

# Editing the *Geoponica*: The Arabic Evidence and its Importance

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**A**GRICULTURE was one of the most significant economic factors in pre-industrial societies.<sup>1</sup> In the Mediterranean, agricultural practices remained stable despite multiple political and cultural revolutions.<sup>2</sup> As such, technical agricultural texts kept their relevance for a particularly long time.<sup>3</sup> But while the work of Latin authors has largely survived (Cato, Varro, Virgil, Columella), the equally rich corpus of Greek agricultural literature, with the exception of the tenth-century *Geoponica* from Constantinople, is almost entirely lost.

*Early Greek agricultural literature*

In the Homeric poems, agricultural activities appear mostly in allegorical passages, such as the description of Achilles' shield.<sup>4</sup>

<sup>1</sup> Well summed up by J. Niehoff-Panagiotidis, "Landwirtschaft und ihre Fachsprache: eine Übersicht," in L. Kalverkämper et al. (eds.), *Ein internationales Handbuch zur Fachsprachenforschung und Terminologiewissenschaft* (Berlin 1998) 2292–2304.

<sup>2</sup> On this continuity see e.g. Niehoff-Panagiotidis, *Landwirtschaft* 2293. Even the shift to Christianity changed little for the importance of agriculture; cf. J. L. Teall, "The Byzantine Agricultural Tradition," *DOP* 25 (1971) 35–59.

<sup>3</sup> Thus J. Niehoff and E. Christmann, "Geoponika," *Der Neue Pauly* 4 (1998) 938–941. On the importance of ancient agricultural writings compare R. H. Rodgers, "Κηποποιία. Garden Making and Garden Culture in the *Geoponika*," in V. A. Littlewood et al. (eds.), *Byzantine Garden Culture* (Washington 2002) 159–175, especially 174–175, which describes how "an educated readership could appreciate a convenient and respectably literary book for more than antiquarian amusement."

<sup>4</sup> Hom. *Il.* 18.541–589. See W. Richter, "Die Landwirtschaft im homerischen Zeitalter," *Archaeologia Homerica* II (Göttingen 1968) 7.

In the second part of his *Works and Days*, Hesiod describes agricultural activities in the form of a farming calendar, explaining how to work the fields over the course of the year.<sup>5</sup>

For the period that follows, we possess no work that systematically discusses agricultural matters even if agriculture (γεωργία) had, in the Classical period, established itself as a discrete discipline in the canon of τέχναι.<sup>6</sup> Xenophon's *Oikonomikos*, which reports a discussion between Socrates and Ischomachus about the management of an Attic estate, does show some interest in agriculture. Section 16.9–18 of that work, a kind of systematic agricultural τέχνη in condensed form, can be taken as evidence that agricultural manuals were circulating in Xenophon's time.<sup>7</sup>

Evidence that a wealth of agricultural treatises was produced in the Hellenistic era comes from the source list of Varro's *De re rustica* (1.7–10) and the slightly different list of Columella (1.1.7–14).<sup>8</sup> At that time, technical agricultural works circulated not only in Greece and the realms of the Diadochi, but also in Carthage,<sup>9</sup> where they were summarized and systematically collated in Mago's encyclopedia. That work, surviving only in short citations in Varro, Columella, Pliny, and Palladius, was arguably influenced by Hellenistic scientific approaches, and probably took Greek authors into account.<sup>10</sup>

<sup>5</sup> See M. L. West, *Hesiod. Works and Days* (Oxford 1978) 46; R. Martin, *Recherches sur les agronomes latins et leurs conceptions économiques et sociales* (Paris 1971) 55; Niehoff and Christmann, *Der Neue Pauly* 4 (1998) 938–941.

<sup>6</sup> As attested for example by Plato; see e.g. *Phlb.* 56B1, *Symp.* 187A1, *Plt.* 299D5.

<sup>7</sup> Aristotle (*Pol.* 1258b39–1259a2), for his part, mentions agricultural treatises by Charetides of Paros and Apollodorus of Lemnos.

<sup>8</sup> Varro gives 52 names, Columella 45 (44 of which correspond to Varro's list). Pliny gives 52 names in his 18<sup>th</sup> book, wherein only 31 match with Varro's list. Cf. G. Hentz, "Les sources grecques dans les écrits des agronomes latins," *Ktèma* 4 (1979) 151–160, esp. 158.

<sup>9</sup> On Carthaginian agriculture see Martin, *Recherches* 37 ff.

<sup>10</sup> See B. Meißner, *Die technologische Fachliteratur der Antike* (Berlin 1999) 172.

*Late ancient and Byzantine compilations*

A large number of compilatory works were produced in the Greek-speaking part of the late empire and important agricultural compilations are likely to have been produced at this time. Of these, however, only authors' names are known (e.g. Florentinus, Tarantinus, Paxamus), mentioned in the *Geoponica* as sources. Their work is entirely lost. The two most important compilations from the fourth-to-sixth century were doubtless those of Anatolius of Berytus and Cassianus Bassus Scholasticus, both lost in the original, but preserved in oriental translations.

As Ullmann rightly noted, the study of the sources and the creation of the *Geoponica* "die von Seiten der Gräzisten vorgenommen wurden, [sind] durch die Wiederentdeckungen der arabischen Übersetzungen der älteren Geoponiker alle überholt [worden]."<sup>11</sup> Thanks to the oriental translations, we can gain an idea of what Anatolius' and Cassianus' compilations looked like.

Anatolius of Berytus: *Συναγωγή γεωργικῶν ἐπιτηδευμάτων* (*Collection of Agricultural Practices*) is part of a compilation of works comprising twelve or fourteen books,<sup>12</sup> put together in the fourth or fifth century by Vindonius or Vinda(nio)nius Anatolius.<sup>13</sup> Almost nothing is known of Anatolius' life.<sup>14</sup> Apart from a few

<sup>11</sup> M. Ullmann, *Die Natur- und Geheimwissenschaften im Islam* (Leiden 1972) 427. Similarly J. Hämeen-Anttila, *The Last Pagans of Iraq. Ibn Wahshīyya and his Nabatean Agriculture* (Leiden 2006) 78: "The fact that the early Greek works have been lost makes the Oriental tradition extremely important in reconstructing the tradition of Greek agronomical literature in general."

<sup>12</sup> In the Arabic and Armenian versions of Anatolius the number of books is given as fourteen, while in Photius it is twelve. There may have been two versions of Anatolius' work; see the discussion in C. Scardino, *Edition antiker landwirtschaftlicher Werke in arabischer Sprache* 1 (Boston 2015) 129–130.

<sup>13</sup> On the name see E. Oder, "Beiträge zur Geschichte der Landwirtschaft bei den Griechen I und II," *RhM* 45 (1890) 58–99, 212–222, esp. 67–68 n.1.

<sup>14</sup> He may be the same person as, or at least related to, the jurist Anatolius, also from Berytus, who became *praefectus* of Italy, Illyricum, and Africa in the mid-fourth century. Support for identification of the jurist/politician with the agriculturalist can be found e.g. in R. H. Rodgers, "Hail, Frost, and Pests in the Vineyard, Anatolios of Berytus as a Source for the *Nabatean Agriculture*,"

fragments, Anatolius' Greek text has not survived.<sup>15</sup> Oriental translations exist in a badly preserved Syriac manuscript,<sup>16</sup> a summarized Armenian version probably translated from Arabic in the eleventh century,<sup>17</sup> and an almost complete Arabic manuscript (*Mašhad Riḏā'* 5762) from the fourteenth century.<sup>18</sup> There is a further, condensed Arabic version named *Sbath* after the owner of the manuscript.<sup>19</sup> A short manuscript from Madrid (*Gayangos XXX*) is closely related to MS. *Sbath*, but in worse condition.<sup>20</sup> Proof of the popularity of Anatolius' work comes from

*JAOs* 100 (1980) 1–11. See also W. Gemoll, *Untersuchungen über die Quellen, den Verfasser und die Abfassungszeit der Geoponica* (Berlin 1883) 223–224; S. Bradbury, "A Sophistic Prefect, Anatolios of Berytus in the Letters of Libanius," *CP* 95 (2000) 172–186, esp. 185 n.23; M. Decker, "The Authorship and Context of Early Byzantine Farming Manuals," *Byzantion* 77 (2007) 106–115.

