THE METHOD OF DIVISION AND ARISTOTLE'S CRITICISM OF PLATONIC PHILOSOPHY

A Thesis

by

ROBERT FUSELIER HOWTON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

May 2010

Major Subject: Philosophy

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Approved by:

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ABSTRACT

The Method of Division and Aristotle's Criticism

of Platonic Philosophy. (May 2010)

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This thesis investigates Aristotle's criticism and consequent reformulation of the Platonic method for formulating definitions called the Method of Division. For both Plato and Aristotle, the object of division is a natural kind, which consists in a class whose members stand in a homologous relationship to a single form. I argue that Aristotle's criticisms of the Method of Division fall under two categories: logical objections and ontological objections. The logical objections focus on division as a method for demonstrating definitions, a method that Aristotle wants to distinguish from his syllogistic logic, the centerpiece of his theory of scientific demonstration. The ontological objections focus on the question of whether the sort of account generated by division is sufficient to constitute a definition of its object. Aristotle's revised Method of Division is supposed to avoid the problems he raises by constructing definitions that satisfy the principles motivating his ontological objections through a logical process devised to make the resulting account a 'necessary' consequence of the initial assumptions of the division.

I argue that Aristotle's ontological objections to the Method of Division reflect a deeper disparity between the Platonic and the Aristotelian notion of a form and natural kind. Underpinning Aristotle's notion of a natural kind is an ontology of discrete substances. Because the unity of substance is paramount in this ontology, Aristotle

argues that a definition, which is supposed to give an account of the essence of a substance, must account for the unity of its object by itself possessing a non-accidental unity. Yet, on a Platonic ontology, a definition by division invokes a plurality of independent Forms whose conjunction does not constitute a unity. On the basis of this consideration, Aristotle argues that an ontology of abstract Forms cannot account for the unity of an individual substance. To this extent, I conclude, Aristotle's methodological objections to the Platonic Method of Division are a component of his broader criticisms of Platonic metaphysics.

For my family

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1. INTRODUCTION

"I myself am fond of these divisions and collections,
Phaedrus, so that I may be able to speak and understand."
Plato, *Phaedrus* 266b

One major concern for contemporary metaphysicians and philosophers of science is whether the concepts that inform our colloquial and technical vocabularies accurately reflect the organizational structure of reality. When we divide and classify, how can we be sure that we are carving nature at its joints? That this concern was shared by Plato and his successors in the early Academy is evidenced by the Method of Division (διαίρεσις), a procedure for formulating definitions by positing a kind into a comprehensive genus which is then successively divided until the kind to be defined is reached. As early as the *Phaedrus*, Plato identifies division as the activity of the dialectician, who "is capable of discerning a single thing that is also by nature capable of encompassing many" (266b; tr. Nehamas and Woodruff). As such, the method is a prominent feature of his later metaphysical investigations, the purpose of which is to search for and offer a clear account of what a thing is (e.g., *Sph.* 218b–c). Aristotle is highly critical of division as a method of deduction, calling it "a sort of weak syllogism" the value of which is misunderstood and exaggerated by its practitioners (*An. Pr.* 46a31-39). Yet he sees enough value in it as a procedure

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for discovering "what is predicated in what a thing is" (*An. Post.* 96a22-23) to offer conditions on which a division becomes "necessary" (91b28-32).

The goal of this thesis is to investigate the development of the notion of division in Plato and Aristotle, in an effort to understand the nature of their disagreement over the value of this method. In particular, I will examine the connection between division and the metaphysical commitments underpinning Plato and Aristotle's incompatible views on definition, with the intention of situating Aristotle's polemics against the Method of Division within his more general criticism of Platonic philosophy. This examination will require a discussion of Platonic division, as well as an analysis of Aristotle's critique of the method. It will also require a discussion of Aristotle's revisions of the Method of Division, with a particular focus on how these revisions are designed to resolve the flaws he observes in Platonic division.

In the first section, I will consider the structure of Platonic divisions. The central problem will concern the object of Plato's divisions: what exactly is Plato dividing? Some scholars suggest that the object of division is an abstract, intensional Form, while others argue that it is rather the extension of an abstract Form. There are difficulties attending both views. I will argue for an alternative reading on which a successful application of the Method of Division has as its object a natural kind, that is, a class of disparate particulars (either less comprehensive kinds or sensible objects) unified under a Form that typifies their common nature. Division exploits this unique property of natural kinds—i.e., their connection to abstract Forms—by establishing logical relations between kinds that parallel ontological relations among the Forms. A definition generated by division makes a true predication by accurately mapping relevant connections among the Forms. Underpinning the Method of Division, therefore, is a rich theory of connections between Forms and their relationship to true and meaningful statements, which Plato develops in the *Sophist*. Accord-

ingly, when in the *Statesman* Plato offers guidelines for proper division, they are designed to aid the divider in selecting differentiae that separate naturally unified kinds. I will suggest that, although the interpretation of Platonic division developed in this section alleviates some of the difficulties attending the purely intensional or extensional interpretations, it highlights many problems with the deductive power of Platonic division. In particular, it will become apparent that Platonic division proceeds on a series of assumptions comprising the Collection phase of the method.

The second section will focus on Aristotle's reception of the Method of Division. I argue that there are two distinct aspects of Aristotle's criticism of division, one stemming from his theory of scientific demonstration, and another stemming from his commitment to a substance ontology. This section will address the first of these aspects. In the *Topics*, likely an early work, Aristotle seems well versed in division. He offers advice for proper divisions and formalizes relationships between genera, species, and differentiae. But in the *Analytics* he issues sharp criticisms of the method, contrasting the strengths of his own analytic method of demonstration with the shortcomings of division. In particular, division is faulted for lacking the deductive necessity of syllogistic deductions that is the cornerstone of the Aristotelian conception of scientific demonstration. Moreover, Aristotle argues that division is incapable of demonstrating what it sets out to demonstrate, namely definitions. He argues that, not only is division ill-suited to the task of demonstration, but that definitions are of a class of indemonstrable propositions that are accessible in a manner distinct from demonstrative science. Despite these objections, however, Aristotle maintains that a division, performed properly, can be a reliable means of arriving at definitions. In this section I will detail Aristotle's criticisms of division in his logical and biological works—the *Analytics* and *Parts of Animals.* The discussion will open a question about Aristotle's motivation for one of his requirements for successful di-

vision, namely that the resulting definition should be necessary and possess a basic unity.

In the final section, this question will be addressed by considering his discussion of substance and definition by division in *Metaphysics* VII.12. In this discussion, it will become apparent that Aristotle's demand for the unity of a definition stems from his claim that definition is the formula of a compound substance, a central point of contention with the Platonic theory of Forms. This point will be illustrated by an examination of an objection to the Platonic notion of a kind given in *Metaphysics* VIII.6. I will suggest that, just as Platonic definition relies on a theory of predication grounded in his ontology of Forms, Aristotle's account of definition is grounded in his substance ontology, on which the form of an individual substance is wholly present in it. Thus, Aristotle's reformulation of the Method of Division may be seen as an attempt to make it consistent with his own metaphysics. I conclude that Aristotle's criticism of division is not only a polemic aimed at championing his own theory of demonstration, but, so far as it is premised on a view of definition and predication radically different from Plato's, is an integral part of his rejection of Platonic metaphysics, and in particular the Platonic theory of Forms.

2. THE STRUCTURE OF PLATONIC DIVISIONS

The method of dialectical argumentation characteristic of many of Plato's later dialogues—its presence is most notable in the *Sophist* and *Statesman*, but on some accounts the same method is at work in the *Philebus*[1]—is simple in its basic structure, but difficult to interpret and understand. This method, which we might call the Platonic Method of Division (**MD**),[2] proceeds roughly as follows: the divider searches for some class (γένος) or kind (εἶδος) for which an account (λόγος) is to be given by, first, locating it within a broader class or kind and, second, distinguishing it from the other classes or kinds subsumed under it though successive, usually dichotomous divisions intended to separate distinct parts (μέρη) of the divided kind or class. When the division terminates at a part containing only the definiendum kind or class, the divider ought to be in possession of a "completely adequate" (παντάπασι [...] ἱκανῶς, *Sph.* 221c) account of it, which consists in a recapitulation or "weaving-together" (συμπλέξαντες, e.g., at Ibid. 268c) of the steps of the division, beginning with the comprehensive kind under which the definiendum is initially located and ending with the final differentia that delimits the part containing only it from its closest neighboring part(s).[3]

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[1]Hampton, for instance, sees an affinity between the 'Divine Method' presented in *Philebus* 16 ff. and the method of the *Sophist* and *Statesman*. See her 1990, 35 ff.

[2]The procedure is referred to in the *Sophist* as a method (μέθοδος) by which to search for (ζητεῖν) and give a clear account (ἐμφανίζειν) of what it is (τί ποτ' ἔστι) that one seeks (*Sph.* 218b–219a; cf. *Plt.* 258c, where similar language is employed to describe the procedure carried out in the investigation of the statesman). It is not until later, perhaps beginning with Aristotle, that this method receives its name, the Method of Division. Cf. *An. Post.* II.5, 91b12; Aristotle actually refers to it as "the method through divisions" (ἡ διὰ τῶν διαιρέσεων ὁδός).

[3]So, e.g., the Stranger's account of the angler (or the expertise of angling): "Of the whole of expertise one half-part was acquisitive; half of acquisitive was subduing; half of subduing was

It is immediately clear that **MD** relies on a part-whole relationship between kinds. Division distinguishes various parts of a given whole, and proceeds by making finer distinctions within those various parts until one finds a part that encloses only the definiendum. But one soon runs into difficulty explicating this part-whole relationship. The task of **MD** is to formulate an adequate account of some specified εἶδος—usually translated as 'form' or 'kind'. Some scholars take the object of **MD** to be an abstract, monadic Form complete with all the ontological baggage Plato saddles that term with in earlier dialogues like the *Republic*.[4] It would follow that **MD** functions to establish determinate relations among the Forms, the relevant combinations of which constitute an account of the definiendum. But if Plato understands himself to be dividing intensional entities like Forms, the part-whole relationship that must obtain for **MD** to work seems the inverse of what we should expect. For, if statesmanship were a kind of knowledge, one would expect that the Form Knowledge would be a part of the Form Statesmanship, since 'kind of knowledge' is included in the definition of statesmanship, but statesmanship is not necessarily included in the definition of knowledge. Yet, according to the definition formulated by **MD**, statesmanship is a part of knowledge, and not the other way around.[5] If Plato is dividing intensional entities, the part-whole relationship he has in mind seems to be

hunting; half of hunting was animal-hunting; half of animal-hunting was water-hunting; the whole lower portion of water-hunting was fishing; half of fishing was striking; half of striking was hooking; and the part of this [i.e., hooking] that involves striking a blow that draws up something from below has a name comparing with the action itself, called 'angling', for which we have just now been searching" (*Sph.* 221b–c). In some cases Plato seems to abbreviate the resulting account to the immediate differentia of the definiendum, as when the Stranger reviews the first six divisions of the sophist (231d–e)—i.e., "some kind of merchant of learning about the soul," which is supposed to summarize the second division of the sophist (231d). Yet each of these six divisions is found to be inadequate because it fails to generate agreement about the precise nature of the sophistic expertise. For this reason these formulations are compared to appearances rather than accounts of what the sophist is; this might suggest that the resulting abbreviated accounts are insufficient to capture the sophist.

[4]Among those who accept this view are Solmsen (1968), Vlastos (1973, 302-305), and especially Moravcsik (1973).

[5]See Cohen 1973, 190 f.

counterintuitive.

This consideration against the intensional model of **MD** recommends a model that preserves a more intuitive reading of the part-whole relationship. Some scholars have accepted a model of Platonic division that can be explicated in terms of basic set-theoretical notions.[6] On this sort of model, the part-whole relationship is the familiar relationship of class inclusion. Thus statesmanship, for instance, is a part of knowledge in virtue of the fact that the class of statesmen (or, alternatively, instances of statesmanship) is a subclass of the class of knowledge. But then Plato cannot be dividing intensional entities like Forms, but rather a class of individuals (e.g., kinds or instances of knowledge). On this model, then, **MD** divides the *extension of* a Form, rather than a Form itself. But while this extensional model might accommodate an intuitive understanding of the part-whole relationship, it seems to obscure how **MD** functions to furnish a definition of some class or kind. If, as this model must maintain, Plato is dividing classes of particulars, it would seem that co-extensive Forms would have the same definition.[7] Yet Plato does not want to say, for instance, that the Forms of Wisdom, Courage, Temperance, and Justice as given in the *Republic*,[8] or indeed the all-pervasive "greatest kinds" of the *Sophist*—in particu-

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[6]See Cohen 1973, who seems to champion what he calls the 'superclean model' of division, Wedin 1990, and Cavini 1995. For the sake of simplicity, I will be referring only to Cohen's 'superclean model' as the extensional model of **MD**.

[7]Cf. Cohen 1973, 184: "If dividing a form *A* is just dividing its extension into subclasses, it would seem to follow that if two Forms are extensionally equivalent, to divide one is to divide the other." Cf. Moravcsik 1973, 338.

[8]See, e.g., *Republic* IV, where Plato distinguishes three different virtues—Courage, Temperance, and Wisdom—to correspond to the three different parts of the soul. The fourth virtue, Justice, is explained as the proper relationship of ruler and ruled between the parts of the soul. The just person, moreover, in maintaining the proper relationship between the parts of the soul, will in turn possess all the other virtues. Plato concludes here that "there is one form (εἶδος) of virtue" (445c). In the *Protagoras* Plato reaffirms the thesis that virtue is one, but goes on to refute the claim that there are distinct parts of virtue (329d–e). He concludes that the five virtues (these four plus Piety) are five names for the same thing (349b), so that all virtue is a species of knowledge (361b). It might be wondered, then, whether Plato's idea of virtue is different in the *Republic* and *Protagoras*. The discussion of this section will shed some light on this question, so this issue will be taken up again below (see note 32).

lar Being, Sameness, and Difference—are identical just because they are exemplified by the same individuals.

Thus, there are serious problems attending both the intensional and extensional models of **MD**. If it is maintained that Platonic division aims to give an account or definition of a given Form, it becomes difficult to explain the part-whole relation that his method exploits. But if one tries to explicate this relation in terms of the familiar set-theoretic notion of class inclusion, one faces problems relating to how **MD** could formulate distinct definitions of coextensive Forms. In the following pages, I will try to alleviate some of these difficulties by developing a model of **MD** on which the definiendum is not a purely intensional or extensional Form, but a term or definite description that designates a natural kind (εἶδος). Plato understands a natural kind to be unique in that it comprises *both* a class of particulars that share a likeness and an abstract Form that typifies that likeness. Platonic division depends on this correlation between Form and class because it proceeds by mapping relations among natural kinds. In virtue of this correlation, the logical relations obtaining among natural kinds point to ontological relations among the Forms, and because Plato insists that true statements make predications that correspond to real relations among the Forms, it is only divisions that distinguish and make connections between natural kinds that generate definitions. As a method for dividing natural kinds, **MD** is designed to track the ontological relationships that constitute adequate definitions.

To explicate this model, we will turn first to Plato's remarks on **MD** in the *Phaedrus*, *Sophist*, and *Statesman*. After developing a preliminary model of the method, we will look at how **MD** develops out of Plato's earlier accounts of the relationship between Forms and classes, and how it correlates with an account of predication presented in the *Sophist*. We will see that, in order reliably to cut nature at its joints, **MD** depends crucially on the unique nature of natural kinds, so much so

that Plato takes steps toward formalizing the procedure by establishing guidelines for dividing in such a way that one distinguishes parts corresponding to natural kinds.

2.1 Outlines of the Method of Division

Perhaps the earliest reference to **MD** in Plato's dialogues occurs at *Phaedrus* 265d–266d, where it is described in connection with the ability to see "a single thing that is also by nature capable of encompassing many," (tr. Nehamas and Woodruff)[9] an ability Socrates identifies with the expertise of the dialectician. As it is presented here, the method consists of two component operations called Collection (Συναγωγή) and Division (Διαίρεσις). Collection consists in "grasping together things scattered about in many places to bring them to a single form (ἰδέαν), so that by defining each you always make clear what you wish to teach" (265d). By contrast, Division consists in cutting up the class brought together in Collection "according to kinds (κατ' εἴδη)" and "along its natural joints," that is, without fragmenting any class by means of arbitrary distinctions. Later in the dialogue, Socrates concludes that by using this method the dialectician is able to give "discourse together with knowledge" (276e–277a) by knowing how to "define everything in itself" and "cut according to kinds until one reaches what is indivisible (ἀτμήτου)" (277b–c).[10]

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[9]Unless otherwise noted, all translations are my own. My translations of Plato are based on Burnet 1967–8, and my translations of Aristotle are based on Louis 1956, Minio-Palnello 1966, and Ross 1968, 1970a, 1970b. All other translations of Plato are taken from Cooper and Huchinson 1997, and all other translations of Aristotle, unless otherwise noted, are from Barnes 1984.

[10]Does Plato think that kinds are essentially divisible or indivisible, or is this an ad hoc property of kinds that depends on the purposes to which the divider puts them? Gill (forthcoming) argues that whether or not a division makes proper cuts is entirely determined by the intention of the divider: "The target at the bottom of the tree—however vague or even misguided the initial conception of it—determines the selection of the wide kind at the start, the proper first division, and relevant next steps. Different target kinds (the angler, the sophist, the statesman) prompt the investigators to carve up the world in different ways. [...] Thus what counts as a 'natural joint' (*Phdr.* 265e1-3; cf. *Plt.* 262a9-b2), a proper break between kinds, depends on the goal of the investigation" (20). It follows on this view that a kind is indivisible only insofar as the purposes of the division do not require it to be divided. I disagree with this claim for two reasons. First, Plato evidently thinks some cuts are illicit. In the *Statesman*, for instance, Plato will advise against making divisions that

As it is presented in the *Phaedrus*, a successful application of **MD** is supposed to establish a connection between a broader (generic) kind and the subordinate kinds contained in it. After it is collected into a single common kind (ἔν τι κοινῇ εἴδος), Socrates' division of madness (μανία) distinguishes it into two broad kinds, divine- and human-caused, and locates the target kind, love (ἔρως), under the divine part of madness. The division of the divine part of μανία reveals two kinds of ἔρως that are distinct despite sharing a name. Only one kind of ἔρως is divine, and in virtue of the distinction revealed through Division, Socrates can "hold it out and praise it as a cause of our greatest goods" while discarding the lesser ("left-handed," σκαιόν) kind of love (266b). Thus, if the division is performed correctly, distinguishing parts according to actual kinds and not attempting to make distinctions which are not really there, it should be able to separate all the parts of the broader kind and eliminate the equivocations that homonymous terms engender.[11]

From Plato's brief remarks it is apparent that Division is concerned with giving definitions. By subsuming disparate kinds under a common class like μανία, Collection aims to provide a definition of what it gathers together. That is, whatever is subsumed under the kind μανία is thereby defined as a part or kind of μανία. By pay-

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separate one unified class but leave behind a disordered collection. It would follow that what counts as a natural joint would be determined by the nature of the divided kind rather than the divider's intentions. Second, as I will argue in § 2.3, it is essential to Plato's theory of predication that there be *determinate* relations among the Forms. If such properties as divisibility and parthood are merely ad hoc devices for facilitating division, it is unclear how **MD** would be able to formulate a true definition of its object. If there are determinate relations among the Forms, on the other hand, there also will be determinate relations among natural kinds. Then whether a kind has subordinate kinds as parts would not be contingent upon what part that kind plays in a division. To the contrary, one goal of **MD** would be to determine whether a given kind has parts, such that it is or is not subject to further division.

