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ESSENCE, DEFINITION, AND SCIENTIFIC INQUIRY IN ARISTOTLE

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ABSTRACT OF THE DISSERTATION

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In his *Posterior Analytics*, Aristotle articulates a theory of ‘science’ (*epistēmē*) according to which each science is organized around certain indemonstrable principles (*archai*) concerning the kinds studied by that science. The most prominent of the three types of principles discussed by Aristotle are *definitions* (*horismoi*). In this dissertation, I clarify Aristotle’s account of how we can come to know what the definition of a kind is. I examine three existing interpretations of Aristotle’s views on this issue, namely, the Intuitionist Interpretation (defended by Frede, Irwin, and Ross), the Explanationist Interpretation (defended by Bolton, Charles, and Lennox), and the Socratic Interpretation (defended by Bronstein). I argue that the Explanationist Interpretation is superior to its competitors. In doing so, I provide new arguments against the Intuitionist Interpretation and a serious challenge to the Socratic Interpretation, addressing in particular the as of yet unchallenged arguments which David Bronstein provides in support of the Socratic Interpretation and against the Explanationist Interpretation in his 2016 book, *Aristotle on Knowledge and Learning: The Posterior Analytics*. Finally, in my last chapter, I defend the need for a refined version of the Explanationist Interpretation. In contrast to leading Explanationists like Robert Bolton, David Charles, and James Lennox, I argue that Aristotle in fact proposes two different but complementary accounts of how we can come to know what the essence of something is. Consequently, I develop what I call an ‘Enriched Explanationist Interpretation’ which takes into account both of these distinct elements in Aristotle’s epistemology of essence.

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§1: Introduction

Essentialists maintain that at least some individuals or kinds have essences. This raises an important question: how do we come to know what the essence of something is? Unlike the related topic of modal epistemology, the epistemology of essence has received relatively little attention from contemporary philosophers.¹ This is a particularly striking gap given the recent surge of interest in a ‘non-modal’ approach to essences, an approach according to which the essence of something does not just consist of all the properties which it necessarily has if it exists but rather includes only those necessary properties which are part of the ‘real definition’ of that entity or part of ‘what it is to be’ that entity.² For non-modal essentialists, the question of how we come to know what the essence of something is is particularly pressing since even if an answer is found to the modal epistemological question of how we come to know what the necessary properties of something are, the non-modal essentialist faces the further question as to how we can distinguish an individual or kind’s essential properties – the properties which are part of ‘what it is to be’ that individual or kind of individual – from its non-essential but necessary properties.

The primary aim of this dissertation is historical and exegetical: the goal is to explicate Aristotle’s epistemology of essence, i.e., Aristotle’s account of how it is that we can come to know what the essence of something is. It is well-known that Aristotle develops and employs a non-modal conception of essence. It is less well-known that Aristotle explicitly took up and tried to answer the question of how we come to know what a thing’s essence is. Though my primary aim is exegetical and historical, my hope is that, just as contemporary essentialists have found it fruitful to consult Aristotle’s work in their efforts to

¹ Contemporary discussion of the epistemology of essence can be found in Oderberg 2007: ch.3; Lowe 2008a; Lowe 2008b; Lowe 2012; Hale 2013: ch.11; Tahko 2017; and Tahko 2018.

² For a classic discussion of the difference between a modal account of essence and a non-modal account of essence, see Fine 1994.

explicate a non-modal conception of essence, likewise contemporary essentialists who favor a non-modal conception of essence will find the following discussion of Aristotle's epistemology of essence to be fruitful in their efforts to explicate their own account of how it is that we come to know what a thing's (non-modal) essence is.

Four interpretations of Aristotle's epistemology of essence have been proposed in the literature. According to the 'traditional' Intuitionist Interpretation, Aristotle's view is that we come to know what the essence of a kind is by *rational intuition*; this knowledge is 'intuitive' in the sense that it is foundationally-justified rather than justified by inference from our other knowledge (or justified beliefs) concerning the kind.³ By contrast, the Explanationist Interpretation attributes to Aristotle the view that our knowledge of a kind's essence *is* justified by inference from our other, prior knowledge concerning the kind; in particular, according to the Explanationist Interpretation, we can discover what the essence of a kind is by identifying which of its features ultimately explain, in conjunction with other principles, why it has the other necessary features it is known by experience (*empeiria*) to have.⁴ David Bronstein has recently developed a third interpretation – what he calls the 'Socratic Interpretation' – according to which some essences (viz., the essences of demonstrable attributes) come to be known in an Explanationist fashion, whereas other essences (viz., the essences of 'subject-kinds') come to be known through induction and division.⁵ These three interpretations have been offered as interpretations of the picture of inquiry discussed in the *Analytics* and related methodological passages found throughout

³ The Intuitionist Interpretation is said to be the 'orthodox view' in Barnes 2002/1993. Recent defenses of this interpretation can be found in Ross 1949; Irwin 1988: 124-125, 130-50; and Frede 1996.

⁴ Versions of the Explanationist Interpretation are defended in Kosman 1973: 374-92; Bolton 1987; Charlton 1987; Lennox, 1987; Bolton 1991; Charles 2000; Lennox 2001: 161-2; Charles 2010; Bolton and Code 2012; Bolton 2014; Charles 2014; and Bolton 2017.

⁵ See Bronstein 2016: ch.8. The 'Socratic Interpretation' is so-called because it maintains that we must first acquire knowledge of a subject-kind's essence before we can know what its demonstrable attributes are (compare *Laches* 190b7–c2 and *Meno* 71a3–b8, 86d3–e3).

Aristotle's works. A fourth view, the Dialectical Interpretation, instead takes its cue from Aristotle's *Topics* and purports to reflect the method of discovery actually employed by Aristotle in his philosophical treatises (e.g., his *Physics*, *De Anima*, *Metaphysics*, and *Nicomachean Ethics*). According to the Dialectical Interpretation, Aristotle holds that knowledge of essences and other scientific principles is reached through dialectical reasoning, i.e., a form of reasoning which takes as its starting point the relevant *accredited opinions* (*endoxa*) concerning the kinds in question.⁶ Here I set aside discussion of this fourth interpretation in order to focus on the three aforementioned *Analytically*-based interpretations of Aristotle's epistemology of essence: the Intuitionist Interpretation, the Explanationist Interpretation, and the Socratic Interpretation.

In what follows, I examine the exegetical and philosophical merits of each of these three interpretations, arguing in the end for the exegetical and philosophical superiority of a revised version of the Explanationist Interpretation which I call an 'Enriched Explanationist Interpretation.' While others have dismissed the Intuitionist Interpretation as textually unsupported and philosophically unsatisfying, they have often done so without carefully identifying the central thesis of the view or addressing the arguments advanced on its behalf. My treatment of the Intuitionist Interpretation fills this gap and, in addition, clarifies why it is philosophically unsatisfying given Aristotle's conception of the explanatory role of essences. In a similar vein, when discussing the Explanationist Interpretation, I not only

⁶ An influential defense of this view can be found in Owen 1986/1961 (see especially p.244 n.18; see also Owen 1986/1970). Owen focuses on Aristotle's *Physics* and *Nicomachean Ethics* and considers examples such as Aristotle's definition of *place* in *Phys.* IV and definition of *akrasia* in *EN* VII. In a similar vein, Burnyeat (2002: 32ff) suggests that Aristotle employs dialectical methods in his efforts to define perception in *DA* II.5. Likewise, concerning Aristotle's *Metaphysics*, Frede claims 'It [the science (*epistēmē*) of metaphysics] is demonstrative, but, as with all other sciences, one arrives at [the] starting points [i.e., the principles] dialectically' (1987: 95). For similar claims about the role of dialectic, see Lloyd 1979: 118; Barnes 1980: 510; Nussbaum 1982; Burnyeat 1986; Irwin 1987; Irwin 1988: ch.8 and *passim*; and Shields 2014: 151-155. For critical discussion, see Bolton 1987 and 1990.

offer a sharper account of the view and the reason why certain texts support it but also illustrate why, unlike its competitors, this view fits well with Aristotle's ideas about the explanatory role of essences. Finally, in regard to Bronstein's recently developed and yet unchallenged Socratic Interpretation, I raise a novel objection which shows that the methods of division and induction recommended by the view cannot be used to come to know the essences of things given the explanatory role Aristotle assigns to those essences. In addition to developing this general argument against the Socratic Interpretation, I also examine the specific passages Bronstein uses to motivate the Socratic Interpretation and explain why these passages do not in fact provide strong support for that interpretation. In the course of doing so, I clarify what role the method of division can play in Aristotle's epistemology and contrast this role with the role assigned to division by the Socratic Interpretation. Finally, I conclude by highlighting the relevance of my discussion for Aristotle scholarship in general and for contemporary philosophical discussions of essence and the epistemology of essence.

