge success: More than 230 manuscripts preserve the corpus, as a whole or in part, and 76 printed versions between 1471 and 1623 show that it was still read and used, although not only in Academic milieu, nor in innovative scientific contexts, during the Early Modern Time²⁸.

The exceptional character of the corpus of writings attributed to the Ps.-Mesue lies, as we have noticed, in the presence of a high-profiled theoretical background based on the notion of the specific action performed on the body by the *purgatio*, and substantiated by its explanation according to the theory of the «specific form» (a

27. *Opera Mesue*, ed. cit., f. 39va-40rb, here 39vab.

28. Cf. Ventura, «Les mélanges»; Ead., «Typologies and Pharmaceutical Markets: The Reception of Ps.-Mesues' *Schriftencorpus* in Print», in *Worlds and Networks of Higher Learning*, ed. A.-S. Goeing, M. Feingold *et al.*, forthcoming; D. N. Hasse, *Success and Suppression. Arabic Sciences and Philosophy in the Renaissance*, Cambridge Mass 2016 (I Tatti Studies in Italian Renaissance History).

notion firstly exposed by Avicenna, according to which a medical remedy can act not only through the primary qualities or its matter, but through its «whole substance», or, better, to a form of «perfection» reached by the whole substance in consequence of its transformation caused by external or internal factors)²⁹. The Ps.-Mesue adds an important detail to this theory, claiming that this «specific form» is a «hidden virtue» (*virtus occulta*) which is originated in a «celestial virtue» (*celesti virtute*) that acts upon the remedy, transforming its *complexio*. He then seems to imply that the therapeutical power *secundum formam specificam* could depend both from the nature of the medicament and from an external influence (for instance, an astrological one). The success of the corpus also lies in its all-encompassing form that provides the reader with information related to simple and compound remedies, and involving both theoretical explanation of their action and practical instruction about their use. Surely, the topic of *purgatio* and the practical instructions of how to use it (including lists of *medicamina simplicia* and *composita* performing this action, as well as elucidations of the rules in employing it correctly, mostly to avoid unpleasant, if not dangerous, side-effects) was not entirely new: Small works such as the *Summa de modo medendi* attributed to an unknown magister Giraldus (often wrongly related to Montpellier) and possibly written at the end of the 12th century, or the so-called *Rogerina minor* (viz., the *Practica parva* written by Roger of Baron) focused upon the use of *medicamina laxativa*. However, they did not provide a deep and sophisticated theoretical background explaining the reasons for the purgative action, nor did they offer a large array of remedies that could rival the one put at disposal by the Ps.-Mesue. Besides, it is possible that the huge success of the Ps.-Mesue can be related to the changes and transformations of medicine in theoretical sense after the diffusion of Avicenna's *Liber canonis*, with which he basically shares the definition of the action performed by drugs *secundum complexionem*, *secundum qualitatem*, and *secundum formam specificam*.

Apparently, the success of the *Schriftencorpus* attributed to the Ps.-Mesue was not only huge, but, so to say, monopolized the market,

29. On the notion of *forma specifica* and «whole substance», cf. J. Chandelier, A. Robert, «Nature humaine et complexion du corps chez les médecins italiens de la fin du Moyen Âge», *Revue de synthèse*, 134/4 (ser. 6; 2013), 473–510; Chandelier, *Avicenne et la médecine* cit.

becoming one of the reference-texts for Late medieval and Early Modern pharmacy. Surely, this conclusion, albeit correct in general, needs to be nuanced. First of all, the *Schriftencorpus* never officially entered any Medieval academic *curriculum studiorum*, although several *magistri medicinae* commented upon it from Christophorus de Honestis to Johannes Costaeus. Secondly, if we attempt to go beyond this general assumption, we soon realize that reconstructing the reception and the impact of Ps.-Mesue's writings is not an easy task. The main difficulties can be found in the different paths followed by the works belonging to the corpus, which were not always transmitted together, and in the nebulous origins and first phases of dissemination of the corpus. If the first manuscript witnesses (including only the first three works, viz. the *Canones*, the *De consolatione*, and the *Antidotarium sive Grabadin*) can be dated back to the second half of the 13th century and located in Northern Italy, the first quotations of the works do not seem to indicate that the link between the works was clearly perceived, nor that they were read together. To my knowledge, the most quoted work of the corpus during the Middle Ages (and, perhaps, the one that was quoted most early) is the *De consolatione*, widely used in the last decades of the 13th century, for instance by John of Saint-Amand in his collection of *medicamina simplicia* and their properties, the *Areolae*, by Simon of Genoa in his *Clavis sanationis*, and – in the first decades of the 14th century – by Peter of Abano in his glosses on the *Dioscordies alphabeticus*. More complex is the search for witnesses of the *Canones universales*. The editions of the *Opera omnia* printed from 1489 feature the text accompanied by a commentary which, in the 1489 Venetian print, is attributed to Dino del Garbo, but, from 1495 onward, is put under the name of Mondino de' Liuzzi³⁰. As no manuscript seems to have been preserved, the only way to convincingly connect the commentary with the name of an author will be to search for quotations of the *Canones universales* in Dino's and Mondino's works, a study still to be carried out. This study will shed new light on the impact of the theoretical pillars of Ps.-Mesue's pharmacology in Academic medicine. On the other hand, not much can be said, for the moment, about the *Practica sive Grabadin*: The mentions of «Mesue»

30. On this aspect of the reception of Ps.-Mesue's *Canones* in print, cf. Ventura, «Typologies and Pharmaceutical Markets».

I could find in Nicolaus Sancta Sophia's *Receptarium* and in his son Marsilius' *Commentum super IV Canonem Avicenne* seem to refer to recipes included in the *Antidotarium* more than to the *Practica*³¹. On the other hand, I could detect at least one quotation of the work in Peter of Abano's *Conciliator*³². This discovery, which may not appear surprising, is, as a matter of fact, a good starting point to prove that 1) the *Practica* was known in Padua at the beginning of the 14th century, 2) that Peter knew it; and, 3) which seems to me the most important goal, that Peter may really be the author of the *Additiones* attributed to him. Nevertheless, to prove this last point, we do not only need to find more passages from the *Practica* quoted by Peter, but also references to his own *Additiones*. The *Practica sive Grabadin* might have been available at the beginning of the 14th century in Montpellier as well, for Bernard de Gordon recalls in his *Lilium medicinae* (III,9) a therapy against *pleuresis* based on *medicamina repercussiva*³³. Although he does not quote the Ps.-Mesue openly, it is quite probable that the source from which he derived this prescription may be the *Practica*. At any rate, some remarkable similarities in the description of the illness suggest that Bernard used the text, which therefore may be considered as a meaningful source of information for him, and not merely as an object of criticism.

Finally, the *Antidotarium sive Grabadin* appears to have been the most successful works in the *longue durée*: If the first quotation of «Mesue» in a pharmaceutical context can be found in Lanfranc of Milan's *Cirurgia* (although we cannot exclude that his master, William of Saliceto, might have used the *Antidotarium* without openly quoting it), the following centuries saw the affirmation of the content and the classification system of the *medicamina composita* exemplified by the Ps.-Mesue. In his *Compendium aromatariorum*,

31. See for instance the description of the *syrupi* put together by Marsilius in the *Commentum: Marsilii De Sancta Sophia, Opus aureum non parum utile arti medicine vacantibus*, ch. III, Lugduni 1517, f. 2v-8r, which mirrors the section VI of the *Antidotarium sive Grabadin*, in *Opera Mesue*, ed. cit., f. 53vb-60ra.

32. Petrus de Abano, *Conciliator*, Venetiis 1483, diff. 189, *Quod gargarismata conferunt in passionibus pectoris*, esp. f. ddVra; the passage of the *Practica sive Grabadin* can be found in the chapter *De cura catarrhi*, in *Opera Mesue*, ed. cit., f. 84vb

33. Cf. Bernardus de Gordonio, *Lilium medicinae*, Venetiis 1496-1497, f. 133rb, and Ps.-Mesue, *Practica sive Grabadin*, I,2,2, cap. *De pleuresi*, f. 105vb-109ra. Cf. on the subject Jacquart-Micheau, *La médecine arabe*, 215.

written in the middle of the 15th century and printed for the first time in Bologna in 1488, Saladino de Asculo considers «Mesue» (whom he acknowledges as author of the *Canones*, the *De consolatione*, and the *Antidotarium sive Grabadin*, without quoting the *Practica*) as one of the indispensable sources each apothecary must know and use, and as one of his main sources³⁴. The impact in the long run can be still perceived in the age of print. The official pharmaceutical collections released by institutions such as guilds of physicians and apothecaries, academic commissions, or city councils, such as *Ricettario Fiorentino* (1498), the *Pharmacopoea Augustana (editio princeps: Augsburg 1564)*, the *Antidotarium Bononiense (editio princeps: Bologna 1574)*, or the *Pharmacopoeia Londinensis (editio princeps: London 1618)*, consist of recipes derived from a bulk of Medieval sources (Ps.-Mesue's *Antidotarium sive Grabadin*, the *Antidotarium Nicolai*, the *Antidotarium* written by Nicolaus Praepositus) which still count, in the Renaissance, as established *vade mecum* for apothecaries³⁵.