[11]If this interpretation is correct, then Plato is here foreshadowing Aristotle's formal discussion of homonymy in *Topics* I.15. Among Aristotle's suggestions for identifying homonymous terms, he states that whether or not a term is used homonymously may be determined by what objects it denotes. If in any two cases the term denotes a distinct set of objects, then the term admits of two different accounts and so is homonymous. Socrates' distinction between the human and divine kinds of ἔρως might be seen to fit this description.

ing attention to the kinds subsumed under the comprehensive class, Division aims to distinguish its various parts. As a result, the kind of ἔρως Socrates seeks is defined, not only as a kind of μανία, but as a divine μανία, since Division discovers it as a kind that falls under the divine part of μανία. Stated generally, Plato's account of **MD** in the *Phaedrus* proceeds as follows: for any set of indivisible kinds $K = \{k_1, \ldots, k_n\}$ collected under a superordinate divisible kind F, Collection defines any subordinate kind $k_i \in K$ as an F-kind, while Division identifies differentiae (i.e., subordinate divisible kinds) within F, $F_1 \ldots F_n$, allowing further classifications under a differentia F_m, $F_{m_1} \ldots F_{m_n}$, and more precise definitions of subordinate kinds (i.e., $k_i =_{df} F_{m_i}$). Finer divisions yield more precise classifications and definitions. When the dialectician reaches the indivisible definiendum, we may presume, the definition is complete (see Figure 1).[12]
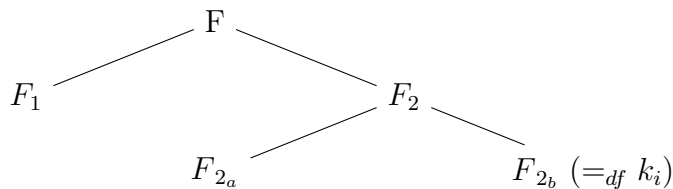

Figure 1: The *Phaedrus* Model of **MD**

Like the *Phaedrus*, the divisions of the *Sophist* and *Statesman* are meant to give a defining account of what is sought by the dividers. In the *Sophist* the Stranger

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[12]This notation is not meant to suggest that there is a categorical distinction between a subordinate kind and the differentiae of the superordinate kind. Presumably, the differentia F_1, which classifies subordinate kinds, is itself an F-kind. There is, however, a relevant distinction between the sort of kind F_1 is and an indivisible kind that has no further subordinate kinds. This distinction rests on the fact that the members of a divisible kind are subordinate kinds, whereas the members of an indivisible kind are particulars themselves (I can find no other sense than this in Plato's phrase "indivisible kind," but see note 10 above). Thus, insofar as the definiendum is indivisible, it will be distinct from its superordinate kinds of which it is a part and which comprise its definiens.

proposes to initiate the investigation into the differences between the sophist, states-man, and philosopher, beginning with the sophist, by "searching for him and giving a clear account (λόγῳ) of what he is (τί ποτ' ἔστι)" (218b–c). Once again the aim is to avoid equivocations between kinds engendered by homonymous terms: "in every case it is necessary to agree about the thing itself (τὸ πρᾶγμα αὐτό) by means of explanations (διὰ λόγων), rather than a name alone, apart from the account" (218c). Before attempting to give an account of the sophist, the Stranger performs a division of the angler as a model (παράδειγμα) for the method by which he and Theaetetus will investigate the sophist.[13] When the angler (or angling) is found among the parts of expertise (τέχνη), the Stranger declares that they have come to an agreement on the angler's expertise and "sufficiently grasped the account concerning the thing itself (περὶ αὐτὸ τοὔργον)" (221b). The account he offers enumerates the steps of the di-vision connecting the expertise of angling to the whole of expertise. Similarly, when the Stranger undertakes to give an account of the statesman, he begins his search by positing the statesman as someone who has knowledge and proceeds to divide knowledge (ἐπιστήμη) into distinct classes (*Plt.* 258b ff.). Though this division is ill-fated—it yields a final differentia incapable of distinguishing statecraft from other kinds of ἐπιστήμη like farming and medicine (276e–268a)—its aim is to produce an account of the statesman similar to that of the sophist, an enumeration of the parts of knowledge that link statesmanship to knowledge as a whole (267a–c). What Plato is looking for in an account of a kind, it seems, is nothing other than a complete division of it.

In the sort of account generated by **MD**, the successive differentiae that separate parts of the divided kind also connect the definiendum (e.g., love, angling) to the superordinate divided kind (e.g., madness, expertise) that it is collected under, and

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[13]Cf. *Plt.* 285d–286b. On the role of models in **MD**, see Gill 2006 and 2009.

this connection comprises its definition. But if collecting and defining kinds is the task of the dialectician, **MD** appears to be a poor tool for the job. Plato notes that dividing according to kinds and "along natural joints" is a condition for a successful division, but what assurance does the method offer that the divisions one makes will not fragment a unified kind? In other words, how are we to tell a natural kind from an unnatural or fragmented kind? Moreover, what assurance does the method give that a kind located under one differentia does not fit equally well under another differentia? As it is presented in the *Phaedrus*, **MD** lacks any guidelines along which a successful operation could be differentiated from an unsuccessful one. Indeed, in this text Plato himself is apprehensive of the reliability of Collection and Division: Socrates says of his definition of ἔρως that, whether or not it is correct, it at least made the speech consistent and smooth, and he notes the need to formalize Collection and Division into a expert discipline (265d).

In the next section it will become clear that Plato needs rules for distinguishing natural kinds from unnatural or fragmented kinds and proper ordering of differentiae. When he returns to Division in other dialogues he will attempt to furnish **MD** with such rules. These rules will depend on a crucial relationship between terms and abstract Forms that Plato formulates in the *Republic*, and which informs his account of definition, but is forced to reconsider in light of developments in his subsequent metaphysics. To understand how Plato will make **MD** a more reliable means of classifying and defining kinds, then, we must take a closer look at what a definition is for Plato and how his account depends on the relationship between Forms and terms.

2.2 Forms and natural kinds

The dialogues featuring **MD**, and in particular the *Statesman*, represent a reformulation of one of Plato's characteristic doctrines. In *Republic* X, Plato notes a basic connection between the words we use and the abstract entities that unify the disparate objects to which those words refer:

> Then do you want us to start our investigation here following the usual method? For we have been accustomed to posit (τίθεσθαι) some single Form (εἶδος) for each of the many things that we give the same name (ταὐτόν ὄνομα ἐπιφέρομεν). (596a)

In the *Republic*, Plato's "usual method" of inquiry consists in positing a single Form to correspond to a class of particulars called by the same name. The Form functions as a principle of unity for the class of particulars denoted by the same term. To take Plato's own example, though there is a plurality of things called 'bed', there is only one Bed in nature:

> The god either did not want to, or some necessity set upon him not to make any more than one bed in nature, so he made only the one itself, what a bed is. [...] If he made only two, again one would appear whose form both of these would have, and this one, but not the other two, would be what a bed is. (597b–d)

Corresponding to the term 'bed' there is an abstract, eidetic Bed that unifies the class of disparate particulars to which it refers. Everything (properly) called 'bed' is so called in virtue of having in common the form of a bed, and this form is typified by the single eidetic Bed. Without this formal unity, there would be no principle in virtue of which two disparate objects are both (properly) called beds. Consequently, argues Plato, were there only two disparate beds, they would both be called 'bed' in virtue of sharing the form of some third bed, which would then be Bed itself, what it is to be a bed. Therefore, the objects that the term 'bed' refers to are unified

under a single εἶδος so far as each in some capacity possesses the essential form of bed, which is reified as the eidetic Bed.

Call the "usual method" of the *Republic* the Naive Method of Collection (**NM**). According to it, there is a strict one-to-one correspondence between general terms and abstract Forms. For every general term 't' there is a corresponding Form T whose extension contains the totality of t-objects, such that every particular t-object is properly so called in virtue of possessing the form typified in the eidetic T.[14] I call this method naive because it is premised on a claim that Plato will call into question in subsequent works, that the general terms we use reliably denote natural kinds. Stated otherwise, **NM** works only if two critical assumptions prove to be true: (i) that the extension of the eidetic T, the class of t-objects, contains no more than the class of objects denoted by the general term 't', and (ii) every term 't' exhaustively denotes the class of t-objects, all of which are so called in virtue of possessing the form embodied by the eidetic T. If (i) is false, there will be some case in which the extension of a Form contains an object that the corresponding general term does not commonly denote. If (ii) is false, there will be some case in which a general term denotes some object that does not possess the form typified in the Form corresponding to that term. If either assumption fails, **NM** will be prone to identifying a class as a natural kind when it is really an unnatural or fragmented class, or identifying a natural as an unnatural or fragmented class when in reality it possesses a natural unity. Ultimately, Plato will reject both of these assumptions.

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[14]Cf. Vlastos 1973, 270 ff. On Vlastos' reading, every *sentence* in ordinary language corresponds to an "ontologically revealing" sentence that "purports to disclose the ontological basis of its [the ordinary language sentence's] meaning and truth" (271). The sentence 'Socrates is wise' is true if and only if it is true that Socrates participates in Wisdom. My account adds that an independent *term* can be a bearer of meaning insofar as it corresponds to a natural kind, which is cashed out in the *Republic* as a correspondence between a general term and an abstract intensional entity, i.e., a Form.

The *Phaedrus* provides evidence that Plato's rejection of **NM** and subsequent development of **MD** is motivated in part by a reconsideration of assumption (i). Socrates' division of μανία reveals that the general term 'ἔρως' indicates at least two distinct kinds of ἔρως. The term, in other words, indicates a class of objects which may be differentiated into two distinct natural kinds. This discovery comes only when Socrates divides the comprehensive kind μανία into differentiated kinds. Because simple collection leaves such distinctions obscure, **NM**, so far as it relies on (i), is impotent to distinguish the various connotations of a term. Plato also comes to reconsider assumption (ii) when he argues in the *Statesman* that it is characteristic of improper division to assume that every general term uniformly corresponds to a natural kind unified by a single Form. The Stranger illustrates the impact of this illicit assumption with the word 'barbarian' (βάρβαρος):

> [I mean] this sort of thing: if for instance someone who endeavored to divide humankind (τἀνθρώπινον [...] γένος) divided it in two just as most people here apportion things, separating the Greeks as one, distinct from all the rest, and the other races all together, which are unlimited, and which do not mix or speak the same language as one another, calling them by one name, 'barbarian'. Because of this single name they also suppose it to be a single kind (γένος). (*Plt.* 262c–d)

Unlike the general term 'bed', the class of particulars denoted by the term 'barbarian' is not unified in virtue of a single form typified in an abstract Barbarian. There is no abstract Barbarian, only a collection of non-Greek peoples who are collectively referred to as 'barbarian'. In other words, 'barbarian' designates a class of disparate kinds who on Plato's account are severally unified by a single form (i.e., Lydian, Phrygian), but lack a common principle of unity. Therefore, 'barbarian' does not designate a natural kind as the term 'Greek' does.[15] Consequently, there is not a uniform one-to-one correspondence between general terms and abstract Forms, for

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[15]See Moravcsik 1973, 330.

some such terms completely lack a corresponding Form.[16] And given the assumptions governing **NM**, there is no assurance that by positing a single Form for every collection of objects denoted by a general term one reliably identifies a naturally unified kind.

NM ultimately fails because it places too much stock in the idea that general terms pick out natural kinds. As the Stranger advises, "should you persist in not paying serious attention to names, you will appear wealthier in wisdom into old age" (261e). In seeking definitions it is better to heed natural distinctions between kinds, rather than conventional distinctions embodied in the words we use. In fact, there are distinctions between natural kinds for which we lack a term, and in such cases it is easier to appeal to the account of a natural kind rather than burdening oneself with naming it (265c). If the account sufficiently separates the kind from the other parts of the collection, one is licensed to "impress a single form (ἰδέαν) on it," that is, to treat it as a naturally unified kind (258c).

These considerations lead Plato to reject **NM** in favor of a procedure for definition that is more sensitive to the disparity between naturally unified kinds and the classes of objects denoted by general terms. But even in adopting the Division method of definition, Plato maintains that there is an intimate relationship between natural kinds and Forms. A natural kind is unified in virtue of the fact that its members share a common nature that is typified in an abstract Form. Although Plato comes to doubt whether our terminology is apt for picking out natural kinds, he is committed the notion that, where there is a kind that possesses a natural unity, there is a corresponding Form in virtue of which it is unified. For, insofar as any term or definite description 't' indicates a natural kind, it indicates Form T that typifies the

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[16]Moreover, some Forms lack a corresponding term. It often happens in the course of divisions that the kind one distinguishes lacks a name. See *Plt.* 261d–e, for instance.

common form or nature uniting the individual members of the class. This, for Plato is what a natural kind is—a class of individuals that share a common form typified in a abstract Form. To this extent, therefore, Plato takes 't' to indicate *both* the set of t-objects and the abstract eidetic T.[17]

This point will be important for resolving difficulties raised by the intensional and extensional models of **MD**, but presently it raises difficulties for Plato's notion of definition. If, as we have suggested, Plato understands the definiens of an adequate defining account of a natural kind to consist in an enumeration of the superordinate kinds that connect it to the broadest kind it is a part of, and if each of these kinds (so far as they are natural kinds) comprise both a naturally unified class of particulars and a Form that typifies their common nature, then he is committed to an account of definition that entails positing relationships among the Forms. Accordingly, **MD** is premised on an account of the interaction between Forms that Plato develops in the

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[17]Extra support for this claim may be found in the 'Divine Method' of the *Philebus*. According to this account, "whatever is said to be consists of one and many, having in its nature limit and unlimitedness. Since this is the structure of things, we have to assume that there is in each case always one form (μίαν ἰδέαν) for every one of them, and we must search for it, as we will indeed find it there. And once we have grasped it, we must look for two, as the case would have it, or if not, for three or some other number. And we must treat every one of those further unities in the same way, until it is not only established of the original unity that it is one, many and unlimited (ἄπειρα), but also how many kinds it is (ὁπόσα)" (16d; tr. D. Frede). Here, Plato appears to be making explicit the two-aspects of every natural kind: the unity of the kind corresponding to a common form as well as the plurality of disparate particulars subsumed under it. Just like **MD**, the Divine Method proceeds by establishing various kinds subsumed under it until it establishes a finite plurality of kinds.

As Hampton notes, on this reading "the Divine Method reinforces the idea that a monad or Form must be a mind-independent entity of a high ontological order; it is one (and, assuming it has parts, a definite number or many) over its indefinite sensible instances. The Divine Method suggests that the Forms exist in that they order the sensible world and thus make it intelligible" (1990, 35). It is in virtue of grasping the form of the one that one comes to comprehend the nature of the plurality subsumed under it.

This reading, however, may be problematic, for it requires that the ἄπειρα referred to in this passage must be understood as sensible particulars, the disparate objects that populate the class typified by the single form. However, only a few lines below in the text, Plato uses the same term to refer to the class of the unlimited, which includes every quality susceptible to the more and the less, like hot and cold (24a–25a). Thus, the present reading has difficulty accommodating the use of ἄπειρα in both passages. Fortunately, the interpretation of **MD** developed here does not depend on the evidence of *Philebus* 16, so we may leave this matter for another discussion.

Sophist. Upon turning to this account in the next section, we will see that, because on Plato's view true statements make predications that correspond to real connections among the Forms, **MD**, as a method for formulating definitions, is supposed to map relations between the Forms in virtue of which a definition is true and meaningful.

2.3 Platonic definition

For Plato, an adequate defining account of a natural kind is a statement that enumerates a chain of related kinds connecting it to a comprehensive kind of which it is a part. **MD** functions as a means of formulating definitions by discovering the relations that obtain between a superordinate kind and the indivisible kind that lies at the terminus of the division. This relation generally is mediated by a number of intermediate kinds (differentiae) that are divisible yet possess a natural unity that allow them to constitute a subkind of the superordinate kind. This notion of definition naturally entails a rich theory of the relations that obtain between kinds, and Plato attempts to furnish such a theory in the *Sophist*.

The Stranger's first six divisions of the sophist are inadequate because they fail to generate agreement on the precise nature of the sophist's expertise, the specific feature that unites the class of individuals properly called 'sophist' (*Sph.* 232a). The seventh (and successful) division—the division that locates the sophistic expertise as a sub-kind of the appearance-making part of the human kind of the productive part of expertise—leads the Stranger and Theaetetus to consider the possibility of false belief and speech, which invites the question "To what should this name, 'that which is not' (τὸ μὴ ὄν), be applied" (237c)? Put otherwise, the question asks in what sense the kind indicated by 'that which is not' is a part of the kind indicated by 'that which is'. The ensuing account of the ability of the kinds to commingle (συμμείγνυσθαι) distinguishes different types of relations between kinds.

It cannot be the case that none of the kinds commingle, for "on this agreement everything quickly becomes upset" (252a). Any statement that predicates one kind of another is bound to apply the kind being (e.g., 'angling *is* a part of expertise'). Minimally, some kinds must associate with being, namely those that are said to be.[18] Hence there must be relations among the Forms. Yet it cannot be the case that all of the kinds commingle with each other, for "if motion and rest belonged to each other, then change would be completely at rest and conversely rest itself would be changing" (252d).[19] But motion and rest are contrary kinds (250a); something is at rest only if it is not in motion and vice versa. Since not all kinds are capable of commingling, but some kinds are capable of sharing in many other kinds, there must be different types of relations that obtain between kinds.[20]

In a very difficult passage, Plato limns four types of relation between kinds:

> Then someone who is able to do this would adequately discern [iii] a single form (μίαν ἰδέαν) extended in every way through many, each one standing separately, as well as [iv] many [forms] different from each other encompassed by a single [form] outside them, and again [v] one joined together through many wholes, and [vi] many that are completely separate. This, the ability [to know] in what way each associates and in what way each does not, is to know how to distinguish (διακρίνειν) according to classes (κατὰ γένη). (253d–e)

The last line of the passage suggests that comprehending the range of possible relations between forms constitutes the ability to divide according to classes. More-

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[18]Cf. 254d: "But that which is is blended with both, for both in some way are."

[19]Tr. White. Interestingly, Plato adds the counterfactual claim that "if motion in some way had a share in rest, it would not be strange to call it resting" (256b). That is, if change and rest were sufficiently to commingle there would be truth to the statement '(some) change is resting', though in reality the two kinds have no share of one another, so one cannot truly be predicated of the other. On the ambiguity of the predication relation in the *Sophist*, see Vlastos 1973.

[20]Plato summarizes as follows the range of possible relations obtaining among kinds: "So we have agreed that some of the classes (τῶν γενῶν) are disposed to associate (κοινωνεῖν) with each other and some are not, some only with a few and others with many, and nothing prevents some communicating with every one, passing through everything" (254b–c). Note that in the next line Plato moves from talking about γένη to talking about εἴδη, without any discernable change in topic.

over, relations (iii)–(vi) are promising models for the relations among kinds revealed through division.[21] But there is better evidence for this claim just a few lines above. The Stranger draws an analogy between relations among kinds or forms and relations among letters of the alphabet: "Since some [kinds] are disposed to do this [sc., commingle] and some are not, they are almost like letters, for some of them are not suited for each other, but some fit together well" (252e–253a). And just as it takes an expert in grammar to identify the determinate combinations among letters, it takes an expert in dialectic to discern relations among kinds:

> Won't we say that it is of the dialectical expertise (τῆς διαλεκτικῆς [...] ἐπιστήμης) to divide according to classes (κατὰ γένη) and not to suppose that the same kind (εἶδος) is another or that a different kind is the same? (253d)

As in the *Phaedrus*, the expert in dialectic is characterized by the ability to divide κατά τινα,[22] but while the dialectician is characterized in the *Phaedrus* as being able to divide "according to kinds (κατ' εἴδη)," the account of the dialectician here notes the ability to divide according to classes (γένη). We are not getting a different account of the dialectician, however, but rather a different side of the same account. It has often been noted that, in the *Sophist* at least, Plato uses γένος and εἶδος interchangeably,[23] and it is true that Plato often seems to substitute one for the other

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[21]It is tempting to suppose that there is a neat fit between the relations outlined in this passage and those discovered through **MD**. The relationship between a comprehensive kind and one subsumed under it, for instance, seems aptly characterized by (iii) or (iv)—perhaps an instance of (iii) would be the relationship obtaining between the kinds being, change, and rest (250a–c), and of (iv) the relationship obtaining between the kind expertise and the subkinds productive expertise and acquisitive expertise (219). But what about (vi)? How can a kind that stands totally separate from the other forms be reached through division? This consideration should invite doubt whether Plato is actually enumerating the relations that **MD** reveals, but it should not discourage the project as a whole. That there are some kinds which cannot be accounted for by means of **MD** does not entail that **MD** does not adequately distinguish between kinds. The last line of the passage states to the contrary that recognizing that (iii)–(vi) are all possible relations between kinds is a feature of someone who possesses the expertise necessary for **MD**, the ability to distinguish natural kinds.

