0. Introduction

A recent study on scientific translations has called these products a result of “a zone of cultural and linguistic collision”\(^1\). The crossing of linguistics and culture is particularly apparent for translations of Greek science into Latin. We have available two cultures separated by centuries that attempted to bring Aristotle’s corpus into the same language. The differences in their results can be best explained by differing cultural understandings of ideals of language. What were seen as successes in linguistic style were also rejected by others, particularly those who dedicated themselves to the study and explication, who saw medieval translations as no worse than those of their contemporaries.

Renaissance Latin translators of Aristotle sought to revolutionize scientific terminology by eliminating transliterations and what they considered to be medieval corruptions. While these translators often exaggerated the revolutionary nature of their work, their new terminology created a new textual tradition sharply divided from that of the Middle Ages. Among commentators on Aristotle, however, the success of humanist translations of Meteorologica IV was limited. Commentators and university lecturers most often preferred to use the vulgate version of Meteorologica IV, translated by William of Moerbeke in the thirteenth century, although some, while retaining the medieval translation, altered the specialized vocabulary of the book so that it matched humanist innovations\(^2\). The Latin translations of Meteorologica IV give particular insight

\(^2\) This limited success was not universal for Aristotelian natural philosophy. For example, Gaza’s translation of the *De partibus animalium* was the standard for Renaissance commentators, see: Perfetti S., *Aristotle’s Zoology and its Renaissance Commentators (1521-1601)* (Leuven, 2000), p. 4-5.
into Renaissance attempts to revise Aristotelian scientific vocabulary, because this book contains a multitude of technical terms for natural and artificial processes. Furthermore, the vocabulary of Meteorologica IV challenged translators and commentators, since even Aristotle was conscious that he was developing his own specialized vocabulary in this work and noted the inadequacy of existing Greek terminology.

By the 1260’s William of Moerbeke replaced a number of the existing translations of Aristotle, many of which had been composed from Arabic, with new versions made from Greek sources. Meteorologica IV, however, stood out from much of the Latin Aristotle at this time, including Meteorologica I-III, because what had been the most widely circulated Latin version, the so-called vetus translatio, was produced from the Greek. Nevertheless, William of Moerbeke’s translation of Meteorologica IV contrasts with that of Renaissance translators in its wide acceptance. Despite its similarities with Henry Aristippus’ vetus translatio, which it replaced, commentators and scholars adopted his version soon after its completion and continued to do so throughout the early modern period. For Meteorologica IV, William of Moerbeke’s work did little to update the terminology, it nevertheless eliminated the most glaring Arabic aspect of many of the copies of the older translation, namely the appendage of a portion of Avicenna’s Kitab al-shifa as the final chapters of the book.

The broad acceptance of William of Moerbeke’s work offers a point of comparison with respect to the role of new translations in the medieval and in Renaissance commentary traditions. While medieval scholars welcomed William of Moerbeke’s translation, Renaissance commentators on Meteorologica IV, especially Italian ones, despite their professed concerns for textual analysis, had little regard for the humanist translations of the fifteenth and sixteenth centuries.

Renaissance translations of the Meteorologica arrived relatively late, some fifty years after Leonardo Bruni’s Nicomachean Ethics. George Trapezuntius complained in a letter of 1465 that no one recently had translated this book because it was widely considered unworthy of eloquence. He also erroneously claimed that the only extant translation was made from the Arabic. Soon after, Mattia Palmieri remedied his laments.

3. Monfasani J., Collectanea Trapezuntiana: Texts, Documents, and Bibliographies of George of Trebizond (Binghamton, NY, 1984), p. 107: ‘Cur autem pessimi homines, si nomen suum transferendo preclarum facerump, cur, inquam non transferunt que ab antiquioribus minus Latine traducta sunt? Dicent, fortassis non extare digna eloquentia sua opera philosophi non verba Latine. At Metaurorum quatuor libri perversi magis sunt quam versi nec a Greco, sed ab Arabico traducti mendose sunt.’ The two most common medieval translations, William of Moerbeke’s and Henry of Aristippus’ of the fourth book, were both made from the Greek.
by translating the *Meteorologica* in the late 1460’s. His was the first translation of this work in approximately two centuries. A half century later, a wave of new translations of the *Meteorologica* emerged from printing houses.

Typically these translations were part of complete works of Aristotle, although two commentators, Francesco Vimercati (1512-1571) and Francisco Vallés (1524-1592), produced new translations that accompanied their own expositions. Occasionally the *Meteorologica*, and sometimes *Meteorologica* IV alone, appeared as separate volumes. François Vatable’s (first printed in 1518) and Joachim Périon’s (first printed in 1552) translations were printed most frequently. According to F.E. Cranz, Vatable’s work was printed 36 times, and Périon’s 26. Pietro Alcionio and Juan Ginés de Sepúlveda created Latin translations that were first printed in 1521 and 1532 respectively. All of these works shared a general concern with *latinitas*. They were also fairly consistent in their adoption of novel technical terms.

Attempts to transform Aristotle’s scientific vocabulary can be traced back to the early part of the 1400’s and the efforts of Leonardo Bruni and Theodore of Gaza. Rejecting the belief that Latin lacked a sufficient vocabulary, Bruni attacked the *verbum de verbo* method of medieval translators and their adoption of Graecisms, believing that if Latin was as rich as Greek, suitable Latin terms could be found for even the most opaque terminology. Gaza abhorred the medieval translations of Aristotle.
tle that simply transliterated technical terms, and attempted to render these technical words into a better classical Latin. The aim of their translations was not merely to render Aristotle’s prose into a more aesthetically pleasing corpus. Rather, they attempted to make medieval commentators obsolete. Once a new vocabulary was accepted for Aristotelian science, it would only be with great difficulty that one could understand medieval comments based on a substantially different text. If successful, humanist translations could undermine the work of previous centuries and give Aristotelian science a tabula rasa on which interpreters, unhindered by the weight of scholastic jargon and disputations, could put forth new interpretations of the text and consequently of nature.

