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- 1 In a letter to Lorenzo de' Medici, dated 5 June 1490, Angelo Poliziano requested a revision of his translation of Hippocrates and Galen by the court physician Pier Leoni da Spoleto. Writing in the vernacular, he made an impassioned plea:

Vorrei che V.M. intendessi, se maestro Pier Lione volessi durar fatica in riveder quella mia traduzione di Ippocrate e Galieno, che è quasi al fine, e così el commento che fo sopra, dove dichiaro tutti i termini medicinali che vengono dal greco, e truovo come si possino chiamare latine. Se la Sua Eccellenza volessi durar fatica, poi al tempo la manderei fuori più arditamente; che stimo sarà bella cosa et utile, se l'amor non me ne inganna. Messer Ermolao e'l Conte mostrono pur d'averne buona opinione.¹

- 2 Regrettably, neither Poliziano's translation nor his commentaries have survived. Yet, this brief epistle is illuminating in a number of ways. It not only signals Poliziano's encyclopaedic impulse to elucidate all branches of knowledge, but also offers a glimpse into the circulation of scientific literature and scholarly practices in the late Quattrocento. Poliziano's request of an expert review of his medical Neo-Latin translation and his insistence on the terminological challenges are indeed remarkable. First, it shows a keen awareness of the cross-disciplinary exigencies of the translation of science – a task that not even the most accomplished *grammaticus* is capable of bringing off successfully without the aid of a medical expert². Second, his letter expressly mentions terminology as the main focus in the review of the manuscripts, which was a major quandary in the humanists' scientific translation agenda. Finally, the letter draws the attention to the social status and intellectual networks of the *interpre*s (both translator and commentator) in Quattrocento Italy, revealing a complex

exegetical activity that fostered both collaboration and competition within and across academic circles.

- 3 The letter to Lorenzo serves as a colophon to a taxing intellectual endeavour (the translation of natural science and medical texts) spanning the second half of the fifteenth century. Leading Italian humanists took part of this challenge as they became engaged in an ambitious re-translation scheme of Greek texts³. Humanist scientific translations, many of which served to renew interest in long-neglected classical authors, took the form of a complex inter-discursive operation that involved the emendation or expurgation of manuscripts, and the rendering of such Greek texts into Latin (and later, into the vernacular)⁴. By providing a wealth of new material to shape contemporary discussions of scientific topics, this (re-)translation agenda also prompted a sustained re-engagement with well-known Latin natural texts, such as Pliny's *Natural History*, and the mainstream Arab-Latin medical tradition.
- 4 As Poliziano's letter reveals, the translation of texts on natural science spanned across a broad intellectual field, including philologists and university professors, as well as practicing physicians and pharmacists. Not only did scholars take part in the (re-)translation of natural Greek texts, but they also often discussed (and defended) their own translation practices. Yet, the *interpretatio* of these texts posed unique challenges due to their obscure subject matter, their murky terminology, and the interpretive instruments available. Indeed, the problems derived from the engagement with scientific literature significantly accrued during the later Quattrocento as Greek botanical, zoological and medical texts were recovered or re-translated⁵. This paper aims to elucidate some of the humanist approaches to the translation of these texts, as well as the various strategies used to meet the terminological and semantic challenges.

The Italian humanist re-translation scheme and scientific literature

- 5 Humanism can be regarded as a watershed in translators' "visibility", and as the transitional period that paved the way for the modern status of translation as a relatively autonomous field of inquiry. During the Middle Ages, translation was barely distinguished from other erudite or didactic procedures, such as glossing, annotating, paraphrasing, editing, and re-writing⁶. Hence, it had hardly elicited any separate theoretical interest. The medieval translator generally performed the role of textual critic, glossator, and editor of texts, thereby not producing a substitute (that is, a new text in lieu of source text) but rather a supplement or adjunct to mediate between the source text and the reader. The medieval translators took, broadly speaking, two seemingly disparate approaches to translation (which, nonetheless, often co-existed). On the one hand, a word-for-word rendering was the usual procedure particularly in dealing with religious, philosophical, or scientific texts: a literal method that tended to ignore the idiosyncratic structural, grammatical, and stylistic patterns of source and target language. This method was usually adopted due to the obscurity of the subject matter, the translator's lack of technical or linguistic competence in one or both languages, and the dearth of available glossaries and lexica to aid the translation process. On the other hand, when it came to the translation of classical texts into the vernacular languages (the so-called *volgarizzamenti*), the translator's approach relied heavily on the *enarratio poetarum* and the established exegetical practices, which often

resulted in sprawling amplification, variation, or re-writing of the original. The translated text was taken as a form of commentary, gloss, or appendix to the classical source, and was often read and circulated afterward as a new text altogether.

- 6 While it would be a mistake to assume a radical break with earlier medieval practices, the humanist (re-)translation agenda implied the formation of a new canon of works, the remoulding of classical *auctoritas*, as well as the adoption of an increasingly rhetoric-based approach to translation that would reach a new readership⁷. The idea of translation as a substitute for the original, rather than as an adjunct or supplement, started to be felt more strongly in the early Renaissance. Likewise, the translator acquired a more independent status and prominent social role, while the process of translation began to be seen as a relatively autonomous practice (increasingly detached from other meta-textual procedures: commentaries, glosses, paraphrases, etc.). This realisation paved the way for the first tracts dealing with translation practice, such as those by Bruni and Manetti⁸. More importantly, the relationship between the source and target text was gradually seen as mediated by historical distance. This historical gap required an expert individual who was capable of producing an equivalent effect in the target audience, which was now felt as irremediably detached from the classical past. Furthermore, the humanist translator became ever more aware of language variations and cross-cultural differences (which took the form of intellectual debates regarding the prestige of Greek, Latin, and vernacular languages),⁹ as well as the controversies over the re-fashioning and consolidation of the target language (Neo-Latin in the case of translations from Greek). Leonardo Bruni's *De interpretatione recta* (c. 1420) can be regarded as the manifesto of this renovation programme. Rhetoric and style took centre stage in the early humanist re-translation scheme. In matters of style, Cicero stood as the prime model of imitation in rendering Greek texts into elegant Latin (Ciceronianism) and the classical *auctores* were reclaimed to pour scorn on the earlier medieval translations produced in "shoddy" Latin¹⁰.
- 7 Whereas the translation of Greek literary texts into Neo-Latin could profit from such a rhetorical and stylistics-based approach (as was the case, for example, with the successive humanist re-translations of Homer's *Iliad*)¹¹, scientific texts posed a number of problems. Indeed, alongside literary works, the Italian Quattrocento saw an unprecedented increase in the number of translations, re-translations, and exegesis of scientific texts. The features of this natural and scientific material fostered a meta-linguistic speculation on otherwise unheeded translation-related issues (the question of terminology, the relation between *res* and *verba*, specific translation strategies, and genre awareness, among others). In this respect, the humanists' ever-growing rhetorical and stylistic pronouncements in translation could hardly be reconciled with the demands of scientific texts in terms of accuracy, terminological exactness, and the utilitarian value of the translated works.

Linguistic and semantic quandaries

- 8 In the current literature, scientific translation tends to be seen as a subclass of the general theory of translation, and is generally understood as a form of specialised or technical field clearly distinguished from the translation of literary texts¹². While theorists have acknowledged that the translation of science is not a purely denotative act, the term "pragmatic translation"¹³ is widely used to stress the emphasis on the

efficient and accurate rendering of the content as opposed to its literary or stylistic form. In the early modern period, no such distinction was made. Both literary and non-literary texts were dealt with in roughly similar ways. Translators focused on the stylistic and rhetorical standards, with classical Latin models used to render Greek texts into elegant Neo-Latin. Humanists were not unaware of the specific difficulties posed by these texts, however, especially in terms of lexis and subject matter. The question of loans, neologisms, and semantic calques – as well as the accurate interpretation of the specialized content – figured prominently in humanist debates. Most of these discussions tied in with broader linguistic questions beyond the strictly scientific domain, such as the expansion and renovation of the Latin language through imitation of the classical authors, the accurate choice of models, as well as wide-ranging debates regarding translation methods (notably, the *ad verbum* or *ad sensum* methods)¹⁴.