[22]See *Phaedrus* 265d–266d, outlined in § 2.1 above.

[23]See e.g., Vlastos 1973, 271n3 and Cohen 1973, 187.

without any change in topic or context—notable examples include 222d, 227d–228e, 253d, and especially 254b. But given the disparity between the common connotation of 'γένος' ('clan', 'family', and, more generally, 'collection' or 'class') and 'εἶδος' ('shape', 'figure', 'nature'), there must be an independent reason why Plato can use these words interchangeably. Recall from the last section that there are two aspects to a natural kind. Plato takes a natural kind to comprise both a class of particulars that share some common nature and an abstract Form that typifies that common nature. For this reason, I suggest that 'εἶδος' and 'γένος' are used interchangeably in the *Sophist* because Plato is concerned exclusively with natural kinds. The former term designates a natural kind while emphasizing its formal unity, whereas the latter term designates a natural kind while emphasizing the plurality of disparate particulars subsumed under it. The interchangeability of these terms for Plato's purposes indicates that the dialectician, and hence **MD**, is focused on natural kinds. For it is according to the distinctions among these that division proceeds and only relations among these that entail associations between the Forms.

Accordingly, Plato claims that association among the forms is what makes speech meaningful: "Separating each thing from every other thing is the complete destruction of all statements (πάντων λόγων), for speech came about for us in virtue of the combination of the kinds with each other (τὴν ἀλλήλων τῶν εἰδῶν συμπλοκὴν)" (259e).[24] Meaningful statements consist in the successful weaving together of names and verbs that fit together (262d–e), but this does not of itself guarantee a true statement. A statement is true when it "says things that are, as they are," but false

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[24]For more evidence of Plato's commitment to the intimate connection between meaningful speech and the Forms, see *Parmenides* 135b–c: "If someone, having an eye on all the difficulties we have just brought up and others of the same sort, won't allow that there are forms for things and won't mark off a form (εἶδος) for each one, he won't have anywhere to turn his thought, since he doesn't allow that for each thing there is a character (ἰδέαν) that is always the same. In this way he will destroy the power of dialectic entirely" (tr. Gill and Ryan).

when it says things "other than the things that are" (263b). In short, a true statement will make, and a false statement will fail to make, a true predication about its subject. Such predications minimally invoke connections between Being itself and other Forms, so a true predication will correspond to an actual relation among Forms. Thus, so far as **MD** formulates definitions for natural kinds, it will track actual relations between Forms. The chain of connections between a natural kind and a more comprehensive kind of which it is a part entails a chain of connections between Forms in virtue of which those relations are meaningful.[25]

Consequently **MD**, in discovering relations among natural kinds, maps actual connections among their corresponding Forms. This is why Division must proceed along natural kinds or classes. For if it did not, the connections established in the differentiation of kinds would not correspond to connections between Forms, and the resulting definition would not make a true predication. It is therefore of paramount importance that the dialectician divide according to natural kinds—kinds corresponding to Forms. To make the procedure reliable, Plato will need to establish rules for making proper "cuts," that is, for differentiating parts of a divided kind that correspond to natural kinds. As we turn to the mechanics of **MD**, it will become apparent that this is Plato's central aim in establishing rules for proper division.

2.4 The mechanics of division

If **MD** is to meet its objective of formulating the defining account of a given kind, the weaving-together of the kinds linking the definiendum to the broadest kind of which it

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[25]See Moravcsik 1973, 326: "The method not only answers the question, What are definitions about? but also the question, What configurations make a definition true or adequate? At the same time, in so far as we find Forms as parts of several other Forms, or as an entity that can have other Forms as parts, the uniqueness of each Form can be expressed by locating it on a conceptual map that traces the interrelationships. [...] In short, what underlies the successful divisions and collections must yield unique characterizations of any given Form."

is said to be a part must make a true predication corresponding to relations actually obtaining between Forms. To do this, Plato argues that Division must divide natural kinds, for only these have a Form as a principle of unity. Failing to heed distinctions among natural kinds yields a division that does not correspond to relations among Forms, and the resulting definition consequently fails to make a true predication. Plato recognizes the pitfalls attending haphazard collecting and dividing, and in the *Statesman* he takes steps to identify and eliminate illicit applications of **MD**:

> Because they [sc. "many of the sophisticates"] are not accustomed to conducting inquiries by dividing according to natural kinds, they straightaway [vii] group together differing sorts of things into the same [collection], thinking them to be alike, and furthermore they [viii] do the opposite of this by dividing other things not according to parts (οὐ κατὰ μέρη). (*Plt.* 285a)

By (vii), in Collection one should avoid classifying things that are seemingly alike but are in reality different, and by (viii), in Division one should not neglect the real "parts" of the kind being divided. Plato goes on to describe features of proper collections and divisions:

> It is necessary, when someone perceives first the fellowship between many things, not to desist before one [ix] sees all the differentiae (διαφορὰς) in it established in as many kinds (εἴδεσι); and likewise, when the various unlikenesses are seen in large number, one must [x] be incapable of looking askance and ceasing before surrounding them in some real class (γένους τινὸς οὐσίᾳ) by enclosing all of the related things within one likeness (ὁμοιότητος). (285a–b)

By (ix), proper Division consists in identifying all of the διαφοραί that separate natural kinds. Likewise, according to (x), proper Collection consists in classifying disparate kinds ("unlikenesses") according to real classes by subsuming related kinds under a single likeness. While this account of **MD** agrees with the model developed

from the *Phaedrus* account in section 2.1, it does not offer much help in distinguishing proper from illicit applications of the method. The difference between collections described in (vii) and (x) lies in whether one collects kinds that can be subsumed under a genuine class. But how does one discern whether the collection is a genuine class, rather a loose grouping of unrelated particulars? Proper divisions as characterized by (ix) differ from those characterized by (viii) in that one discerns only the differentiae separating natural kinds and divides according to parts. But how does one know whether the resulting parts correspond to natural kinds, or whether the selected differentiae are those distinguishing natural kinds? Moreover, what is the relationship between a natural kind (εἶδος) and a part (μέρος)?

To answer the problems related to Division, Plato stipulates conditions on which a chain of divisions would reliably distinguish natural kinds such that, for each relationship posited between kinds, there is a corresponding ontological relationship between the relevant Forms. These conditions are cashed out as three guidelines for making proper "cuts" in Division. Let us examine each of these rules in turn.

(1) *Cut through the middle.* The Stranger urges us not to divide off only "one small part, leaving behind many large [parts], and not with respect to kinds" (262b). To guard against this mistake, one must be wary of making thin cuts: "When cutting it is safer to go through the middle, so that one will encounter more forms (ἰδέαις)" (Ibid.). Plato's worry is that, in establishing the differentiae of the divided kind, one separates only one real class (and hence, natural kind), leaving behind a heterogeneous and ununified collection. An instance of such a mistake is the division of humankind into 'Greek' and 'barbarian'. Though the word 'Greek' may pick out a natural kind of human being, the division also posits a class of non-Greeks or barbarians, which for Plato is not a natural kind. Cases like this can result if one picks out too few differentiae—as in the case of 'Greek' and 'barbarian'—but also if one tries to

divide too quickly and skips an intermediate kind linking a subordinate kind to a more comprehensive one.[26] If one tries to make even cuts (i.e., cutting "through the middle" of the divided kind), the differentiae are more likely to distinguish classes whose members have a real likeness typified in an abstract Form. Of course, this rule presupposes that a dichotomous division of the divided kind is possible; if the divided kind does not split neatly into two subordinate kinds, then dividing through the middle will not discover differentiae of parts corresponding to natural kinds.

(2) *Make as few cuts as possible.* Almost all of the divisions of the *Sophist* and *Statesman* are dichotomous. However, Plato does recognize that sometimes dichotomous division is not possible. When the Stranger reaches the kind corresponding to care of human herds in his division of the statesman from the superordinate kind called 'knowledge', he is forced to make a polytomous division: "So then let us divide them [sc., contributory causes] limb by limb, just like a sacrificial animal, since we are unable to divide them into two; for one must always cut into the nearest number that one can" (287c). As in guideline (1), Plato is trying to avoid positing differentiae that fail to distinguish real classes. But this time, he wants to avoid positing too many differentiae. Just as too few differentiae makes one liable to dividing into parts too broad to correspond to a natural kind, too many differentiae makes one liable to fragmenting kinds and making arbitrary distinctions. Therefore, if dichotomous division (by definition the smallest number of cuts one can make) is impossible, one should try to make as few cuts as one can to differentiate the divided kind into parts corresponding to natural kinds.

(3) *Divide into classes of successive generality.* Though one should be careful not to make more or fewer cuts than necessary, it is also necessary to avoid making a division into a part of such a generality before that level of generality has been

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[26]E.g., Young Socrates' division of herd rearing into that of humans and that of animals (262a).

reached:

> The division would be done better, more by natural kinds and more into two, if one cut number by means of even and odd, and the human race in its turn by means of male and female, and only split off Lydians or Phrygians or anyone else and ranged them against all the rest when one was at a loss as to how to split in such a way that each of the halves split off was simultaneously a class and part. (262e–263a; tr. White, with modifications)

Division proceeds according to parts, and it is essential to the part-whole relationship that the part be less comprehensive than the whole of which it is a part. In the class corresponding to humankind, the classes of males and females are much broader than the classes of Lydians and Phrygians, so the former cannot be parts of the latter. If one were to divide humankind first into Greek, Lydian, Phrygians, and so forth, each would be subject to further division into male and female. Because these latter kinds are more general than the former, they do not fall under a single kind, but are spread across all of them. Consequently, this division is illicit because it is not correct to say 'Female is a part of Lydian (or Greek, Phrygian, et cetera)', so it has failed to generate an adequate chain of connections between a indivisible kind and the most generic kind of which it is a part.[27] Making successively smaller divisions is supposed to solve this problem by keeping the part-whole relation, on which the whole process of Division depends, intact. As Plato puts it, it is only when one cannot find a way to split the divided kind into broad natural kinds that one should look for more precise distinctions.

The motivation for each of these rules is summarized in a pithy maxim uttered by the Stranger: "Let the part at the same time contain a kind" (262b). It is possible to divide in many different ways, each way yielding different parts of the same whole.

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[27]Of course, it is also false to say 'Lydian is a part of female', for instance, because it is just as correct to say 'Lydian is a part of Greek', so it is unclear exactly what ontological relation this division reveals. Unfortunately, this problem is not taken up by Plato.

But the Stranger warns that the various parts into which a whole may be divided do not necessarily correspond to natural kinds: "Whenever there is a natural kind of something, it is necessarily also a part of whatever thing of which it is said to be a kind; but there is no necessity that a part be a natural kind" (263b). The defining characteristic of proper Division is that the parts divided consist in natural kinds. Thus, it is only proper divisions that discover the ontological configurations in virtue of which definitions make true predications.

It will be noticed, however, that Plato's guidelines for proper Division are not strictly formal, and so fall short of making this component of **MD** a decidable process.[28] In every application of the procedure, where one ought to divide is determined by specific content of the divided kind. Thus, guideline (1) applies only in cases in which the divided kind divides neatly into two subkinds, but it is of no help where proper dichotomous division is not possible. Guideline (2) seems more generally applicable, but it is not helpful in deciding *how many* cuts to make; Plato only advises that the fewer cuts one makes, the more reliable the division is likely to be. Of these three guidelines, (3) is perhaps the most helpful. The part-whole relationship exploited by Division requires, of course, that the whole be more comprehensive than its parts. By requiring divisions of successive generality, Plato ensures that the part-whole relationship stays intact. Though necessary for proper Division, (3) of itself is not sufficient for proper application of the method. Rather, it only maintains the integrity of the divisions *on the assumption that* it proceeds according to natural kinds. Ultimately, then, these three guidelines are neither independently necessary,

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[28]On this point I agree with Moravcsik. See his 1973, 344: "It is crucial for the understanding of the Method of Division that Plato gives no mechanical procedure for finding natural kinds. Plato does not think that there are any such procedures. He is not giving a discovery procedure, he is explicating the ontological configurations that obtain once we have discovered natural kinds. [...] The discovery of such kinds is as much the work of creative intellectual intuition as the discovery of the truths of mathematics."

with the notable exception of (3), nor jointly sufficient for proper Division. This conclusion has motivated some scholars to claim that Platonic division is a fundamentally intuitive procedure,[29] and Plato himself seems to concede the inadequacy of his guidelines: "In the present circumstances, I have to say, it is impossible to show what I mean with absolute completeness; but I must bring it just a little further forward for the sake of clarity" (262c). Though they fall far short of genuine rules for discerning natural kinds, Plato's guidelines for proper Division are meant to be helpful guides for dividing in such a way that one is *more likely* to separate distinct natural kinds.

Unfortunately, Plato does not offer similar guidelines for Collection. To ensure proper Collection one must be careful to group things according to one real, and not merely apparent, likeness or common form, but there is no rule of thumb for distinguishing a real from an apparent likeness. Thus, the initial step of **MD**, in which a comprehensive kind is predicated of the definiendum, requires the *assumption* that the definiendum is part of the comprehensive kind, that is, that it shares in the common form unifying the broad kind of which it is said to be a part. Accordingly, Platonic divisions begin with an assumption or θέσις, namely that the definiendum belongs as part to a more comprehensive kind.[30] Not only that, but this sort of assumption is required at every step of the division. After dividing the calculative part of theoretical knowledge into directive and judgement-making, the Stranger asks "into which of these sorts of expertise should we posit (θετέον) the kingly expertise" (*Plt.* 260c; cf. also 259d)? In general, for each step of the division, it is necessary to

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[29]E.g., Balme 1987, 70 f.; see also note 28 above.

[30]So begins, e.g., the division of the angler: "So tell me: shall we posit (θήσομεν) him to be an expert or some sort of non-expert, but having another ability? (*Sph.* 219a); and the division of the statesman: "So tell me: should we posit (θετέον) this as someone who has knowledge too, or what?" (*Plt.* 258b). Cf. also the beginning of the division of the sophist (*Sph.* 221d).

make an assumption that the definiendum is a part of only one of the divided kinds.[31]
Consequently, the division as a whole can only be as strong as the assumptions on
which it depends. If any one of these assumptions fails, the whole division fails to map
onto the ontological connections in virtue of which the definiendum is connected to
the comprehensive kind of which it is a part, and the resulting definition consequently
fails. A division, it seems, is only as strong as its weakest assumption.

On this understanding of the component operations of **MD**, we may elaborate on
the model developed in section 2.1: for any set of indivisible kinds $K = \{k_1, \ldots, k_n\}$
collected under a superordinate divisible kind F, Collection posits some indivisible
definiendum $k_i \in K$ as an F-kind as a preliminary account of k_i. Division identifies
differentiae corresponding to divisible natural kinds within F, $F_1 \ldots F_n$, and for each
stage of Division an assumption is made that k_i is a subkind of some differentia F_m.
The operation proceeds by dividing differentiae into classes of successively less gen-
erality and positing the definiendum as a subkind of one of the differentiae until one
reaches the definiendum itself. The complete definiens consists in a recapitulation of
the steps of the division from the most general superordinate kind to the immedi-
ate differentia that separates the definiendum from the closest neighboring kind(s).
If **MD** is performed successfully, each posited part-whole relation between natural

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[31]Cavini (1995) refers to the whole of these assumptions as the "thetic step" of Platonic divi-
sion: "[I]n Plato's *Sophist* and *Statesman* one disjunct [of the disjunction of parts of the divided
class] is always 'assumed' (with the systematic occurrence of the verb τίθημι in this sense) and the
other (implicitly or explicitly) 'taken away'..." (125). I agree with this much of Cavini's analysis.
However, I disagree with his contention that "a diaeretic (chain) argument is also a chain of eidetic
disjunctions and divisions [i.e., the statement that the definiendum is a part of one or the other
of the differentiated kinds of the superordinate divided kind] linked up by a thetic step of class
inclusion ('Every statesman has a cognitive competence') *or class membership* ('Statesmanship is
a cognitive competence')" (127, my emphasis). Platonic division proceeds exclusively according to
kinds, which consist in a class of particulars (or, in the case of divisible kinds, subordinate kinds)
and a corresponding Form typifying the form shared by the members of the class. Therefore, on my
view the thetic step is always an assumption of class inclusion. See, for instance, *Plt.* 259d: "Then
shall we combine (συνθήσομεν) all these, the statesman's expertise and the statesman, as well as
the kingly expertise and the king, into the same [kind]?"

kinds stipulated by the division corresponds to an ontological relationship between the relevant Forms. If **MD** successfully maps the ontological relations obtaining between the relevant Forms at each step of the division, the resulting account will make a true predication of the definiendum. In this consists the defining account of the definiendum k_i.

2.5 What do divisions show?

The proper object of Platonic division is a natural kind. Natural kinds have a special place in Plato's ontology because each one consists in class of particulars that share in a form typified by an abstract Form. In virtue of this connection between class and Form, a natural kind is subject to definition, a meaningful statement that predicates relationships between the defined kind and more comprehensive natural kinds of which it is a part. These logical relationships between natural kinds indicate ontological connections among the Forms typifying the relevant natural kinds, and the definition formulated through division is true in virtue of corresponding to these ontological connections. A successful application of **MD**, therefore, will accurately trace the relations that make a statement about the defined kind true.

In light of the preceding discussion, what can be said about the problem with which we began? We saw that, if **MD** is construed as a procedure for dividing intensional entities like Forms, it must be accompanied by a novel understanding of the part-whole relationship on which the procedure depends. But if **MD** is construed as a procedure for dividing extensions of Forms, and so depends on set-theoretic relationships like class inclusion, then Plato seems committed to the claim that coextensive Forms are identical. But if, as on the view developed here, **MD** is understood as a procedure for dividing natural kinds, we are committed neither to the identity of coextensive Forms nor (fully) to a counterintuitive understanding of the part-whole

relationship. For on this view, coextensive Forms would not be identical, because they are intensionally distinct. That is to say, Wisdom and Justice, though perhaps coextensive, typify distinct properties or intensions, so the class of particulars whose members all possess these properties belong to two distinct natural kinds, each having a distinct Form.[32] Moreover, this view allows an intuitive understanding of the part-whole relation that is fully explicable in terms of class inclusion. Any natural kind is a part of a superordinate, divisible kind just in case it constitutes a subclass of the superordinate kind. The unique nature of natural kinds entails that their interrelations correspond to interrelations among the Forms. This is why the focus of Plato's guidelines for division is on reliably identifying *natural* kinds; any collection can be a part of a superordinate kind, but only the part-whole relations among natural kinds indicate relations among the Forms. That relationships between intensional entities like Forms are not easily explicated should not pose a problem for this model, for as long as the connections established through divisions are between kinds that consist in a Form and a class of particulars that share its likeness, there is good reason on Plato's ontology to expect that the relations of the latter aspect of the kind correspond to relations of the former.

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[32]This analysis holds of the account of the virtues given in *Republic* IV, but it evidently does not hold of the *Protagoras* account (see note 8 above), for if the account of natural kinds presented in this section is correct, then the *Protagoras* and *Republic* IV give inconsistent accounts of virtue. On the *Republic* IV account, Justice, Wisdom, Temperance, and Courage are all subsumed under the single Form Virtue, yet they admit of different definitions so far as they correspond to different parts of the soul. On this account Virtue would be a divisible kind, and so could be differentiated into parts corresponding to the four virtues. In the *Protagoras*, however, Plato refutes the thesis that these are distinct parts of virtue. On the view of natural kinds presented there, Plato, in maintaining the homogeneity of the parts of virtue, is arguing in effect that virtue is an indivisible kind. Because there are not differences inherent in virtue adequate to constitute a subkind of virtue, Justice, Courage, Temperance, Piety, and Wisdom collapse into the same account. Hence, Plato is tempted to conclude that these terms are nothing more than "five names for one thing," namely, virtue (349b). The difference between the *Republic* IV and *Protagoras* accounts of virtue consists in part in Plato's treatment of the natural kind termed 'virtue'. In the former dialogue this kind is divisible into four subkinds, but in the latter it is treated as indivisible, such that any division of the kind is bound to be arbitrary.

