

## Aristotle's Conception of Universality

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By all accounts Aristotle is a significant figure in the history of thought about universals. “Καθόλου,” the Greek word translated “universal,” may have first occurred in Aristotle’s writings, and the medieval debates about universals to which we are the heirs were sparked by a comment in Porphyry’s *Introduction* to Aristotle’s *Organon*.<sup>2</sup> Moreover, Aristotle is generally acknowledged to have originated a view of universals that is significantly different both from Plato’s realism and from nominalism (as exemplified by such figures as Hobbes, Berkeley, and Hume). With this much I agree, but I think that the common understanding of Aristotle’s position is badly mistaken. He is almost universally regarded as a moderate (or “immanent”) realist. I will argue that he in fact rejected this position (which predates him) and developed an alternative to it.

As with most pieces of philosophical jargon the phrase “moderate realism” is used somewhat differently by different authors. Several distinct positions on universals have gone by this name and been attributed to Aristotle. My target is a thesis common to all of these positions, which I call “the partial-identity thesis.” It can be formulated as follows:

The particulars that fall under a universal do so in virtue of sharing some identical component or aspect, which exists independently of any thought or speech about the universal and provides a basis in reality for universal thought and speech.

It is this thesis that I will argue Aristotle rejected. Distinguishing between different positions that accept it will help to relate my rejection to the literature and will provide a framework in which I can introduce the alternative position that I will argue Aristotle held.

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<sup>1</sup> Earlier versions of this paper have been in circulation since 2008.

<sup>2</sup> *Isagoge* 1 10-13. For an argument that the *Isagoge* is an introduction to Aristotle’s logic as a whole, rather than just to the *Categories* (as is often thought), see Barnes 2006 xiv-xvi.

There are at least two issues related to the thesis on which its proponents disagree. The first is the relation between the universal and the identical component. Some identify the component itself as the universal, whereas others think that (strictly speaking) universals exist only in or relative to thought but that the identical component provides a *basis* in reality for such universals. The second issue concerns the way in which the component is identical from one particular to the next. Some take the identity involved to be numerical, whereas others think that it is merely a qualitative identity—i.e., that in each particular under a universal there is a component that is exactly like (though numerically distinct from) a corresponding component in each other particular.

Currently (especially among analytic metaphysicians) the phrase “moderate realism” is most associated with the first alternative mentioned for each issue. However, this was not always the case. The phrase entered common philosophical parlance from its use by the early 20<sup>th</sup> Century Neo-Scholastics to name the position that they attributed to Aristotle and themselves endorsed. This position takes the second alternative on both of the enumerated issues. According to the Neo-Scholastics, universals exist as such only in thought, but each universal is “real” in that it corresponds to a qualitatively identical element present in each of its particulars.<sup>3</sup>

In the literature of the last several decades, one can find variants of both positions (under various names) attributed to Aristotle. Michael Loux’s interpretation, for example, represents the more contemporary version of moderate realism. He takes Aristotelian universals to be “non-linguistic, extra-mental objects”—“multiply instantiated entities” that are “immanent in their subjects” in the sense of being “components of or ingredients in sensible particulars.”<sup>4</sup> Lloyd Gerson’s Aristotle is intermediate between the Neo-Scholastics’ and Loux’s. According to Gerson, Aristotelian universals are to be understood in terms of their role in predication which “is without exception assumed by Aristotle to be an

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<sup>3</sup> For examples of the Neo-Scholastic position see: Windelband 1899 257-8; Maher 1900 249; Mercier 1906 380; DeWulf 1909a ; Coffey 1938 7-8; Copleston 1946 44; Owens 1951 273; Veatch 1952 105-115; Coffey 1958 270-1, 277-8; Donagan 1963 227-8; Grene 1967 55; and Owens 1981b. (Many of these passages are discussed in Salmieri 2008 §1.3.4.) On the sense in which such Neo-Scholastic universals can be called “real,” see DeWulf 1909b 150 and Moore 1961 25-6.

<sup>4</sup> Loux 2009 186, 189, and 193; cf. Geirsson and Losonsky 1998 18 and Ferejohn 2009 71.

extra-ontological category of activity”. Thus Gerson takes an Aristotelian universal to be a mental or linguistic item; but, he adds, it is predicated of many particulars “in recognition or acknowledgement of their sameness” and the particulars are the same “because they share the same form”.<sup>5</sup> He argues that some of Aristotle’s other positions commit him to viewing these forms as eternal entities that explain the sameness between particulars, but he sees Aristotle as resisting this conclusion and treating the identity between members of a kind as in need of no explanation.<sup>6</sup> An Aristotle that followed Gerson’s advice would agree with the Neo-Scholastics in denying that the universal is an “extra-mental, extra-linguistic object”, but would agree with Loux’s Aristotle that the particulars under a universal share a component—viz. a form—that is numerically rather than merely qualitatively identical.<sup>7</sup> Michael Frede’s influential interpretation of Aristotelian forms as particulars agrees with the Neo-Scholastics on both counts:

[According to Aristotle’s *Metaphysics*], things of the same kind have the same form only in the sense that for things of the same kind the specification of their form is exactly the same... It is a basic non-trivial fact about the world that things come with forms which are exactly alike, and not just sufficiently similar to class them together in one kind. The reality of kinds amounts to no more than this, that the specification of the form of particular objects turns out to be the same for a variety of objects. But for this to be true there is no need for a universal form or a universal kind, either a species or a genus. And in fact the import of Z13 seems to be that there are no substantial genera or species in the ontology of the *Metaphysics*.<sup>8</sup>

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<sup>5</sup> Gerson 2004 237, 9.

<sup>6</sup> Gerson 2004 239-40.

<sup>7</sup> The two issues that I identified as points of disagreement among proponents of the partial-identity thesis give rise to four possible positions: (i) the universal is a numerically identical component in the particulars, (ii) the universal is based on a numerically identical component in the particulars, (iii) the universal is a qualitatively identical component in the particulars, (iv) the universal is based on a qualitatively identical component in the particulars. Loux attributes (i) to Aristotle; Gerson seems to attribute (ii) to him; and the scholastics attribute (iv). Ross (1923a cxviii, cf. cxix) seems to take Aristotle to have (inconsistently) held (iii), for he says that the view that forms are individuals rather than universals would commit Aristotle to the forms being qualitatively different. Ross thinks that Aristotle slips into this position occasionally—e.g., in *Metaphysics* Λ.5, which will be discussed below.

<sup>8</sup> Frede 1985 23.

Frede is taking a deflationary stance on universals, arguing that they are not real in the sense maintained by (e.g.) Loux. In doing this, however, notice that he asserts the partial-identity thesis and acknowledges that universals are real in just the sense maintained by the Neo-Scholastics. Frede's position is typical of those arguing (in the 1980s at least) that Aristotelian forms are particulars.<sup>9</sup>

My position is that Aristotelian universals are not real even in this weaker sense. I agree with the Neo-Scholastics that Aristotle thinks that universals have a basis in mind-independent reality but exist only in or relative to thought. However, I will argue that the ontological basis of universals is not the sharing of any identical component (whether qualitatively or numerically identical). In fact, Aristotle recognizes several different types of universals, and their ontological bases differ. In each case, however, the basis is some *causally significant likeness* among the particulars: there is some relation of likeness in which the particulars under the universal stand to one another; and there is some other universal such that either each of the like particulars under the first universal is the cause of some particular under the second, or each particular under the first is an effect of one under the second. The different varieties of universals correspond to different types of likeness, but in all cases the relation is such that, given the causal connections, regarding the particulars as instances of a universal enables us to understand their place in a causal system.

Typical universals are forms or kinds (εἶδη or γένη, alternately translated “species” and “genera”). Kind and form are relative terms in that a given universal (e.g., locomotion) may be a form relative to a wider kind (e.g., motion), and a kind relative to a narrower form (e.g., walking).<sup>10</sup> However, there are lowest, “uncuttable”, forms (ἄτομα εἶδη, *infima species*), which cannot be subdivided into narrower forms; and there are highest (μεγίστα) kinds, which are not the forms of any overarching kind.

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<sup>9</sup> See A.C. Lloyd 1981 2, Tweedale 1988 520, and Witt 1989 179. By contrast, Balme (1987), Lennox (1987a), and Cooper (1990) all argued, on the basis of evidence in Aristotle's zoological works, that the members of an Aristotelian species have forms that are not only numerically particular but also qualitatively different from one another. (See Henry 2006 for a more recent development of these ideas.) Forms that are particular in this stronger sense would be incompatible with the Neo-Scholastic position. However, the sweeping implications of these conclusions beyond Aristotle's biology have been rarely appreciated.

<sup>10</sup> The example of locomotion is drawn from *Topics* IV.2 122a18-30. On the relativity of form and kind, especially as the terms are used in Aristotle's zoology, see Balme 1962 and Pellegrin 1986.

In addition to forms and kinds, there are several sorts of atypical universal. Some universals comprise items that exhibit what Owen aptly called a “focal meaning.”<sup>11</sup> In such cases each item is called by a single name because it stands in some relation or other to a single “focal” term to which that name primarily applies.<sup>12</sup> Aristotle thinks that “being” is a universal of this sort, for he insists that there is no kind subsuming the various categories (substance, quantity, quality, etc.) as forms.<sup>13</sup> Another sort of universal is what Aristotle calls a succession (ἐφεξῆς). It differs from a kind in that the particulars falling under it do so in a definite order, with each somehow including its predecessors within itself. Examples of successions include figure, soul, good, citizen, and (perhaps) friend.<sup>14</sup> Aristotle regarded focal unities and successions as difficult or borderline cases of universality; he sometimes speaks of them as being universals and at other times seems to deny that they are.<sup>15</sup> Because of this, I will focus on the unambiguous case of kinds.

Far from being an identical component shared by particulars, the likeness on which a kind is based consists in the particulars lying near to one another along some continuum (or set of continua). This view of Aristotelian kinds was argued for by James Lennox (1987b) as an account of kinds in Aristotle’s zoological works, and is familiar in the literature concerning them; but this has not yet led to the sort of rethinking of the received wisdom on Aristotle’s view of universals for which I will advocate in the present paper.

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<sup>11</sup> Owen 1979.

<sup>12</sup> Aristotle’s examples are that various things are called “healthy” because of the different relations in which they stand to health, and “medical,” because of the various relations in which they stand to medicine (*Metaphysics* Γ.2 1003a35-b5).

<sup>13</sup> *Posterior Analytics* II.7 92b14; *Metaphysics* B.3 998b22, K.1 1059b31-4. Cf.; *Sophistical Refutations* 172a14-15; *Metaphysics* H.6 1045b5-7.

<sup>14</sup> On souls, see *De Anima* II.3 414b20-33, 415a12-13; on goods, *Nicomachean Ethics* I.6, 1096a17-23; on friends, *Eudemian Ethics* VII.2 1236a15-30, b21-26; and on citizens, *Politics* I.3 1275a33-b5. For discussion of succession, see Wilson 2000, Chapter 7, and Salmieri 2008 §2.1.2.

<sup>15</sup> For example, compare the usage of “universal” in *Nicomachean Ethics* I.6 with its use throughout the *Metaphysics*. Aristotle also sometimes treats as members of a kind things that he elsewhere treats as items in a succession (see *Metaphysics* Δ.5 1024a36ff, *Topics* IV.3 123b11 and possibly *Metaphysics* B.3 999a10), and he says things that may imply that the items in a succession must be in the same kind. (Compare *Politics* III.1 1275a33-b5 with the point from *Metaphysics* I.3 and 8.) A succession might, then, be thought of either as a special sort of kind or as a subgroup of kind-members that does not constitute a form. This is the view taken by A. C. Lloyd (1962 76) and Wilson (2000). However, Aristotle sometimes speaks of the categories as forming a succession (*Nicomachean Ethics* I.6 1096a22, *Metaphysics* Λ.1 1069a20ff), and, since the categories are not members of a single kind, he cannot have consistently held that the items in a succession must be members of a single kind.

The paper proceeds in stages. In section 2, I argue that Aristotle thinks universals have an ontological basis, but exist only in or relative to thought. This is the point on which I agree with the Neo-Scholastics (and Frede and Gerson) and disagree with the more fashionable view, represented by Loux. The remaining two sections focus on the case of kinds. Section 3 argues that Aristotle rejected the partial-identity thesis in their case, and Section 4 elaborates on the view of kinds that I favor, relating it to the more general account of universals developed in Section 2.

Before beginning on this agenda, however, it will be necessary to devote a section to the question of what Aristotle means by the word “καθόλου.” It should be evident from our brief look at the verities of moderate realism that different thinkers use the word “universal” differently. This makes possible verbal agreements or disagreements that do not reflect the actual similarities and differences between the positions.<sup>16</sup> If our aim in investigating Aristotle’s view of universals is to get clear on his understanding of the things he called “τά καθόλου”, we should not prejudge the question of how his usage of that term relates to contemporary usage of the word “universal”. A second purpose of this first section is to call attention to the intimate connection between universality and demonstration; this connection which will figure prominently in the argument of the later sections.

### **1. The Socratic Context**

“Καθόλου” is an indeclinable form, meaning “generally.” It was used rarely if at all prior to Aristotle, and he is the first author in which it is pressed into service as a noun.<sup>17</sup> The phrase, “κατὰ ὅλου,” from which it is presumably contracted, is also rare; I’ll discuss its one pre-Aristotelian occurrence (*Meno* 77a6) below. Since “καθόλου” (at least as a noun) was a neologism, it is worth asking why Aristotle felt the need to coin or adopt it.

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<sup>16</sup> Terminological confusions have affected the literature on Aristotelian universality, causing the Neo-Scholastic view to seem unintelligible to many of the contributors to the late-20<sup>th</sup> century literature and to recede from scholarly consciousness. On this issue, see Salmieri 2008 §2.4.0.

<sup>17</sup> The few earlier occurrences of it listed as earlier by the *Thesaurus Linguae Graecae* (TLG) are in fragments, and are uncertain.

Aristotle introduced many terms (often by nominalizing adjectives or phrases), but he objected to capricious name-making (ὀνοματοποιεῖν), so he must have thought the new term served some need.<sup>18</sup> In particular, he must have seen it as an advance on the terminology of forms (εἶδη or ἰδέαι) in which (what we can recognize as) the problem of universals was already being discussed. Plato's *Parmenides* (130b-133a) considers not only the classic Platonic view that forms (εἶδη) are “paradigms set in nature” (132d2), but also such alternatives as that they are “thoughts” existing “only in the soul” (132b3-5). Aristotle mentions further views, including Eudoxus', that the ἰδέαι exist “in” (rather than “separate from”) perceptible objects (*Metaphysics* A.9 991a13-19, M.5 1079b15-23).<sup>19</sup> The range of things called εἶδη or ἰδέαι suggests that these terms mean something quite close to what contemporary philosophers call universals. Indeed, many textbooks alternate freely between the terms when discussing Plato and Aristotle's positions, and Russell wrote that he means by “universal” what Plato meant by “ἰδέαι.”<sup>20</sup>

Something important to Aristotle must be lost when the terms are used in this way, for there would have been no need to introduce καθόλου if it was interchangeable with the Platonic jargon, and, even in contexts like *Metaphysics* A.6 and M.4-5, where Aristotle is using ἰδέαι broadly enough to include views such as Eudoxus', he rejects the posit of ἰδέαι altogether, rather than presenting an alternative theory of them. Indeed he sometimes rejects it in extremely harsh terms.<sup>21</sup> We can begin to get a sense of what is being lost and of how Aristotle understood “καθόλου” by turning to the *Meno* passage in which the phrase “κατὰ ὅλου” appears.

But come on and try to fulfill your promise to me by stating about the whole of virtue what it is (κατὰ ὅλου εἰπὼν ἀρετῆς περί ὅτι ἐστίν), and stop making many from one, as

<sup>18</sup> *Rhetoric* III.13 1414a30-b15, *Topics* I.11 104b36-105a2.

<sup>19</sup> Since this view seems to be the one so often attributed to Aristotle, it is striking that he dismisses it as “very easily upset” by “many insuperable objections” (991a18-19 cf. 998a7-19, 1076a38-b11, 1079b22-3). Ross (1924a 198) and Dancy (1991, 23-8) try to distinguish the position in question from (what they take to be) Aristotle's own commitment to immanent universal forms. However, the subtlety of the differences they cite makes it perplexing that Aristotle would hold the view in such contempt.