§2: The Background to the Controversy

§2.1: Kind Essentialism

Before proceeding to discuss Aristotle's epistemology of essence, it is important to note that the essentialism discussed here concerns the essences of *kinds* rather than those of individuals. To use an Aristotelian phrase, the concern is with *what it is for something to be* an instance of a kind *K* (*to ti ên einai tō(i) K*). The claim that kinds have essences can be distinguished both from (a) the claim that individuals have essential properties (or are essentially members of certain kinds) and (b) the claim that individuals have individual essences (i.e., what are sometimes called 'haecceities') which distinguish them from other individuals of the same kind.⁷ Whatever his views concerning the essences of individuals, it is agreed that Aristotle thinks that kinds (e.g., human being, triangle, eclipse, thunder, etc.) have essences.⁸ For this reason, I focus on Aristotle's claims about the essences of *kinds* and how it is that we can come to know what the essence of a *kind* is.

This leads to a second point of clarification concerning my subsequent talk of the 'features of a kind.' By the 'features of a kind,' I mean to refer to the features which belong to all instances of the kind. Thus, for example, the property of having interior angles equal to two right angles is a feature of the kind *triangle*: all triangles have interior angles equal to two right angles. Likewise, when I speak of the 'necessary features of a kind,' I mean the features which are such that, necessarily, something has that feature if it is an instance of the kind. Finally, I note that I use 'feature' in a broad sense according to which the form,

⁷ For some evidence that Aristotle thinks *individuals* have essences, see *Metaph.* V.18 1022a24-28 (where Aristotle speaks of the 'essence of Callias') and *Metaph.* VII.4 1029b14-16 (where Aristotle speaks of 'your essence'). On the other hand, in *Metaph.* VII.11, Aristotle famously claims that only universals (i.e., kinds) are definable, a claim which some authors think implies that individuals are not definable and hence do not have essences (since what it is to define something, on Aristotle's view, is to specify its essence).

⁸ See *APo* I.8, I.24, and I.31. For further discussion, see Bronstein 2016: 81-82.

matter, parts, and properties of something can all be called ‘features’ of it; relatedly, I use the terms ‘belong to’ and ‘have’ in a broad sense according to which any feature of a thing can be said to ‘belong to’ it or be ‘had’ by it.

§2.2: The Prior Knowledge Needed to Acquire Knowledge of a Kind’s Essence

Before discussing the three competing interpretations of Aristotle’s epistemology of essence mentioned in §1, it is necessary to highlight an important piece of common ground for all interpretations of Aristotle’s epistemology of essence. It is widely accepted that Aristotle holds that, in typical cases, some prior knowledge (*gnōsis*) of a kind is required for one to come to know what its essence is. On Aristotle’s view, our knowledge begins with knowledge (*gnōsis*) acquired through perception. Perceptual episodes are retained in memory, and over time the accumulation of such memories eventually gives rise to a kind of knowledge which Aristotle calls ‘experience’ (*empeiria*).⁹ Aristotle characterizes one who has *experience* (*empeiria*) as knowing that something is the case (*to hoti*), (e.g., that the moon undergoes a certain kind of loss of light, which we call ‘an eclipse’) or whether a certain kind exists (*ei estin*) (e.g., whether there are human beings).¹⁰ A person who *merely* has experience does not yet know ‘the why’ (*to dioti*, *to dia ti*) of the facts known by experience and does not yet know, concerning the kinds of whose existence she is aware, what the essence (*ti esti*) of each of these kinds is. Thus, for example, one who has mere experience may know that the moon undergoes a certain kind of loss of light known as an ‘eclipse’ but not know why it does; that some individuals are human beings but not what makes them human beings; that

⁹ See *APo* II.19 100a3-9; *Metaph.* I.1 98027-982a2; and *APo* I.18. See also *DA* III.8 432a7-8.

¹⁰ In keeping with Aristotle’s usage, when I speak of ‘an eclipse’ or ‘eclipses,’ I mean just to refer to *lunar* eclipses.

there are eclipses but not what the essence of an eclipse is; or that there are human beings but not what the essence of a human being is.¹¹

There are many interesting issues here, but for our purposes the key point is that Aristotle holds that some prior knowledge of a kind (knowledge included in or at least derived from one's accumulated experience (*empeiria*) involving that kind) is typically needed for one to acquire knowledge of its essence.¹² Hence, we can reformulate our central question in the following way: once we acquire through experience (*empeiria*) sufficient knowledge concerning a kind (i.e., knowledge that there is such a kind and that its instances have such and such features), how can we then come to know what the essence of that kind is?

§2.3: Essences as Explanatory Principles in an Aristotelian Science

According to one influential line of interpretation, Aristotle holds that a kind's essential features can be distinguished from its merely necessary features by virtue of their *explanatory role*.¹³ Put loosely, the idea is that the essential features of a kind are its 'explanatorily basic' necessary features. More precisely, the claim is that the essence E of a kind is not only a necessary feature of the kind but also such that (a) E does not belong to any instance of the kind in virtue of other features of the kind belonging to that instance and (b) at least some of the other necessary features of the kind (viz., its *in itself accidents*) belong

¹¹ See *APr* I.30 46a17-27, *APo* I.13 78b34-79a6, *APo* II.2, *APo* II.8, and *Metaph.* I.1 981b9-13. See also *EN* I.4 1095b6-8.

¹² There is a debate about how to understand the content of *empeiria* and in particular whether 'the whole universal' mentioned at *APo* II.19 100a3-9 is part of the content of *empeiria* or is a reference to a stage of knowledge intermediate between *empeiria* and knowledge of essences. This debate need not detain us here. For discussion of this issue, see Bronstein 2012 and Hasper and Yuridin 2014.

¹³ See Barnes 2002/1993: 120; Bolton 1987: 145; Bronstein 2015; Bronstein 2016: 49, 57, and 106; Charles 2000: 202-203; Charles 2010: 291 and 295-6; Charles 2014: 20; Goldin 1996: 76; Irwin 1980: 38-39; Irwin 1988: 21 and 124; Kung 1977: 369; Lennox 2001: 161-2; Loux 1991: 73; Malink 2013: 125-6; Shields 2014: 122; and Williams & Charles 2013: 121 and 140.

to its instances (at least in part) because E belongs to those instances. Thus, for example, if the essence of a triangle (the ‘what it is to be’ a triangle) is to be a three-sided closed plane figure, it follows that (a) there are no other features had by all triangles such that something is a three-sided closed plane figure because it has those features and (b) at least some of the other necessary features of triangles (e.g., the property of having interior angles equal to two right angles) belong to anything which is a triangle because anything which is a triangle is a three-sided closed plane figure.

Aristotle’s commitment to this theory of essence comes through most clearly when he discusses his theory of science (*epistēmē*) and in particular his idea that *definitions* (*horismoi*) are among the principles of a science. A science, on Aristotle’s view, encompasses two kinds of facts: indemonstrable *principles* (*archai*) and the facts which are demonstrable from (i.e., ultimately explained by) the principles. The principles of a science are not explained by reference to other facts but instead are the fundamental, unexplained starting-points of the science by reference to which the other facts in the domain of that science can be explained. Aristotle identifies two kinds of principles: *theses* and *axioms*. The former group of principles are *proper* (*oikeia*) to the science in question, i.e., they are not used as principles in the demonstrations of other sciences, whereas the latter principles (e.g., the principle of non-contradiction) are *common* (*koina*) in the sense of being used in several sciences (if only by analogy – see 76a38-40).¹⁴ Crucially for our purposes, Aristotle identifies *definitions* (*horismoi*) as one of the two kinds of *proper* principles of a science. A definition is, Aristotle says, as an account of the definiendum’s essence (*ti esti*), i.e., a proposition which predicates a kind’s

¹⁴ Aristotle discusses the different types of principles in *APo* I.2 and I.10.

essence of that kind.¹⁵ Since a definition predicates a kind's essence of that kind and is indemonstrable, it follows that the essential features of a kind are indemonstrable features of that kind; in other words, there are no further facts which explain why it is the case that all instances of the kind have the features which make up the kind's essence. For example, if a triangle is essentially a three-sided closed plane figure, then there is no demonstration of the fact that anything which is a triangle is a three-sided closed plane figure; this fact does not obtain in virtue of any other facts but rather represents a basic or fundamental truth about triangles.

I note here that Aristotle sometimes utilizes a broader concept of 'essence' and 'definition' according to which a feature can be part of the essence or definition of a kind even if it is a *demonstrable* feature of that kind, i.e., even if it is a feature which belongs to that kind in virtue of other, more basic features of that kind. For example, Aristotle says that the account (*logos*) of *thunder* as 'a certain noise which occurs in the clouds' is a 'definition' of thunder and, in this context, treats the property of occurring in the clouds as part of the 'essence' (*ti esti*) of thunder even while noting (in the same context) that the property of occurring in the clouds is a demonstrable feature of thunder. (In particular, he suggests that thunder (i.e., a certain kind of noise) occurs in the clouds because the cause of thunder is something, viz., the quenching of fire, which occurs in the clouds). For this reason, Aristotle contrasts this type of definition, an account which includes demonstrable feature(s) of the definiendum among the definiendum's 'essential' features, with definitions which serve as principles in the science, i.e., which specify only indemonstrable features of their definienda (see especially *APo* II.10 94a7-14; cf. *APo* I.8 75b30-32).

¹⁵ See *APo* I.2 72a21-24. For the general idea that a definition is an account of its definiendum's essence, see *Top.* I.5 101b38; *Top.* VII.5 154a31-2; *Metaph.* VII.6 1031a12; *Metaph.* VII.5 1031a11-12; *Metaph.* VII.4 1030a6-7, 1030b5-7; and *Metaph.* VIII.1 1042a17-21.