<sup>15</sup> The fragments are *Paris.gr.* 2313, fol. 49<sup>v</sup> (see H. Beckh, "De *Geoponicorum* codicibus manuscriptis," *Acta Seminarii Philologici Erlangensis* 4 [1886] 261–346, esp. 268–270) and the papyrus Vindob.gr. 40302 (see A. Papatomas, "Das erste Zeugnis für die veterinärmedizinische Exzerptensammlung des Anatolios von Berytos," *WS* 113 [2000] 135–151).

<sup>16</sup> Today in the British Museum (Brit. 14662), edited by P. de Lagarde, *Geoponicorum in sermonem Syriacum versorum, quae supersunt* (Leipzig 1860). See C. Guignard, "L'agriculture en syriaque: L'*Anatolius Syriacus* ('*Geoponiques syriaques*')," in E. Villey (ed.), *Les sciences en syriaque* (Paris 2014) 215–252.

<sup>17</sup> C. Brockelmann, "Die armenische Übersetzung der *Geoponica*," *BZ* 5 (1896) 385–409.

<sup>18</sup> F. Sezgin, *Alchimie – Chemie, Botanik – Agrikultur bis ca. 430 H. Geschichte des Arabischen Schrifttums* IV (Leiden 1971) 315, and *Mathematik bis ca. 430 H. Geschichte des Arabischen Schrifttums* V (Leiden 1974) 427. For a summary of the different chapters of *Mašhad Riḏā'* and the other oriental versions compared with the *Geoponica*, see Scardino, *Edition* 63–112.

<sup>19</sup> See P. Sbath, "L'ouvrage géoponique d'Anatolius de Bérytos," *BIÉ* 13 (1931) 47–54.

<sup>20</sup> The manuscript's publisher C. Vázquez de Benito, "El manuscrito número XXX de la Colección Gayangos, folios 1–98," *Boletín de la Asociación de Orientalistas* 9 (1973) 73–124 and 10 (1974) 215–308, Ullmann, *Die Natur- und Geheimwissenschaften* 431–432, and Scardino, *Edition* 148–149, all attribute the work to Anatolius. Sezgin, *Alchimie* 315–316, on the other hand, attributes it to the Hermetic author pseudo-Apollonius.

the Patriarch Photius (*Bibl. cod.* 163, 106b41–107a4), who mentions Anatolius as representative of all agricultural literature.<sup>21</sup>

Cassianus Bassus: in the fifth or sixth century (or, at latest, in the early seventh) Cassianus Bassus Scholasticus<sup>22</sup> compiled his *Περὶ γεωργίας ἐκλογαί* (*Selections on Agriculture*).<sup>23</sup> It seems that Cassianus' work was quickly translated, probably in the sixth or in the first half of the seventh century, into Middle Persian. This translation does not survive, but was itself translated, probably in the eighth century, into Arabic. Although the original Greek version is now fully lost, we can use the Arabic translation to reconstruct its layout. The Arabic Cassianus Bassus is preserved in numerous manuscripts. Varying details in the prolegomena attest to two different versions.<sup>24</sup> The first, translated from the Middle Persian with the title *Filāḥa Fārisiyya* (henceforth *Filāḥa*) is attributed to Qusṭūs (= Cassianus) as an 'indirect version'. A second version by the name of *Filāḥa ar-Rūmiyya* (or *Filāḥa al-Yūnāniyya*) was, according to the prolegomenon, translated directly from the Greek by Sirġis ibn Hiliyyā in the ninth century, and is therefore referred to as the 'direct version'. In reality, the second is simply a re-worked and expanded version of the

<sup>21</sup> Cf. Niehoff and Christmann, *Der Neue Pauly* 4 (1998) 939.

<sup>22</sup> Cf. E. Oder, "Beiträge zur Geschichte der Landwirtschaft bei den Griechen III," *RhM* 48 (1893) 1–40; E. Fehrle, *Studien zu den griechischen Geoponikern* (Leipzig 1920) 49; C. Guignard, "Sources et constitution des *Geoponiques* à la lumière des versions orientales d'Anatolios de Béryte et de Cassianus Bassus," in M. Wallraff and L. Mecella (eds.), *Die Kestoi des Julius Africanus und ihre Überlieferung* (Berlin 2009) 242–344, esp. 248–251.

<sup>23</sup> It is unclear how many books Cassianus' work contained, although the Arabic translation suggests twelve, and not twenty as for the *Geoponica*: thus Rodgers, in *Byzantine Garden Culture* 164; Guignard, in *Die Kestoi des Julius* 256; Scardino, *Edition* 277.

<sup>24</sup> For what follows cf. Scardino, *Edition* 230 ff. Important older studies are J. Ruska, "Weinbau und Wein in den arabischen Bearbeitungen der *Geoponika*," *Archiv für die Geschichte der Naturwissenschaften und der Technik* 6 (1913) 384–405, and "Cassianus Bassus Scholasticus und die arabischen Versionen der griechischen Landwirtschaft," *Der Islam* 5 (1914) 174–179.

first.<sup>25</sup> There are two modern Arabic editions of the text, neither of which is satisfactory; there have been no translations into European languages.<sup>26</sup>

*The making of the Byzantine Geoponica*

In Byzantium, an anonymous editor considerably expanded Cassianus Bassus' work by adding material from Anatolius and other authors.<sup>27</sup> Either this same person or a different, pre-Constantine Porphyrogenitus editor also added a number of mythological accounts.<sup>28</sup> Two important *Geoponica* codices, *Marc. gr.* 524 (M) and *Pal.gr.* 207 (P), retain this format.<sup>29</sup> During the so-called Macedonian renaissance, a further anonymous editor (K) attempted to excise traces of Cassianus and placed the work's pinax at the beginning of the first Book only. This edition is represented by the codices F, C, H, and L. Thus arose αἱ περὶ γεωργίας ἐκλογαί (later called simply Γεωπονικά) in 20 books.

*The usefulness of the Oriental tradition I:*

*the problem of the Geoponica's authorial lemmata*

Alongside the circa 120 citations from thirty different authors, we find, in all manuscripts of the *Geoponica*, approximately 490

<sup>25</sup> Traces of a direct translation are found in the agricultural work attributed to Kasīnūs, from which a few citations are preserved in medieval Andalusian compendia; see M. Ullmann, *Wörterbuch zu den griechisch-arabischen Übersetzungen des 9. Jh.* Suppl. I (Wiesbaden 2006) 44, and Scardino, *Edition* 282–283 and 387–391.

<sup>26</sup> The anonymous Cairo edition *Kitāb al-Filāḥa al-Yūnāniyya: ta'līf al failasūf al-ḥakīm Qusṭā b. Lūqā ar-Rūmī, tarḡamat Sirḡis ibn Hilyyā ar-Rūmī* (Cairo 1876) is unsatisfactory (see B. Attié, "L'origine d'al-Filāḥa ar-Rūmiyya et du pseudo-Qusṭus," *Hespéris Tamuda* 13 [1972] 139–181), as is the edition of W. 'Abd ar-Raḥīm A'ubayd (*vel* I'bīd) (ed.), *al-Filāḥa ar-Rūmiyya, ta'līf Qusṭā b. Lūqā al-Ba'albakī* (Amman 1999), which presents a mix of both versions, as the incomplete and carelessly compiled *apparatus criticus* reveals.