<sup>20</sup> Russell 1912 92. One example of such alternation in a popular textbook is Geirsson and Losonsky 1998 18: “Aristotle was a realist about universals; in addition to individuals there exist forms. But universals do not transcend individuals. Unlike Platonic forms, Aristotle's forms exist in individuals. [...] For Aristotle, forms are immanent in individuals, and thus Aristotle elevated nature and human affairs by bringing Plato's forms down to earth.” (cf. Pojman 1997 246, Roochnik 2004 161, and Clay 2000 215.)

<sup>21</sup> See, especially, *Posterior Analytics* I.22 83a32-5.

jokers say when someone breaks something—rather, leaving it whole and sound, state what virtue is. (77a5-9)<sup>22</sup>

Socrates is speaking to Meno, who has promised him an account of virtue but has now, for the second time, enumerated specific virtues instead (71e-72a, 73d-74a). Meno has learned from the sophist Gorgias to define the virtues severally (71d ff.), but Socrates insists that a single, overarching account of virtue is needed to answer Meno's question of how virtue is acquired. He explains the principle involved as follows:

If I do not know what something is, how can I know its qualities (ὅποιόν τι)? Or do you think that someone who did not know at all who Meno is could know whether he is beautiful, wealthy, wellborn, or the opposite of these? (71b)

Thus, according to Socrates, knowledge (or perhaps some favored *sort* of knowledge) of a thing's attributes is made possible only by knowing *what it is*—that is, by having a definition of it.<sup>23</sup> This epistemic principle is prominent in many of Plato's early dialogues and is central to Aristotle's own view of ἐπιστήμη.<sup>24</sup>

Ἐπιστήμη differs from other forms of knowledge in that it grasps its objects as necessary consequences of their causes. This is accomplished by demonstrating them—i.e., deducing them from

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<sup>22</sup> There are two notable occurrences of related phrases. First, *Prior Analytics* I.28 describes what is required to establish something “κατά τινος ὅλου” (43b39). Second, in *Republic* V, Socrates says that, like an unable speaker, he will make a point “not κατά ὅλον but rather by taking up some part” (392d-e). The meaning in this passage seems to be slightly different. The genitive in κατά ὅλου is presumably the same genitive used for the indirect objects of verbs of predication, whereas in the *Republic* passage it is more natural to translate the κατά + accusative with some formula like “in accordance with”.

<sup>23</sup> It was once conventional wisdom that, throughout the “early” dialogues, Socrates held that knowledge of an item's attributes presupposed knowledge of its definition. (See Burnet 1924 37, Shorey 1933 157, Taylor 1937 47, Robinson 1951 51, Ross 1951 16, Crombie 1962 57, and Geach 1966, who dubbed the principle the “Socratic Fallacy”.) This interpretation came under attack in the late 20<sup>th</sup> Century. (See Santas 1972 and 1979 115-126, Beversluis 1992, Brickhouse and Smith 1994 Chapter 2, Vlastos 1985, and Nehamas 1987.) A useful summary of the interpretive arguments can be found in Benson 2011 95-98. In any event, most critics of the traditional reading accept that Socrates, at least in the *Meno*, is committed to the principle that there is some significant sort of knowledge that is made possible by possessing a definition. Exceptions include Brickhouse and Smith (1994 52) and Santas (1979 123). Brickhouse and Smith claim that “Meno makes the commitment; Socrates merely solicits it.” But Socrates does not merely solicit the commitment; he presupposes the principle when he sets up a challenge to the possibility of knowing a thing's attributes without first knowing what it is. Santas treats the statement as ambiguous in its range, but he ignores the latter half of it, which is perfectly general.

<sup>24</sup> See: *Charmides* 159a; *Euthyphro* 6e; *Hippias Major* 286c-c, 304e; *Gorgias* 463c; *Laches* 190b-c; *Lysis* 233b; *Protagoras* 312c, 361c-d; and *Republic* I 354b-c (though some of these passages admit of alternative explanations).

principles, among which are definitions.<sup>25</sup> A recurrent theme in the *Posterior Analytics* is that demonstrations must be universal. To use Aristotle's standard example, in order to have ἐπιστήμη that the interior angles of a given triangle have a sum equal to that of two right angles, one must show that this property follows from the definition of triangle, rather than from the definition of some narrower kind—say isosceles. Someone might prove that the a given triangle had the relevant angle-sum in this other way, or he might even prove that all triangles do by a series of such arguments, but there would remain an important respect in which he would not know it.

[E]ven if someone proved of each triangle, whether by a single demonstration or by different ones, that each has two right angles ([proving this] separately of the equilateral, the isosceles, and the scalene), he would not yet know (οἶδε) of the triangle that it had two right angles, except in the sophistic manner; nor would he know it of triangles universally, not even if there are no other triangles besides these. For he would not know [it] *qua* triangle, nor of every triangle—or rather, [he'd know it of every triangle only] in number, but not of every [triangle] with respect to form, even if there were none of which he did not know [this]. (*Posterior Analytics* I.5 74a25-32)

This is a recurrent theme in the treatise: I.5, is devoted to the ways in which one might fail to demonstrate universally; I.24 considers and rebuts arguments that it is better to prove the relevant feature of isosceles triangles rather than of triangle in general; and I.31 argues that we cannot get ἐπιστήμη directly from perception because knowledge of causes requires universals which are not present in perception (though they are grasped on the basis of it). “The universal is honorable”, he tells us in this chapter, “because it reveals the cause” (88a5-6). Moreover, the distinction we see in the I.5 passage between knowing something properly and knowing it “in the sophistic manner” is present in I.2's initial characterization of ἐπιστήμη:

We think that one knows (ἐπίστασθαι) *simpliciter* (rather than in the sophistic manner, incidentally) when we think he apprehends (γινώσκειν) the cause due to which the object

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<sup>25</sup> *Posterior Analytics* I.2

exists, that it is the cause of this [object], and that it does not admit of being otherwise.

(71b9-13)

The sort of knowledge that Aristotle contrasts with genuine ἐπιστήμη and dismisses as “sophistic” consists of propositions like those with which Gorgias has filled Meno’s head. Though Meno takes himself to be knowledgeable *about virtue*, by Aristotle’s lights, his putative knowledge would count as *of virtue* only incidentally; since the proper objects of his claims are the members of the loosely connected “swarm” of states (72a) that Gorgias and Meno take to be virtues, without knowing just what they mean by this term.<sup>26</sup> Even if some of Gorgias’ claims about courage, justice, and the like do constitute some sort of knowledge, it will not be ἐπιστήμη *of virtue*; and it is not the sort of cognitive state that can license demonstrations about virtue as such.

Aristotle credits Socrates with being the first to “seek the universal” (*Metaphysics* A.6 987b3) or “universal definitions” (M.4 1078b19), and he sees Socrates’ reasons for seeking universal definitions as in line with his own: “It is natural that Socrates should seek the what-it-is, because he was seeking to deduce, and the what-it-is is the principle of deductions” (1078b23-50). This is what Socrates is doing in the *Meno*. The inquiry into what virtue is is part of a larger inquiry into whether it can be taught (70a, 86c), and he thinks that it can be taught if and only if it is prudence (86d-87c, cf. *Protagoras* 361a-c); thus, a definition of virtue as (a type of) prudence would yield a deduction that virtue is teachable. The account of the whole of virtue is meant to serve as a middle term between virtue and teachability.

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<sup>26</sup> In *Politics* I.13 (1260a20-28) Aristotle appears to take the opposite side in this debate:

Thus it is evident that all of the aforementioned people [viz., freemen, slaves, women, and children] have virtue of character, and that a woman’s temperance is not the same as a man’s, nor her courage and justice, as Socrates supposed. Rather, the one is courage for ruling and the other for submitting; and it’s the same with the other [virtues]. And this is also clear when we examine it more particularly (κατὰ μέρος μᾶλλον). For those who speak universally delude themselves when they say that virtue is the soul’s being well disposed or that it is acting rightly or some such thing. For those who, like Gorgias, enumerate the virtues speak much better than those who define them in this way. (1260a20-28)

I take it that Aristotle’s point here is not that Gorgias’ method is sufficient, but rather that (whatever its inadequacies) it is superior to universal definitions of virtue that are either false or vacuous. Socrates may be right that knowledge of virtue requires a universal account, but the type of universality involved will be that proper to the subject matter, which admits of several categories of special or defective cases (corresponding to what Aristotle took to be several categories of special or defective cases of human being). In any event, the mention of the dispute between Gorgias and Socrates in the *Politics* is likely a reference to the present passage from the *Meno*, and so supports my conjecture that the passage captured Aristotle’s attention.

In both the *Meno* and the *Posterior Analytics*, then, we have a contrast between genuine or high-grade knowledge and the type of intellectual content peddled by the sophists; and, in both works, the genuine knowledge is supposed to come about by a deduction in which the middle term is a definition (or, perhaps, partial definition) of “the whole of” the minor term. In Plato’s later works this requirement on knowledge took on a metaphysical cast; he argued that transcendent forms must exist in order for there to be any such thing as knowledge (ἐπιστήμη or νοῦς), as opposed to mere opinion.<sup>27</sup> Aristotle rejects this Platonic conclusion, but retains the Socratic epistemological principle:

It is not necessary that there be forms (εἶδη) or some one thing besides the many if there is to be demonstration; however it is necessary that it be true to state (εἰπεῖν) one thing of many; for there will not be a universal if this is not so, and if there is not a universal, there will not be a middle, so that there will not be a demonstration. Therefore, there must be something one and the same that applies to many non-homonymously. (*Posterior Analytics* I.11 77a5-9)<sup>28</sup>

In order to demonstrate (and, more generally, to deduce), we need to be able to make universal statements—i.e., to state one thing *of the whole of* another. And this requires universal terms—i.e., ones that can be applied to many things. If we are demonstrating something about virtue, for example, the term virtue applies to a whole comprising the many virtues. If we are going to demonstrate anything about this whole, we will need a middle term (e.g. prudence) that we can state of *the whole of it*.<sup>29</sup> A universal is whatever holds of the whole of some multiplicity—it is something that “by its nature is predicated of many things” (*De Interpretatione* 17a39-b2, cf. *Metaphysics* Z.13 1038b11) and therefore is suited to serve as a term in a deduction.

Whereas “form” names a putative type of *thing*, which Plato thought existed prior to perceptible objects (but which might be thought to exist instead in the objects or in the mind), “καθόλου,” as Aristotle

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<sup>27</sup> *Phaedo* 74a-77a, 78d-79b; *Republic* V 476e-579e; *Timaeus* 51c-e; *Parmenides* 132a, 135b-c; cf. *Cratylus* 440a-b.

<sup>28</sup> Cf. *Peri Ideōn* 79.15-19, 81.9-10, where Aristotle acknowledges that some of the arguments intended to establish forms do prove that there are “common things” (κοινά) or universals.

<sup>29</sup> Alternatively, the middle term might apply only to some of the minor, but then the major will need to apply to the whole of it, since one of the terms in a syllogism must be universal for there to be a valid deduction.

uses it, names a certain *role* that one thing plays relative to others—namely the role of being predicated of many things. Forms are supposed to be universals in that they are supposed to play this role relative to the things that participate in them, but what it is to be a universal and what it is to be a form are different.

Whereas Plato treats the difference between forms and non-forms as absolute, Aristotle's distinction between universals and particulars is relative. Notice that the particulars with which universals are contrasted in the passages we saw above are things like "isosceles" and "justice," rather than perceptible individuals. These terms are particular only relative to the universals predicated of them, but are universal relative to narrower terms of which they can be predicated (e.g. particular isosceles triangles or just actions). Aristotle does occasionally mention such absolute particulars; for example, he defines a particular in *De Interpretatione* as an object that is not predicated of multiple things and gives Callias as an example (17b1). However, such cases are the exception rather than the rule: when Aristotle speaks of particulars, he is usually referring to forms like man and contrasting them to kinds like animal, which he sometimes describes as *more* universal.<sup>30</sup>

I emphasize this difference between Platonic forms and Aristotelian universals because contemporary ontologists and logicians typically work with a dichotomy between universals and particulars that is far closer to Plato's position than to Aristotle's, and this dichotomy is too often read into Aristotle.<sup>31</sup> According to the contemporary (Platonic) view, the relation between man and Callias is quite different from that between animal and man. The first is a clear instance of the universal-particular relation, whereas the second is one of material implication. For Aristotle, by contrast, these are both instances of the universal-particular relation, and (as we will see) his concerns about universals apply at least as much to the second case as to the first.

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<sup>30</sup> For example: dog, man, and horse are called particulars in *De Anima* I.1 (13b37), as are plant and beast (which is predicated of dog and man) in II.4 (414b32). Again, health, sickness, justice, injustice, courage, and cowardice are each called "particulars" in *Categories* 10 (13b37), as are fire and earth in *Metaphysics* Λ.1 (1069a29). For further discussion of Aristotle's use of "particular" see Cooper 1986 28-31 and Owens 1981c 64-5.

<sup>31</sup> Loux (2009, 186) describes Aristotle's distinction between universals and particulars as a "fundamental ontological dichotomy"; Sykes (1975, 313) argues that Aristotle is committed to "a dichotomy between particular and universal which appears to be both exclusive and exhaustive"; and Albritton (1957, n.2) rejects as unintelligible the Neo-Scholastic view that Aristotle regarded forms as neither universal nor particular in their own right.

In forming the concept “universal,” Aristotle isolated a certain role played in Plato’s theory by forms. Plato had argued that there must be forms in order for there to be ἐπιστήμη, and Aristotle took these arguments to establish only that there must be something playing this role. Possibly inspired by *Meno* 77a6, he introduced the term “καθόλου” to name anything that is predicated of many and which must therefore be defined as a means to achieving ἐπιστήμη, and he recognized Plato’s theory of forms as a certain view of τὰ καθόλου. Thus, in *Metaphysics* M.4 he writes that “Socrates did not make the universals or definitions exist apart”, but the Platonists “gave them separate existence, and this was the sort of thing they called ἰδέαι” (1078b30-32).<sup>32</sup> Aristotle rejects this theory of “separate” universals and develops an alternative. I turn now to the question of what this alternative is, beginning with the issue of the relation between universals and the mind.

## **2. The Dependence of Universals on the Mind**

My thesis in this section is that Aristotle did not regard universals as real in the sense of existing independently of the mind; rather, he held that they exist only in thought, but with a basis in extra-mental reality. Since this thesis has often sometimes met with incredulity, it is worth reminding readers that the position I am defending here seemed as obvious to the Neo-Scholastic interpreters as its denial now seems many scholars. One rarely finds arguments for either position, and I see no reason to take the realist position as a default other than that it is the currently fashionable one. I grant that the arguments I give in this section for the alternative are not conclusive, but few arguments in Aristotle scholarship are, and at the close of this section, I will make a suggestion about how readers who are not persuaded by might still take on board much of what I say in the subsequent sections of this paper. However, I do think that my arguments are stronger than those in favor of the realist interpretation, and I encourage any readers who are not persuaded by the arguments to produce stronger arguments for the position that Aristotle believes in mind-independent universals.

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<sup>32</sup> It is worth noting that all the theories of forms discussed in *Parmenides* are theories of forms that are “separated” in the relevant sense. Socrates at 131b2 introduces the forms as separate (χωρῖς), and this conception of them governs the subsequent discussion.

The argument one most often encounters that Aristotle is a realist about universals relies on a few passages in which Aristotle refers to universals using language that (allegedly) commits him to their reality. In *Categories* 2 (1a20-21), he classes “things said of a subject” (i.e. universals) among existents (ὄντα) as opposed to things that are said (λεγόμενα), and in *De Interpretatione* 7 (17a39-b2), he describes universals and particulars as types of *objects* (πράγματα).<sup>33</sup> “Πρᾶγμα”, in its relevant usage, refers to the *object* of a psychological state or linguistic item. The πράγματα of our thoughts and speech needn’t actually exist—indeed Aristotle explains falsehoods in terms of their non-existence.<sup>34</sup> However, when we speak or think truly, the πράγματα do exist, and to call them “πράγματα” is to distinguish them from the psychological or linguistic items whose objects they are. Thus the *De Interpretatione* definition suggests that universals are distinct from linguistic and psychological items and so agrees with *Categories* 2’s treatment of them as ὄντα rather than λεγόμενα.