For the sake of clarity, I will call definitions which are principles ‘basic definitions’ and the essences specified by them ‘basic essences.’¹⁶ The core question of this dissertation concerns Aristotle’s epistemology of *basic* essence, i.e., Aristotle’s account of how we can come to know what the *basic* definition or essence of a kind is. One could ask a more general question: how can we come to know what the principles of a science are, including the basic definitions of that science? However, I will focus specifically on Aristotle’s account of how we can come to know basic definitions, setting aside for future discussion the issue of whether Aristotle thinks that we can come to know the other, non-definitional principles of a science in the same way that we can come to know the basic definitions of a science.¹⁷

The fact that basic definitions are principles implies not only that basic essential truths do not hold in virtue of other truths but also that such truths are explanatory of other, demonstrable facts. In particular, Aristotle’s discussion of *in itself accidents* (*keath’ hanta sumbebēkota*) implies that at least some of a kind’s necessary but non-basic-essential features, viz., those which Aristotle calls ‘*in itself accidents*,’ can be explained by reference to the kind’s basic essence.¹⁸ More precisely, the claim is that certain necessary features of a kind (including in particular the *in itself accidents* of a kind) belong to any instance of that kind

¹⁶ For a similar use of the phrase ‘basic essence,’ see Charles 2010: 288 and Charles 2014: 17 n.29

¹⁷ It is possible that an answer to the more general question can be extrapolated from one’s answer to the more specific question. For example, proponents of the Intuitionist Interpretation hold that we come to know all principles, not just definitional principles, by rational intuition. Similarly, proponents of the Dialectical Interpretation typically hold that we come to know all principles, not just definition principles, by dialectical reasoning. Some proponents of the Explanationist Interpretation hold that we come to know all principles, not just definitional principles, in an Explanationist manner, i.e., by showing that they play a certain explanatory role (see, e.g., Kosman 1973: 387 and Bayer 1997). By contrast, the epistemology of the Socratic Interpretation does not easily generalize to non-definitional principles.

¹⁸ See *Metaph.* V.30 1025a30-34; *APo.* I.7 75b1; *APo.* I.9 76a4-9; *APo.* I.10 76b6-7, b13-15; and *APo.* I.22 83b19-20. See also *PA* I.1 640a32-35; *DA* I.1. 402b16-403a2; *Phys.* II.7 198a16-18; and *Metaph.* XIII.4 1078b24-25. It is widely agreed that the *in itself accidents* of a kind belong to it in virtue of its essence belonging to it (see Bronstein 2016: 47; Charles 2000: 202-3; Irwin 1988: 124; Lennox 2001: 161-2; Malink 2013: 125-6; Ross 1949: 577; and Alexander of Aphrodisias, *In Top.* 50.6-51.5). Some commentators make the stronger claim that Aristotle holds that *all* of a kind’s non-essential, necessary features belong to it in virtue of its essence belonging to it (see Bronstein 2016: 114 and Koslicki 2012: 202). However, it’s not clear that there is any textual evidence for this stronger claim.

because the kind's basic essence belongs to those instances. Thus, for example, necessarily, human beings are capable of finding things funny (an *in itself* accident of human beings) because, necessarily, human beings have a rational soul (the basic essence, or part of the basic essence, of a human being) and the capacity to find things funny is a capacity which follows from and is explained by something's having a rational soul.

This interpretation of Aristotle's position on the explanatory role of essences is widely accepted by commentators, including the proponents of the three interpretations of Aristotle's epistemology of essence discussed below.¹⁹ This is important because in what follows I will use this observation about the explanatory role Aristotle assigns to basic essences to argue in support of the Explanationist Interpretation of Aristotle's epistemology of essence and against the Intuitionist and Socratic Interpretations of Aristotle's epistemology of essence.

¹⁹ See Bolton 1987: 145; Bronstein 2015; Bronstein 2016: 49, 57, and 106; Charles 2000: 202-203; Charles 2010: 291, 295-296; Charles 2014: 20; Irwin 1988: 21 and 124; Irwin 1980: 38-39; Lennox 2001: 161-162; and Williams & Charles 2013: 121 and 140.

§3: The Intuitionist Interpretation

§3.1: The Intuitionist Interpretation

I have argued that given Aristotle's views about the prior knowledge (typically) needed to acquire knowledge of a kind's basic essence, we can reformulate our central question, viz., how do we come to know what the basic essence of a kind is, in the following way: once we acquire through experience (*empeiria*) sufficient knowledge concerning a kind (i.e., knowledge that there is such a kind and that its instances have such and such features), how do we then come to know what its basic essence is?

According to the Intuitionist Interpretation, we come to know what a kind's basic essence is by rational intuition, the result of which is a cognitive *state* (*hexis*) in which the kind's basic essence is known as such.²⁰ (Intuitionists identify this cognitive state as the state Aristotle calls '*nous*' in *APo*). This knowledge is 'intuitive' in the sense of being *epistemically basic* or *foundationally-justified*, i.e., it does not depend on one's other knowledge or beliefs for its justification or warrant. This does not imply that no prior knowledge of the kind is needed. On the contrary, Irwin, a prominent proponent of this interpretation, warns, 'The acquisition of *nous* is not meant to be magical, entirely independent of inquiry' (1988: 136). In other words, Intuitionists maintain that, in order to achieve intuitive knowledge of scientific principles, including the basic definitions which specify the relevant kinds' essences, one must have sufficient prior experience (*empeiria*) with the kinds studied by that science. However, the claim is that this prior experience, though causally or psychologically

²⁰ See n.3 for references. Though Ross and Irwin defend the Intuitionist Interpretation, they do not claim that the view they attribute to Aristotle is philosophically satisfying. In fact, Irwin argues that Aristotle himself, having recognized problems with this view, abandoned it in his later work and developed an alternative view which Irwin calls 'strong dialectic' (see Irwin 1988: 155-178). In what follows, I focus on Irwin and Frede's presentation of the Intuitionist Interpretation, as their discussions are more developed than Ross's discussion.

necessary, plays no role in *justifying* or *supporting* the intuitive judgments we make about the basic essences of the relevant kinds. As Irwin puts it,

[Though] experience and familiarity with appearances are useful to us as a way of approaching the first principles... [and] may be psychologically indispensable as ways to form the right intuitions...they form no part of the justification of first principles. When we have the right intuition we are aware of the principle as self-evident, with no external justification. (1988: 136).²¹

Now some authors have objected to the Intuitionist Interpretation on the grounds that in his *APo* Aristotle uses the term '*nous*' to refer not to a faculty whereby principles (including basic definitions) are discovered but rather to the *state* (*hexis*) of knowledge one is in when one knows a principle as such.²² Some of these authors go on to add that in *APo* II.19 Aristotle clearly distinguishes the question of what state (*hexis*) we are in when we know principles from the question of how such a state is reached (see 99a18-19). While Aristotle's answer to the former question is *nous*, his answer to the latter question (it is said) is *induction* (*epagōgē*); after all, Aristotle's asserts in *APo* II.19 that 'the primaries (*ta prōta*) come to be known by us by induction (*epagōgē*)' (100b3-4, my translation).²³

Though prevalent in the literature, this objection misconstrues the core thesis of the Intuitionist Interpretation. While Intuitionists often talk of a 'faculty' of rational intuition

²¹ In a similar vein, Frede claims that 'the relation between our perceptions and our knowledge of first principles, or whatever knowledge we have by reason [i.e., Frede's translation of '*nous*'], is a natural, a causal, rather than an epistemic, relation. Our knowledge of first principles is not epistemically, but only causally, based on perception' (1996: 172).

²² See Barnes 2002/1993: 268; Bolton 2014: 39-40; Bronstein 2016: 111; and Burnyeat 1981: 130-131.

²³ Critics of the Intuitionist Interpretation who make this move include Barnes (2002/1993: 268) and Burnyeat (1981: 130-133). However, it is controversial whether *APo* II.19 tells us that induction (*epagōgē*) is the way we reach first principles. One can take the 'the primaries' (*ta prōta*) in *APo* II.19 to refer to initial or 'first' accounts of the sort discussed in *Phys.* I.1 184a21-184b14 and *APo* II.8 93b21-24 rather than to principles (see Bronstein 2012 and Bronstein 2016: ch.13; for a related view, see McKirahan 1992: 256). Moreover, even if one takes 'the primaries' (*ta prōta*) to refer to principles and takes Aristotle to be claiming that the primaries, i.e., the principles, come to be known to us by induction, this does not undermine the Intuitionist Interpretation since one can take Aristotle to be referring to a kind of 'intuitive induction' (see Ross 1949: 48-49 and Irwin 1988: 135). In a similar vein, some Explanationists claim that the 'induction' in question refers to an explanatory inference rather than a more ordinary, enumerative inductive inference (see Kosman 1973: 389-391 and Bolton 2014: 41-43).

and sometimes call this faculty ‘*nous*,’ they do not deny that the term ‘*nous*’ is (typically) used in *APo* to refer to the acquired cognitive *state* (*bexis*) one is in when one knows a principle as such. Moreover, the main proponents of the Intuitionist Interpretation agree that Aristotle claims that we reach knowledge of principles by induction (*epagōgē*). However, they maintain that Aristotle has in mind a kind of ‘intuitive induction.’²⁴ The core thesis of the Intuitionist Interpretation is not that we reach knowledge of principles by means of a faculty which Aristotle calls ‘*nous*’; instead, the Intuitionist’s core thesis is that our knowledge of principles is *intuitive in the sense of being epistemically basic, i.e., not dependent on our other knowledge or beliefs for its justification*. This claim is not touched by the aforementioned exegetical objection.²⁵

Hence, the key exegetical question is not whether Aristotle posits a faculty of *nous* in *APo* but rather whether Aristotle claims that our knowledge of principles, including basic definitions, is intuitive in the sense of being epistemically basic, i.e., not justified by inference from our other beliefs or knowledge.