These goals provoked a certain degree of controversy and were in fact rejected by contemporaries of Gaza such as Cardinal Bessarion and George Trapezuntius, both of whom supported at least some aspects of the medieval intellectual tradition. Nevertheless, Renaissance translators of Meteorologica IV, following Gaza’s lead, eschewed transliterating Greek words. They did not, however, succeed in creating a lasting revolution. Commentators and translators more than occasionally noted that Latin lacked an appropriate vocabulary for translating the technical terminology of Meteorologica IV. Furthermore, the conservatism of universities, Jesuit teaching, and the revival of Thomism in the second-half of the sixteenth century ensured that medieval commentators and translations continued to be vital. The vulgate text remained extremely popular throughout the sixteenth century, and the adoption of a new set of technical terms made medieval commentators and translations neither incomprehensible nor obsolete. The persistence of William of Moerbeke’s translation was particularly strong in Italian universities where it remained the standard text for Italian commentators.


10. The text of William of Moerbeke’s translation is embedded in the following sixteenth- and seventeenth-century commentaries: Nifo A., Commentaria in librum De mixtis qui a veteribus quartus Meteororum liber inscriptur (Venice, 1560); Boccadifero L.,

lation was such that even the only Renaissance commentary on *Meteorologica* IV written in the vernacular follows his Latin translation. In *Meteorologica* IV Aristotle outlined a number of concepts that previously lacked a systematic nomenclature. The first three chapters of *Meteorologica* IV set out to explain πέψις, its opposite, ἀπεψις, and their species. Πέψις refers to a substance’s perfection, typically caused by the actualization of the substance’s innate heat. Modern scholars typically translate it into English as ‘concoction’ or leave it transliterated as ‘pepsi’. Aristotle defines three species of πέψις: πέπανσις or ripening, ἐψησις or boiling, and ὑπησις or roasting. For each of these three species there is a corresponding imperfection. These are named ὀμότης, μόλυνσις and κότειν, respectively. The opposite of ripening, or ὀμότης, can accurately be translated as rawness; the precise meanings of the other two opposites, however, are trickier. The difficulty in pinning down clear definitions and translations for these terms is evident in the divergence of two of the more influential modern English translations of *Meteorologica* IV. Ingemar Düring translates μόλυνσις as ‘parboiling’, H.D.P. Lee as both ‘half-cooked’, and ‘scalding’. Despite supplying a name for it, Aristotle called this process ‘very difficult to name’ (ἀνωνυμότερον). It means something close to ‘scorching’.

Many critics of the last two-thousand years has accused Aristotle of obscurity. In the case of terminology of *Meteorologica* IV, this obscurity arises from the attempt to craft a specialized vocabulary out of everyday terms, from the self-consciousness that he was developing a new scientific
tific vocabulary out of ordinary language. After listing the species of concoction and inconcoction, Aristotle wrote:

It is necessary to understand that these names [concoction, etc.] do not strictly belong to the subjects at-hand, for there are no terms universally accepted for these processes. So it is necessary to consider these terms as applied to these forms in general and according to common usage\textsuperscript{14}. There are, however, distinctions between the normal usage of these eight terms and how Aristotle intended to apply them. He wrote that: ‘roasting and boiling occur via artifice; there are, however, natural processes that are the same in respect to form, for their affections are similar, but we do not have names for them’\textsuperscript{15}. Therefore, it was necessary to extend the usage of these widely understood terms and apply them to natural processes that do not have specific names.

These eight terms for concoction, inconcoction, and their species represent only a fraction of the scientific terminology of \textit{Meteorologica} IV. For example, this book uses πόροι (pores) to describe the inner workings of material change. Renaissance translators departed from their medieval predecessors, opting for meatus instead of the transliterated term. Similarly, putredo replaced putrefactio for the translation of σήψις, or rotting. Additionally, \textit{Meteorologica} IV.8-9 describes 18 secondary passive qualities of solid bodies, each of which has an opposite. A number of these terms are obscure, and have not played a significant role in the history of natural philosophy. Nevertheless, the obscurity of the names of these qualities presented translators with opportunities to fashion their interpretations\textsuperscript{16}. Aristotle’s description of some of these qualities is not without interest for the history of natural philosophy. For example, in \textit{Meteorologica} IV.9 he defined the term φλογιστόν (phlogiston), which eventually played a large role in eighteenth-century chemistry. He divided combustible substances (καυστά) into two kinds: those that emit flames (φλογιστά) and those that do not (αφλογιστά)\textsuperscript{17}. The persistence of the Greek term φλογιστόν even into the late eighteenth century is indicative of the limited success of Gaza’s ideals, since revivals of philhellenism eventually swept away the linguistic reforms of the fifteenth and sixteenth centuries and transliterated Greek words remain implanted in scientific and medical vocabularies.

\footnotesize{\textsuperscript{14} 379b14-18. My translation. 
\textsuperscript{15} 381b3-5. My translation. 
\textsuperscript{16} For example see the discussions of the translation of these terms in: Vallés, \textit{In IV. librum...}, fols. 56v-86r. 
\textsuperscript{17} 387b18-21.}
1. Medieval Translations

Medieval translations of *Meteorologica IV* were not as homogeneous as one might expect (see Appendix I). There were in fact four Latin translations that circulated in the thirteenth and fourteenth centuries. A fragment of a fifth exists as well, although it is unclear whether this fragment represents part of a completed work or is merely the start of an unfinished project. Henry Aristippus made the first complete Latin translation of *Meteorologica IV* from the Greek text in the late twelfth century. His work formed the final chapter of what has become to be known as the *vetus translatio*. Gerard of Cremona was responsible for the translation of the first three books of the *vetus translatio* of the *Meteorologica*, all of which were the product of a *verbum de verbo* method from Ibn al-Bitriq’s Arabic paraphrase that differed significantly from the Greek text. Gerard began translating *Meteorologica IV*, but stopped just before the end of the first chapter. Why he stopped is unknown, but it is possibly the result of learning of the existence of Henry’s translation from the Greek.