<sup>27</sup> These are listed in Guignard, in *Die Kestoi des Julius* 319–322, editor "R."

<sup>28</sup> Guignard, in *Die Kestoi des Julius* 322–324, names this editor "E."

<sup>29</sup> On the codices of the *Geoponica* see the description in the introduction to H. Beckh, *Geoponica sive Cassiani Bassi scholastici De re rustica ecologiae* (Leipzig 1895), and Guignard, in *Die Kestoi des Julius* 257–258.

added author names in the genitive (again, from about thirty different authors) under select chapter titles. These author attributions were not part of the original chapter titles, since other chapters are anonymous. Older scholars considered both the in-text citations and the attributions following the chapter titles to be credible, believing them to have been added by Cassianus Bassus as his sources.<sup>30</sup> However, Oder showed that only the in-text citations (where these can be verified) are reliable.<sup>31</sup> The author attributions following the chapter titles, on the other hand, are generally arbitrary, inconsistent, and anachronistic.<sup>32</sup> For Oder, they were added by the Constantinian editor in the tenth century. Oder's conclusions have since been watered down and modified, but never fully discredited.<sup>33</sup>

<sup>30</sup> Gemoll, *Untersuchungen* 228, acts on the assumption that Anatolius gave the author of each chapter in the pinax alone, and not in the text; the mistakes in the *Geoponica* are put down to a scribe wrongly copying some names from this list. Gemoll believes that the author citations found within the chapters, however, are free inventions. Compare the legitimate criticisms in E. Maass, "Rezension von Gemoll (1883)," *Deutsche Literaturzeitung* 3 (1884) 575–576.

<sup>31</sup> Oder, *RhM* 45 (1890) 64.

<sup>32</sup> Examples in Oder, *RhM* 45 (1890) 63 n.3: "Weil A bald den B, bald aber B den A anführt, kam man zu dem folgerichtigen, wenn auch ungeheuerlichen Schlusse, daß die in den Eclogen verarbeiteten Autoren alle zur gleichen Zeit gelebt und in ihren Schriften auf einander Rücksicht genommen hätten"; Oder watered down his findings in his *RE* article "Geoponika," *RE* 7 (1910) 1221–1225. Rodgers also checked the authorial lemmata of Apuleius, Varro, Virgil, and Africanus: "As a preliminary conclusion I submit that the Constantinian editorial endeavour was no more than the starting point—if even that—for attempting a systematic pattern of chapter title + 'name of authority'. Subsequent readers and copyists continued the process with widely differing standards and purposes. One point needs to be made emphatic: until each and every one of the authorities named in the chapter headings has been examined in light of the manuscript tradition of the *Geoponika* itself and in comparison to the more complicated tradition that underlies this compendium, these names ought not to be cited as if they were a reliable index of transmitted truth" (*Byzantine Garden Culture* 164).

<sup>33</sup> Also Guignard, in *Die Kestoi des Julius* 301–302: "Les choix ne sont donc pas totalement aléatoires, mais témoignent d'un souci de vraisemblance. Tout n'est pas forcément faux. Mais les cas d'attributions heureuses, sinon

The Oriental translations, that is, the Syriac and Arabic Anatolius as well as the various translations of Cassianus Bassus, all accord with the *Geoponica* in terms of the citations within the individual chapters. However, none of them contain author attributions in the titles of separate chapters. Since the Oriental versions are older than the Byzantine codices, this strongly supports Oder's hypothesis.<sup>34</sup>

*The usefulness of the Oriental tradition II: the importance of the Oriental translations for the restitution of the Geoponica*

The *Geoponica* contains large sections of text taken from Anatolius and Cassianus Bassus. The Oriental translations of those authors therefore represent a clear side-tradition that relies on manuscripts older than our medieval codices. Consequently, the text of the *Geoponica* (which contains many difficult passages) can be enriched and improved with *variae lectiones*.<sup>35</sup> In his 1895

exactes, reposent non pas sur la connaissance précise des sources utilisées, mais sur la connaissance générale d'une tradition qui associe tel élément à tel auteur, indépendamment du cheminement précis des textes jusqu'aux *Géoponiques*."

<sup>34</sup> Scardino, *Edition* 57–58. On the basis of the Oriental versions of the *Filāḥa* known at the time, V. Rose, *Aristoteles Pseudepigraphus* (Leipzig 1863) 269, considered the authorial lemmata to be the unsuccessful additions of a late editor.

<sup>35</sup> The same has been suggested by D. Gutas, "Introduction: Graeco-Arabic Studies from Amable Jourdain through Franz Rosenthal to the Future," *Intellectual History of the Islamicate World* 3 (2015) 1–14, esp. 8 regarding Arabic translations of philosophical and scientific texts: "the Arabic translations constitute the most neglected evidence in the establishment of the Greek text for those works for which such translations exist, for patently no modern edition of such a Greek text, some very few recent exceptions apart, has used to any appreciable degree, if at all, the evidence in an extant Arabic translation. As is well known, the Arabic translations ... were based on Greek manuscripts that were either older than, or at least as old as, the extant Greek manuscripts, and these Greek exemplars of the Arabic translations were either manuscripts in uncials and thus dating at the latest to the sixth century, or transliterations in minuscule, copied in the ninth, usually from archetypes different from those from which derive our extant Greek manuscripts ... Such analyses of the Arabic translations of Greek works will yield independent



edition, Beckh did consult the mangled and incomplete Syriac Anatolius and was able to improve the text in some places.<sup>36</sup> In the introduction to his Greek-Arabic dictionary, Ullmann was also able to make conjectures on the text of the *Geoponica* on the basis of the (highly unreliable) modern Arabic editions of the *Filāḥa*.<sup>37</sup> However, the three most recent annotated translations of the *Geoponica* have ignored the Oriental evidence.

In what follows, I use several examples to show the significance of the Arabic Anatolius (better and more complete than the Syriac translation, and representative of the Arabic tradition) for the *constitutio textus* of the *Geoponica*.

(1) At *Gp.* 5.28, which, as the Oriental versions reveal, stems entirely from Anatolius, the author speaks about the removal of superfluous vine sprouts.<sup>38</sup>

witnesses to the text beyond those available in the extant Greek manuscripts, or, at the very least, variant readings not transmitted or corrupted in those extant.”

<sup>36</sup> Beckh, *Geoponica* vii–xxiv, looks at approximately forty problematic passages, but can partially improve only a small number on the basis of the Syriac version.

<sup>37</sup> Ullmann, *Wörterbuch* 35–47, mostly compares I’bīd’s edition with the *Geoponica*, and suggests several *variae lectiones* on the basis of the Arabic translation (43): “Der arabische Text läßt auf Varianten zurückschließen, die in den griechischen Codices nicht bezeugt sind, und er ermöglicht es, letztere zu emendieren.” Ullmann thinks that: “das *K. al-Filāḥa* ist ein besonders interessanter Text der Übersetzungsliteratur. Trotz der Zwischenübersetzung ins Mittelpersische ist der Wortlaut so getreu bewahrt, daß die arabischen Formulierungen meist unmittelbar mit den griechischen verglichen werden können.”

<sup>38</sup> Greek ed. Beckh; transl. A. Dalby, *Geoponika. Farm Work: A Modern Translation of the Roman and Byzantine Farming Handbook* (Totnes 2011) 138. Cf. E. Lelli, *L’agricoltura antica I Geoponica di Cassiano Basso* (Soveria Mannelli 2010) 227: “Inoltre conviene zappare la vigna quando è in fase di crescita”; J.-P. Grélois and J. Lefort, *Géoponiques. Traduction* (Paris 2012) 87: “Quand la vigne est encore en train de croître, elle doit être binée au hoyau.” The Syriac texts are all from the edition of de Lagarde, *Geoponicorum*.

