

# *The Discovery of Definitions: Giles of Rome on Posterior Analytics II 13*

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## *Abstract*

In this article I shall take into consideration Giles's of Rome commentary on *Posterior Analytics* II 13. After sketching Giles's theory of demonstration, I shall summarise the content of the Aristotelian text, as well as the opinions of modern commentators. Then I shall analyze in some detail Giles's commentary, even contrasting his understanding of the text with those of the authors who preceded him within the medieval tradition, in an effort to identify the main points of his interpretation and the reasons on which it is grounded.

In *Posterior Analytics* (= *APo*), II 13 Aristotle aims to provide us with some methods for discovering definitions, but his discussion is often cumbersome and convoluted. Modern commentators disagree as to what kinds of definitions the methods set out in the text are concerned with, how many methods are described by Aristotle, and what the relationships among them are.

In this article I shall take into consideration Giles's of Rome commentary on *APo* II 13, trying to understand how he could have replied to the above-mentioned questions. To this end, after sketching Giles's theory of demonstration (§1), I shall summarise the content of the Aristotelian text, as well as the opinions of modern commentators (§2). Then I shall analyze in some detail Giles's commentary on *APo* II 13, even contrasting his understanding of the text with those of the authors who preceded him within the medieval tradition, in an effort to identify the main points of his interpretation and the reasons on which it is grounded (§3). Finally, some concluding remarks will be put forward (§4).

## *1. Giles of Rome on Demonstration*

Before starting our analysis of Giles's commentary on *APo* II 13 it is worth summarising those features of his theory of demonstration which are useful for a full understanding of his views; this will also enable us to fix some piece of terminology.<sup>1</sup>

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<sup>1</sup> There is no comprehensive work on Giles of Rome's commentary on the *Posterior Analytics*, even if the relevance of his theory of demonstration is largely acknowledged. See for example M. Bertagna, "La *divisio textus* nel commento di Egidio Romano agli *Analitici Posteriori*. Parte I", *Documenti e studi sulla tradizione filosofica medievale* 13 (2002), pp. 285-371; Parte II, 14 (2003), pp. 263-326; Parte III, 15 (2004), pp. 439-86; A. Corbini, "L'oggetto della conoscenza scientifica nei commenti di Tommaso d'Aquino e di Egidio Romano agli *Analitici Secondi*", *Documenti e studi sulla tradizione filosofica medievale* 13 (2002), pp. 231-84; J. Longeway, "Aegidius Romanus and Albertus Magnus vs. Thomas Aquinas on the Highest Sort of Demonstration (*demonstratio potissima*)", *Documenti e studi sulla tradizione filosofica medievale* 13 (2002), pp. 373-434; A. Corbini, *La teoria della scienza nel*

According to Giles a demonstration in the highest sense – which he labels ‘most powerful’ (*potissima*) or ‘universal’ demonstration<sup>2</sup> – is a *Barbara*-syllogism whose premises produce a scientific understanding of the conclusion, as ( $D_1$ ):

every figure that has its external angle equal to the two adjacent internal angles, has its internal angles equal to  $180^\circ$ ;  
 every triangle has its external angle equal to the two adjacent internal angles;  
 $\therefore$  every triangle has its internal angles equal to  $180^\circ$ .

The subject-term in the conclusion denotes the subject of the demonstration, and the predicate-term denotes the proper attribute of the subject; hence, a universal demonstration proves that the proper attribute inheres in its subject. Giles uses the same word ‘subject’ (*subiectum*) for referring both to the subject-term in the conclusion and to the item the conclusion is about, typically a species or a genus; the item which a demonstration is about doesn’t need to be an item in the category of substance: triangle, which is often used by Aristotle himself and by Giles as an example of subject, belongs to the category of quantity. The expression ‘proper attribute’ translates Giles’s word *passio*: an attribute A is the proper attribute of a subject S if and only if (i) necessarily  $SaA \ \& \ AaS$ ,<sup>3</sup> and (ii) A belongs to S as S. Clause (i) states that there cannot be a S’ other than S such that S’aA is true, and such that AaS’ is true. Clause (ii) expresses the fact that S must be the cause of A’s inhering in S, which is the reason why a universal demonstration explains why A inheres in S, and hence produces a scientific understanding of that fact.<sup>4</sup> Clause (ii) seems also to entail that the middle term in a universal demonstration must be the definition of the subject: for the

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*XIII secolo. I commenti agli Analitici Secondi*, SISMEL - Edizioni del Galluzzo, Firenze 2006 (Testi e studi XX); M. Bertagna, “Giles of Rome and Paul of Venice on *Demonstratio Potissima*”, *Documenti e studi sulla tradizione filosofica medievale* 20 (2009), pp. 375-94; A. Corbini, *Da Roberto Grossatesta a Jonathan Barnes. Dialoghi a distanza sulla teoria della dimostrazione in Aristotele*, ETS, Pisa 2019 (Philosophica 229); J. Longeway, “Medieval Theories of Demonstration”, in E.N. Zalta (ed.), *Stanford Encyclopedia of Philosophy*, Spring 2021, Online Edition: <<https://plato.stanford.edu/archives/spr2021/entries/demonstration-medieval/>> (consulted 01.15.2024). Let me reiterate that my discussion of Giles’s theory of demonstration does not aim at completeness at all, but only at introducing those notions which can help us understand his remarks on *APo* II 13.

<sup>2</sup> Giles’s ‘official’ treatment of *potissima demonstratio* can be found in *lectio* XI on *APo* II (Aegidius Romanus, *Super libros Posteriorum Analyticorum*, Bonetus Locatellus, Venetiis 1488 [reprint Minerva, Frankfurt a.M. 1967], ff. n 5rb56 - n 8va54), but remarks on this issue are scattered all over his commentary. See also Aegidius Romanus, *Quaestio quid sit medium in demonstratione*, in J. Pinborg, “Diskussionen um die Wissenschaftstheorie an der Artistenfakultät”, *Miscellanea Mediaevalia* 10 (1976), pp. 240-68, part. pp. 254-68.

<sup>3</sup> Here and in the following I use ‘XaY’ as a shorthand for ‘every X is Y’.

<sup>4</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. i 4ra4-16: “demonstratio universalis est quando demonstratur universalis passio de universali subiecto, ut passio quae universaliter inest subiecto quod universaliter subicitur. Si enim habere tres demonstraretur de figura, non esset universalis demonstratio, quia figura non universaliter subicitur tali passioni: nam non omnis figura habet tres. Rursus si talis passio demonstraretur de ysochele vel de aliqua specie trianguli, non esset universalis: nam, licet tale subiectum universaliter subiciatur tali passioni, talis tamen passio secundum totum suum ambitum [arbitrium ed.] et universaliter non comparatur ad tale subiectum, sed particulariter. Universalis ergo est demonstratio quando passio per causam per se demonstratur de suo universali subiecto. Ut puta habere tres per habere angulum tamquam per causam per se demonstratur de triangulo tamquam de proprio universali subiecto: haec ergo ‘omnis triangulus habet tres’ erit conclusio demonstrationis universalis”. – *Habere tres* abbreviates “having the three internal angles equal to two right angles”.

middle term, which provides the link between the subject-term and the predicate-term in the conclusion, must denote the cause of the attribute's inhering in its subject, which is the subject itself; but this cause cannot be the subject itself, for in that case, the demonstration would be circular; hence, it will be the definition of the subject. Yet, Giles is dissatisfied by this view, in that it only conceals but does not solve the problem of circularity, for there is no real distinction between the subject and its definition. Thus, Giles holds to the view that the middle term in a universal demonstration is the definition of the attribute. At first glance this seems to be a very bad move, however; for it does not avoid the charge of circularity – there is no real distinction even between the attribute and its definition –, and it loses any reference to the subject as the cause of the inherence of the attribute. But Giles is able to reply to this objection by distinguishing between the formal and causal definitions of an attribute: the formal definition of an attribute displays its formal features (*quid est*), whilst the causal definition of an attribute displays its cause (*propter quid est*), which typically consists in its proper subject or some of its features. By assuming that the middle term in a universal demonstration denotes not the formal but the causal definition of the attribute, Giles can reject the above-mentioned objection: for, the fact that the causal definition of the attribute includes a reference to its subject both avoids the charge of circularity – because the attribute and its (causal) definition are really distinct – and warrants that the middle term includes a reference to the cause of the attribute's inhering to the subject.

In a *notandum* included in *lectio XX* on *APo I*, Giles draws a distinction among three kinds of definitions an attribute can have: the definition which only shows its essence (*quid est*), as 'anger is the overheating of the blood near the heart'; the definition which shows the cause (*propter quid*) of the attribute, as 'anger is caused by the desire for suffering on the part of one's foe'; and the definition which shows both the essence and the cause of the attribute, as 'anger is the overheating of the blood near the heart caused by the desire for suffering on the part of one's foe'. The first definition is the conclusion of a demonstration; the second is the principle of a demonstration, i.e. its middle term; the third is virtually identical to a demonstration except for the arrangement of the terms. For consider the following demonstration ( $D_2$ ):

whoever has the desire for suffering on the part of his foe has his blood overheated near the heart;  
 whoever is in anger has the desire for suffering on the part of his foe;  
 ∴ whoever is in anger has his blood overheated near the heart.

In the conclusion, the *definiens* in the essential definition of 'anger' is predicated of 'anger' itself; the *definiens* in its causal definition, on the other hand, is the middle term of the demonstration; and the whole demonstration differs from the complete definition of 'anger' only for the arrangement of its terms.<sup>5</sup> Notice that the essential definition of an attribute can

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<sup>5</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. e 1va56 - vb13: "Notandum autem quod diffinitio vel dicit quid passionis tantum vel dicit propter quid tantum vel dicit quid et propter quid. Si dicit quid tantum, est demonstrationis conclusio. Si propter quid tantum, est demonstrationis principium. Sed si dicit utrumque, est tota demonstratio positione differens. Ut si quaeratur quid est ira, dicetur quod est accensio sanguinis circa cor. Et si quaeratur propter quid sit ira, dicetur quod est propter appetitum doloris in inimicum vel contrarium. Prima ergo diffinitio erit demonstrationis conclusio; secunda vero erit principium demonstrationis. Sed si heae duae diffinitiones coniungantur, erit virtualiter tota demonstratio. Arguatur ergo sic: quicumque appetit dolorem in contrar-

be demonstrated, hence it can be known through a demonstration; on the contrary, the causal definition of an attribute is a principle of the demonstration, and as such it cannot be known through a demonstration but in some other way.