However, for something to be distinct from speech or thought about it is not necessarily for it to exist *independently* of speech and thought. We can see why not if we consider the case of mathematical objects, which Aristotle describes as existing “in abstraction” (*De Anima* III.4 429b18) and often refers to as the things that “exist” (or, sometimes are “spoken of”) “from abstraction” (*Metaphysics* K.3 1061a29, M.2 100b10, *De Caelo* III.1 299a16, *De Anima* III.7 431b12).<sup>35</sup> Since abstraction is a mental action, if mathematical objects exist only “in” or “from” it, then their existence depends on an activity of the mind. Indeed, *Metaphysics* M.2 makes it clear that mathematical objects exist in a derivative and specialized way: it concludes that they “either don’t exist at all or else exist in some manner (τρόπον τινά) and therefore don’t exist simpliciter, for existence is said in many ways” (1077b16-17).<sup>36</sup> Yet, he goes on in the next chapter to say that “it is true to state simpliciter that the mathematical [objects] exist and that they

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<sup>33</sup> Irwin (1988 §41) and Loux (2009 189) take the *Categories* passage to commit Aristotle to realism about universals. The *De Interpretatione* is cited as suggesting realism by Fine (1980 210, n. 21), and Akkrill’s (1963) translation of “πρᾶγμα” as “actual thing” suggests that he understand the passage this way as well.

<sup>34</sup> *Categories* 12 (14b20-21) tells us that “it is because the object does or does not exist that we say the statement is true or false”; and *Metaphysics* Δ.29 (1024a17-26) says that πράγματα such as “the diagonal’s being commensurate” are said to be false in the sense of *not existing*.

<sup>35</sup> On Aristotle’s usage of “abstraction” (ἀφαίρεσις) in these passages and elsewhere see Cleary 1985.

<sup>36</sup> See also *Metaphysics* Θ.6 1048b9-18, where Aristotle tells us things such as the infinite and the void exist in potentiality “but only for knowledge” (ἀλλὰ γνώσει) (1048b15).

are indeed as they are said to be” (1077b32-4), and in most contexts he speaks unhesitatingly of their existing and as being objects of thought and knowledge.<sup>37</sup>

Since Aristotle often speaks of mathematical objects as existing, though he thinks that their existence is dependent on a mental act, we cannot infer from his description of something as “an existent” or the “object” of a mental state that he thinks that it is real in the sense of being mind-independent. Thus describing universals as “πράγματα” and “ὄντα” does not commit Aristotle to their mind-independence, and I don’t think it constitutes evidence that he thought that they were real in any stronger sense than he thinks about numbers. These descriptions are evidence, however, that he thinks universals exist in some manner and are not wholly identical with the psychological states or linguistic items whose objects they are. This is compatible with the position that universals exist only as a result of (or relative to) the operations of the mind.

Our first piece of evidence that this is Aristotle’s position can be found in the passage we considered earlier from *Posterior Analytics* I.11:

It is not necessary that there be forms (εἶδη) or some one thing besides the many if there is to be demonstration; however *it is necessary that it be true to state (εἰπεῖν) one thing of many; for there will not be a universal if this is not so*, and if there is not a universal, there will not be a middle, so that there will not be a demonstration. Therefore, there must be something one and the same that applies to many non-homonymously. (*Posterior Analytics* 77a5-9)

The clause I have italicized treats whether a universal exists as dependent on whether it is true to state one thing of many. This is precisely the opposite of what Aristotle would think if he held that universals were mind-independent objects that underwrite the possibility of universal predication. Rather than the existence of the universal making the statement possible, Aristotle sees the possibility of the statement as grounding (or perhaps being equivalent to) the universal. Notice that what is required for there to be a

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<sup>37</sup> For example, in *Posterior Analytics* I.1, he speaks of having to already know that the unit exists in order to learn mathematics (1071a16).

universal is not just that we can state one thing of many, but that it be *true* to do so. Though the existence of universals depends on our ability to do something, it is not wholly a creation of our abilities or actions; there is an ontological requirement that must also be met.

Although “state” (εἰπεῖν) is a linguistic verb, Aristotle’s point needn’t be one about language or speech as such.<sup>38</sup> The point seems to be that certain items admit of universal *treatment* in our thought or speech, and so are able to serve as the universal terms required for demonstration; it is such universals, rather than universal objects (as the forms were supposed to be), that are required for ἐπιστήμη.<sup>39</sup>

It is because ἐπιστήμη is achieved by demonstration that it requires universals. In particular, the present passage emphasizes the need for a universal to serve as a middle term. In a demonstration, the middle term causes the major. Thus it seems that the chief requirement for ἐπιστήμη is the ability to state causes universally. In *Metaphysics* Λ.5, Aristotle discusses cases in which causes do and do not admit of universal statement.

Further one must see that, while some [causes] can be stated universally, others cannot.

Indeed, of everything, the first [i.e. proximate] principles are the first *this* in actuality and another thing that is in potentiality. So, then, those are not universals (ἐκεῖνα μὲν οὖν τὰ καθόλου οὐκ ἔστιν); for the particular is a principle of particulars; for man [is the principle] of man universally, but there is none (ἄνθρωπος μὲν γὰρ ἀνθρώπου καθόλου, ἀλλ’ οὐκ ἔστιν οὐδέϊς); for Peleus [is the principle] of Achilles, and your father of you,

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<sup>38</sup> The same verb is used in the same connection in the *Metaphysics* Λ.5 passage when Aristotle says that we can “state some causes universally” (1071a17-18) and (twice) in *Meno* 77a5-b1 when Socrates asks Meno to “state” what virtue is “as a whole”, but since the verb is common this is of limited value in establishing a link between the passages. It may be significant, however, that Aristotle frequently uses the phrase “καθόλου εἰπεῖν” (and rarely similar constructions with other verbs of speech) when introducing or drawing on universal propositions. (*Categories* 12a27; *Topics* 121a6, 142b20, 147a15, 152b25, 153b12, 156a13; *Parts of Animals* 697b25; *Politics* 1304b5; *Rhetoric* 1390b6; cf. *Nicomachean Ethics* 1137b14-15 and *Politics* 1374a31.)

<sup>39</sup> Since Aristotle thinks that grasping causes requires universals, and since there is no evidence in the corpus of the idea that there are causes that are inaccessible to human knowledge, we should not understand the claim that some causes cannot be stated universally to mean that there are causes that cannot be revealed by any universal statement whatsoever. Rather the point is presumably that if one takes a random set of particular things with their particular causes, there may not be any one universal revealing the cause of all of them. However, for any particular, with its particular cause, there will be some universal statement that can be made revealing its cause.

and this B [is the principle] of this BA, but B [is the principle] of BA *simpliciter*.<sup>40</sup>

Therefore, if indeed the [principles] of substances are causes and elements [of them], but other [principles are causes or elements] of other things, as has been said, [the principles] of what is not in the same kind—of colors, of sounds, of substances, of qualities—[are different from one another] except by analogy; and the [principles] of things that are in the same form are different (ἕτερα), not in form, but because of distinct (ἄλλο) particulars—[there is] both your matter and form and mover and mine, but their universal account is the same. (*Metaphysics* Λ.5 1071a17-29)

Aristotle is distinguishing the respects in which there is and is not a single, universal set of causes or principles for everything. Ultimately, he thinks that the principles for everything are one in a way—not in number, nor in form or kind, but by analogy. In order to introduce the role that analogy will play in metaphysical explanation, this passage discusses causality in the more familiar case of unity in form, using man as the stock example of a form.

In the case of man, the principles “can be stated universally,” but Aristotle is concerned to block the mistaken inference that the causes are themselves universals. Rather, the cause of any particular man (e.g. Achilles) is some other particular man (e.g. Peleus). Man, the universal form, isn’t the cause of any man. If this universal were the cause of anything, it could only be the cause of ἀνθρώπος καθόλου—that is of “man universally,” “the universal man,” or “man in general.” But, says Aristotle, “there is none.” Depending on how one parses the sentence, it means either that there is no “universal man” (or “man-in-general”) to serve as an effect of the universal, or else that there is no cause of “man universally.”<sup>41</sup> In

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<sup>40</sup> There are several issues concerning the translation of this sentence, which are laid out nicely by Code (2000 173-175), and I have avoided translating in a way that would favor my preferred interpretation, though I think such a translation (such as Ross’ [1928]) is more natural and elegant than the one I provide here (which strives to preserve ambiguities). I discuss some of the relevant issues of translation below.

<sup>41</sup> Code (2000 173) suggests that Aristotle is saying that “no one”—that is no particular man (or perhaps no particular at all) “is the principle of man generally.” I find this reading doubtful: it requires οὐδείς to either reach back for its antecedent past ἄνθρωπος (which is clearly used in a general sense) to τὸ καθ’ ἕκαστον, or else to acquire a specifically personal sense (akin to “nobody”) by anticipating the reference to particular people (Peleus, etc.) in the following clause. It is far more natural to read οὐδείς as referring back to one of the two items in the previous clause, either ἀνθρώπου καθόλου (as Ross seems to read it) or (less likely) the cause of ἀνθρώπου

either case, the point is that “Man causes man universally” is simply a universal way of formulating such particular facts as that Pelias caused Achillies and Laertes caused Odysseus.

Depending on how one resolves the ambiguities in Aristotle’s Greek, this passage may go so far as to deny the existence of the universal man. This is what the passage says in Ross’s (1928) translation. Of course, if we read the passage this way, we should understand him to be denying that there is *any* sense in which a universal could be said to exist, and we certainly can’t take him to be saying that universal statements like “man causes man” are false. Aristotle’s point is to give us a metaphysically light-weight understanding of formulations about “the universal man”—an understanding that we can use to shed light on cases where it is (even) less plausible to suppose that there might be real universals to serve as causes.

But even we do not read the passage as directly denying the existence of real universals, it still undermines the reason Aristotle would have for believing in their existence. The upshot of the passage is, as Code (2000 178) puts it: “that although it is possible to specify causes generally, the causes of particulars are themselves particulars.” Each man has his own particular cause (or set of causes) which is distinct from the cause of other men, even though the “universal account is the same” (1171a29).

The significance of universals for Aristotle is precisely that it is only with reference to them that causes can only be identified: “The universal is honorable because it reveals the cause” (*Posterior Analytics* I.31 88a5-6). Any causal statement in entirely particularistic language, such as “Peleus caused Achilles” will fail to reveal the causality at work. Peleus and Achilles are each particulars that answer to many descriptions, and it only *qua* men that the two stand in relevant causal relation; for it is as a man, (rather than as Heracles’ ally or Laomedon’s foe) that Peleus fathered Achilles, and a man (rather than as Hector’s killer or Patroclus’ lover) that Achilles was fathered by Peleus. Thus this causal episode, if it is to be understood at all, must be understood universally as “a man’s causing a man.” Likewise, with respect to the question that motivates Λ.5, the principles of the various particular beings (or sorts of

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καθόλου. Even if Aristotle is saying what Code suggests, however, the reasons I give below for thinking that the statement would undermine the motive for believing in real universals still apply.

beings) will need to be understood universally (in the manner appropriate to this somewhat unusual case). If, as the present passage maintains, this is possible without invoking universal objects as causes or effects, then there is no need to suppose that universal objects exist at all. In *Metaphysics* Λ.5, as in *Posterior Analytics* I.11, universality is a feature not of objects in their own right, but of how we must formulate them in our thought and speech in order to grasp the causal relations between them and thereby achieve ἐπιστήμη.

The purpose of the Λ.5 passage is to make it intelligible how there could be universal principles of being, even though being is not a kind. A paradigm case of universal explanation is that men are caused by men. But even in this case, Aristotle points out, each particular man has his own particular cause, and it is only the statement of the causes that is universal. This universal statement is possible because there is a respect in which the different causes of the different men do not differ—they don't differ "in form." This sameness in form licenses the universal explanation. It is not the case that all beings are the same in form, however, provided that there is *some* respect in which they are alike, some sort of universal account will be possible.

Thus we can see in Λ.5, as we did in *Posterior Analytics* I.11, that the universality of our statements has a basis in something independent of us, and we now see that basis is a likeness among the particulars and that there are different sorts of likenesses that can fill this role. For now, however, the crucial point is that the universal causes required by ἐπιστήμη are not universal in their own right but are merely susceptible to universal statement. A similar point is made by *Metaphysics* M.10, which takes up directly the question of whether ἐπιστήμη requires the existence of universal principles.

That all knowledge (ἐπιστήμη) is universal, so that it is necessary also for the principles of beings to be universals and not separated substances, does contain the greatest difficulty of those we've discussed; however, though the statement is true in one way, it is not true in another. For knowledge is twofold, as knowing (ἐπίστασθαι) also is: one is in potentiality and the other in actuality. While the potentiality, being as matter, is universal and indefinite and is of the universal and indefinite, the actuality is definite and

of the definite, being a certain this of a certain this. It is rather incidentally that sight sees the universal color, since the color that it sees is a color; and what the literate man contemplates, this alpha, is an alpha. If the principles are universal, it is necessary for what is from them also to be universal, just as in the case of demonstration; but if this is so, nothing will be separate or a substance. It's clear rather that, while knowledge is universal in a way, in a way it is not. (1087a10-25)

Here Aristotle confronts the claim that ἐπιστήμη's universality requires its objects and the principles from which they are demonstrated to be universals. He regards this as an unacceptable result because he thinks it is incompatible with his position that the principles are separated substances. Aristotle does not claim or argue in the chapter that universals lack mind-independent existence, but the position he develops in the chapter does remove much of the reason for thinking that they have it.

The pivotal move is distinguishing ἐπιστήμη in potentiality from ἐπιστήμη in actuality. The point that ἐπιστήμη is universal and of universals is then restricted to the former. Ἐπιστήμη in actuality is the state enjoyed, for example, by a geometer while contemplating a proof, or by a literate man when reading or writing. Ἐπιστήμη in potentiality, by contrast, is the state of being literate or a geometer. It is the potentiality that Aristotle normally refers to as “ἐπιστήμη.” His most common term for the corresponding actuality is “contemplation” (θεωρία).<sup>42</sup> Calling the actuality “ἐπιστήμη” somewhat stretches the natural sense of the word. This is presumably why Aristotle exploits the verb form (ἐπίστασθαι) to help to motivate the distinction between ἐπιστήμη's potentiality and actuality.<sup>43</sup>

Whether one reserves the word “ἐπιστήμη” for the potentiality (as Aristotle often does) or treats it as ambiguous between the potentiality and actuality, the point remains that the ἐπιστήμη a knowledgeable person has when he is not contemplating is a potentiality to contemplate. Actuality is always prior to

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<sup>42</sup> For the contrast between ἐπιστήμη as a potentiality (or first actuality) and θεωρία as the corresponding actuality, see *De Anima* II.1 412a22-23 (cf. III.4 429b5-9) and *Nicomachean Ethics* VII.3 1146b31-1. In the *De Anima* passage, as in the present one from *Metaphysics* M, he says that contemplation is ἐπίστασθαι in actuality and that it is of objects like “this A”.

<sup>43</sup> Cf. Salmieri 2010 162-3, which compares the several passages in which Aristotle draws what seems to be this same distinction.

potentiality, and the latter must be understood in terms of the former.<sup>44</sup> Thus an ἐπιστήμη in potentiality—e.g., a literate man’s understanding of the way that alpha functions in syllables—is an ability to contemplate, and the objects of contemplation are particulars.<sup>45</sup> Though the particulars fall under universals, it is not the act of contemplation (i.e., the ἐπιστήμη in actuality), but only the ability to contemplate (i.e., the ἐπιστήμη in potentiality) that has these universals as objects.<sup>46</sup>

To see what it means for an ability to have a universal object, consider the parallel case of sight: the faculty of sight stands to the activity of seeing as an ἐπιστήμη in potentiality stands to an act of contemplation.<sup>47</sup> Aristotle writes that it is “incidentally that sight sees the universal color, since the color that it sees is a color”. Clearly he is referring here to seeing in actuality—the sort of thing that would occur when someone looks at, for example, a cherry. On Aristotle’s view, the proper object of the man’s seeing would not be the cherry but red or (equivalently) a red thing. (More exactly, it would be the

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<sup>44</sup> The *locus classicus* for the principle that actuality is prior to potentiality is *Metaphysics* Θ.9. For discussion of the principle, see Witt 2003 (especially pages 13, 37-38, and Chapter 4) and Beere 2009, Chapter 13.