<i>Gp.</i> 5.28.5	Anat. Arab. 5.13	Anat. Syr. 6.12
ἔτι δὲ ἀυξοῦσα ἡ ἄμπελος ὀφείλει σκάπτεσθαι.	وأما الوقت الذي تزه فيه الكرمة فينبغي أن تستتر.	ܘܡܐ ܕܝܗ ܩܝܡܐ ܕܡܘܠ ܗܘܢܐ ܕܡܠ ܠܚܥܠܣܐ.
The vine should be dug up even when it is still at the growing stage.	But at the time when the vine is in blossom, it must be covered.	In turn, we must also work the vine as soon as it becomes weaker.

Beckh's text ἔτι δὲ ἀυξοῦσα ἡ ἄμπελος ὀφείλει σκάπτεσθαι has been adopted by all modern translators without mention of the fact that Beckh replaced the MSS. ἀνθοῦσα (“blossoming”) with ἀυξοῦσα (“growing”). Beckh thought it made little sense to dig around the vines during blossom. The extremely literal Syriac translation seems to offer support for Beckh's text, even if *mareḡ* (“weak”) does not really correspond to ἀυξοῦσα. The Arabic translator, on the other hand, provides quite a different interpretation. He did not read ἀυξοῦσα, but rather the ἀνθοῦσα preserved in the manuscript tradition of the *Geoponica*.

Semantically, the Arabic word *satara* (“cover”) is quite unlike both the Greek σκάπτεσθαι (“dig”) and the Syriac *mēplah* (“plough, farm”). And yet, Anatolius himself says (5.14.4):

ومن الناس من يستر ثمرة العنب بالشوك المنتقش في البلاد الحارّة اليابسة  
ولا يقتصرون في سترها على الورق فقط

Some people in the warm and dry countries cover (*yasturu*) the grapes with spikey thorns, and do not limit themselves to covering them only with leaves.

This corresponds to *Gp.* 5.29.5 τινὲς δὲ ἐν τοῖς θερμότεροις καὶ ξηροτέροις τόποις καὶ σκέπουσι τὸν καρπὸν φρυγάνοις καὶ ἀκάνθαις, οὐκ ἀρκούντων τῶν φύλλων. This example shows that the Arabic translator gives *satara* as the equivalent of the verb σκέπειν or the medio-passive σκέπεσθαι (“cover”). So, the Arabic translator read ἔτι δὲ ἀνθοῦσα ἡ ἄμπελος ὀφείλει σκέπεσθαι (“while the vine is in blossom it must be covered”). It is therefore possible that σκάπτεσθαι is a corruption of the original σκέπεσθαι. Unlike Beckh, it seems sensible to preserve the transmitted ἀνθοῦσα and to replace σκάπτεσθαι with

σκέπεσθαι.<sup>39</sup>

(2) At *Gp.* 6.14 we find instructions about how to prepare wine vats to prevent must from spilling out. In the Greek, at §2, there is a noticeable difference between the pre-Constantine version preserved in M and the later version in F. This chapter survives in both Syriac (8.30) and Arabic (7.19):

M	F	Anat. Arab. 7.19	Anat. Syr. 8.30
<p>τινὲς δὲ τὰ ἔσω τῶν πίθων περὶ τὰ χεῖλη τῆ &lt;...&gt; ἄλλοι δὲ πιμελῆ ταριχηρῶ ἔνδοθεν τὰ χεῖλη διαχρίουσιν·</p>	<p>τινὲς δὲ τὰ ἔσω τῶν πίθων περὶ τὰ χεῖλη διαχρίουσιν·</p>	<p>تم امسح أفوا الخوابي الفونج الجبلي.  ومن الناس من يأخذ شحمًا مملوحًا فيلطخ أفواه الأنية من داخل</p>	<p>ܘܡܫܚ ܐܘܩܘܐ ܗܘܐ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܘܡܢ ܢܘܫܐܡ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ</p>
<p>ἄλλοι τυρῶ βοείῳ καθέξει γὰρ εἴσω ζέον τὸ γλεῦκος τοῦτο μάλιστα.</p>	<p>ἄλλοι τυρῶ βοείῳ καθέξει γὰρ εἴσω ζέον τὸ γλεῦκος τοῦτο μάλιστα.</p>	<p>غيرهم يلطخ أفواه الأنية من داخل بأخنة البقر فإنّ خاصية هذا يحبس العصير داخل الإناء إذا غلى.</p>	<p>ܘܡܫܚ ܐܘܩܘܐ ܗܘܐ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ ܕܘܢܝܗ</p>
<p>Some [...] the inside of the vats near the lips;  others smear the lips on the inside with lard as used for conserving.</p>		<p>Then smear the opening of the vat with calamint.  Some people also take salted fat and spread it on the opening of the vats from inside;</p>	<p>And wipe down their openings with the bindweed.  But others rub fat on to the opening of the vats from the inside.</p>
<p>Others use cow's milk cheese. This is the best for keeping the fermenting must inside the vat.<sup>40</sup></p>		<p>others spread cow dung on the opening of the vats from</p>	<p>And others cow's butter, which is very</p>

<sup>39</sup> The covering of trees when in blossom is also attested at *Gp.* 13.3.6.

<sup>40</sup> Transl. Dalby 157. Lelli, *L'agricoltura* 275: "Alcuni intorno agli orli esterni dei dogli [...], altri ungono interamente con grasso salato gli orli; altri ancora con formaggio di mucca: soprattutto quest'ultimo rimedio trattiene il mosto."

	inside; its [the dung's] special property keeps the must inside the vat while it is fermenting.	helpful.
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Beckh rightly concluded that M has a lacuna and that F abridges the passage. Comparison with the Syriac version did not, however, allow him to fill out the text.<sup>41</sup> In F, it seems clear that we are dealing with a *saut du même au même*, since τὰ χεῖλη appears twice in the passage. When we take into consideration the Arabic version, which is more complete than the Syriac, we can perhaps supplement the dative object after τῆ. The predicate in the Arabic version is أمسح (*amsaha*), which, like the Syriac ܚܦܦ (*kapper*), can mean both “wash away” or “rub in.” In Greek, this corresponds to χρίειν or ἀλείφειν (or a compound formed from one of these verbs). The Arabic specifies as the object calamint (الفوننج الجبلي), while the Syriac has “bindweed/*convolvulus*” (ܚܘܚܘܚ).<sup>42</sup> In the Greek, mint appears in the preceding passage with two virtually synonymous terms: γλήχων and καλαμίνθη. So, in the Greek of our passage we would expect either γλήχωνι<sup>43</sup> or καλαμίνθη, allowing us to fill in the lacuna in M postulated by Beckh with: εἶτα τὰ ἔσω τῶν πίθων περὶ τὰ χεῖλη

Grégoire and Lefort, *Géoponiques* 104: “Certains (*vacat*) à l'intérieur des jarres, près du bord. D'autres enduisent de graisse salée l'intérieur des bords, d'autres de fromage de vache (*tyros boieion*). Bien que bouillonnant, ce moût restera en effet très bien à l'intérieur.”

<sup>41</sup> Beckh, *Geoponica* vii: “Quae tum sequuntur ܚܦܦ ܚܘܚܘܚ ܘܥܡܫܚܦܦ propter variam vocis ܚܘܚ vim ad explendam codicis Maricani lacunam mihi non sufficiunt; denique pro καθέξει – μάλιστα verbis duo tradidit κάλλιστα ποιεῖ. Hoc unum videtur constare et Syri exemplar Vindanioni e nostrorum codicum archetypum hoc loco fuisse vitiosum.”