An important feature of Giles's theory of demonstration is that the same subject can have one and only one proper attribute in virtue of itself, even if it can have several in itself accidents, i.e. accidents which follow from its essence and necessarily belong to it. For example, having the sum of its internal angles equal to  $180^\circ$  is *the* proper attribute of the triangle, an attribute the triangle possesses in virtue of itself, i.e. insofar as it is a triangle. But having the external angle equal to the sum of the corresponding internal angles is an in itself accident of the triangle, because the triangle possesses it in virtue of its being a rectilinear figure. Since being a rectilinear figure belongs to the definition of the triangle, having the external angle equal to the sum of the corresponding internal angles follows from the essence of the triangle and thus belongs to it in itself. But since being a rectilinear figure does not exhaust the essence of the triangle, having the external angle equal to the sum of the corresponding internal angles is not an attribute the triangle possesses in virtue of itself, hence it is not its proper attribute.

The universal demonstration is not the only kind of demonstration Giles takes into account: here it is sufficient to consider the opposite of universal demonstration, i.e. singular demonstration. Despite its name, singular demonstration does not concern singular terms or singular propositions at all; on the contrary, it is made out of universal affirmative propositions: it is called 'singular' because it is not concerned with the proper subject of the demonstrated attribute, but with one of its species, as in (D<sub>3</sub>):

every triangle has its internal angles equal to  $180^\circ$ ;  
 every isosceles is a triangle;  
 every isosceles has its internal angles equal to  $180^\circ$ .

Notice that the first premise in (D<sub>3</sub>) is the conclusion in (D<sub>1</sub>), and 'isosceles' is a species of 'triangle', the proper subject of the attribute 'having the internal angles equal to  $180^\circ$ '. As is clear, a singular demonstration depends on a universal one, hence it is not as powerful as it is.<sup>6</sup>

## 2. *The Aristotelian Text*

Given the crucial role played by the definitions of the subject and of the predicate within Giles's theory of demonstration, it is of the utmost importance for him to lay down an

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ium habet accensionem sanguinis circa cor; iratus appetit dolorem huiusmodi; ergo habet huiusmodi accensionem. Igitur accensio sanguinis, quae est diffinitio dicens quid irae, concluditur propter appetitum doloris in contrario, quae est diffinitio dicens propter quid. Si ergo ex his diffinitionibus duabus fiet una diffinitio tertia et dicatur quod ira est accensio sanguinis propter appetitum doloris in contrario, patet quod haec diffinitio continet conclusionem demonstrationis factae, quia continet diffinitionem dicentem quid et continet quodammodo praemissas, quia continet diffinitionem dicentem propter quid; ergo virtualiter est ista tota demonstratio. Sed haec diffinitio continens sic totum differt a demonstratione positione, id est ordine et situ, quia, ut communiter dicitur, non ordinata est in modo et in figura».

<sup>6</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. i 4ra16-22: "Rursus autem si haec 'omnis triangulus habet tres', quae fuit conclusio in demonstratione universali, accipiatur ut praemissa et concludatur per eam habere tres de aliqua specie trianguli, et fiat talis sillogismus 'omnis triangulus habet tres; ysocheles vel aequitibiarum est triangulus; ergo etc.', dicitur haec demonstratio esse particularis. Est ergo quaestio quae istarum demonstrationum est potior".

effective procedure for obtaining such definitions: thence the central importance of Giles's commentary on *APo* II 13, which is just devoted to the discovery of definitions.

The aim of *APo* II 13 is clearly stated by Aristotle at the beginning of the chapter: “[l]et us now say how we should hunt out the items predicated in what something is”;<sup>7</sup> since the items predicated in what something is constitute its definition, the chapter has the purpose of explaining how we can discover the definition of something. Yet, Aristotle's arguments are often obscure and difficult to understand. Modern commentators even disagree about the kinds of definitions Aristotle has in mind here: according to Ross<sup>8</sup> the chapter deals only with non-causal definition, whilst according to Barnes<sup>9</sup> and Mignucci<sup>10</sup> it encompasses both causal and non-causal definition. In *APo* II 9 Aristotle draws a distinction between things whose cause consists in something else and things which cause themselves. According to Ross, “[b]y the things that have a cause other than themselves Aristotle means, broadly speaking, properties and accidents; by those that have not, substances, the cause of whose being lies simply in their form”.<sup>11</sup> Thus, the definitions of the things which are the cause of themselves include only formal features of the thing to be defined; as such, they are immediate and principles, and they must be assumed or made clear «in some other way» than demonstration. On the contrary, the definitions of the things that have a cause other than themselves must contain a reference to such a cause, and their essence can be made clear by a demonstration – which is not, however, a demonstration of that essence. Since the definition of an attribute includes a reference to its cause – typically consisting in (some of the characteristics of) the subject in which it inheres –, we can call it ‘causal definition’. And since the definition of a subject/substance refers only to formal features of the *definiendum*, we can call it a ‘non-causal definition’. Now, since we must already know the definition of the subject and the predicate of a demonstration before formulating the demonstration itself<sup>12</sup>, definitions are among the principles of demonstration, and are discussed by Aristotle in the second book of the *Posterior Analytics*. According to Ross, in *APo* II 8-10 Aristotle shows that the causal definition of an attribute, although it cannot be demonstrated, can be made clear through a demonstration; and from the fact that Aristotle states in 93 b 21-24 that a non-causal definition can be made known by some method other than demonstration, Ross deduces that *APo* II 13 must exclusively deal with non-causal definition.

On the contrary, Barnes thinks that there is no hint in the text which can support Ross's interpretation. In particular, in 96 b 19-20 Aristotle says that we can determine to which category the *definiendum* belongs, and he makes as examples ‘quality’ and ‘quantity’; moreover, many Aristotelian examples of *definienda* are attributes.

Different assumptions about the kind of definition involved in *APo* II 13 deeply influence its interpretation. Ross conceives of it as a description of one, albeit articulated, method for discovering the definitions of the subjects of demonstration, i.e. species and genera in the

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<sup>7</sup> Trans. J. Barnes, *Aristotle. Posterior Analytics*, Clarendon Press, Oxford 1993<sup>2</sup> (Clarendon Aristotle Series), p. 64.

<sup>8</sup> Cf. *Aristotle's Prior and Posterior Analytics*, ed. W.D. Ross, Clarendon Press, Oxford 1949, p. 656.

<sup>9</sup> Cf. Barnes, *Aristotle. Posterior Analytics* (above, n. 7), p. 240.

<sup>10</sup> Cf. M. Mignucci, *Aristotele. Analitici Secondi. Organon IV*, Laterza, Bari 2007 (Biblioteca Universale Laterza 606), p. 321.

<sup>11</sup> Ross, *Aristotle's Posterior Analytics* (above, n. 8), p. 633.

<sup>12</sup> Cf. Arist., *APo* I 1, 71 a 14-16.

category of substance. In particular, according to him (a) in 96 a 24 – b 14 Aristotle asserts that the definition of a species must include all those items that individually have an extension larger than the species, but collectively have the same extension; (b) in 96 b 15-25 he shows how knowledge of the definition of the simplest species in a genus can enable us to infer the definitions of the more complex species; (c) in 96 b 25 – 97 b 6 Aristotle shows that the method of division can be helpful to check the correctness of the inductive method illustrated in (a); (d) finally, in 97 b 7-29 Aristotle shows how relevant it is to define the species before defining the genus they belong to. According to Barnes and Mignucci, on the other hand, *APo* II 13 is much more fragmentary in nature: in fact, they even think that it is not at all clear how many methods Aristotle is envisaging here, and how they are related to each other.<sup>13</sup>

Even if Ross's interpretation is not generally accepted, it is useful to follow his division of the chapter in order to analyze in more detail its content and to account for its different interpretations. The content of section (a) is not particularly controversial: Aristotle puts forward a method for discovering definitions which can be summarised as follows. Let S be the term whose definition is sought after. First, we must take all those attributes such that (i) they belong to S universally and necessarily;<sup>14</sup> (ii) they belong universally and necessarily to other terms than S, (iii) but do not extend beyond the genus to which S belongs. Now, to formulate the definition of S, we must assume the first set of attributes that meet conditions (i)-(iii) and whose conjunction does not extend beyond S: this set will constitute the definition of S. In more formal terms,<sup>15</sup> in order to discover the definition of S, first we must assume all those predicates  $A_1, A_2, \dots, A_n$  which satisfy the following conditions: (i\*) every S is necessarily an  $A_i$  ( $1 \leq i \leq n$ ); (ii\*) for some  $S' \neq S$ , every  $S'$  is necessarily an  $A_i$ ; (iii\*) for every  $S' \neq S$ , if every  $S'$  is necessarily an  $A_i$ , then S and  $S'$  belong to (are species of) the same genus. The essence of S will be the first conjunction  $\varphi^*$  of attributes  $A_1 \& A_2 \& \dots \& A_n$  such that every  $A_i$  meets conditions (i\*)-(iii\*): for, if  $\varphi^*$  were not the essence of S, it should have an extension larger than S (and hence it should be a genus of S, predicable of other terms than S), which is impossible by construction.

Aristotle gives as an example the definition of 'three', that is,  $\psi = \{\text{number, odd, prime both in the sense of being neither the product nor the sum of two integers}\}$ : each of the attributes in  $\psi$  (i) is universally and necessarily predicated of 'three', (ii) it belongs to terms other than 'three' – in particular, 'prime both in the sense of being neither the product nor the sum of two integers' belongs to 'two' either, for the unity is not considered as a number by Aristotle –, and (iii) it does not extend beyond the genus 'number'. And since the conjunction of the attributes in  $\psi$  is the first one which has the same extension of 'three', it will display the essence of 'three'.

Barnes makes two interesting remarks on Aristotle's argument.<sup>16</sup> First, he observes that Aristotle's method does not warrant that S has a unique essence. For, suppose that we have reached a set  $\varphi' = \{A_1, A_2, \dots, A_{n-1}\}$  such that both  $\varphi' + A_n$  – that is,  $\varphi$  – and  $\varphi' + B$  meet the

<sup>13</sup> On *APo* II 13 see also D. Charles, *Aristotle on Meaning and Essence*, Oxford U.P., Oxford 2000, pp. 221-39; D. Bronstein, *Aristotle on Knowledge and Learning*, Oxford U.P., Oxford 2016, pp. 189-222.

<sup>14</sup> For the addition of 'necessarily' – which does not occur in Aristotle's original formulation – to conditions (i)-(iii), see Barnes, *Aristotle. Posterior Analytics* (above, n. 7), p. 241; cf. also Mignucci, *Aristotele. Analitici Secondi* (above, n. 10), p. 287.