3. ARISTOTLE ON DIVISION I

On Plato's view, the Method of Division (**MD**) owes its eminence in philosophical inquiry to its capacity to illuminate the nature of the Forms. To be sure, for Plato knowledge of the Forms constitutes the highest form of knowledge.[33] For in studying the relationships among the Forms one thereby reveals the connections that make statements true and meaningful. By exploiting the unique nature of natural kinds—that they comprise a class whose members share a common form typified in an abstract Form—**MD** establishes logical part-whole relations among kinds that map onto ontological relations obtaining among the Forms. Paying heed to these ontological relations enables the dialectician to formulate complete and true definitions that correspond to real connections in nature.

When Aristotle, likely in his Academic period (circa 367-347 B.C.E.), takes up the topic of relations among kinds, he makes a number of important distinctions that allow him to formalize the relations between divisible and indivisible kinds. On his view, however, division is but a "small part" of his analytic system of deduction, the cornerstone of his theory of scientific demonstration (*An. Pr.* I.31, 46a31). Because he maintains that proper demonstration is a deduction from necessary premises, he argues that **MD** fails to meet the demands of scientific inquiry. In the *Analytics* and *Parts of Animals*, Aristotle presents a host of objections to division, criticizing it for lacking deductive necessity and assuming the definitions it sets out to demonstrate. Most importantly, he faults division for failing to account for the unity required of

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[33]See Deslauriers (1990), esp. § V.

definitions. But, perhaps curiously, Aristotle also takes steps to correct the flaws he identifies in **MD** and offers criteria on which division might be useful for formulating definitions. He suggests that, if these criteria are met, then in fact division will possess a sort of deductive necessity.

The task of this section is to outline Aristotle's reception of Platonic division. It will be argued that Aristotle's views on **MD** are motivated by two distinct, if not completely independent, considerations. One motivation is logical in nature. Aristotle's conception of demonstration depends in large part on the claim that definitions, as the starting points of deduction, are themselves indemonstrable. To the extent that it purports to *demonstrate* definitions, **MD** is inconsistent with Aristotle's picture of scientific inquiry. The other motivation is metaphysical in nature. Underpinning Aristotle's account of definition is an ontology of discrete substances. Because the unity of substance is paramount in this ontology, Aristotle requires that a definition, which is supposed to give an account of the essence of a substance, constitute a unity. On the basis of this commitment to the unity of substance, he criticizes **MD** for failing to account for the unity of definition. The discussion of this section will detail those of Aristotle's criticisms that stem from the former consideration, but in large part will leave those stemming from the second consideration unanalyzed. These will be taken up in the final section.

This discussion will proceed as follows: first, we will examine the innovations in formalizing relationships among natural kinds[34] Aristotle develops in the *Topics*; second, we will examine Aristotle's critique of division in the *Prior Analytics* in comparison with his own analytic method of deduction; third, we will examine how these criticisms are applied to his theory of scientific demonstration in the *Posterior*

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[34]In remaining two sections, except where otherwise indicated, I will be using 'kind' and 'natural kind' interchangeably.

Analytics; and finally, we will examine Aristotle's modifications of **MD** and outline his criteria for proper division. These criteria depend on his analysis of kinds into species and genera, which are explained in detail in the *Topics*. It is therefore to this text that we must first draw our attention.

3.1 Species and genera

It was suggested (§ 2.3) that, in the dialogues under consideration, and most notably in the *Sophist*, Plato uses 'εἶδος' and 'γένος' interchangeably when speaking of natural kinds. He uses the former generally to stress the specific nature shared by the members of a natural kind and typified in its corresponding Form, and the latter to stress the community of members unified under the kind. It was noted also that, so far as some natural kinds have other kinds as parts and some do not, Plato maintains a distinction between divisible and indivisible kinds. When Aristotle takes up the issue of relations among kinds in the *Topics*, 'εἶδος' and 'γένος' had become terms of art for the practice of dialectic in the early Academy.[35] Instead of employing these terms interchangeably, he uses 'γένος' ('genus') to refer exclusively to a broad, divisible kind, and 'εἶδος' ('species') to refer exclusively to a narrow, indivisible kind. Accordingly, his definition of the former term acknowledges its characteristic generality: "A genus is what is predicated in what a thing is for a plurality of things differing in their kind (εἴδει)" (102a31–32). A genus, in other words, is a component

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[35] Aristotle in *Topics* I.2 notes three purposes for which the treatise is useful: "[i] for intellectual exercise (γυμνασίαν), [ii] conversation, [and iii] the philosophical sciences" (101a27–28). Of particular interest for the present discussion is (i), for what Aristotle likely means by "intellectual exercise" is a formalized style of debate that Plato mentions in the *Parmenides* and many scholars think was institutionalized in the Academy (see Slomkowski 1997, 11 ff.). If this is correct, it is plausible that the *Topics* has origins at a time when Aristotle was affiliated with the Academy. This is important to our study because, if Aristotle's analysis of genus-species relations arose from his experience in dialectical exercise with systematic dividers like Plato, Speusippus, and Xenocrates, this fact makes it plausible that it should be understood to coincide with his polemics against **MD** in other works like the *Analytics*, a work that might not have origins in Aristotle's Academic period.

of the essence of a plurality of kinds, such that it will be included in any account of the essence of any one of these kinds.[36] Thus, genera are distinguished from species in that they are "predicated" in the essence of many different kinds of thing. It follows that every genus is predicated in the essence of two or more species (*Top.* IV.2, 123a30), each of which is distinguished by 'differentiae' (διαφοραί), qualities of the genus that individuate species according to their special features (*Top.* IV.6, 128a27). For any genus G and species $S_1...S_n$ in which G is predicated, there are at least n differentiae D qualifying G that individuate the species.[37] A species, then, is the subject of a genus predicate. Though species too are predicated of the individuals that populate them, those individuals are not different in kind such that there could be differentiae of the species, but rather are the same *qua* members of the species. Aristotle elaborates on the predication relationship in the *Categories*:

> Whenever one thing is predicated of another, as of a subject, everything that is said of what is predicated will be said of the subject as well. For instance, human being is predicated of some individual human, and animal is predicated of human being; therefore animal will be predicated of the individual human as well, for an individual human *is* both a human being and an animal. (*Cat.* 2, 1b10–15)

On Aristotle's view, to predicate something of another thing is to attribute to it the account of what is predicated of it. The statements 'Socrates is a human' and 'Socrates is an animal' are both true in virtue of the fact that he is the member of the species human being; because the genus animal is predicated of the species human being, it is true to say both 'human beings are animals' and '*this* human being (e.g., Socrates) is an animal'—the former statement, of course, referring to the species,

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[36]See *Top.* I.9, 103b35–37: "for each of these sorts [of predicate], if it is said of itself or if its genus is said of it, signifies what it is."

[37]Of course, there may be more differentiae, since some will distinguish classes of species, each of which is individuated by its own specific differentia (see Figure 2 below). These former differentiae function as subordinate genera of the genus they qualify. Thus, Aristotle sometimes speaks of genera that fall under the same genus (see e.g., *Top.* IV.2, 122a3–5 and VI.6, 144b20–30).

and the latter to a member of the species.

In forging this distinction between genus and species, Aristotle makes explicit what had remained a tacit premise in Plato's discussions of kinds: the sort of thing that stands as the subject term in a definition is different in kind from the sort that stands as an element of its definiens. As a result of this common premise, Aristotle's terminology can be constructed into a formal model for the relation between genus and species that resembles the model of Platonic division pictured in Figure 1 (§ 2.1), as Figure 2 illustrates. Moreover, the formal relationship that for Aristotle obtains

$$G$$
$$D_1(G_1) \qquad D_2(G_2)$$
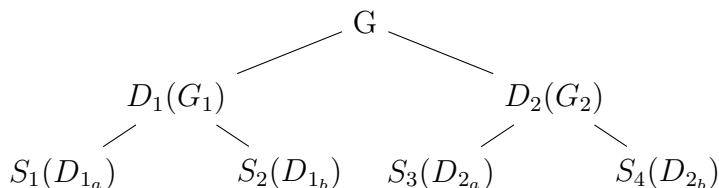$$S_1(D_{1_a}) \qquad S_2(D_{1_b}) \quad S_3(D_{2_a}) \qquad S_4(D_{2_b})$$

Figure 2: Basic Model of Genus-Species Relations

between a genus and its various species reflects this important distinction. *Topics* IV is dedicated to a discussion of genera, and here we find an account of the connection between genus and species, a relation that Aristotle calls 'partaking':

> Partaking (μετέχειν[38]) is defined as the admitting of the account (λόγον) of what is partaken. It is clear, then, that the species partake of their genera, but the genera do not partake of their species. (IV.1, 121a11–13)

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[38] Aristotle's use of this term may provide further evidence for the continuity between his and Plato's views on kinds. This word, of course, has a long and complicated history in Platonic philosophy, but he uses it in particular in the *Sophist* and *Statesman* to refer to the interaction among kinds. For instance, on the association of change with the kinds being and non-being, the Stranger says, "then clearly change really is both something that is not and something that is, since it partakes (μετέχει) of that which is" (*Sph.* 256d); indeed, this verb turns up throughout the discussion of the interaction of the greatest kinds. For a similar instance in the *Statesman*, see 260a.

The statement 'x μετέχει y' is true just in case y admits the account of x, but x does not admit of the account of y. This relation is analogous to the predication relation between a subject and a predicate. Just as that which is said of an essential predicate can also be said of its subject, that which describes or accounts for something partaken is included in the account of what partakes of it. The analogy can be taken further by recalling Aristotle's definition of genus as what is predicated of a plurality of species. Whatever is said of the genus can also be said of its species, so it being the case that the genus is predicated of its species is sufficient for the species to partake of it. Partaking and predication, then, are two aspects of the same relation.

With respect to genera and species, partaking, like predication, is a transitive, asymmetrical relationship that obtains between terms of different orders of generality. This gives Aristotle a formal account of the genus-species relation that both ensures uniform connections among kinds and disambiguates the terminology of kinds he inherits from Plato. A genus G is predicated of a species S, and likewise S partakes of G, just in case whatever is said of G essentially may also be said of S, so that a complete account of S will include an account of G.[39]

For Aristotle, then, the relationship between natural kinds, construed intensionally, depends on this notion of predication. It follows from this account also that there are determinate relations between species, differentiae, and genera construed extensionally. Since every genus is predicated of more than one species, and since each species is disjoint with every other species in its genus, a species always has a narrower denotation than its genus: "The elementary principle in regard to all such cases is that the genus has a wider denotation than the species and its differentia; for the differentia too has a narrower denotation than the genus" (121b11–14; tr.

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[39]See IV.2, 122b9–10: "It is necessary that the accounts of its genera be predicated of the species and the things that partake of the species."

Pickard-Cambridge). A species, moreover, must have a smaller denotation than the differentia it falls under, unless it is the only species falling under the differentia, in which case they will be coextensive. Hence, returning to Aristotle's example of a member of the species human being, a person is both a human and an animal because she partakes of the species human being, which in turn partakes of the genus animal. The fact that this person is a human being *entails* that she is also an animal.[40]

Aristotle's analysis of the association of kinds obtains for any set of associated kinds. Whether a given kind fits in among other kinds as a genus or species is determined by how its account fits within that of the other relevant kinds; that is, which accounts it partakes of and which accounts partake of it: if it partakes of the account of no other kind, but others partake of its account, it is a genus of the highest order; if it partakes of some and some partake of it, it is a subordinate genus (differentia); and if it partakes of others but none partake of it, it is a species of some genus. Following Plato, Aristotle understands these relations to be important for defining kinds. In *Topics* VI, where Aristotle discusses definition at some length, he describes the process of defining in terms not unlike those characteristic of **MD**:

> The definer must put (θέντα) [the definiendum] into the genus and attach the differentiae, for of the parts in the definition the genus seems to be the greatest indicator of the substance (οὐσίαν) of the definiendum. (VI.1, 139a28–31)

For both Plato and Aristotle, then, defining begins with an assumption or θέσις, namely that the definiendum belongs to a certain generic kind or genus. Aristotle continues that this seems to be the most important step, since the genus is the "greatest indicator" of what the definiendum is. Evidently, the next step is to discern the

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[40]For Aristotle, individual members of a species partake of their species: "For individuals (ἄτομα) too partake of their genus and species, as for instance some individual human partakes of both human being and animal" (*Top.* IV.1, 121a38–39).

differentiae of the genus, which allows for finer classifications of the definiendum: "the genus must separate [the definiendum] from other things, and the differentia from the things in the genus" (VI.3, 140a27–29). It is the last differentia that uniquely identifies the species within the genus: "the specific [or, species-making] differentia (εἰδοποιὸς διαφορά[41]), together with the genus, always make the species" (VI.5, 143b8–9).

If this is the recipe for the definition of a species—genus plus specific differentia— it follows that there is a unique definition for every species (VI.4, 141a35). But this is not to deny the importance of the connections bridging the specific differentia and the highest genus. Aristotle argues that stating the specific or final differentia and highest genus of a definiendum is an elliptical way of stating all of the relevant relations: "for each differentia imports (ἐπιφέρει) its appropriate genus, just as terrestrial and biped import with them animal" (VI.6, 144b16–18; cf. VI.5, 143a19–24).[42] This point will be important for understanding the metaphysical gravity Aristotle attributes to definitions, but for now let it suffice to say that this argument satisfies the account of definition Aristotle gives at the beginning of the treatise: "a definition is an account signifying what a thing is (τὸ τὶ ἦν εἶναι)" (I.1, 101b38).[43] For each species there is a unique essence, and a proper definition ought to account for precisely that essence.

[41]There is some debate over the integrity of the phrase 'εἰδοποιὸς διαφορά'. It occurs only twice, with both instances in this chapter, and in their context they seem pleonastic, especially in light of 143b6–7. Brunschwig cites this consideration among his reasons for excising the phrase in his edition, but argues further that the phrase is not Aristotelian because it indicates a distinction between intermediate and "species-making" differentiae. Elsewhere Aristotle does not seem to maintain such a distinction beyond the claim that it is only the final differentia, along with the genus, that makes the species. See Brunschwig 2007, *ad loc.* In any case, Aristotle's claim is that the final differentia together with the genus comprise the definition of a species.

[42]For an illuminating discussion of this passage, see Falcon (1996). I agree with Falcon's analysis that "this passage is [...] clear evidence for the claim that every differentia entails its genus or rather that it is logically dependent on its genus" (377).

[43]Compare this definition to what the Stranger says he seeks in hunting down the sophist: "With me I think you need to begin the investigation from the sophist—by searching for him and giving a clear account of what he is (ἐμφανίζοντι λόγῳ τί ποτ᾽ ἔστι)" (218b-c; tr. White).

Clearly, Aristotle thinks definition depends on relations between genera and species. But does he see a role for **MD** in formulating definitions? Though he notes in *Topics* VI.6 that divisions are helpful in identifying the differentiae of a genus (143a34–b6), he does not go so far as to claim that **MD** is a reliable procedure for arriving at a definition. We will see in the following sections that Aristotle's attitude towards division is very complicated. He will advocate a version of the Method of Division for discovering definitions, but he will also criticize practitioners of **MD** for misjudging its virtues and failing to recognize its failures. To examine Aristotle's reception of **MD** more closely, we must turn next to Aristotle's own theory of demonstration, which he takes great pains to distinguish and champion over what he sees as its greatest rival, the division method of demonstration.

3.2 'A weak syllogism': *An. Pr.* I.31

In *Prior Analytics* I.31 Aristotle says of "division by means of kinds (διὰ τῶν γενῶν)" that it is only "a small part of the procedure that has just been described" (46a31–32; tr. Smith). The procedure he has just described is a method of demonstration premised on his own formal syllogistic. This method, he suggests, applies to all types of inquiry, and in each case begins with identifying the principles of the subject in question:

> Thus the route is the same for all things, both for philosophy and for any sort of art or study. For one must [i] discern the things that belong to each term and supply as many of them as possible, and [ii] examine them through the three terms, refuting in this way, and establishing in that. (I.30, 46a3–7)

Aristotle's method consists of two components: (i) gathering facts about the terms proper to the subject of study and (ii) examining the implications of these facts through formal syllogism. Let us briefly outline each of these components.

(i) For Aristotle, scientific inquiry begins from previously known facts: "for each problem one must look to what is previously known about each [of the terms], for every deduction is through these" (I.29, ; cf. *An. Post.* I.1, 71a1–2). Thus, the first task of scientific inquiry is to get the preliminary facts proper to the subject of study. In light of this body of facts one next generates the terms through which deductions will be carried out. By grasping what follows from and what implies the terms proper to a subject of study, one thereby establishes relationships between them. In grasping these terms and their interrelations, one generates premises from which deductions can be carried out. The ultimate premises are principles of the subject of study, and each of these is garnered from experience rather than deduction (I.30, 46a17–18).[44]

In his commentary on this chapter, Alexander gives an example using the term 'good': "for each thing we should make a selection and have prepared things which are proper to it, [choosing] for example, what things are consequents of good, what are its antecedents, and what do not hold of it" (*in An. Pr.* 332, 6–9; tr. Mueller). Of particular importance to syllogistic deductions are facts about what the term entails, what entails it, and what does not belong to it (43b1–5). But, of what the term entails, the only terms that are useful in demonstration are those "predicated in its essence (ἐν τῷ τί ἐστι)" (I.27, 43b7–8). This, Alexander explains, is because "the things contained in the defining account of something are predicated in its essence in the strict sense; and if a thing of which they are predicated were deprived of their actuality, it would absolutely not exist at all [...] and every definition is in the essence" (295, 35–296, 2; tr. Mueller). In order to make a demonstration pertaining to something's essence, one must deduce from premises about its essence, i.e., from

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[44]See Smith (1989, 158 f.): "These data constitute a 'collection of facts' or 'history' (*historia*) concerning the subject. We then use this summary to draw up the various term-classes with respect to each term in the science. Application of the procedure to any truth in this *historia* will then yield premises from which to deduce it, *if they exist.*"

definitions.

(ii) By examining the premises of a given subject "through the three terms," Aristotle means that the next step for scientific inquiry is to apply the principles of the subject to his syllogistic method of deduction. Aristotle's primary task in the *Prior Analytics* is to develop this analytic method of deduction, which is premised on the claim that every valid deduction is reducible to one of a finite set of valid logical forms organized into three 'figures':[45]

> Every demonstration and every deduction must necessarily come about through the three figures stated before. With this proved it is clear that every deduction is both brought to completion through the first figure and led back into the universal deductions in it. (I.23, 41b1–5; tr. Smith)

Every syllogism consists of a first or 'major' term, a middle term, and a last or 'minor' term.[46] The middle term, he explains, is the term "which both is itself in another and has another in it," so that it appears in both of the premises (I.4, 25b35–36; tr. Smith). The middle term establishes the relationship between the major and minor terms, so the deduction is ultimately carried out through the middle term. One way Aristotle distinguishes the three figures is by the relationship the middle term has to the major and minor terms. Because he maintains that every deduction can be resolved into a first-figure deduction, it is important for understanding Aristotle's criticism of the deductive power of division to observe the relationship that the middle term ought to have with the major and minor terms in this figure.

Aristotle explains the relationship between the three terms in universal first-figure deductions as follows:

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[45]The Greek word ἀνάλυσις can be translated as 'dissolution' or 'reduction'. The point that Aristotle seems to be making in giving this name to his work is that any valid deduction can be resolved and carried out through one of the three figures he identifies. See Smith (1989, 161).

[46]In all, Aristotle identifies fourteen valid argument forms for combinations of assertoric statements. For a detailed exposition of Aristotle's assertoric logic, see Smith (2007), esp. § 5.