<sup>42</sup> Bindweed (*convolvulus*) according to M. Sokoloff, *A Syriac Lexicon* (Winona Lake 2009) 654.

<sup>43</sup> Both plants are a type of mint (*mentha*); see J. André, *Les noms des plantes dans la Rome antique*<sup>2</sup> (Paris 2010) 44 and 112.

τῆ γλήχωνι *vel* καλαμίνθη περιαλείφουσιν *vel* διαχρίουσιν.

In the second part, the Syriac has only the instruction to smear the vats with cow's butter ܠܘܬܐܢܐ ܠܘܬܐܘܗܐ (*h(ē)wtā d-tawrā*),<sup>44</sup> but the γάρ clause is missing, while the Arabic replaces cow's butter with cow dung. A closer look at the Arabic text reveals, however, that we are probably not dealing with an error of translation, but rather that a copyist mistook the Arabic word for τυρός (جبن, plural أجبان) for أختاء "dung," which appears regularly in the text and looks similar. Like the Greek, but unlike the Syriac, the Arabic version preserves the γάρ clause.

(3) At *Gp.* 9.5.4, the text discusses how to transport shoots to conservatories. Beckh recognized a textual problem. He thought that an earlier editor of the *Geoponica*, Niclas, had wrongly tried to defend ("frustra defendere conatus est") the transmitted ἐν οὐδὲν μέτρῳ παχεῖ. Beckh proposed ἐν συμμέτρῳ παχεῖ (he arguably meant πάχει), but the Syriac (11.7) version poses a problem for this conjecture, since it speaks of fruit "that are thick in their circumference." This makes no sense, since we are dealing with the circumference of the shoots and not the fruit. Beckh therefore refrained from altering the text.<sup>45</sup>

<sup>44</sup> R. Payne Smith, *Thesaurus Syriacus* (Oxford 1879–1901) 1166, describes ܠܘܬܐܘܗܐ as "lac spissum ... clotted cream ... butyrum e lacte caprarum," and cites this passage. Cf. Sokoloff, *A Syriac Lexicon* 402 s.v. ܠܘܬܐܘܗܐ.

<sup>45</sup> Beckh, *Geoponica* viii–ix: "quae quidem corrupta esse censeo, si enim premis verba, ܠܘܬܐܘܗܐ referri debet ad ܠܘܬܐܘܗܐ; quid vero hic sibi volunt καρπὸν παχεῖς ἐν μέτρῳ? Exspectes ܠܘܬܐܘܗܐ aut ܠܘܬܐܘܗܐ: ἀπὸ ἐλαιῶν (véων deest!) εὐφόρων ἐν μέτρῳ παχειῶν, ex cuius litteris in margine suppletis nostrum corruptum esse dicas; verum etiam tum non omnia quadrant. Neque enim de arborum, sed de plantarum crassitudine agitur; cf. *Geop.* IX 7 φυτόν ... πάχος ἔχοντα στελέχους ἢ παχύτερα et *Colum.* V 9,2 ramos ... quod comprehensos manus possit circumvenire, hoc es manubrii crassitudine; cum autem nomen crassi formam pluralem apud Syrum habeat, apud Cassianum propter vocabulum sequens ἐκπεφυκότα accipere debeat, nomen plantae in utroque praecedit forma singulari; accedit, quod similibus locis certam mensuram tradi modo vidimus. Itaque codicum lectionem quamvis suspectam retinui."

<i>Gp.</i> 9.5.4	Anat. Arab. 12.7	Anat. Syr. 11.7
ληπτέον δὲ εἰς τὰ φυτῶρια ἀπὸ τῶν νέων ἐλαιῶν καὶ εὐφύρων ἐν οὖν μέτρῳ παχεῖ.	وينبغي أن تكون الأغصان التي تؤخذ وتصير في المواضع التي تربي فيها الغروس من شجرة الزيتون الطرية الكثيرة الحمل فيكون غلظها معتدلاً	ܘܠܗ ܕܡܠܟܘܬܐ ܢܝ ܘܠܗ ܕܡܠܟܘܬܐ ܘܠܗ ܕܡܠܟܘܬܐ ܘܠܗ ܕܡܠܟܘܬܐ ܘܠܗ ܕܡܠܟܘܬܐ ܘܠܗ ܕܡܠܟܘܬܐ
Take into your nurseries [shoots] from young and well- fruiting trees <i>en</i> <i>oun metro pachei</i> . <sup>46</sup>	The shoots that have been taken and brought to the place where the seedlings will be nurtured must be shoots from fresh olive trees that have a high yield; their thickness must be uniform.	And one should not take plants from olive trees that are bearing fruit thick in circumference.

Unlike the Syriac version, the Arabic translates νέων as طري (“fresh”). From the Arabic, we therefore conclude that this refers not to the fruit, but rather to the shoots (whose thickness should be uniform). The best solution, as Beckh suggested, would therefore be to read ἐν συμμέτρῳ πάχει or ὄν σύμμετρον πάχει, for which one can find several parallels in Greek.<sup>47</sup>

4) *Gp.* 10.37, half of which comes from Anatolius and half from Didymus,<sup>48</sup> describes the grafting of the pomegranate tree.

<sup>46</sup> Dalby, *Geoponika* 186 n.3: “These four words cannot be translated. An earlier version of the text probably recommended what thickness the shoots should be.” Cf. Lelli, *L’agricoltura* 359: “Per i vivai bisogna prendere polloni di robusta grossezza da olivi giovani da olivi giovani e produttivi.” Grélois and Lefort, *Géoponiques* 135: “On doit prélever pour les pépinières, sur les oliviers jeunes et productifs d’une grosseur convenable, les pousses”; at n.362, but without further explanation, they adopt the conjecture ἐν συμμέτρῳ.

<sup>47</sup> E.g. Gal. *De crisibus* IX 626 K. καὶ μὲν δὴ καὶ ἡ ἐρυθρὰ νεφέλη καὶ ἡ ὑπόστασις ἢ τοιαύτη. καὶ χωρὶς ὑποστάσεως δὲ τὸ εὐχρουν οὖρον ἅμα τῷ συμμέτρῳ πάχει πεπαύσθαι δηλοῖ τὴν ἀρχήν. Also Thphr. fr.4.50 Wimmer ἀγαθὸν δὲ καὶ δοκεῖ πρὸς τοὺς κόπους εἶναι τῇ θερμότητι σύμμετρον ὄν καὶ τῇ κουφότητι καὶ τῇ διαδύσει.

<sup>48</sup> §§1–2 are also reproduced in both Syriac and Arabic, while §§3–4 stem from Didymus (as the twice repeated ὡς ὁ Δίδυμος ἐν τοῖς γεωγικοῖς αὐτοῦ διδάσκει [or φησιν] shows). In this case, the editor of the *Geoponika* has supplemented the chapter from Anatolius with material from Didymus.