<sup>45</sup> Owens (1951 427-430) and Lear (1987), both point out that Aristotle never quite says that the objects are particulars, only that they are *thises* and that they are not universals. Both authors are developing variants of the neo-Scholastic interpretation and hold that forms are neither particular nor universal, and that only forms (and not particulars or universals) are *thises*. I find no evidence that Aristotle denied that particulars could be *thises* or thought that there could be *thises* that were not particular. Moreover, I think the parallels between the present passage and the Λ.5 1071a17-29 (discussed above) give us reason to reject the Owens/Lear reading of “this” in the present passage, for there the causes of particulars are said to be particulars, rather than *thises*. In my view, the difference between the *this/such* distinction and the particular/universal distinction is that the former is absolute whereas the latter is relative (as was discussed above). If this is correct, then calling something a “*this*” commits Aristotle to its being a particular, but the reverse does not hold.

<sup>46</sup> I think that a failure to appreciate the principle that actualities are prior to potentialities is what leads Annas (1976 191) to conclude that the distinction between ἐπιστήμη in actuality and in potentiality fails to solve M.10’s ἀπορία: Aristotle has shown that there is *a* sense in which there is knowledge of individuals, namely in [sic] the sense in which the individual is known by the actualization of the (merely potential) knowledge of the universal. But if we apply this to knowledge of the first principles or elements, we find that these do after all have universals prior to them in some way (since knowledge of them is necessary for there to be knowledge of the elements), and we seem to be back in the second horn of the original dilemma [i.e., in the position of saying that the principles are universals]. Thus, though what Aristotle says here does not contradict his often-repeated claim that knowledge is of the universal, neither could it be said to solve the present problem.

Annas treats the “merely potential” ἐπιστήμη of universals as a primary and allows that there is “*a* sense” in which particulars are derivatively known by its exercise. However, this gets Aristotle’s way of understanding it precisely backwards. Though the word “ἐπιστήμη” may be more naturally used for the potentiality, this potential is the derivative phenomenon; knowing in the primary sense is an *act*, which the potentiality is merely the ability to perform. As Aristotle puts the point in *De Anima* II.5: “the one who is already contemplating is actually and strictly knowing (ἐντελεχεία ὄν καὶ κυρίως ἐπιστάμενος) this alpha” (417a28-29). It is the potentiality not the actuality that is ἐπιστήμη only in “*a* sense,” and so it is the universals, not the particulars, that are known only in a derivative sense. They therefore qualify as objects only in a derivative sense and (for reasons that I will go on to discuss) need not exist prior to the particulars. Indeed, they need not exist at all, except relative to the act of thinking.

<sup>47</sup> The analogy is explored in *De Anima* II.5.

cherry's specific red or shade of red, but we can leave this complication aside.) In addition to this proper object, there are any number of things that can be called incidental objects of the seeing: something sweet, an agricultural product, someone's favorite fruit, etc. The man sees something sweet incidentally in that the red thing, which is the proper object of his seeing, happens to be sweet. In the same sense, Aristotle tells us in the present passage, the man sees color incidentally, since the red, which is the proper object of his seeing, is a color. But it can be misleading to assimilate this case to that of other incidental objects. Though color (like sweet) is an incidental object of the episode of seeing, it is not incidental to our seeing the red that it is a color (as it is incidental that the red thing is sweet); for it is precisely in virtue of red's being a color that it is an object of sight. And when (as in *De Anima* II.7) Aristotle discusses either seeing in general or the faculty of sight, rather than particular episodes of seeing, he names color as its proper object.

To say that color is the proper object of sight is not to say that color-in-general is the object of any episode of seeing. To see is always to see some particular color, and to say that the faculty of sight has color in general as its object is simply to say that the faculty enables one to see *any* color. By the same token, to say that an ἐπιστήμη in potentiality is of a universal is to say that it is an ability to contemplate any of the particulars that fall under the universal. A geometer's ἐπιστήμη that the diagonal of a square is incommensurable with its sides is his ability to contemplate the incommensurability of the diagonal of any square. And, in order for him to be actualizing this ἐπιστήμη at all, he must be exercising it with respect to some particular diagonal, which is the object of his contemplation. The universal, diagonal, is only an object of the act of contemplation incidentally, in that the diagonal is *a* diagonal. But the diagonal's being a diagonal is no more incidental to the geometer's ability to contemplate it than red's being a color is incidental to our ability to see it. It is precisely insofar as the particular diagonal falls under the universal diagonal that the geometer is able to actualize his ἐπιστήμη with respect to it.

The potentiality and actuality of ἐπιστήμη are not different types of ἐπιστήμη with correspondingly different objects, in the way that grammatical and mathematical knowledge are different. Rather the potentiality is the ability to know the very objects that one actually knows when one has

ἐπιστήμη in actuality. And ἐπιστήμη in potentiality is universal insofar as it is one generic potentiality that enables contemplation of the many particulars under the universal.

Aristotle's way of putting this is to say that ἐπιστήμη in potentiality is indeterminate and has an indeterminate object. The potentiality stands to definite acts of contemplation—to ἐπιστήμη in actuality—as a substance's matter stands to the substance: the potentiality is not, in itself, an act of contemplation but may be actualized (at different times) into various acts of contemplation. Thus it does not itself have an actual definite object, but ranges indefinitely over the many objects of which it enables contemplation.

The reason for thinking that ἐπιστήμη and its objects had to be universal was that ἐπιστήμη is demonstrative, and demonstrations (as deductions) require universal terms. We must, therefore, consider how M.10's point that ἐπιστήμη in actuality is of particulars applies to demonstrations. We can see from M.10 itself that Aristotle thought that demonstrations were possible for particulars:

ἐπιστήμη is of universals; this is clear from demonstrations and definitions; for a deduction does not come about that this triangle has two rights unless every triangle has two rights, nor that this man is an animal unless every man is an animal. (1086b33-37, cf. B.4 999a24-29)<sup>48</sup>

The mention of demonstration in the second clause makes it clear that the deduction spoken of in the last is meant to be a demonstration about a particular triangle. One might think that the deduction Aristotle has in mind is the following: "All triangles have two rights, and this is a triangle; therefore, it has two rights." This cannot be correct however, because Aristotle is treating demonstration and definition in parallel here, and there is no analogous way of defining a particular.

The deduction Aristotle has in mind about a particular triangle must depend on the universal proposition that all triangles have two rights in a way in which a definition of a particular man as an animal can also depend on all men being animals, and this excludes the proposition's serving as a major term in the deduction. The relevant deduction must be about a particular triangle and not have the

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<sup>48</sup> It should be noted that this passage comes earlier in the chapter than the solution to the puzzle. It is used in laying it out. However, it is written in a manner that indicates where space lies for the solution to come.

universal triangle as a term, but be made possible by a corresponding universal demonstration about triangles in general. Further, the particular demonstration must have a particular middle term. The middle terms are the causes, and the whole point of M.10 is that the universality of ἐπιστήμη does not require these causes to actually be universals. But what would a demonstration with a particular middle term look like? How could there be such a thing, since deduction requires a universal middle?

To get a sense of how demonstrations concerning particulars might work and how they relate to universal demonstrations, let's consider some examples from the *Posterior Analytics*. One is given in II.11:

Why did the Persian War come about for the Athenians? What is the cause of the Athenians being waged war on? It is because they attacked Sardis with the Eretrians; for this first set it in motion. War is in the A position; first to attack, in the B position; and Athenians, in the Γ position. B belongs to Γ (being first to attack, to the Athenians); and A, to B (for people wage war on those who have first wronged them; therefore A belongs to B—being waged war on, to those who first started it); but this B belongs to the Athenians (for they first started it). (*Posterior Analytics* II.11 94a36-b7)

Notice that the major term of the demonstrandum is first stated as a particular (the Persian War) and then restated as a universal (being waged war on). The middle term, too, is given first as a particular (attacking Sardis) and then restated universally (being first to attack). When demonstrating why this particular war occurred, Aristotle regards *the* war simply as *a* war, and he regards its particular cause (the action detailed by Herodotus in *Histories* V.27.3), universally, as a case of being first to attack and then, more universally, as a case of “first wronging” someone. It is insofar as the particular cause (middle term) and effect (major term) are regarded as falling under these universals, that one is able to deduce the latter of Athens and therefore to understand why the war was waged. Nevertheless, the demonstration is throughout about *a certain war* and *a certain wrongdoing*—each universal term is actualized so as to stand for a determinate individual.

The same point applies in the case of demonstrating that a triangle's interior angles are equal to two right angles. When one is actually demonstrating this, one is dealing with a particular (drawn or imagined) triangle and showing that its particular angles are equal to two particular right angles. One draws a line parallel to the base through the point opposite it and then shows the triangle's interior angles to be equal to the two right angles formed on that line by a perpendicular formed through the point on the triangle. However, throughout, one regards the triangle simply as *a triangle*, and the lines and angles as *lines* and *angles*.

II.11 is not the only chapter of the *Posterior Analytics* in which one finds Aristotle demonstrating about particulars. A careful reading of the recurring example in which the existence of a lunar eclipse is demonstrated makes it clear that the demonstrandum is not eclipses in general, but a specific eclipse that is now occurring. Aristotle contrasts knowing that the moon is eclipsed via the demonstration from knowing it via inference from such effects as the absence of the shadows it would otherwise have produced (I.8 93a37-39).<sup>49</sup> Moreover, in II.12 he speaks of demonstrating eclipses in tensed terms that could only apply to particulars:

The cause of something's coming about and of its having come about and of its being in the future is the same as [the cause] of its existing; for the middle is the cause; except that [it's the cause] of existence [when it is] existing, but [the cause] of coming to be [when it is] coming to be, and [the cause] of future existence [when it] will exist. E.g., "Why has an eclipse come about?" "Because the earth has come to be in the middle." And it is coming about because it is coming to be there; and [there] will be [an eclipse] because [the Earth] will be in the middle; and there is [one] because it is [there]. "What is ice?" Assume that it is solidified water. "Water" is in the C position; "solidified" is in the A position; the middle, "total absence of heat", is the cause in the B position. Now B belongs to C, and "having solidified", which is in the A position, belongs to this. And ice

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<sup>49</sup> The example is mentioned at 88a1, 89b30, 90a3, 93a23, and 98b18.

is coming about when B is coming about, and it has come about when it has come about, and will be, if it will be. (*Posterior Analytics* II.12 95a10-21)

The eclipse example is slightly complicated by the moon's being a unique subject. However, in understanding why it is eclipsed, we need presumably to think of it under some such universal as *illuminated body*, just as, in order to think of Athens as aggressing and as having war waged on it, we need to think of it as *a city*. For it is only *qua* illuminated body that the moon can have its light obstructed and go dark, and it is only *qua* city that Athens can aggress on another city with the result that war is waged upon it.<sup>50</sup>

Thus when one demonstrates that the Persian War fell upon Athens, that the moon is eclipsed, that a certain quantity of water is solidified, or that a certain triangle's angles are equal to two rights, all of the terms in one's demonstration are particular in one way but universal in another. Each is a particular *qua* falling under some universal. The terms of one's deductions are the particulars, but considered in a certain way—as determinations of indeterminate universals. One's demonstrations about the particulars are enabled by an ability to produce demonstrations about any of the particulars under the relevant universals; and, within any given demonstration, each particular term only is able to play the role it does insofar as it does fall under the relevant universal. This is reflected in the perspective the demonstrator takes on the particular. In producing the demonstration he must think the particular *qua* falling under the universal.

We get a description of what it is like to regard a particular in this way in *On Memory and Recollection* 1:

We have spoken about imagination (φαντασία) earlier, in *De Anima*, and there is no thinking without an image (φάντασμα)—for the same affection attaches to thinking and diagramming; for in the latter case, making no use of the triangle's being of a determinate size (ποσόν), we nevertheless draw it determinately with respect to size, and it's the same

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<sup>50</sup> In some cases, some of the terms of an actualized demonstration will fall under a universal only by analogy or in some other extended way, and it is in part interest over these sorts of cases that motivates the concerns of *Metaphysics* Λ.5, discussed above.

way with the thinker: if he thinks [something that is] not sized, he sets a sized thing before his eyes, but thinks it not *qua* sized; but if its nature is among the sized things but indeterminate, he sets [before his eyes] a determinately sized thing but thinks it *qua* sized only. (449b30-a7)<sup>51</sup>

Aristotle is discussing the state in which we think universals actively, and his focus is on the role in the process of an imagined particular. But notice that, rather than merely accompanying or somehow inspiring a thought whose true object is a universal, the imagined particular *is* the object of thought. The thought is universal, not because it has a different object from the concurrent act of imagination, but because of the way in which it regards the imagined particular.<sup>52</sup> One thinks about size in general by picturing a particular, determinately sized item and thinking this very item “*qua* sized only.” We are told little about what thinking it in this way involves, though we can infer from the analogy to a geometric diagram that it involves at least “making no use” of the determinate size.<sup>53</sup>

Given our present interests, the significant point is simply that the difference between the thought in actuality (which is, in an important respect, universal and indeterminate) and the image (which is particular and determinate) is not that they have different objects, but rather something about the way in which they relate to or regard the very same object. This reinforces the point (made in M.10) that the role of universals in contemplation is analogous to that of the universal color in an episode of seeing red. The universal color is involved both in that it is the object of the faculty of sight (which is the ability to see *any color*) and in that the particular red one sees on a given occasion is an object of sight precisely insofar as it is a color. But, though a universal is involved in this way even in the actuality of seeing, there is no universal color to be seen, and neither are there any universals to know (in actuality). Nor does the role

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<sup>51</sup> Cf. *De Anima* III.7, where we are also told that “the soul never thinks without an image” (431a16-17) and that “the intellect (νοητικὸν) thinks the forms in images” (431b2).

<sup>52</sup> The contrast to *Republic* VI 510d5-511a1 is instructive. There Plato says that though geometers draw and make arguments about perceptible things “they are not thinking about them, but about those other things that they are like” (510d6-7). Aristotle’s geometers, by contrast, do think about the very objects they perceive (or imagine), but they think them in a specialized way.

<sup>53</sup> On the relation between Aristotle’s position here and the only superficially similar positions of Berkeley and Hume, see Salmieri 2008 179-182.

played by universals in the actuality of knowledge (or sight) or their status as the objects of ἐπιστήμη in potentiality establish that these universals must exist independently of our minds and of our perspective on the world. What is required for ἐπιστήμη is just for us to be able to regard the particulars as falling under the universal—for us to be able (in the language of *Posterior Analytics* I.11) “to state one thing of many.” We saw earlier that Aristotle thinks that there must be some basis in reality for such stating, but we have seen reason (in I.11 and *Metaphysics* Λ.5) to think that what Aristotle calls “τὰ καθόλου” is not this basis in reality, but rather something about the way in which, because of this basis, we do and can truly “state” or regard things.

If you are not convinced of this last point, I encourage you to treat my claims about universals in the subsequent sections as claims about the ontological basis of universals as claims about the universals themselves (understood as mind-independent objects). The main arguments will still go through, and the resulting interpretation of Aristotle will be a notational variant of the one I endorse. The difference of notation is a substantive interpretive issue. However, there is much about which the notational variants agree with one another and disagree with received opinion.

### **3. Kinds and the Composition of Forms**

In the last section, I argued that Aristotle thinks the existence of universals is to be understood in terms of our ability to perform certain intellectual operations on objects that are ultimately particular. To make this case is to argue that Aristotle is not a moderate realist in the sense in which that term is most often used today (e.g., as it is used by Loux). However, my conclusions thus far are consistent with the view that Aristotle is a moderate realist on the more traditional (neo-Scholastic) interpretation of this term, and with the more contemporary interpretations of Aristotle along similar lines by Frede and Gerson, from which I quoted in my introduction. All of these interpreters deny that an Aristotelian universal exists independently of the mind and all affirm that universality has a basis in mind-independent facts. They identify this basis as an (at least qualitatively) identical component shared by the particulars. In the remainder of this paper, I will argue against this view of the basis and in favor of an alternative—namely,

that universals are based on relations of likeness (which need not be reducible to partial identity) among their particulars and on causal relations between these particulars and those under other universals.

Despite their differences, both the interpreters who read Aristotle as believing in real universal objects and those who take the Neo-Scholastic position agree in attributing to Aristotle the partial-identity thesis—viz.:

The particulars that fall under a universal do so in virtue of sharing some identical component or aspect, which exists independently of any thought or speech about the universal, and provides a basis in reality for universal thought and speech.

In this section, I will argue that this thesis is an instance of a type of view that Aristotle explicitly rejected. Discussing his reasons for rejecting it will shed light on the respects in which, on Aristotle's view, universals can and cannot be said to be constituents of particulars, and it will give me an occasion to introduce my alternative account of the basis in reality for universals, on which I will elaborate in the final section.