- 9 The question of neologisms, for example, had surfaced in the early humanistic debates about the renovation and expansion of the Latin linguistic capital. Nonetheless, the approach was for the most part philological and did not make meaningful distinctions in terms of discourse genres or specific branches of knowledge. Positions varied among humanists: some adopted a Classicist stance impervious to innovation (such as Facio and Bembo), while others, like Lorenzo Valla, Biondo Flavio, and Bartolomeo Scala, favoured a more innovative approach. This approach utilised linguistic criteria based on usage (*usus*), and was therefore more prone to linguistic innovation. This more innovative posture stemmed from an embryonic socio-historical insight into language use, which was cognizant of the changing social reality and the concomitant linguistic change¹⁵. In general, the tendency was to expurgate the scholastic Latin inherited from medieval times in the light of the classical sources and their own explicit rules of word formation and composition. In matters of style, Cicero stood as the model of imitation, especially among those who advocated the imitation of a single author rather than a wide assortment of texts.
- 10 The epistolary exchange among leading humanists furnishes ample evidence of such lexical angst. In a spiteful libel, Angelo Poliziano accused Bartolomeo Scala of adulterating Latin by coining terms that were extraneous to Latinity, such as “*vexilliferatum*” and “*prioratum*”¹⁶. Indeed, in his *Vita Vitaliani Borrhomaei*, Scala had explicitly declared his intention to make use of new names to speak about the institutions of his own time, rather than drawing on the Roman quasi-equivalents.¹⁷ He invoked a socio-linguistic criterion to account for this preference: to adjust words to the current practice and improve mutual understanding. Scala was following Lorenzo Valla and Flavio Biondo in his predilection for neologisms, a preference that was bitterly resented by the Florentine school. Indeed, Lorenzo Valla had proclaimed that “*Nova res novum vocabulum flagitat*” (*Antidotum in Facium* I, 14, 19), and had insisted that new words were required to name the new institutions rather than the old attested classical words that referred to objects no longer used or that designated different *realia*. For example, instead of *imperator* as the commander of an army, the word would be *capitaneus* or *senescalcus*. Valla’s criterion was grounded on the *usus* rather than the *norma* or *auctoritas*, a consideration that shows his awareness of the historicity of languages and human customs. In his view, the choice of words in composition should be dictated by the *consuetudo* –that is, the prevalent linguistic usage – when several alternatives are considered. In the case of new concepts that had no

equivalent in antiquity, or in the face of no written record in the best classical authors, Valla admitted the use of neologisms or the adoption of the vernacular variant of a term. Sometimes, the new word would be accompanied by caveats such as *ut vulgo aiunt, sic vocant, si licet dicere* – a procedure that is well attested in lexicographical works such as Niccolò Perotti's *Cornu Copiae* (1478) and Hermolao Barbaro's *Castigationes Plinianae* (1492).

- 11 In a few epistles written in 1493, Poliziano further disputed with Bartolomeo Scala over the use of rare words¹⁸. Poliziano claimed that sophisticated Latin vocabulary was welcome, unless one wanted to use the language of notaries (“*tabellionum lingua*”). He accused Scala of being used to the *vulgaris consuetudo* in his chancellery style, alluding to his office of secretary to the Republic. In these letters, Poliziano downplayed the centrality of Cicero as a master of style and fostered the use of words attested in a variety of Classical authors. He also made valuable remarks about the importance of genre (communicative situation, text type) and register (degree of formality/informality), which the recreation of the Latin *usus* required¹⁹. The well-known debate between Angelo Poliziano and Paolo Cortesi on the imitation of Latin style, the former favouring an eclectic and creative imitation of a variety of Latin authors and the latter a moderate Ciceronianism, also reflects different linguistic approaches in terms of incorporation of new or rare words²⁰. Poliziano's impulse to expand the breadth and richness of the Latin language was not always welcome, as evidenced by Giorgio Merula's invective “*In Politianum*” (1490) which criticises the use of rare, unusual, and obscure words.
- 12 These debates not only impinged on the creation of original Neo-Latin literature, but also significantly affected the criteria used by Italian humanists in the translation of Greek texts. The engagement with Greek scientific literature, however, would broaden the humanists' meta-linguistic awareness. It forced them to both consider philological and linguistic criteria, and to confront empirical problems that often lay beyond their comfort zone. The material dimension of scientific literature required that humanists addressed the interconnection between *res* and *verba* in ways that had been previously overlooked.

Res, verba and realia

- 13 Words that evoke a direct referential link with reality are commonly known as “*realia*”²¹. Many of the humanist discussions over the *nova verba* surveyed above arose from the mismatch between the extralinguistic realities of source and target culture – classical antiquity and early modern Europe, respectively. In Translation Studies, the interpretation and rendering of *realia* is generally problematic, and translators adopt different strategies to deal with these cultural gaps, from deletion or suppression of the culturally awkward item, to various forms of mediation in the target language (direct transfer, coinage of neologisms, cultural adaptation, explication, or addition of paratextual explanations, among others)²². The translation of scientific works poses similar difficulties to the translator as interlingual mediator, albeit in slightly different ways. The extra-textual, referential dimension of language is also central to scientific discourse but, unlike cultural objects and practices that shift considerably in different times and settings, natural objects and phenomena remain a lot more stable – such is the case with zoological, botanical, and medical referents. The humanist translators of

Greek scientific texts did not only have to iron out linguistic quandaries (finding the exact equivalent of a given term in source and target language), but they were also compelled to tackle a more complex epistemological problem: the identification of the *realia* designated by a maze of confusing terms. While few of them were actually cognizant of the broader epistemic implications of translating science, the engagement with these texts soon gave rise to bemused inquiries into such natural objects that resided outside the strict bounds of the texts and commentaries humanists typically dealt with. In the absence of reliable glossaries or a standardized terminology, translators were often pushed to identify the referent object in their source text in order to be able to offer the best one-to-one equivalent. Hence, the discussion slowly moved away from a purely stylistic language-based approach to an increasingly complex and empirical one, occasionally among non-specialists but more frequently among the medical humanists, who – as discussed below – invoked utilitarian reasons for such inquiries.

- 14 Niccolò Perotti offers a compelling example among the non-specialists. In a letter to Iacopo Ammannati (1472)²³, Perotti declared himself appalled by the rare words he found in the classical sources, which his contemporaries claim to understand, and wonders about their exact meaning:

Quis enim aut quotus est qui in praesentia aut intelligat aut explicare possit quid apinae sint? de quibus facetissimus poeta scribit [...] Quis nunc tuburum et apyrinorum significationem intelligit? de quibus idem poeta [...] Quis novit quod genus inter quadrupedes sit melis, inter aves phoenicopterus, inter pisces lupus, qui Romae inter duos pontes optimus capi dicitur, inter alites redivius, inter arbores mixa, inter frondes mustacae, inter fructus cariota? quae praeterea animati corporis partes sint gula, stomachus, praecordia, lactes, omasum, vulva, loci et alia pene infinita? quae quum intellegi ab omnibus videantur ignorantur tamen a pluribus. (f. 73r)²⁴

- 15 The kinds of questions Perotti posed in this extract are not exactly the same as those his colleagues mused on, which often resulted in the bitter lexicological and stylistic controversies mentioned above. Indeed, the main focus here is the meaning (*significatio*) of the obscure forms he comes across in Martial's epigrams, that is, the kind of real-world objects the poet is referring to. Nevertheless, the phrasing of the rhetorical questions shows that the referent is at stake here: "Quis intellegit X? / Quis novit quod genus sit X? / Quae sint X?" Interestingly, most of the lexical items cited belong to the natural world: plants (trees, bushes, and fruits), animals (birds, quadrupeds, and fish), or anatomical parts of the human body (most of which are related to the digestive system and are not always clearly distinguishable). The words are indeed rare: for example, "apyrenum" is a kind of pomegranate with soft kernels" (Mart. 13.43), "meles (or maeles)" is a marten or badger, "phoenicopterus" is a flamingo (Mart. 13.71), and "lupus" a wolf fish or sea bass (Mart 13.89). The identification of the referents of these items is further complicated by the corrupted textual variants in the manuscript Perotti was reading (a fact that is regularly acknowledged by the fifteenth-century philologists, with special emphasis in the case of Pliny). What is interesting in this extract, however, is that the problem of the reference (*Bedeutung*) – that is, the object that a name means or indicates – is raised as a major stumbling block in the interpretation of a classical poet. By bringing up the matter, Perotti ridiculed his colleagues' vain erudition when going at each other's throats over the correct spelling or the adequacy of certain Latin words whose meaning they completely ignored.