<i>Gp.</i> 10.37.1	Anat. Ar. 9.20	Anat. Syr. 9.18
<p>εἶτα κατόγουσιν ἐπὶ τὴν γῆν, οὐχ ἀπτόμενοι τοῦ ἐμφυλλισθέντος μέρους, ἀλλὰ τὸ κατώτερον τῆς ἀρμογῆς χωννύουσιν ἀσφαλίζόμενοι σφόδρα, πρὸς τὸ μὴ ἀναδραμεῖν, ἕως ἢ ἐνθεσις φύη.</p>	<p>ثم ينزلونه في الأرض من غير أن يمسوا الجانب الذي طعم، لكنهم يمسون الموضع الذي هو أسفل من تأليف التطعيم لنألا يخرج القضيب الذي ركب، ثم بطمرونه ويحترسون منه لنألا يفلت فيرتقع حتى يلتحم التطعيم ويصلب ويصير له أصول.</p>	<p>هناك جمعهم لم حط كذلك. ح. له فمصب حجر. يعض حلك. كلك لله ح. ماله ح. كذلك الحاح ح. عصب هناك كلك لي ح. ح. ح. كذلك ح. ح. هناك ح. ح. ح. هناك ح. ح.</p>
<p>Then they bend the stem to the ground, so as to bury not the grafted part, but the part below the join, and fix it there firmly so that it will stay in the ground until the graft takes.<sup>49</sup></p>	<p>Then they lower it into the ground, without touching the side that has [already] been grafted. Rather they secure the part that is under the join [used] during the grafting, so that the seedling, which has been planted, does not come out. Then they cover it and take care that it does not slip away and rise up until the graft takes hold, becomes hard, and grows roots.</p>	<p>We spread it over the earth one time. In doing so, we cut off nothing from the upper section, but rather rip out anything under the grafting join so that the seedlings are not pressed together. We cover everything, so that it does not grow until, by burying also the roots, the thing we have planted adheres.</p>

Beckh rightly identified a problem in the sentence following ἀλλὰ τὸ κατώτερον κτλ. He wanted to emend to τοῦ κατώτερον

<sup>49</sup> Dalby, *Geoponika* 214, does not translate literally, however, since (and without giving a reason for his decision) he does not translate the word χωννύουσιν, “they cover.” Contrast Lelli, *L’agricoltura* 597: “Poi flettono lo stelo fino a terra, non toccando la parte innestata, ma ricoprono di terra fin sotto la giuntura assicurandola ben bene, perché non si fletta indietro fintanto che l’innesto non sia riuscito.” Grémois and Lefort, *Géoponiques* 163–164: “On amène ensuite le tronc vers le sol sans toucher à la partie greffé, mais on butte en dessous de la jointure en la maintenant fermement, afin qu’il ne se redresse pas que l’ente n’aura pas pris.”

and make this dependent on ὄπτόμενοι, but saw the Syriac version as speaking against this conjecture.<sup>50</sup> The Arabic version allows us to consider a different reconstruction. Neither χωννύουσιν nor ὄπτόμενοι governs κατώτερον, but rather ἀσφαλιζόμενοι (يُؤمِسِكون), as the Arabic version suggests. In this way, the Greek πρὸς τὸ μὴ ἀναδραμεῖν was accurately translated as لئلا يجرح القضيبي الذي ركب (“so that the seedling, which has been planted, does not come out”). The Syriac also suggests that χωννύουσιν is in the wrong place in the *Geoponica*. If we follow the Oriental versions, the clause belonging to χωννύουσιν has gone missing in the Greek. In the Arabic, we find the following: ويحترسون منه لئلا يفلت فيرتفع (“and take care that it does not slip away and rise up”), corresponding to the shorter, Syriac ܥܘܢܘܣܝܢ (“so that it does not grow”). The loss from the Greek text can be attributed either to the (inept) work of the editor who put the chapter together from the works of Anatolius and Didymus, or is the result of a *saut du même au même*. In the second case, the missing text ought to have said something like πρὸς τὸ μὴ ἀναδραμεῖν. The Syriac and Arabic versions show that the end of the sentence is also too short, since there is no mention of “roots.”<sup>51</sup>

With help from the Arabic Anatolius, we could therefore supplement the sentence with something like the following:

ἀλλὰ τὸ κατώτερον τῆς ἀρμογῆς ἀσφαλιζόμενοι σφόδρα πρὸς τὸ μὴ ἀναδραμεῖν. <εἶτα> χωννύουσιν <αὐτὸ φυλαττόμενοι μὴ εἰς

<sup>50</sup> Beckh, *Geoponica* ix: “τὸ κατώτερον mutarem in τοῦ κατώτερον, nisi vetaret S IX 18. Haec enim videtur legisse interpres in suo Vindanioni exemplari ἡσύχως κατάγομεν αὐτὸ (τὸ στέλεχος) ἐπὶ τὴν γῆν οὐδὲν ἀποκόπτοντες τῆς ἄνω κεφαλῆς αὐτοῦ, ἀλλὰ τὸ κατώτερον τῆς ἀρμογῆς, καθ’ ἣν ἐνεφυλλίσασαμεν, ἐκτυφλοῦμεν (vel -οῦντες ܥܘܢܘܣܝܢ) ἵνα μὴ βλαβῆ τὸ ἐγκεντρισθὲν ἐν αὐτῷ κτλ. Itaque haud scio an illud τὸ sit indicium maioris corruptelae.”

<sup>51</sup> Unless we accept that the Greek φέειν (which according to LSJ s.v. A.II can mean “put forth shoots”) has been generously paraphrased in both the Arabic and Syriac versions.



ὑψος ἀναδραμεῖν><sup>52</sup> ἕως ἢ ἔνθεσις φύη <καὶ στερεὰ γενομένη  
ρίζας ἔχει>.<sup>53</sup>

(5) At *Gp.* 10.38, where methods for conserving pomegranates are described, only §§4–8 stem from Anatolius. In §8, Beckh identified several problems.

<i>Gp.</i> 10.38.8 F	M	Anat. Ar. 12.38.1	Anat. Syr. 4.7.1
ἄλλοι δὲ τὰς ροιάς ἐπὶ χρόνον ἐν τῷ δένδρῳ δια- μένειν ... εἰς καινάς χύτρας ἐμβάλλουσιν ἐκάστην ροιάν, ... ὥστε μηδὲ ... ῥήγνυσθαι, ἔξουσι διαπαν- τὸς εὐθαλεῖς. ροιαί ...	ἄλλοι δὲ τὰς ροιάς ἐπὶ χρόνον ἐν τῷ δένδρῳ δια- μένειν ἔξουσι διαπαντὸς εἰ εἰς καινάς χύτρας ἐμβάλλουσιν ἐκάστην ροιάν, ... ὥστε μηδὲ ... ῥήγνυσθαι εὐθαλεῖς ροιαί ... <sup>54</sup>	إن أردت أن يبقى لك الرمان في شجره زمنًا طويلًا فافعل هذا وهو أن تصير كلَّ رمانة في إناء فخار ... ما لا ... ولا... فتكسر، فيكون لك بهذه الجيلة رمان السنة كلها.	ܘܢ ܐܪܕܬ ܐܢ ܝܒܩܝ ܠܟ ܠܪܡܢ ܦܝ ܫܝܝܟܬܗ ܙܡܢܢܐ ܘܘܝܠܐ ܦܘܩܝܠ ܗܙܐ ܘܗܘ ܐܢ ܬܘܘܝܪ ܟܠ ܪܡܢܐܬܐ ܦܝ ܐܢܐܘ ܦܚܐܪ ܟܘܠܘܢ ܘܠܐ... ܘܠܐ... ܦܬܟܫܪܘܢܝܘܬܗܢ ܠܟ ܒܗܙܝܬܗ ܕܪܡܢܐ ܕܫܢܬܐ ܕܫܘܠܘܢܝܬܗ.
Some, [intending] that the pomegranates stay on the tree for a while, put each fruit into earthenware newly made ... so that they do not knock ... they get sound fruit that lasts a long time. Pomegranates ...		If you want the pomegranates to stay on the tree for a long time, put each pomegranate into a ceramic pot ... break. In this	When the pomegranates are on their trees, one must pick them, whereby you put each pomegranate in a new pot ...

<sup>52</sup> Compare εἰς ὑψος ἀναδραμεῖν at *Gp.* 10.45.10.

<sup>53</sup> Parallels for ρίζας ἔχειν can be found at e.g. *Gp.* 2.23.1, 3.11.2, 4.1.2.