<sup>15</sup> Cf. Barnes, *Aristotle. Posterior Analytics* (above, n. 7), pp. 240-1.

<sup>16</sup> Cf. *ibid.*, pp. 241-2.

requirements for being the essence of S. Now, we can decide which between  $\varphi$  and  $\varphi'$  display the essence of S only if we can establish on the basis of an objective ordering which definition is reached first. According to Barnes, the rest of *APo* II 13 just aims at establishing what this objective ordering is.

Second, Aristotle's statement that, if  $\varphi^*$  is not the essence of S, then it is a genus of S, is not but an assumption in need of justification –  $\varphi^*$  could be a proper attribute of S. Barnes thinks that Aristotle is assuming that the  $A_i$ s in  $\varphi$  are arranged in an ordered set  $\psi = \langle A_1, A_2, \dots, A_n \rangle$  whose ordering relation is subsumption, i.e. for every  $i$ ,  $A_{i+1} a A_i$ , for in that case, if  $\varphi^*$  is not the essence of S and  $\varphi'^* a S$  does not hold, then  $\varphi'^*$  is a genus of S. However, that  $\psi$  is arranged according to subsumption is just another assumption in need of proof.

Section (b) = 96 b 15-25 is much more problematic: as Barnes puts it, “even its overall purpose is obscure”.<sup>17</sup> Aristotle says:

When you are dealing with some whole ( $\delta\lambda\omicron\nu\ \tau\iota$ ), you should divide the kind into what is atomic in form, i.e. into the primitives ( $\tau\grave{\alpha}\ \acute{\alpha}\tau\omicron\mu\alpha\ \tau\tilde{\omega}\ \epsilon\tilde{\iota}\delta\epsilon\iota\ \tau\grave{\alpha}\ \pi\rho\tilde{\omega}\tau\alpha$ ) (e.g. number into triplet and pair). Then you should try to get definitions of these items (e.g. of straight line and circle and right angle). After this, having got what the kind is (e.g. whether it is a quantity or a quality), you should study its proper attributes ( $\tau\grave{\alpha}\ \tilde{\iota}\delta\iota\alpha\ \pi\acute{\alpha}\theta\eta$ ) through the primitive common items ( $\delta\iota\grave{\alpha}\ \tau\tilde{\omega}\nu\ \kappa\omicron\iota\nu\tilde{\omega}\nu\ \pi\rho\tilde{\omega}\tau\omega\nu$ ).

For the characteristics of the items compounded from the atoms ( $\tau\omicron\tilde{\iota}\zeta\ \gamma\grave{\alpha}\rho\ \sigma\upsilon\nu\tau\iota\theta\epsilon\mu\acute{\epsilon}\nu\omicron\iota\zeta\ \acute{\epsilon}\kappa\ \tau\tilde{\omega}\nu\ \acute{\alpha}\tau\omicron\mu\omega\nu$ ) will be plain from the definitions, because definitions and what is simple are principles of everything, and it is of the simples ( $\tau\omicron\tilde{\iota}\zeta\ \acute{\alpha}\pi\lambda\omicron\tilde{\iota}\zeta$ ) alone that the characteristics hold in themselves – they hold of the other items in virtue of the simples (trans. Barnes, p. 65).

According to most ancient and medieval commentators, Aristotle is here giving instructions for studying an intermediate genus, i.e. a term which is intermediate between an ultimate species (*infimae species*) and a category (as ‘animal’ between ‘man’ and ‘substance’). First, one should divide the genus into its *infimae species* ( $\tau\grave{\alpha}\ \acute{\alpha}\tau\omicron\mu\alpha\ \tau\tilde{\omega}\ \epsilon\tilde{\iota}\delta\epsilon\iota\ \tau\grave{\alpha}\ \pi\rho\tilde{\omega}\tau\alpha$ ); then, try to get definitions of them, presumably by using the method discussed in section (a); third, determine the category to which the genus belongs; and finally, infer the appropriate *differentia* from those common to the species. This last step is justified in the second part of the section by the assertion that the attributes of a genus belong to it because they belong to the *infimae species* the genus is composed of.

The traditional interpretation is untenable according to modern commentators, however. Ross states that the expression  $\tau\grave{\alpha}\ \tilde{\iota}\delta\iota\alpha\ \pi\acute{\alpha}\theta\eta$  does not seem to refer to the *differentiae*, but rather to the proper attributes of a genus, that is, the in itself (*per se*) accidents whose study is the task of demonstration, not of definition. Moreover, it is unlikely that  $\tau\omicron\tilde{\iota}\zeta\ \sigma\upsilon\nu\tau\iota\theta\epsilon\mu\acute{\epsilon}\nu\omicron\iota\zeta\ \acute{\epsilon}\kappa\ \tau\tilde{\omega}\nu\ \acute{\alpha}\tau\omicron\mu\omega\nu$  refers to genera and  $\tau\omicron\tilde{\iota}\zeta\ \acute{\alpha}\pi\lambda\omicron\tilde{\iota}\zeta$  to the *infimae species* – indeed, the reverse should be expected. Finally, section (c), which deals with division, is relevant for defining *infimae species* and not genera.<sup>18</sup> Following Pacius, Ross maintains that  $\tau\omicron\tilde{\iota}\zeta\ \sigma\upsilon\nu\tau\iota\theta\epsilon\mu\acute{\epsilon}\nu\omicron\iota\zeta$

<sup>17</sup> Barnes, *Aristotle. Posterior Analytics* (above, n. 7), p. 242. Cf. also Mignucci, *Aristotele. Analitici Secondi* (above, n. 10), p. 288.

<sup>18</sup> Cf. Ross, *Aristotle's Posterior Analytics* (above, n. 8), pp. 657-8.

ἐκ τῶν ἀτόμων refers not to all but only to *primary infimae species*, i.e. the simplest species in the genus, whose study will allow us to deduce the properties of the other species from the attributes common to the primary and the complex species. For example, by studying the definitions of ‘two’ and ‘three’, which are primary *infimae species* of number, we could deduce the attributes of ‘six’ as following from the definitions of its factors.<sup>19</sup>

Yet, Barnes rejects Pacius’s interpretation by claiming (i) that Aristotle does not seem to restrict his discussion only to genera that have primary *infimae species*, and (ii) that at any rate this view leads to the false conclusion that all the attributes of the non-primary *infimae species* are attributes of primary *infimae species*. On his part, Barnes has no coherent interpretation of section (b) to submit. He reconstructs Aristotle’s argument as follows: “First pick out the atoms, and prove their attributes; for the attributes of non-atoms will be deducible from these; for attributes hold of non-atoms in virtue of holding for atoms”. But, as he himself remarks, the argument equivocates on the term ‘atom’, for it means successively *infima species*, ‘primitive term’, and ‘primitive subject of predication’ – which do not coincide.<sup>20</sup>

Mignucci suggests that what Aristotle has in mind here is that the reason why an attribute inheres in a complex term (i.e. the ὅλον τι of 96 b 15) depends on the definitions of the primary elements which constitute the complex term. For example, the reason why ‘having the sum of the internal angles equal to two right angles’ (= 2R) belongs to ‘triangle’ lies in the definitions of ‘line’ and ‘angle’, that is, of the primitive terms which constitute ‘triangle’. For ‘line’ and ‘angle’ – but not ‘triangle’ – are included in the definition of the attribute 2R, and hence 2R is a *per se* attribute of them. As Mignucci himself points out, however, this interpretation weakens the connection of section (b) with the rest of *APo* II 13, for then it should be considered as a digression meant to illustrate the role of definitions in science.<sup>21</sup>

Section (c) can be divided into two subsections. In 96 b 25 – 97 a 22 Aristotle shows that the method of division can be useful for the discovery of definitions – even if it cannot prove them, as he has made already clear in *APo* II 5. Barnes says that it is unclear whether the method of division can be useful either for checking the correctness of the procedure described in section (b) or for the ‘hunting’ of definitions in general<sup>22</sup> – in which case, it could be considered as either another method for discovering definitions or ancillary to the procedure described in section (a). According to Aristotle, the divisional method is useful for discovering definitions because (d<sub>1</sub>) it warrants that we take the essential attributes of S, i.e. the attributes in  $\varphi$ , in the right order; (d<sub>2</sub>) it warrants that we do not overlook anyone of the essential attributes of S; (d<sub>3</sub>) it is not open to the objection that, in order to carry it out, one must know anything. I shall overlook Aristotle’s discussion of (d<sub>3</sub>), for it does not bear very much in the overall interpretation of the chapter. As to (d<sub>1</sub>), here he merely restates the importance that the attributes that enter a definition are taken in the correct order, but he fails to explain how division could fulfill this task. Finally, the argument for (d<sub>2</sub>) is reiterated in the following subsection, hence I shall deal with it later on.

Likely, clauses (d<sub>1</sub>)-(d<sub>3</sub>) are not meant as conditions the method of division in itself must meet, but as conditions every method for discovering definitions must meet, the method of

<sup>19</sup> Ross, *Aristotle’s Posterior Analytics* (above, n. 8), pp. 658-9.

<sup>20</sup> Cf. Barnes, *Aristotle. Posterior Analytics* (above, n. 7), pp. 242-4.

<sup>21</sup> Cf. Mignucci, *Aristotele. Analitici Secondi* (above, n. 10), pp. 289-90.

<sup>22</sup> Cf. Barnes, *Aristotle. Posterior Analytics* (above, n. 7), p. 244.



division being a procedure by means of which this task can be achieved. From this point of view, the method of division is ancillary to the method(s) for discovering definitions. This impression is strengthened by the fact that in 97 a 23 – b 6 Aristotle, when restating the conditions to which the method of the division is useful for discovering definitions, mentions no more ( $d_3$ ), and he adds condition ( $d_0$ ), according to which the method warrants that we collect only the essential attributes of S, to ( $d_1$ ) and ( $d_2$ ). He states then that ( $d_0$ ) has to be met by resorting to the *topoi* described in *Top.* IV, that allow us to test whether X is a genus under which a species S falls or even whether X is a *differentia* of S, from which it follows that ( $d_0$ ) has nothing to do with division.