- 16 Among the non-specialists, a similar concern related to the names of natural species was expressed by Bartolomeo Scala. In a pastoral poem dedicated to Lorenzo de' Medici, "De arboribus" (1494), Scala declared:

Nunc ego poma canam levi cum cortice pulchris
 Picta modis multis, divum redolentia dona.
 Tam multae species, tam multa vocamina quae sint
 Dicere difficile est variataque reddere versu.
 Quis modo Crustumiasque puros grandesque volemos
 Noverit, aut usa est olim quibus alma vetustas
 Nomina? cum rebus periire vocabula rerum,
 Aut sunt mutatis obscura negotia verbis.
 Nunc igitur nostris intellectisque canemus
 Nominibus.²⁵

- 17 In this section of the poem, Scala begins to sing ("canam") about the assorted types of fruits ("poma"), but he declares himself baffled by the manifold species ("tam multae species") and the various names ("tam multa vocamina") that complicate his poetic composition. He wonders who is capable of understanding the difficult names ("nomina") bestowed by the ancients. He offers two explanations: first, those names given to natural things have died out or become lost ("periire") along with the things themselves; second, the things themselves have been obscured by the change of names ("mutatis verbis"). Finally, he announces that his poem will adopt the names he and his contemporaries use and are capable of understanding ("nostris intellectisque nominibus"). In these verses, Scala builds poetically on a debate that had kept humanists busy for several decades: the adequate understanding of the names given to plant species and natural *realia*, and the ways in which linguistic change and the passage of time have obscured the identification of such *realia*. This debate had been rekindled in the last decade of the Quattrocento by the so-called *disputatio pliniana*, which will be discussed shortly. Interestingly, by the time this poem was composed, both the transiency of ancient institutions and cultural phenomena, and the historical dimension of language development (the gap between Classical Latin, Neo-Latin and the vernacular), had been fruitfully incorporated into the discussion.

- 18 The problem of the one-to-one correspondence between words and real-world items (the referential problem of language) becomes particularly knotty in the exegesis of scientific texts, and it materialises as a major quandary in the Greek-Latin translation of natural philosophy and medical texts. These lexical quandaries are customarily mentioned in the prefaces to new translations, though commonly not analysed in depth. These paratexts followed a rather standardised series of rhetorical *topoi*: praising the patron, stressing the importance and difficulty of the task at hand, criticising the earlier medieval translators and their inelegant and rambling Latin, and bemoaning the corrupted state of the textual transmission.²⁶ Incidentally, a few interesting observations concerning the process of translation are also made. For example, in the dedication to Pope Nicholas V in his translation of Aristotle's zoological works (1450), George of Trebizond indicates some of the criteria he used in rendering the zoological vocabulary:

Collegi omnia que legi apud Latinos de animalibus, pluraque in dies querebam, et ab accidentibus certo multa conspicatus sum argumento, ut, verbi gratia, glanydas dicit Aristoteles pisces masculos, si tenello fetui occurrerint suo, residere ad defensionem fetus illico nec inde abire donec se parvuli tutari iam pro etate queant. Hoc ipsum siluros facere apud Latinos inveni. Non dubitavi ergo ubicunque

glanydes pisces Grece dicuntur siluros ponere. Multa praeterea secundum verborum potestatem expressimus, neque id nobis absque exemplo factum est, cum non nulli Latinorum auctorum belonem acum et rubeolos erythinos appellant, verba Greca Latine exprimentes. In non nullis etiam cum neutrum fieri commode posset, Greca ipsa posuimus paululum plerumque ad formam Latinam commutata.”²⁷

- 19 Trebizond says that in order to translate Aristotle’s zoological works he read all that the Latin authors had written on animals (“omnia legi apud Latinos”), since he claimed he was badly informed about the topic. Interestingly, he reported that some of the solutions he found to translate the obscure Greek lexis arose from his close reading of these texts. For example, he matched the information he happened to read on a specific species of animal in Aristotle’s works with an equivalent one in the Latin corpus in order to derive the appropriate nomenclature. Such is the case of the Greek γλάνις (“sheat-fish,” Arist. HA. 568a25). Trebizond states that, according to Aristotle, the male *glanis* (*masculos glanydas*) protect their offspring from predators until they are capable of fending for themselves. Since this behaviour is attributed to the *silurus* in the Latin sources, Trebizond says that he adopted the Latin term *silurus* every time Aristotle mentions the *glanis*. In other cases, the Latin texts provided an equivalent term of the Greek, as in the case of the Greek βελόνη (a sea-fish, possibly the hornpike or garfish) also called *acus*, and the Greek ἐρυθῖνος, also known as the rubeolus (“a fish of red color”). Finally, he stated that whenever equivalent Greek and Latin terms were not available, he used the Greek term with a slight adaptation to the Latin form (“paululum plerumque ad formam Latinam commutata”). This three-fold method Trebizond reportedly used was based on a close reading of the source text with a focus on the information provided about the different species, followed by a correlation with the information given by the Latin texts. The direction he appears to take is from *res* to *verba* (rather than the standard *verba-verba* approach that often resulted in mistaken names for certain species, or abstruse Latin neologisms).
- 20 This approach is consistent with some guidelines for translation (“officium interpretis”) Trebizond gives elsewhere. In the *Adversus Theodorum Gazam. In perversionem Problematum Aristotelis a quodam Theodoro Cage et Problematicae Aristotelis philosophiae protectio* (1456)²⁸, a scathing invective against Theodore Gaza’s translation of Aristotle’s *Problemata*, Trebizond presents the core principle every translator should observe: correct understanding of the texts is crucial (“si non intellegit, non traducat”)²⁹. In Trebizond’s view, which some critics have seen as a reactionary scholastic stance against the humanist program, the main duty of the translator was to preserve the “sensus argumentorumque vis”³⁰. This approach implied not sacrificing the accurate rendering of the content of the text for the sake of fatuous eloquence, as Gaza appeared to have done in his translations. Thus, the word-for-word method adopted by the medieval predecessors (whom the humanists bitterly attacked in their retranslation scheme) was, in Trebizond’s view, not altogether flawed, especially when translating science. In this respect, he lays down a rule (“regula”): more serious and difficult matters should follow a word-for-word translation whereas a more flexible approach is suitable in the case of history or less difficult topics: “Hanc igitur regulam in traducendo tenendam studiosis putamus, ut graviora difficilioraque ad verbum de verbo pene reddant, historica et facilia latius angustiusve, sicuti iudicabunt, complectantur”³¹.