²⁴ See Ross 1949: 48-9, 85-8, 565; Irwin 1988: 135; and Frede 1996: 169-173. In fact, Ross argues that the kind of induction at issue *must* be intuitive: ‘The induction [whereby we reach knowledge of principles] must be *intuitive induction*...since [only this] could establish propositions having the universality and necessity which the first principles of a science have and must have’ (1949: 565). This argument seems to rest on the assumption that necessary and universal truths can be known as such only *a priori*. However, as Bolton (2014: 41) observes, no textual evidence is given by Ross to show that Aristotle is committed to this assumption, an assumption which many philosophers today generally reject (see Kripke 1980 for an influential defense of the idea that some necessary truths can be known to be such *a posteriori*).

²⁵ Bolton seems to be the only commentator aware of this discrepancy. Instead of objecting that Aristotle uses the term ‘*nous*’ in *APo* to refer to a cognitive state rather than a faculty, Bolton provides a different argument against the Intuitionist Interpretation. He argues that Aristotle’s other discussions of induction imply that knowledge based on induction is not epistemically basic but instead depends for its justification on one’s knowledge of the inductive base (see Bolton 1987: 15-17 and Bolton 2014: 41-43). I think Bolton’s argument is plausible and could be added to those arguments discussed below as further reason to doubt the adequacy of the Intuitionist interpretation.

§3.2: The Putative Textual Basis for the Intuitionist Interpretation

Is there any textual basis for the Intuitionist Interpretation's claim that our knowledge of principles, including basic definitions, is intuitive in the sense of being epistemically basic, i.e., not justified by inference from our other beliefs or knowledge?

Some Intuitionists seem to think that this follows from the fact that principles, including basic definitions, are indemonstrable truths.²⁶ However, the fact that *p* is a principle and hence does not hold in virtue of any other facts does not imply that our knowledge that *p* cannot be justified by inference from other knowledge that we have. This would follow if Aristotle thought that demonstration were the only kind of inference through which knowledge could be justified, but no evidence has been given to show that Aristotle endorses this radical claim. And even if he did, it would not follow that our knowledge *that p is a principle*, or that *p expresses the basic definition of a certain kind K*, is epistemically basic but only that our knowledge that *p* is epistemically basic.

An alternative argument for the Intuitionist Interpretation can be found in Irwin's appeal not to the explanatory priority Aristotle assigns to principles but rather to the 'epistemic priority' Aristotle assigns to principles. Aristotle claims that principles are 'better known' (*gnōrimōtera*) and 'more credible' (*pistōtera*) than what is demonstrable from them and, unlike what is demonstrable from them, 'known through themselves' (*gnōrizētai di' hautēs*) and 'credible through themselves' (*pistis di' hautōn*).²⁷ Irwin argues that these claims show that Aristotle thinks our knowledge of principles must be epistemically basic, i.e., not justified by our other knowledge (or justified beliefs) that we have. As Irwin puts it,

In claiming that the principles are known through themselves, Aristotle cannot simply mean that nothing else is needed to justify them within the demonstrative

²⁶ This kind of reasoning seems to be what motivates Frede to adopt the Intuitionist interpretation (see Frede 1996: 157 and 172).

²⁷ See *APo* I.2 71b29; *APo* I.2 72a30-32; *APo* II.16 98b23-24; and *Top.* I.1 100b18-19.

system; he must also mean that nothing else is needed to justify them at all....Aristotle's demands for epistemic priority rule out all types of inferential justification, not merely demonstration. The principles are not entitled to their primacy unless they are non-inferentially justified altogether. (1988: 132).

Now even if Irwin were correct in thinking that our knowledge that p , where p is a principle, is epistemically basic, it wouldn't follow that our knowledge *that p is a principle* is epistemically basic. Likewise, even if he were correct in thinking that our knowledge *that E_K belongs to K* must be epistemically basic if E_K is the basic essence of K , it wouldn't follow that our knowledge *that E_K is the basic essence of K* is epistemically basic. Hence, even if Irwin were right that Aristotle's claims about the 'epistemic priority' of principles implies that our knowledge of such propositions is not reached through inferences based on other, prior knowledge that we have, this would not show that we know in a non-inferential, epistemically-basic way that something is a principle or that E_K is the basic essence of K .

But in any case Irwin is not right about this since he misunderstands the 'epistemic priority' Aristotle assigns to principles. When Aristotle says that the principles are 'better known than' (*gnōrimōtera*) what follows from them, it is clear from the context that the knowledge at issue is *scientific knowledge (epistēmē)*, which requires that 'we know (a) of the *cause (aitia)* because of which it is that it is the cause and (b) also that it is not possible for it to be otherwise' (*APo* I.2 71b10-13, my translation). The principles are 'better known' (*gnōrimōtera*) than what can be demonstrated from them because to have *scientific knowledge (epistēmē)* of the latter requires knowing that the former are the case and explain the latter but not vice-versa (cf. *APo* I.9 76a19-23 and *Metaph.* II.1 993b20-31). This point is confirmed in *APo* I.3, where Aristotle argues that, in order to avoid an infinite regress or circle, there must be some facts (viz., the principles) of which we have *non-demonstrative epistēmē*, i.e., a kind of *epistēmē* which does not involve knowing some prior facts which explain why the facts in question obtain. In short, Aristotle's claim is that, unlike *epistēmē* of demonstrable facts, *epistēmē* of

facts which are principles does not depend on knowing of some other facts that they are explanatory of these facts which are principles. In this sense, facts which are principles are ‘known through themselves’ and ‘better known’ than demonstrable facts.²⁸ Notably, this claim in no way suggests that our knowledge that such and such facts are principles cannot be reached or justified by an inference based on our other knowledge.^{29,30}

This point is confirmed by Aristotle’s discussion in *APo* II.16 98b17-98b24. In this passage, Aristotle contrasts principles which are ‘known through themselves’ (*gnōrizetai di’ hautēs*) with demonstrable facts which are ‘known through something else’ (*gnōrizetai dia allou*). To illustrate his point, Aristotle claims that the fact that the moon is eclipsed is ‘known through’ (*gnōrizō dia*) its cause, viz., the fact that the earth is interposed between the sun and the moon, and not vice-versa. Crucially, in the same passage, Aristotle suggests that you can know that the earth is eclipsed without knowing that the earth is interposed between the sun and the moon. Hence, the claim that demonstrable facts are ‘known through’ the facts which explain them and not vice-versa should not be understood to mean that we cannot know the former without knowing the latter. Instead, Aristotle’s claim is that *epistēmē* of demonstrable facts depends on our knowing that certain other facts explain them (and hence demonstrable facts are ‘[scientifically] known through something else’), whereas principles are not explained by other facts (and hence are ‘[scientifically] known through themselves’).³¹

²⁸ See Ross 1949: 53-54; Burnyeat 1981: 127-128, and Charles 2000: 272 for similar interpretations, though they do not address these points in as much detail and do not connect their discussions to Irwin’s argument.

²⁹ Irwin thinks that in *APo* I.3 Aristotle is concerned with our *justification* for believing principles and interprets this chapter as showing that our knowledge of principles is non-inferentially justified (see 1988: 125-131). This is a mistake. *APo* I.3 shows that Aristotle thinks that, unlike *epistēmē* of demonstrable facts, *epistēmē* of principles is not acquired by demonstration from prior facts. But this doesn’t show that *epistēmē* of principles is immediate in the sense of not being justified by inference from other knowledge that we have, for demonstration is not the only kind of inference.

³⁰ Consider also Aristotle’s claim that the principles must be ‘already known’ (*prognōskomena*) (see 71b31-33 and 72a28). Aristotle’s claim is not that we must already know that *p* is a principle before we can demonstrate something from *p*. Rather, Aristotle’s claim is that we must know that *p* is the case (*hoti estin* – see 71b33) in order to know that it explains why some other fact is the case (demonstrative explanation is factive).

³¹ For further evidence of this, see *APr* 2.16 64b34–6.