> Whenever, then, three terms are so related to each other that the last is in the middle as a whole and the middle is either in or not in the first as a whole, it is necessary for there to be a complete deduction of the extremes. (I.4, 25b32–35; tr. Smith)[47]

This passage suggests that the relationship between the terms is one of class inclusion, where the terms denote distinct classes.[48] In the first figure, the relationship between the major and middle terms is that the (class denoted by the) middle term is wholly included in, or wholly excluded from, the (class denoted by the) major term. The relationship between the minor and middle terms is that the (class denoted by the) minor term is wholly included in the middle term. Thus, when the middle term is wholly included in the major term, then the minor term too will be wholly included in the major term (*Barbara*). In this case, the major term will be true of everything in the minor term. But when the middle term is wholly excluded from the major term, so too will the minor term (*Celarent*). In this case, the major term will be true of nothing in the minor term. When Aristotle claims that every deduction can be resolved into a universal first-figure deduction, then, we should understand him to be claiming that every deduction is analyzable in terms of one of these relationships of class inclusion.

Furthermore, in the last clause of this passage Aristotle alludes to an important property of syllogistic deductions. Deductions have a unique property in that, if the premises obtain, the conclusion obtains of necessity. He defines a deduction as "an account in which, certain things having been supposed, something different from the things supposed results of necessity because these things are so" (I.1, 24b18–20; tr. Smith, with modifications). Any argument that can be resolved into a syllogism

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[47]Striker notes (2009, 95) that this sentence "actually describes, not the first figure in general, but syllogisms in Barbara and Celarent with true premises." This is well enough, for Aristotle will argue against the deductive power of division by resolving it into a syllogism in *Barbara*.

[48]See Hintikka 2004, 88–89.

thereby possesses this property of deductive necessity. Given true statements as premises, then, the conclusion will of necessity also be true. On this understanding, it is unsurprising why Aristotle will make the syllogistic the cornerstone of his theory of scientific demonstration (see below, § 3.3).

In *Prior Analytics* I.28, Aristotle gives a schema to show how, given the appropriate premises, anything can be demonstrated through the figures. To demonstrate something universally true of something else, for instance, Aristotle advises to "look to the subject terms of which the predicate that is to be established is in fact said, and to those which follow the term of which this term must be predicated," in order to discover equivalent terms (43b39–44). That is, if the desired conclusion is that 'mortal' belongs to every human being, one must look to what 'mortal' is predicated of and to what is entailed by the term 'human being'. If one finds any terms that are the same, there will be a deduction for the desired conclusion (in *Barbara*); if not, there will be no deduction. For different kinds of conclusion Aristotle suggests searching for different kinds of premises. Indeed, he argues that, given a complete set of preliminary facts about a particular subject, anything concerning the subject that is demonstrable can be demonstrated through his syllogistic; and what cannot be demonstrated can be proved indemonstrable:

> If the facts concerning each [subject] have been grasped, already the demonstrations are at hand for us to make plain. For if none of the things that truly belong to the subjects has been left out of our collection of facts (ἰστορίαν), then for everything for which there is a demonstration, we will be able to find it and carry out the demonstration, and for everything for which there is not naturally a demonstration, we will be able to make this clear. (I.30, 46a22–27)

For Aristotle, then, the syllogistic is the only method of deduction needed to carry out investigations. Indeed, he claims that his is the *only* method of deduction, and that it is impossible to deduce through any other method (I.29, 45b36–46a2).

Procedures (i)–(ii) comprise the method that Aristotle wants to distinguish from division in I.31. The method of division by means of kinds to which Aristotle refers there is closely associated with Platonic division, if not **MD** itself. It is likely that Aristotle's opponent in his refutation of division as a method of demonstration is not only Plato, but also some of his associates in the Academy.[49] In any event, however, the following question arises: of which limb of Aristotle's method does he think division is a part? Does Aristotle think that **MD** fails as a method for (ii), that it is a sort of imperfect syllogism, or (i), that it is a faulty means of arriving at the set of facts required for deduction?[50] I answer that Aristotle faults **MD** for failing at both of the tasks he thinks are necessary for proper scientific inquiry, but his focus in this chapter is its failure to satisfy (ii).

At the outset of I.31, Aristotle gives two reasons why division is "a sort of weak syllogism": "for [iii] what it must prove it asks for (αἰτεῖται), and [iv] it always deduces something higher" (46a33–34). Aristotle's arguments for these claims rely on the conclusion he draws in I.23 that every valid deduction is reducible to a syllogism in one of the three figures. On the basis of this claim, Aristotle can test the deductive validity of **MD** by attempting to resolve it to a deduction in one of his figures. To demonstrate (iii)–(iv), he gives as an example a partial division of human being:

> Let *A* stand for animal, *B* for mortal, *C* for immortal, and let human

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[49]Alexander understands Aristotle to be referring to Platonic division. He states that Aristotle "is speaking about the art of division, which Plato used" (333, 10; tr. Mueller), but later suggests that the method was widespread among Aristotle's Academic contemporaries and predecessors; i.e., "the associates of Plato" (333, 23). Cf. Striker (2009, 208–209) and Smith (1989, 160).

[50]Alexander, at least, finds either possibility plausible (333, 12–20). Striker (2009, 209) notes that there is evidence for either view: for the former there is Aristotle's claim that the bulk of his criticism in this chapter focuses on an argument that divisions cannot amount to a syllogistic proof, but the fact that the criticisms come after Aristotle has just finished presenting his account of how the premises of deductions are formulated attests to the latter view. She goes on to note that commentators after Alexander tend to endorse one of these views while ignoring the other. But given the scope of Aristotle's critique of division, not only here but elsewhere in the *Analytics*, it is likely that it does not correspond nicely with only one limb of Aristotle's method, but rather extends to both.

being, the account of which must be grasped, be D. Now [division] takes every animal to be either mortal or immortal, and this is to take every A to be either B or C. And again, always dividing, it assumes (τίθεται) human being to be an animal, so that it takes A to belong to D. Thus the deduction is that every D will be either B or C, so that it is necessary for human being to be either mortal or immortal. Yet it is not necessary for it to be a mortal animal; rather, this is begged. But this was what needed to be deduced. (46b3–12)

Aristotle thinks this division can be converted into a syllogism by taking 'animal' (A) as the middle term, 'mortal or immortal' (B or C) as the major term, and 'human being' (D) as the minor term. On this interpretation the division can be put into a first-figure deduction (*Barbara*). A comparison of the division and its corresponding syllogism nicely illustrates Aristotle's point (see Figure 3). Suppose we were to argue
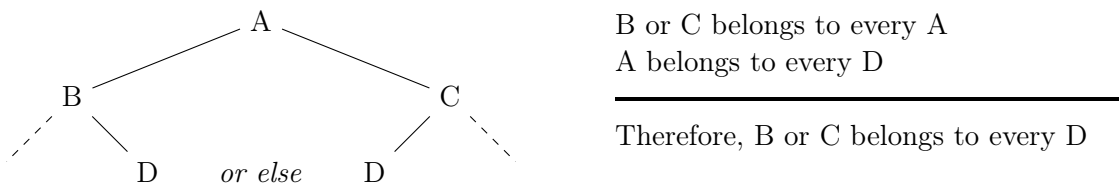
Figure 3: Comparison of Division and Syllogism of *An. Pr.* I.31

through division that humans are mortal animals. By positing human being in the genus animal and taking the first differentiae of animal to be mortal and immortal, it immediately follows that human being falls under either mortal or immortal.[51] But from these initial hypotheses it does not follow either that human being is a species of mortal animal or a species of immortal animal. In order to put it under the desired differentia an additional hypothesis is required, namely the assumption that human

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[51]Indeed, for Aristotle this statement follows *because* it is the conclusion of the corresponding syllogism. See 46b9–10, quoted above.

being is a species of mortal animal. Recall from our discussion of Plato's guidelines for **MD** (§ 2.4) that, because Collection requires an assumption, a division can only be as strong as its weakest assumption. Aristotle demonstrates this by resolving this division into a first-figure syllogism, with the major premise stating that every animal is mortal or immortal, the minor premise that every human being is an animal, and the conclusion that every human being is either mortal or immortal. The division does not demonstrate anything, but rather ends up assuming the very thing it set out to prove, namely that human being is a species of mortal animal.

Thus, Aristotle's resolution of the division into a first-figure deduction demonstrates claim (iii). But what does he mean when he says that division "always deduces something higher"? He explains that in a this sort of syllogism the middle term must have a smaller denotation than the major term (46a39–b2). In the schema of I.28, the middle term of a universal first-figure deduction is either wholly included in or wholly excluded from the major term. But, as Figure 3 illustrates, the major term of the syllogism corresponding to a division (the complex term 'B or C') is instead wholly included in the middle term ('A'); mortal animal and immortal animal are included in animal. Thus, division does the "opposite" of what a syllogism should do—instead of looking at what the major term is predicated of, it deduces from something higher up, i.e., entailed by, its major term. In other words, **MD** takes the universal (or major) term as the middle and uses the middle term as the major (46b2–3).[52] This observation suffices to demonstrate claim (iv), but why should this pose a problem for the deductive power of **MD**? Because Aristotle thinks he has already shown that

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[52]Striker (2009, 210) notes that "[w]hat Aristotle says here is strictly speaking incorrect, for a syllogism in Barbara will obviously also be valid if the major and middle term are coextensive. This is in fact the case in the examples he gives, since he uses a complex term (B∨C) that must have the same extension as the genus-term A." It is likely, as Striker suggests, that this is simply an oversight on Aristotle's part, since B and C, taken individually, are smaller in scope than the genus-term A.

every valid deduction is expressible as a syllogism, the fact that divisions are not easily expressible as syllogisms belies their deductive power. Because demonstrations through division fail to be resolved into a syllogistic deduction, they lack the deductive necessity that those performed through syllogism enjoy: "And the end—that this is human being or whatever is being sought—they [sc., those who practice division] never say clearly how it is necessary" (I.31 46b22–24). For Aristotle, then, **MD** is incapable of attaining its stated goal of discovering definitions, for the conclusion of a demonstration through division is not necessary.[53]

To summarize: Aristotle argues that **MD** is a "weak syllogism," and hence "only a small part" of his method of demonstration, because, when it is converted into a syllogism (*Barbara*), it fails to deduce what the division aims to demonstrate. That is, it fails to find an appropriate middle term through which a suitable deduction can be carried out. Moreover, it fails to meet the condition that the major term of a universal first-figure syllogism (with true premises) must have a wider denotation than the middle term. As a result, **MD** lacks the property in virtue of which syllogisms have their deductive power: the conclusion is not true *because* the premises are true. Not only does division begin with the hypothesis that the definiendum falls under some generic kind, but at every step it relies on an assumption, so that the whole demonstration will be sound just in case each assumption is sound. For these reasons Aristotle argues that practitioners of division misunderstand what division is good for and use it in improper contexts (I.31, 46a34–39). His intention in arguing for these claims is apparently to prove the superiority of his own deductive method over that of his predecessors. Accordingly, he concludes I.31 by noting a number of tasks

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[53]See 46a35–37: "they [sc., those who practice division] tried to convince us that it is possible for a demonstration concerning substance, or what something is, to come about" (tr. Smith). As we will see in the next section, Aristotle goes to great lengths to show that definitions are not subject to demonstration.

for which his method is useful but for which division is not well suited: refuting, deducing statements about accidental properties and *propria*, and demonstrating facts that were not previously known (46b26–29).

Of all of Aristotle's polemics against **MD** in this chapter, perhaps the most important is his claim that it cannot be used to demonstrate or deduce definitions. That definitions are incapable of demonstration will be a central claim of *Posterior Analytics* II, where we find Aristotle's next set of attacks on division.

3.3 Further critiques of MD: *An. Post.* II.5–6

Posterior Analytics II.5 is sister to *Prior Analytics* I.31, to which the former makes reference, for here too Aristotle issues a host of arguments against **MD**. This chapter comes in the course of an extended discussion of definition, in which Aristotle is concerned to show that definitions cannot be deduced or demonstrated. Central to his conception of science is the claim that not everything is understood through demonstration (*An. Post.* I.3, 72b7–24). For, if all knowledge were demonstrative, then the principles that serve as the premises of a syllogism would themselves be subject to demonstration through syllogism. But then there must be some higher premises from which these are demonstrated, and these too would be demonstrated from other principles; clearly, an infinite regress of demonstration ensues.

To solve this problem and guarantee the soundness and necessity of the claims of scientific knowledge, Aristotle avers that not all knowledge arises from demonstration. In particular, he identifies a class of statements as "unmediated propositions" (πρότασις ἄμεσος) that are not known though demonstration from prior premises. Such propositions are essential to scientific inquiry because they are the principles of demonstration: "A principle of demonstration is an unmediated proposition, and an unmediated proposition is one than which there is no other prior" (*An. Post.*

I.2, 72a7–8). The word "unmediated" is important for understanding the connection between scientific demonstration and syllogistic deduction, because for Aristotle a demonstration is "a deduction from what is necessary," i.e., a special kind of deduction in which the premises are necessary (I.4, 73a24). Because deductions are carried out through the middle term, the claim that some propositions are unmediated (or, more literally, 'unmiddled') suggests precisely that they are not the sort of thing that can be established through demonstration. A demonstration is an explanation of why something is the case, and as such, it always proceeds by means of a middle term (I.6, 75a1–3). In all scientific inquiry what is sought is the middle term, "for the middle term is the explanation (αἴτιον)" (II.2, 90a6–7). Thus, insofar as unmediated propositions lack a middle term, they lack an explanation and hence are indemonstrable. Rather, they must be discovered in a manner distinct from syllogistic deduction: "we say that, not only is there knowledge, but some principle of knowledge, by which we are made aware (γνωρίζομεν[54]) of definitions" (72b23–25).

Importantly, definitions are grouped in the class of unmediated propositions.[55]

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[54]It may be important for understanding Aristotle's solution to Meno's paradox in *Posterior Analytics* I that "nothing [...] prevents one from in a sense knowing and in a sense being ignorant of what one is learning; for what is absurd is not that you should know in some sense what you are learning, but that you should know it in *this* sense, i.e. in the way and sense in which you are learning it" (71b6–8; tr. Barnes, with modifications). Ackrill suggests that Aristotle maintains a distinction between knowing something (ἐπίστασθαι) in the way one knows the conclusion of a deduction and becoming acquainted with it in a weaker sense: "one must truly believe (or 'weakly know') that *p* if one is to make and bring to a successful conclusion the inquiry '*p* because of what?'; one must be in possession of the answer to this inquiry if one is to count a knowing (or 'strongly knowing' or 'having scientific knowledge') that *p*" (1981, 366 f.). If Ackrill is right, then knowledge of definitions would be different in kind from knowledge of demonstrable propositions. In that case, Aristotle's claim that **MD** cannot demonstrate or deduce definitions would amount to the claim that it does not yield this stronger kind of knowledge, but it would remain open whether it can yield knowledge in the sense of acquaintance. See the discussion of *An. Post.* II.13 below (§ 3.4).

[55]Of course, definitions are not the only unmediated proposition. Definitions, on Aristotle's view, are always universal and affirmative propositions (II.3, 90b5). But the class of unmediated propositions includes some negative propositions which cannot be definitions: "And just as there are some non-demonstrable principles to the effect that this is *this* and this belongs to *this*, so too there are some to the effect that this is *not this* and this does *not* belong to *this*; so that there will be principles to the effect that something is, and others to the effect that something is not" (I.23, 84b27–31; tr. Barnes).

This fact is crucial to demonstration, for on Aristotle's view the principles of demonstration are definitions (II.3, 90b25–28). It is therefore integral to Aristotle's conception of science that (v) there exists a class of indemonstrable propositions and (vi) this class includes definitions that serve as the principles of demonstrations. In *Posterior Analytics* II.3–10 Aristotle attempts to establish (vi). He argues for this claim as follows:

> There is not demonstration of that of which there is definition. For definition is of what something is and its essence; but all demonstrations apparently suppose and take up what something is, as mathematicians [assume] what a unit is and what odd is, and similarly with the other [sciences]. [...] So the definition should clarify (δηλοῖ) what it is, and the demonstration that this is or is not [true] of that. (90b29–91a2)

On Aristotle's view, then, the content of definitions is categorically different from the content of demonstrable propositions. The former make claims about the essence of some object of knowledge, and the latter make claims about its attributes and relationships to other terms. The latter, moreover, depend on the former so far as they supply the necessary facts of the subject of inquiry. This body of facts in turn serves as the starting point of deductions. Consequently, to attempt to demonstrate a definition of something would require assuming just what one is attempting to prove, namely, its essential nature (II.4, 91a14–31).

This notion of demonstration puts Aristotle fundamentally at odds with what he takes to be the aim of **MD**: to demonstrate the definition of a term designating a natural kind.[56] Thus, to defend his conception of scientific knowledge, and in particu-

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[56]Does Plato share Aristotle's view that **MD** is means of *demonstrating* a definition? It is difficult to argue that Plato understands demonstration in the same way that Aristotle defines it, but Aristotle's word for demonstration (ἀπόδειξις), and the cognates thereof, does appear in the *Sophist* and *Statesman*, most notably at *Sph.* 261a, and at *Plt.* 273e and 284d. Nowhere in these dialogues does Plato explicitly refer to division as a form of demonstration, but the some of these passages might be interpreted as referring to the argument by **MD** as a demonstration. At *Sph.* 261a, for instance, the Visitor states that in the course of the division he might be able to

lar claim (vi), against the rival conception that focuses on demonstrating definitions through division, Aristotle must argue that **MD** is incapable of demonstrating or deducing definitions. In II.5–6 Aristotle takes up this issue, and once again argues that division is not a form of deduction. Though division may arrive at an account of the definiendum,

> it [vii] never becomes necessary for the thing to be *this* when *these* are the case, just as one giving an induction does not demonstrate. For one must not ask for the conclusion, nor must it be given that it is this. [...] For [viii] what prevents all this from being true of human being, yet not making clear what it is or what it is to be it? Moreover, [ix] what prevents either positing something additional, or taking something away, or omitting something of its substance? (II.5, 91b14–27)

In (vii), Aristotle again faults division for lacking deductive necessity. But in (viii)–(ix), he illustrates the implications of this failure. Though one may arrive through division at an account of, say, human being, in virtue of what does this account comprise the specific *definition* of human being? Recall that the Stranger's first six divisions of the sophist are inadequate because they fail to generate agreement on his precise expertise. If the sophist truly constitutes a natural kind, then there must be a single account of the sophistic expertise.[57] Aristotle's point against this kind of reasoning is that, even if one arrives at a single account of human being, there is no reason why this account elucidates its *substance*. For, as (ix) suggests, though this account may say something true about a human being, there is nothing about the division that guarantees the account will contain everything required of a definition.

"demonstrate (ἀποδείξαντες) that we can entangle the sophist in it [sc., falsity]." This statement might be read as suggesting that the final division of the sophist as a kind of insincere imitator is a demonstration that the sophist is associated with falsity. But neither this speculation, nor any of these passages, constitute decisive evidence. I prefer to remain agnostic on the matter, letting it suffice that Aristotle understands **MD** to be a sort of demonstration.

[57]See *Sophist* 232a: "...if somebody takes him to be an expert at many things, then that observer can't be seeing clearly what it is in his expertise that all of those many pieces of learning focus on" (tr. White).

To the contrary, division rests on a set of assumptions *about* the account that is to be demonstrated, and clearly these assumptions cannot ground any claim about the sufficiency of the resulting definition. There always lingers the possibility that the division left something out of, or put something extraneous into, the resulting account. By contrast, a demonstration possesses deductive necessity, in virtue of which its conclusion is as certain as its indemonstrable premises. Thus, so far as division cannot be a demonstration, it cannot be used to demonstrate definitions.

Though he complains that "these [concerns] are disregarded" by advocates of **MD**, Aristotle argues that the conclusions of a division may possess a sort of deductive necessity if the following three criteria are met: "[x] assuming (λαμβάνειν) everything in what it [sc., the definiendum] is, [xi] making the division successive by assuming (αἰτούμενον) what is primitive, and [xii] leaving nothing out" (91b28–30). Aristotle will not elaborate on these criteria for proper division until he takes up the issue of how to hunt for definitions in II.13, so we will save a detailed discussion of them until the next section. But here Aristotle contends that, even if division is carried out properly in accordance with (x)–(xii), it would still fall short of a demonstration of definition. That is, even if the division succeeds in making something known (γνωρίζειν[58] ποιεῖ), each step still relies on an assumption, for which reason it is possible to ask, why must this be the case (91b34–92a2)? This will require the divider to explain the reasoning behind each assumption, but all that can be explained is that, if (for instance) human being is a species of animal, then it must be either mortal or immortal. But even with the support of this reasoning, Aristotle thinks the definition still will not have been demonstrated: "For the whole of this sort of account is not a definition, so that even if it were demonstrated, still the definition

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[58]On the connection between this term and Aristotle's account of scientific knowledge, see note 54 above.

would not be a deduction" (92a3–5). The definition will not have been deduced from necessary premises, but rather from questionable assumptions. And such an argument, on Aristotle's view, falls short of a demonstration.