As far as ( $d_1$ ) is concerned, suppose we have collected all the attributes  $A_i$  in  $\varphi$ . In order to arrange the  $A_i$ s in the correct order we must select the  $A_i$  that has the larger extension, i.e. that is predicable of each of the other terms in  $\varphi$ , whilst no other term is predicable of it, that is, the  $A_i$  such that  $\forall j[(A_i \supset A_j) \ \& \ \neg(A_j \supset A_i)]$  holds. Then, one must repeat the same procedure on  $\varphi - A_i$ , and so on until all the terms in  $\varphi$  are exhausted. As Barnes notes, the procedure requires that at every step there exist a unique  $A_i$  for which  $\forall j[(A_i \supset A_j) \ \& \ \neg(A_j \supset A_i)]$  holds, which amounts to saying that the members of  $\varphi$  can always be ordered by subsumption.

The divisional method is able to meet also condition ( $d_2$ ) as follows. First, one must take the first element in  $\varphi$ , that is  $A_1$ , and single out a pair of opposite terms  $A_2$  and  $A_2^*$  such that every S which is  $A_1$  is  $A_2$  or  $A_2^*$ ; then, by grasping that every S is  $A_2$  (let us suppose), we form the new set  $(A_1, A_2)$ . Successively, one must apply the same procedure to  $(A_1, A_2)$  in order to find  $A_3$ . The procedure is completed when there is no further divisional pair, and one has got the set  $\varphi = (A_1, A_2, \dots, A_n)$ . As is clear, every  $A_i$  in  $\varphi$  belongs to the definition of S, because by construction every  $A_i$  is an essential predicate of S. Nor there can be any term X which is in the definition of S but not in  $\varphi$ , for in that case X will be either a genus or a *differentia* of S; but X cannot be the genus of S, because its genus is  $A_1$ ; and X cannot be a *differentia* of S, because  $\varphi$  cannot be further differentiated. As before, the argument is sound provided that the members of  $\varphi$  can always be ordered by subsumption.

In section (*d*) Aristotle introduces a new method for discovering definitions, whose relation with the inductive method expounded in section (*a*) is uncertain – it is unclear if the former is alternative or complementary to the latter. In order to discover the definition of S, one should consider first the individuals belonging to the same species and select the characteristics they have in common. Then, one should take into consideration other individuals belonging to the same genus as the first ones, but different in species from them, and again select the characteristics they have in common – and so on until the species in the genus are exhausted. At this point, if all the groups singled out have characteristics in common, those characteristics will constitute the definition of S; otherwise, the term S is ambiguous and hence cannot be defined univocally.

In other words, one should take into consideration the ultimate species  $S_1, S_2, \dots, S_n$  of the genus of S, and the sets of individuals that belong to them. Then, one should take those characteristics the individuals of each set have in common, let them be  $\varphi_1, \varphi_2, \dots, \varphi_n$  – notice that  $\varphi_i$  is the set of the characteristics common to the individuals that belong to  $S_i$ . At this point, one should form the set  $\varphi_S$  by taking the elements common to  $\varphi_1, \varphi_2, \dots, \varphi_n$  – that is,  $\varphi_S = \{ \varphi_1 \cap \varphi_2 \cap \dots \cap \varphi_n \}$ . Now, if  $\varphi_S \neq \emptyset$ , then the conjunction of the members of  $\varphi_S$  will be the definition of S; otherwise, if  $\varphi_S = \emptyset$ , S is ambiguous and cannot be defined univocally.

For example, let S be ‘magnanimity’. We should inquire what characteristics some magnanimous men share. Let us suppose that Alcibiades, Achilles, and Ajax have in common

intolerance of insult. Now, let us take some other magnanimous men, e.g. Socrates and Lysander, and be the characteristic they have in common their being indifferent to good and bad fortune.<sup>23</sup> If intolerance of insult and being indifferent to good and bad fortune have something in common, that will be the definition of magnanimity; otherwise, there will not be a unique definition.

The last part of section (d), that is 97 b 28-39, according to Barnes, contains four loosely connected notes: (i) every definition is universal, i.e. the *definiens* must be universally predicated of the *definiendum*; (ii) more general is a term, more difficult is to recognize its ambiguity; (iii) clarity is an essential feature of definition; (iv) metaphors cannot occur in definitions.<sup>24</sup>

To sum up, modern commentators disagree as to (q<sub>1</sub>) the kind(s) of definitions the procedure described in *APo* II 13 are concerned with, (q<sub>2</sub>) the number of methods for discovering definitions which are in fact described by Aristotle, (q<sub>3</sub>) the relationships among the methods which can be found in the text and consequently among the sections it can be divided into. As we have seen, Ross gives the most uniform interpretation, according to which the chapter deals with non-causal definitions and presents one method for discovering them. Barnes and Mignucci maintain that *APo* II 13 concerns every kind of definition, and they are uncertain about the question whether Aristotle is here offering us one method for discovering definitions, and about how the single parts of the chapter can be harmonized with each other.

### 3. Giles of Rome on Posterior Analytics II 13

Let us now turn to Giles of Rome's commentary on *APo* II 13, which includes *lectiones* XVII-XIX on the second book of the *Posterior Analytics*. In the *continuatio* – that is, the section which connects the chapter commented on with the preceding ones – which opens *lectio* XVII Giles says that Aristotle's discussion of definition in *APo* II has two main tasks: (i) to establish the relationship between essence (*quod quid est*, 'what something is') and demonstration, and (ii) to show how we can hunt out or inquire into essence. Having accomplished the first task in *APo* II 3-12, Aristotle now switches to the second one, whose discussion will keep him busy until *APo* II 18. In order to understand Aristotle's reasoning in this whole section of book II – Giles warns us – we must know that 'what something is', i.e. something's essence, is what is expressed by a definition, the middle term of the demonstration, and the cause of the predicate's belonging to the subject in the conclusion of a demonstration. Hence, we could not know how to hunt out 'what something is' without knowing how to hunt out the definition of something, and how to select the middle term and the cause of a demonstration. Consequently, in *APo* II 13, 96 a 24 – b 6 Aristotle teaches us the method for discovering the definition of the subject; in *APo* II 13, 96 b 7-39 he presents the method for discovering the definition of the predicate; finally, in *APo* II 14-18 he shows how to find the middle term and the cause of a demonstration.<sup>25</sup>

<sup>23</sup> Alcibiades, Achilles, Ajax, Socrates, and Lysander are not considered qua men, for in that case they would belong to the same species, but qua men intolerant to insult (Alcibiades, Achilles, Ajax) and qua men indifferent to bad and good fortune (Socrates, Lysander) – 'man' in the example acts rather as a genus.

<sup>24</sup> Cf. Barnes, *Aristotle. Posterior Analytics* (above, n. 7), pp. 249-50. I have already quoted Ross's more favorable reading. See also Mignucci, *Aristotele. Analitici Secondi* (above, n. 10), p. 293.

<sup>25</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. o 8rb37-56: "Dicebatur supra quod circa 'quod

According to Giles, then, in *APo* II 13 Aristotle actually describes two different procedures: the one, spanning sections (a)-(c), is useful for discovering the definition of the subject of the conclusion in a demonstration; the other, including section (d) only, is useful for discovering the definition of the attribute which is predicated of the subject in the conclusion of a demonstration. Thus, Giles's general interpretation of the chapter is at variance with modern commentators': it differs from Ross's insofar as Ross maintains that Aristotle only deals with the non-causal definitions, which are typical of subjects; and, even if they believe that Aristotle's arguments encompass both causal and non-causal definitions, Giles's view also differs from Barnes's and Mignucci's, since they do not think that Aristotle is here distinguishing between two methods for achieving definitions *according to the kind of the definition* – causal or non-causal – sought after.

But Giles's interpretation is different from his predecessors' as well. Even Robert Grosseteste thinks that Aristotle in *APo* II 13 lays down two methods for discovering definitions, precisely in 96 a 20 – 97 b 7, i.e. sections (a)-(c), and in 97 b 7-39, i.e. section (d). The first method, which Grosseteste labels *per compositionem* (by composition), is a process from simpler universals to compound universals, that is, a method for discovering the definition of an item by starting from what is more universal (its genera) and hence simpler.<sup>26</sup> The second method, called *per resolutionem* (by resolution), is a process from what is more compound (*inferiora*) to what is simpler (*superiora*), that is, a method for discovering the definition of an item starting from the individuals belonging to its genus.<sup>27</sup> But nowhere Grosseteste implies that the two methods concern different kinds of definition.

Introducing his commentary on *APo* II 13 Robert Kilwardby states that the final chapters of *APo* II (except for II 19) concern how to discover the middle term of a demonstration; and since the middle term of a demonstration can be both a non-causal and a causal definition

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quid est' duo principaliter intendebat Philosophus: primo quidem quomodo se haberet ad demonstrationem; secundo vero quomodo possemus venari et investigare 'quod quid'. Primo ergo declaratum est quomodo 'quod quid est' se habeat ad demonstrationem, et quod hoc intendebatur in praecedenti parte ex epilogo immediate habito, ubi dicitur *assignatum est*, id est ostensum est, *quomodo quod quid est sit inter terminos* sillogisticos et quomodo ipsius sit demonstratio. In hac autem parte intendit de secundo principaliter, videlicet quomodo possumus venari et investigare 'quod quid est'. – Propter quod sciendum quod ipsum 'quod quid est' est illud quod per diffinitionem exprimitur et etiam habet rationem medii demonstrativi et rationem causae, quia secundum omne genus causae potest formari diffinitio. Non ergo possemus sufficienter scire quomodo contingit venari 'quod quid est' nisi sciremus diffinitionem venari et nisi sciremus quomodo accipiendum sit medium et causa ad demonstrandum. — Ideo tria facit: quia primo dat artem quomodo accipienda sit diffinitio subiecti; secundo quomodo accipienda sit diffinitio passionis; tertio docet invenire medium et causam ad demonstrandum passionem de subiecto (secunda ibi *Quare autem oportet intendentem* [= II 13, 97 b 7; *Aristoteles Latinus* IV 1-4, *Analytica Posteriora*, edd. L. Minio-Paluello – B.G. Dod, Desclée de Brouwer, Bruges-Paris 1968 (= *AL* IV), p. 96.12]; tertia ibi *Ut habeamus autem proposita* [= II 14, 98 a 1; *AL* IV, p. 98.3]).

<sup>26</sup> Robertus Grosseteste, *Commentarium in Posteriorum Analyticorum libros*, ed. P. B. Rossi, Olschki, Firenze 1981, p. 364, lin. 3-9: "Ars autem diffiniendi est via inveniendi diffinitionem rei propositae secundum quod explicat quid est res proposita. Hec autem via duplex est. Una namque est *per compositionem*, et alia *per resolutionem*. Viam autem inveniendi diffinitionem componendo primo docet Aristoteles, eo quod hec via est sicut progressio ab universalibus et simplicibus in magis composita; via autem resolutionis est econtrario illi".