In short, properly understood, Aristotle's claim that principles are 'known through themselves' does not imply that our knowledge of principles is epistemically basic but only that having scientific knowledge (*epistēmē*) of a fact which is a principle does not involve knowing of some other fact that it is what explains why this principle obtains.³²

A similar point can be made with respect to Aristotle's claim that the principles are 'credible through themselves' and 'more credible' than what is demonstrable from them. After claiming that the principles are 'credible through themselves' (*pistis di' hautōn*) in *Top.* I.1, Aristotle clarifies, 'For with respect to scientific principles, it is not necessary to seek the explanation (*to dia ti*); but each of these principles is credible through itself' (100b19-21, my translation). Here Aristotle provides an important clue to understanding what he means when he calls principles 'credible through themselves' and 'more credible' than the facts which can be demonstrated from them: principles are 'credible through themselves' because, unlike the obtaining of a demonstrable fact, which can be explained as something which follows from more basic facts, the obtaining of a principle is not something which can be explained by reference to more basic facts. In other words, when Aristotle calls a proposition 'credible through itself' and 'more credible than' certain other propositions, his point is not what Irwin claims it is, i.e., that our belief in the proposition is epistemically basic and not justified by our belief in propositions which are 'less credible' than it. Rather, when Aristotle calls a proposition 'credible through itself' and 'more credible than' certain other propositions, he means only that there is no more basic proposition which one can invoke to *explain why* it is true (and hence should be believed) and that, by contrast, the

³² Hence Irwin is wrong to say that 'In claiming that the principles are known through themselves, Aristotle cannot simply mean that nothing else is needed to justify them within the demonstrative system; he must also mean that nothing else is needed to justify them at all' (1988: 132). It just doesn't follow from the fact that principles are not justified by demonstration from prior facts that our knowledge of them is not justified by inference from other knowledge that we have. Again, demonstration is not the only kind of inference.

propositions than which it is ‘more credible’ are such that one can *explain why* those propositions are true (and hence should be believed) by reference to the principle.

In short, contrary to what Irwin claims, the ‘epistemic priority’ Aristotle assigns to principles does not imply that our knowledge of them must be epistemically basic and not justified by inference from other knowledge that we have.

§3.3: A General Problem of Fit for the Intuitionist Interpretation

Besides these problems in the arguments given for the Intuitionist Interpretation, there is a more general problem with the Intuitionist Interpretation. Other commentators have suggested that the Intuitionist Interpretation is philosophically unsatisfying. For example, David Bronstein writes,

The Intuitionist Picture appeals to perception, experience, and empirical inquiry in just the way one would expect given Aristotle’s remarks on the subject – but then stops short, appealing to a mysterious faculty in order to deliver us the relevant knowledge. In this way it leaves off right at the point at which the question becomes most interesting. (2016: 111-112).

Unfortunately, like other detractors of the Intuitionist Interpretation, Bronstein fails to say why exactly an appeal to intuition is ‘mysterious.’ In what follows, I aim to fill in this gap by suggesting that the reason the Intuitionist Interpretation is philosophically unsatisfying lies not so much in its appeal to a ‘mysterious faculty’ as in the mismatch between the Intuitionist’s epistemology of basic definitions and the explanatory role Aristotle assigns to such definitions.

Given Aristotle’s theory of essence, our other knowledge (or justified beliefs) can play a role in justifying our knowledge (or justified belief) that E_K is the basic essence of some kind K . In particular, the judgment that E_K is the basic essence of K could be justified by inference from one’s knowledge (or justified belief) that E_K plays the explanatory role of

K's basic essence, i.e., that (a) E_K belongs to all instances of K by necessity, (b) E_K 's belonging to all instances of K is not explained by other features which belong to all instances of K, and (c) E_K belonging to each instance of K explains (with the help of other principles) why every instance of K has certain other necessary features, including the *in itself accidents* of the kind. The availability of this alternative does not show that it is impossible that we could know that E_K is the basic essence of K in a non-inferential, epistemically basic way, as the Intuitionist claims. Nonetheless, the availability of this alternative makes salient the following challenge for the Intuitionist position: why think that we can know that E_K is the basic essence of K without doing any work to confirm that E_K plays the explanatory role it must play to be K's basic essence? The Intuitionist can insist that, once we've acquired sufficient experience-based knowledge of a kind, we can reliably intuitively recognize which of a kind's features are part of its basic essence, but notice that no reason has been given to think that we can do this. It is for this reason that the view is 'mysterious' and 'ad hoc.'

This objection is related to what Irwin identifies as the central reason to think the Intuitionist Interpretation is unsatisfying, namely, the poor fit between the Intuitionist's claim that our knowledge of a kind's basic essence is epistemically basic and Aristotle's claim that prior, empirical knowledge of a kind is (typically) required for us to reach knowledge of its basic essence.³³ According to the Intuitionist, enough experience (*empeiria*) with the kind puts us in a position to 'form the right intuitions' about its essence.³⁴ The problem with this is that it's unclear how the accumulation of experience puts us in such a position: if we aren't using the knowledge acquired by experience to justify or support our judgment that E_K is the basic essence of K, then why is such knowledge needed for us to come to a justified

³³ See Irwin 1988: 141-143.

³⁴ See Irwin 1988: 136. See also Frede 1996: 171.

judgment or knowledge that E_K is the basic essence of K ? Again, the unsatisfactory nature of the Intuitionist Interpretation is made salient by considering the explanatory role Aristotle assigns to basic essences. Given that the basic essence of the kind includes all and only its explanatorily basic necessary feature(s), a natural role for experience to play is to provide enough knowledge of the kind's necessary features that one can begin looking to explain why all instances of the kind have such features, with the ultimate aim of identifying which such features are explanatorily basic. But if this were right, then our judgment that E_K is the basic essence of K would not epistemically basic. Instead, it would be inferred from our judgment that E_K 's belonging to all instances of K (a) explains why all instances of K have the other necessary features they are known by experience to have and (b) there are no more basic features possessed by all instances of K which explain why they have the feature(s) included in E_K .

As it turns out, this is not just an abstract alternative to the Intuitionist Interpretation: there are several passages which suggest that Aristotle himself thought we acquire knowledge of basic essences in this way, i.e., that we can discover what the basic essence of a kind is by seeking and discovering what more basic features of the kind explain why all instances of that kind have the features which prior experience shows them to have. This has lead these commentators to propose an alternative interpretation of Aristotle's epistemology of essence: the Explanationist Interpretation.

§4: The Explanationist Interpretation

§4.1: The Explanationist Interpretation

According to the Explanationist Interpretation, Aristotle thinks we can come to know the basic essence of a kind by identifying what are the features of the kind which ultimately explain why instances of that kind have the features which experience has taught us belong always (or at least for the most part) to instances of that kind.³⁵ Like the Intuitionist, the Explanationist holds that we (typically) begin with some prior, perceptually-based knowledge (*gnōsis*) that the target kind exists and is always (or at least for the most part) characterized by certain features. Unlike the Intuitionist, the Explanationist does not think that, once we have acquired a sufficient amount of this prior knowledge, we can then proceed to intuit (in a non-inferential way) what the kind's basic essence is. Instead, the Explanationist claims that we proceed by attempting to identify the causes of the features known to characterize all instances of the kind, with the ultimate aim of identifying the kind's explanatorily basic necessary feature(s). On this view, our prior, experience-based knowledge (*gnōsis*) of the kind *does* play a role in justifying our judgment about what is basic essence is, and thus, for the Explanationist, our knowledge of what a kind's basic essence is is not *epistemically basic*. In particular, for any kind K, our judgement that E_K is the basic essence of a kind K will be justified by our knowledge (or justified belief) that (i) all instances of K have certain features $P_1, \dots, P_n$, (ii) E_K 's belonging to all instances of the K explains (with the help of other principles) why all instances of the kind have $P_1, \dots, P_n$, and (iii) there are no other features of all instances of K which explain why E_K belongs to these instances. L.A. Kosman, an early Explanationist, summarizes the view well when he writes, 'Our ability

³⁵ Versions of the Explanationist Interpretation are defended in Kosman 1973: 374-92; Bolton 1987; Charlton 1987; Lennox, 1987; Bolton 1991; Charles 2000; Lennox 2001: 161-2; Charles 2010; Bolton and Code 2012; Bolton 2014; Charles 2014; and Bolton 2017.

or inability to *use* certain principles, to explain by them the phenomena with which we begin and thus to gain with them scientific understanding [*epistēmē*] of these phenomena, constitute the criteria of adequacy for these principles' (1973: 387).³⁶

It is worth noting that a kind's basic essential feature(s) need not be among those the inquirer initially knows (by experience) to belong to the kind. Aristotle claims that what is 'better known to us', i.e., what is initially known by us, is typically not what is prior by nature (see *APo* I.2 71b33-32a5; *Top.* 101a36-b4, 141b3-14; *Phys.* I.1 184a16ff; *Metaph.* VII 1029b3-12; and *EN* 1098a33-b4, 1139b28-31, 1151a16-18). In addition to looking for explanatory connections among the attributes one initially knows to characterize a kind, one can also hypothesize that the kind has certain additional feature(s), beyond those already known to characterize it, which ultimately explain why it has the attributes it is already known to have. Thus, for example, in the lunar eclipse example Aristotle discusses in *APo* II.8, the inquirer initially knows by experience that there are lunar eclipses and that a lunar eclipse is a certain kind of loss of light from the moon. At this stage, the inquirer does not know that a lunar eclipse is due to the interposition of the earth between the moon and the sun (the moon's light source). But, Aristotle imagines, in the course of seeking to explain why lunar eclipses occur, one could hypothesize that a lunar eclipse is due to the interposition of the earth between the moon and the sun because this would explain why lunar eclipses have certain other features, e.g., why they always involve a circular black spot which gradually overtakes the whole surface of the moon, why they recur periodically, etc. In such a case, the fact that lunar eclipses are caused by the interposition of the earth between the moon and the sun would not be something known on the basis of experience (as in the more fanciful case

³⁶ I note that though Kosman speaks of a 'criteria of adequacy' for principles, he does not explicitly link this observation to the question of how our belief that *p* is a principle is justified or warranted.

imagined in *APo* II.2 90a26-30, where a person standing on the moon *sees* the interposition occur) but would instead be a piece of knowledge reached by inference from (a) our experience-based knowledge that lunar eclipses have certain features (e.g., they always involve a circular black spot which gradually overtakes the whole surface of the moon, they recur periodically, etc.) and (b) our knowledge (or justified belief) that lunar eclipses' being caused by the interposition of the earth between the sun and the moon would explain why they have the aforementioned features.