Mesue's impact, however, as well as the one of the other Medieval sources, did not go unchallenged. The continuous renewal of content, sources, and structure of these collections went hand-in-glove with some consistent changes in the background of pharmacy, with special respect to the progressive insertion of chemical recipes that contrasted the original Galenic orientation of the collections. This form of development, which in turn reflects the progress and the gradual metamorphosis of pharmacy from a branch of knowledge relying on natural substances and on their evaluation according to the principles set by Galen to a science based on chemical ingredients and the principles of chemistry, was slow and involved several authors and texts, from *Antidotaria* to commentaries to them, from Academic manuals to polemical pamphlets³⁶. During the decades in

34. On Saladino's *Compendium*, cf. T. M. Capuano, «El *Compendium aromatariorum* de Saladino Ferro d'Ascoli (sec. XV) y la traducción castellana de Alonso Rodríguez de Tudela», *Romance Philology*, 71 (2017), 10-12 on Mesue.

35. Thanks to a Van de Sande Fellowship awarded by the Scaliger Institute (University of Leiden), I am currently preparing a specific study on the subject.

36. Cf. for instance the *Animadversiones* written by J. Zwelfer (*Animadversiones in Pharmacopoeiam Augustanam et annexam ejus Mantissam, sive Pharmacopoeia Augustana reformata [...] opera et studio Joannis Zwelferi Palatini, Norimbergae, 1693*) and L. Schröck (*Pharmacopoeia Augustana restituta, sive Examen Animadversionum in Dispensatorium Augustanum, eiusdemque Mantissam Hermeticam Joannis Zwelferi Palatini, adornatum a Luca Schröckio, Augustae Vindelicorum,*

which this metamorphosis was taking place, we may generally notice that the recipes derived from Ps.-Mesue's *Antidotarium sive Grabadin* as well as from other Medieval collections seem to have been «pushed aside», to have been either discarded or confined among old-fashioned, rarely used remedies. Thus, Ps.-Mesue's impact, albeit remarkable both from a chronological and a cultural point of view, must be (re-)considered by putting the evidence of production and use of the *Schriftencorpus* in combination with, and maybe in contrast to, the advancement of the pharmacological, pharmacotherapeutical, and pharmaceutical learning.

The short survey of the history of pharmacology and pharmacotherapy I have put together in the previous pages has hopefully demonstrated that the evolution of those branches of knowledge (to which we may add pharmacy, too, if we take into account the whole corpus of writing attributed to the Ps.-Mesue) is the result of the dissemination, the influence, and the impact of various text which still await further studies, and put several questions with respect to their identity, their content, and their reciprocal connections, superpositions, and conflicts. It also showed how difficult it is, especially for the Arabic writings rendered into Latin after 1250, to determine how successful and influential they were, in which way they contributed to the progress of scientific and technical background, and in which form and extent they altered the panorama of the branches of knowledge they belong to. And, hopefully, it could illustrate how vital was the the history of pharmacology and pharmacotherapy before and after 1250, and how diversified was the impact of Arabic authors on Western medical and scientific culture.

Now, in the last part of my study, I would like to focus on a specific case of «impact» of an Arabic work on *materia medica* in Western culture, namely, on the history of the Late-Medieval manuscript tradition and reception of the so-called *Liber aggregatus de simplicibus medicinis* attributed to the «Ps.-Serapion», and on the consequences of the arrival and the affirmation of the specific type of collection of properties of *medicamina simplicia* into the Academic and professional medical background.

1733) on the *Pharmacopoeia Augustana*, where the explanation of the recipes quickly turn into a ferocious polemic around their interpretation, preparation and practical employment.

A CASE IN POINT: THE *LIBER AGGREGATUS DE SIMPLICIBUS MEDICINIS* ATTRIBUTED TO THE «PS.-SERAPION» AND HIS READERS

Sometimes around 1290, Abraham of Tortosa, alone or in collaboration with Simon of Genoa³⁷, completed the translation of an Arabic collection of *medicamina simplicia* that soon found success

37. There is actually no consensus about the date of the translation, the place where it was produced, and the name of the translators. M. Steinschneider, *Die hebraischen Übersetzungen des Mittelalters und die Juden als Dolmetscher*, Berlin 1893 (repr. Graz 1956), 737, § 474 on the Ps.-Serapion and 972 on Abraham, M. Ullmann, *Die Medizin im Islam*, Leiden-Köln: Brill, 1970 (Handbuch der Orientalistik. Ergänzungsband 6.1), here 283, and P. Dilg, «The *Liber Aggregatus in medicinis simplicibus* of Pseudo-Serapion: an Influential Work of Medical Arabism in Islam and the Italian Renaissance, in *Islam and the Italian Renaissance*, ed. C. Burnett and A. Contadini, London 1999 (Warburg Institute Colloquia 5), 221–31, here 226, name Simon and Abraham as translators, followed by Jacquart-Micheau, *La médecine arabe*, here 216. On the other hand, the author (identified by the initial M.S.) of the entry «Abraham Ben Shem-Tob» in *Jewish Encyclopedia*, New York 1901–1906, here vol. I, 119, P. E. Pormann, «Yuhanna ibn Sarabyun: Further Inquiries into the Transmission of His Works», *Arabic Science and Philosophy*, 14 (2004), 233–62, here 236 and M. Cronier, «Dioscorides' Excerpts in Simon of Genoa's *Clavis sanationis*», in *Simon of Genoa's Medical Lexicon*, 79–97, here 82 Footnote 5, claim that Abraham was the sole translator, and, to paraphrase M. S., «Simon merely added his name». J. Martínez Gázquez, *The Attitude of the Medieval Latin Translators towards The Arabic Sciences*, Firenze 2016 (Micrologus Library, 75), 146–47 on Simon of Genoa, does not recall Simon's translating activity at all, nor mentions Abraham of Tortosa as a translator from Arabic into Latin. It is possible that the double attribution has been originated in a confusion between the *Liber aggregatus* and Abulcasis' *Liber servitoris*, which was translated by Abraham and Simon. Nevertheless, it must be pointed out that I have found no explanation to support the attribution of the translation of the *Liber aggregatus* to Abraham alone, or to Abraham and Simon, nor I am aware of any study outlining the characteristics of both translations, and therefore providing evidence for any hypothesis of attribution. The date of the translation is conventionally put in the years around 1290, possibly because it was used by Simon of Genoa for the redaction of the *Clavis sanationis*, written between 1292 and 1296, and connected with Simon's stay in Padua (cf. on that subject M. Giaccone, «Simone da Genova», in *Dizionario Biografico degli Italiani*, 92 [2018], accessed on http://www.treccani.it/enciclopedia/simone-da-genova_%28Dizionario-Biografico%29/). No clear explanation of the genesis of the translation is provided in the literature I was able to consult. Finally, the place where the translation was produced is unknown, but, given the predominance of Italian manuscripts and the *terminus ante quem* represented by the redaction of Simon's *Clavis sanationis*, we may take into consideration Italy as the geographical location of the translation, and use the information provided by the geographical origin of manuscripts to determine the exact connection between the compiler and the translation.

with the title of *Liber aggregatus de simplicibus medicinis* and the attribution to «Serapion». The circumstances of the translation (geographical origin, date, identity of the translator[s]) are still unclear, and only an extensive comparison between the *Liber aggregatus* and the *Clavis sanationis* on one side, and the same *Liber* and Abulcasis' *Liber servitoris* will hopefully shed more light on the role played by Simon. As for the date and the location of the translation, a thorough analysis of the manuscript tradition will possibly contribute to be more precise. As for the moment, we can only use the redaction of the *Clavis sanationis* (1292-1296) as *terminus ante quem* for the completion of the translation.

Let us now describe the content. The *Liber aggregatus* is a collection of properties of *medicamina simplicia* divided in two parts, the first of which illustrates, in a different fashion when compared to treatises like Avicenna's *Liber canonis* or Averroes' *Colliget*, the basic principles of pharmacology. The main difference between Avicenna's and Averroes works and the collection attributed to the Ps.-Serapion is represented by the lack of a complete theoretical account on the principles of pharmacology, and its practical orientation, whose main goal is to teach its readers how to distinguish and classify drugs. In consequence of this practical orientation and specific aim, the first part of the *Liber aggregatus* offers no complete or coherent account on pharmacology, but only deals with selected topics that are useful to differentiate natural substances clearly. The first section starts with a description of the difference between subtle matter (*subtilis substantie*) and thick matter (*crasse substantie*), and with a preliminary list of simple remedies belonging to the two categories. In the following chapters, the author focuses on only one of the criteria traditionally used in Galenic medicine to determine the nature of simple remedies, the taste, leaving aside the others, viz. smell and color³⁸. He does not only describes what «taste» is and how it contributes to a precise knowledge of the natural object, but details the characteristics of the 8 main tastes³⁹. Following these first main ways

38. Cf. on these criteria McVaugh, «Determining a Drug's Properties», and I. Ventura, «Wie beherrscht man die Kenntnis der *medicamina*? Fehler und Normierung in der universitären Pharmakologie», in *Miscellanea Mediaevalia 40: Irrtum - Error - Erreur*, ed. A. Speer and M. Mauriège, Berlin-Boston 2018, 123-48.

39. Cf. on the subject C. Burnett, «The Superiority of Taste», *Journal of the Warburg and Courtauld Institutes*, 54 (1991), 230-38. See also Id., «*Sapores sunt*

to distinguish drugs which, as any reader would easily understand, are closely related to the *complexio medicinarum*, the next part of the account deals with the *qualitates primariae* and, again, with the way to employ them to differentiate between drugs, and especially with 1) the theory of degrees, 2) the distinction between food and medicaments, and 3) the distinction between simple and compound remedies. To the explanation of the theory of degrees, the author attaches small lists of drugs belonging to the different categories (such as *medicamina temperate complexionis, calida et sicca in primo gradu* etc.). Then, after elucidating the criteria to be used to distinguish drugs *secundum substantiam* and *qualitates primariae*, the author turns to the *qualitates secundariae*. A long account follows, where each of those «qualities» (or therapeutical effects, such as *maturativa, mollificativa, resolutive* etc.) is described in a specific chapter; the same goes for some *qualitates tertiariae* (for instance, *De medicinis que provocant urinam, De medicinis tussis, or De medicinis mundificantibus renes*) which are described in the same fashion. The last two accounts (namely, the ones devoted to the *qualitates secundariae* and *tertiariae*) are separated by a long list gathering together laxative drugs, a category that, as we have seen when dealing with the works attributed to the Ps.-Mesue, was attracting the attention of several medical authors.