<sup>27</sup> Grosseteste, *Commentarium in Post. An.*, p. 376.256-259 Rossi: "Cognita sic arte diffiniendi per viam compositionis, consequenter Aristoteles docet venari diffinitionem per viam resolutionis, hoc est per viam accipiendi primo compositiora, hoc est inferiora, et ascendendi ab ipsis per partitionem usque ad superiora simpliciora".

– i.e. both the definition of the subject and the definition of the predicate in the conclusion –, Aristotle first deals with non-causal definitions in *APo* II 13, whilst he takes into consideration causal definitions in *APo* II 14-18. As we have seen, however, non-causal definitions can be given not only of subjects but also of attributes. Hence, according to Kilwardby, in sections (a)-(c) Aristotle explains how to discover non-causal definitions of subjects, whilst in section (d) he explains how to discover non-causal definitions of attributes.<sup>28</sup> Moreover, in sections (a)-(c) Aristotle puts forward two methods for discovering the definition of a subject, the first of which, discussed in sections (a)-(b), yields only plausible (*probabiles*) results, the second, discussed in section (c), yields instead necessary results.<sup>29</sup>

Albert the Great strictly follows Kilwardby as far as the overall structure of *APo* II 13 is concerned. At the end of his exposition of the procedure described in section (a) for discovering the definition of an ultimate species, Albert says that the discourse obtained by means of such a procedure “necessarily is the essence (i.e. the essential definition) of the thing defined, which is a species as the subject of a demonstration”.<sup>30</sup> Moreover, Albert opens his exposition of section (d) by saying that “in order to discover the definition of an attribute (*passio*), which is not an entity in itself, but insofar as it tends towards something as to the subject in which it has its being, it is necessary etc.”<sup>31</sup> And he ends his commentary by carefully remarking that the definition that can be achieved by using the procedure described in section (d) is *only* the essential definition of an attribute, for this is the only kind of definition that can be reached through logic: to discover causal definitions is the task of ontology<sup>32</sup> – although this does not prevent Albert from stating that the discussion starting in *APo* II 14 is about the discovery of causal definitions.<sup>33</sup> Unlike Kilwardby, however, Albert seems to consider the procedure described by Aristotle in sections (a)-(c) as unique.

Thomas Aquinas agrees with Robert Kilwardby and Albert the Great about the overall aim of *APo* II 13, for he opens his commentary on this chapter by asserting that Aristotle, after having shown the relationships between essential and causal definitions on one side and demonstration on the other, goes on showing how both kinds of definition can be

<sup>28</sup> The clearest statement of this view can be found in the introductory remark to the commentary on section (d): “Postquam Aristotiles determinavit artem inueniendi quod quid est eius quod hoc <in hoc est> et ut per se stans, hic intendit dare artem accipiendi quod quid est eius quod hoc in hoc est et non per se stans, sed inclinatum ad alterum, et sic se habet passio, si considereretur ut ens in substantia”. Cf. D. Cannone, *Le Notule Libri Posteriorum di Robert Kilwardby nella tradizione esegetica latina medievale del XIII secolo*, PhD diss., Università di Cassino - Università ‘La Sapienza’ Roma 2004, vol. II, p. 471.5-8.

<sup>29</sup> Kilwardby, *Notule Posteriorum*, p. 457.17-20 Cannone: “Et dividitur [sc. 96 a 20 – b 35] in duo: in prima determinat quamdam(!) uiam probabilem ad accipiendum diffinitionem; in secunda, cum dicit: *sed divisiones que sunt* [sc. 96 b 25-35] determinat aliam que cum diuisionibus communibus necessaria est ad accipiendum diffinitionem speciei”.

<sup>30</sup> Albertus Magnus, *Liber Posteriorum Analyticorum*, ed. A. Borgnet, Vives, Paris 1890, p. 209a: “Hanc enim orationem ex omnibus diuidentibus ad illud ordinatis sic collectam, necesse est substantiam (hoc est, substantialem diffinitionem) esse rei diffiniendae quae est species ut subjectum demonstrationis”.

<sup>31</sup> Albertus Magnus, *Liber Posteriorum*, p. 215b Borgnet: “Intendentem autem ad inueniendam diffinitionem passionis, quae non est ut ens stans per seipsum, sed sicut ens in hoc quod inclinatum ad aliquid sicut ad subjectum in quo habet esse, oportet quaerere...”. Albert here is quoting Kilwardby almost *verbatim*; cf. the text quoted in n. 28.

<sup>32</sup> Albertus Magnus, *Liber Posteriorum*, p. 216b Borgnet: “Sic igitur colligitur diffinitio passionis quae dicit quid tantum passio, quae est ex communibus quae considerat logicus. Diffinitio enim passionis quae dicit quid et propter quid, quia est propria scientiae metaphysicae, reservanda est ei”.

<sup>33</sup> Cf. *ibid.*, p. 218a.

discovered; and while *APo* II 13 is devoted to essential definition, the discussion on causal definition starts on II 14.<sup>34</sup> Unlike Kilwardby and Albert, however, Thomas never alludes to the distinction between subjects and attributes: even if he thinks that sections (a)-(c) and section (d) contain two different procedures for discovering definitions, Thomas does not believe that they concern or yield as a result different kinds of essential definitions. In particular, he assumes that in sections (a)-(b) Aristotle shows what the things that constitute the essence of something are, and that in sections (c) and (d) he provides us with two methods for discovering definitions, the one, the most appropriate, based on the division of a genus, the other based on sameness and difference.<sup>35</sup>

It is worth noticing that Giles, unlike Kilwardby and Albert, believes that the outcome of the method described in section (d) is the genuine *causal* definition of an attribute, not a ‘mere’ essential definition. This is clear from the *continuatio* which opens *lectio* XIX, where Giles states that, whilst in the foregoing Aristotle has given us the method for discovering definitions suitable for subjects/substances, that is, definitions made out of genus and *differentia*, in section (d) he teaches us to discover definitions suitable for attributes, that is, definitions which include either the cause in virtue of which the attribute inheres in its subject or the subject itself<sup>36</sup>. Hence, if compared with the preceding tradition, Giles’s overall interpretation of *APo* II 13 is characterized by two assumptions: (i) in section (a)-(c) Aristotle explains how to discover non-causal definitions of subjects; (ii) in section (d) he explains how to discover causal definitions of attributes.

That *APo* II 13 can be divided into two parts dealing respectively with the definitions of subjects and the definitions of attributes is a view that Giles shares with Kilwardby and Albert. It is unlikely that this view can have arisen from the mere consideration that Aristotle’s example in section (d) concerns an attribute, i.e. magnanimity, for there is no hint in the text suggesting that the method worked out here is restricted to attributes, and Aristotle sometimes uses attributes like ‘triangle’, as we have seen, for exemplifying subjects of demonstration.

More likely, the view upheld by Kilwardby, Albert, and Giles stems from their conception of *demonstratio potissima*. There was considerable disagreement among medieval

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<sup>34</sup> Thomas Aquinas, *Expositio Libri Posteriorum*, in Sancti Thomae de Aquino *Opera Omnia*, t. I\* 2, Commissio Leonina - J. Vrin, Roma - Paris 1989, p. 220, lin. 1-7: «Postquam Philosophus ostendit qualiter ‘quod quid est’ et ‘propter quid’ se habeant ad demonstrationem, hic ostendit quomodo possint investigari. Et primo quomodo investigetur ‘quod quid est’; secundo quomodo investigetur ‘propter quid’, ibi: Ad habendum autem problemata etc. [sc. 98 a 1 ff.]”.

<sup>35</sup> Thomas Aquinas, *Expositio Posteriorum*, p. 223.1-11: “*Congruum autem est, cum totum aliquod etc.* [= 96 b 15 = (c)]. Postquam Philosophus ostendit qualia oporteat esse ea quae constituunt diffinitionem significantem essentiam rei, hic ostendit qualiter debeant investigari. Et circa hoc duo facit: primo proponit modum maxime conuenientem ad inuestigandum ea quae sunt in diffinitione ponenda, scilicet per divisionem generis; secundo ponit quendam alium modum, per similia et differentia, ibi: *Querere autem oportet etc.* [= 97 b 7 = (d)]”.

<sup>36</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 4vb46-59: “Postquam Philosophus dedit artem diffiniendi quae magis competit ipsis subiectis vel ipsis substantiis, cuiusmodi est diffinitio constans ex genere et differentia, in parte ista docet accipere diffinitionem magis competentem ipsis passionibus, quae non sufficit fiat per genus et differentias, sed oportet quod fiat per causam quam habet in subiecto, vel oportet quod fiat per ipsum subiectum. Cum ergo volumus diffinire aliquam passionem, debemus videre ea in quibus habet esse illa passio quomodo conueniant et quomodo differant, et ex conuenientiis et differentiis poterimus formare unam rationem passionis quaesitae, dum tamen quaesita passio habeat rationem unam. Immo haec methodus et haec ars docebit nos cognoscere utrum passio diffinienda habeat rationem unam et quae sit illa una ratio”.

commentators about the nature of this kind of demonstration. They all agreed that a *demonstratio potissima* proves that a proper attribute inheres in its subject, but there was fierce disagreement about the middle term of this kind of demonstration – the definition of the subject according to some authors, the definition of the attribute according to others. Robert Kilwardby, Albert the Great, and Giles of Rome held to the view that the middle term in a *demonstratio potissima* is the definition of the attribute,<sup>37</sup> and it is likely that the relevance of the definition of the attributes within their theory of demonstration has led them to find, in the cumbersome discussion of *APo* II 13, a place where this kind of definition is explicitly discussed – section (*d*) being the only plausible candidate to this role. In this respect, it is not irrelevant that Robert Grosseteste, who, like modern commentators, was not concerned with the problem of the middle term of *demonstratio potissima*, and Thomas Aquinas, who instead held to the theory according to which the definition of the subject is the middle term of such a demonstration, drew no distinction in this context between definitions of subjects and definitions of attributes.

It remains to explain why according to Kilwardby and Albert the procedure described in section (*d*) leads to the discovery of essential definitions, whilst according to Giles it leads to the discovery of causal definitions. The reason for their disagreement seems to be their different interpretations of *APo* II 14-18. As we have seen, in Kilwardby's and Albert's opinion, this section of the text deals with the discovery of causal definitions. As Kilwardby puts it at the beginning of his commentary to *APo* II 14, Aristotle, after having established the method for discovering the 'what something is', i.e. the essential definition of something, determines the method for discovering that because of which something is, or its cause.<sup>38</sup> This assumption can have persuaded Kilwardby that the essential definition of attributes 'must' be at issue in *APo* II 13: for since subjects have essential definitions only, attributes have both essential and causal definitions, and the causal definitions of attributes are treated in *APo* II 14-18, for the sake of completeness the essential definitions of attributes must be dealt with as well – and *APo* II 13, 97 b 7-29 is the only section of the text that can plausibly contain such a discussion.