- 21 This genre distinction in terms of translation strategies echoes the one made by Giannozzo Manetti in his *Apologeticus*, a defense of his new Latin Psalter translation, written during his exile at the court of Nicholas V after 1453. In a section of this text, Manetti recommended a freer translation for poetry and oratory and a stricter one for Scripture, philosophy, and theology³². Given this genre distinction and the ad hoc translation strategies, Trebizond states that the prevalent medieval translations were not always worthless, since they managed to be precise in terms of content – albeit at the expense of elegance and proper Latin usage³³. A comparison of the *ratio interpretandi* of Trebizond and Gaza, a younger Greek émigré who soon became the former's rival, shows that Trebizond depended more heavily on Moerbeke's medieval translations, often adopting or adapting the lexical solutions of the earlier versions in rendering Aristotle's *Libri Naturales*, while Gaza's translation tended to reject the transliteration of Greek terms and instead proposed Latinate equivalents or made (sometimes convoluted) Latin periphrases³⁴. Explicative insertions, interpolated commentaries, and emendations are also well documented in Gaza's version. These were strongly criticized by Trebizond in his *Protectio*:

Fidus interpres, quae Aristoteles dilucide scripsit, ea dilucide, quae ambigue aut obscure, ea similiter traducit. Sic enim pro ingenio quisque suo singula examinabit. Si vero nonnulla obscura liquide tibi patere putas aut ambigua certiora esse ducis, in marginibus, sicuti nos facere consuevimus, quae sentis, scribe nec tua cum alienis commisce. Ita enim et Aristoteles integer erit, et sententia tua non erit ignota. Nunc quid facis? Derogas Aristoteli. Multa addis. Multa commutas. Et quae non intelligis, quasi mendiosa sint, emendas.³⁵

- 22 Trebizond appears to favour a more faithful approach ("fidus interpres") to the source-text and advises a minimal interference with the text. All addenda and corrigenda should be kept to a minimum and clearly demarcated. As noted above, comprehension is the cornerstone of a good translation. Gaza's translation, by contrast, seems less concerned with the content of the source-texts, and more with the effect the translated version is expected to create in the target culture. Gaza's translation strategies are more attuned with the horizon of expectations of his readership, the wide-ranging renovation program of the Italian humanists, and the stylistics-based translation criteria. It comes as no surprise that Gaza's translations were widely acclaimed, while Trebizond's versions were generally judged as inferior³⁶. Only the unbiased acumen of a philological expert like Angelo Poliziano could do justice to Trebizond's version³⁷. Nevertheless, the Trebizond-Gaza feud should be read beyond their petty professional enmity; in fact, it raises a number of important questions concerning changing translation norms³⁸ within a specific cultural setting. Indeed, the dispute is reminiscent of one that had taken place three decades earlier between Leonardo Bruni and Alonso of Cartagena. Indeed, Cartagena – whom scholars have generally regarded as the conservative voice in the controversy – made similar reflections on science and philosophy as specific disciplines requiring a more rigorous and literal translation than literary works³⁹.
- 23 In his critique of Gaza's translation, Trebizond furnished a number of examples of his translation method, which gives precedence to the understanding of the *res* – that is, the specialised philosophical or scientific content – as a prerequisite for the choice of the accurate terminology. For example, he criticised Gaza's inconsistency in translating the Aristotelian οὐσία. Gaza, for the sake of *variatio*, used alternatively "natura", "essentia", and "constantia", in lieu of "substantia". Trebizond argued that it is

ridiculous to render the same Aristotelian concept (“*praedicamenti unius*”) by so many different names (“*tot appellationibus*”), and explained that, besides this logical flaw, the three words are not exactly synonymous⁴⁰. Likewise, he also (rightly) criticised Gaza’s use of a Latinate word (“*biliosus*”) to replace a Greek calque (“*melancholicus*”). Trebizond correctly observed that “*biliosus*” in Latin only means “full of bile”, while “*melancholicus*” specifically refers to those full of black bile (“*atra bilis*”). The terms, therefore, are not interchangeable⁴¹. This is a good example of the way that the humanists’ dogma of avoiding the direct transfer of Greek terms into Latin could sometimes lead to imprecise translations. In his explanation, Trebizond seems to understand the fact that “*melancholicus*” is a technical term referring to one of the four temperaments, so it is best left transliterated into Latin rather than replaced by an inexact Latin quasi-equivalent.

- 24 George of Trebizond also devoted a large section of his invective to showing the various ways that Gaza has misconstrued biological processes or anatomical parts in translating Aristotle due to a careless interpretation of the text. In George’s view, these errors arose both from Gaza’s misunderstanding of the technical content of Aristotle’s work, and from his mistranslation of specific terms – such as “*digestio*”, “*modificatio*”, “*concoctio*”, “*pepsin*”, and “*synepsesin*” – based on the use of the wrong *auctores*. He claimed that Gaza had drawn the technical terms from Celsus, who in turn had misconstrued Aristotle’s *lexis*: “*Aliud dicit Celsus, aliud Aristoteles. Celsus concoctionem ac synepsesin esse arbitratur id quod Aristoteles pepsin ac digestionem esse censet, deceptus fortasse, quia digestionem coctio quaedam semper antecedit.*”⁴² At any rate, Trebizond explained that the ancient Greeks “*verba enim rebus, sicuti oportet, non res verbis accommodabant,*”⁴³ which (one should surmise) is the opposite of what Gaza did. Regardless of the accuracy of Trebizond’s physiological observations about human digestion, the fact that he stressed the importance of the *res* (the actual organs and processes described) over the *verba* (the names accorded) is consistent with his general approach to the translation of scientific literature.

Medical humanism: Challenging translation norms

- 25 The re-translation agenda of the fifteenth-century Italian humanists implied a substantial shift in translation norms. As discussed above, translation became an increasingly target-oriented activity and the “acceptability” of translation was judged by the extent to which it conformed to the stylistic rules of classical Latin that the humanists strove to emulate. This became highly problematic in the *interpretatio* of scientific literature. The genre-specific constraints of natural philosophy and scientific texts required translation procedures that ran counter to the primarily rhetorical goals of the *studia humanitatis* inspired by the *renovatio linguae latinae*. The controversies over Greek and Latin lexical equivalences, as well as the correlation of *res* and *verba*, are two salient ways in which such discrepancies started to take shape in the second half of the Quattrocento. It is among medical humanists discussing the meaning of natural terminology in Latin sources, especially Pliny’s *Naturalis Historia*, and embarking on the taxing translation of Greek medical corpus (notably, Hippocrates and Galen), that these discussions were taken to the next level.
- 26 The peak of this controversy is what came to be known as the “*disputatio pliniana*” (1491-1509). A heated argument over alleged “errors” in Pliny’s *Naturalis Historia*, it

divided philologists and medical humanists and continued well into the sixteenth century⁴⁴. The phases of this scholarly dispute have been well documented.⁴⁵ However, neither its epistemological corollaries have been fully charted, nor has the impact of this intellectual strife on the translation norms governing scientific literature in the early modern period been closely assessed. Niccolò Leonicensi's *De Plinii et aliorum in medicina erroribus* (Ferrara, 1492) is the cornerstone of the debate. Contrary to what the title may suggest, the work does not attack Pliny as much as the Arab medical tradition, and it instead intends to pave the way for the restoration of the Greek medical texts (particularly Galen) as the true source of knowledge. At any rate, it was the attack on Pliny's *auctoritas* that the Florentine humanists particularly abhorred. Yet, Leonicensi's statements represent a major turning point in the history of scientific translation. By bridging a gap between textual criticism and empirical knowledge, Leonicensi challenged the mainstream rhetoric-based criteria laid down by Brunini and helped shape the profile of the translator of scientific literature⁴⁶.