Interestingly, a clear statement of the partial-identity thesis can be found early in Plato's *Meno*:

Socrates: ...if, when I asked what the substance of bees is, you said that they are many and varied, what would you reply to me, if I asked you: "Do you claim that they are many and varied and differ from one another in being bees? Or do they not differ at all in this way but in some other way—such as in their beauty or their size or in some other such way?" Do tell, what would you answer when questioned in this way?

Meno: That's what I would say, that they do not differ at all from each other in their being bees.

Socrates: If, after this, I said "Then, tell me, Meno, this thing itself, in which they do not differ at all but are wholly the same, what do you claim it is?" perhaps you would have something to say to me?

Meno: I would.

Socrates: And so too with the virtues; even if they are many and varied, they all have one same form (εἶδος), due to which they are virtues, and to which it is proper to look when asked to make clear what virtue is. (72b-d)<sup>54</sup>

According to Socrates, the many bees are all bees (and the many virtues, all virtues) because of some same form that they share, and this form is something *in which they do not differ at all*. The form is an identical component present in all the bees, and all of the bees' differences are in attributes (such as size and beauty) that are independent of the form.<sup>55</sup> Thus, for Socrates, each particular under a universal is composed of a form, which is exactly (if not numerically) the same from one particular to the next, and of another component, which makes the particular different from the others that share its form.

Socrates position is the one so often attributed to Aristotle, and indeed it is a *form* that is typically thought to be the identical component shared by the particulars under an Aristotelian universal. In light of this, we should recall that Aristotle uses the word “εἶδος” in two related ways. In one usage, it is contrasted with kind (γένος), and is often translated “species,” rather than form. As was discussed earlier, the distinction between forms and kinds is relative, but there are lowest (“uncuttable”) forms, which do not qualify as kinds. Thus, “εἶδος,” in the relevant sense, can be used to refer specifically to these lowest universals, or to (almost) any level in a taxonomic grouping. In its other usage, “εἶδος” is contrasted with matter: the form is that which is acquired by matter when something—especially a substance—comes to be. The form is communicated to the thing that comes to be by the efficient cause which is “synonymous” with what the thing comes to be (*Metaphysics* Λ.3 1070a4). Thus, in the coming to be of a man, the form which makes him a man is communicated into the matter by the father, who is also a man.

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<sup>54</sup> It might seem odd to ascribe moderate realism to the *Meno*, since the dialog includes some of Plato's distinctive metaphysical speculations. However the dialog does not contain his extreme realist theory of universals. The theory of recollection is present, but the identification of the objects of recollection as transcendent forms occurs only in the *Pheado* (72e-77a). In any event, the present passage is in from the first third of the *Meno* before any of the Platonic ontology has been introduced.

<sup>55</sup> The present passage is one among several that lead Allen (1970) to find an “Earlier Theory of Forms” in the Plato's early dialogs. The passage does, of course, contain a view about something that Socrates calls forms, and one that is importantly involved in the progression that led to the Theory of Forms in the middle dialogs. (On this progression, see Ross 1951, Gerson 2002, Dancy 2004, and Salmieri 2008 §1.) However, unlike Plato's mature theory, Socrates' position on forms in the *Meno* and the early dialogs does not include commitments to any distinctive or controversial metaphysical views. (For responses to Allen along these lines, see Rist 1975, Vlastos 1991 59, and Dancy 2004 65-68.)

This makes it easy to see why forms are so often viewed as identical components shared by the particulars under a universal: a particular man comes to be when some matter comes to be a substance in the form (i.e., species) man, and it comes to be this because it receives a form from another man. Since the form is transmitted from father to son, it seems that multiple men have the same form, so it is not implausible to think that it is the same in all men, especially since Aristotle seems to say as much in *Metaphysics* Z.8 when he writes of Socrates and Callias that “while they are different because of the matter (for it is different), they are the same in form (for the form is uncuttable)” (1034a7-8). Moreover, since what makes a particular man a man is his form (rather than his matter), and being a man is falling under a form (i.e., species), which is a universal, it is natural to think that it is the possession of the identical human form that makes particular men fall under the universal man. Thus we arrive at the partial-identity thesis.

It has sometimes been argued, most notably by Balme (1987) and Cooper (1990), that the theory of reproduction in the *Generation of Animals* is incompatible with the view that all members of a species share a form that is (even qualitatively) identical. Though I find this argument convincing I will not rehearse it here or defend it against criticisms.<sup>56</sup> I think on other grounds, that, even if all of the members of a biological species do share an identical form, it would still not be the case that this is why the members fall under a universal, since there are many universals whose particulars do not share any identical components. Uncuttable forms are a special, limiting case of universality, and they are not the most important case for understanding the issues that motivate Aristotle’s thought about universals, since most demonstrations take place at the level of wider kinds. Thus I will focus on the case of kinds, remarking more briefly (at the end of the next section) on how what I say can be extended to the case of uncuttable forms. In the present section I will discuss Aristotle’s reasons for rejecting the partial-identity thesis in the case of kinds.

Let us begin by considering what it would mean for the partial-identity thesis to hold of kinds. The members of a kind (e.g., animal or bird) are the forms under it (e.g. man and horse or hawk and

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<sup>56</sup> E.g., Lloyd 1990 and Gelber 2010.

pigeon). Each form can be defined by genus and differentia—i.e., by specifying, first, the kind that is (in some sense) common to the forms and, then, the traits that differentiate the form in question from the other kind-members. For the partial-identity thesis to hold would be for the kind (or genus) to be (or, perhaps, be based on) an identical component shared by the forms and distinct from the differentia.<sup>57</sup> The kind would have to be something that “does not differ but is wholly the same” from one form to the next, as Socrates thought that the form of bee is “wholly the same” from one bee to the next. And the differentia would have to be independent of the kind in the way that Socrates thought that the form of bee was independent of the traits (like size and beauty) in which one bee differs from the next. In fact, however Aristotle denies precisely this in several passages. One of the most explicit can be found in *Metaphysics* I.8

That which is other in form than something is other in something, and this thing must belong to both—e.g., if an animal is other than an animal, both are animals. Necessarily, therefore, things other in form are in the same kind. For this is what I call a kind: the one same [thing] said of both that is non-incidentally different (whether [it’s] matter or otherwise). For not only must the common [thing] belong—e.g., both are animals—but this same animal must be other for each—e.g., horse for this one, but man for that one. That’s why the common [thing] is other in form [for one] than [it is] for the rest. In themselves, then, this one will be such an animal and that one will be such [an animal]—e.g., this one [will be] a horse, and that one [will be] a man. Necessarily, therefore, this difference is an otherness of the kind. For I call a “difference of the kind” an otherness that makes this itself different. (*Metaphysics* I.8 1057b35-a8, cf. 1054b22-a12, 1018a9-15)

Though man and horse both fall into the kind animal, this kind he says here is itself *non-incidentally different* in the one from the other. That is: the kind will not be related to the difference

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<sup>57</sup> I will alternate between referring to *γενή* as kinds and as genera. I think “kind” is the better translation, but when referring to the *γενός* as a component of a definition, genus is more natural.

accidentally as (Socrates supposes) being a bee is related to differences in beauty and size; rather than “being wholly the same” from form to form, the kind will *itself* differ. Differing in this way is essential to being a kind, rather than a form whose members (at least) may be exactly alike in the features in virtue of which they belong to the form. Thus any universal that satisfied the partial-identity thesis would thereby fail to be a kind.

Aristotle has a reason for denying that forms of a kind are each composed of the identical kind and another component in which the forms differ from one another: this sort of composition would prevent the form from having the unity that Aristotle thinks it must have in order to function as a term in predications. The commitment that each term in a predication be a unity is voiced frequently in the *Organon*. Consider, for example, the following passage from *De Interpretatione* 11:

It is not a single affirmation or denial to affirm or deny one thing of multiple things or multiple things of one, unless some one thing is composed from the multiple things. I do not call it one if one name is posited though there isn't any one thing from them. E.g., man is, perhaps, animal and biped and tame, and yet some one thing comes from these; but there is not one thing from white and man and walking. So, if someone affirmed some one thing of these, there would not be a single affirmation (rather, while the utterance (φωνή) would be single, the affirmations would be multiple), and likewise, if someone affirmed these multiple things of one thing. (*De Interpretatione* 11 20b12-22)<sup>58</sup>

A proposition predicates *one thing of another*, and not just anything that can be expressed in a grammatical phrase qualifies as “one thing” in the relevant sense—for example, “white, walking man,” (or even “white man”) does not.<sup>59</sup> In *De Interpretatione* Aristotle gives a (putative) definition of man as

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<sup>58</sup> See also *De Interpretatione* 8 18a12-25; *Prior Analytics* I.23 40b35; I.2 72a9; *Posterior Analytics* I.22 83b17-31, II.10 93b36; *Sophistical Refutations* 6 169a6ff, 17 179a39ff, and 30; and *Metaphysics* Γ.7 1011b24. The issue of what constitutes “one proposition” is of special significance to Aristotle, especially in the *Sophistical Refutations*, because of the common sophistic tactic of “making two questions into one” by asking a question with an equivocal term and taking the answer to apply in the sense other than the one intended by the answerer.

<sup>59</sup> Alan Code (2010, 79) summarizes Aristotle's position nicely: “It might be the case that a man is both musical and literate, but the expression ‘musical and literate’ does not indicate a single predicable, and the musical thing and the literate thing are one merely accidentally. The complex phrase is applicable to a man just in case the man is the

an example of a case in which components do make up a single term, but he does not tell us why the genus and differentia make up one thing (except that it is not because a single name is associated with the complex). In the central books of the *Metaphysics*, however, he does address the question of why the parts of a definition constitute a unity. Consider the following passage from Z.12:

How is the thing whose account we call a definition one? Take, e.g., man, i.e., biped animal—let this be its account. Why, then, is this one thing and not many: animal and biped? (Z.12 1037b12-15, Cf. *Posterior Analytics* II.6 92a27-33)

In the ensuing discussion, Aristotle allows that even “white” and “man” constitute a unity of a sort, when the former is predicated of the latter; but he argues that this is not the sort of unity involved in definition, and that, even if it were, the problem would not be solved, because definitions often have many differentia, rather than one—“e.g., footed, bipedal, and featherless.” “Why are these one rather than many?” he asks, “It is not because they inhere in one thing; for in this way, one thing could be made from everything” (1037b22-24). Definitions must enjoy a sort of unity that is absent from mere collections of items predicated of the same subject. As Aristotle puts the point earlier (in Z.4), they must be one not only “by continuity like the *Iliad* or a bundle” (1039b9-10). This issue is revisited in H.6, where Aristotle accuses the Platonists of being unable to account for how definitions can have the requisite unity.

Now a definition is one account, not as a bundle or in the manner of the *Iliad*, but by being of a single thing. Well, then, what is it that makes man one? Why is it one thing, not many—e.g., both animal and biped—especially if there are, as some say, an “animal itself” and a “biped itself”? Why isn’t man these “themselves,” so that men will exist by participation not in man, not in one thing, but in two, animal and biped? And, in general, man would not be one, but more than one: animal and biped? Clearly, then, for those who

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subject for each of two distinct predicables. That being the case, the expression ‘musical and literate’ does not signify one thing but picks out two different items, each of which the man (accidentally) is.”

proceed in this way, as they are wont to define and speak, it is not possible to answer and escape this difficulty. (H.6 1045a12-22, Cf. M.5 1079b30-35)<sup>60</sup>

Though the difficulty Aristotle raises here is especially pronounced in the case of transcendent Platonic forms, it is not limited to them. The source of the difficulty is not the transcendent nature of Platonic forms or even their status as substances, but the *independence* that this implies between forms.<sup>61</sup> This is the same sort of independence that Socrates in the *Meno* insists there must be between the universal and the characteristics in which particulars under it differ. So long as the genus must be something in which the species “do not differ at all,” it must be independent of the differentia, with the result that the definiendum composed from the two can have no more unity than “white, walking man” or even than “waxing wroth and skulking in one’s tent until one’s lover is killed in battle at which point one kills the son of the opposing king, etc.”—i.e., than the *Iliad*.

By bifurcating each particular under a universal into a component that is shared with the other particulars and one that is not, the partial-identity thesis undermines the unity of the particulars. Thus, to elaborate on Socrates own metaphor, a particular bee, with its various distinctive features (size, beauty, etc.), turns out to be a swarm of attributes. And since the universal bee is a particular relative to the kind insect, the universal too turns out to be a swarm. Insect will likewise be a swarm of terms, as likely will some of bee’s differentiae. The further one carries the analysis, the larger the swarm will grow, and there will be no basis for grouping the teeming items back together in the specific way (and order) one would need to if there is to be any unity to any of the definienda or any hierarchy of genera and species.<sup>62</sup> To borrow a phrase of Hume’s, everything is “loose and separate . . . *conjoined* but never *connected*”.<sup>63</sup>

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<sup>60</sup> Cf. 1030b9, where the idea of being one in the manner of the *Iliad* is first mentioned.

<sup>61</sup> On this point see Lennox 1987b 349-350 and Gill 2010 104.

<sup>62</sup> The view of definition that results is that endorsed by Locke in Book III, Chapter III, §10 of his *Essay*. The definition becomes a mere *enumeration* of simpler ideas that are conjoined in a complex one, rather than an account of a unitary being; and, far from being necessary for understanding what the species is, the role of the genus in the differentia is simply “to save the labour of enumerating the several simple ideas which the next general word or genus stands for, or, perhaps, sometimes the shame of not being about to do it.”

<sup>63</sup> An Enquiry Concerning Human Understanding (Part II), p. 76.

Aristotle avoids this unacceptable consequence by rejecting the independence of genus and differentia. This is what we saw him do in I.8 where he says that a differentia is “an otherness that makes this itself [viz. the kind/genus] different” and describes the kind as “non-incidentally different (whether as matter or otherwise)” from one form to the next. Z.12 and H.6 explain this non-incidentally difference by treating the genus as matter.<sup>64</sup>

If, then, the kind does not exist *simpliciter* besides the forms (as [the forms] of a kind)—or, if it does, it exists as matter (for voice is the kind and matter, but the differences make the forms and the letters out of this)—then it is clear that the definition is the account out of the differences. (Z.12 1038a5-9)

But if, as we say, one [part of the definition] is the matter and the other is the form, and the one potentially and the other actually, then the topic of investigation would no longer seem a difficulty. (H.6 1045a22-25)

To understand the import of Aristotle’s assimilating kinds to matter, we must recall that his sense of “matter” is quite different from our own. First, matter is primarily a relative notion: to be matter is to be the matter for something.<sup>65</sup> Second, to be matter for something is to be *able* to be that thing, while also being able not to be it. Thus central to the concept of matter is being “indeterminate” and thus being able to be contrary things.<sup>66</sup> The term matter is introduced in *Physics* I to help account for the coming to be of substances, but Aristotle uses it more broadly for any subject that underlies any sort of change, on the

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<sup>64</sup> The relationship between the treatments of the ἀπορία in Z.12 and H.6 is a matter of some controversy, as is the direction in which H.6 exploits the analogy between the genus-differentia relation and the relation between bronze matter and spherical shape. The traditional view (expressed, e.g., in Ross 1924b 238 and Loux 1995) is that the point of the analogy is to exploit our understanding of hylomorphic composition to shed light on the unity of definition. Gill (2010) argues that the analogy is intended in the other direction, shedding light on the unity of hylomorphic compounds by reference to the understanding of the genus-differentia relation that had been developed in Z.12. Gill agrees with the consensus that in Z.12 the analogy is used to shed light on the genus-differentia relation, but she argues (convincingly) that the chapter appeals to facts about matter that are salient in the case of voice, but not in cases like the bronze, which is matter for a sphere. Nothing in my argument turns on which reading of H.6 we accept. It is sufficient that Aristotle thinks that kinds and matter are alike in the relevant respect and that (in Z.12 at least) he thinks that appealing to this likeness resolves ἀπορία about the unity of definition. The controversies about H.6 concern why the ἀπορία is being raised again and what (if anything) new the chapter adds to our understanding of the unity of hylomorphic composites.

<sup>65</sup> See Fine 1992 and Witt 2003 13.

<sup>66</sup> See Furth 1988 164-5, Hinton 2005 379-380, and Gill 2006 365.

grounds that “all subjects admit some contraries” (*Generation and Corruption* I.4 320a4-5). Thus, for example, he describes the stars, which do not come to be, as having “matter for change of place” (*Metaphysics* H.1 1042b6).