On his part, Giles of Rome has a different interpretation of *APo* II 14-18. He starts his commentary on *APo* II 14 in *lectio* XX by stating that, since Aristotle has given us the method for discovering the (causal) definitions of attributes (in 97 b 7-29), and the definition of the attribute is the middle term of a demonstration, i.e. of a *demonstratio potissima*, here he moves on to teach us how to discover the middle term of a demonstration. And Giles – probably arguing just against his predecessors, not only Kilwardby and Albert, but also Aquinas – carefully warns us that the content of *APo* II 14-18 is different from that of the foregoing chapters because one thing is to know how definition and demonstration are related each other (*APo* II 3-10), another thing is to give the method for discovering definitions and to show how a definition must be taken (*APo* II 13), another thing is to say how the middle term is related to demonstration and how it is possible to demonstrate by means of each of the four causes (*APo* II 11-12), and still another thing is to give the method for discovering

<sup>37</sup> According to them, the most powerful demonstration is a demonstration that proves that an attribute A inheres in its proper subject S by means of the definition of the attribute itself:  $df(A)aA, Sa_{df}(A) \rightarrow SaA$ .

<sup>38</sup> Kilwardby, *Notule Posteriorum*, p. 475.5-6 Cannone: "Postquam determinauit artem inueniendi quod quid est, hic determinat artem inueniendi propter quid est siue causam".

the middle term of a demonstration (*APo* II 14-18).<sup>39</sup> Giles has a point here, for in particular demonstrations like ( $D_3$ ) the middle term is the proper subject of the attribute, whilst in universal demonstrations like ( $D_1$ ) the middle term is the cause for which the attribute inheres in the subject, and clearly there cannot be one unique method for finding the middle term both in particular and in universal demonstrations – and above all the method for finding the middle term of a particular demonstration cannot also be the method for discovering the definition of an attribute. Moreover, even in the process of finding the suitable middle term of a universal demonstration one has to take into consideration other things than the definitions of the subject and of the attribute,<sup>40</sup> such as whether the same attribute inheres in different subjects for the same cause or not. For example, the increase in the flow of the river Nile by the end of the month is caused by the increase in humidity which occurs in that period; and the cause of the increase in humidity by the end of the month is the waning of the moon. Hence, both the increase in the flow of the Nile and the increase in humidity by the end of the month have the same cause, i.e. the waning of the moon. Not in the same way, however, for the increase in the flow of the Nile by the end of the month is caused directly by the increase in humidity, and indirectly by the waning of the moon in that period; but the increase in humidity by the end of the month is caused directly by the waning of the moon.<sup>41</sup>

All in all, Giles's interpretation of *APo* II 14-18 seems more adequate than his predecessors'. On the other hand, his interpretation of section (*d*) as containing a procedure for discovering causal definitions of attributes seems to be imposed by his views on the various kinds of definitions an attribute can be. As we have seen, for Giles the essential definition of an attribute can be proven, whereas its causal definition is a principle of demonstration and as such it cannot be demonstrated. But if the causal definition of an attribute is a principle of demonstration, there must be another way for knowing it than demonstration – otherwise, demonstration itself would be impossible. Hence, there must be a section in the *APo* where Aristotle teaches us how to discover such a kind of definition, and 97 b 7-29 seems to be the most suitable one. But then, Giles's interpretation of section (*d*) seems to be residual as much

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<sup>39</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 6rb49-60: "Postquam Philosophus dedit artem diffiniendi passionem, quia diffinitio passionis est medium in demonstratione, ideo postquam venatus est quo modo accipienda sit diffinitio passionis, in parte ista venatur quo modo accipiendum sit medium in demonstratione. Unde hoc quod hic traditur differt ab eo quod superius tradebatur: nam aliud est scire quo modo diffinitio se habeat ad demonstrationem, et aliud est dare artem diffiniendi et ostendere quo modo diffinitio accipienda sit, et aliud est ostendere quo modo medium se habeat ad demonstrationem et declarare quo modo contingit demonstrare per singula genera causarum, quod fiebat in superioribus, et aliud est dare artem inveniendi medium ad demonstrandum, quod fit hic".

<sup>40</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 6rb60 - va5: "Sciendum ergo quod venari et invenire medium in demonstratione est dupliciter, quia aliter accipitur medium in demonstratione particulari, aliter in universali. Nam in demonstratione particulari medium est ipsum subiectum, ut per triangulum demonstratur / habere tres particulariter de ysochele; sed in demonstratione universali medium est causa inhaerentiae passionis in subiecto. Ad investigandum autem hanc causam multum valet scire problemata et quomodo demonstrabilia diversimode ad invicem identitatem habent".

<sup>41</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 8ra21-30: "Augmentationis enim Nili in fine mensis causa est maior humiditas circa finem mensis; et causa maioris humiditatis circa huiusmodi finem est defectus lunae. Ista ergo duo problemata, videlicet propter quid in fine mensis crescit Nilus et propter quid in fine mensis crescunt humida, reducuntur in unam causam, videlicet in defectum lunae. Non tamen eodem modo, sed modo subalternativo, quia unum reducitur per aliud. Nam augmentum Nili reducitur in defectum lunae tamquam in causam per augmentum humidi, et hoc appellat habere medium sub medio. Haec ergo problemata sic se habent ad invicem quia aliquo modo sunt eadem, aliquo modo diversa".

as Kilwardby's and Albert's.

Giles's understanding of section (*d*) – and consequently of *APo* II 13 as a whole – seems to be too much determined by his will to find at all cost unity and systematicity in a text that is very far from being unitary and systematic. Giles himself seems to be aware that his interpretation runs into difficulty. As is clear also from his example, Aristotle does allow that the same attribute can inhere in individuals who belong to two or more species of the same genus. This seems to imply that by means of the procedure described in section (*d*) one cannot define proper attributes (*passiones*), for a proper attribute cannot extend further than the species it belongs to – as we have seen, in the same subject only one proper attribute can inhere. Giles addresses the question in a specific *dubitatio*,<sup>42</sup> but his answer is not very satisfactory. For he replies that, if one takes the expression 'subject of an attribute' in the strict sense, insofar as it signifies the subject of its proper attribute, then to one subject cannot correspond but one attribute. But if the expression 'subject of an attribute' is not taken in the strict sense, then it is possible that the same attribute inheres in (specifically) different subjects. In fact, following Aristotle's example, 'to be magnanimous' belongs both to 'intolerant man' – for some men are said to be magnanimous because they cannot tolerate insults – and to 'tolerant man' – because some men are said to be magnanimous because they are indifferent to bad and good fortune. And 'tolerant' and 'intolerant' can belong to the same genus, even if they cannot belong to the same species<sup>43</sup>. Yet, this boils down to conceding that the method does not necessarily result in the definition of a proper attribute.

Giles's answer to (*q*<sub>1</sub>) is then clear: in *APo* II 13 Aristotle teaches us how to discover essential definitions of subjects and causal definitions of proper attributes; he accomplishes the first task in sections (*a*)-(*c*), the second in section (*d*). Let us now turn to questions (*q*<sub>2</sub>) and (*q*<sub>3</sub>).

According to Giles, in sections (*a*)-(*c*) Aristotle actually describes two methods for finding (essential) definitions of subjects: the first (*M*<sub>1</sub>), explained in sections (*b*)-(*c*), is absolutely (*simpliciter*) valid, and leads to definitions made out of proper genus and specific *differentia*; the second (*M*<sub>2</sub>) – put forward in section (*a*) – is valid in certain cases only (*in casu*), when we do not know the specific *differentia* of the *definiendum*, and in its place we assume attributes that individually have a larger extension than the *definiendum*, but taken collectively have the same extension. Thus, Giles agrees with Kilwardby that sections (*a*)-(*c*) contain two

<sup>42</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 5rb19-22: "Dubitaret forte aliquis de superiori littera, quomodo possit contingere quod una et eadem passio sit in aliquibus quae sunt eiusdem generis et sint ad se invicem alteri specie".

<sup>43</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 5va22-43: "Dicendum quod, si acciperetur subiectum passionis secundum quod illi passioni subicitur, semper uni passioni responderet unum subiectum. Sed quia aliquando accipitur subiectum passionis non secundum omnino debitam rationem, ideo contingit quod eiusdem passionis accipiatur alterum et alterum subiectum. Ut magnanimitas accipietur subiectum 'non tolerans' quidem quantum ad eos qui non potuerunt sufferre iniurias, 'tolerans' autem quantum ad eos qui omnia aequo animo tolerabant. 'Tolerans' autem et 'non tolerans' possunt esse in eodem genere, sed non possunt esse in eadem specie; non tolerantibus igitur sunt sibi ipsis idem specie, sed illorum, id est ab illis, qui toleraverunt sunt alteri specie: non enim hic loquimur de specie substantiarum secundum se (nam tam tolerantibus quam non tolerantibus fuerunt homines, omnes erunt eiusdem speciei), sed hic loquimur de specie subiectorum in ordine ad magnanimitatem vel ad quamcumque aliam passionem. Nam Alchibiades, Achilles et Ayax habuerunt ordinem ad hanc passionem quae est magnanimitas per intolerantiam; Alexander et Socrates per tolerantiam; tolerantia autem et intolerantia non sunt eiusdem speciei, licet possint esse eiusdem generis. Hoc ergo modo eadem passio potest competere his qui sunt idem genere et alteri specie, quia non omnino proprie et directe acciperetur illud secundum quod inest talis passio; sed si acciperetur omnino proprie et directe, semper eiusdem passionis esset eadem ratio".



methods for discovering definitions, the first of which yields only plausible results, while the second yields instead necessary results.<sup>44</sup> But he disagrees with Kilwardby about the role of section (b): for, according to Kilwardby it is part of the method which yields plausible results, whereas according to Giles it is part of the method which yields necessary results. We shall see in a short while what this disagreement amounts to.

As to (M<sub>2</sub>), Giles's interpretation is not different from the modern commentators': the method consists in taking all those attributes of the *definiendum* which belong to S universally and necessarily, which belong universally and necessarily to other terms than S, but do not extend beyond the genus to which S belongs; then, the definition of S will be the first set of attributes which meet such conditions and whose conjunction does not extend beyond S.