William of Moerbeke’s translation, which was also made from the Greek, made the *vetus translatio* obsolete by the 1260’s. His translation was widely available in the Middle Ages, and even in the sixteenth century his translation remained among the most widely circulated translations. William of Moerbeke also translated Alexander of Aphrodisias’ commentary on the *Meteorologica*. Fragments of Aristotle’s text are embedded in that commentary and do not vary greatly from William of Moerbeke’s other translation. In addition to these works, an anonymous translation of Ibn al-Bitriq’s Arabic paraphrase, almost always accompanying Averroes’ commentary on the *Meteorologica*, circulated beginning...
in the thirteenth century and was printed numerous times in the Renaissance, most famously in the Giunta editions. This translation is the most corrupt of all medieval versions, lacking many substantial passages altogether.

The broad acceptance of William of Moerbeke’s translation of *Meteorologica* IV was accompanied by a redefinition of the book’s contents. Led by the Arabic translation and by Gerard of Cremona’s translation from the Arabic of *Meteorologica* I.1, which erroneously mentioned an Aristotelian work on minerals, copyists of the *vetus translatio* often appended three chapters of Avicenna’s *Kitab al-shifa* to *Meteorologica* IV translated by Alfred of Sarashel. These three chapters became to be known as the *De mineralibus*. In the first half of the thirteenth century Latin scholars generally accepted them as part of the Aristotelian corpus. For example, Adam of Buckfield’s commentary on the *Meteorologica*, written probably around the middle of the thirteenth century, included comments on the *De mineralibus* without distinguishing it from the rest of *Meteorologica* IV. In Roger Bacon’s commentary on the *Physics* we find citations and even quotations of the *De mineralibus* that he identified as coming from *Meteorologica* IV.

William of Moerbeke’s work did not contain the errors found in the Arabic version of *Meteorologica* I.1, in addition to cutting the *De mineralibus* from the work. By the middle of the thirteenth century, a number of scholars, including Vincent of Beauvais, questioned the authorship of the *De mineralibus*. When William of Moerbeke’s translation became available in the 1260’s scholarly opinion on this work changed as a whole. For example, Bacon reversed his opinion on the authentic-

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ity of the *De mineralibus*. In his *De erroribus medicorum*, Bacon faulted physicians for their reliance on poor translations and their incomplete knowledge of Aristotle’s works in general. For example, he claimed that these ignorant doctors relied on ‘a brief little chapter that is added onto the end of the *Meteorologica*, and is not derived from Aristotle’s text,’ that is the *De mineralibus*.

That the *De mineralibus* was widely rejected as inauthentic by the end of the thirteenth century is borne out by the medieval commentary tradition. There is no extant medieval or Renaissance commentary explicitly on the *De mineralibus*, although a small number of commentaries on *Meteorologica* IV, all from the thirteenth century or early fourteenth century, address Avicenna’s work as part of *Meteorologica* IV. Boethius of Dacia cited his own *Quaestiones* on the *De mineralibus* in his *Quaestiones super Topica*; although his work on minerals has never surfaced.

It is possible that this self-reference is to his final two questions of his *Quaestiones super quartum Meteorologicorum*, which addressed topics found in the *De mineralibus*. However, being familiar with William of Moerbeke’s *translatio nova*, he recognized Avicenna as the author.

Giles of Rome, who died in 1316, supposedly wrote a commentary on the *De mineralibus*, although it has yet to be discovered. Beyond these there is no evidence that scholars treated the *De mineralibus* in commentaries

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or *Quaestiones*. Thus, in cleansing *Meteorologica* IV of Arabic works, William of Moerbeke enjoyed much success in the scholarly world.

Besides redefining the accepted contents of *Meteorologica* IV, William of Moerbeke’s work had a smaller impact on the language of the translation itself. Because Henry Aristippus had also translated from the Greek, the *translatio nova* does not differ from the *vetus translatio* as significantly for *Meteorologica* IV as it did for other texts. An examination of these works (see Appendix 1) shows the similarities in language and syntax. Furthermore, the *translatio nova* did not change the rendering of this book’s technical vocabulary (see Table 1).

Medieval translations uniformly render πέψις and ἀπεψία as *digestio* and *indigestio*. Both William of Moerbeke and Henry Aristippus adopted transliterations for the six species of πέψις and their incompletions. On the other hand the Averroistic version, paving the way for Renaissance revisions, translated πέψινιτες as *maturatio*, ὀπτησίας as *assatio*, and φιμότης as *cruditas*. Even though these translations primarily used transliteration, medieval commentators strove to find purer Latin terms for these words. Since the commentator’s role is to explain words via other words, it should not be surprising that some of the earliest written efforts to clarify the Latin text of Aristotle put forth translations of these words, which remained transliterated in the translations. Two of the most influential medieval commentaries on the *Meteorologica*, those of Albertus Magnus and Ps.-Thomas Aquinas, defined at least some of these opaque Greek terms in Latin, thereby establishing synonymous Latin terms for these processes. The terms they used were identical, or at least similar, to those that were adopted by many of the humanist translators of the Renaissance, thereby suggesting that the continuity between medieval and Renaissance Aristotelianism was stronger than sixteenth-century scholars imagined it to be.

Albertus’ commentary, which is based on his reading of the *vetus translatio*, explained the text in a straightforward manner. He counted

translation among the tools of exposition and notably used this tool to explain some of the species of πέψις and their opposites. For example, in his definition of ὀπτήσις he stated that: 'a digestion of this kind is in the manner of roasting, in which the heat acts with the dry: and it is called ὀπτήσις, which in Latin is called assatio, just as ἡπεσίς is called elixatio'\textsuperscript{34}. Albertus alternated between the transliterated Greek terms and the Latin translations, and used the words epsesis and elixatio interchangeably. He failed, however, to provide translations of all of the species of concoction and inconction. He translated ὀμότης as crudum\textsuperscript{35}, and defined στάτευσις at times as semiassum and at others as imperfectum perassatum, but left πέπανσις and μόλυνσις undefined. These gaps probably do not necessarily suggest an inability to translate these words. If asked, he probably would have translated πέπανσις as maturatio or some variation of that word, judging from the frequency of the verb ‘maturescere’ in his explanation of πέπανσις. While μόλυνσις is more difficult to translate than πέπανσις, it would have been easy to render it in the same way he did στάτευσις and call it semielixum or imperfectum perelixatum. Rather these gaps suggest that translation was only one of the keys to understanding Aristotle’s text, and Albertus’ use of translation was meant to clarify the text and was not necessarily a critique of the existing standards of translation.