Aristotle’s conception of matter is essentially that of a *determinable*: of something which is *able to be* any of a range of *determinate* things, without being (in its own right) any specific thing—as the timbers that compose a house are able to be the house, but need not be it, but could be a stage or a heap instead.<sup>67</sup> Matter is “that which in itself is not a *this*” (*De Anima* II.1 412a7, *Metaphysics* H.1 1046a26). This conception of matter is essential to Aristotle’s account of change, which he understands as the matter’s coming to be determined differently—i.e., acquiring (or loosing) a form. Importantly, however, he also applies the terminology of matter in cases where there is no literal change at all. In H.6 we are told that addition to “perceptible matter”—i.e., the stuff that we can perceive coming to be a substance (or changing in place)—there is “intelligible matter”:

One [sort] of matter is intelligible, the other is perceptible, and always one [part] of the account is matter and the other actuality—e.g. circle: plane figure. (1045a33-35)

Given the context of this remark, it is generally—and I think correctly—taken to mean that a thing’s kind is its intelligible matter.<sup>68</sup>

Aristotle’s only other uses of the phrase “intelligible matter” are in Z.10-11 to describe that out of which geometrical objects can be thought to be spatially composed. In both contexts, the thing called intelligible matter accounts for an ability of an object to be changed or manipulated *in thought* in a way that it cannot be in reality.<sup>69</sup> Something’s perceptible matter is that in virtue of which it is able to come-to-be and pass away existentially or (sometimes) to change in other ways (e.g., in place). Something’s

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<sup>67</sup> Indeed the root meaning of ὕλη (“matter”) is wood or timber. The *LSJ* notes that it is “rarely” used more broadly to include other materials. One such example is Plato’s *Philebus* at 54c2, which may be the inspiration for the now familiar sense in which Aristotle seems to have been the first to employ the term.

<sup>68</sup> This is how he is read, for example, by Ross (1924b 199-200, 238), Grene (1974 65-66), Gaukroger (1980 189), Kit Fine (1992 37), and Mendell (2004 §7.5). For alternative readings see Rorty (1974 76) and Bostock (1994 284-5).

<sup>69</sup> There has been surprisingly little written on the relation between the uses of the phrase “intelligible matter” in Z and H. For a survey of views on the subject see Thorp 2009. The interpretation I adopt here is developed in greater detail in Salmieri 2008 §2.3.2.

intelligible matter is that which makes possible similar operations in thought by being able to be *thought of* either as the thing in question or as other, alternative things. Something's perceptible matter is that into which it can be physically decomposed and from which some alternative can be recomposed; something's intelligible matter is that into which it can be mentally decomposed and out of which one mentally compose both it and alternatives to it.

Thus, it is in virtue of intelligible matter that a circle can be divided into semicircles, a line can be extended, and a pentagon can be composed of triangles. A kind, too, is intelligible matter from which things can be mentally composed and into which they can be decomposed, though the relevant operations of composition and decomposition are different from their mathematical counterparts. When thinking of man, one can de-specify one's thought into a thought of the kind, animal, which can then be re-specified to yield a thought either of man or of some other animal, depending on the differentia one adds to it. Indeed, in *Metaphysics* I.8, eight lines after describing a differentia as a difference that makes the kind itself different, Aristotle speaks of the contrary forms as "coming to be" throughout the process of "division" by which one proceeds from wide kinds, through intermediate forms, to the uncuttables (1058a19-21). He goes on to describe "the kind as the matter of that of which it is called the kind" (1058a23-4).

The kind is matter precisely in that it is indeterminate and able to be divided in thought into contrary determinate forms. The differentia that are introduced in the division to yield the forms are not independent of the kind, as one timber is independent of another; rather the differentia stands to the kind as the structure of a house stands to the timbers that compose it. Just as house-shaped and stage-shaped are alternative ways that the set of timbers can be arranged into a definite object, so too bipedal and quadrupedal are alternatives ways that the kind animal can be determined into a definite form. Like perceptible matter, the kind is a determinable that can be determined into any of several alternative forms.<sup>70</sup>

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<sup>70</sup> The term "determinable" was introduced into modern logic by W.E. Johnson (1921, 1922, and 1924) and has sometimes been contrasted with the genus-species relation—for example, by Searle:

It is worth recalling at this point that we saw Aristotle in M.10 speak of universals as “matter” and “indefinite.” His subject there was not kinds specifically, but universals quite generally, and his example of a universal was alpha, which is surely a form rather than a kind that admits of further division. This gives us reason to suspect that Aristotle regards all universals, rather than only kinds, as determinable matter.

Whether it is all universals that are determinables or only kinds, the partial-identity thesis will fail in their case. The determinates under a determinable are not the same in virtue of sharing any identical component, since the determinable that they might in some sense be said to “share” is itself “non-incidentally different” in each of the determinates. Rather, the determinates fall under the determinable—the particulars under the universal—in virtue of a relation in which they stand to one another.

I will have more to say about this relation in the next section, but first there is an objection that must be addressed. I have argued that Aristotle rejected the partial-identity thesis in the case of kinds, which he treated as intelligible matter. But the assimilation of kinds to matter might be thought to support the view that the kind is an identical component in its forms, since matter is a component in ordinary hylomorphic compounds, such as bronze spheres. Though the matter is not independent of the form in the way that the ingredients in a cocktail or the timbers of a house are independent of one another, surely it is

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[The relation of determinable to determinate] is logically distinct from the relation of genus to species. The denotation of a species term is marked off within the denotation of the genus term by the possession of properties known as the differentia. The species is thus to be construed as formed by the conjunction of two logically independent terms... Both the genus-species relation and the determinable-determinate relation are relations of the less specific to the more specific, but in the former case the specification is provided by some property logically independent of the genus, whereas in the latter case the determinate cannot be specified by adding additional independent properties to the determinable.

This characteristic has been emphasized by Johnson, Cook Wilson, Prior, and Searle; and it is this feature which chiefly justifies the introduction of this terminology to the traditional arsenal. (Searle 1967 357-8, cf. Granger 1980 37-8)

Searle understands the genus-differentia relation in the “traditional arsenal” to be the pre-Aristotelian, Academic view that Aristotle rejects in Z.12 and H.6. Certainly Searle is right that the genera and differentia have often been understood this way, but this is not the only way that the relation has been understood, and it is odd that Searle should write as though it was, while he cites Cook Wilson and A. N. Prior. Cook Wilson (1926 §155-§160, §406-§414) insists that a true genus must be a determinable; and Prior (1949) gives a brief and fascinating history of the “traditional Aristotelian and scholastic doctrine” that the genus is “determinable,” in which he explains how it fell out of favor due to attacks by Leibniz and a number of 19<sup>th</sup> Century logicians, and how Cook Wilson and Johnson attempted to “rehabilitate” it. It is now not uncommon to find Aristotelian kinds described as determinables—see, e.g., Granger 1980 and 1992, Gill 2001 255 and 2010 105, and Butchvarov 2009 171.

the *very same* bronze that is able to take on different shapes at different times, and surely the identity of this bronze over time is a mind-independent fact.

What would it mean for the kind, as intelligible matter, to be a mind-independent identical component in its forms? It would have to mean that in a horse there is some indeterminate animal that could be (or could have been) a man. There would have to be some item that could actually come to be a horse, a man, and any other animal but not any non-animal. There is no evidence that Aristotle thought any such thing.<sup>71</sup> It is only *in thought* that forms of animal can be decomposed into the kind animal and recomposed from it. If something's intelligible matter is its ability to be manipulated in thought, then it is a potentiality *relative to thought*, and is, in that sense, mind-dependent. This is not, of course, to deny that there is *something* mind-independent about the members of kinds that enables us to treat them in thought as we do. Let us turn now to this ontological basis for universality.

#### **4. The Ontological Basis for Kinds**

We saw in the last section that Aristotle rejected the partial-identity thesis in the case of kinds at least. The kind cannot be or be based on an identical element present in each of its forms. What, then, is the basis for a kind? What is it about the forms of a kind that enables us to mentally decompose them into a genus and differentia and perform the other operations discussed towards the end of the last section?

Earlier I said that the kind is a determinable whose forms are its determinates. Johnson, who introduced this distinction into 20<sup>th</sup> Century logic, had the following to say about the basis on which determinates are grouped together under a determinable:

The several colours are put into the same group and given the same name colour, *not* on the ground of any partial agreement, but on the ground of the special kind of difference which distinguishes one colour from another; whereas no such difference exists between a colour and a shape. Thus red and circular are adjectives between which there is no

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<sup>71</sup> Rorty (1973) argued that Aristotle did hold this. See Greene 1974, Wilson 2000 74-7, and Salmieri 2008 §2.3.1 for what I take to be decisive refutation of this interpretation.

relation except that of non-identity or otherness; whereas red and blue, besides being related as non-identical, have a relation which can properly be called a relation of difference, where difference means more than mere otherness. What is here true of colour is true of shape, pitch, feeling-tone, pressure and so on: the ground for grouping determinates under one and the same determinable is not any partial agreement between them that could be revealed by analysis, but the unique and peculiar kind of difference that subsists between the several determinates under the same determinable, and which does not subsist between any one of them and an adjective under some other determinable. (Johnson 1921 176)

The distinction Johnson appeals to here between difference and mere otherness is right out of *Metaphysics* I.3:

Difference (διαφορὰ) and otherness (ἑτερότης) are distinct (ἄλλο). For, while the other and that which it is other than are not necessarily other in something (for everything that exists is either other or the same [as a given thing]), that which is different differs from something in something, so that it's necessary for there to be something the same in which they differ. (1055b22-28)

Aristotle goes on to say that “this same thing is a kind or a form”, but, in the case of a kind, he cannot mean by this that the kind is in no way different from one form to the next, for we have seen that he denies this a few chapters later.<sup>72</sup> Rather, like Johnson, Aristotle understands the basis for the determinable kind as lying in the relation of difference or opposition that holds between a kind's members. We get a better sense of how he understands this relation a few lines later:

Since differing things admit of differing from one another in the more and the less, there is some greatest difference, and I call this contrariety. It is clear from induction that contrariety is the greatest difference. For, while things that differ in kind do not have a

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<sup>72</sup> He also goes on to comment on the difference between differing in kind and in form, mentioning matter in connection with kinds, but there are textual problems that make interpretation difficult. On the textual problems, see Ross 1924b 288-9; on some of the interpretive difficulties, see Salmieri 2008 78-9.

way to one another—rather, they keep entirely apart and are incommensurable [ἀσύμβλητον]—comings-to-be for things that differ in form are from contraries as extremes; and the distance between extremes is greatest, so that between contraries must be as well. (1055a3-a12)

Here we learn that items that are different (as opposed to being other), differ in “the more and the less” (with contrariety being the limiting case of difference). To differ in the more and the less is to be “commensurable,” and being such gives the forms of a kind “a way to one another” which enables them to “come to be” from one another.

Aristotle cannot be saying that all the forms of any kind can actually transform into one another—e.g., that any animal can transform into any other.<sup>73</sup> His point is, rather, that it is a necessary condition for a transformation that there be a *continuity* between the termini. This is why it is unintelligible to speak of transformations between disparate things like a marathon and the color blue; there are no dimensions along which these two can be compared. By contrast, when we can compare two items along some dimension, saying that one exceeds or falls short of the other, we can think of one of the items altering along that dimension to be more like the other, whether or not the item is in fact capable of undergoing such an alteration. For example, since the sun is brighter than the moon, we can think of the moon becoming brighter until it is like the sun in this respect, though the moon is not in fact capable of altering in this way. Difference, as opposed to mere otherness, is always difference in some respect; and this respect serves as the matter that enables the objects to pass into one another in thought, if not in reality.

When discussing zoological classification, Aristotle frequently makes use of the point that the members of a kind differ in the-more-and-the-less:

By “kind,” I mean, e.g., bird and fish; for each of these has difference with respect to kind, and there are many forms of fishes and birds. Roughly, the majority of the parts differ in themselves by oppositions of their affects—e.g., color and figure—one thing

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<sup>73</sup> Recall that I.8 1057b35-a8 (quoted in the last section) gives animal as an example of a kind when making a related point.

having a feature more that another has less; still [other parts differ] by multiplicity and fewness, and by largeness, smallness, and, generally, by excess and defect. [...] But, as stated, most parts, and the ones out of which the entire mass is composed, are either the same or differ by opposition and by excess and defect—for we can count the more and the less as a sort of excess and defect. (*History of Animals* I.1 486a15-b17)

This passage, like those we have been considering from *Metaphysics* I, makes clear that the forms of a kind stand in the relation of commensurability to one another, but does not make it clear whether it is *because* they stand in this difference that they qualify as a kind. This is what Aristotle would need to hold to think, as I suggested earlier, that this relation between the particulars is the basis of the universal. We get a strong indication that this is what he does think in *Parts of Animals* I.4, where he treats this relation as explaining and justifying our practices of grouping forms into kinds and “stating what belongs [to them] universally” (644a24-5). The chapter begins as follows:

Someone might puzzle over why men have not denominated (προσηγόρευσαν), by some one name encompassing both at once from above, one kind, which comprises those of the animals that are aquatic and those that fly. For there are some features common to these (and to all other animals). Just the same, they are correctly distinguished in this way [viz. as they presently are, without an overarching kind]. For, of kinds, whatever differs in accordance with degree and the more and the less has been yoked together (ὑπέζευκται) in one kind, whatever is analogous [has been kept] separate. I mean, for example, that bird differs from bird by more or by degree (for one has long feathers, another short feathers), while fish differs from bird by analogy (for what is feather in one is scale in the other). (*Parts of Animals* I.4 644a12-23)

The language of yoking the forms together and of encompassing them into a kind by denominating them by one name suggests that the universal kind is in an important respect a product of the way we regard the forms. However it is not a subjective matter, because there are standards for when

we should regard them in the relevant way. We should only do so if they differ only in the-more-and-the-less. We go wrong if we treat as a kind forms that do not stand in this relation but are merely analogous.<sup>74</sup> The chapter continues by raising the question of the level of universality at which animals ought to be studied, suggesting first that we should study them at the level of the uncuttable, but deciding to proceed at the level of kinds, under the following conditions:<sup>75</sup>

Perhaps, then, it is right to speak in common in accordance with kinds wherever [one] is spoken of properly (men having defined it well) and has a single common nature and forms in it that are not very different ([e.g., the kinds] bird and fish, and [likewise] any other there may be that, though unnamed, comprises the forms in it like a kind), but wherever there is not such [a nature], [to speak] particularly (e.g., about man, and [likewise] if there is any other such [form]). (*Parts of Animals* I.4 644b1-7)

Here again Aristotle endorses the sorts of considerations that he thinks led to regarding bird and fish as kinds, and he advises us to seek universal explanations for the features of these kinds, and for any unnamed groups of animals whose members are related to one another in the manner epitomized by these kinds. Instead of citing the more-and-less differences he focused on 18 Bekker lines earlier, however, Aristotle now speaks of the members of the kind sharing “a common nature.”

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<sup>74</sup> As Lennox (2001a 169) notes, the present passage is evidence against the view (defended in Pellegrin 1986 and Balme 1962) that the distinction between being the same “in kind” and “by analogy” is relative, as the distinction between forms and kinds is. However, the passage allows for a limited sort of relativity for the distinction. It may be that when one is focused on kinds at a certain level, it is proper to think of things that the kinds have in common as the same by analogy even if one could rise to a higher level of abstraction and consider them as having the same kind of attribute. Be that as it may, what is most significant about sameness by analogy is that it is a type of sameness that can sometimes obtain even between things that are not alike in the way they would need to be to constitute a kind. This is the feature about it that is clear from the present passage from *Metaphysics* Λ.5 (discussed above).

<sup>75</sup> Interestingly the argument given here is considerably more pragmatic than the one given when (what amounts to) the same issue addressed in *Posterior Analytics* I.24. Rather than arguing (as he does there) that we cannot grasp the causes unless we have the universal, he argues here that treating each uncuttable form separately is “silly and tedious” because it would involve “speaking many times about the same feature” when it occurs in different forms of animals (644a34-b1). Perhaps this more pragmatic argument is used here because of the esoteric character of the *Analytics*’ arguments, some of which Aristotle himself apologetically characterizes as λογικός (86a22).