Yet, in a *dubitatio* Giles makes an interesting remark about the ordering relation of the elements in  $\varphi$ . The question discussed in the *dubitatio* is whether (M<sub>2</sub>) can yield true definitions (*utrum secundum veritatem posset fieri diffinitio secundum hunc modum*). Giles's answer is negative, which is also the reason why (M<sub>2</sub>) is deemed by our author to achieve only plausible definitions.<sup>45</sup> Briefly stated, his argument is that the terms in the definitions formulated according to (M<sub>2</sub>) must stand each other in the relation of subsumption: that is, if 'X<sub>1</sub> & X<sub>2</sub>' is the definition of Y established by an application of (M<sub>2</sub>), then it must be the case that (i) X<sub>1</sub> ∩ X<sub>2</sub> ≠ ∅, (ii) ∃a(a ∈ X<sub>1</sub> & a ∉ X<sub>2</sub>); (iii) ∃b(b ∈ X<sub>2</sub> & b ∉ X<sub>1</sub>).<sup>46</sup> But a true definition is made out of the proper genus and the specific *differentia* of the *definiendum*, and the specific *differentia* cannot extend further than its genus. Hence, (M<sub>2</sub>) cannot produce true definitions.<sup>47</sup> Notice that this is

<sup>44</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. o 8va5-13: "sciendum quod ars ad accipiendum diffinitionem subiecti est duplex: una quae est bona simpliciter, et alia quae est bona in casu. Ars bona simpliciter est ut accipiat proprium genus et propria differentia; ars autem bona in casu est ut quando ignoratur propria differentia, quod loco propriae differentiae accipiantur aliqua plura, quorum quodlibet se habeat in plus et omnia in aequae. Duo ergo facit: quia primo dat artem diffiniendi subiectum quae est bona in casu; secundo dat artem quae est bona simpliciter (ibi *Congruum autem est [= APO II 13, 96 b 15; AL IV, p. 93.12]*)».

<sup>45</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, ff. o 8v43 - p 1ra21: "Dicendum quod non. Nam quod aliqua sic se habeant respectu alicuius, quod quodlibet illorum se habeat in plus et totum in aequae, hoc esse non potest nisi quia illa duo se habeant sicut excedentia et excessa. (...) Quod ergo aliqua duo sic se habeant respectu alicuius, quod quodlibet sit in plus et totum in aequae, hoc esse non poterit nisi quodlibet illorum duorum restringat aliud. Et si quodlibet vel si utrumque restringat utrumque, utrumque erit restringens et restrictum, et per consequens utrumque erit excedens et / excessum. Nam non restringit nisi quod excedit et non restringitur nisi quod exceditur; esse ergo restringens et restrictum est esse excedens et excessum. Sed impossibile est secundum veritatem in diffinitionem esse aliqua duo sic se habentia sicut excedentia et excessa. Nam in diffinitione sunt genus et differentia; vel, si sunt ibi plures differentiae, hoc erit secundum ordinem praedicamentalem, quarum una erit differentia generis superioris et alia inferioris. Genus ergo et differentia non possunt se habere sicut excedentia et excessa, quia differentia non se extendit extra genus. Rursus duae differentiae ordinatae secundum ordinem praedicamentalem non possunt sic se habere, si bene datae sint. Nam differentia generis inferioris, si bene data sit, non poterit excedere differentiam generis superioris. Talis ergo diffinitio, continens plura quorum quodlibet est in plus et totum in aequae, non erit diffinitio vera, sed poterit esse supplens in esse diffinitionis verae. Iste ergo modus diffiniendi traditus hic a Philosopho non est bonus simpliciter, sed est bonus respectu nostri, et est bonus in casu, ut diximus in continuando litteram. Nam, quia nobis sunt ignotae differentiae propriae, ut supra diximus, ideo hic modus est nobis competens, quia post diffinitionem continentem differentiam propriam, haec diffinitio est congruentior, quod continet aliqua quorum quodlibet sit in plus et totum in aequae, ut est ex quaestione praehabita manifestum".

<sup>46</sup> To meet conditions (i)-(iii) is what Giles has in mind when he says that two terms stand with each other in the relation of *excedens* and *excessum*.

<sup>47</sup> Giles's claim that every definition reached by applying (M<sub>2</sub>) must be made out of terms that stand with each other in the relation of *excedens* and *excessum* seems to be too strong; but surely it can be the case that the terms in an (M<sub>2</sub>)-definition stand with each other in such a relation – and this is already enough to disqualify (M<sub>2</sub>). For, if 'X<sub>1</sub> & X<sub>2</sub>'

the same as saying that the terms in a true definition must be ordered by subsumption – a point on which Giles agrees with Barnes, even if they differ from each other about the nature of  $(M_2)$ .

In Giles's opinion the discussion of  $(M_1)$  includes sections (b) and (c), i.e. 96 b 15 – 97 a 39. Giles divides this portion of the text into four main parts: (i) 96 b 15-25 contains the proper exposition of  $(M_1)$ ; (ii) then, in 96 b 25 – 97 a 6 Aristotle describes the conditions on which  $(M_1)$  can be applied; (iii) in 97 a 6-22 he shows that  $(M_1)$  can effectively be used, by rejecting the view that in order to apply it one has to know everything; (iv) finally, in 97 a 23-39 Aristotle sums up  $(M_1)$  and shows its soundness.

It is important to note that, according to Giles, section (b) describes the method for discovering true definitions of species in the category of substance – the foremost subjects of demonstration –, and that such definitions, insofar as they are essential, are made out of genus and *differentia*. Giles's view is thus at odds with his predecessors', according to whom section (b) describes the method for discovering definitions of intermediate genera, and in this way integrates section (a), where the method for discovering definitions of species is given.<sup>48</sup> That it is a species that whose definition  $(M_1)$  is meant to discover seems to be confirmed also by a *notandum* where Giles explains Aristotle's reference to 'whole' (*totum*) in 96 b 15 in a way that can include species as well: the thing to be defined in  $(M_1)$  is called 'whole' by Aristotle for the reason that, since the definition, i.e. the *definiens*, is constituted of parts, the *definiendum* must be constituted of parts as well; but what is constituted of parts is a whole.<sup>49</sup>

As a consequence of his interpretation, Giles states that the first step in  $(M_1)$  is to divide a genus into its ultimate species (*species specialissimae*) (96 b 15-19). Yet, this step does not aim at defining the genus itself, but to determine the proper genus of the species to be defined, for only a genus that divides itself into its ultimate species is their proper genus.

Having found the proper genus of the *definiendum*, the next step is to determine its proper *differentia* (96 b 19-22). From the proper genus we can infer the category to which the *definiendum* belongs; then, we must determine the proper attributes of such a category, by means of which we can single out the proper *differentia* of the *definiendum*. How this task can be fulfilled is explained by Giles as follows. Suppose we have to discover the definition of man. Now, it is easy to determine what pertains to man and does not pertain to other animals. But we can establish whether that thing is the proper *differentia* of man only by means of what is proper of substance – the category to which man belongs. For example, suppose we have established that 'able to laugh' tells man apart from other animals; it would be wrong to deduce from this alone that 'able to laugh' is the proper *differentia* of man. Instead, we have to take into consideration what is proper of substance; and since 'able to laugh' does not pertain to substance, then 'able to laugh' will not be the proper *differentia* of man. Giles gives us another example. Suppose that only triangles are white. Then white will differentiate the triangle from all other items in the category of quantity. But this does not imply that white is the proper *differentia* of the triangle, for white does not pertain to the category of quantity, in that white is neither divisible nor extended.<sup>50</sup>

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is the definition of Y established by an application of  $(M_2)$ , then (j)  $X_1 \supset Y$ , (jj)  $X_2 \supset Y$ , (jjj)  $X_1 \cap X_2 = Y$ . Now, conditions (j)-(jjj) are compatible with conditions (i)-(iii), but do not imply them – it could be the case that  $X_1 \supset X_2 \supset Y$ .

<sup>48</sup> This applies both to the authors who believe that the method at issue yields only plausible results, as Kilwardby, and to the authors who believe it to yield necessary results, as Robert Grosseteste and Thomas Aquinas.

<sup>49</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 2ra2-12.

<sup>50</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 2ra40-63: "(...) facile est videre quid competit

From Giles's second example it seems to follow that a necessary condition for an item *d* to be the *differentia* of a species *S* is that (*d*<sub>1</sub>) the attributes pertaining to the category of *S* belong to *d* as well – and since 'divisible' and 'extended', which are immediate attributes of 'quantity', are not predicable of 'white', then 'white' cannot be the *differentia* of 'triangle'. In this respect, it is worth noticing that according to Giles the reason why one must resort to the proper attributes of a category in order to determine the proper *differentia* of the *definiendum* is made clear by Aristotle in 96 b 22-25 as follows. Let  $\langle A_0, A_1, \dots, A_n \rangle$  be a predicative line stretching from the more universal genus (*genere generalissimum*)  $A_0$  to the ultimate species  $A_n$ . Since for every *i, j* such that  $i > j$ ,  $A_i \text{ } a A_j$ , if  $A_0 \text{ } a P$ , then  $A_n \text{ } a P$ . But *P* belongs to  $A_0$  as such, whilst *P* belongs to  $A_n$  not as such, but in virtue of  $A_0$ . Hence, we have to consider what is common to all (the items in) a category in order to determine the proper *differentia* of the *definiendum*.<sup>51</sup>

Another necessary condition for an item *d* to be the *differentia* of a species *S* is that (*d*<sub>2</sub>) *S* is the only species in its category to have *d* – or that *d* tells *S* apart from all the other species in its category. Yet, it is not clear if (*d*<sub>1</sub>) and (*d*<sub>2</sub>) taken together could constitute also a sufficient condition for an item to be the *differentia* of a given species. For example, 'rational' is often taken as the specific *differentia* of 'man', but it does not seem to possess – precisely as 'able to laugh' – the immediate attributes of substance.

In 96 b 25 – 97 a 6 Aristotle puts forward the conditions which (*M*<sub>1</sub>) must meet in order to be effectual: (*M*<sub>1</sub>) must enable us (*c*<sub>1</sub>) to take only the essential attributes of the *definiendum*; (*c*<sub>2</sub>) to take such attributes in the correct order; (*c*<sub>3</sub>) to take all the essential attributes of the *definiendum*. How (*M*<sub>1</sub>) can meet these conditions is explained both in this subsection and in 97 a 23-39,<sup>52</sup> but I shall omit a detailed analysis of Giles's commentary on these texts, in that his views here do not show peculiar differences from both his predecessors' and modern commentators'. What is interesting to notice, on the contrary, is the role Giles assigns to section (c) as a whole. In fact, he does not consider the content of this section as a new method for discovering definitions, like e.g. Kilwardby, but as a proof of the effectivity of (*M*<sub>1</sub>). This entails that according to Giles division is not an alternative method for discovering definitions, a fact of which he seems to be aware.