2. Renaissance Commentaries and Translations

While Albertus and [Ps.-] Thomas discussed translation in Meteorologica IV to a limited degree, and Roger Bacon wrote polemics against those unskilled in translation and textual exegesis\textsuperscript{36}, medieval treatments of Meteorologica IV rarely emphasized the details of Aristotle’s Greek and commented on the methods of rendering it into Latin far less frequently than their Renaissance counterparts.

\textsuperscript{34} Albertus Magnus, Liber…, p. 726, ‘et hujusmodi digestio est per modum assatio-nis, in qua calor agit cum sicco: et dicitur esse optesis, quod Latine sonat assatio, sicut epsesis elixatio interpretatur’.


Following the lead of Bruni and Gaza, sixteenth-century translators of *Meteorologica* IV uniformly avoided using transliterated terms. This is also true for the only known fifteenth-century translation composed by Mattia Palmieri. While Palmieri retained the terms *digestio* and *indigestio*, sixteenth-century translators, and a good number of commentators, typically rejected these terms in favor of *concoctio* and *inconcoctio* (see Table 2).

A revolution in terminology could not take place over night, if it was to take place at all. Replacing a transliterated Greek word with a more commonly known Latin word did not necessarily clarify the text. Indeed, the multiplicity of new terms used to translate the word brought forth debate, and for the first time in the Latin tradition, commentators debated the merits of various translations of *Meteorologica* IV. Commentators, however, for the most part did not use humanist translations even though they accepted the changes of terminology. To my knowledge only four early modern commentaries on *Meteorologica* IV contain Renaissance translations; two commentators, Francesco Vimercati and Francisco Vallés, used their own, and Johannes Hawenreuter and Christoval Nuñez use Alcionio’s. Vimercati and Hawenreuter provided the Greek text, thereby allowing readers to bypass the issue of translation altogether. Sixteenth-century editions of Thomas Aquinas typically included both the *nova translatio* and a Renaissance translation, usually, if not always, Vatable’s; the Giunta editions of Averroes included the *nova translatio* accompanied by the Averroistic version. There was particular need to supplement the Averroist translation because of its numerous and large lacunae. The remaining commentaries that included a text used the vulgate translation. The vulgate, however, was not etched in stone, and many early modern commentaries emended the medieval translation so that it

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reflected the recently crafted vocabulary. Thus, the translation remained for the most part the same, only the objectionable transliterations were replaced.

Commentators participated in propagating these changes in the Latin vocabulary of *Meteorologica* IV. Early attempts used equivalences to establish the new terms. Lefèvre’s paraphrase on *Meteorologica* IV is perhaps the best example. He gave notes before each chapter of the paraphrase allowing the reader to review the vocabulary before examining the text. For example his notes to *Meteorologica* IV.2 began by giving equivalents to the six species of concoction and inconcotion and continued to rephrase other longer and complex phrases. Agostino Nifo’s commentary, written in 1523 and first printed in 1531, went one step further and provided a chart that contains the Greek words, their transliterations, and the new translations. The existence of charts, such as Nifo’s, show that the meaning of the text and the words have not changed at all. The new translation is directly equivalent to the old one, and does not necessarily pave the way for a clearer interpretation of Aristotle. Thus, these new terms could substitute the old words in the vulgate without actually improving the translation or reforming natural philosophy. Commentators, however, were aware that Renaissance translations remedied errors that had crept into the medieval tradition. For example, Nifo points out that the medieval versions translate μῦλαμ as ‘lead’ (plumbum) rather than

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the more accurate ‘mill-stones’ (molares lapides)\(^{44}\). These errors, however, were limited in number.

By the middle of the sixteenth century a new type of commentary had come into vogue that specifically dedicated itself to the problems of translation. Joachim Péron’s Observationes, first printed in 1552, gave notes at the end of his translation that explained the rationale of his choice of words thereby providing a linguistic foundation for students of Aristotle\(^{45}\). Not surprisingly, his two notes on Meteorologica IV were dedicated to the explanation of the species of πέψις and the names of some of the eighteen passive qualities. Echoing Lucretius’ pleas of excuse for the inadequacy of the Latin language and implicitly rejecting Bruni’s defense of Latin, Péron noted that there are names for many things in Greek that do not exist in Latin. As a result he was compelled to use compound terms to describe ἄνθησις and ὀπτήσις. Cicero, and classical Latin in general, guided Péron in his choice of usage and terms. For example, he justified his choice of terms as non plena assatio, and non plena elixatio by claiming that Cicero often called what is imperfect ‘not full’\(^{46}\). Following what he considers to be a more classical Latin, Péron rejected maturatio in favor of maturitas. In general he avoided transliterations, but nevertheless used phymata to translate φύματα, which as a technical medical term means boils, arguing that the Latin word has a proper classical provenance because it was adopted as a technical term by Aulus Cornelius Celsus, the Roman physician of the first century A.D.\(^{47}\).

Both humanist translations and Renaissance versions of William of Moerbeke’s translation rejected the medieval use of digestio to translate

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\(^{44}\) Nifo, Commentaria…, fol. 135v: ‘Quod vero ad verba attinet, μυλίατ, non plumbum, ut in antiquis translationibus legitur, sed molares lapides intelligendum est, ut Alexander exposuit.’ Nifo took the term ‘molares lapides’ from William of Moerbeke’s translation of Alexander. Alexander of Aphrodisias, Commentaire…, p. 327.


\(^{46}\) Péron, Pars…, p. 156: ‘Et certe Cicero saepe id quod imperfectum est, non plenum appellat.’

\(^{47}\) Péron, Pars…, p. 156: ‘φύματα appello phymata, cum Celso, qui haec a tuberculis distinguet’. Péron states that Celsus distinguishes phyma from tuberculum presumably referring to De medicina 5, 28, 9. Péron’s reasoning for translating φύματα as phymata, however, may be on shaky ground, as elsewhere Celsus specifically identifies phumatia as tuberculata. See De medicina 6, 18, 2: ‘Tuberculata etiam, quae φύματα Graeci vocant…’.
πέψις, opting for concoctio instead\(^\text{48}\). It may not be readily apparent why Renaissance translators and commentators chose concoctio over digestio. Neither term transliterates the Greek, and both appear in classical Latin. For example, the rhetorician Quintillian employs both words\(^\text{49}\). However, the first appearance of digestio in written Latin came after the Augustan era, giving it a shakier provenance than its rivals concoctio and coctio. Controversy over the replacement of digestio with concoctio began when George Trapezuntius attacked Gaza’s translation of the Problematik, in his view Gaza was mistaken for equating these terms, when they in fact refer to separate processes\(^\text{50}\).