§4.2: The Textual Support for the Explanationist Interpretation

Several prominent Explanationists have argued that Aristotle's discussion in *APo* II, especially *APo* II.2 and *APo* II.8, provides strong support for the Explanationist Interpretation.³⁷ Later (in §6 below), I argue that this assessment of what Aristotle claims in *APo* II.2 and II.8 is incorrect and that in fact Aristotle proposes in these texts a distinct, albeit complementary, thesis about how it is that a kind's basic essence can be 'made clear' (*dēlon*). For this reason, I set aside discussion of these texts for now and focus instead on several other methodological passages which I believe Explanationists have *correctly* identified as providing strong support for the Explanationist Interpretation.

Consider first the following passage from *APr* I.30:

(a) Most [of the principles] of each science are proper [to it]. That is why it is the role of experience (*empeiria*) to provide the principles (*archai*) concerning each thing. I mean, for example, that astronomical experience [provides the principles] of astronomical science; **(b)** for (*gar*) once the phenomena were sufficiently grasped [through experience], in this way the demonstrations of astronomy were discovered. Similarly with any other art or science. As a result, if the attributes (*ta huparchonta*) of each thing are apprehended, at that point it falls to us to readily make apparent the demonstrations (*tas apodeixeis hetoimōs emphanizēin*). **(c)** For if none of the true attributes (*huparchontōn*) of the objects had been omitted from the survey of facts

³⁷ See Bolton 1987: 130-146; Bolton 1990: 10-11; Charles 2000: 197-204; Charles 2010: 286-292; Charles 2014: 16-18; and Lennox 2001: 161-162.

(*historian*), then, that about which there is a demonstration, we will be able to discover this [demonstration] and demonstrate it, and, that about which there is by nature no demonstration, [we will be able] to make this apparent (*touto poiein phaneron*). (*APr.* I.30 46a17-27, my translation).³⁸

Part **(a)** recalls the common ground of all three interpretations of Aristotle's epistemology of essence: we are in a position to discover the *proper* principles of a science, including the basic definitions of the kinds studied by that science, only after we've acquired sufficient knowledge through experience (*empeiria*). In **(b)** Aristotle explains ('*gar...*') *how* we use this prior experience-based knowledge to discover what the principles are: we do so by discovering demonstrations, i.e., by discovering the explanations for why the empirically known facts are as they are. In **(c)**, Aristotle explains his reasoning: by discovering these demonstrations, we will have 'made apparent' that such and such facts are not principles, since they can be explained by more basic facts, and that such and such other facts are principles (or at least good candidates for principles), since (a) they play a role in explaining the previous facts and (b) they are not themselves explained by further facts (or at least do not seem to be explained by any further facts). More specifically, by discovering these demonstrations, we will have 'made apparent' that such and such features (*huparchonta*) of a given kind are not part of the basic definition of that kind, since they can be explained by more basic features of the kind, and that such and such other features of the kind are part of its basic essence (or at least good candidates for being part of its basic essence), since (a) they play a role in explaining why instances of the kind necessarily have certain other features and (b) there are not (or at least do not seem to be) any more basic features possessed by all

³⁸ See also the related *APo* I.13 78b34-79a6 and *HA* I.6 491a7-14. In the *HA* passage, it is suggested that inquiry proceeds first with a survey of the facts (*historia*) and then with an attempt to discover the causes of those facts. When combined with the *APr.* I.30 passage above, there is a clear suggestion that the way we reach knowledge of the principles is by making clear the causes, i.e., by finding the demonstrations, of previously known facts. It is in this Explanationist way (and not the Intuitionist or Socratic way) that experience 'provide[s] the principles concerning each thing' (46a17-18).

instances of the kind which explain why instances of the kind necessarily have these features.³⁹

Consider also the following passage from *DC* III.7, in which Aristotle criticizes predecessors for positing principles which are inconsistent with the empirically known facts:

[They] accept any consequence of their [principles'] application, as though some principles need not be judged by what follows from them and particularly from what is ultimate (*bōsper ouk enias deon krinein ek tōn apobainontōn, kai malista ek tou telous*)! And what is ultimate in productive knowledge is the product, while [what is ultimate] in the knowledge of nature is always what is authoritatively apparent through perception (*tēs de phusikēs to phainomenon aei kuriōs kata ten aisthēsin*). (*DC* III.7 306a13-17).

Here Aristotle claims that scientific principles must be *judged* (*krinein*) by reference to what follows from them and in particular by their fit with the facts known on the basis of perception (or accumulated perceptual experience, i.e., *empeiria*). This strongly suggests an Explanationist epistemology, according to which we justify our claim that such and such facts are principles by showing that they can explain the other facts, known on the basis of perception or experience, which characterize that domain (and by showing that they cannot themselves be in turn explained by other, more basic facts).⁴⁰

Finally, a well-known methodological passage in *DA* I.1 provides the strongest and clearest piece of textual support for the Explanationist Interpretation. In this opening, methodological chapter of Aristotle's treatise on the soul, Aristotle observes that a central aim of the science of the soul is to make clear the essence of the soul (402a7). He then raises a general question about how one is to ascertain what the essence of something is (see 402a10ff) and, later, gives at least a partial answer to this question when he remarks,

(a) It seems that not only is knowing the essence useful for discerning the causes of the [in itself] accidents of substances... **(b)** but also knowing the [in itself] accidents [of something] contributes in great part (*sumballetai mega meros*) to knowing [its]

³⁹ For a similar interpretation of this passage which also connects it to *HA* I.6, see Bolton 1993: 209-11.

⁴⁰ See the related discussions in Kosman 1973: 387 and Bolton 1987: 126-127.

essence (*pros to eidenai to ti estin*). **(c)** For whenever we are able to give an account in conformity to what is apparent concerning all or most of its [in itself] accidents, at that time we will be able to speak best about the essence (*ousia*). For in every demonstration [concerning a given kind] the essence (*to ti esti*) [of that kind] is a principle (*archē*). **(d)** Hence, whichever definitions are not such that [our] knowing (*gnōrizēin*) the [in itself] accidents (*ta sumbebēkota*) follows [from our knowing the definitions] but instead do not even make it easy [for us] to form a plausible conjecture about these [i.e., its in itself accidents], it's clear that all [these definitions] are stated in a dialectical and empty manner. (402b16-18, 402b21-403a2, my translation).

In **(a)**, Aristotle makes the point that knowing something's basic essence can be useful for explaining why it has the *in itself* accidents that it does, a point which recalls the idea that the basic essence of a kind is explanatory of why it has certain other necessary properties (including in particular certain *in itself* accidents). He then goes on in **(b)** to make the point which is more crucial for his purposes and ours, viz., that knowing (by experience, as 'in conformity to what is apparent' suggests) the *in itself* accidents of a kind can play a crucial role in our discovering what its basic essence is. In **(c)**, he explains *how* this prior knowledge helps us discover what the kind's basic essence is: we know a kind's basic essence 'best' when we know what accounts for or explains why it has the *in itself* accidents that it does since 'in every demonstration [concerning that kind], the essence is a principle.' This suggests that Aristotle thinks we ought to use our knowledge of a kind's *in itself* accidents to guide us in our search for its basic essence, for the basic essence of a kind is a *principle* (*archē*) explanatory of why the kind has these accidents. Indeed, in **(d)** Aristotle condemns as 'dialectical and empty' (rather than genuinely scientific) definitions which cannot account for their definienda's *in itself* accidents. This underscores the point that our theorizing about the basic essence of a kind must be guided by the need for that essence to explain why the kind has the *in itself* accidents it is known to have. In fact, later on in *DA* I.4, Aristotle criticizes his predecessors' definitions of soul on precisely this basis (see 409b12-18).