In the end, Aristotle's thinks **MD** leaves us with the same questions that the division was supposed to answer. Division proceeds by assuming the differentiae that belong to the definiendum's genus at each step of the division, so that the divider ultimately construes the assumptions made throughout the procedure as the elements of the definiens. This, as we saw, is why Aristotle rejects **MD** as a kind of deduction. But in II.6, he goes beyond these criticisms to offer a reason why division also fails at formulating definitions. In every case of division, the same sort of question arises: "why will human being be a two-footed terrestrial animal and not animal and terrestrial? For on these assumptions there is no *necessity* that what is predicated becomes a *unity*, but it could be just as if the same person were both musical and literate" (92a29–33). Notice that the necessity Aristotle here is calling for is different from the deductive necessity that characterizes proper syllogism. A definition, recall, is an account that signifies the substance of a thing. Because a substance possesses a natural unity, so should its account. And for Aristotle, an account can possess a unity in one of two ways: "either by connection, like the *Iliad*, or by making one thing clear of one thing non-accidentally" (II.10, 93b35–36; tr. Barnes). Because a definition is an account of something's substance and essence, it cannot possess the former kind of unity, but must consist in the definiendum partaking of the account non-accidentally. However, Aristotle cannot find a reason why the various elements of a definition by division can be said to possess such an essential unity. Thus, he concludes, this method is unsuited to the task of definition.

This argument plainly goes beyond the logical criticisms brought up in *Prior Analytics* I.31 and *Posterior Analytics* II.5. Now **MD** fails as a means for demon-

strating definitions, not only because it assumes exactly what it is meant to prove and lacks the deductive necessity requisite for scientific demonstration, but also because the sort of account it produces lacks a certain unity that an account of a thing's substance requires. For Aristotle's present purposes—i.e., defending his claim (vi) that definitions are unmediated, and hence indemonstrable, propositions—it suffices to show that **MD** does not present a challenge to his conception of scientific inquiry, so he quickly turns from this issue to other questions about definition. To understand the force of Aristotle's criticism, therefore, we will have to look beyond II.6. When Aristotle turns in II.13 and *Parts of Animals* I.2–3 to the question of how one ought to search for definitions, he seems to elaborate a procedure whereby an account resulting from division can possess the requisite unity. But questions still remain: why does Aristotle think the account of a substance requires such a unity, and in what does this unity consist? Why, moreover, does not Plato require the same thing of his definitions? These questions cannot be adequately addressed until we examine Aristotle's conception of proper division, but then they will arise again with even more urgency.

3.4 Revising MD: *An. Post.* II.13 and *PA* I.2–3

That definitions are indemonstrable is a central component of Aristotle's conception of scientific inquiry, and in *Posterior Analytics* II.5 he defends this claim against the practitioners of division who attempt, on his view, to demonstrate definitions through the division of kinds. Having distinguished **MD** from his own analytic method of deduction on the grounds that the former lacks the deductive necessity characterizing the latter and constituting its value for scientific demonstration, Aristotle proceeds in II.13 to lay out "how one must hunt for what is predicated in what a thing is," that is, how to discover the elements of a defining account (96a22–23). His procedure for

discovering definitions relies on the predication/partaking relation between genera and species he introduced in the *Topics*.

We saw that for Aristotle an account of a thing's substance consists in all the things in its genus that, taken together, are predicated universally and uniquely of the definiendum. But many of these extend beyond the definiendum in question and are predicated of other species:

> Of the things that always belong to a thing, some extend further than it, though not outside of its genus. [...] Well, such things must be taken up to the first point at which so many are taken that each of them belongs further, but altogether do not belong further; for this necessarily is the substance of the object. (96a24–35)

He gives as an example the definition of 'triplet': "a number that is odd, prime, and prime in this sense" (96a38).[59] Number is the genus of triplet, so it applies, in addition to triplet, to every other species that partakes of it. The differentiae odd, prime, and (other) prime, being qualities of number, are less comprehensive than number, but they are predicated of more species than triplet. What makes this account of triplet a unique account of its substance is that, when the genus and these differentiae are taken together, the resulting compound is predicated of only the species triplet. Thus, when the account of a species is sufficient to constitute its definition, wherever it obtains, so too will its objects (II.16, 98b29–32).

For all its failures as a method of deducing or demonstrating definitions, Aristotle maintains that, under the appropriate conditions, division can be useful for hunting down and discovering definitions:

> To establish (κατασκευάζειν) a definition through divisions, one must aim for three things: [xiii] taking what is predicated in what a thing is, [xiv]

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[59]Aristotle distinguishes two senses of 'prime': in one sense as "not being measured by a number" and in the other as "not being composed from numbers" (96a36–37).

> arranging these as first or second, and [xv] ensuring that these are every-
> thing. (97a23–26)

Notice first that (xiii)–(xv) parallel the three criteria (x)–(xii) given in II.5 for furnish-ing divisions with a sort of deductive necessity. Here Aristotle details these criteria. With the help of some complementary remarks from *Parts of Animals* I.2–3, we may outline Aristotle's three criteria for successful division.

(1) *Assume the appropriate genus and all the relevant differentiae.* As we saw, these are the elements of a definition of a thing's substance. Aristotle indicates that a division meets this criterion when the divider is able "to establish [conclusions] through the genus" (97a27–28). The species to be defined must therefore be assumed to partake of the proper genus, and the genus must be populated by the various differentiae that separate the species that partake of it. If one assumes both the proper genus and all the differentiae of which the definiendum partakes, then one will have identified all the elements in its definition.

Proper collection is thus a crucial component of a successful division. In II.13, 97b7–15 Aristotle makes some suggestions for identifying a common genus for things by looking at their similarities. First, we should look at similar things and ask what it is that makes them similar. Having found this common account (i.e., the account of the genus),[60] we should look next to the things which we supposed to partake of this account, paying attention to their various similarities and differences and grouping the similar things together under the same species. Division proceeds by looking

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[60]Like Plato, Aristotle warns us not to pay too much heed to names: "Now at present we argue in terms of the common names that have been handed down; but we must not only inquire in these cases, but also if anything else has been seen to belong in common, we must extract that and then inquire what it follows and what follows it" (II.14, 98a13–19; tr. Barnes). It is unclear what Aristotle means by "at present we argue in terms of common names," but perhaps he is referring to the style of dialectical argumentation for which he apparently wrote the *Topics* as a manual. Alternatively, Barnes suggests that Aristotle is "referring to the ways of contemporary biologists, who limit themselves to attributes expressible by a single common term" (1994, 251).

for differences in the species, dividing when necessary, until we arrive "at a single account: for this will be the definition of the object" (97b12–13). Of course, arriving at this single account entails that we have accurately classified the definiendum under differentiae that actually divide up the genus into kinds, so successful division depends on selecting the correct differentiae. Fortunately, in *Parts of Animals* I.2–3, Aristotle elaborates on how to select the differentiae that will distinguish natural kinds. Though many of his remarks are applicable only to divisions of biological species, we will focus on those that may be understood to apply to every case of division.

The guiding principle for selecting differentiae is that "it is not proper to break apart a single genus, like birds, with some in this and others in that subdivision, as is the case in the published divisions" (I.2, 642b10–12). For Aristotle, this immediately rules out dichotomous division, which he thinks invariably leads to the breaking-up of unified species (b16–20). He also argues that dichotomous division requires one differentia to be a privative, as Plato's example of the division of human being into 'Greek' and 'barbarian' illustrates (though of course Plato would not agree that dichotomous division requires that one differentia be a privative). The problem is that a privative differentia cannot be further divided: "for it is impossible for there to be species of a negation, for instance of footless or featherless, as there are for feathered and footed" (I.3, b22–24). Thus, placing privative differentiae at higher orders of generality stops the division before the individual species can be located.[61] Aristotle advises instead that "one must divide the one straightaway by a plurality [of differentiae]," for then one will have access to privative differentiae at lower orders

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[61]See Balme (1981, 75): "Aristotle argues that a privation cannot stand either (a) as a general differentia or (b) as a particular differentia; and (c) since it cannot be further divided, it blocks the division at that point, so that the forms to be defined will outnumber the the final differentiae that can be available."

of generality, when they can be used to separate indivisible species (643b23–24). The goal is to ensure that the division will be exhaustive, for which reason Aristotle also advises that the differentiae must be opposites (a31). If the differentiae are mutually exclusive and exhaustively divide the genus, then it is impossible for a species to fall under more than one differentia for every order of generality. But ultimately, Aristotle advises us to follow the same natural instincts that led human beings to separate natural kinds in the first place (b10–13). By taking care to preserve the unity of species, we are more likely to select differentiae that mark real distinctions among them, and so also to take into account everything that must be included in their respective definitions.

(2) *Take the differentiae of a differentia.* If one has selected the appropriate genus for the definiendum and populated it with the appropriate differentiae, one's next task is to put the differentiae into the proper order of generality. As Plato described this rule, one ought to make a division into narrow differentiae only when one cannot find any broader differentiae into which to divide. But Plato did not offer an account of the relationship between broader and narrower differentiae. Aristotle takes this criterion one step further by making explicit the relationship that must obtain between differentiae:

> It will be ordered as it must be if one takes the first term. And this will be the case, if one takes the one that follows all, but is not followed by all; for there necessarily will be some such term. When this one is taken it is the same way now for the lower terms: for the second will be first among the others, and the third will be first of those the next; and having taken away the highest one the next of the others will be first. (*An. Post.* II.13, 97a28–34)

Once again, the important relationship bearing on differentiae is based on the predication/partaking relationship. In every case the first (i.e., highest or most general) differentia will be the one whose account will be predicated of every other differ-

entia, but which partakes of the account of no other (excepting the genus). The next most general differentia will be the one that partakes only of the account of the first term (and the genus) and is predicated of all the others. If this procedure is carried through to its completion—i.e., its finding of a final differentia that uniquely identifies the definiendum—the account of the final differentia will partake of every higher-order differentia up to the first. Thus, the resulting account of the definiendum will contain the accounts of all of the differentiae that qualify it as a certain species of the posited genus.

In the *Parts of Animals*, Aristotle explains the importance of this criterion: "the continuity (συνέχεια) of differentiae from a genus along the division means that the whole is a certain unity" (643b33–34). Aristotle's claim that a definition possess a non-accidental unity was noted in the previous section. Here he claims that, by ordering differentiae such that a lower-order differentia partakes of all of the higher-order differentiae, the resulting definition gets this essential unity. Recall also the claim in *Topics* VI.6 that "each differentia imports its appropriate genus." It is clear how this might be the case if each differentia partakes of all the higher-order genera, which in turn partake of the genus. In this case the genus is predicated of the species in virtue of being predicated of its final differentia.[62]

(3) *Leave nothing out of, and add nothing to, the definition.* Aristotle thinks that, by adhering to (1) and (2), it is assured that the division will lack nothing and contain nothing superfluous (*An Post.* II.13, 97a35–b6). For, by (1), it is assumed that the division contains the genus and the differentiae appropriate to the specified definiendum, so that none of the elements of the definition have been left out. By (2), moreover, the differentiae have been ordered in such a way that the narrower

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[62]This assumption, that the highest-order differentia partakes of the genus, will be called into question in the discussion of Aristotle's solution to the unity of definition in *Metaphysics* VII.12 (see below, § 4.2).

differentiae partake of the broader differentiae, which in turn partake of the genus. Thus, on this view the final differentia plus genus that makes up a definition will entail just those differentiae that are predicated of the former and partake of the latter, so that no extraneous terms are added to the definition. Thus, the division becomes necessary since, as Aristotle requires, "everything falls into the division and nothing is left out" (II.5, 91b31–32).

These three criteria comprise Aristotle's reformed Method of Division (**MD***). Its characteristic features differ in important respects from those of Platonic division (**MD**). The principle difference is the predication/partaking relation that Aristotle recognizes between species and their genera. Though he agrees with Plato that there is a categorical difference between divisible and indivisible kinds, Aristotle goes on to make explicit that only genera are predicated of species, and species are predicated of nothing but their members. This allows Aristotle to elaborate on the proper ordering of differentiae within a species based on this relationship. Thus, while **MD** requires a fresh assumption, and an additional application of Collection, at each step of the division, the order of differentiae according to **MD*** cannot be so questioned. This is not to say, however, that **MD*** does not rely on any assumptions. To the contrary, it relies on assuming both the genus and all the differentiae appropriate to the specified definiendum. The difference is that these are the only requisite assumptions for proper division, whereas **MD** requires both these assumptions and an additional set of assumptions concerning the ordering of differentiae (or divisible kinds). This difference moreover translates into different criteria for proper division. Plato suggested dividing into as few parts as possible in order to avoid fragmenting a naturally unified kind. But Aristotle retorts that dichotomous division does just that, and additionally groups together loose collections of species under indivisible privative differentiae. In **MD***, the general rule is not to make as few divisions as

possible, but to make the divisions exhaustive and mutually exclusive.

In virtue of these criteria for proper division, **MD*** enjoys a sort of deductive necessity on which the definition resulting from a division is true when the initial assumptions are true. But furthermore, Aristotle wants to claim that only on his account can divisions produce definitions possessing a non-accidental unity. Without the central partaking relation, division lacks an account of how a final differentia can "import" higher-order differentiae and, ultimately, the genus. This is a criterion for division that does not rely on Aristotle's logical theory, but rather on his claim that a definition is an account of a thing's substance. Insofar as a substance possesses a natural unity, he maintains, so should its account. To understand Aristotle's motivation for this view, we must look beyond his logical and scientific works to examine his ontology of substance. This will be the task of the final section.

4. CONCLUSION: ARISTOTLE ON DIVISION II

The last section ended with an unresolved question about the reasoning behind Aristotle's demand for the unity of a definition. We saw that most of his criticisms of **MD** arise from his syllogistic conception of scientific demonstration and logical deduction. Because analysis of a demonstration by division into a syllogistic deduction fails, Aristotle concludes that it lacks the deductive necessity characteristic of scientific demonstration. Moreover, Aristotle wants to maintain that some statements, importantly those that serve as the premises of demonstrations, are incapable of demonstration. For this reason too he argues that definitions formulated through division are not thereby deduced or demonstrated. We were unable, however, to find a similar motivation for Aristotle's claim that definitions must possess a unity, which gives rise to his contention that definition by division does not account for the unity of its object.

To understand Aristotle's reasoning on this point, we will look in this section at his discussion of definitions by division in the *Metaphysics*. In light of this discussion, I will suggest that Aristotle's demand that a definition account for the unity of its object stems from his ontological commitment to the unity of form. He meets this demand in the case of definitions from division by arguing that the definition of a substance consists in a simple predicate, namely the final differentia of its species. This argument relies on the second criterion of **MD***, that the differentiae be ordered successively according to non-accidental attributes, as well as an obscure claim that the genus will be entailed by the final differentia either if it does not exist apart

from its species or if it exists as matter. This latter claim will turn out to be very difficult to understand, as a survey of competing interpretations will attest. However, it will emerge from this discussion that, on any plausible interpretation, Aristotle's methodological remarks on division highlight the central role his account of definition occupies in his ontology. We will consider an objection to the Platonic Forms from Aristotle's discussion of the unity of definition in *Metaphysics* VIII.6 that will illustrate the relationship between Aristotle's conception of substance and his account of proper division (**MD***). Aristotle argues, I suggest, that the Platonic account of definition cannot account for the unity of its object precisely because it presupposes the Platonic theory of Forms. Before we inquire into the relation between Aristotle's methodological critique of **MD** and his substance ontology, however, we must understand why Aristotle thinks the unity of the object of definition poses a problem for the Method of Division.

4.1 The problem of unity in *Met.* VII.12

The problem Aristotle raises in *Posterior Analytics* II.6 about the unity of definition is not resolved there. The chapter ends aporetically with the concern that a definition could look "just as if the same person were both musical and literate" (92a32–33). The solution that a definition is a unity when at every step of the division the selected differentia is a differentia of the immediately higher differentia is offered in the methodological discussion of *Parts of Animals* I.3, but the problem gets its fullest treatment in *Metaphysics* VII.12.

Here Aristotle undertakes to address definition "inasmuch as it was not addressed in the *Analytics*" (1037b8–9). He asks again what it is that makes a definition a unity, but goes on to elaborate why it will not suffice for a definition to possess only the sort of incidental unity that obtains, for instance, when the same person

possesses the attributes 'musical' and 'literate':

> In virtue of what is it one, the account of which we call a definition?[63]
> For instance 'two-footed animal' for human being (let this be the account
> of human being): in virtue of what is this one and not many, animal and
> two-footed? Concerning 'human' and 'pallid' there is a plurality when
> one does not belong to the other, but a unity when it belongs and the
> subject, the human, has a certain attribute. For then a unity comes
> about and there is a pallid human. But [i] here one does not partake
> (μετέχει) of the other, for the genus is not thought to partake of the
> differentiae. For then it would partake of opposites at the same time,
> since it is opposite differentiae that divide the genus. But [ii] even if it
> does partake [in them] the same argument applies, if the differentiae are
> many, for instance footed, two-footed, wingless. On what account are
> these one and not many? [iii] It is not because they belong [to the same
> thing], for in this way a unity will be [made] out of anything. (1037b11–
> 24)

There are a number of arguments in this passage. As in *Posterior Analytics* II.6,
Aristotle contrasts the unity of subject and attribute and the unity of definition. In
virtue of belonging to the same subject 'musical' and 'literate' may be one. Similarly,
a person, as subject, and an attribute like pallor may be one in virtue of the latter
belonging to the former. And in general, as (iii) indicates, this sort of unity can obtain
between any set of attributes predicated of the same subject. The unity of subject
and attribute described here corresponds to an account of accidental predication
developed in the *Posterior Analytics*. For Aristotle something is an accident if it is
said of some underlying subject (ὑποκειμένος) (I.4, 73b8–10). Accidents always are
predicated of some subject but are not included in the account of what that subject
is. A subject's accidental predicates, in other words, are not a part of its essence:

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[63]Is Aristotle discussing the unity of a definition or its object? This sentence, at least, suggests
that he is primarily concerned with the unity of the definiendum, the substance whose account is
called a definition. This understanding certainly fits the broader context of *Metaphysics* VII, which
is a extended discussion of substance. However, VII.12 is concerned explicitly with the unity of
definition which, he will argue, is necessary to account for the unity of its object. This interpretive
question may not be so pressing, however, for we will see that Aristotle wants to maintain that the
unity of a definition is the same in kind as the unity of its object.

> For human is not what pallid is or what a sort of pallid is, but presumably is an animal; for human is what animal is. But what does not signify substance must be predicated of some subject, and there is nothing pallid which is not pallid through being something different. (I.22, 83a28–32)

For a person to be musical or pallid says nothing about what that person is, since by definition an accident is predicate of what is *different* from it. What a person is is different from what musical and pallid are and, generally, different from everything accidentally predicated of her.[64]

Clearly, then, definitions cannot be one in the same way that that a subject and its attributes are one. A definition, recall, is an account of what a thing is *essentially*, so it does not account for the accidental properties of the definiendum. In 1037b11–24, Aristotle gives two arguments in support of this claim. He argues in (i) that the elements of a definition are not related to one another as subject and (accidental) attribute. If it were, the genus would act as a subject and the differentiae as its attributes. Notice, first, that this is the inverse of the partaking relation in the *Topics*.[65] On that account, the differentiae (*qua* subordinate genera) partake of the genus, but not the genus of the differentiae. Moreover, as we saw (§ 3.4) and as Aristotle here affirms, the differentiae that divide up a genus are opposites—that is why they exhaustively divide the genus such that each species fits under exactly one differentia. If the genus partakes of the differentiae as a subject partakes of a set of attributes it would, absurdly, possess contrary attributes at the same time. Hence,

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[64]Barnes understands Aristotle to be arguing in this section of *An. Post.* I.22 that "non-substantial predications are non-essential and so (in one of the many senses of the term) incidental" (1994, 177). It follows that non-substantial predications, as illustrated in the passage quoted above, do not signify the substance of their subject. Barnes notes that "a crude account of *ousia* might say, without being unduly misleading, that *ousia* is ambiguous between 'essence' and 'substance'" (Ibid.). On the interpretation developed below, Aristotle is claiming (minimally) that accidental predicates do not say anything about the essence of their subject. It follows, I shall argue, that this precludes the idea that a definition, which does signify the substance of its definiendum, possesses the sort of unity that obtains between subject and attribute.