While sixteenth-century Aristotelians no longer used transliterated forms of the varieties of πέψις, digestio remained part of the scientific vocabulary. Ambivalence, and at times confusion, reigned in regards to the replacement of digestio with concoctio. This ambivalence, perhaps, was not new and a parallel is found in Celsus’ De medicina where it is suggested that digestio and concoctio are synonymous\(^\text{51}\). Similarly, Ernolao Barbaro’s Compendium scientiae naturalis, composed in 1484 but first printed in 1545, labeled the chapter that summarizes the first part of Meteorologica IV as ‘De digestione et concoctione’. While he joined these two words with a copula in the section’s title, he made clear in the summary of the chapter that his simultaneous use of both terms is pleonastic. Thus he defined the goal of the chapter as ‘Quid sit concoctio sive digestio quotque eius species sint aperiemus’\(^\text{52}\). Lodovico Boccadiferro’s Lectiones in quartum Meteorologorum written in the 1530’s or 40’s at the University of Bologna, used the two terms interchangeably except where he applied them simultaneously, typically separating them by ‘vel’ or ‘seu’\(^\text{53}\). These terms, however, eventually came to be distin-

48. See, for example, the translations embedded in the commentaries of: Chiaramonti S., In quartum Meteororum…; Cabeo, In libros Meteorologorum…; Boccadiferro, Lectiones….
49. Institutio oratoria, 8, 4, 16; 11, 3, 19. Quintillian used the noun digestio and the verb coquere.
51. ‘Sive concoctio, sive illa, sive tantum digestio’. De medicina, 1 praefatio, 63.
52. Barbaro E., Compendium naturalis scientiae (Venice, 1545), fol. 51v.
guished in medical literature. More or less following George Trapezuntius’ critique of Gaza, Santorio Santorio (1561-1636), a professor of medicine at the University of Padova, basing his views on Galen’s De methodo medendi, claimed that concoction refers to the transformation of food into chylum or blood, while digestio is the transmission of these newly created substances throughout the body. Santorio’s views, which are not based on Aristotle’s text, illustrate the incompleteness of the attempt to reform Aristotelian vocabulary. According to Santorio there is nothing stylistically problematic with digestio but it merely refers to a different process than concoctio.

The inclusion of Vatable’s translation with William of Moerbeke’s in editions of Thomas Aquinas occasionally caused confusion rather than clarification. For example, Francisco Fernandez Bexarano included in his Super IV libros Meteororum questiones, published in 1643, a discussion over the distinction between digestio and concoctio. Apparently having consulted an edition of Thomas’ and Pseudo-Thomas’ commentary that contains both medieval and Renaissance translation, Fernandez Bexarano found support for the existence of both concepts within Aristotle. Quoting Vatable’s translation that uses concoctio, he cited [Ps.-] Thomas’ comments that refer to digestio, leading him to the conclusion that digestio is the perfection of the principle of generation in animals, while concoctio refers to perfection of inanimate substances, the most notable example being the perfection of must when it turns into wine.
Boccadiferro’s commentary, despite not showing a marked preference for *concoctio* over *digestio*, nevertheless marked a new role for commentaries that could only have arisen with the availability of multiple new translations. For the first time we find commentators comparing, criticizing, and offering amendments to translations of *Meteorologica* IV. In particular, the choice of Latin words for these obscure processes was a bone of contention, leading Boccadiferro to judge the relative merits of these new translations. His inability to resolve these issues prompted him to argue that in some cases it was futile to find the appropriate word in Latin. Although Boccadiferro’s commentary is accompanied by a modified vulgate translation, he was familiar with both Vatable’s and Alcionio’s translations, which he did not find entirely satisfactory. Even though the modified vulgate that accompanies his text translated στάτευσις as *tostio*, Boccadiferro argued that this is not the appropriate word. Citing Alcionio’s translation of ‘tastio [sic] et frixio’, he argued that these words do not correspond to Aristotle’s intent, because the appropriate word does not exist in Latin. Rather he offered his own Latin phrase, which is not found in any other translation, that explains the term via negation: *diminuta assatio*. Boccadiferro’s critiques of the new translations highlight some of the difficulties in rendering many of the new words of *Meteorologica* IV into Latin. In particular, the eighteen qualities outlined *Meteorologica* IV.9 provided difficulties for the translator. Boccadiferro praised Vatable’s translation of *τιμητὰ* into *scissile*, which barely alters William of Moerbeke’s translation of *scissibile*. The descriptions of these properties and the examples of them, however, posed difficulties for the translator. For example, the translation of the Greek word στάθευσις, which Lee translates as dough, into *pasta* was unsatisfying and again Boccadiferro was pessimistic about Latin’s ability to render Greek words with precision.

57. It should be noted that this volume was printed posthumously, and Aristotle’s text may not have been identical to the one Boccadiferro used.

58. Boccadiferro, *Lectiones*..., p. 67: ‘Est autem statheusis diminuta assatio, sed non bene translatum est hoc verbum a latinis: Vatablus transtulit ex...[Lacunae are in the text, presumably where Greek words belong.] Alcionius autem tastio aut frixio; sed nec... nec tostio est proprium vocabulum ipsius stateheusis, quia hoc verbum ex... est quid commune ad intensam assationem & ad remissam assationem: neque etiam tostio est conveniens, ut dicit Alcionius, quia est tostio vehemens assatio; neque est frixio, quia ut infra diciemus frixio est species coctionis seu digestionis: & ideo isti non bene transtulerunt hoc vocabulum stateheusis: & ideo ego credo, quod non habemus vocabulum & verbum appropria tum Latinum, sed debet circumscribi; & ideo debet dici diminuta assatio & imperfecta, & principium ipsius assationis, quia non habemus proprium verbum.’