The second section is much easier to detail. Here, ca. 480 drugs of vegetal, mineral, and animal origin are described in three different sub-sections; the first of them, devoted to plants and their products, is the largest one, and is structured according to the Galenic system (viz., according to qualities and degrees). In each sub-section, drugs are listed according to the alphabetical order. The second and the third part are shorter, and the drugs arranged in an alphabetical order determined by the *adjab*. The main goal of the work is explained by the author in the Prologue. According to him, the origin of the *Liber aggregatus* can be found in the necessity to «conflate» the information conveyed by Dioscorides and Galen on drugs, for, if taken together, their works provide a complete overview on

octo. The Medieval Terminology for the Eight Flavours», in The Five Senses = Micrologus. Nature, Sciences, and Medieval Societies, 10 (2002), 99–112, and Id., «Experimentum and Ratio in the Salernitan Summa de saporibus et odoribus», in Expertus sum. L'expérience par les sens en philosophie naturelle, XII^e-XIV^e siècles (Pont-à-Mousson, 5-7 février 2009), ed. T. Benatouïl and I. Draelants, Firenze 2011 (Micrologus Library, 40), 337–58.

materia medica. Dioscorides, the author observes, has offered information about the physical appearance of the natural objects and the effects of the medicaments derived from them, whereas Galen has dealt in particular with their *complexio* and substance. Hence, if excerpts derived Dioscorides' *De materia medica* and Galen's *De simplicium medicamentorum facultatibus* can be gathered together, organized in entries, and integrated by the data furnished by other acknowledged medical writers, the result would be (and, actually, is) a reliable collection providing a satisfactory, all-encompassing summary of the nature and the employments of drugs. This specific characteristic made the *Liber aggregatus* a useful source to Western readers, who, thanks to it, could access 1) the Arabic Dioscorides, which was different from the Latin version that circulated from the 11th century onward, the so-called *Dioscorides alphabeticus*, and 2) the content of books VI-IX of Galen's *De simplicium medicamentorum facultatibus* that had not been translated by Gerard of Cremona, and were rendered into Latin only some decades later (probably, before 1317) by Niccolò da Reggio. This characteristic is not without meaning, for, if considered in connection with the chronology of Niccolò's translation, which was very faithful to the Greek text but not easy to use for Latin readers, and which did not add much information on *materia medica* that were not already available via other sources (Avicenna's *Liber canonis* or the *Circa instans*, for example), it might have influenced Galen's impact, or, at least, promote a comparison between the «Arabic» and the «Greek» Galen. On the other hand, the *Liber aggregatus* introduced to Western readers an «Arabic Dioscorides» which was different from the two main translations that circulated during the Middle Ages, the *Dioscorides langobardus* and the *Dioscorides alphabeticus* (the former being soon forgotten, and rapidly supplanted by the latter)⁴⁰.

The Arabic original remained unknown for long time, until it was identified, thanks to the studies published by P. Dilg, L. F. Aguirre de Carcer, and J. C. Villaverde Amieva, in the *Kitāb al-adwiyā al-mufrada* written by Ibn Wāfid between 1242 and 1253. Ibn-Wāfid's original Arabic text is actually preserved in incomplete form in a unique manuscript, the codex Escorial, Biblioteca de l'Escorial, G-II-9, and

40. Cf. M. Cronier, «Pour une étude du Dioscorides alphabétique latin», *Galenos*, 11 (2017), 31-50.

has been edited in 1992 by F. Aguirre de Carcer⁴¹. On the other hand, the Latin version is handed over by several manuscripts (see Appendix). Despite of what has been claimed several times, Ibn-Wāfid's *Kitāb* was translated for the first time by Abraham (with or without Simon). The *Liber Albenguesim medicinarum simplicium et ciborum* whose Latin translation is attributed to Gerard of Cremona, and today accessible in 6 manuscripts as well as in the first printed version published, together with Ibn Butlan's *Tacutnum sanitatis*, in Strasbourg in 1531⁴², cannot be considered anymore as a first incomplete translation of the *Kitāb*, for its content is largely different from it (and, by the way, differs from all the pharmacological collections I have been able to consult so far)⁴³. Perhaps, the Arabic original that laid on Gerard's desk handed over a text similar to the one preserved in the manuscript Gotha, Forschungsbibliothek, A 72 (arab. 504), f. 11v-16v, but no comparison between this codex and the *Liber Albenguesim* has been performed so far, and no one has attempted a precise identification of the text handed over by the Gotha manuscript, either. Whatever its origin may be, the *Liber Albenguesim* only enjoyed a limited success; only 6 manuscripts preserve the work, to which we may add the witnesses of its presence in Richard de Fournival's *Biblionomia* (and therefore in his personal library) and in the library of the Abbey of Canterbury.

On the other hand, the *Liber aggregatus de simplicibus medicinis* was far more popular. More than 70 manuscripts could be identified so far, handing over the Latin translation, as well as an Italian and a Hebrew version⁴⁴. Traces of a German translation can be seen in the

41. See Poormann, «Yuhanna ibn Sarabyun», esp. 236-38.

42. The work was also printed in the *Opera Mesue*, e.g. in the edition Venetia 1581. Cf. Ventura, «Typologies and Pharmaceutical Markets».

43. On this work, see I. Ventura, «Gerard of Cremona and the *Liber Albenguesim medicinarum simplicium et ciborum*», in *Ex oriente Lux. Translating Words, Scripts and Styles in Medieval Mediterranean Society*, ed. C. Burnett and P. Mantas España, Cordoba - London, 2016 (*Arabica Veritas*, 2), 107-32.

44. See the preliminary list of the Latin manuscripts in the Appendix. On the Italian version, which does not seem to correspond to any Latin original, cf. C. Burzio, «Un'ipotesi sulle relazioni tra i testimoni toscani del libro di Serapione», in *Lo scaffale della biblioteca scientifica in volgare (secc. XIII-XVI). Atti del Convegno di Studi Matera, 14-15 ottobre 2004*, ed. R. Librandi and R. Piro, Firenze 2006 (*Micrologus Library*, 16), 219-26. The Hebrew version is transmitted by following codices: Paris, Bibliothèque nationale de France, hebr. 1187, Moscow, Günzburg Collection, Günzburg 573, f. 258a-396b, and Città del Vaticano, Biblioteca Apostolica Vaticana, Neofiti 29.

Leipziger Drogenkompendium, an alphabetical collection of simple remedies handed over by the codex Leipzig, Universitätsbibliothek, HS 1224⁴⁵. Whether the compiler of the *Drogenkompendium* translated some excerpts derived from the *Liber aggregatus* ad hoc for his translation, or he drew on an existing one (possibly of the complete text), it is not possible to say.

The number of Latin copies (which will without doubt increase in time) is not the main element of interest, though, not it will help us any further, if we will not combine this number with more information about the distribution of the copies and the connection between the work and the development of Late Medieval pharmacology and pharmacotherapy. As for the chronology of the copies, we notice a remarkable concentration of the codices in the Fourteenth century, and only few ones written during the Fifteenth (mostly in the German-speaking area). The peak of production during the 14th century becomes more interesting when connected with the geographic distribution; here, Northern Italy emerges as a focal point of concentration of copies. In particular, the dissemination of copies is centered around Bologna and Padua, who emerge as centers of production as well as of use of the text. More problematic is, on the other hand, the reconstruction of the connection between the work and the Parisian academic milieu. If one of the oldest manuscript, the codex Paris, BnF, latin 16184 was produced for Pierre de Limoges in Paris, and can be therefore considered as a witness of an early reception among the local *magistri*, it is still difficult to determine whether, and how, the text was read and used. However, I argue that, compared to Avicenna's *Liber canonis*, Ps.-Mesue's *De consolatione simplicium medicinarum*, or, to some limited extent, Galen's *De simplicium medicamentorum facultatibus*, the *Liber aggregatus* did not affirm itself on the Parisian medical book market. For example, I could not find any use of this source in Pierre de Saint-Flour's *Colliget florum medicinae*, who still relies on Avicenna when putting together the entries on *materia medica* he added to his

45. On the *Leipziger Drogenkompendium*, see B. Schnell, «Die deutschen Kräuterbücher des Mittelalters. Ein aktualisierter Überblick», in Id., *Arzneibücher, Kräuterbücher, Wörterbücher. Kleine Schriften zu Text- und Überlieferungsgeschichte mittelalterlicher Gebrauchsliteratur*, ed. D. Klein, Würzburg 2019 (Publikationen aus dem Kolleg «Mittelalter und Frühe Neuzeit», 7), 301-43, esp. 326-27, with further literature.

main source, John of Saint-Amand's *Concordantiae*⁴⁶. Even Jacques Despars, when commenting upon the *Liber canonis*, made ample use of Ps.-Mesue's writings, but less of Ps.-Serapion's *Liber aggregatus*, whom he knows and mentions among his sources, though⁴⁷. Generally speaking, the Parisian milieu seems not to have been very interested in, or innovative about, pharmacology. As noticed by D. Jacquart, no remarkable works on pharmacology and medicine were produced by the Parisian Faculty of Medicine⁴⁸. This may explain the substantial lack of renewal of the library of sources after the end of the 13th century, and the lack of success experienced by the *Liber aggregatus*.