- 27 Indeed, Leonicensi's work merges two intellectual traditions in the late Quattrocento, and two scholarly discourses on the natural world: the philology-driven humanist impulse for textual criticism and interpretation (both exegesis and translation) and the empirical dimension of medicine as a discipline that purports to derive practical information from the available literature to operate (concretely) in the world (the cure of patients, the manufacture of medicine, and so on). The function (*skopos*) of classical medical literature was different from literary texts in that it not only informed the curriculum of the physicians' instruction (*magisterium*), but it also orientated their practice (*ministerium*). In his critique of Pliny, Leonicensi was not so much guided by a text-driven impulse to restore the true *lectio* (as was the customary practice among leading humanists), but was instead concerned with the referential value of names (or more precisely, with the correct identification of the *realia*). It is this core epistemological goal that underpinned Leonicensi's tract. Textual criticism is only an instrument to account for obscure *loci*, mystifications, or terminological confusions in the sources. Thus, Leonicensi significantly changed the terms of the debate and became a major figure in the history of early modern scientific translation. His contributions both opened a new chapter in the understanding of scientific terminology and helped shape the *habitus* of what we currently refer to as a "specialized translator".
- 28 A key passage in Leonicensi's tract illustrates the breadth of his approach to the study of the *naturalia* and the question of scientific terminology:

Venerandus antistes Petrus Barotius episcopus patavinus quemadmodum in omnium bonarum artium disciplina eminentissimus ita in hac quoque medicinae parte, neque ipsis medicis inferior, herbarum noticiam nostris temporibus pene impossibile arbitratur, quoniam prisca earum nomina sunt nobis ignota, in nulla vero tam manifesta indicia ab antiquis tradita habemus, quin totidem ex adverso in contrariam possint auferre sententiam, sive hec aut tradendi aut discendi herbarum scientia difficultas inde habeat originem que variis anni temporibus herbae faciem cum aetate commutent, sive que earum colores atque figuras non facile sit homini describere, quam naturae pingere atque formare. Hinc illa auctorum in eisdem notificandis dissensio, hinc illa nominum ambiguitas.⁴⁷

- 29 The prime difficulty in the development of botanical knowledge, wrote Leonicensi, stemmed from the obscurity of the names in the classical authors ("prisca earum nomina sunt nobis ignota"). Moreover, the description of the species through explicit references ("manifesta indicia") is often equivocal ("ex adverso in contrariam possint auferre sententiam"). These difficulties in learning and teaching botany are not only

due to the mystification of names as they were handed down by the *auctores*, but they also stem from the *materia* itself: for one thing, the seasonal growth of plants makes identification difficult and, for another, the variety of colours and shapes of species (“colores atque figuras”) further complicates the process. Even if Leonicensio does not explicitly say so, one should note that the same material constraints of botanical science must have operated in antiquity and in his own time. Yet, things become further complicated by the fact that the moderns’ task is twice as cumbersome, since they must unravel a maze of names (which were probably not accurately allotted in the first place). Interestingly, Leonicensio’s arguments are far more sophisticated than the humanists’ perplexed debates over the “correct names” discussed earlier. While he acknowledges that scribal errors and a flawed manuscript tradition have played a major part in the errors in scientific texts (and, indeed, he often suggests emendations),⁴⁸ he is also cognizant that botany is a complicated discipline, and that errors or inconsistencies in the identification and naming of species may well be a problem of the ancient texts themselves. The outcome is a bewildering confusion among doctors in his time:

Hinc illa auctorum in eisdem notificandis dissensio, hinc illa nominum ambiguitas
ut fere maior pars medicorum nesciat quid Struthii quod arabes condisi appellant.
Quid Eupatorii quid Centaurae maioris.⁴⁹

- 30 The confusion is two-fold: it arises from the divergence in the description of identical species (“notificandis dissensio”) and from the ambiguity in terminological tags (“nominum ambiguitas”). In Leonicensio’s account, the process has been further obscured by the Arab-Latin medical tradition and its derivative medieval sources that abounded in confusion and errors. The study of medical literature, argues Leonicensio, has also been impoverished by scholastic teaching (“garulas quasdam atque sophisticas disputationes”), which resulted in an ostentatious display of erudition (“ostentationis”) rather than true practical value (“utilitas”). Indeed, Leonicensio’s concerns are primarily of a practical nature, as he plainly puts in the following section of the text:

Nam cum haec atque alia similia nomina plurimum sint ab illis quibus hodie in eisdem rebus significandis utimur differentia hinc plerumque accedit, ut cum eadem in veterum libris lectantur, aut medicina peregrine, aut a communi usu remotissima esse putentur, quum tamen nemo sit quae illa in orto suo non habeat, ac non eisdem frequentissime utatur. Non sine omni tamen periculo, quum quis eis aliter utitur, quam prisci medicinae auctores statuerunt, siquidem quid ipsi de huiusmodi rebus senserint coniectare non possumus, quarum nomina apud eosdem usitata ignorentur, tum vero maxime (ut diximus) aberratur, quum quispiam se nosse existimat quid aliquot nomine ab antiquibus indicetur, quod tamen sub alia ab eisdem nuncupatione comprehenditur.⁵⁰

- 31 The estrangement between *res* and *verba* (which Leonicensio’s diction stresses throughout) may have dire consequences (“omni periculo”) for practicing doctors who, misled by the names, are likely to administer the wrong medicine to their patients. The problems are various: doctors read names of plants which they consider foreign (“peregrinus”) or out-of-use (“a communi usu remotissima”) when they actually keep these species in their backyards (“in orto suo”) and use them frequently (“frequentissime utatur”) because they know them by a different vernacular name; in other cases, the names they currently use for certain plants were used by the ancients to designate other species and placed under different categories (“sub alia nuncupatione”). As both a university lecturer and a practicing physician, Leonicensio

was familiar with the threat these misunderstandings posed on a regular basis, and he provided numerous examples in his treatise.

- 32 Though not explicitly mentioned by Leonicensio, this empirical (cum philological) approach to medical terminology challenged the mainstream translation norms of his time, which were largely modelled on the translation of Greek poetic, historical, and oratorical works. The engagement of medical humanists in the late Quattrocento translation agenda soon called into question some of these criteria by exposing the pragmatic value (“utilitas”) of scientific texts, stressing the genre-specificities, focusing on the source-text and its correct interpretation rather than the rhetorical effects in the target culture, and re-orienting the discussion on “neologisms” and terminology from a purely text-based approach to an increasingly empirical one. As medical humanists joined the debate, the *habitus* of the translator also began to change: the *peritia* Bruni had signalled as the mark of the *optimus interpres* was not solely attained by linguistic expertise (in both languages) and a wide cultural competence, but required now a specialised knowledge in natural philosophy and medicine, as well as broader experience-based skills like the ones apothecaries, physicians, and herbalists accumulated. The profile of a sort of “specialized” translation thus slowly began to emerge, and the medical humanists were the natural candidates for the vacancy.

Conclusion

- 33 This article’s discussion has shed light on the extent to which the humanists’ metadiscursive awareness was considerably enhanced by their exposure to Greek scientific works, and the ways in which some of the mainstream translation criteria were re-visited, and intellectual debates were reoriented in the face of the new material. For a start, the humanist discussions about translation methods, revolving around the *ad verbum* and *ad sensum* dichotomy, broadened towards the end of the century and began to accommodate epistemological questions such as the status of the *realia* and their correct interpretation. As noted earlier, medical humanists played a central part in this re-orientation. Second, the philology-driven, rhetoric-based model of *interpretatio* enforced by the humanists’ renovation programme started to reveal its own limitations when the Greek scientific literature was incorporated into the discussion. This resulted in ever-increasing qualifications and distinctions in terms of discourse genres, a point that was occasionally made by figures like Cartagena in his dispute with Bruni, by Manetti in his translation of the Bible, or by Trebizond in his translation of Aristotle’s philosophical works, and was finally brought home by Leonicensio in his discussion of botanical terminology. Functional, pragmatic criteria in translation slowly began to surface, with a greater understanding that not all texts could be approached in the same way. When it came to scientific texts, the recreation of the *scribendi ornatus*, as Bruni advised, was less relevant than the accurate rendering of the *doctrina rerum*. This also impinged on translation strategies. The literalistic, word-for-word approach of the earlier medieval translators could not be ruled out altogether, and the coinage of neologisms or Greek calques was not entirely flawed if it fostered the correct understanding of the text. Indeed, contrary to the domesticating approaches of the *studia humanitatis* – a fluent strategy offering the experience of recognising one’s own culture in a cultural other – the translation of science appeared to require a “foreignizing” one. While this created a sense of estrangement and

distance in the target culture, and was generally associated with the scholastic methods, the abstruse nature of scientific lexis and content seemed to favour – as some heterodox voices began to express – this kind of translation approach. Furthermore, the challenges of the scientific literature started to reconfigure the *habitus* of the translator. Bilingual competence and an encyclopaedic cultural lustre were no longer the sole mark of the *optimus interpres*. Scientific translation required, it was soon acknowledged, expertise in specific disciplinary areas. In the case of medical texts, this called for a sound philological and textual knowledge and, perhaps more importantly, empirical and practical expertise. These early debates regarding the translation and interpretation of the *naturalia* certainly paved the way for the expansion and consolidation of medical philology as a more autonomous field of study in the sixteenth century.