Critiques, however, did not end at the simple choice of words; Boccadiferro criticized the translators for not being true to the text and interpolating interpretation that is either incorrect or beyond the literal sense of Aristotle’s text. This method of translation, however, had defenders as well as critics, as is illustrated by the works of Vallés and Vimercati.

As one might expect, the two commentators who translated Meteorologica IV used their commentaries to justify their translations. Vimercati, rejecting methods of translating ‘word to word’ and even those that ‘only render the sense’ of the text, wanted his translation to ‘explain its sense’. Thus his commentary on the Meteorologica is in part a justification of his translation. Accordingly his introduction promises that the commentary will note and correct the negligence and errors of other translations.

Despite his self-professed care in translating, Vimercati translated the technical terms of Meteorologica IV with hesitancy. He appeared almost apologetic for his translations of μόλυνσις and στάτευσις as imperfecta elixatio and imperfecta assatio respectively, writing that ‘we translate these words in this way because more appropriate words do not exist’. As a result he left these two terms in the Greek in his discussions of the species of concoction and inconcoction, in addition to providing Latin translations. Στάτευσις remained particularly problematic, and we are


63. Vimercati, Commentarii…, fol. preface A iii[r]: ‘Complura loca loca a caeteris interpretibus perperam & oscitanter conversa, & emendata, fideliter, ni fallimur, reddidimus: illorumque errores interdum in Commentariis notavimus, alios ex conversione nostra, & verbis Graecis, quae singulis particularis ascribenda curavimus, diligentiae vestrae reliquimus, ne illos reprehendendi gratia novam nos conversionem edidisse videremur.’

64. Vimercati, Commentarii…, vol. 4, p. 23: ‘Concoctionis veluti species sunt, maturitas, elixatio, assatio: inconcoctionis, cruditas, μόλυνσις, id est, imperfecta elixatio, & στάτευσις, id est, imperfecta assatio. Ita enim vocabula haec reddimus, cum magis propria non suppetant.’ He repeats this claim with respect to μόλυνσις on vol. 4, p. 44: ‘Eo itaque vocabulo appellantur, quod alium commodius non habeatur, quo affectio illa exprimatur.’
presented with three alternative translations: *imperfecta assatio*, *prava assatio*, and *tostio*. Vimercati traced his inability to find the precise Latin words back to Aristotle himself, because he claimed that theses processes lack proper names. In these cases, the meagerness of Latin mimics the meagerness of Aristotle’s Greek.

In contrast to Vimercati’s promotion of his translation that sought to give a better interpretation of the text, Vallés promoted his translation by openly attacking the interpolations of Alcionio. In Vallés’ view, Alcionio overstepped his role as translator by rearranging the text and adding words that are not in the Greek version. While in some instances Alcionio’s editorializing expressed the essence of Aristotle’s words, in other instances it alters the sense of the passage or is just plain wrong according to Vallés. For example, Alcionio, apparently unsatisfied with the sense of the text, translated ἐξίοντος τοῦ υγροῦ as ‘per egressum caloris’. Vallés, who rendered these words with the much more literal phrase ‘exeunte humido’, noted that Alcionio’s translation ‘reads not without a large corruption of the sense of the words’. Less egregious alterations did not escape Vallés scrutiny. For example, he noted that Alcionio has inserted the word *calefacta* to his translation of the sentence that reads: ὅταν γὰρ οὐ παχύνεται μόνον τὸν ὑγρὸν (‘water is the only wet substance that does not thicken’), so that his translation reads ‘aqua enim rerum humidarum sola calefacta non crassescit’. Vallés’ translation more closely follows the Greek text, reading: ‘aqua enim sola humidarum non crassescit’. In his eyes, Alcionio’s addition interpreted rather than translated the text. The addition of the word *calefacta* suggests that while water does not thicken when heated, it does solidify under the influence of the cold. Thus, Vallés, following a method of translation contrary to Vimercati’s, criticized...
Alcionio for not faithfully translating the actual words and thereby giving the text an altered meaning\(^71\). According to Vallés, the weakness of Alcionio’s translation comes not only from his loose method, by also a lack of philological sophistication: Alcionio did not follow satisfactory manuscripts\(^72\). The errors of translation that Vallés called an impediment to natural philosophy, in his _Controversiae medicinae_, were not confined to medieval translations and mar the works of recentiores as well\(^73\).

Pomponazzi, Boccadiferro’s teacher, even though he shared concerns over Alcionio’s translation, dismissed excessive preoccupation with translation as being beneath the concerns of philosophy. Nevertheless, in his _Dubitationes in quartum Meteorologicorum_, he noted that _tostio_ is not a good translation of _στάτευσις_ because it does not denote a superabundance of heat. Pomponazzi, however, cut short his discussion, arguing that this topic is not suitable to philosophers but rather ‘pertains to the Grammarians. Therefore I leave it to them’\(^74\). Pomponazzi’s disdain for discussions of grammar and vocabulary is indicative of the limited success of the humanist translation movement. Among most university lecturers and commentators on Aristotle, problems of understanding natural philosophy were not limited to rendering texts into Latin. Even those dedicated to translation and grammatical issues, such as Périon, Vimercati, and Boccadiferro, defied Bruni’s denial of the poverty of Latin, and confessed the impossibility of finding accurate Latin terms that correspond to Aristotle’s Greek. Thus, uncovering Aristotle’s intent and its relation to the truth involved more than translation, and William of Moerbeke’s translation was for the most part a sufficient textual foundation for explorations of natural philosophy that utilized logic, dialectic, and the consideration of experience, rather than considerations of philology and prose style\(^75\).

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\(^71\) Vallés, _In IV librum…_, fol. 25r: ‘ut illinc constet, male ac superflue, Alcyonium interposuisse dictionem calefacta, ita legentem aqua humidarum rerum sola calefacta non crassescit. praeterquam quod verba autoris non reddidit fideliter, sensum etiam alio transtulit.’