Let us now return to the Northern Italian academic context. The evidence provided by the manuscripts should be interpreted in connection with the traces we have of the use of the work in the local Academic context. Several among the manuscripts I have been able to consult show, in fact, the typical feature of local university manuscript, especially with reference to the *mise en page* and the decoration. The connection with the Academic milieu is confirmed by an indirect witness, viz. by the 1405 list of the works that the *bidelli* of the University of Bologna had to keep in forms of *pecia* («petias de bona littera et bene correctas»), which include a *Serapio de simplicibus* together with some Galenic writings and Averroes' *Colliget*⁴⁹, and with the existence of at least two codices showing traces of *pecia*, the codices Oxford, Bodleian Library, Laud. Misc. 651 and Vendôme, Bibliothèque Municipale, 239⁵⁰. The witness provided by the list and by the *codices peciati* is all the more intriguing, if we consider that the *Liber aggregatus* was not part of the local curriculum. But then, how

46. Cf. Ventura, «Galen's *Simple Drugs* and Its Medieval Readers», forthcoming.

47. D. Jacquart, «Où il est à nouveau question de Jacques Despars: les *marginalia* du latin 6915», in Ead., *Recherches médiévales sur la nature humaine: essais sur la réflexion médicale*, Firenze 2014 (Micrologus Library, 63), 221-50; Ead., *La médecine médiévale*, 221 on the presence of *Serapion* in Jacques Despars' commentary.

48. D. Jacquart, «Médecine et pharmacie à Paris au XIII^e siècle», *Comptes rendus de l'Académie des Inscriptions et Belles-Lettres*, 150 (2006), 999-1029, here 1026.

49. G. Murano, *Opere diffuse per exemplar et pecia*, Turnhout 2005 (Textes et Études du Moyen Age, 29), 159-60, document nr. LIX, «La lista delle opere peciate della Facoltà di Medicina di Bologna» (= B 1405).

50. *Ibid.*, 736-37, nr. 847.

was it read and used, and which impact did it have on the Northern Italian academic milieu?

The content and the *Mitüberlieferung* of the manuscripts do not seem to offer a clear answer, either, for they do not show a direct connection with the medical manuals used to teach medicine in Universities. In most manuscripts, Ps.-Serapion's *Liber* is copied alone (a decision that, given the size of the collection, is quite understandable), or included in anthologies revealing an attempt to reconstruct an *Opera omnia Serapionis* and therefore combining the *Breviarium sive practica*, the *Liber aggregatus*, the so-called *Synonyma Serapionis*, a medical and pharmacological lexicon which seems to have been created as a tool to access the *Breviarium*, and the *Liber servitoris*. This type of *Opera omnia* is represented, for example, in the manuscript Oxford, Bodleian Library, Can. Misc. 250. The codex consists of two parts, the first of which includes the *Liber aggregatus*, the *Breviarium sive practica*, and the *Synonyma Serapionis*, while the second (attached sometimes to the first) preserves the *Liber servitoris*. Nonetheless, if a connection with Northern Italian Academic curriculum existed, it is not clearly featured in the manuscript production.

At this point, we should try to find another answer which will not be limited to the mere quantitative analysis of the manuscripts and the assessment of their dissemination. If we wish to reason about the impact of the text, we need to ask ourselves a very simple question, namely: To which extent the Latin translation of Ps.-Serapion's collection represented a turning point in the history of medieval pharmacology and pharmacotherapy? Did it open a new path in *materia medica*, or was it simply another collection describing nature and properties of simple remedies? In order to answer this question, we should spend some few lines illustrating the specific type of text and literary genre Ibn Wāfid's work belonged to.

Ibn Wāfid's *Kitāb* is one of the Arabic collections *de materia medica* we can define as «encyclopedic», as they are not written with the aim of putting at readers' disposal new material, but to collect and organize some reliable one that could be derived from authorities of high reputation on the field. This type of collection, which basically consists of excerpts taken from other texts and copied in sequence together with the name of the author they originate from, is ultimately based on the intensive studies carried out by Islamic medical scholars on the main authorities of *materia medica*, Dioscorides and

Galen, and on the necessity to structure, order, and make accessible a continuously growing amount of data concerning both natural objects and their employment provided by the Arabic pharmacological and pharmacotherapeutical works that were, so to say, piling up on the shelves of Oriental libraries⁵¹. Among those «encyclopedic» collections, which are by no means to be considered as the result of uncritical collecting and copying activities, but reflect the scholarship and the erudition as well as the practice and the observation of nature of their authors, we find some famous works, such as al-Ghāfiqī's *Kitāb al-adwiya al-mufrada*, Ibn al-Baiṭār's *Kitāb al-Ġāmi li-mufradāt al-adwiya wa-l-aḡdiya*, and Ibn Wāfid's *Kitāb*. These collections did not enjoy the same success in Western culture. Al-Ghāfiqī's *Kitāb* was translated in 1258 in Lerida by an unknown *magister* G., but its impact was very limited and somehow difficult to reconstruct. According to J.-L. Bosc, it was quoted by few authors between the 14th and the 15th century (Guglielmo Corvi da Brescia, John of Gaddesden, Velasco de Tarenti, Arnold of Bamberg)⁵², and yet its scarce manuscript tradition, exemplified by three witnesses, points to Late Medieval Germany as a its main focus⁵³. Astonishingly enough, Ibn al-Baiṭār's *Kitāb* was never translated during the Middle Ages; the first – and only – Latin translation dates back to the 18th century; it was produced by Antoine Galland, and is preserved in the manuscripts Paris, BnF, latin 11221 and latin 11222⁵⁴.

As we have already noticed, Ibn Wāfid's fared much better. However, if we want to measure its impact and not simply assess its diffusion, we must now ask ourselves how it was read and used. More specifically, we must determine whether it was acknowledged and employed as conveyor of an ample pharmacological tradition (especially because it could supply information included in both Dioscorides' and Galen's works, and facilitate their comparison), as manual written to support practical medicine with a carefully

51. P. E. Pormann, «The Formation of Arabic Pharmacology,

52. J.-L. Bosc, *Montpellier et la médecine andalouse au Moyen Âge. Transfert des textes et des savoirs*, Montpellier 2016, 118-23 e 216-30 on al-Gāfiqī.

53. Cf. I. Ventura, «Note sulla tradizione del *Kitāb al-adwiya al-mufrada* di al-Gāfiqī», in *Quid sit modestia? Mélanges de médecine ancienne en l'honneur de Klaus-Dietrich Fischer*, special issue of the review *Medicina nei secoli*, forthcoming.

54. On these manuscripts, see <https://archivesetmanuscrits.bnf.fr/ark:/12148/cc72837t> (full digitization, and short description).

selected and structured theoretical background, and/or as tool employed to solve the increasing problems of identification and nomenclature of natural objects (mostly plants) created by the overlap of Arabic-Latin sources and their translations. The Northern Italian Academic milieu (especially the Paduan context) and some authors more or less closely related to it will help us providing some preliminary answers to these questions. Basically, we can distinguish three different form of impact, namely: 1) the contribution given by the *Liber aggregatus* in connection with Simon's *Clavis sanationis* to the discussion (and, possibly, the solution) of linguistic issues related to the increase in size of the library *de materia medica*, which had not only lead to an explosion of the texts available on the «medical book market», but also to the proliferation of the nomenclature forms in (transliterated) Arabic and Greek, in Latin, and in the various vernacular languages, and to subsequent contradictions and debates; 2) the use of the *Liber aggregatus* «in context» to create reliable tools pointing to the right source describing *complexio* and therapeutical properties of each *medicamen simplex*. The need of such tools would increase in parallel with the enlargement of the library of works dealing with drugs and their use, which created, in that case as well, divergences and conflicts between texts; a part of the Academic world tried to settle those disagreements by writing tools offering reliable solutions and attempts of agreement between the authorities; 3) the role played by the *Liber aggregatus* as source for collections of properties of simple drugs, a literary genre that, in consequence of the same expansion and renewal of the pharmacological and pharmacotherapeutical library, was not only in need to be updated, but also in the obligation to revise its traditional structures and forms of organization.

If we try to deal with the function performed by the *Liber aggregatus* in solving issues related to identification of plants and nomenclature, we must stress that this function was performed by the *Liber aggregatus* in close combination with Simon of Genoa and his *Clavis sanationis*. This work actually played a decisive role in establishing the authority of the Ps.-Serapion and to enhance the impact of the *Liber aggregatus*. As demonstrated by M. Cronier, Simon used the Ps.-Serapion as a key to reconnect with the original content of sources (read: Dioscorides) that had been transformed and re-elaborated so

deeply that they might have lost connection with the author's versions. On the other hand, the *Clavis sanationis* established how the *Liber aggregatus* could be conveniently used, viz. as a source of information concerning both 1) the physical appearance, the *complexio*, and the therapeutical use of drugs, and 2) their Arabic and Latin nomenclature. The first kind of information could help medical authors who used the *Liber aggregatus*, either in connection with the *Clavis* or not, putting together a solid textual structure around which they could arrange data derived from different sources. The second, on the other hand, contributed toward a better identification of the same natural objects across different languages and different texts representing them, and consequently toward the establishment of more solid connections between collections *de materia medica* and the technical vocabulary they displayed and the natural objects they described. To say it more clearly: the multiplication of Arabic-Latin and Greek-Latin translations and the use of strategies such as transliterations and insertion of Latin equivalents was creating uncertainties about the validity of the names given to the same natural object by different authors and/or of the equivalence between a natural object and the nomenclature provided by one or more sources. On the other, the development of a technical vocabulary in vernacular languages obliged some compilers of «herbals» to connect the vernacular nomenclature with a natural object described by established Ancient and Medieval (read: Arabic) authorities. In order to reconnect the Greek, Arabic, and Latin traditions, collections of *Synonyma* elucidating the technical vocabulary displayed by Avicenna or Rhazes were produced. In order to solve the second problem, some authors of collections dealing with properties of single remedies such as the enigmatic Rufinus, who compiled a large work *De virtutibus herbarum*⁵⁵, were trying to incorporate into their text descriptions of natural objects (for instance, plants) known through their vernacular definition, and to reconnect the object with a *res* mentioned in Ancient collections. The *Clavis*