[65]See § 3.1 above.

Aristotle concludes that the unity of the parts of a definition is different in kind from the unity of subject and attribute.

Furthermore, and perhaps more to the point, he argues in (ii) that this account of unity is inadequate for the task for which the unity of definition is required. In the case presently under consideration, in which the definition of human being is stipulated as 'two-footed animal', the defining account is a complex statement consisting of the genus-term 'animal' and the differentia-term 'two-footed'. Aristotle argues that, even if genus and differentia were related as subject to attribute, we are faced with the same problem because the defining account is composed of many parts. For these parts to compose a definition they must have an intrinsic connection stronger than the incidental connection between 'musical' and 'literate' or 'human' and 'pallid'.[66] This is suggested by the sentences that immediately follow 1037b11–24:

> But surely whatever is included in the definition must be one, for a definition is a single account and [an account of] a substance, so it must be an account of a unity. For substance signifies a 'one' and a 'this', as we say. (1037b24–27)

The unity required of a definition must correspond to the unity of its object. Consequently, just as the unity of a substance cannot be explained by appeal to the subject-attribute relation, the unity expressed in the statement 'two-footed animal' cannot be explained by positing 'animal' and 'two-footed' as attributes of a common subject. The parts of a definition, in other words, must possess an intrinsic and non-accidental unity.[67]

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[66]See Code (unpublished ms, 4): "Insofar as the two predicables themselves [sc., 'literate' and 'musical'] indicate some kind of unity, this is due simply to the fact that they both apply to a single subject. It is not due to any intrinsic relation between these two predicables. There is a unity when there is some one other thing (i.e., a man) that happens to be characterized by both. That unity (the unity indicated when we say of a man that he is both musical and literate) is for Aristotle accidental."

[67]See Ibid., 5: "...although it is true to say of a man that he is footed and it is true to say of a

Aristotle's solution to the problem of unity in this chapter echoes the solution he offers in *Parts of Animals* I.3 in that it depends on the final differentia entailing the superordinate differentiae. But here he will make the stronger claim that, in a proper division, "the last differentia will be the substance of the thing (ἡ οὐσία τοῦ πράγματος) and the definition" (1038a19–20). This conclusion of VII.12 comes after an extended discussion of definition, its parts, and its relation to substance. In *Metaphysics* VII.10–11 in particular, Aristotle treats the parts of substance and the question of which of these are included in the account of its essence. In order fully to grasp Aristotle's solution and its relation to division, then, we must take a brief digression into this discussion of substance and the parts of definition in *Metaphysics* VII.

In the *Categories* Aristotle considers the term 'substance' to apply primarily to individual objects (see, e.g., *Cat.* 5). It is not obvious, however, whether he maintains this understanding in the discussion of substance in *Metaphysics* VII. In this discussion, a substance is considered primarily as an independent (i.e., nonpredicable), and self-subsistent entity (VII.6), and it is apparent that the term refers additionally to entities other than individual objects. In VII.3, 'substance' is taken to indicate either the form (εἶδος) of an object or the object itself, conceived as a unified compound of form and matter (1029a27–30). Of these two notions of substance, Aristotle considers the form of the object to be more basic because it exists prior to the compound substance (a6–7). A substance (in this basic sense) is identical to its essence (τὸ τί ἦν εἶναι) (VII.6, 1031b18–21), and the essence of each substance is "what it is said [to be] in itself (καθ' αὐτό)" (VII.4, 1029b14). Aristotle concludes,

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man that he is an animal, the predicate 'footed animal' must be unified in a stronger manner, and a footed animal cannot be merely an accidental unity. The unity indicated by the predicate should not consist merely in the fact that each of the two constituent predicables applies to one and the same subject in such a way that that subject (the man) happens to be footed and happens to be an animal."

as the Greek might suggest, that "nothing which is not a species (εἶδος) of a genus will have an essence, but [it will belong] only to these" (1030a11–13; tr. Ross, with modifications). Because essence is identical with form, it will also be identical with the species of which the substance partakes.

Here, as in *Topics* I,[68] Aristotle understands definition to be an account of what a thing is, i.e., its essence (VII.5, 1031a12–13). Accordingly, a definition will be an account of both the substance itself and its corresponding species. He describes an adequate account of a substance's essence as one "in which the word [sc., the word denoting the definiendum] is not present, but in which its meaning is expressed (λέγοντι)" (1029b19–20). A defining account, in other words, should be substitutable for the term denoting the thing itself (cf. *An. Post.* II.16, 98b29–32)—to use Aristotle's own example, if the account of 'white surface' is 'smooth surface' then 'white' is equivalent to 'smooth'. Moreover, because only substances strictly speaking have essences, only substances strictly speaking are definable (VII.4, 1030b5–6). And since a substance is identical with its essence, in the basic sense of 'substance' an account of a thing's essence will be an account of its form or εἶδος.

On this understanding of substance, it is plain why a definition must possess unity. Its object, the essence or form of an object—and that which it shares with the other members of its species—is, as Aristotle puts it, a 'one' and a 'this'. If a defining account should be able to stand in for its definiendum, then it must possess an intrinsic unity sufficient to account for its object being a 'one' and a 'this' (VII.4, 1030b8–11). So the unity that Aristotle is looking for in the case of definitions is *substantial* unity.[69] The stipulated definition of human being in VII.12 consists of

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[68]For the account of definition given there, see § 3.1 above.

[69]Substantial predication is precisely not accidental predication: "the things signifying a substance signify of what they are predicated of just what is that thing or just what is a particular sort of it; but the things which do not signify a substance but are said of some other underlying subject which is neither just what is that thing nor just what is a particular sort of it, are accidental, e.g.

two elements, the genus-term 'animal' and the (final?) differentia-term 'two-footed'. In VII.10–11 Aristotle discusses the parts of a substance and the parts of definition at length. He identifies three categories of parts of a substance: parts of the matter, parts of the "εἶδος," and parts of the compound (10, 1034b34–1035a5).[70] These parts are distinguished by their priority with respect to the substance they comprise. The parts of the εἶδος are distinguished in that they are prior to the substance itself and essential to it. To the question of which of these parts are parts of the account of the substance, Aristotle answers that "all the parts of the account and those into which the account is divided are prior, either all or some of them" (1035b4–6). Thus, only parts of the εἶδος are included in the definition.

VII.12 explicitly identifies genus and differentiae as parts of the definition (1037b29–30), and this view is consistent with the claim in the *Topics* that the formula for a definition is genus plus final differentia (VI.3, 143b8–9). So, in order for the genus-term 'animal' and the differentia-term 'two-footed' to comprise a definition of human being they must constitute a unity sufficient for it to account for the unity of the form of the human species. In other words, there must be a principle, analogous to

white of the man" (*An. Post.* I.22, 83a24–29; tr. Barnes). Cf. Code (unpublished ms, 28): "It is not just that the predicate in a definition must signify a unity. It must signify an intrinsic unity as opposed to an accidental unity. This in turn is required because a definition says of some definable object what it is in its own right, intrinsically. However, the definable object itself would not be an intrinsic unity if the only account saying what it is has parts that are related in non-intrinsic and accidental ways. If the account saying what man is fails to express an intrinsic unity, and yet this is the account that gives the being of the item in question, then the object of the account, man, also fails to be an intrinsic unity. But in that case it cannot be a substance." On Code's understanding of the problem, the key seems to be that a definition ought to be a *unique* account of the substance defined (cf. *Topics* VI.4, 141a35). If that unique account fails to possess an intrinsic unity, then so too must its object.

[70]Devereux (2009) argues for a fourth (quasi-) category of parts, the "functional parts" of a living organism. He suggests that functional parts, like parts of the form, are distinct from homoeomerous material parts because they are essential to the organic substance. In this sense, "functional parts are formal parts" that are distinct insofar as they indicate something about the activity of the organism (14). I admittedly am unclear exactly what Devereux has in mind as functional parts, but if a part of the form like two-footedness qualifies as a functional part it may explain why it ought to be included in the definition of human being despite making reference to the matter of the body.

the principle that two attributes are one in virtue of belonging to the same subject, that explains why the predicates 'animal' and 'two-footed' can coherently be combined into a unified whole, a 'two-footed animal'.[71] The question of VII.12, then, is, what makes these distinct terms into a *substantial* unity?

Aristotle's answer to this question is that, for definitions generated from proper division, there really is no problem of unity: "Then if there is a differentia of a differentia [at each step of the division], *one*, the final [differentia], will be the form (εἶδος), that is, the substance" (1038a25–26).[72] If the division proceeds according to

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[71]It might be questioned whether Aristotle thinks such an account could be adequate for a definition of human being. In VII.11, only a few paragraphs before 12, he indicates that the defining account of an organism will be an account of its soul (1035a14–21). It is hard to imagine that 'two-footed animal' could stand as a definition of the human soul, so one might be tempted to conclude that division is wholly inadequate to furnish a defining account of an organism. This is the view that Code (unpublished ms) defends: "...the definition by division is not the account that captures the being or *ousia* of man. The definition by division may well be a necessarily true proposition that classifies the species by isolating a factor that distinguishes it from the other members of its kind [i.e., the final differentia], but it does not capture the *ousia* of the definable item" (40).

Of course, the definition of human being as 'two-footed animal' in VII.12 is suggested only for illustrative purposes and is clearly an inadequate defining account; it would group humans with other bipeds in the genus animal, whereas a definition ought to single out only the species human being. But even with a complete division and a suitable final differentia of human being, it might still be doubted that such an account can constitute the definition of the human soul. This consideration is immaterial to the present question of the unity of definition, but if correct it would suggest that Aristotle is not confident at all in the ability of division, even on **MD***, to generate suitable definitions.

[72]Ross translates this sentence "If then a differentia of a differentia be taken at each step, one differentia—the last—will be the form and the substance;" and Bostock translates it "So then, if each new differentia is a differentia of the previous one, there will be one last differentia and it will be the form and the substance." I agree with Bostock's understanding of Aristotle's solution: "a properly formulated definition will reduce to its last differentia alone, so there is really no problem over how its parts 'form a unity', for it does not actually have distinct parts at all" (1994, 183). I deviate from his translation for two reasons. First, following Ross' translation, I want to make clear that Aristotle's solution is specific to definitions arising out of division. I will argue (§ 4.2 below) that Aristotle's solution to the problem rests on two claims, one of which we have already identified as a criterion for proper division on **MD***. Thus the efficacy of this solution for definitions not arising from division is questionable. But this is not to say I disagree with Bostock, for he even acknowledges this point, arguing that *Metaphysics* VII.12 and VIII.6 offer incongruous solutions to the problem of unity (see his 1994, esp. 176 f., 183 f.). Second, in light of conclusion of the foregoing discussion that the object of definition is an indivisible natural kind, i.e., the species of some genus, I read the 'καὶ' in 'τὸ εἶδος καὶ ἡ οὐσία' as epexegetical. Given that the discussion of VII is about division, I think the only sense of οὐσία Aristotle has in mind is the one on which it is the form of an individual object. On this understanding, 'substance' would be equivalent to 'form'.

differentiae that are part of the essence of the species or substance being defined, then the resulting account will identify the elements of its essence that make it a unique member of its genus. Aristotle thinks this will be the case if, at each step of the division, the divider selects differentiae of the differentia under which the definiendum has been placed. Otherwise, he warns, the divider will select accidental attributes as differentiae—as when we divide 'footed' into 'pallid' and 'dark' (a27). Then the division will not yield a unified account, for "the differentiae will be as many as there are cuts (τομαὶ)" (a28; tr. Bostock). Thus, only if one divides by selecting subordinate differentiae that non-accidentally qualify superordinate differentiae will the final differentia that uniquely identifies the definiendum include them in its account. In such cases, to state the final differentia would be elliptically to state the differentiae it entails. And because the final differentia is equivalent to the form and essence of the substance, the definiens will be a unity in virtue of consisting of only one term. Without a plurality of parts (i.e., a plurality of differentiae), the definition becomes a simple predicate. Its unity, therefore, is secured through its simplicity.[73]

If this is Aristotle's solution to the problem of the unity of definition, it gives a stronger account of definitions from division than those he gives in the *Topics*, *Analytics*, and *Parts of Animals*. In the next section, I will argue that this stronger account depends on the methodological revisions to division characteristic of **MD***, as well as a reconsidered account of genus alluded to in VII.12. In the next section, we will turn to Aristotle's argument for the simplicity of definition to inquire how it develops from these considerations.

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[73]My understanding of Aristotle's solution to the problem of unity follows closely that of Code. Cf. Ibid., 32: "The ultimate answer to the question 'What is man?' would in that case simply be 'two-footed.' This answer has none of the internal complexity of a definition by genus and differentiae. Since it does not mention a plurality of parts, the question as to what unifies those parts does not even arise. And if this is correct, then we have discovered *the* constituent element in a definition by division that is that by which the parts are one."

4.2 MD* as a solution to the problem of unity

Aristotle's conclusion that a definition formulated through division is a simple predicate, namely the final differentia of the definiendum, depends on two claims: that (iv) definitions generated through division need only comprise the differentiae (1037b29–1038a8), and that (v) when the elements of a definition are so related that the subordinate differentiae are differentiae of the superordinate differentiae, the definiens is reducible to the final differentia (1038a9–21). Let us first consider the argument for the latter claim.

(v) On Aristotle's revised Method of Division (**MD***) a definition becomes necessary when three criteria are met.[74] First, the divider must assume the genus and all the relevent differentiae that will comprise the definiens. Second, the differentiae must be ordered successively such that a subordinate differentia always partakes of the superordinate differentiae. Third, the divider must make sure that the resulting definition contains all and only the requisite parts—of course, this criterion is met just in case the other two are also met.

In VII.12, Aristotle elaborates on the second criterion for proper division according to **MD***. In the *Analytics* and *Parts of Animals* it was argued that the division is successive when the subordinate genera partake of the superordinate genera. Here he goes further to claim that "one must divide by the differentia of a differentia" (1038a9–10). That is to say, the differentia of a higher differentia cannot be an accidental attribute of it. Rather, it must correspond to an actual distinction in what it is of itself.[75] Only in this circumstance will the superordinate differetia be predicated of its subordinates. Given the differentia 'footed', therefore, the divider should divide it into "differentiae of the foot," for instance, into cloven- or noncloven-footed (a15–16).

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[74]See § 3.4 above for a detailed account of the three criteria of **MD***.

[75]See note 69 above.

Then clearly the subordinate differentiae will entail the superordinate differentiae—for a substance to be cloven-footed entails that it is also footed.[76] Thus, by following this procedure the divider identifies an ordered class of differentiae in which each term is entailed by its successor. If the defining account is to be complete the chain of entailment relating the terms of this class must begin with the first differentia of the genus and end with the final differentia that uniquely identifies the definiendum; when the divider arrives by this procedure at what cannot further be differentiated, the division and the class of relevant differentiae is complete (1038a16–17).

Aristotle argues that when divisions are carried out according to this procedure only the last differentia will be the form and essence of the definiendum, for in this case the superordinate genera are redundant: "it is not necessary to state these [differentiae] many times over in the definition; for this is superfluous" (a20–21). Given the partaking (and predication) relation on which successive differentiation depends, it ought to follow that, insofar as the substance or species being defined possesses a subordinate differentia, it ought to possess the differentiae higher up along the chain of entailment—that a human is two-footed naturally entails that she is footed, which naturally entails that she is..., which naturally entails that she is terrestrial (assuming this is the first differentia of the highest genus 'animal' under which 'human being' falls). Aristotle suggests this point is demonstrated by reversing the order of the differentiae, for it is obviously redundant to say 'two-footed and footed', but this is just what is said when both 'footed' and 'two-footed' are included in the definiens (a30–34). Therefore, to include the intermediate differentiae is only to

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[76]Granger (1980) suggests that, on this conception of the genus-species relation, the ordering of successive differentiae corresponds to the determinable-determinate relationship. Thus, "cloven-footed is a determinate of the determinable footed" (44). This relationship certainly obtains between 'footed' and 'cloven-footed', but it is unclear whether it will also obtain between other successive differentiae like 'footed' and 'manycleft' (cf. *PA* 642b26–30). Though being manycleft with respect to feet is a quality of footedness, it is not a determinate property like 'cloven-footed' is since it admits of further division.

restate what is already implied in the final differentia, so the whole class of differentiae that strictly speaking are part of the account is expressed in only a single predicate. In short, there is no internal complexity in the definiens at all.

(iv) To infer from this consideration that the whole definition consists in a single predicate, however, Aristotle needs another premise. Recall that here as elsewhere a definition is said to consist in the genus and the final differentia of the definiendum. The argument for (v) is meant to show why the final differentia is sufficient to express the whole class of differentiae that uniquely identifies the definiendum, but what about the genus? How does it figure into the single predicate consisting of the final differentia?

Aristotle argues that the genus does not introduce complexity into the definition because "a definition is an account comprising the differentiae" (a8–9; tr. Ross, with modifications). This claim might seem inconsistent with his earlier account of definition as genus and final differentia, since the genus does not seem any longer to be a part of the definition. Aristotle's reasoning behind this claim is opaque, but it is clear that he does not take it to conflict with his previous accounts of definition—he even reaffirms this view in this chapter (1037b29–30).[77] He argues that a definition is made up only of differentiae if at least one of two statements hold of the genus: "if, then, [vi] the genus without qualification (ἁπλῶς) does not exist apart from the species which it as genus includes, or if [vii] it exists but exists as matter—for the voice is genus and matter, but the differentiae make the species,

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[77]The obscurity of Aristotle's remarks on this point (1037b29–38a8) is notorious. See, e.g., Bostock 1994, 180 ff. Code reads these lines as supporting Aristotle's claim that the genus cannot be "the unifying substance of the thing" (unpublished ms, 31). If this is the purpose of that passage, it is unclear to me why Aristotle should take the claims that "the genus does not exist in an unqualified way over and above its species, or if it does, it does so only in the way that matter does" to settle the issue (Ibid., 31n37). It seems to me more plausible that the purpose of these two claims is to show that, as the intermediate differentiae are entailed by the final differentia, so too is the genus, so that there need be no complexity in the defining account of a substance.

i.e., the letters, from it)..." (1038a5–8; tr. Ross, with modifications). If the genus is construed extensionally, statement (vi) is reasonably clear: each member of a genus is a member of one of its species; hence, the genus exists only through its species. If this is what Aristotle is getting at in (vi), then one immediately notices a connection with the view given in *Topics* VI that, so far as each differentia "imports" its appropriate genus, "each of the genera as well is true of that of which the differentia is true" (144b18-19; tr. Pickard-Cambridge).[78] Thus, as the superordinate differentiae are entailed by their subordinates, so too will the highest genus that the definiendum partakes of[79] be entailed by the highest differentia entailed by the final differentia. It of course follows that, in stating the final differentia, the definition elliptically states the genus as well as the higher differentiae.[80]

Statement (vii), however, does not admit of such an easy interpretation. If the genus exists as matter, why should it follow that a final differentia entails its genus? This question is further complicated by Aristotle's claim only a few lines earlier that "there is some matter in everything which is not an essence and a bare form (εἶδος αὐτὸ καθ' αὐτὸ) but a 'this'" (VII.11, 1037a1–2). To the extent that a definition is an account of a thing's essence and its form, it would seem to follow from this claim that it lacks matter. But Aristotle seems to be arguing in VII.12 that the genus is both matter and an element of the definition, so that the definition *does* have matter.