\(^72\) Vallés, _In IV librum…_, fol. 21r: ‘Locus primus huius dictionis invenitur in aliquibus codicibus mutatis, quos sequutus est Alcyonius, non sine magna sententiae corruptione, ita dicens. Natura quam designamus (dimissis prioribus verbis) ut forma & essentia est; concoctionis enim finis nonnullis in rebus ad substratum quandam formam est. Quae verba post ea, qua antea scripserat, non video, quid pulchrum possint significare. melius itaque multo habetur in codice Aldino, quem sum secutus.’

\(^73\) Vallés F., _Controversiae medicae_ (Alcalá, 1556), p. 2.

\(^74\) Pomponazzi, _Dubitationes…_, fol. 22v: ‘Hoc pertinet ad Gramaticos. ideo illis reliquo.’

\(^75\) I am grateful for comments and corrections received from Gudrun Vuillemin-Diem, Katharine Park, William Newman, John Murdoch, John Monfasani, and an anonymous reader.
Table 1: Medieval Terminology

<table>
<thead>
<tr>
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<th>õptsis</th>
<th>õmótis</th>
<th>mólnsis</th>
<th>státeis</th>
<th>státeusiv</th>
<th>mólunsiv</th>
<th>Stateusis</th>
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<td>assatio</td>
<td>cruditas</td>
<td>[wanting]</td>
<td>[wanting]</td>
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Table 2: Renaissance Terminology

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<th>õptsis</th>
<th>õmótis</th>
<th>mólnsis</th>
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<td>non plena asatio</td>
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<td>immaturitas</td>
<td>leviscoctio</td>
<td>frixio aut tostio</td>
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* Périon includes Greek words for all except pépansis and õmótis. Vimercati included Greek words for mólnsis and státeusiv in addition to the Latin terms. Gesner included all of the Greek terms, his work is a paraphrase rather than a translation.

All Renaissance translators translated πέψις and ἁπεψία as concoctio and inconcoctio respectively, save Palmieri, who retained digestio and indigestio, and Alcioni, who rendered them as concoctio and cruditas. In Piccolomini’s translation of Alexander that retains digestio and indigestio. Camozzi’s translations of Olympiodorus used digestio as well as concoctio.
Appendix: Incipits to translations of Meteorologica IV

a. Aristotle’s Text (ed. F.H. Fobes (Cambridge, Mass., 1919)):

[378b10-20] Ἐπει δὲ τέταρτα αὕτα διώρισται τῶν στοιχείων, τούτων δὲ κατὰ συζυγίας καὶ τὰ στοιχεῖα τέταρτα συμβέβηκεν είναι, ὅν τὰ μὲν δύο ποιητικά, τὸ θερμόν καὶ τὸ ψυχρόν, τὰ δὲ δύο παθητικά, τὸ ξηρόν καὶ τὸ όγνύρον· ἡ πίστις τούτων ἐκ τῆς ἑπαγογῆς· φαίνεται γὰρ ἐν πάσιν ἡ μὲν θερμότης καὶ ψυχρότης δρίζουσι καὶ συμφέρουσι καὶ μεταβάλλουσι τὰ δ’ ὁμογενῆ καὶ τὰ μὴ ὁμογενῆ καὶ ύγραίνουσι καὶ ξηραίνουσι καὶ σκληρύνουσι καὶ μαλαττοῦσι, τὰ δὲ ξηρὰ καὶ ύγρα καὶ τάλλα τὰ εἰρήμεα πάθη πάσχοντα αὐτὰ τε καθ’ αὐτὰ καὶ ὁσα κοίνα ἡξί ἁμφοῖν σῶματα συνεστήκεν.

b. Medieval

Corpus Vetustius
Ms. Venezia, Biblioteca Marciana, Lat. VI. 47 (3464), fol. 184r:

Quoniam autem quatuor cause determinate sunt elementorum harum autem iuxta coniungationes et elementa quatuor contingit esse. Quarum sane due sunt active calidum et frigidum; due passive aridum et humidum. fides utique horum ex inductione. apparebit namque in universis caliditas et frigitas terminantes et permutantes unigenea et non unigenea. et humectantes et arefacientes nec non indurantes ac mollificantes. arida namque et humida formata. et quas dixit tollerantia passiones ipsaque secundum se ipsam et quaecumque communia ex ambobus corpora constant.

Fragmentum Parisinum of Gerard of Cremona (apud Schoonheim, p. 144):
Capita primitiva elementorum quattuor, sicut elementa composita, ex quibus sunt duo elementa agentia et duo elementa patientia. Verum duo elementa agentia sunt caliditas et frigidas, et duo quidem elementa patientia sunt umiditas et siccitas. Illius vero demonstratio est quod caliditas et frigiditas sunt distinguendae res et componentes eas et mutantes generata convenientia in genere et indurantes et umectantes. Umiditas autem et siccitas patientes sunt per se ipsas, et patiuntur propter eas omnia corpora composita ex eis.

Nova translatio from [Ps.-] Thomas Aquinas, In libros Aristotelis Meteorologicorum expositio, ed. R.M. Spiazzi (Rome, 1952), p. 645:
Quoniam autem quatuor caussæ determinatae sunt elementorum: harum autem secundum coniungeriontes et elementa quatuor accidit esse: quarum

Translation associated with Averroes, *In quartum librum Meteorologorum* (Venice, 1562-1574), fol. 467v:

Postquam divisum est quod principia elementorum, quae sunt secundum modum formae, sunt quatuor sicut est numerus elementorum, ex quibus componuntur: & duo sunt activa, & sunt calor, & frigus: & duo passiva, & sunt humidum, & siccum. Et signum huius est, quod calor, & frigus sunt ambo, quae componuntur res ad invicem & admiscens, quousque res nova generetur: & universali istae duae potentiae, & virtutes sunt, quae mutant creaturas convertentes in genere unam in aliam. Sed siccatas, & humiditas sunt passiva in se ipsis istarum duarum qualitatum, & per illas duas patiuntur omnia composita et signum huius est. quod etiam Antiqui definiunt cum istis distinctionibus illas, & nomenavere illas nominibus istorum: & dixerunt quod calor, & frigus erant virtutes…


Quoniam quattuor sunt causae elementorum determinatae… [282] videntur in omnibus caliditas et frigiditas terminantes et copulantes et permutantes…[283] congeuna…

c. Renaissance

Mattia Palmieri, *Meteorologica*, ms. Milano, Biblioteca Ambrosiana, L 40 sup (xv), fol. 92r:

Cum vero quatuor iam elementorum causae quae secundum coniunctionem, atque elementa. Quatuor esse continget, difinitae sint: quorum duae quidem activae, calidum nempe & frigidum: quemadmodum ex inductione ostenditur. Nam in cunctis quidem caliditas, atque frigiditas ea quae aut eiusdem generis sunt, aut partibus different circumscribere coniungere et permutari videntur humectari quaque illis et exiccari: dura fieri ac mollia reddi apparent. Quae autem sicca humidaque determinata sunt:
tum et alia, quae eiusmodi pati dicuntur ipsa per se: tum quaecumque ex ambobus communia corpora constant.