This common nature cannot be a determinate feature that is shared by all the forms of the kind as the partial-identity thesis would have it. First, this would prevent the kind from itself being different in each of its forms (as Aristotle says it is in *Metaphysics* I.8). Moreover, Aristotle recognizes more-and-less differences in all the features that are plausible candidates for constituting birds' "common nature". There are differences not only in the color, texture, location, and composition of their various parts, but also in their activities, characters, and lifestyles (βίαι). There are even differences in flying, which Aristotle tells us is part of the οὐσία of bird (693b12). For example, hawks fly higher and swifter than ducks, and the different birds fly by subtly different motions.<sup>76</sup> If one removes all the characteristics in which Aristotle thinks birds differ in the more and the less, one is left with no remaining determinately identical characteristics that could constitute the common bird-nature.<sup>77</sup> Thus the common nature must be common not in the sense of being identical from form to form, but in the sense of being commensurable and differing only in the more and the less.

However, this commensurability cannot be Aristotle's whole basis for kinds. If it were, his view would amount to the following: there are (or, perhaps, we are justified in introducing) just as many kinds as there are dimensions along which things can differ, and all the items that differ along a given dimension fall under the corresponding kind. We can see immediately that this view cannot be correct and that it is unlikely to have been Aristotle's.

First, this view is subject to the criticisms we saw Aristotle level against the independence of genus and differentia. If each kind corresponds to a distinct dimension, then the dimensions corresponding to superordinate and subordinate kinds will need to be distinct, so that the subordinate kind will not really be a determination of the superordinate kind, as we saw that Aristotle thinks it must be to

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<sup>76</sup> *Parts of Animals* IV.12 693b28-a8 tells us that characteristics of wings vary according to whether the birds fly and that different birds fly for different reasons, some because they're predators and others to escape danger or to migrate. This and other differences lead to different ways of flying. Predatory birds fly with their legs drawn up into their bellies, ready to grasp at prey (694b25), but longer-legged, marsh-dwelling birds stretch their legs out behind them in flight to compensate for their shorter tail feathers (694b19-20 cf. *History of Animals* II.12 504a32-4 and *Progression of Animals* 10 710a3-b3). See also *Parts of Animals* IV.13 on the differing movements and parts by which the different forms of fish swim, and *History of Animals* VII 588a16ff (especially a25, b8, b22, and 589a1) and VIII 606a11-20, b1-18).

<sup>77</sup> On the possibility that the single nature could be a common matter from which all the members of the kind are formed see the sources referenced in n. 71 above.

allow for the unity of definitions. If the subordinate kind is to be a determination of the superordinate kind, it will have to correspond, not to a dimension, but to a range along a dimension (or within a wider range) that corresponds to the superordinate kind.

Moreover, zoological kinds clearly do often correspond to ranges rather than to dimensions. Consider some of the different kinds of tissue (i.e., the things Aristotle calls “uniform parts” of animals): flesh, bone, cartilage, sinew, etc. There is more-and-less variation within each (for example, some forms of skin are thicker or moister than others, and some forms of bone are harder than others), but these same sorts of differences hold between the tissues: Bone is harder than cartilage, which is harder than skin, etc.<sup>78</sup> If kinds correspond to ranges rather than dimensions, then there is a question as to how the boundaries of the ranges are set. Why are there separate kinds, bone and cartilage, rather than one embracing them both? And why are forms like man uncuttable when there are many manifest more-and-less differences between men? Why can’t differences in height, color, or nose shape ground sub-divisions of man into further forms?

Clearly commensurability is a necessary but not a sufficient condition for a kind. What else is required? In a word, the answer is causality. Recall that universals are honorable because they reveal causes by serving as terms in demonstrations (*Posterior Analytics* I.30 88a5-6). In order to do this, universals must imply or be implied by other universals, and these implicatures must reflect causal relations. In fact, Aristotle tells us that we should introduce new terms precisely when we discover new things that follow from or are followed by the terms we already recognize and that by doing so we will discover causal relations:

Though we now speak in accordance with the common names that have been handed down, it is necessary to enquire not only in these cases. Rather, also, if any other common attribute should be observed, then, after selecting it, [it is necessary to enquire into] what it follows (ἀκολουθεῖν) and what follows (ἔπεται) it—e.g. if possessing a “vase” [i.e.,

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<sup>78</sup> See Balme 1962 88-19 for a list of features that are said (in different passages) both to differ in the more and the less and by analogy.

an additional stomach] belongs to the possessors of horns (τοῖς κέρατα ἔχουσι) [as does] not having a second set of teeth, then [inquire into] what follows (ἔπεσθαι) horn-possessing (τὸ κέρατ' ἔχειν). For it is clear why what was mentioned belongs to these things; for it belongs to horn-possessing (τὸ κέρατ' ἔχειν). (*Posterior Analytics* II.14 98a13-19, cf. *Prior Analytics* I.27-31)<sup>79</sup>

The context for the passage is a discussion of how, by taking note of what follows what, we can stock ourselves with conclusions to be demonstrated and premises from which to demonstrate them.<sup>80</sup> In the present passage, Aristotle advises us to introduce a new universal term (viz. “horn-possessing”), when we find that there are things that would follow such a term (in this case, having a “vase” and lacking a second set of teeth).<sup>81</sup> We get similar advice in *Topics* VIII.2’s discussion of induction:

While in some inductions it is possible to ask for the universal, in some it is not easy, because a common name has not been laid down for every likeness; rather, whenever anyone needs to take the universal, he says “[it’s] so in all such things”. But this—which of the things put forward are and aren’t “such”—is among the most difficult things to distinguish. And, besides this, [people] often lead one another astray with respect to the accounts, some claiming things to be alike which are not alike while others dispute the

<sup>79</sup> Presumably Aristotle has in mind the explanations that he gives in the *Parts of Animals*. Horned animals lack a second set of teeth because the earthy material that goes to form such teeth in other, similar animals is diverted to form the horns (*Parts of Animals* III.2 663b35-a3), and they have additional stomachs in order to help digest their insufficiently masticated food (III.14 674b5-15).

<sup>80</sup> On this and related passages and their relation to Aristotle’s scientific practice, see Lennox 1987a and 2001b and Salmieri 2008 §4.3.2 and the sources cited therein.

<sup>81</sup> I take it that “τὸ κέρατ' ἔχειν” is meant to be a new term introduced in the passage. This is signaled by its (otherwise unnecessary) repetition. Phrases of the form “τὸ X ἔχειν” appear with some frequency as terms in the demonstrations (endorsed or considered) in *Parts of Animals* (see 683a7, 868b26-7, 687a9, and, perhaps, 655b4). Of special significance is “τὸ πλεύμονα ἔχειν” (“lung possessing”), which III.6 tells us belongs in the οὐσία of certain animals for whom what is common is unnamed (669b8-13). The phrase reappears at 697a17 where lung-possessing is cited as the cause of an anatomical feature that he (incorrectly) ascribes to cetaceans. (On the error here, see Lennox 2001a 342.) “Τὸ τὸν πλεύμονα ἔχειν σομφόν”, which could be thought of as a form of “τὸ πλεύμονα ἔχειν”, is also cited as a cause at 671a9-10. (On Aristotle’s method of explaining a feature by reference to elements in the essence of a kind and then explaining variations in that feature with reference to variations in the kind, see Lennox 1987a.) Interestingly, “τὸ κέρατ' ἔχειν” does not appear in the *Parts of Animals*, though we do find “τὰ κέρατα ἔχοντα” (meaning, in context, “their possession of horns”) in III.2 at 663b18. That chapter refers to the animals that possess them as “κερατοφόρα” (663a18, b25, b35). Likely in the *Posterior Analytics* passage Aristotle prefers an infinitive to a participle because what he is naming is the *attribute* of possessing horns, whereas the participial would naturally be taken to refer to animals that have the attribute.

likeness of things that are alike. That's why one must try oneself to make up a name applying to all such things, so that it won't be permissible for the defense to dispute [on the grounds] that the cited thing is said in an unlike [way], nor for the questioner to allege that [it's said in a] like [way] to what's been said, since many of the things said [in an] unlike [way] appear to be said [in a] like [way]. (157a21-33)

Here Aristotle is considering a case in which we notice that a common predicate is shared by a certain group of things that are alike in some un-conceptualized way. The predicate is an already existing universal, and we now want to make an induction that this universal "follows" all things *such as* the ones we began by considering. In order to do this, we need to make up a name for the group of things that the established universal follows. In doing this, we introduce a new universal. Our need to do so derives from two mind-independent factors that form our basis for introducing the term. The first is the existence of a "likeness" which can be understood (along the lines suggested by *Parts of Animals* I.4) in terms of the particulars being commensurable and "not too different"—i.e., in terms of their constituting a range along some axis or set of axes. The second factor is that each of the objects is followed by a common predicate such that, when a new term is introduced comprising all the objects, there is at least one term that follows this new term *universally*.

I think it is these two factors that constitute having a "common nature" in the sense mentioned in *Parts of Animals* I.4. We can see evidence of this in the lines that immediately follow the *Posterior Analytics* passage on horn-possessing if we read them bearing in mind the *Parts of Animals*' contrast between a kind (with its "single common nature") and groups whose members were the same only analogously:

Again, another manner is excerpting with respect to analogy. For one cannot take one same thing that squid-pen, fish-spine, and bone should be called; but there will be things that follow these also, *as though there were some such single nature*. (98a20-23)

The case of bone and its analogs is being compared with the case of horn-possession, which was just discussed. The difference between the cases is that in the one but not the other there is some "single

nature” which one “can take” and which the particulars “should be called.” It is a bit odd to speak of calling something a nature, since “call” is a linguistic verb; presumably what Aristotle means is that the nature would have a name by which one should call the particulars. I think it is clear from the context of the present passage, though, that the things with single natures include ones for which we need to make up names because none have been handed down. This is confirmed by *Posterior Analytics* I.5 where Aristotle gives among the reasons why we fail in some cases to formulate demonstrations at the requisite level of universality that “there is nothing from higher to take besides the particular, or there is {one} but it is unnamed over objects that differ in form” (I.5 74a8-12). The first of these two cases is evidently that of analogous groupings—note the idea in both passages that there is nothing for us to “take”. In the second case, there is something to “take”, which we fail to notice because it hasn’t been named. Putting the passages together, it is clear that this unnamed “something” is the “single nature”. A group of analogs lacks such a nature, but is like a kind, which has one, in that things *follow* it. This is why one can sometimes make use of an analogous grouping in demonstrations. Despite this, the grouping lacks something that would be required to count as having a nature and deserving a name. *Parts of Animals* I.4 makes it clear that what is missing is the relationship of commensurability (or differing in the-more-and-the-less). And notice that the reason that chapter gives for which someone might consider treating flying and swimming things together as a kind is that they share common features—i.e., there are things that would *follow* from membership in the ersatz-kind. Putting these passages together, then, suggests that what it takes to for a set of things to have a single or common nature is for them to be commensurable and for the group of them to have things that follow the *whole* of it so that if one introduced a term, there would be other terms that followed it universally.

Because of the second of these factors, the new term can serve as a middle term in deductions. Having introduced the term “horn-possession” and induced that having a vase and lacking a second row of teeth follows it, we are able to deduce of species to which we knew horn-possession belongs that they will lack a second row of teeth and have a vase. In the passage quoted from *Posterior Analytics* II.14, Aristotle goes further than this, saying that if we find anything that horn-possessing follows, it will be

clear not just that they will have these other attributes, but also *why* they do so. Evidently he is taking horn-possessing to be a middle term in a *demonstration* rather than a mere deduction—i.e., he is taking it to be the cause of the features that follow it. It is not obvious why Aristotle should assume this, especially since he thinks that demonstrations need to be conducted at the most universal level, where the major premise will normally convert.<sup>82</sup> Given that the two terms convert, couldn't having a "vase" just as easily be the cause of horn-possession, or couldn't both be effects of some other cause?

II.16-17 qualifies the point that the major premises of demonstrations should convert, and the qualifications (when combined with some information drawn from other treatises about the horn-possessing case) provide some reason for drawing the conclusion Aristotle does about the direction of the causality. The upshot of the chapters is that the major term of a demonstration will (at least often) extend to some particulars that do not possess the middle, but that these particulars will not fall under the minor term, whereas the middle term will never be present without the minor. It is clear from other texts that Aristotle thinks this circumstance holds in the case discussed in II.14. The middle term, horn-possessing, only occurs in large land animals (*Parts of Animals* III.2 663b25-26), whereas the major terms, lacking a second set of teeth and lacking horns, are present (due to other causes) in other sorts of animals.<sup>83</sup>

Still, one cannot help but wish that Aristotle had said more in *Posterior Analytics* II.14-17 than he does about how causes can be discovered once one has a battery of universal terms, and the chapters leave one with the impression that Aristotle was overly optimistic about the ease with which this can be accomplished. Nevertheless, it is clear that he thinks that having a battery of such terms facilitates a causal, demonstrative perspective on the world, and that this is their purpose.

This purpose determines which ranges of commensurable forms should be grouped together into a kind. Grouping into kinds is proper if and only if falling within a certain range along some dimension

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<sup>82</sup> One might be tempted to read the verbs for "following" in a causal rather than inferential sense, in which case Aristotle's conclusion here would be obviously correct. However, the context of the passage and the use of the same verbs in an extremely similar connection in *Prior Analytics* I.26-31 (where causality is not at issue) tells against this reading.

<sup>83</sup> Fish lack a second row of teeth (*History of Animals* II.1 501a24), and the camel, which lacks horns, has a vase (*Parts of Animals* III.14 674a31).

follows or is followed by falling within another range along another dimension. It is in just these cases that kind will be able to function as a term in demonstrations and so to reveal causes. What remains vague is what it means for one thing to “follow” another. I am not able to shed much light on this at present except to say that, in order to serve Aristotle’s purposes, if the relation is not that of cause to effect, it must at least indicate the presence of a causal connection (in some direction or other) between its terms.

The key idea here is that certain ranges along certain dimensions are such that falling within them is causally related to falling within other ranges along other dimensions. The particulars along such a range constitute a kind—or, rather, they do once we regard them in the proper way. *A kind is a causally-relevant range of commensurable things, insofar as it is regarded as a whole.* And the kind’s ontological basis is a certain set of relations of commensurability and causality.

The preceding is a generic account of what it takes to be a kind. There will presumably be other conditions on being kinds of certain sorts. For example, to be a sub-kind of a given kind, a kind will have to be a more determinate range along the superordinate kind’s axis (or axes). And, if something is to be a kind pertaining to a given science, there may be restrictions on the type of causality involved. But these are nuances that I will not pursue here.

Thus far I have been speaking about kinds as opposed to uncuttable forms. Differing in the more and the less is essential to being a kind, so that a group of particulars that were grouped under a universal term on the basis of sharing a qualitatively identical feature would necessarily fail to constitute a kind. Such particulars could, however, constitute an uncuttable form; and, for all I have said so far, it may be that being related in this way is what makes uncuttable forms uncuttable. This would certainly explain why forms cannot be subdivided as kinds can, by specifying narrower ranges within them. Though I think this view of Aristotelian forms is mistaken, I will not undertake to argue against it here. However, I do want to show that the existence of uncuttable forms follows from accounts already given of the basis for kinds with no need to appeal to any qualitatively identical form shared by the members of a species.

A determinable kind will be divisible into narrower forms only so long as narrowing the range in which the kind consists continues to yield causally significant groupings. A form that has no causally-

relevant sub-ranges will therefore be uncuttable, whether its members are qualitatively identical or differ in the more and the less of all of their attributes.<sup>84</sup>

For example, the many birds that populate the world differ in the more-and-the less along such dimensions as the size, shape, texture, etc. of their wings, beak, talons, etc., the swiftness with which they fly and the and height at which they do so, the manner in which they acquire their food, the environment in which they live, etc. Falling somewhere within the range birds do along any one of these dimensions is causally related to falling within the relevant range along the others.<sup>85</sup> In particular, there is a single range (or perhaps a small set of ranges) that constitutes what it is to be a bird, and the characteristic bird-ranges on the other axes follow from this.<sup>86</sup> Hawks all fall within a sub-range along all or most of the dimensions along which birds differ from one another, and the hawk sub-ranges along the various dimensions will be caused by what it is to be a hawk, where this will itself be a range along a dimension. Hawk-shaped wings, for example, enable a hawk's high and swift flying, which, along with the keenness of its eye-sight and the sharpness of its talons, enables it to hunt. And what it is to be a hawk is (in part at least) to be a predatory bird of a certain sort. Likely the kind hawk can be divided into narrower forms, whose attributes and essence will similarly be causally unified, and we may be able to further divide some of these kinds, but eventually we will reach an uncuttable form—say, collared sparrowhawk. This form may still embrace differences in the more-and-the-less both in those features that make it the sort of thing it is and in its attributes: for example one collared sparrowhawk's talons may be slightly sharper than another's, its wings slightly shorter, and it may fly slightly faster. But (*ex hypothesi*) these differences are not causally-related, and so there is no basis for dividing collared sparrowhawk into narrower forms.<sup>87</sup>

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<sup>84</sup> The view I sketch here is a version of that defended by Balme (1987 298) and Lennox (1985 80-81 and 1987b 353-358). The extended example in the next paragraph is a variant of one that Lennox uses in these pieces. For fuller discussion of Balme's and Lennox's positions, see Salmieri 2008 §2.4.2-5, §4.3.3.