55. Edition: Rufinus, *De virtutibus herbarum*, in: *The Herbal of Rufinus. Edited from the Unique Manuscript* by L. Thorndike assisted by F. S. Benjamin Jr., Chicago 1946 (Medieval Academy of America, Corpus of Medieval Scientific Texts, 1). Cf. I. Ventura, «Auf der Suche nach einem Phantom: Dioscorides im Verweissystem naturkundlicher und medizinischer Werke des 13. Jahrhunderts», *Romance Philology*, 71 (Fall 2017), 697-728.

sanationis acted, of course, especially with respect to the first issue, and used the *Liber aggregatus* both to show how Serapion was closely connected to the identification provided by Dioscorides (e.g., in the entry *Alcionium*), or better, how faithfully he conveyed Dioscorides' opinion on the nature and the identification of a natural object, or to show his agreement with the Arabic pharmacological tradition (e.g., in the entry *Bitumen iudaicum*)⁵⁶. In other terms, Simon did not only recognize the value of the *Liber aggregatus* for the solution of issues related to identification and nomenclature, but tried to reconstruct two-ways connections between Serapion and the Greek tradition on one side, and between the same author and the Arabic pharmacopoeia. The few notes I have just put together cannot pretend to have dealt with the subject because many questions are still to be answered. They do not only concern Simon's attitude toward the *Liber aggregatus*, but also the impact on this book in lexicographic literature. A first example, which I shall recall very shortly, as it has been recently studied by H. Funk, concerns Peter of Abano's glosses on the *Dioscorides alphabeticus*⁵⁷. The *Liber aggregatus* is not only the most quoted source by Peter, but the Arabic names of plants included by him in his glosses parallel the nomenclature displayed by the *Clavis sanationis* and the *Liber*. Therefore, it is possible to venture that Peter was not only one of the first users of both texts, but that he was one the first that understood their mutual connection. Another, less known, example can be offered, though.

Some years after the publication of the *Clavis*, Mondino da Cividale del Friuli, a Paduan *magister medicinae*, completed an abridged version of the *Clavis*, the *Synonyma*, a collection now preserved in at least 7 manuscripts in different versions, including up to 6500 entries⁵⁸. As demonstrated by T. Pesenti, Mondino's *Synonyma* show a clear link to teaching activity, and especially to the *expositio litterae Avicennae*, viz., the commentary upon Avicenna's *Liber canonis*. Mondino's *Synonyma* have been considered as a simple redaction and

56. The entries can be read on www.simonofgenoa.org, ad locum.

57. Cf. H. Funk, «The first printed Latin editions of Dioscorides's *De materia medica* (1478/1512). A re-evaluation», *Archives of Natural History*, 43/2 (2016), 237-54.

58. On Mondino's *Synonyma*, cf. T. Pesenti, «Studio dei farmaci e produzione di commenti nell'Università di Arti e Medicina di Padova nel primo ventennio del Trecento», *Annali di Storia delle Università Italiane*, 3 (1999), 61-78.

simplification of Simon's *Clavis*, a text that smooths the contrasts and practically erases the conflicts between authorities, leaving place only to solutions. Now, it would be worth analyzing how Mondino deals with the content and the linguistic choices of the *Liber aggregatus* as reflected by the *Clavis sanationis*, and whether he agrees with Simon in making *Serapion* a link between the Greek and the Arabic identification of species and nomenclature. The same should be done for an author like Jacques Despars, who valued the *Clavis* not only as a lexicographic tool, but as an important source to become more acquainted with the Arabic technical vocabulary⁵⁹. It would be interesting to see whether he explores Avicenna's specialized language with the help of the data Simon had derived from the *Liber aggregatus*.

The second aspect of Ps.-Serapion's impact on Northern Italian Academic milieu can be identified in the way in which the *Liber aggregatus* was «put in context» and used to create a synoptic tool whose aim was to guide his readers and help them to find both reliable information and the indication of the most authoritative source to refer to. A good example of this kind of reception of the *Liber aggregatus* is represented by the *Aggregator de simplicibus medicinis*, completed by Iacopo Dondi in Padua in 1355⁶⁰. The work, which has not yet received the attention he would deserve, can be firstly defined as a mnemotechnic tool devoted to pharmacology and as a modest collection of sources quotations. This is, indeed, the image of the work its author intends to show to his readers. In the Prolog, he introduces his work by modestly stating that his aim is to offer both young and neophyte (who lacks time!) and experienced physicians (especially old ones, as they are prone to forget!) an useful work, or, more specifically, a collection of data derived from various authors and gathered together «*in tabulis [...] sub debitis rubricis, reliquendo que in practicis libris ordinate scribuntur non egentes aggregatione*», viz. in forms of lists concerning various subjects; in this process, Iacopo would leave aside what is written in medical *practicae* and does not need to be summarized, such as prescriptions and descriptions of

59. On Jacques Despars' use of the *Clavis*, see Jacquart, *La médecine médiévale*, 211-13.

60. On Iacopo Dondi, cf. T. Pesenti, «Iacopo Dondi dall'Orologio», in *Dizionario Biografico degli Italiani* (accessed on www.treccani.it, ad locum).

therapies. All in all, the work is a literary product which can be considered as a predecessor of a modern database created with the aim of referring its user to the relevant source quickly and profitably. The sources are mentioned in the same Prolog: Ps.-Serapion's *Liber aggregatus* is the first source to be mentioned, with a suggestive remark, which I should quote in full: «*Serapio principaliter, eo quod plures adducit auctores, maxime tamen Dioscoridem et Galienum, quare non posui simpliciter Dioscoridem et raro Galienum*». Other authors are listed in a descending order, probably based on their chronology as well as on their reputation among Academic and professional physicians: Plinius «*qui post Dioscoridem fuit antiquior Galieno*», Rhazes (mentioned only in connection with his *Liber ad Almansorem* and *De divisionibus*, whereas the *Hāwī sive Continens* seems not to have been taken into consideration), Isaac Israeli (with reference to his *De diaetis*), al-Majūsī, *Macer floridus*, Avicenna, Averroes' *Colliget*, the Ps.-Mesue (perhaps the *De consolatione* and the *Antidotarium sive Grabadin*, but I cannot exclude that the *Practica sive Grabadin* might have been used as well), an enigmatic *Preparator* I could not identify, Abulcasis, the *Kyranides*, Sextus Placitus Papyriensis, Antonius Musa, Thessalos of Tralles, the Ps.-Apuleius, Plato (possibly, a second-hand reference derived from the Ps.-Mesue), an «unknown» (*Ignotus*) quoted by the Ps.-Serapion, Simon of Genoa, a «lapidary» which can be possibly identified with Marbode of Rennes' *Liber lapidum*, Albert the Great's *De mineralibus*, and the *Circa instans*. All these works are recalled with short references, mostly without any further commentary. The choice of authors goes far beyond the intention to mirror an academic curriculum or an academic reference library. On the contrary, it seems to have the ambition of covering the whole development of pharmacology, pharmacy, and therapeutics, and to spread from medicine to medico-magical therapeutical strategies.

However, when looked at more closely, the collection is more than a list of names and objects created to support memorization. It can actually be recognized as an impressive attempt to gather together the main references (and therefore the most authoritative writings) for each part of therapeutics, and as a perfect mirror of the library of sources the Paduan curriculum was based upon. In order to understand better what I have just argued, let us give a glimpse to its structure and content. The work is divided in ten sections, the first and the second of which deal with the *qualitates primariae* and

secundariae of simple remedies (the drugs being grouped, in the section concerning the *qualitates primariae*, according to their Galenic qualities, in the one listing the *secundariae*, to the alphabetical order), the third with the *qualitates tertiariae* and with the remedies recommended against each disease *a capite ad calcem*, the fourth with the compounds and their action against bad *humores*, the fifth with the *aegritudines universales* and fevers, the sixth with cosmetics, the seventh with surgery, the eight with poisons. The ninth book leaves the domain of human medicine to turn to animals; the tenth concludes the undertaking by providing some tables of concordance. Each chapter consists of the name of a simple remedy accompanied by the reference to the source Iacopo considers the main reference to apprehend its nature and therapeutical effect. To give just a few examples: In the first chapter of the first book, which lists the *medicinae temperatae*, we find entries like *Lapis lacteus Avicenna*, or *Mum Avicenna*⁶¹. Usually, Iacopo only mentions a single source, but this is not a rule. When he remarks a difference in the assessment of the nature, the *qualitates*, and the therapeutical uses of simple remedies, he quotes more than one author, recalling with a short note the differences in their opinions (cf., e.g., the entry «*Cassia fistula Serapion; secundum Eben Mesue, Hali ad caliditatem, Ciranides ad caliditatem et humiditatem*»). Hence, when browsing the lists, the readers of the *Aggregator* could get an immediate reference of 1) the right source to consult in order to obtain reliable information, 2) the topics and the objects (illnesses, medical remedies, etc.) belonging to a specific branch of knowledge and field of study, and 3) the reference library for medicine as an entire branch of knowledge and for its specific sub-sections (pharmacology, pharmacy, therapeutics, as well as human and animal medicine).