NOTES

1. “I beseech your Excellency to intercede with master Pier Leoni to have him revise my translation of Hippocrates and Galen, which is now nearly completed, together with the preceding commentary in which I discuss the Latin names of the medical terms deriving from Greek. If your Excellency went to such lengths I would soon muster courage to publish it, as I deem it should be something fair and useful, if I do not delude myself. Master Ermolao and the Count also share a high opinion of it.” All translations are my own, unless otherwise indicated. The letter is cited by Isidoro del Lungo, *Angelo Poliziano. Prose volgari inedite e poesie latine e greche edite e inedite*, Firenze, Barbera 1867, p. 77. For a discussion of this letter and Poliziano’s engagement with medical texts, see Alessandro Perosa, “Codici di Galeno postillati dal Poliziano”, *Studi di filologia umanistica I*, Roma, Edizioni di Storia e Letteratura, 2000, p. 185-217, at 190-195.
2. On the concept of *grammaticus* for Poliziano, see the discussion in Christopher Celenza, *Angelo Poliziano’s Lamia. Text, Translation and Introductory Study*, Leiden, Brill, 2010, p. 39-41, 91-93, 103, 120, 140-141.
3. For an overview of the role played by scientific translation into Latin in knowledge transfer during the Middle Ages, see Scott L. Montgomery, *Science in Translation: Movements of Knowledge through Cultures and Time*, Chicago, Chicago University Press, 2002, esp. p. 138-188; Pieter de Leemans, An Smets & Michele Goyens (eds), *Science Translated. Latin and Vernacular Translations of Scientific Treatises in Medieval Europe*, Leuven, Leuven University Press, 2008, esp. p. 1-181.
4. For an overview (mostly sixteenth century onward), see Peter Burke & R. Po-Chia Hsia (eds), *Cultural Translation in Early Modern Europe*, Cambridge, Cambridge University Press, 2010, especially for scientific translation, p. 161-217; Roger Chartier & Pietro Corsi (eds) *Sciences et langues en Europe*, Paris, E.H.E.S.S., 1996; Véronique Boudon-Millot, Antonio Garzya, Jacques Jouanna, Amneris Roselli (eds), *Ecdotica e ricezione dei testi medici greci, Atti del V Convegno internazionale*, Napoli, M. D’Auria Editore, 2004. On translations of Hippocrates, see Silvia Fiaschi, *Philelfiana. Nuove prospettive di ricerca sulla figura di Francesco Filelfo*, Firenze, Leo S. Olschki editore, 2015. On Aristotle’s zoological works, Stefano Perfetti, “Cultius atque integrius. Teodoro Gaza traduttore umanistico del *De partibus animalium*”, *Rinascimento*, n° 35, 1995, p. 253-286; John Monfasani, “The Pseudo-Aristotelian Problemata and Aristotle’s *De Animalibus* in the Renaissance,” in Anthony Grafton & Nancy Siraisi (eds), *Natural Particulars. Nature and the*

Disciplines in Renaissance Europe, 1999, Cambridge [Mass.]/London, p. 205-247; on Theophrastus, Luciana Repici, “Teodoro Gaza traduttore e interprete di Teofrasto: la ricezione della botanica antica tra Quattro e Cinquecento” *Rinascimento*, 2004, p. 417-505; on Galen, Stephania Fortuna, “Galeno latino, 1490-1533”, *Medicina nei Secoli*, n° 17, 2005, p. 469-505; on Dioscorides, Daniela Fausti, “Su alcune traduzioni cinquecentesche di Dioscoride: da Ermoalo Barbaro a Pietro Andrea Mattioli”, in Ivan Garofalo, Stefania Fortuna, Alessandro Lami & Amneris Roselli (eds), *Sulla Tradizione indiretta dei testi medici greci: Le traduzioni*, Pisa, Fabrizio Serra editore, 2009.

5. For a catalogue of these texts, including Aristotle, Hippocrates Galen and Dioscorides, see Ferdinand Edward Cranz, *A Bibliography of Aristotle's Editions*. rev. Charles B. Schmitt, Baden-Baden, 1984; Paul Oskar Kristeller, *Catalogus Translationum et Commentariorum. Medieval and Renaissance Translations and Commentaries*, Washington, 1980; Paul Kibre, *Hippocrates Latinus: a repertorium of Hippocratic writings in the Latin Middle Ages*, New York, Fordham University Press, 1985; Richard J. Durling, “A chronological census of Renaissance editions and translations of Galen”, *Journal of the Warburg and Courtauld Institutes* vol. XXIV, 1961, p. 230-305.

6. For the transition from the predominant medieval word-for-word literalism to the freer, rhetorical-conscious approach adopted by the vernacular and the humanist-inspired translators in the later sixteenth century, see Theo Hermans, “Renaissance Translation between Literalism and Imitation”, in Harald Kittel (ed.), *Geschichte, System, Literarische Übersetzung / Histories, Systems, Literary Translations*, Berlin, Schmidt, 1992, p. 95-116, esp. 99; Theo Hermans, “The Task of The Translator in the European Renaissance: Explorations in a Discursive Field”, in Susan Bassnett (ed.), *Translating Literature*, Cambridge, Brewer, 1997, p. 14-40, esp. 35-36.

7. Re-translations are intrinsically bound up with literary canon formation and the establishment of translation norms. On retranslation as a “doubly domesticating phenomenon”, see: Lawrence Venuti, “Retranslations: The creation of value”, in Katherine M. Faull (ed.), *Translation and Culture*, special issue of *Bucknell Review*, vol. XLVII, n° 1, 2004, p. 25-38.

8. Cf. Paul Botley, *Latin Translation in the Renaissance. The Theory and Practice of Leonardo Bruni, Giannozzo Manetti and Desiderius Erasmus*, Cambridge, Cambridge University Press, 2004; James Hankins, “Translation practice in the Renaissance: The case of Leonardo Bruni”, in Hankins James (ed.), *Humanism and Platonism in the Italian Renaissance*, Roma, Edizioni di Storia e Letteratura, vol. I, 2003, p. 177-192; Annet den Haan, *Giannozzo Manetti's New Testament. Translation Theory and Practice in Fifteenth century Italy*, Leiden-Boston, Brill, 2016.

9. On the multilingual humanist milieu and the theories and discussions on language, see recently Jan Bloemendal (ed.), *Bilingual Europe. Latin and Vernacular Cultures c. 1300-1800*, Leiden-Boston, Brill, 2015.

10. For literature on Ciceronianism, see John Monfasani, “The Ciceronian Controversy”, in Glyn P. Norton (ed.), *The Cambridge History of Literary Criticism*, vol. III, *The Renaissance*, Cambridge, Cambridge University Press, 1999, p. 395-401. For the Cortesi-Poliziano debate and the question of Neo-Latin style, see Christopher Celenza, “Endgame: Humanist Latin in the late fifteenth Century”, in Yanick Maes, Jan Papy, Wim Verbaal (eds), *Latinitas Perennis II: Appropriation and Latin Literature*, Leiden-Boston, Brill, 2009, p. 201-242.

11. Eloquence and rhetorical suasion was the yardstick by which early Italian humanists produced and judged translations of Greek literary texts into Neo-Latin. The case of Homer's epics is illuminating. On the style and success of these Latin translations, see Robin Sowerby, “Early Humanist Failure with Homer”, *International Journal of the Classical Tradition*, vol. IV, 1997, p. 37-63, and 165-194.

12. For an overview of this subfield and its interactions with other areas of translation studies, see Olohan, Maeve, “Scientific and Technical Translation”, in Mona Baker & Gabriela Saldanhac (eds), *Routledge Encyclopedia of Translation Studies*, 2nd ed., New York, Routledge, 2009, p. 246-249.