<sup>85</sup> Notice that being causally relevant is not the same thing as being a necessary or sufficient (causal) condition. Some things will fall within the bird-range along some of these dimensions and not along others—bats, for example.

<sup>86</sup> For example, *Parts of Animals* IV.12 tells us that “being a flier is in the οὐσία of a bird” (693b12-13). For discussion see Gotthelf 1985b 43-5.

<sup>87</sup> Or, at least they're not causally-related in the appropriate way. It may be that the determinate sharpness of a given eagle's talons and the determinate length of his wings are both results of his father's having features with these same dimensions. However, in the context of biology, where (for Aristotle) teleology is the dominant mode of causation,

Thus we have innumerable kinds to which this bird belongs and an uncuttable form, without there needing to be anything that is determinately identical about all the particulars under any of these universals. And notice, too, that this example implies a similar hierarchy of (name and unnamed) universals in categories other than substance—universals for the different types of flight and of beaks, etc. possessed by the different types of birds. Of course, it may be that all collard sparrowhawks are exactly alike in some respect (or in many), but this need not be the case to explain why the form is uncuttable.

Either the account of the ontological basis of kinds can be extended to the case of uncuttable forms in this way or the members of an uncuttable form do share some identical component, but even if the latter alternative is correct, the partial-identity thesis is not true of forms, for the partial-identity would not explain why the particulars fall under a universal, but only why the universal under which they fall cannot be subdivided, as most universals can.

In general, an Aristotelian universal is not an identical item discoverable among the items that differentiate the particulars from one another. Indeed it is not a thing in the world at all, but exists only in or in relation to thought as a way in which we can regard particulars that reveals their causal roles and thus achieve *ἐπιστήμη*. What enables us to regard the particulars in this way is both the very causal relations the universal reveals and relations of likeness among its particulars. When all of these relations obtain, there is a “common nature” present to be “taken” and named, and it can then serve as a term in deductions. This nature is the universal and it is common to the particulars, but not in the way that has been so often supposed—as an element in the particulars independent from those in which they differ. Nor is the universal an object of knowledge in the way that has often been supposed. One is said to know a universal only in the sense that one can be said to see the universal color. In both cases, the universal specifies the domain of particulars that can be the objects of a cognitive power in a way that reveals that about the particulars in virtue of which they are objects of that power. What is actually known is always

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this may not be sufficient to ground a sub-kind, especially since the causal-connection will be of a quite different sort than the one that licensed the wider kind.

particular, but can only be known in the relevant way insofar as it falls under the universals it does—i.e., insofar as it stands in the relevant relations to other particulars.

## Works Cited

- Ackrill, J. 1963. *Aristotle: Categories and De Interpretatione*. Oxford.
- Albritton, R. 1957. "Forms of Particular Substances in Aristotle's Metaphysics", *The Journal of Philosophy* 54, 22.
- Allen, R.E. 1970. *Plato's "Euthyphro" and the Earlier Theory of Forms*. Humanities.
- Anagnostopoulos, G. (ed.) 2009. *A Companion to Aristotle*. Oxford.
- Annas, J. 1976. *Aristotle's Metaphysics, Books M and N*. Oxford.
- Balme, D.M. 1962. "ΓΕΝΟΣ and ΕΙΔΟΣ in Aristotle's Biology" *Classical Quarterly* 12, 1.
- Balme, D. M. 1987. "Aristotle's Biology was not Essentialist" in Gotthelf and Lennox 1987.
- Barnes, J. 2006. *Porphyry: Introduction*. Oxford.
- Beere, J. 2010. *Doing and Being: An Interpretation of Aristotle's Metaphysics Theta*. Oxford.
- Benson, H. 2011 "Socratic Method" in D. Morrison (ed.) *The Cambridge Companion to Socrates*. Cambridge.
- Beverluis, J. 1992. "Does Socrates Commit the Socratic Fallacy?" in Benson 1992.
- Bostock, D. 1994. *Aristotle: Metaphysics Books Z and H*. Oxford.
- Brickhouse and Smith. 1994. *Plato's Socrates*. Oxford.
- Burnet, J. 1924. *Plato's Euthyphro, Apology and Crito*. Oxford.
- Butchvarov, P. 2009. "Categories" in J. Kim (ed.) *A Companion to Metaphysics*. Oxford.
- Code, A. 2000. "Metaphysics Λ 5" in M. Frede and D. Charles (eds.) *Aristotle's Metaphysics Book Lambda: Symposium Aristotelicum*. Oxford.
- Code, A. 2010. "An Aristotelian puzzle about definition" in Lennox and Bolton 2010.
- Clay, D. 2000. *Platonic Questions: Dialogues with the Silent Philosopher*. University Park.
- Cleary, J. 1985. "On the Terminology of Abstraction in Aristotle". *Phronesis* XII/1.
- Coffey, P. 1938. *The Science of Logic*. New York.

- Coffey, P. 1958. *Epistemology or the Theory of Knowledge: an Introduction to General Metaphysics*.  
Vol. 1. Gouchester.
- Cook Wilson, J. 1926. *Statement and Inference*. Oxford.
- Cooper, J. M. 1986. *Reason and the Human Good in Aristotle*. Indianapolis.
- Cooper, J.M. 1990. "Metaphysics in Aristotle's Embryology" in Devereux and Pellegrin (eds.) *Biologie, Logique et Métaphysique ches Aristotle*. Paris.
- Copleston, F. 1946. *A History of Philosophy, Volume 1: Greece and Rome*. New York.
- Crombie, I.M. 1962. *An Examination of Plato's Doctrines*. Volume I. London.
- Dancy, R.M. 1991. *Two Studies in the Early Academy*. Albany.
- Dancy, R.M. 2004, *Plato's Introduction of Forms*. Cambridge.
- DeWulf, M. 1909a. "Nominalism, Realism, and Conceptualism", *Catholic Encyclopedia*, 11.
- DeWulf, M. 1909b. *History of Medieval Philosophy*. P. Coffey Tr., New York.
- Donagan, A. 1963. "Universals and Metaphysical Realism." *The Monist* 47.
- Ferejohn, M. 2009. "Empiricism and the First Principles of Aristotelian Science" in Anagnostopoulos  
2009.
- Fine, K. 1992. "Aristotle on Matter," *Mind* 101.401.
- Frede, M. 1985. "Substance in Aristotle's Metaphysics" in Gotthelf 1985a.
- Furth, M. 1988. *Substance, Form, and Psyche: An Aristotelian Metaphysics*. Cambridge.
- Geach. P.T. 1966. "Plato's Euthyphro: An Analysis and Commentary", *The Monist* 50, 1.
- Geirsson, H and Losonsky, M. 1998. *Beginning Metaphysics: An Introductory Text with Readings*,  
Oxford.
- Gelber, J. 2010. "Form and Inheritance in Aristotle's Embriology", *Oxford Studies in Ancient Philosophy*,  
vol. XXXIX.
- Gerson, L.P. 2002. "Plato's Development and the Development of the Theory of Forms" in W. Welton  
(ed.) *Plato's Forms: Varieties of Interpretation*. Lexington. 2002.

- Gerson, L.P. 2004. "Platonism and the Invention of the Problem of Universals". *Archiv f. Gesch. D. Philosophie* 86. Bd.
- Gill, M.L. 2001. "Aristotle's Attack on Universals." *Oxford Studies in Ancient Philosophy*, 20.
- Gill, M.L. 2006. "First Philosophy in Aristotle" in M. L. Gill and P. Pellegrain (eds.) *A Companion to Ancient Philosophy*. Oxford.
- Gill, M. L. 2010. "Unity of Definition in *Metaphysics* H.6 and Z.12" in Lennox and Bolton 2010.
- Granger, H. 1980. "Aristotle and the Genus-Species Relation". *Southern Journal of Philosophy* 18.
- Granger, H. 1992. "Aristotle on Genus and Differentia" in Preus and Anton 1992.
- Grene, M. 1967. *A Portrait of Aristotle*. London.
- Grene, M. 1974. "Is Genus to Species as Matter to Form in Aristotle's Taxonomy?", *Synthese* 28.
- Gotthelf, A. 1985a. ed. *Aristotle on Nature and Living Things*. Pittsburgh.
- Gotthelf, A. 1985b. "Notes towards a Study of Substance and Essence in Aristotle's *Parts of Animals* ii-iv" in Gotthelf 1985a.
- Gotthelf, A. and Lennox, J.G. 1987 ed. *Philosophical Issues in Aristotle's Biology*. Cambridge.
- Henry, D. 2006 "Aristotle on the Mechanism of Inheritance". *Journal of the History of Biology*, 39 (3).
- Hinton, B. 2005. "Elemental Matter and the Problem of Change in Aristotle" *Ancient Philosophy*," 25.
- Irwin, T. 1988. *Aristotle's First Principles*. Oxford.
- Johnson, W. E. J. 1921. *Logic*, volume 1. Cambridge.
- Johnson, W. E. J. 1922. *Logic*, volume 2. Cambridge.
- Johnson, W. E. J. 1924. *Logic*, volume 3. Cambridge.
- Lear, J. 1987. "Active Episteme" in A. Graeser (ed.) *Mathematics and Metaphysics in Aristotle*. Akten des X. Symposium Aristotelicum. Bern: Haupt.
- Lennox, J.G. 1985. "Are Aristotelian Species Eternal?" in Gotthelf 1985
- Lennox, J.G. 1987a. "Divide and Explain: The *Posterior Analytics* in Practice" in Gotthelf and Lennox 1987.

- Lennox, J.G. 1987b. "Kinds, Forms of Kinds, and the More and The Less in Aristotle's Biology" in Gotthelf and Lennox 1987.
- Lennox, J.G. 2001a. *Aristotle On the Parts of Animals: Translation with an Introduction and Commentary*. Oxford.
- Lennox, J.G. 2001b. "Between Data and Demonstration: The *Analytics* and the *Historia Animalium*" in *Aristotle's Philosophy of Biology*. Cambridge.
- Lennox, J.G. and R. Bolton. 2010. *Being, Nature, and Life in Aristotle*. Cambridge.
- Lloyd, A.C. 1962. "Genus, species and ordered series in Aristotle", *Phronesis* 7.
- Lloyd, A.C. 1981. *Form and Universal in Aristotle*. Liverpool.
- Loux, M.J. 1995. "Composition and Unity: An Examination of *Metaphysics* H.6" in M. Sim (ed.) *The Crossroads of Norm and Nature: Essays on Aristotle's Ethics and Metaphysics*. Lanham.
- Loux, M.J. 1998. "Nominalism" in Craig (ed.) *Routledge Encyclopedia of Philosophy*. London.
- Loux, M.J. 2009. "Aristotle on Universals" in Anagnostopoulos 2009.
- Lloyd, G.E.R., 1990. "Aristotle's Zoology and his Metaphysics: The *status quaestionis*, A critical review of some recent theories" in Devereux and Pellegrin (eds.) *Biologie, Logique et Métaphysique chez Aristotle*. Paris.
- Maher, M. 1900. *Psychology: Empirical and Rational* 4<sup>th</sup> Edition. London.
- Matthews, G.B. 2009. "Aristotelian Categories" in Anagnostopoulos 1999.
- Mendell, H. 2005. "Aristotle and Mathematics," *The Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/aristotle-mathematics/>.
- Mercier, D. 1906. *Critériologie générale*. 5th edit., Paris and Louvain.
- Moore, E.C. 1961. *American Pragmatism: Pierce, James and Dewey*. New York.
- Nehamas, A. 1975. "Confusing Universals and Particulars in Plato's Early Dialogues," Review of *Metaphysics* 29 287-306.

- Owen, G.E.L. 1979. "Logic and Metaphysics in Some Earlier Works of Aristotle". in Barnes, Schofield and Sorabji (eds.) *Articles on Aristotle: 3. Metaphysics*. London.
- Owens, J. 1951. *The Doctrine of Being in the Aristotelian Metaphysics: a study in the Greek background of Medieval thought*. Toronto.
- Owens, J. 1981a. *Aristotle: The Collected Papers of Joseph Owens*. Albany.
- Owens, J. 1981b. "The Grounds of Universality in Aristotle" in Owens 1981a.
- Owens, J. 1981c. "The Universality of the Sensible in the Aristotelian Noetic" in Owens 1981a.
- Pellegrin, P. 1986. *Aristotle's Classification of Animals*. Berkeley.
- Pojman, L. 1997. *Classics of Philosophy, Volume I: Ancient and Medieval*. Oxford
- Prior, A. N. 1949. "Determinables, Determinates and Determinants" in *Mind* 58, 229-230.
- Rist, J.M. 1975. "Plato's 'Earlier Theory of Forms'", *Phoenix* 29, 4.
- Robinson, R. 1951. *Plato's Earlier Dialectic*. Oxford.
- Roochnik, D. 2004. *Retrieving the Ancients: An Introduction to Greek Philosophy*. Oxford.
- Rorty, R. 1973. "Genus as Matter: A Reading of Metaphysics Z-H" in Lee, Mourelatos and Rorty 1973.
- Rorty, R. 1974. "Matter as Goo: Comments on Grene's Paper", *Synthese* 28.
- Ross, W. D. 1951. *Plato's Theory of Ideas*. Oxford.
- Ross, W. D. 1924a. *Aristotle Metaphysics: A Revised Text with Introduction and Commentary Volume I*. Oxford.
- Ross, W. D. 1924b. *Aristotle Metaphysics: A Revised Text with Introduction and Commentary Volume II*. Oxford.
- Ross, W. D. 1928. *The Works of Aristotle, Volume VII Metaphysica*. Oxford.
- Russell, B. 1912. *The Problems of Philosophy*. Oxford.
- Salmieri, G. 2008. *Aristotle and The Problem Of Concepts*. University of Pittsburgh Dissertation.
- Salmieri, G. 2010. "Αἰσθησις, Ἐμπειρία, and the Advent of Universals in *Posterior Analytics* II 19" in James Leshner (ed.) *From Inquiry to Demonstrative Knowledge: New Essays on Aristotle's Posterior Analytics* (*Apeiron* XLIII: 2, 3).

- Searle, J. 1967. "Determinables and Determinates" in P. Edwards (ed). 1967. *The Encyclopedia of Philosophy*. New York.
- Shorey, P. 1933. *What Plato Said*. Chicago.
- Santas, G. 1979, *Socrates: Philosophy in Plato's Early Dialogues*. London.
- Sykes, I. D. 1975. "Form in Aristotle: Universal or Particular?", *Philosophy*, 50.
- Taylor, A.E. 1937. *Plato: The Man and His Work*. London.
- Thorp, J. 2009. "Intelligible Matter in Aristotle." *Newsletters for the Society for Ancient Greek Philosophy*, 10(4).
- Tweedale, M. 1988. "Aristotle's Realism", *Canadian Journal of Philosophy* 18.
- Veatch, H. B. 1952. *Intentional Logic*. New Haven.
- Vlastos, G. 1985. "Socrates Disavowal of Knowledge", *Philosophical Quarterly* 35.
- Vlastos, G. 1991. *Socrates: Ironist and Moral Philosopher*. Ithaca.
- Wilson, N. 2000. *Aristotle's Theory of the Unity of Science*. Toronto.
- Windelband, W. 1899. *History of Ancient Philosophy*. H.E. Cushman Trans. New York.
- Wedin, M.V. 1993. "Non-Substantial Individuals." *Phronēsis* 38.
- Witt, C. 1989. *Substance and Essence in Aristotle*. Ithaca.
- Witt, C. 2003. *Ways of Being: Potentiality and Actuality in Aristotle's Metaphysics*. Ithaca.