For our specific purpose, it is worth noticing some few characteristics of Iacopo's evaluation and use of the *Liber aggregatus*. First of all, he explicitly affirms that he quotes *Serapion* not, as Simon of Genoa and Matthaeus Sylvaticus did (see below), because it was a key to *access* and to *reconnect* with Dioscorides' and Galen's works and their content, but because it is a tool that *substitutes* them, and makes their perusal not immediately necessary. According to Iacopo, it is

61. Iacopus de Dondis, *Aggregator*, Venetiis 1481 (digital version on www.digitale-sammlungen.de, ad locum), f. 1ra.

not compulsory to compare the Latin Dioscorides and Galen that were available around 1350; the Arabic-Latin Dioscorides and Galen conveyed by the Ps.-Serapion were largely sufficient! This attitude can be read as a crucial point for the definition of the library of sources in Padua around 1350, as well as an equally crucial moment for Dioscorides' and Galen's *Fortleben*. Refraining from indulging in speculations, I may point out that, ca. 1350, the manuscript tradition of the *Dioscorides alphabeticus* comes to a still, and Niccolò's translation of books VI-XI of Galen's *De simplicium medicamentorum facultatibus* is already disappearing from the library of medical sources. Secondly, it is interesting to notice how «pragmatically» Iacopo dealt with the Ps.-Serapion. In actual facts, although the *Liber aggregatus* is one of the main sources and authorities on which Iacopo relies (if not the main authority), the references to it are often accompanied by the mention of the source (Dioscorides or Galen) the Ps.-Serapion is transmitting. This is the case, for instance, of the entry *Camomilla* included in the first chapter of the third book: «*Camomilla: Avicenna; Serapion secundum Galienum*»⁶². The examples could be multiplied, but what is worth noticing is that Iacopo Dondi is not only showing clearly how important the Ps.-Serapion has become for professional and Academic culture, but also how carefully the information provided by him was selected in order to allow readers to identify immediately what was really worth consulting. In this sense, it must be noticed that, generally speaking, it does not seem that Medieval readers understood the richness of the library of sources on which the *Liber aggregatus* was based. Second-hand quotations derived from the *Liber aggregatus* of authors other than Dioscorides and Galen are quite rare, if we exclude the extensive passages included by Matthaeus Sylvaticus in the *Liber pandectarum medicinae*, to which we will now turn our attention.

It would not be an easy task to map the impact of the *Liber aggregatus* on pharmacological collections. Our knowledge of this literary genre is still rather insufficient, from a quantitative as well as a qualitative point of view. We still have no complete overview of the number of collections written in Latin and in the vernacular (with the exception of the German-speaking area, which has been

62. *Ibid.*, f. 31va.

extensively analyzed by B. Schnell)⁶³, nor can we claim that the collections we are better familiar with have been conveniently studied. For instance, we still do not have enough critical editions corroborated by trustworthy identification of sources; nor can we outline the reception and the impact of sources like Avicenna's *Liber canonis*, the Salernitan collection *Circa instans* or, as this article has hopefully shown, the *Liber aggregatus* on Late medieval writings *de materia medica*. Some of them are, in actual facts, difficult to access, since still preserved in manuscripts, or not properly identified in catalogs and inventories. To mention one example: Galeazzo Santasofia († 1427), member of the renowned Paduan family Santasofia, who had counted among its members illustrious physicians and *magistri medicinae* like Marsilio or Giovanni⁶⁴, compiled ca. 1425 (viz., while he was professor of medicine at the University of Vienna, and *Leibarzt* of the duke of Austria, Albert III) an *Onomasticon de simplicibus medicinis* handed over by 24 manuscripts⁶⁵. The *Onomasticon* is, as we may expect, an alphabetical collection of properties of *medicamina simplicia*, each entry of which is formed of excerpts taken by various sources. At a first glance, the only author who is explicitly quoted is Avicenna, who was probably the top of the hierarchy of authorities selected by Galeazzo, but we cannot exclude that he used the *Liber aggregatus* as well. In fact, some abbreviations *Ser.* seem to refer to *Serapion*. Whatever the situation may be, the *Onomasticon* is an interesting witness of the selection of sources and data available, and

63. Schnell, «Die deutschen Kräuterbücher».

64. On Marsilius Santasofia, cf. T. Pesenti, *Marsilio Santasofia tra corti e università. La carriera di un «monarcha medicinae» del Trecento*. Treviso 2003 (Contributi alla Storia dell'Università di Padova, 35).

65. On Galeazzo and his *Onomasticon*, cf. T. Pesenti, *Professori e promotori di medicina nello Studio di Padova dal 1405 al 1509. Repertorio bio-bibliografico*, Sarmedia di Rubano (PD) 1984, (Contributi alla Storia dell'Università di Padova, 10), 182-86, esp. 183-84. To the manuscripts listed by Pesenti, we should now add the codices Berlin, SBBPK, MS Lat. Qu. 367, Città del Vaticano, Biblioteca Apostolica Vaticana, Pal. Lat. 1197, Città del Vaticano, Biblioteca Apostolica Vaticana, Reg. Lat. 1097, Krakow, Biblioteka Jagiellonska, 778, Krakow, Biblioteka Jagiellonska, 779, München, Bayerische Staatsbibliothek, Cgm 662, Nürnberg, Stadtbibliothek, Cent. III, 9, Tübingen, Universitätsbibliothek, Mc 310, and Trento, Biblioteca Comunale, Fondo Manoscritti, BCT 1-1803. Possibly, the manuscript Dresden, Sächsische Landesbibliothek - Staats- und Universitätsbibliothek Dresden, Mscr. Dresd. C 278, here f. 69v-77v, preserves a collection of excerpts derived from the *Onomasticon*.

highly regarded by Academic physicians in Late Medieval Vienna. A critical edition of the text, provided with a commentary, will corroborate our knowledge of this cultural context and its background, and gives us a concrete example of the role played by Avicenna in Late Medieval Vienna and of its impact on the local curriculum. And now, let us return to our main task, namely the identification of the cultural impact of the *Liber aggregatus*.

As it became clear while putting together the preliminary list of manuscripts, the tradition of the *Liber aggregatus* shows different branches. Either the work is preserved in full, or the two sections are copied independently. If the autonomous tradition of the second, descriptive part transforms de facto the *Liber aggregatus* in a collection of properties of simple remedies dispossessed of every theoretical background, the transmission of the first part alone deserves some attention. In actual facts, this section does not seem to have been particularly valued. I have not been able to find quotations of this section in the works I have consulted. On the other hand, some scribes included it (or parts of it) in some kinds of miscellanies resulting from «note-taking» and personal study, such as the codex Sevilla, Biblioteca Colombina, 5-5-21. Here, the «theoretical section» of the *Liber aggregatus* is copied within a sequence of «notes» taken from various authors and texts and of small texts, among which we find Albert the Great's biological works, Averroes' *Colliget*, Isaac Israeli's *De diaetis*, or Avicenna's *De viribus cordis*. Possibly, such type of miscellanies were the result of an independent reading, and of a precise strategy of collecting information related to natural philosophy and medicine for personal use⁶⁶. Another reason is, however, to be taken into account. The reason of for the independent copy of the first, «theoretical section» of the *Liber aggregatus* can be found both in the process of «personal note taking» I have just recalled, but also in the nature of the section itself, which included lists of drugs showing the *complexiones* and the *qualitates* illustrated by the Ps.-Serapion. If we take that into account, we may argue that a scribe and/or a reader who did not need (our could not afford) to copy and/or to procure the whole text, might have been satisfied with the theoretical information and the practical examples provided by the

66. On note-taking, see A. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age*, New Haven/London, Yale University Press, 2010.

first part. That was not quite often the case, though. Most codices cannot be identified, in fact, as the result of a personal initiative of note-taking, but of the activity of *scriptoria* copying the work in full. On the other hand, the second one was very successful, both as a «new source» to update the pharmacological and pharmacotherapeutical background, as a tool to access the Greek-Arabic-Latin tradition on *materia medica*.

The first author who, to my knowledge, made use of the *Liber aggregatus* is Manfredus de Monte Imperiali⁶⁷. Nothing is known about him, not even his birthplace, identified either with Poggibonsi or with Castel del Monte in Puglia. However, his cultural background, as well as the textual tradition of his work, show close links to the Northern Italian medical culture. His fame is closely connected with the only work attributed to him, the *Tractatus de herbis*, a collection of properties of *medicamina simplicia* arranged according to the alphabetical order, today preserved in 7 manuscripts, the codices Paris, BnF, lat. 6823, Città del Vaticano, BAV, Chigi, F. VII. 158, Città del Vaticano, BAV, Chigi, F. VIII. 188, Città del Vaticano, BAV, Ross. 1067 (XV Jh.), København, Det kongelige Bibliotek, Thott 191, Siena, Biblioteca Comunale degli Intronati, L.VII. 18 (the so-called «Codice Sermoneta»), and Paris, Musée des Beaux-Arts, Masson 116. The Parisian and the Vatican codices combine the text with a rich illustrative corpus displaying the natural objects from which the drugs described in the entries were derived. Indeed, the illustrative corpus were meant to accompany the text from its origin; as Manfredus stated in his Prolog, he intended to provide his readers with reliable pharmacological knowledge by collecting excerpts taken from authoritative sources and by showing the natural objects through accurate illustrations. Manfredus' *Tractatus* was with all probability the result of an extensive re-elaboration and improvement of the *Tractatus de herbis* attributed in the most ancient manuscript preserving it, the codex London, British Library, Egerton 747, to a certain *Bartholomaeus Mini de Senis*. Manfredus' «innovations» to Bartholomaeus' text follow exactly the trends that