13. On the term “pragmatic translation” see Joseph Casagrande, “The Ends of Translation”, *International Journal of American Linguistics* vol. XX, n° 4, 1954, p. 335-340, at 335.

14. On the much-debated question of the humanist translation methods and the tension between the *ad verbum* and *ad sensum* approaches, see Paolo Viti, *Sulla perfetta traduzione*, Napoli, Liguori, 2004, p. 6-7, 52-53. For a general overview see James Hankins, *op. cit.* p. 177-192; also Mariarosa Cortesi, "La tecnica del tradurre presso gli umanisti", in Claudio Leonardi & Birger Munk Olsen (eds), *The Classical Tradition in the Middle Ages and the Renaissance*, Spoleto, Fondazione CISAM, 1995, p. 143-167.
15. For an overview of these humanist controversies, see Silvia Rizzo, "Il latino del Poliziano", in Vincenzo Fera & Mario Martelli (eds), *Agnolo Poliziano, poeta scrittore, filologo. Atti del convegno Internazionale di Studi, Montepulciano, 3-6 novembre 1994*, Firenze, Le Lettere, 1998, p. 83-125, esp. p. 104-117.
16. Ep. XII 19 *Opera Omnia* (Basel, 1553), p. 178. Cf. Alison Brown, *Bartolomeo Scala. Humanistic and Political Writings*, Temple, AZ, 1997, p. 437-438.
17. Cf. Bartolomeo Scala, *Vita Vitaliani Borromaei* ed. C. Bartolini, Rome, Tinassi, 1677, p. 11-12. On this see Santiago López Moreda, "At nova res novum vocabulum flagitat: neologismos y nuevas acepciones en la prosa latina de los humanistas", in *Pubblicare il Valla (Edizione nazionale delle opere di Lorenzo Valla. Strumenti*, 1, ed. Mariangela Regoliosi, Firenze, Edizioni Polistampa, 2008, p. 465-505.)
18. Cf. Ep. VI 1 and VI 3 in Angelo Poliziano, *Opera Omnia* (Basel, 1553), p. 58-64.
19. "Fateor tamen rationem habendam, vel materiae, quam scribas, vel personae ad quam scribas, vel temporis in quo scribas" ("However, I acknowledge that one should take into account either the subject matter one writes about, or the person one addresses or the time in which one writes.") Ep. VI 1 *Opera Omnia* (Basel, 1553), p. 59.
20. Cortesi touches on the question of new vocabulary; see Christopher Celenza, "Endgame: Humanist Latin in the late fifteenth Century", *op. cit.*, p. 211.
21. Birgit Nedergaard-Larsen, "Culture-bound problems in subtitling", *Perspectives: Studies in Translatology* vol. II, 1993, p. 207-241, at 211.
22. For a survey of strategies to deal with realia, see Ritva Leppihalme, "Translation strategies for realia", in Kouvola, Pirjo Kukkonen & Ritva Hartama-Heinonen (eds), *Mission, Vision, Strategies, Values: A Celebration of Translator Training and Translation Studies*, Helsinki, Helsinki University Press, 2001, p. 139-146.
23. The epistle is partially transcribed in Giovanni Mercati, *Per la cronologia della vita e degli scritti di Niccolò Perotti*, Roma, Biblioteca Apostolica Vaticana, 1925, p. 158-161.
24. "For who or how many are now able to understand or explain what are the *apinae* about which this witty poet writes? Who knows the meaning of *tuburum* and *apyrinorum* also used by this poet? Who could tell what kind is the *melis* among the quadrupeds, the *phoenicopterus* among the birds, the *lupus* among the fishes, which was reportedly caught between the two bridges in Rome, the *redivius* among the fowls, the *mixa* among trees, the *mustacae* among the bushes, the *cariota* among the fruits? Moreover, what parts of the living body are the *gula*, *stomachus*, *praecordia*, *lactes*, *omasum*, *vulva*, *loci* and so on and so forth? While everyone seems to understand these words, most people in fact ignore what they mean."
25. "Now I shall sing the praises of fruits, fair, soft-shelled, many-coloured, fragrant gifts of the gods. So many species, and so variously named, they are hard to turn into verse! Who would know the Crustumia pear-trees or the lofty Volema? Or the names lavish antiquity once used? The names of things have died out with things themselves or the things have been obscured by the change of names. So we shall sing along with our well-known names." (Bartolomeo Scala, *Humanistic and Political Writings*, *op. cit.*, p. 437-438. "De arboribus", vv. 491-502.)
26. For an analysis of the content and style of the prefaces to medical translations, see Stefania Fortuna, "The Prefaces to the first humanist medical translations", *Traditio*, vol. LXII, 2007, p. 317-335.

27. “I gathered all I had read on animals in the writings of the Latin authors, and as I looked for more every day I picked out much with conclusive evidence from their characteristics. For example, Aristotle says that the male *glanis* (a kind of fish) protect their delicate offspring from predators and refuse to go away until the young are of age and capable of fending for themselves. I read in the Latin authors that the *silurus* does such thing. Therefore, I did not hesitate to write *silurus* every time I found the word *glanis* in Greek. Moreover, we translated many terms based on the meaning of the words, and we did not do such thing without a model, as several Latin authors call the *belone acus* and the *erythini rubeloi*, imitating the Greek words in Latin. In some cases, when neither of the two methods could be aptly used, we left the Greek words themselves, often slightly changed into the Latin form.” The text is cited from John Monfasani, *Collectanea Trapezuntiana: Texts, Documents, and Bibliographies of George of Trebizond*, Binghamton, NY, Center for Medieval and Early Renaissance Studies, S.U.N.Y., 1984, p. 299.

28. The references and citations are taken from: “Adversus Theodorum Gazam in perversionem Problematum Aristoteles” (Against Theodore Gaza on the Corruption of Aristotle’s *Problemata*), ed. Ludwig Mohler, *Kardinal Bessarion als Theologe, Humanist und Staatsmann*, Paderborn, Ferdinand Schöningh, 3 vols, vol. III, 1967, p. 277-342, at 307 (19). For a survey of this dispute, see John Monfasani, “George of Trebizond’s Critique of Theodore Gaza’s Translation of the Aristotelian *Problemata*”, in Pieter De Leeman and Michèle Goyens (eds), *Aristotle’s Problemata in Different Times and Tongues*, Mediaevalia Lovaniensia, 1st ser., Leuven, Leuven University Press, 2006, p. 273-292.

29. In his preface to the commentary on Ptolemy’s *Almagest*, written around 1460-1462, Trebizond makes similar remarks about the importance of understanding the text correctly as a prerequisite of translation. For this and other useful observations about Trebizond’s translation criteria, see J. Cornelia Linde, “Translating Aristotle in Fifteenth-Century Italy: George of Trebizond and Leonardo Bruni”, in Anthony Ossa-Richardson & Margaret Meserve (eds), *Et Amicorum: Essays on Renaissance Humanism and Philosophy*, Leiden-London, Brill, 2018, p. 47-68.

30. Cf. George of Trebizond, “Preface to Alphonsus rex for the translation of Demosthenes’ Oration on the Crown and the Preface to Anonymous (Vittorino da Feltre) for the same”, in John Monfasani, *Collectanea*, p. 93-97, at 95 (8). Cf. also J. Cornelia Linde, *op. cit.*, p. 51.

31. “This is the rule that the learned should observe when translating: that more serious and difficult matters be rendered almost word for word, and historical and easier matters be treated with more or less prolixity as they think appropriate.” (*Adversus Theodorum Gazam*, *op. cit.*, p. 327 [33.8].)

32. *Apologeticus*, V, 45. Alfonso De Petris, *Apologeticus*, Roma, Edizioni di storia e letteratura, 1981, p. 119-120.

33. George of Trebizond, *Adversus Theodorum Gazam*, *op. cit.*, p. 319-320; also J. Cornelia Linde, *op. cit.*, p. 63. On Trebizond’s defense of scholasticism and especially Dominican scholasticism, see John Monfasani, *George of Trebizond*, *op. cit.*, p. 156.