Overall, this passage provides strong evidence for the Explanationist Interpretation. Here Aristotle clearly has in view his idea that the basic definition of a kind is a principle explanatory of why it has the *in itself accidents* that it does. Moreover, here Aristotle explicitly connects this claim about the explanatory role of basic essences with a claim about how it is that we can come to know what a kind's basic essence is. In particular, the claim in **(c)**, viz., that we are in the best position to identify a kind's basic essence when we can explain why it has the *in itself accidents* that it does, fits well with the Explanationist's claim that we can identify a kind's basic essence by identifying the feature(s) of it which ultimately explain why it has the *in itself accidents* it is known (by experience) to have. Moreover, the claim in **(d)**, viz., that a definition is 'dialectical and empty' if it fails to identify as the essence of a kind something which can explain why the instances of the kind have the *in itself accidents* that they do, not only reinforces this point but draws attention to a way of testing a putative definition for adequacy as a *basic* (as opposed to merely dialectical) definition (a test which we saw Aristotle himself use in the preceding *DC* III.7 passage): the definition is adequate as a basic definition only if the essence specified by it can do the job of explaining why the definiendum has the *in itself accidents* that it does. Indeed, this is a natural test for Aristotle to recommend, given Aristotle's non-epistemological idea that it is part of the explanatory role of a kind's basic essence that it explain why the kind has certain further, non-basic-essential features by necessity. Hence, I conclude, in line with other Explanationists, that this passage provides strong support for the Explanationist Interpretation.⁴¹

⁴¹ Explanationists who appeal to this passage to support their interpretations include Bolton (1987: 133 n.27) and Charles (2010: 302; 2014: 30). Hicks (1907: 191), Johansen (2012: 10), and Shields (2016: 94) offer similar, Explanationist-friendly accounts of this passage, though their focus is on the role this passage plays in *DA* and not on its implications for Aristotle's epistemology of essence in general. Against these authors, Bronstein (2016: 120-123) argues that this passage need not be taken to support the Explanationist Interpretation over his own Socratic Interpretation. According to Bronstein, this *DA* I.1 passage describes a case in which the 'inquirer has a candidate definition of S, tests it against S's demonstrable attributes, finds that it fails to explain them, and concludes that the definition is 'dialectical and empty' and that in this case the 'order of inquiry is

§4.3: The Explanationist Interpretation's Fit with Aristotle's Theory of Essence

The aforementioned methodological texts do not just suggest *that* Aristotle proposes an Explanationist way of coming to know basic essences; they also give some insight into *why* he thought this was the right procedure and rejected certain alternatives. In the latter two passages, Aristotle criticizes predecessors for not taking into account the explanatory role of principles, including basic definitions. It is a mistake, Aristotle claims, to accept certain facts as principles without considering whether these facts can do the explanatory work of principles, which includes explaining what is apparent (*to phainomena*) concerning the kinds studied by that science. In short, the procedure we use to identify principles (including the basic definitions of the kinds under investigation) must be sensitive to the explanatory role of these principles.

This brings us to a crucial general point in favor of the Explanationist Interpretation: unlike its competitors, the Explanationist epistemology of essence fits well with the explanatory role Aristotle assigns to basic essences. We have already seen a problem of fit arise for the Intuitionist Interpretation: given that the basic essence of a kind is distinguished from its non-basic-essential but necessary features by its being explanatorily basic, it is implausible to think that we could reliably intuit what the basic essence of a kind is without considering whether the selected feature(s) could explain why the kind has certain other

clear: she has the candidate definition before she attempts to explain from it' (2016: 123). Though Bronstein focuses on claiming that this text supports the view that an inquirer 'has a candidate definition before she attempts to explain from it,' I note that Bronstein's Socratic Interpretation requires a *stronger* claim, i.e., the claim that the inquirer *knows* what the kind's basic definition is before she attempts to explain from it. The text does not support this stronger claim; on the contrary, the text (especially the line 'whenever we are able to give an account in conformity to what is apparent concerning all or most of its [in itself] accidents, at that time we will be able to speak best about the essence (*ousia*)') suggests that one's justification or grounds for holding that a definition specifies the basic essence of the kind (and hence is a basic definition rather than a merely dialectically adequate definition) depends on one's being able to account for the kind's *in itself accidents* by reference to this definition. There is no suggestion that, as Bronstein's Socratic Interpretation claims, one could know that one's definition specifies the basic essence of the kind before testing the definition in this way.

necessary features or could be explained by other, more basic necessary features of the kind. Indeed, in general, one would expect that the way to justify one's belief that E_K is the basic essence of K would be to provide evidence that E_K is well-suited to fill the theoretical role of K 's basic essence. Hence, given the theoretical role Aristotle assigns to basic essences, one would expect that the way to justify one's belief that E_K is the basic essence of K would be to provide evidence that E_K 's belonging to instances of K is what ultimately explains (with the help of other principles) why these instances have the other features they are known (by experience) to have. This is precisely what the Explanationist Interpretation proposes and, in fact, what Aristotle himself proposes in the aforementioned methodological texts.

§5: The Socratic Interpretation

§5.1: The Socratic Interpretation

In his recent monograph, *Aristotle on Knowledge and Learning*, David Bronstein defends a new interpretation of Aristotle's epistemology of essence which he calls the 'Socratic Interpretation.' With a nod to the Explanationist Interpretation, the Socratic Interpretation acknowledges the importance of explanatory reasoning by claiming that our knowledge of certain kinds of basic definitions, viz., those of 'subject-kinds,' is *perfected* when we show that these definitions can be used to explain why these kinds have the other necessary but non-essential features that they do. Nonetheless, like the Intuitionist Interpretation, the Socratic Interpretation holds that we first come to know what a subject-kind's basic definition is without explanatory reasoning. According to the Socratic Interpretation, this initial knowledge is acquired not by self-warranting intuition but rather by induction (in the case of *primary* subject-kinds) or division (in the case of *subordinate* subject-kinds).

In order to understand the Socratic Interpretation, it is necessary to review some of the distinctions Bronstein draws. First, Bronstein argues that Aristotle distinguishes between two types of essence-bearing entities: attributes and subject-kinds. According to Bronstein, the category of subject-kind includes kinds of standard Aristotelian substances, e.g., man, horse, etc., and kinds of 'substance-like' entities, e.g., triangle, unit, line, surface, etc.⁴² The difference between subject-kinds and attributes lies in the fact that instances of attributes are 'by nature such as to belong to a subject' whereas instances of subject-kinds are 'by nature such as to be the subjects to which attributes belong without belonging to any subject (they

⁴² See Bronstein 2016: 45. Bronstein refers to Marko Malink's (2013: 160 n.15) observation that mathematical terms like 'line,' 'triangle,' 'unit,' and 'number' seem to be treated as terms for substances in the *Analytics* (e.g., see *APr* 1.5 27a20).

are *Categories* primary substances)’ (Bronstein 2016: 82). Bronstein makes the controversial claim that Aristotle thinks that subject-kinds and attributes have different types of essences and that there is a corresponding difference in how these different types of essences become known.⁴³

Second, Bronstein argues that Aristotle draws a further distinction within the category of subject-kind between *primary* subject-kinds and *subordinate* subject-kinds. According to Bronstein, primary subject-kinds are distinguishable from subordinate subject-kinds in the following ways: (a) the existence of the former is not demonstrable but instead assumed as a *hypothesis* (*hypothesis*) in the relevant science, whereas the existence of the latter is demonstrable in the relevant science, and (b) subordinate subject-kinds are such that their respective primary subject-kinds are parts of their respective definitions (e.g., number is part of the definition of three), but not vice-versa (e.g., three is not part of the definition of number).⁴⁴ Examples of primary subject-kinds include animal (in the science of zoology), unit or number (in the science of arithmetic), and point and line (in the science of geometry). Examples of subordinate subject-kinds include three (in the science of arithmetic), triangle (in the science of geometry), and human being (in the science of zoology).⁴⁵

Together, these two distinctions carve out three types of definienda or essence-bearing kinds: attributes, primary subject-kinds, and subordinate subject-kinds. According to the Socratic Interpretation, we first acquire knowledge of a primary subject-kind’s basic essence by *induction* and then acquire knowledge of the basic essences of its subordinate

⁴³ See Bronstein 2016: 97. Goldin (1996: 72-76) and Ross (1949: 633) also claim that Aristotle draws a distinction between substances (or substance-like) entities and attributes in *APo*. By contrast, Bolton (2017) argues directly against this, and Charles (2000: ch.11; 2010: 309-319), appealing to *Metaph.* Z.17, argues that the essences of substances can be characterized and discovered in the same way in which the essences of attributes like thunder and eclipse can be.

⁴⁴ See Bronstein 2016: 171-173 and 175-177.

⁴⁵ See Bronstein 2016: 170.

subject-kinds by *division*. Once we know the basic essence of a subject-kind S, we are in a position to acquire knowledge of the essences of S's *in itself attributes* by identifying the explanation or cause of S's having those attributes. Finally, we achieve a more perfect form of knowledge of S's basic essence (a more perfect of knowledge which Bronstein identifies with the state which Aristotle calls '*nous*' in *APo*) by tracing the explanation of S's *in itself attributes* all the way back to the basic-essential features of S, thereby showing that the features previously identified by division or induction as essential to S do in fact ultimately explain why S has the aforementioned *in itself attributes*.