<sup>54</sup> Dalby 215. Grémois and Lefort, *Géoponiques* 164: “D’autres, [qui préfèrent] laisser un certain temps les grenades sur l’arbre, les mettent chacune dans une marmite neuve, ... auront toujours de beaux fruits.” Lelli, *L’agricoltura* 599: “Altri lasciano che le melagrane rimangano per un certo tempo sull’albero ... mettono ciascuna melagrana in pentole di terracotta appena fatte ... non ... né si rompano ... otterranno di certo frutti buoni.” Lelli (951 n.88) notes simply that something is missing in the text and that Beckh rightly inserted a *lacuna*.

	way, you have the pomegranate all year long.	break. In this way, it is possible for them to be fresh at any time.
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Beckh thinks that the words (ἔξουσι διαπαντός εἰ) after διαμένειν “insertis M locum nequaquam sanavit.”<sup>55</sup> He would prefer to fill the gap with βουλόμενοι and thinks that this is suggested by the Syriac, which he translates with ροιάς ὡσπερ ἐπὶ τῶν δένδρων εἰσί, δεῖ ἐκλέγεσθαι, even if the Syriac in fact has no verb corresponding to βούλεσθαι. The Arabic, which when back-translated reads something like εἰ δὲ βούλει τὰς ροιάς ἐπὶ χρόνον πολὺν ἐν τῷ δένδρῳ σοι διαμένειν τοῦτο ποίησον. ἐκάστην ροιάν εἰς κεραμικὴν χύτραν ἔμβαλε, does suggest a verb of wanting. At the same time, the Arabic offers support for the εἰ-clause in M. In F, ἔξουσι διαπαντός comes at the end of the sentence, together with εὐθαλεῖς. We could, however, take the nominative εὐθαλεῖς, which sits awkwardly in the sentence, together with ροιαί in §9 and, as M suggests, punctuate after ῥήγνυσθαι. The Syriac *ragyā* (“new, fresh”)<sup>56</sup> corresponds neither to the Greek εὐθαλεῖς (“blooming, flourishing, thriving”) nor the Arabic text, according to which a pomegranate can be conserved for a full year. When we compare the Arabic version, the substantive τοῦ ἔτους could have fallen out in M after διὰ παντός, attested for example at *Gr.* 18.3.4: τινὲς δὲ διὰ παντός τοῦ ἔτους σχεδὸν ἔχειν ἀρνεῖοὺς καὶ γάλα βουλόμενοι.<sup>57</sup> With help from the Arabic Anatolius, we could therefore read:

ἄλλοι δὲ τὰς ροιάς ἐπὶ χρόνον ἐν τῷ δένδρῳ διαμένειν <βουλόμενοι> ἔξουσι διὰ παντός <τοῦ ἔτους>, εἰ εἰς καινὰς χύτρας ἐμβάλλουσιν ἐκάστην ροιάν ... ῥήγνυσθαι.

Some, <intending> for the pomegranates to stay on the tree for a while, will have these throughout the entire year, if they put

<sup>55</sup> Beckh, *Geoponica* ix.

<sup>56</sup> Thus Payne Smith, *Thesaurus* 3806, who translates the word as “recens.”

<sup>57</sup> Corresponding to Anat. Ar. 14.9.4.

each pomegranate into a new earthenware pot . . . so that they do [not] get damaged

(6) At *Gp.* 14.22, the author explains how to fatten geese. Beckh established several differences between the Greek and Syriac texts. The corrupt state of the Syriac version, which contains only §§1-8, does not allow us to improve the Greek.<sup>58</sup> The Arabic version, however, is better and also contains §13.

<i>Gp.</i> 14.22	Anat. Ar. 14.25.1	Anat. Syr. 13.62
7. ἐσθίουσι δὲ τρίτον τῆς ἡμέρας, καὶ περὶ μέσσην νύκτα· πίνουσι δὲ δασιλῶς.	واعتلقت منها في اليوم ثلاث مرات تشبع في كل مرة ويسقى الماء وهي تشرّب أيضًا في نصف الليل ماءً كثيرًا،	ܘܘܫܘܢܘܢ ܕܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ
8. μετὰ δὲ <τριάκοντα ἡμέρας εἰ βούλει τὰ ἥπατα αὐτῶν> μεγάλα ποιῆσαι, ἰσχάδας ξηρὰς συγκόψας εἰς λεπτά, καὶ φυράσας ὕδατι, δίδου πίνειν ἡμέρας κ’.	إن أردت أن تصير كبودها عظيمة فذق تينًا يابسًا واعجنه بالماء واعلفها منه بعد أن يأتي لها ثلاثون ليلة، فإنها تسمن منه في عشرين ليلة.	<sup>59</sup> ܘܘܫܘܢܘܢ ܕܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ <sup>60</sup> ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ ܘܘܫܘܢܘܢ
7. They eat three times a day and in the middle of the night and are given plenty to drink.	They are fed three times per day, each time until they are full. One gives them water to drink, and also at midnight they drink a lot of water.	They eat three times a day and drink at midday and in the night.
8. After thirty days, if you want to make their liver large, chop up dried figs very finely, mix them with	If you want to make their livers large, crush up dried figs, mix these with water, and feed it to them after	Whoever wants to make their liver grow big after thirty days, gives

<sup>58</sup> Cf. Beckh, *Geoponica* xii.

<sup>59</sup> ܘܘܫܘܢܘܢ cod.: corr. Beckh.

<sup>60</sup> An alternative form for ܘܘܫܘܢܘܢ “liver,” cf. Payne Smith, *Thesaurus* 1669.

water and give this to them as a drink for twenty days. <sup>61</sup>	thirty nights. Then they will get fat in twenty nights.	them dried figs to eat, mixed with water, up to twenty days.
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At §7, the Arabic confirms the Greek text, which unlike the Syriac has “at midnight” (في نصف الليل = *perì mészyn nýkta*) rather than “at midday” (في منتصف النهار). The Arabic also confirms the punctuation (καὶ *perì mészyn nýkta pínousi ktλ.*).<sup>62</sup>

At §8, the Arabic Anatolius confirms Beckh’s supplement of <τριακόνα ἡμέρας εἰ βούλει τὰ ἥπατα αὐτῶν>, made on the basis of the Syriac version. Beckh was unsure if the final δίδου πίνειν made sense, since there is no mention of a drink. On the basis of the Arabic Anatolius, we could read δίδου λιπαίνειν or δίδου. λιπαίνει ἐπὶ. On the basis of the Syriac, we could replace πίνειν with ἐσθίειν. However, perhaps instead of πίνειν, the original merely had the prepositional ἐπὶ ἡμέρας κ’ (as in the same context at §13).<sup>63</sup>

(7) In the section on bees and their care, in a chapter taken from Anatolius, *Geoponica* (15.2.12) mentions that these can be treated in different ways when suffering from diarrhea.

<i>Gp.</i> 15.2.12 Transl. Dalby	Anat. Ar. 13.1 Transl. Scardino	Anat. Syr. 13.1 Transl. Beckh
δεῖ αὐτάς τε ἰᾶσθαι	ويعالج النحل	للملح كرمه

<sup>61</sup> Dalby 292. Lelli, *L’agricoltura* 781–782: “Mangiano tre volte al giorno, e verso la mezzanotte; bevono in abbondanza. Dopo trenta giorni, se si vogliono rendere grandi i loro fegati, dà loro da bere per dieci giorni fichi secchi tagliuzzati e impastati con acqua.” Grélois and Lefort, *Géoponiques* 235: “Elles mangent trois fois par jour et au milieu de la nuit, et elles boivent abondamment. Après trente jours, si l’on veut que leur foie devienne gras, couper menu des figes sèches, les pétrir avec de l’eau et les leur donner à boire pendant vingt jours.”