34. For a detailed comparison of Trebizond and Gaza’s versions, see Stefano Perfetti, “Cultius atque integrius. Teodoro Gaza, traduttore umanistico del *De partibus animalium*”, *Rinascimento*, n° 25, 1995, p. 253-286. (esp. 267-271).

35. “A faithful translator renders clearly the words that Aristotle himself wrote clearly and those that are ambiguous or obscure are rendered accordingly. Thus every person will examine the individual words according to their best judgment. Should you consider that some obscure words appear clear to you or that some ambiguous words can be grasped more accurately, note down what you understand in the margins, as we regularly do, and do not mingle your words with those of others. In this way, Aristotle will remain whole and your opinion will not go unnoticed. But what is it that you do? You modify Aristotle. You remove many of his words as if they were wrong. You add many others. You change many others. And whatever you fail to understand, you emend as if it is flawed.”

36. See, for instance, Merula's praise of Gaza's translation of Theophrastus. Cf. Silvia Rizzo, *op. cit.*, p. 110.
37. In Chapter XC of the *Miscellanea*, Poliziano criticized Gaza for the erroneous translation of a key passage and also accused him of plagiarizing George of Trebizond's earlier version. See John Monfasani, "Angelo Poliziano, Aldo Manuzio, Theodore Gaza, George of Trebizond, and Chapter XC of the *Miscellaneorum Centuria Prima* (With an Edition and Translation), in *Interpretations of Renaissance Humanism*, ed. Angelo Mazzocco, Leiden-Boston, Brill, 2006, p. 243-266.
38. In Translation Studies, "norms" refer to regularities of translation behaviour within a specific socio-cultural setting. The concept, first introduced by Toury (1978) has been extremely influential in the cultural turn in translation, especially as a way to examine the way translated texts function collectively in a target culture. Cf. Gideon Toury, *Descriptive Translation Studies and Beyond*, Amsterdam & Philadelphia, John Benjamins, 1995, p. 56-61.
39. On the so-called *Controversia Alphonsiana*, including the epistolary exchange, see Tomás González Rolán, Antonio Moreno Hernández, Pilar Saquero Suárez-Somonte (eds), *Humanismo y Teoría de la Traducción en España e Italia en la primera mitad del siglo XV. Edición y Estudio de la Controversia Alfonsiana (Alfonso de Cartagena vs. L. Bruni y P. Candido Decembrio)*, Madrid, Ediciones Clásicas, 2000.
40. George of Trebizond, *Adversus Theodorum Gazam*, *op. cit.* p. 288 (6.5)
41. *Ibid.*, p. 286 (5.2)
42. "Celsius writes one thing; Aristotle writes something different. Celsius thinks that *concoctio* and *synepsesin* are what Aristotle refers to as *pepsin* and *digestio*, possibly misled by the fact that a certain *coctio* (burning) always occurs before digestion." (George of Trebizond, *Adversus Theodorum Gazam*, *op. cit.* p. 287 [6.4].)
43. "They adapted words to things, as is appropriate, and not things to words." (George of Trebizond, *Adversus Theodorum Gazam*, *op. cit.*, p. 287 [6.4].) Cf. also Gasparino Barzizza, *De compositione* (c. 1420): "non verba rebus, sed res ipsas verbis accommodavit". *Gasparini Barzizii Bergomatis et Guinforti filii Opera*, ed. G.A. Furietti, Roma, Maria Salvioni, 1723, 1.6.
44. The *disputatio* unfolded over several months and involved leading Italian humanists: (a) A letter from Leonicensio to Poliziano (now lost) targeted mainly Avicenna, but noted in passing a confusion in Pliny's texts: *kíssos* (ivy) and *kísthos* (rock rose) using *hedera* (=ivy) for both; (b) A letter from Poliziano to Leonicensio (1941) accepts the critique of Avicenna but takes issue with Leonicensio for his attacks on Pliny's authority; (c) In 1492 Leonicensio responded with his book *De Plinii in medicina erroribus*; (d) In 1492 Ermolao Barbaro publishes his *Castigationes*, attributing Pliny's errors mostly to textual errors; (e) In 1493 Poliziano writes a letter to Barbaro, justifying himself (incorporated in the enhanced edition of Leonicensio's *De Plinii* in 1509); (f) In 1493 Pandolfo Collenuccio publishes his *Pliniana defensio* (Ferrara) against Leonicensio's critique of Pliny.
45. Cf. Arturo Castiglioni, "The School of Ferrara and the Controversy on Plinii", in Edgar Ashworth Underwood (ed.), *Science, Medicine and History I*, London, Oxford University Press, 1953, p. 269-279; Marco Santoro, "La polemica pliniana fra il Leonicensio e il Collenuccio", *Filologia romanza*, CIII, 1956, p. 162-205.
46. For a survey of the school of Ferrara, see Vivian Nutton, "The Rise of Medical Humanism: Ferrara 1464-1555", *Renaissance Studies*, vol. XI, 1997, p. 2-19.
47. "The venerable Pietro Barozzi, bishop of Padua, highly eminent in every field of culture and also a connoisseur of this branch of medicine, practically on equal footing with doctors themselves, believes that the study of botany is nearly impossible in our time because the ancient names of plants are unknown to us. Moreover, although the ancients have handed down an unusually large number of explicit references about plants, these data can be interpreted in one sense or in the opposite one. This difficulty in teaching or learning botany arises from the fact that in the different seasons of the year the growing plants change their appearance, or because it is not as easy for man to describe their colours and appearance as it is for nature to give colour

and shape.” (Niccolò Leonicensi, *De Plinii et plurium aliorum medicorum in medicina erroribus opus primum*, Ferrara, 1509, f. 9r.)

48. Leonicensi deals with textual corrections of Aristotle's *Historia Animalium* and Galen's *Art of Medicine* in the preface to his translation of Galen's *Art of Medicine*, published in 1508. Cf. Stefania Fortuna, *op.cit.*, p. 332-334.

49. “Here lies the disagreement among the authors in classifying the same plants as well as the ambiguity of names, to such an extent that most doctors ignore what are the *struthii* that the Arabs call *condisi*, what are the *eupatorii* and the *centaurae maioris* [...]” (Niccolò Leonicensi, *op. cit.*, f. 9r.)

50. “Because these and other similar names are quite different from those we use today to designate the same plants, it is often the case that when we happen to read such names in the writings of the ancients we believe they are foreign medicine or currently out-of-use, while we actually keep them in our back gardens and make frequent use of them. This is indeed quite dangerous, since those who use these plants differently from the way prescribed by the medical authors – although it is quite impossible to elicit their views about things whose names are unknown to us – are generally wrong when they claim to know what plant the ancients designated by a certain name while they actually give them a different one.” (*Ibid.*, f.9v.)

RÉSUMÉS

Dans cet article, nous examinons les difficultés auxquelles les humanistes italiens ont dû faire face alors que la littérature scientifique grecque est devenue partie intégrante de son vaste programme de traduction au quinzième siècle. La traduction et l'interprétation exactes des *naturalia* ont remis en question les normes rhétoriques de traduction qui sous-tendaient le programme humaniste et ont réorienté les débats intellectuels sur la relation entre *res* et *verba*, la précision terminologique, les genres de discours spécifiques, ainsi que les stratégies de traduction visant à mieux intégrer ce corpus textuel. Dans ce cadre, les médecins humanistes ont contribué de manière essentielle au développement d'une nouvelle approche à l'égard des *naturalia* et la traduction de textes scientifiques.

The article examines the challenges Italian humanists faced as Greek scientific literature was gradually incorporated into their broad translation agenda during the fifteenth century. The accurate translation and interpretation of the *naturalia* called into question the rhetoric-based translation norms underpinning the humanist programme, and instead re-oriented intellectual debates regarding the relationship between *res* and *verba*, terminological exactness, awareness of specific discourse genres, as well as the translation strategies that could best accommodate this body of literature. The contribution of medical humanists was crucial in stimulating a new approach to the *naturalia* and the translation of scientific texts.

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Mots-clés : Quattrocento, humanisme italien, traduction, textes naturels, médecins humanistes

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