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ita homini quod non competit alii. Sed utrum id sit propria differentia quae debeat ingredi diffinitionem eius, ad hoc investigandum regulamur per ea quae sunt propria ipsi substantiae, quod est generalissimum praedicamentum. Ut si videmus quod per risibile differt homo ab omnibus aliis, non statim deberemus currere ad accipiendum risibile tamquam propriam differentiam, sed per ea quae sunt propria ipsi generi generalissimo et ipsi praedicamento substantiae debemus videre utrum risibile pertineat ad praedicamentum substantiae; ex hoc poterit colligi et haberi quod risibile non sit propria differentia hominis. Propria ergo toti praedicamento quae sunt communia prima sunt regula ad investigandum ea quae sunt essentialia omnibus existentibus in illo praedicamento. Et quod dictum est de substantia intelligendum est de quantitate et de aliis praedicamentis. Ut si album non haberet esse nisi in triangulo, non bene faceret ille qui vellet diffinire triangulum per album; sed postquam vidisset quod album non reperitur nisi in triangulo et quod est proprium triangulo, adhuc deberet videre per ea quae sunt propria quantitati, ut puta quod de ratione quantitatis est quod sit quid divisibile vel de ratione quantitatis continuae est quod sit secundum se extensum: per talia enim communia deberet videre utrum album pertineret ad praedicamentum quantitatis, in quo habet esse triangulus, qui debet diffiniri".

<sup>51</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 2rb9-33.

<sup>52</sup> In particular, Aristotle deals with (*c*<sub>1</sub>) in 96 b 25-30 and 97 a 26-28; with (*c*<sub>2</sub>) in 96 b 30-35 and 97 a 28-34; and with (*c*<sub>3</sub>) in 96 b 35 – 97 a 6 and 97 a 35-39.

In the *continuatio* which opens *lectio XVIII* – entirely devoted to the commentary on section (c) – Giles carefully warns us that division here is not the syllogistical procedure Aristotle has criticized in *APo* II 5 for its being question-begging, but a procedure by means of which the results of division are collected and put together, that is, the splitting of a genus into its species according to specific rules – rules that, incidentally, are not mentioned at all by Aristotle in *APo* II 5. Now, it is division taken in this sense that allows (M<sub>1</sub>) to meet conditions (c<sub>1</sub>)-(c<sub>3</sub>).<sup>53</sup> As to (c<sub>1</sub>), when commenting on 97 a 26-28 Giles says, as Aristotle does, that (c<sub>1</sub>) can be met by means of the *methodum de genere*, i.e. the bulk of techniques for singling out essential attributes described in the *Topics*, which has obviously nothing to do with division. Yet, when commenting on 96 b 25-30 Giles deals with the question of whether the divisional method is useful to take the essential attributes of the *definiendum*: he replies positively because (M<sub>1</sub>) enables us to check whether the members of a division – i.e. of the splitting of a genus into its species – are essential attributes of the *definiendum* by ascertaining that they pertain to it because they are primarily common to the category to which the *definiendum* belongs<sup>54</sup>.

The same argument is repeated in a *dubitatio* where Giles resumes the main findings of *lectio XVIII*<sup>55</sup>. Here Giles says that division is able to meet condition (c<sub>2</sub>) – i.e. to take the attributes in a definition in their correct order – because, in the splitting of a genus, one proceeds from what is more general to what is less general, and the members of the definition

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<sup>53</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 2rb37-52: “est utile per divisionem accipere diffinitionem non via sillogistica sed via collectiva: factis enim divisionibus non accipimus membra divisionum ex quibus constituitur diffinitio sillogizando, quia, ut patuit supra, statim peterimus [poterimus ed.] quod est in principio, sed accipimus huiusmodi membra colligendo et coniungendo uni alteri. Est autem utile procedere sic via divisiva, colligendo et coniungendo membra divisionum, ad tria. Primo ad habendum ea quae sunt in eo quod quid; secundo ad habendum ea ordinate; tertio ad habendum ea omnia. In his enim tribus stat tota ars distinctiva, videlicet quod accipiantur ea quae sunt in eo quod quid, quod accipiantur ordinate et quod accipiantur omnia. Si enim accipiantur ea quae pertinent ad quod quid hominis, si accipiantur ordinate et si accipiantur omnia talia, impossibile est quin ex sic acceptis conficiatur vera diffinitio hominis. Ad omnia autem haec tria valet via divisiva collectiva, ad nihil autem tale valet via divisiva sillogistica”.

<sup>54</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 2va21-43: “Dicendum quod utilis est hoc modo praetacto, videlicet considerando ea quae sunt communia toti praedicamento. Per ea enim quae sunt communia toti praedicamento substantiae regulamur ad cognoscendum ea quae sunt essentialia et quae pertinent ad quiditatem eorum quae sunt in praedicamento substantiae. Ut si volumus diffinire hominem et scimus animal esse genus eius, leve est videre quae competunt animali et per quas differentias habet dividi animal, ut quia dividitur per pennatum et non pennatum, per risibile et hinnibile. Sed utrum istae differentiae per quas divisum est animal sint essentialia vel accidentalia, regulamur per ea quae sunt communia toti praedicamento substantiae. Ut si substantia dicit aliquid per se existens et hoc est commune toti praedicamento substantiae, nihil erit substantia et nihil pertinebit ad praedicamentum substantiae secundum se nisi quod est per se existens vel quod est essentia vel pars essentialis per se existentis. Ex hoc ergo regulabimur ad cognoscendum utrum ea in quae divisum est animal sint essentialia vel accidentalia his quae sunt sub animali vel sub speciebus ipsius animalis. Si autem non sint talia, non erunt essentialia. Via ergo divisiva utilis est ad colligendum talia quae sunt in eo quod quid et essentialia, si hoc fiat debito modo secundum datam artem”.

<sup>55</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 4va15-24: “Dicendum quod via divisiva habentur per se partes entis quae sunt decem praedicamenta, quia, ut patet ex quinto *Metaphysicae*, ens per se dividitur in figuras praedicamentorum. Divisio autem praedicamentorum nos regulat ad cognoscendum quae sunt essentialia omnibus quae sunt in quocumque praedicamento: nam, ut supra dicebatur, per communia omnibus quae sunt propria generi generalissimo et toti praedicamento investigare possumus quae sunt essentialia cuilibet existenti in illo praedicamento. Via ergo divisiva nos iuvat ad accipiendum praedicamenta essentialia”.

must be ordered just in this way, so that, if  $A_1, \dots, A_n$  are the members of the definition of  $S$ , then, for every  $i, j \leq n$ ,  $A_i \supseteq A_j$ . This amounts to saying that the terms in a definition must stand each other in relation of strict inclusion (*subsumption*), a feature that, as we have seen above, a true definition must possess according to Giles.<sup>56</sup> Finally, division meets condition ( $c_3$ ) – to take all the essential attributes of the *definiendum* – in that in splitting a genus one has to take its proximate exhaustive *differentiae*, as ‘feathered’ and ‘not feathered’ with respect to ‘animal’, and so on.<sup>57</sup>

In addition to ( $M_1$ ) and ( $M_2$ ), which are useful for discovering essential definitions of subjects, Giles recognizes another method ( $M_3$ ), discussed by Aristotle in section ( $d$ ), which is useful for discovering causal definitions of attributes. We have already dealt with the particular role Giles assigns to ( $M_3$ ) and the difficulties this move involves. Giles’s explanation of the technical details of ( $M_3$ ) is standard and does not present elements of novelty.

### 3. Conclusion

Giles’s interpretation of *APo* II 13 seems to be influenced by two factors: his general attitude – which, however, he shares with all his contemporaries – to consider the Aristotelian text as unitary and systematic, and thus likely to be articulated in well-defined sections logically connected to each other; and his particular conception of universal or most powerful (*potissima*) demonstration, according to which the middle term explaining the inherence of an attribute to its proper subject is the causal definition of the attribute itself. Since the kinds of definitions which can act as principles of demonstration are essential definitions of subjects and causal definitions of attributes, and since they must be known through a procedure other than demonstration, Giles assumes that Aristotle in *APo* II 13 explains both how to discover essential definitions of subjects in sections ( $a$ )-( $c$ ), and how to discover causal definitions of attributes in section ( $d$ ). As far as essential definitions are concerned, in section ( $a$ ) Aristotle describes one method ( $M_2$ ) which is useful when we do not know the proper genus or the specific *differentia* of the *definiendum*, and which yields only plausible results. On the contrary, in section ( $b$ ) Aristotle describes another method ( $M_1$ ) that produces true (necessary) definitions of subjects, i.e. definitions made out of the proper genus and the specific *differentia* of the *definiendum*; such definitions are true because they meet a set of conditions highlighted in section ( $c$ ). Obviously, ( $M_1$ ) and ( $M_2$ ) are not equivalent: we resort to ( $M_2$ ) whenever and only whenever we are not able to apply ( $M_1$ ). Lastly, in section ( $d$ ) Aristotle outlines the method ( $M_3$ ) for discovering causal definitions of attributes: due to the difference in kind between essential and causal definitions, there is no relationship between ( $M_1$ ) and ( $M_2$ ) on the one hand and ( $M_3$ ) on the other.

<sup>56</sup> Aeg. Rom., *Super libros Posteriorum Analyticorum*, f. p 4va24-30: “Rursus via divisiva nos iuvat ad accipiendum talia ordinate. Nam via divisiva procedimus a magis communi ad minus commune, et sic deinceps. Et hoc modo debent ordinari partes diffinitionis, quia prius debet poni quod est communius respectu omnium partium, et postea quod est communius respectu aliorum, et sic deinceps».

<sup>57</sup> *Ibid.*, lin. 30-37: “Tertio via divisiva nos iuvat ad accipiendum omnia, quia oportet accipere aliquod primum quod per se se habet ut genus; si ergo illud dividatur per differentias proximas, ut puta animal per pennatum et non pennatum, si hae sunt differentiae proximae animalis, et iterum si animal non pennatum per proximas, sic procedendo nihil relinuemus, sed accipiemus omnia accipienda usque ad differentiam totius, quae est differentia ultima et specifica”.