<sup>62</sup> This corresponds also to Palladius 1.30.4: *tribus per diem vicibus potu adiuvant, media quoque nocte aquam ministrant.*

<sup>63</sup> This is also Palladius’ version (1.30.4): *peractis vero triginta diebus, si, ut iecur his tenerescat, optabis, tunsas caricas et aqua maceratas in offas volutabis exiguas et per dies viginti continuos ministrabis anseribus.*

and to treat them,	ἰῶνται αἱ μέλισσαι	αὐτάς τε ἰάση(?)
ῥοιᾶς τοῦ καρποῦ τὴν σκέπην by grinding the skin of pomegranate,	بقشور الرمان ῥοιᾶς κελύφεσι	כרובית ריבית καρπῶ ῥοιᾶς·
τουτέστι τὸ κέλυφος, the rind that is,		
κόψαντα	وينبغي أن تدق قشور الرمان χρῆ τῆς ῥοιᾶς τὸ κέλυφος κόψαντα	חב כרובית ἐὰν κοπῆ
καὶ διὰ λεπτοῦ κοσκίνου σήσαντα sifting it through a fine sieve	وتنخل بمنخل ضيق καὶ διὰ λεπτοῦ κοσκίνου σήσαντα	סבול καὶ σησθῆ
<i>lacunam posuit Beckh</i> παρατιθέναι	وتعجن بشراب وتوضع قريباً منه καὶ μετὰ οἴνου φυράσαντα τιθέναι πρὸ αὐτῶν	כרובית מוכנת καὶ παρατεθῆ πρὸ αὐτῶν·
	ويدق العفص καὶ κόπτονται κηκίδες	כרובית ἢ κηκίδας
μετὰ μέλιτος καὶ οἴνου αὐστηροῦ φυράσαντα kneading with honey and austere wine, and feeding it to them. <sup>64</sup>	ويعجن بعسل والشراب καὶ φυρῶνται καὶ μετὰ μέλιτος καὶ οἴνου	כרובית מוכנת μετὰ μέλιτος καὶ οἴνου αὐστηροῦ φυραθέντος
	ويلقى للنحل παρτίθενται ταῖς μελίσσαις.	למפ. παράθες(?) αὐταῖς.

<sup>64</sup> Dalby 300. Lelli, *L'agricoltura* 799: “E curare così le api: tritata la scorza di melograno, cioè la buccia, e vagliata con un crivello sottile, [...] bagnato con miele e vino.” Grélois and Lefort, *Géoponiques* 243: “Et les guérir avec de l’enveloppe, c’est-à-dire de l’écorce, de grenade hachée et passée au tamis fin (*vacat*), pétrie avec du miel et du vin sec.”

Beckh signaled a lacuna after *σήσαντα*. He notes that M adds the infinitive *παρατιθέναι*, but that this does not improve the text.<sup>65</sup> On the basis of the Syriac 13.1 (p.99.7, given in Greek), Beckh did not, however, attempt to supplement the Greek *Geoponica* text. In the Oriental versions, two different recipes are given in this section: one with the skin of pomegranates, the other with oak galls.<sup>66</sup> Unlike the Syriac version, wine (*šarāb*) appears as an ingredient in both of the recipes in the Arabic. Again, the Arabic translation is more complete than the Syriac, mentioning the fine sieve (*διὰ λεπτοῦ κοσκίνου* = *bi-munḥulin dayyiqin*). This suggests that, given the similarities in the recipes, a *saut du même au même* occurred in the Greek archetype. We can envisage two possible reconstructions, whereby the Arabic translation again helps us reconstruct the original version of Anatolius and of the *Geoponica*:

- (a) δεῖ αὐτάς τε ἰᾶσθαι, ροιᾶς τοῦ καρποῦ τὴν σκέπην, τουτέστι τὸ κέλφος, κόψαντα, καὶ διὰ λεπτοῦ κοσκίνου σήσαντα παρατιθέναι **μετὰ** <οἴνου φυράσαντα ταῖς μελίσαις, ἢ καὶ κόψαντα κηκίδας **μετὰ**> μέλιτος καὶ οἴνου ἀύστηροῦ φυράσαντα.
- (b) δεῖ αὐτάς τε ἰᾶσθαι, ροιᾶς τοῦ καρποῦ τὴν σκέπην, τουτέστι τὸ κέλφος, κόψαντα καὶ διὰ λεπτοῦ κοσκίνου σήσαντα **παρατιθέναι** <μετὰ οἴνου φυράσαντα, ἢ καὶ κόψαντα κηκίδας αὐταῖς **παρατιθέναι**> μετὰ μέλιτος καὶ οἴνου ἀύστηροῦ φυράσαντα.

Whether an editor privileges the pre-Constantine (largely based on M) or the Constantine (based on FHC) version, these examples have shown that the Arabic translations of Anatolius and Cassianus Bassus, representing important branches of the tradition, cannot be ignored in the reconstitution of the *Geoponica*.

### Conclusion

Beckh's use of the Syriac Anatolius in the reconstitution of his text was both helpful and commendable. However, as the

<sup>65</sup> Beckh, *Geoponica* xiii: “Παρατιθέναι quod post σήσαντα inserit M, orationis duritiam non tollit, sed auget.”

<sup>66</sup> Col. 9.13.7 mentions the oak apple (*galla*) as a remedy for diarrhea in bees.

examples above have shown, problematic passages in the Greek text can often be better understood thanks to a comparison with the *variae lectiones* offered by the more complete and more accurate Arabic translation. The Oriental versions cannot, of course, replace the Greek manuscripts. However, unlike literary works whose translation is often freer and adapted to the cultural context of the target audience (compare the translation of Greek literary texts into Latin during the Roman Republic), Arabic translators of scientific texts placed great importance on the exact reproduction of the source text. As the examples above have shown, the *variae lectiones* provided by the Oriental translations can help us fill out or improve the Greek text of the *Geoponica*. Dimitri Gutas has reached a similar conclusion regarding the Greek texts of Aristotle's *Poetics* and Theophrastus' *On First Principles*, which are improved by Arabic translations in approximately two places for every page of text.<sup>67</sup>

Since Anatolius covers less than half of the *Geoponica*, comparison with the text of Cassianus Bassus (which, as a direct model, covers large parts of the *Geoponica*) promises further interesting results. Only when a serviceable edition of the *Filāḥa* is available, however, will we be able fully and systematically to compare the sections of the *Geoponica* from Cassianus Bassus with the Arabic text and, where possible, make improvements.<sup>68</sup> Unlike Beckh,

<sup>67</sup> D. Gutas, "The Letter before the Spirit: Still Editing Aristotle after 2300 Years," in A. M. I. van Oppenraay et al. (eds.), *The Letter before the Spirit: The Importance of Text Editions for the Study of the Reception of Aristotle* (Leiden 2012) 11–36; especially 29 emphasizes "the value of the Arabic translations because they provide *direct* and *independent* evidence for the correct reading; whereas the accurate conjectures are merely a tribute to the perspicacity in *divinatio* of Greek scholars ... From this very small sample one cannot, of course generalize and conclude that for each Aristotelian treatise there will be at least two corrections per page made to the Greek text on the basis of the Arabic translation, but the point, I think has been made: the Arabic translations must constitute an integral part of the Greek editions of the philosopher, almost all yet to be made."

<sup>68</sup> The edition of the Arabic Anatolius is already in preparation; an edition of the *Filāḥa* is planned.

who took the available Syriac versions into account in his reconstruction of the *Geoponica*, the three most recent translations from the 21<sup>st</sup> century have not used the Syriac Anatolius to understand better the original Greek text. A new edition of the *Geoponica* should systematically take into account the *variae lectiones* offered by the Oriental translations of both Anatolius and Cassianus Bassus if it is to serve as a replacement for Beckh's edition.<sup>69</sup>

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