67. Cf. Ps. Bartholomaeus Mini de Senis, *Tractatus de herbis* (MS London, British Library, Egerton 747), ed. I. Ventura, Firenze 2009 (Edizione Nazionale «La Scuola Medica Salernitana», 5), 148 sqq. A study on this text is being prepared by I. Ventura and A. Leducq.

established the reputation of the *Liber aggregatus* and the *Clavis sanationis*, namely the necessity to provide a correct and up-to-date nomenclature of natural objects and an all-encompassing information about drugs by using renowned sources, and to transform a collection of average, current level, relying on somehow outdated sources into a tool reflecting upgraded professional knowledge. And it does it in different ways, viz. 1) by changing the content of entries that Bartholomaeus' *Tractatus* had been probably derived from oral sources or local technical lore with the help of some texts that were used by Simon (such as Avicenna's *Liber canonis* or the *Dioscorides alphabeticus*) and were generally closer to the pharmacological cultural background that circulated in Italian Academic circles, 2) by inserting some lexicological data concerning plants nomenclature derived from the *Clavis sanationis*, and 3) by adding some new entries that were set up with the help of the corresponding lemmata of Avicenna's *Liber canonis* or – what interests us more – of the *Liber aggregatus*. This is the case, for example, of the entries *Athel* (which we will encounter again in Matthaeus Sylvaticus' *Liber pandectarum*) and *Alkitram*, both derived from the *Liber aggregatus*⁶⁸. Although we cannot identify the criteria that determined Manfredus' selection of the entries derived from the *Liber aggregatus*, we can at least demonstrate that, with his renewal and «upgrade» of the text of the *Tractatus de herbis*, he shows the influence and the impact of the *Liber aggregatus* on the pharmacological literature of the Northern Italian Trecento. Furthermore, we may argue that the need to renew the content and the library of sources of a collection *de medicaminibus simplicibus* was fulfilled with the help of two sources, the *Liber* and the *Clavis*, that integrated and linked together Arabic and Greek pharmacological traditions, and attempted at smoothing the contradictions they showed and at solving the questions they raised.

Much better known than Manfredus is, without doubt, the Salernitan Matthaeus Sylvaticus who, during the first decades of the 14th century (the *terminus post quem* for the completion of the work being represented by the date «1332» reported as the completion date in the manuscripts Mantova, BC, 138 and München, Bayerische Staatsbibliothek, Clm 30), put together one of the largest and most detailed encyclopedic collections on *materia medica*, the *Liber pandec-*

68. Cf. Ps.-Serapion, *Liber aggregatus*, f. 106vb–107rb.

tarum medicinae. Thanks to the recent studies published by C. Bottiglieri, we know that the *Liber aggregatus* was not only the main source used by Matthaeus (a role it shares with Simon of Genoa's *Clavis sanationis*), but that he used it to access the Arabic Dioscorides and Galen⁶⁹. In Matthaeus' *Liber pandectarum*, the *Liber aggregatus* performed several functions: It was either used as an integration to Simon, to provide information that the *Clavis sanationis* did not include (e.g., the extensive quotations of Dioscorides and Galen), or in substitution of it, especially when the corresponding entry in the *Clavis sanationis* was too complex, and less useful for the practical aims Matthaeus was trying to achieve⁷⁰. Furthermore, the *Liber aggregatus* was especially used when it offered a clear identification between the Arabic and the Latin nomenclature, and acted as the starting point of the entry, around which other sources (e.g., the *Dioscorides alphabeticus*, Ps.-Mesue's *De consolatione simplicium medicinarum*, Avicenna's *Liber canonis*) were structured, either to integrate its content, or to substitute an excerpt originally included in it. This is the case, for example, of passages derived from the *Dioscorides alphabeticus* that are inserted after an excerpt derived from the *Liber aggregatus*, or from Galen's *De simplicium medicamentorum facultatibus*. In these cases, an entry included in books VI–XI of Galen's pharmacological work and available in Niccolò da Reggio's translation are incorporated by Matthaeus into a larger passage taken from the Ps.-Serapion, replacing the original «Arabic-Latin Galen» equivalent handed over by the *Liber*. These mechanisms of interpolation and substitution that practically multiply or substitute the Dioscoridean and Galenic excerpts put at disposal by the Ps.-Serapion may indicate that Matthaeus was not only reading the *Liber aggregatus* «critically», comparing it with the different versions of Dioscorides' *De*

69. Edition: Matthaeus Silvaticus. *Opus pandectarum*. Venetiis 1499 (digital version: www.muenchener-digitalisierungszentrum.de). Cf. C. Bottiglieri, «Ap-punti per un'edizione critica del *Liber pandectarum medicinae* di Matteo Silvatico», in *La Scuola Medica Salernitana. Gli autori e i testi. Convegno Internazionale (Università degli Studi di Salerno, 3-5 novembre 2004)*, ed. D. Jacquart and A. Paravicini Bagliani, Firenze 2007 (Edizione Nazionale «La Scuola Medica Salernitana», 5), 31-58; Ead., «Circolazione dei testi medico-botanici nell'Italia centro-meridionale alla luce delle *Pandectae* di Matteo Silvatico: riscontri e ipotesi», in *La medicina nel basso Medioevo. Tradizioni e conflitti. Atti del LV Congresso storico internazionale (Todi, 14-16 ottobre 2018)*, Spoleto 2019, 493-538.

70. See the examples *ibid.*, 527-38.

materia medica he had on his desk (he could apparently derive material from the *Dioscorides alphabeticus* from the original work, and from the *Dioscorides langobardus* through Simon's *Clavis*) and with the Greek-Latin translation of Galen's *De simplicium medicamentorum facultatibus* that Niccolò of Reggio had just completed in 1317, but that he was possibly, or at least in some cases, «detaching» himself from the Ps.-Serapion in order to come back to what seems to him to be more authentic or simply more reliable. Alternatively, the explanation of these multiplications and substitutions might be easier, free from any implication of unnecessary criticism: It may be possible that Matthaeus, who had initially relied heavily on the Ps.-Serapion, subsequently revised it with help of Simon of Genoa on one side, and of the Greek-Latin Galen on the other, and that lead to a thorough reworking of his choice of passages, and of the information they provided. If this is the case (and only a thorough analysis of several passages will confirm or deny it), Matthaeus' «criticism» (if we may call it so) vis-à-vis the Ps.-Serapion may not point to a limitation of the impact of the *Liber aggregatus*, but to an ongoing verification of its content with the help of the «original» versions of Dioscorides' and Galen's works. In this process, Simon of Genoa and his *Clavis sanationis* might have played an ambiguous role. In a first phase, they may have helped Matthaeus accessing the content of the *Liber aggregatus*, to which Simon made continuous references and which he believed to be the agent transmitting the authentic Dioscorides. Later on, however, they may have been left aside when the *Liber* provided to be a more reliable source, particularly when Matthaeus' practical goal was different from Simon's one. This hypothesis may be corroborated if we consider that Simon and Matthaeus had different agendas. Simon was in fact particularly interested in the physical description of plants, which he considered as a reliable way to identify them and as an integration to the establishment of a correct nomenclature. Correct terminology and reliable description of the natural object were, in his opinion, the main pillars on which a good physician should rely in order to choose the right drug, and to overcome the confusion created by the enlargement of the specialized pharmacological library⁷¹. On the other

71. Simon expresses his intention in the Prolog (ed. cit., ad locum): «[...] satis valens opusculum in quo non modo nomen per nomina: verum etiam per

hand, Matthaeus aimed to offer an all-encompassing kind of information connecting appearance, *complexio*, and therapeutical uses, and employed all sources he had at disposal in order to provide as many data as possible. A good example of this attitude can be found in the two entries related to «tamarisk» included in the *Liber pandectarum*, the lemmata *Athel* and *Cafa*⁷². If Simon had dismissed the correspondence between «tamarisk» and *myrice* and therefore left out of his collection the corresponding chapter of Dioscorides' *De materia medica* he could access through the *Dioscorides alphabeticus* and the *Dioscorides langobardus* because did not provide any physical description of the plant, and had chosen to rely only on one entry of the *Liber aggregatus* (namely, *Tarfa id est tamariscus*), Matthaeus used them both to put together two different entries. All in all, we can conclude that, for Simon as well as for Matthaeus, the *Liber aggregatus* is still a reference-text playing a prominent role, especially because it provided access to «genuine» content of Dioscorides' and Galen's works that were either not accessible, or transmitted in a confusing way. On the other hand, the way in which they treated the text was different, especially because Matthaeus was facing an accumulation of sources that in part (read: in Galen's case) were calling the validity of the content transmitted by the Ps.-Serapion into question, and was therefore obliged to reconsider the choice of reproducing the excerpts put at disposal by the Arabic author. As we have seen before, some decades later, Iacopo Dondi had a different opinion of the *Liber aggregatus*, and testify of a different impact.

CONCLUSIONS

The overview I have provided on the Northern Italian impact of Ps.-Serapion's *Liber aggregatus* has hopefully shown the size of the task we are facing when we intend to rewrite the history of Late Medieval pharmacology and pharmacotherapy in terms of mapping the «impact» of the texts we consider as representative, and not their

ipsas descriptiones rerum quarumcumque potui declarationem sum conatus exprimere, atque clarissimorum antiquorum auctoritatibus subfulcire, quo tegmine incredulorum puto evitasse calumniam».