Joachim Périon, *Aristotelis Stagiritae Meteorologicorum liber quartus* (Wittenberg, 1585), [A2]:

Cf. *Aristotelis Stagiritae tripartitae philosophiae opera omnia absolutissima, ex optimis quibusque, maxime novis interpretibus collecta, aliquot libris aucta, recognita, argumentis valde bonis in singulos libros & capita, multis...* (Basel, 1563)

Quoniam quatuor causae elementorum expositae sunt, ex earumque copulationibus quatuor etiam elementa consecuta sunt, quae quidem earum faciendi, calor & frigus, reliquae duae patiendi vic habent: idque inductione doceri potest. Videntur enim in omnibus rebus calor & frigus tum determinare, tum copulare, tum mutare, tum humida reddere, tum exiccare, tum durare, tum mollire, tam ea, quae eiusdem generis sunt, quam ea quae diversi: siccitatem vero & humorem determinari, aliasque affectione, s [sic] quae expositae sunt accipere [A3] tum ipsas per se, tum corpora, quae ex utraque earum constant....

Pietro Alcionio, *Aristotelis Stagiritae Opera* (Lyon, 1578), vol. 1, p. 761:

Cum quatuor elementorum causae allatae iam sint, pro earum certe paribus accidit quatuor etiam enumerari elementa. Illarum quidem duae agentes habentur, calor, & frigus: duae patibles, siccitas, & humor. Horum autem omnium fidem ipsa inductio facere potest: nam calor & frigus in rebus naturae omnibus videntur figurare, suisque finibus describere, coagumentare: & quae tum eodem similique generi, tum dissimili sunt, mutare, humectare, arefacere, obdurare, & emollire, siccitas autem & humor tum illa separatim, tum quae communiter ex illis compacta sunt, videntur finibus describi, & alias a calore & frigore contraire affectiones....

Giovanni de Camozzi, *In Meteora Aristotelis Commentarii* (Venice, 1551), fol. 76r:

Quoniam quatuor elementorum causae decretae sunt... [76v] Quia duae sunt causae efficientes calidum videlicet & frigidum. Duae autem materiales, siccum videlicet & humidum...

François Vatable in *Operum Aristotelis Stagiritae philosophorum omnium longe principis, nova editio, Graece & Latine*, ed. Isaac Casaubon (Lyon, 1590), vol. 2, p. 359:

Cum autem elementorum causas quatuor esse a nobis definitum sit, & iuxta coniugationes harum ipsas quoque elementa esse quatuor acciderit,
e quibus duae quidem, calor inquam & frigus, agere solent: duae vero ariditas, videlicet & humiditas, pati: (cuiai rei fides ex inductione sumi potest.) nam in omnibus calor & frigus, tam quae uniis, quam quae diversi sunt generis definire, copulare, transmutare, humectare, arefacere, indurare, & mollificare videntur: arida vero & humida, tum ipsa per se, tum communia corpora quae cunque constant ex utrisque, definiri, & caeteros quos diximus affectus pati. praeterea & hoc quoque rationibus ipsis quibus eorum naturas definimus, perspicuum existit..

Francesco Vimercati, In quatuor libros Aristotelis Meteorologicorum commentarii et eorundem librorum e graeco in latinum per eundem converti (Paris, 1556), fol. 163r:

Quoniam autem elementorum causae quatuor sunt constitutae, ex quarum coniugationibus evenit, ut quatuor quoque existent elementa, duae illarum efficiendi vim habent, calor & frigus, duae vero patiendi, siccitas & humor. id quod inductione probatur. Calor enim & frigus, tum ea, quae eiusdem, tum quae diversi generis sunt, determinare, coniungere, immutare, humectare, exiccare, durare, emollire, in omnibus videntur. Humida autem & sicca, tum ipsa per se, tum quae communiter ex utrisque concreta sunt corpora terminari, & aliis, quae dictae sunt, qualitatibus affici.

Francisco Vallés, In quartum librum Meteorologicorum Aristotelis commentaria (Torino, 1583), p. 4:

Quandoquidem quatuor elementorum causae expositae iam sunt, atque pro earum coniugiis quatuor etiam elementa esse contingit: illarum quidem duae agentes habentur calidum & frigidum: duae patibiles, siccum & humidum. Horum autem omnium fides ex inductione est. nam calor & frigus in omnibus videntur finire, coniungere, tum quae eodem genere, tum quae diverso sunt, mutare, humectare, exiccare, durare & mollire: sica autem & humida, cum illa per se, tum quae ex illis ambobus compacta sunt corpora, finibus describi, & alia pathemata dicta pati. Rationibus etiam quibus naturas illorum definire consuevimus, fit manifestum.

Juan Ginés de Sepúlveda, Opera Aristotelis latina facta (Paris, 1532), fol. 29r:

Elementorum causa quatuor esse, supra est a nobis definitum. harum enim copulis quatuor existunt elementa, quorum duae sunt affectivae calidum, & frigidum: duae passivae siccum & humidum. quorum rerum
fides non solum inductione fit, cum calor & frigus in cunctis rebus finire, concernere, mutare tum cognata, tum quae diversi generis sunt: ad haec humectare desiccare, durare, atque mollire notentur: sicca vero & humida tum ipsa per se tum corpora communia, quae ex ambobus conflantur, finiri, & caeteras quae memoratae sunt affectiones pati, sed etiam rationibus, quibus ipsorum naturas definimus.