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[78]See also *Top.* VI.5, 143a19–24: "The substance of a thing in each case involves its genus. This [sc., passing over the genera in a definition] is the same as not putting the object into its nearest genus; for the man who puts it into the nearest one has stated all the higher genera, seeing that all the higher genera are predicated of the lower. Either, then, it ought to be put into its nearest genus, or else to the higher genus all the differentiae ought to be appended whereby the nearest genus is defined" (tr. Pickard-Cambridge).

[79]If Aristotle here maintains the same view of genus and differentia he presents in the *Topics*, it is not possible that a differentia might entail competing genera. On the account given in *Topics* I.15, each differetia unequivocally belongs to only one genus, so only one genus is invoked for every differentia (107a18–30).

[80]*Pace* Bostock, who sees no reason why statement (vi) should support this conclusion (1994, 182).

How does this thesis help him solve the problem at hand?

Aristotle evidently takes statements (vi)–(vii) to entail that the definition is only an account of the differentiae on the basis of an obscure argument he gives earlier in the chapter. He claims that "the other genera [i.e., the differentiae *qua* subordinate genera] are the first [genus] and with this the differentiae collected with it (αἱ συλλαμβανόμεναι διαφοραί)" (b30–32). Using the stipulated definition of human being as an example, he explains that the first genus would be 'animal', next would be 'two-footed animal', with another perhaps being 'featherless two-footed animal' (b32–33). On the basis of this illustration, it might be thought that what Aristotle means by "the other genera" are in fact new, and narrower, genera constructed from the first genus by adding differentiae to it.[81] Thus we have, for instance, the narrow genus 'two-footed animal' and the even narrower genus 'featherless two-footed animal'. These would of course be subgenera of the first genus, but Aristotle's point, on this reading, would be that ultimately a genus with only one differentia, the final differentia, would be included in the definiens. If a complex string of differentiae can be resolved into a single genus plus single differentia, then it seems that Aristotle's conclusion follows. If, by (vi), the genus does not exist outside its species and, by *Topics* 144b18-19, the genus is true of whatever its differentia is true of, then definition can plausibly be construed as an account of the differentiae, consisting only of the final differentia, without abandoning the idea that the genus and differentiae are elements of a definition. It is unclear, however, whether this conclusion also follows from statement (vii). We have good reason to think that Aristotle's argument works

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[81]My view here follows that of Bostock: "Aristotle first points to the fact [...] that we can always regard the initial genus, taken together with some of the differentiae following it, as forming a subgenus. [...] The moral of this would appear to be that the complex case of a genus followed by many differentiae can be reduced to the simple case of a genus followed by a single differentia, namely by taking all of the definition except the final differentia as introducing a (narrow) genus" (1994, 180 f.).

on the basis of (vi), but is he also arguing that genus is matter?

This question is a point of deep disagreement in Aristotle scholarship, for, among other reasons, on it rests in part the larger question of the unity of the *Metaphysics*. In particular, Aristotle treats the issue of the unity of definition once again in VIII.6, this time without specifically addressing definition by division, but rather the unity of the *object* of definition.[82] In this chapter Aristotle's solution to the problem seems to rest on a distinction, not mentioned in VII.12, between potency and actuality. Though the question of unity may arise "if people proceed thus in their usual manner of definition and speech," it will no longer present a problem "if, as we say, one element is matter and another form (μορφή), and one is potentially and the other actually" (1045a21–24; tr. Ross). It follows that the union of form and matter constitutes a unity since "the proximate matter and the form are one and the same thing, the one potentially, the other actually" (b18–19). Unlike the account given in VII.12, this account does not seem to rely on claim (iv), that definition is made of up differentiae, or claim (v), that an ordered class of entailing differentiae is reducible to its last member.

Many competing interpretations of the relationship between VII.12 and VIII.6 have cropped up, but each face certain challenges. Deslauriers, for instance, argues that VII.12 and VIII.6 are consistent because in VII.12 Aristotle identifies the genus with matter. Because the genus is matter, it is potentially what the defined species (form) is actually, so the unity of genus and species (or, more precisely, the unity of genus and final differentia) explicated in the VII.12 corresponds with the unity of matter and form explicated in VIII.6.[83] It follows on this view that Aristotle

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[82]For this reading, see Harte 1996.

[83]See Deslauriers (2007, 137): "The connection between the solutions of 7.12 and of 8.6 to the problem of unity is the identification of the genus in the definition with the matter in the thing, through their role as potentially what the whole is actually. The difference in the approaches of 7.12 and 8.6 is the difference between thinking of the parts of definition in their logical relation to

considers the genus, *qua* matter, to be included in the definition. But this seems to contradict the claim of VII.11 that bare essences and forms lack matter (1037a1–2). For if the defining account of a substance includes matter, what it signifies also will include matter. And if, as we have been supposing, the object of definition is a form, which is identical to its essence, it follows that form and essence possess matter. Thus, on this view, VII.12 and VII.11 offer competing accounts of whether form and essence possess matter. Some scholars, wishing to avoid this commitment to matter as an element of definition, have suggested that the two chapters are incongruous, and have argued that only one should be understood as representing Aristotle's mature and considered view of the problem. Bostock has argued that VIII.6 should be favored as Aristotle's definitive position on the unity of definition.[84] This view holds, however, only at the cost of denying the unity of the *Metaphysics*, and indeed of chapter VII itself.[85] I do not wish to claim that these considerations are decisive, only that serious consequences attend either view.

Since the question of the relationship between VII.12 and VIII.6 is plainly beyond the scope of the present study, let us pass it over in order to return to the problem of the unity of definitions arising from division. On any account of Aristotle's ultimate answer to this problem, Aristotle is committed the thesis that a definition possesses

one another, as genus and species, and thinking of the parts of definition as representing the parts of the object of definition, i.e. the parts of the essence, in which case the relation between the parts is analogous to the relation between the parts of the composite substance: matter and form."

[84]Bostock suggests that VII.12 was an early editor's addition to book VII that was placed after chapter 11 because that chapter introduces the topic of 12 and because 12 seemed to provide "the more complete treatment" of the unity of definition (1994, 176). He continues: "[VIII.6] might well appear to be even more fragmentary than [VII.12], and therefore better relegated to the end. Nevertheless, I think it is clear that [VIII.6] is in fact the more mature treatment" (177). Bostock argues that "the solution recommended in [VII.12] is rejected in *PA* I as impossible in practice, and rejected in [VIII.6] as mistaken in principle, since it employs an inadequate conception of what a definition is [i.e., one based on division]. It is a relatively early attempt, and one that Aristotle himself discarded" (184).

[85]Devereux has argued to the contrary that VII.10–11, in which chapters matter is appears to be excluded from definitions, represents Aristotle's mature view of definition, while book VIII reflects an earlier view. See his 2009, 23–32.

unity in virtue of the relationship between the elements of a definition. He argues that a definition arrived at through proper division—a division conforming to the three criteria of **MD***—will be one because it consists of a single predicate, the final differentia of the definiendum. Aristotle will argue in VIII.6 that this solution is not available to those who maintain an ontology of abstract Forms because, on such a view, the object of definition is not sufficiently unified. In the next section, we will turn to consider this polemic against the Forms, and in particular how it is connected to Aristotle's methodological disagreement with the practitioners of **MD**.

4.3 The critique of the Forms in *Met.* VIII.6

We have been considering Aristotle's demand for the unity of definitions, and how this condition might be met on a suitable account of division. For Aristotle, a definition is an account of a thing's essence—what it is to be that thing. Essence strictly speaking only belongs to substance, conceived either as an individual object or the form of an individual object. On either conception a substance is an inherently unified subject. In accounting for the essence of a substance, then, definitions must signify the intrinsic unity of the substance it defines. This presents a problem for the Method of Division, for the definitions it yields consist of many parts, including a genus and a set of differentiae. Aristotle's solution to this problem, as we saw, is that, in a proper division, the complex account consisting of a genus and a set of differentiae is reducible to just one term, the final differentia.

This solution depends on at least two principles of natural kinds and definition. The first principle is that there is a chain of predication relations obtaining between a set of properly ordered differentiae such that the highest differentia is predicated of all the lower differentiae and the lowest differentia partakes of the account of all the higher differentiae. This chain of entailment is codified as a the second criterion for

proper division on **MD***. A lower differentia, moreover, will partake of the higher only if it is a non-accidental quality of it—that is, if it is a quality of the differentia in itself, and not merely incidentally. Thus, the partaking relation on which the second criterion for **MD*** is premised relies crucially on Aristotle's distinction between accidental and substantial predication. The second principle is that a genus does not exist outside of its species. In other words, every member of a genus must be a member of some species. It follows on the basis of these principles that a definition consisting only of the final differentia entails the genus and all the superordinate differentiae that uniquely identify the definiendum.

These principles are peculiar to Aristotle's understanding of natural kinds and genus-species relations. Recall that for Aristotle a species is an indivisible kind populated by individual substances compounded of form and matter. These individual substances are distinct in virtue of possessing different material components, but each has a token of the same form, and so admits of the same defining account that identifies the particular nature of their respective species. Each of these species is a member of a larger, divisible kind or genus. The species that populate the genus are logically related in that the definition of the former will include an account of the latter, in addition to qualitative differentia(e) that identify a species as a unique member of the genus. The members of a species are individual substances, as is the form they share, and as such each member is a unified whole. Thus, any adequate account of a substance will explain how it is a 'one' and a 'this'. In accounting for the essence of a substance the unity of the definition must parallel the unity of its object.

MD*, to the extent that it systematizes these two principles into a procedure for formulating definitions, embodies Aristotle's commitment to the unity of form. Thus, the solution to the problem of unity of definitions by division offered in VII.12

is informed by his view of form as a unity developed in the preceding chapters. This solution, Aristotle thinks, is unavailable to a view of form that does not make use of these principles. One such view is the Platonic ontology of abstract Forms. In VIII.6, Aristotle raises an objection to Platonic ontology, arguing that this view cannot account for the unity of form:

> A definition is an account which is not one by being bundled together, like the *Iliad*, but by dealing with one thing. Then what is it that makes human being one; why is it one and not many—for instance, animal *and* two-footed—especially if, as some say, there is an animal itself and a biped itself? Why is human being not these themselves, so that human beings would exist not by participation (κατὰ μέθεξιν) in human being, not in one [Form], but in two, animal and biped? And generally human being would not be one but more than one, animal and biped. (1045a12–20)

The problematic connection between the solutions to the problem of unity of definition given in VII.12 and VIII.6 has been discussed; suffice it to say that, for definitions arising from **MD***, the question Aristotle raises here—"what is it that makes human being one"?—has been adequately addressed in VII.12. This difficulty aside, Aristotle contends in this passage that this problem is particularly acute on a Platonic ontology of abstract Forms.

As I understand it, Aristotle's argument against the Platonist may be outlined as follows: A definition possesses unity if its definiendum possesses unity. Then the definition of, say, human being possesses unity if its object, (the form of) human being, possesses unity. Now, the definition of human being is composed of many parts; let us say the parts are 'animal' and 'two-footed'. If these parts do not constitute a unity, then neither does (the form of) human being. In VII.12 Aristotle indicates that the genus 'animal' can be one with the differentia 'two-footed' if it does not exist outside of its species, or rather, if it only exists as some differentiated kind of animality. On the Platonic view, however, the Form Human Being is what it

is in virtue of its association with the *independent* Forms Animal and Two-Footed. Thus, aside from any differentiated form of animality, there is Animal itself and, likewise, Two-Footed itself. But then there will be no substantial unity between these components of the definition of human being, for 'two-footed' does not indicate a kind of animality, but a distinct and independent Form. If this is the case then, insofar as they make up the *one* Form Human Being, these *two* Forms taken together are identical with the one. It follows that if, as on the Platonic view (see § 2.2), individual human beings are what they are by sharing in the form embodied in the eidetic Human Being, it could just as easily be the case that human beings are what they are in virtue of sharing in the *two* independent Forms that, taken together, are identical to Human Being. In other words, Aristotle argues that Human Being collapses into the Forms that constitute its definition.[86] But in that case Human Being would not embody a single form at all, but two.[87]

If Aristotle's argument is sound, it challenges the basis of Platonic definition. For Plato, as for Aristotle, the object of definition is a natural kind. On the former's view, a class constitutes a natural kind just in case its members share a common nature that is embodied in an abstract Form. The definition consists in an enumeration of the Forms that connect the definiendum to the largest kind of which it is a part. But if the Form corresponding to a natural kind—in this case the kind human being— collapses into the Forms that make up its definition, then what is being defined is not a natural kind at all, but a class of objects that share in *two* distinct Forms. And,

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[86]My interpretation here owes much to Harte's: "...if the definition of man is 'biped animal' and if there are two Platonic forms, animality and bipedality, then the putative single form, man, should surely be identified with these two forms. [... I]t then follows from this first difficulty that individual men will be men not in virtue of participating in a single form, man, but rather through their participation in the two forms, animality and bipedality, with which the putative single form has been identified" (1996, 281).

[87]Aristotle gives a very similar argument in VII.14. There he tries to point out difficulties of the idea that Animal itself, though it participates in a number of other Forms, e.g. Horse and Human Being, is nevertheless one.

as Plato acknowledges in the discussion of the class of barbarians in the *Statesman* (262c–263a), such a class falls short of constituting a natural kind. But the argument does not hinge on the definiendum being the kind human being. The implication is very general: Aristotle is pointing out a problem for the relationship between the Platonic conception of form and definition.

The argument also presents a challenge to Platonic division (**MD**). Definitions arising from **MD** consist in a weaving-together of the steps of the division—i.e., the intermediate kinds that connect the definiendum to the largest kind of which it is a part—and as such are made of a plurality of parts. If Aristotle is right to insist that the definition of a unified entity ought to account for its unity, then there is no reason on the basis of a definition by **MD** to suppose that its object is a unified whole. In that case, it is clear why Aristotle would remark in the *Posterior Analytics* discussion of **MD** that, on this method of definition, "there is no necessity that what is predicated becomes a unity, but it could be just as if the same person were both musical and literate" (92a29–33). On his view, a Platonic definition does not account for why the components of a definition of a natural kind constitute an intrinsic unity. Hence, as the argument of VIII.6 is meant to show, there is no reason to suppose that the kind defined does in fact possess a natural unity—it could just as easily be the case that a human being (for instance) is what she is in virtue of sharing in a plurality of forms.

Of course, Aristotle thinks that this objection against the Method of Division can be circumvented if one revises the rules for proper division. In particular, proper division should acknowledge the distinction between accidental and non-accidental predicates, dividing only by the latter predicates so that the differentiae obtained actually figure into the defining account of the definiendum. To avoid the difficulty Aristotle presents in VIII.6, the Platonist needs to give the same analysis of succes-

sive differentiation premised on a distinction between accidental and non-accidental predicates. This is an analysis that Plato might be able to give, but there is another obstacle to meeting the unity condition for definition. If a Form like Animal can exist independently of any particular *kind* of animal, then Plato is faced with the more basic problem of how to account for the unity of the Form corresponding to 'two-footed animal' without compromising the unity of it or the Forms composing it. If indeed this is a problem the Platonist must address, it will require a substantial reevaluation of the Platonic notion of a natural kind, and in particular the sort of relations that obtain between natural kinds. And at least in Aristotle's opinion, such a revision cannot be made without giving up the idea that the specific nature that unifies a natural kind is embodied in an independent and wholly unified Form.

4.4 Epilogue: Division and Aristotle's critique of Platonism

It is immaterial to the present discussion whether Aristotle's argument is in fact a sound indictment of Platonic natural kinds. What is important to this discussion is that, if the above analysis of the argument against the Forms of VIII.6 is correct, we have good reason to think that Aristotle's methodological critique of Platonic division is part of a larger critique of the Platonic ontology of Forms.

For both Plato and Aristotle, the object of definition is a natural kind. On both accounts a natural kind possesses a unity in virtue of its members possessing a common form, though they differ in how they account for this unity. For Aristotle, the definition of a natural kind accounts for its unity in virtue of possessing an intrinsic unity. The components of the definition are related by a partaking relation on which the last differentia of the definiendum entails the genus and the intermediate differentiae that uniquely identify it. Accordingly, he devises rules for division on which this relation is preserved and, hence, on which the resulting definition possesses

the requisite unity. To the contrary, for Plato the unity of a natural kind is accounted for in the unity of its corresponding Form. **MD** exploits this property of natural kinds in formulating definitions. The part-whole relations among kinds established through division map onto ontological connections among the corresponding Forms. Aristotle's critique of **MD** is meant to present problems for this conception. He argues that, on this procedure, we are given no reason to suppose that the complex of kinds that compose a definition by division should constitute the definition of a single, unified kind. Because there is an intrinsic connection between the Forms included in the definiens, it could just as well be the case that the kind defined is not unified under a single Form but under the complex of Forms that comprise its definition. If it is not the case that a natural kind consists in a class whose members share a common form typified in *one* abstract Form, it seems that **MD** will fail in formulating true defining accounts of natural kinds.

Thus, despite their agreement that the object of definition is a natural kind, their methodological disagreement on the Method of Division reflects deep disparities between Plato's and Aristotle's respective metaphysical theories. Aristotle's account of genus-species relations, which is so crucial to this account of definition, is inconsistent with an account of forms as independent entities. Were Aristotle to follow Plato in maintaining this thesis, he would not have been able to claim in VII.12 that a genus does not exist outside of its species. Yet this claim is crucial to this account of the unity of definition. On this understanding, **MD** is ill-suited to the task of definition insofar as it fails to explain the intrinsic unity that for Aristotle must obtain between the elements of a definition. Similarly, Plato's account of a true statement as one making a predication that corresponds to actual relations among the Forms depends on his thesis that the Forms are independent yet interrelated entities. On the Platonic ontology, therefore, **MD*** might seem too strong: the unity of a natural kind is

guaranteed by its corresponding Form, so to require that the complex of Forms that comprise its definition possess an intrinsic unity is either impossible or unnecessary. The inconsistency of **MD** and **MD***, in other words, may in part be explained by the inconsistency of Plato's and Aristotle's respective accounts of a natural kind.

These observations agree with some earlier accounts of Aristotle's critique of division. Balme,[88] for instance, understands Platonic division to lack the formal notions that Aristotle would attribute to kinds. But this is because Plato, on his view, was interested in division primarily as a method for assigning each thing to its proper kind. As the preceding discussion suggests, the purpose of this activity is to define each thing according to the Form in which it shares. Aristotle's rejection of Platonic division as "accidental" division arises out of his rejection of the Platonic theory of Forms. In order to account for the essential nature of objects, as opposed to those attributes that belong incidentally to an object, Aristotle introduces the notion of substantial and accidental predicates. Accordingly, division must be concerned only with the essential attributes of its object. For Balme, then, Aristotle's objections to **MD** have a primarily ontological basis. Deslauriers[89] has a different, but in many ways complimentary, view of Aristotle critique of **MD**. On this account, the principle disagreement between Plato and Aristotle lies in the kind of knowledge garnered through division. For Plato, as we saw, the knowledge of definitions constitutes the highest form of knowledge—knowledge of the nature of the Forms. For Aristotle, however, knowledge of definitions is only the starting point for scientific knowledge; definitions give us the 'that', but we need scientific demonstration to obtain the 'why'. Accordingly, Aristotle criticizes **MD** for failing as a method of scientific demonstration.

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[88]See Balme 1987, esp, 69–80.

[89]See Deslauriers 1990 and 2007, esp. Ch. 1.

The view presented in the preceding sections has the virtue of illustrating both perspectives of Aristotle's criticism. We saw that there are two components to Aristotle's criticism of **MD**, one logical, the other ontological. The logical considerations that led Aristotle to reject **MD** as a procedure for logical deduction and scientific demonstration focus on its failure to deduce conclusions that are necessary consequences of its premises. The ontological component, on the other hand, focuses on **MD**'s failure to account for the unity of the object of definition. Aristotle's rejection of the Platonic theory of Forms is a central component of his claim that **MD** fails to account for the unity of definition, and his rejection of the Platonic idea that knowledge of definitions is a central component of his claim that **MD** fails as a method of logical deduction and scientific demonstration. Still, it might be wondered which of these two components of Aristotle's critique is more basic. As the views outlined above attest, there is something to be said in favor of either view. But this is a topic for a different study.

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