⁷². Matthaeus Sylvaticus, *Liber pandectarum*, Venetiis 1499, ch. 66, f. 23va, s.v. «*Athel*», and 117, f. 35vab, s.v. «*Cafa*».

simple *Fortleben* or «reception». First of all, it is necessary to regard the manuscript tradition not only in quantitative term, but in qualitative ones, that is, with reference to, or in connection with, specific cultural milieus, as well as with specific forms of perception of the text, and practices of use. This may sound obvious, but the implications of this type of research are less evident, especially because these forms of perception and practices of use are to be followed in their chronological and typological development, and in their sometimes subtle changes that, in turn, impacted on the success of the texts on the book market. Secondly, the impact of a scientific text should be considered both in itself and with special attention to the possible forms of interaction it could experience with previous and contemporary sources as well as with writings that are supposed to have used it, but whose interpretation of the source they were using is far from clear. What I have just said is particularly true for the history of Late Medieval *materia medica*, a field on which several text became available through translations and were written by authors relying on them to imitate and/or to innovate, a phenomenon that created an excess of production and supply over demand and therefore determined, at least in part, the success or the failure of specific works, but also generated various forms of connections, superpositions, and conflicts. Finally, we have to consider the works whose impact we are trying to measure both as elements of innovation and as witness of a continuity. In case of the *Liber aggregatus*, we have seen how it interacted with the Dioscoridean and Galenic tradition, and how it related to it or «dialogued» with it. In case of the Ps.-Mesue's *Schriftencorpus*, how it elaborated on a previous background and responded to new needs. Writing the history of Late Medieval *materia medica* means writing a dynamic and fascinating story, not a putting together simple sequence of witnesses. A task that is still before us, and that will require further, and profound, studies.

Appendix: Preliminary List of the Latin Manuscript preserving
Ps.-Serapion's *Liber aggregatus de simplicibus medicinis*⁷³

- Admont, Stiftsbibliothek, Cod. 93, f. 1ra-93rb (Northern Italy, 14th c.)
Reference: cf. http://manuscripta.at/hs_detail.php?ID=25987 (complete digitization, link to catalog description, further literature)
- Admont, Stiftsbibliothek, Cod. 453, f. 41ra-63vb (Italy, beginning of the 14th c., mutilus)
Reference: cf. http://manuscripta.at/hs_detail.php?ID=26283 (complete digitization, description, further literature)
- Basel, Universitätsbibliothek, D I 21, f. 3ra-121vb (Padua, 1429)
Reference: cf. <https://aleph.unibas.ch>, *ad locum* (link to complete description, further literature)
- Bethseda, National Library of Medicine, MS 40 (Schullian 525; 15th c.)
Reference: E. Tunis, *Early Western Manuscripts in the National Library of Medicine. A Short-List*, Bethseda 1969, 5.
- Bern, Burgerbibliothek, 525, f. 210r-334v (Germany, 14th-15th c.)
Reference: H. Hagen, *Catalogus codicum Bernensium pars prior*, Berne 1874, 439-40 (accessible on www.gallica.bnf.fr, *ad locum*); cf. <http://katalog.burgerbib.ch/detail.aspx?ID=129548> (links to further literature).
- Bologna, Collegio di Spagna, MS 149, f. 1ra-85va (Southern France or Italy, 14th c.)
Reference: cf. <http://irnerio.cirfsid.unibo.it/codex/149/> (link to digitization, description, further literature). NB: according to the Catalog, the manuscript is written in *littera Parisiensis*, but I rather point to an Italian origin.
- Cambridge, Peterhouse, MS 95, f. 1r-77v (England?; 14th c.)
Reference: M. R. James - J. W. Clark, *A Descriptive Catalogue of the Manuscripts in Library of Peterhouse*, Cambridge 1899, 112-14.
- Cambridge, Peterhouse, MS 140, f. 1r-68v (13th-14th c.)
Reference: M. R. James - J. W. Clark, *A Descriptive Catalogue of the Manuscripts in Library of Peterhouse*, Cambridge 1899, 166-67.

73. The list is only a preliminary sketch of a larger ongoing work aiming to catalog all copies of the *Liber aggregatus*. It is accompanied by short references to websites providing descriptions, further bibliography, and/or digital reproduction of the manuscript. When no web resource is available, a catalog reference is given.

- Cambridge, Trinity College, O.8.31, f. 127r-132v (England?; 15th c.)
 Reference: cf. <https://mss-cat.trin.cam.ac.uk>, *ad locum* (link to description).
- Chartres, Bibliothèque Municipale, 417 (260), f. 1r-144v (?; 14th c.)
 Reference: cf. the entry in the «Bibliographie des manuscrits de Chartres» (access and download on <https://www.manuscrits-de-chartres.fr/fr/bibliographie#biblio>, *ad locum*). The manuscript was destroyed in 1944, some photos taken by L. MacKinney have been digitized by the IRHT.
- Cesena, Biblioteca Malatestiana, Ms. D.XXIII.3, f. 1ra-125va (Northern Italy [Bologna?], 13th-14th c.)
 Reference: cf. <http://catalogoaperto.malatestiana.it>, *ad locum* (complete digitization of the manuscript, description, further literature).
- Città del Vaticano, BAV, Pal. Lat. 1106, f. 1ra-214rb (Germany, October 5th, 1439)
 Reference: cf. https://digi.ub.uni-heidelberg.de/diglit/bav_pal_lat_1106?&ui_lang=ger (description, complete digitization, link to catalog description).
- Città del Vaticano, BAV, Pal. Lat. 1107, f. 3ra-138va (Bologna, 1426)
 Reference: cf. https://digi.ub.uni-heidelberg.de/diglit/bav_pal_lat_1107?&ui_lang=ger (description, complete digitization, link to catalog description).
- Città del Vaticano, BAV, Pal. Lat. 1109, f. 1ra-84rb (Southern France [Italy?], 14th c.)
 Reference: cf. https://digi.ub.uni-heidelberg.de/diglit/bav_pal_lat_1109?&ui_lang=ger (description, complete digitization, link to catalog description).
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 Reference: cf. https://digi.ub.uni-heidelberg.de/diglit/bav_pal_lat_1234?&ui_lang=ger (description, complete digitization, link to catalog description).
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 Reference: cf. <https://digi.vatlib.it/mss/detail/Reg.lat.1130> (complete digitization, description of the content, further bibliography).
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Città del Vaticano, BAV, Vat. Lat. 2422, f. 1ra-79rb (Northern Italy [Bologna?], 14th c.)

Reference cf. https://digi.vatlib.it/view/MSS_Vat.lat.2422 (complete digitization, further bibliography).

Città del Vaticano, BAV, Vat. Lat. 4435, f. 1ra-91rb (Italy or, more probably, Southern France, September 24th, 1338)

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Reference: cf. C. O'Boyle, V. Nutton, «Montpellier Medicine in the Marsh Library, Dublin», *Manuscripta*, 45-46 (2003), 109-32, esp. 118-19. The manuscript only preserves the section on medical degrees and on purgative medicine included in the first part of the work, together with a collection of properties of simple remedies derived from the second part.

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Reference: unpublished catalog of the Advocates' Library. I thank the Members of the Manuscript Department of the National Library of Scotland for putting their description at my disposal.

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Reference: cf. https://orka.bibliothek.uni-kassel.de/viewer/image/1341312388853/1/LOG_0000/ (complete digitization, link to the description).
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- Krakow, Biblioteka Jagiellonska, 839, f. 48r-219v (scribe: Nicolaus Polonus de Tuchów, *baccalarius medicinae* 1456 and *licentiatus medicinae* 1457, wrote the codex in Paris or in Krakow; ca. 1457)
Reference: Cat. M. Kowalczyk, *Catalogus codicum manuseriptorum Medii Aevi latinorum qui in Bibliotheca Jagellonica Cracoviae asservantur. Volumen VI, numeros continens inde a 772 usque ad 1190*, Cracoviae, 1996, vol. VI, 346-51.
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Reference: summary description in www.ccf.fr/bnf.fr, *ad locum*, and www.manuscripta-medica.com, *ad locum*.
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Reference: cf. <http://www.manuscripta-mediaevalia.de/?xdbcddn!%22obj%2031581675%22&dmode=doc#|4> (complete digitization, description of the manuscript).

- London, British Library, Add. 41623 (= *Codex Bellunensis*), f. 1r-147v (Belluno or Feltre, ca. 1400)
 Reference: cf. <http://searcharchives.bl.uk>, *ad locum* (full description, link to complete digitization, further literature). The manuscript preserves a herbal mostly based on Dioscorides, with sparse references to other sources (Avicenna, the Ps.-Serapion, etc.).
- London, British Library, Harley 1628, f. 99r-153v (England, 15th c. ex.)
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 Reference: some basic information about this item, which is a copy of a formerly exported manuscript under Government export, can be found on <http://searcharchives.bl.uk>, *ad locum*. No further information about this item has been obtained so far.
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Reference: cf. <https://archivesetmanuscripts.bnf.fr/ark:/12148/cc76657f> (short description, full digitization, further literature), and www.manuscripta-medica.com, *ad locum* (content description).

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ABSTRACT

Iolanda Ventura, *On the Impact of Arabic Pharmacological Knowledge in Europe: The Example of Ps.-Serapion's Liber aggregatus de simplicibus medicinis*

This paper deals with the notion of «impact» of scientific texts during the Late Middle Ages, arguing that this notion should be employed instead of the ideas of «reception» or «Fortleben» when we aim to put together a «dynamic history» of science and scientific literature. In order to corroborate this point, this paper focuses on some pharmacological and pharmaceutical texts translated from Arabic into Latin during the second half of the Thirteenth century, and particularly on a successful collection of *medicamina simplicia*, the so-called *Liber aggregatus de simplicibus medicinis* attributed to the Ps.-Serapion, analyzing its manuscript tradition and use in contemporary medical writings, and stressing its impact on Late Medieval pharmacology, and particularly in the Academic milieu of Padua.

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