An initial concern for this view is that there are no texts in which Aristotle explicitly says that we discover the essences of some kinds (viz., attributes) in one way (viz., by demonstration), the essences of other kinds (viz., primary subject-kinds) in another way (viz., by induction), and the essences of a third group of kinds (viz., subordinate subject-kinds) in a third way (viz., by division). Nonetheless, Bronstein argues that this interpretation is indirectly supported by a number of texts. There are two passages in particular which are central to Bronstein's exegetical argument. I consider these two texts in §5.3 below. First, however, I discuss a general problem of fit for this interpretation of Aristotle's epistemology of essence.

§5.2: A General Problem of Fit for the Socratic Interpretation

The core innovation of the Socratic Interpretation is its two-step approach. As Bronstein puts it,

I have suggested that Aristotle distinguishes between (a) first discovering the essence of a subject-kind and (b) acquiring *nous* of it. We acquire *nous* of an essence by demonstration (i.e., explaining from it). In this way there is a close connection between definition and explanation. However, we do not define a subject-kind *by* explaining its demonstrable attributes, as we do in the Explanationist Picture. Rather, explanation (and thus demonstration) is the way we transform our non-

noetic knowledge of a subject-kind's definition, which we previously discovered by different means [i.e., by induction or by division]. (2016: 123; cf. 125-126).

This core innovation leads to a decisive problem for the view: there is no reason to think that the methods of division and induction described by the Socratic Interpretation can be used to reliably identify a subject-kind's explanatorily basic necessary feature(s). But given Aristotle's theory of essence, a feature is part of the basic essence of a kind iff it is an explanatorily basic necessary feature of that kind. Hence, it follows that there is no reason to think that the methods of division and induction described by the Socratic Interpretation can be used to reliably identify a subject-kind's basic essence. Before discussing this objection greater detail, it will necessary to spell out the details of the methods of division and induction recommended by the Socratic Interpretation.

In general, division (*diairesis*) is a method used to define a sub-kind or species of a broader kind or genus. The method involves identifying the definiendum's genus and then repeatedly dividing it into more specific kinds by selecting attributes (*differentiae*) possessed by some of but not all of the species of the kind being divided. One proceeds in this way until a collection of genus and differentiae is reached which is coextensive with the definiendum. The resulting definition will have the following form: S is GD₁...D_n (where 'G' specifies the genus and 'D₁'... 'D_n' specify the differentiae which distinguish S from other species of the genus G). A method of this kind is discussed in several of Plato's later dialogues and was well-known to Academic philosophers.⁴⁶ Definition by genus and differentiae also figures prominently in Aristotle's discussion of proper dialectical procedure in his *Topics* (esp. *Top.*

⁴⁶ See, for example, *Sophist* 221c-232a and 264e-268d; *Statesman* 258b-267c; and *Philebus* 16c-17a.

VI), a work where, notably, the *Analytics*' emphasis on the explanatory role of definitions (especially their role in explaining their definienda's *in itself accidents*) is absent.⁴⁷

On Bronstein's interpretation, in *APo* II.13 Aristotle refines the method of division by specifying five rules⁴⁸ to which any successful definition by division must adhere:

- (D1) *D Attribute*: all attributes in a definition by division must be 'D Attributes,' i.e., attributes which (i) do not belong to anything outside the definiendum's genus and (ii) belong to at least one other species of the definiendum's genus besides the definiendum.⁴⁹
- (D2) *Genuine Way*: each differentia in a definition by division must 'represent a genuine way of being the kind (genus or divisible species).'⁵⁰
- (D3) *Exhaustive Division*: every division in a definition by division must be *exhaustive* (D₁/D₂ is an exhaustive division of K if and only if all Ks are either D₁ or D₂, some Ks are D₁, some Ks are D₂, and no Ks are both D₁ and D₂).⁵¹
- (D4) *Proper Order*: for each genus or species, the differentiae in the final definition must be *properly ordered*, having been taken at each step by the one correct way of dividing.⁵²
- (D5) *First Collection*: the collection of genus and differentiae must not only be (collectively) coextensive with the definiendum but the *first* coextensive collection to be reached when dividing in the proper order.⁵³

Bronstein claims that 'by making properly ordered exhaustive divisions with genuine differentiae (which are also D attributes), the definer ensures that no essential attributes are omitted and no non-essential ones are illicitly introduced' (2016: 218). Notably, Bronstein

⁴⁷ For discussion of the difference between the conception of essence and definition in Aristotle's *Topics* and the conception of essence and definition in Aristotle's *Analytics*, see Bolton 1993.

⁴⁸ These five rules are my distillation of those discussed in Bronstein 2016: ch.12.

⁴⁹ See Bronstein 2016: 200. Bronstein's textual basis for attributing this rule to Aristotle is *APo* II.13 96a24-b1. One implication of this rule is that every definition by division must include at least two differentiae, a claim which *prima facie* conflicts with *Metaph.* VII.12's discussion of a 'final differentia' which is coextensive with the definiendum.

⁵⁰ See Bronstein 2016: 210; see also 218-219. Bronstein does not mention what the textual basis for this restriction is, but he is probably thinking of *APo* II.13 97a11-14 and 97a23-28.

⁵¹ See Bronstein 2016: 206. Bronstein's textual basis for attributing this claim to Aristotle is *APo* II.13 96b36-97a6.

⁵² See Bronstein 2016: 207-210. Bronstein's textual basis for attributing this claim to Aristotle is *APo* II.13 96b30-36, 97a25-26, and 97a28-34.

⁵³ See Bronstein 2016: 201, 207. Bronstein's textual basis for attributing this claim to Aristotle is *APo* II.13 96a32-34, 97a26, and 97a35-97b7.

remarks that ‘which differentiae are genuine (and D attributes), which divisions are exhaustive, and how they are properly ordered are empirical matters to be determined by the hard work of inquiry’ (2016: 218). Elsewhere, he similarly remarks that the question of what is the ‘proper way’ to order the differentiae for a given definiendum can only be answered from within the relevant science and that ‘there are no abstract, meta-scientific principles, or norms of inquiry’ (2016: 209).

Setting aside division, let us now consider the inductive procedure the Socratic Interpretation recommends for coming to know the basic essences of *primary* subject-kinds. Bronstein outlines the following specific inductive procedure:

Step 1: Collect several particular members of an indivisible species of G, S₁, and work out what attributes they all have in common qua S₁. Let’s say those attributes are C₁ and C₂.

Step 2: Collect several particular members of a different indivisible species of G, S₂, and work out what they all have in common qua S₂: C₃ and C₄.

Step 3: Repeat Step 2 for every indivisible species of G. The result of Steps 1–3 is a pool of attributes each of which belongs universally to a single indivisible species of G: C₁, C₂, C₃, C₄, etc.

Step 4: Work out what (if anything) C₁, C₂, C₃, C₄, etc. have in common. Call it E. E is the essence of G [only if E is co-extensive with G]. (If C₁, C₂, C₃, C₄, etc. do not have anything in common, then G is not a single genus and ‘G’ is used ambiguously. In that case the two or more genera of which S₁, S₂, etc. are species must be defined independently, via Steps 1–4). (2016: 220).⁵⁴

For example, Bronstein suggests that to find the basic essence of the genus *animal*, the inquirer must first study what the members of individual species of animal have in common, e.g., what individual horses have in common, what individual cows have in common, etc. Then, with a collection of attributes for each indivisible species in hand, she picks all and only the attributes which are in every collection, e.g., *substance capable of perception*. The

⁵⁴ The parenthetical ‘only if E is co-extensive with G’ is added by Bronstein in n.65. Bronstein’s textual basis for attributing this sort of procedure to Aristotle is *APo* II.13 97b7-15.

resulting collection of attributes will be coextensive with the genus and, according to Bronstein, include all and only its basic essential attributes.⁵⁵

The crucial problem with the Socratic Interpretation is that these methods cannot be used to reliably distinguish explanatorily basic necessary features from those which are merely necessary. But given Aristotle's theory of essence, this implies that these methods cannot be used to reliably identify a kind's basic essence. Let's consider this problem in more detail, examining each method in turn.

Bronstein's rules for division do not succeed in describing a method which can be used to reliably distinguish features which are explanatorily basic from those which are not explanatorily basic.⁵⁶ Let's take each rule in turn. First, the D Attribute restriction does not reliably track explanatorily basicness: a feature can (i) not belong to anything outside the genus and (ii) belong to more than one species within the genus without being explanatorily basic (e.g., the attribute *having hair* meets this requirement (in the genus *animal*) but is presumably not an explanatorily basic attribute of any species of animal). Again, the Exhaustive Division restriction doesn't track explanatory basicness either (e.g., *has hair/has scales/has a shell/etc.* is an exhaustive division of the kind *animal* and yet the attributes in this division are not explanatorily basic features of any species of animal). Third, the Proper Order restriction is irrelevant since whether the differentiae are properly ordered is unrelated to whether they are explanatorily basic. Fourth, while the First Collection restriction may help with blocking *extra* non-explanatorily basic attributes from getting into the definition, it does not help ensure that the attributes included in the 'first collection' are explanatorily

⁵⁵ See Bronstein 2016: 221.

⁵⁶ Each of Bolton (in Bolton 1993), Charles (in Charles 2000: 225), and Barnes (in Barnes 2002/1993: 240-242) raise the concern that division does not seem to be an adequate method for identifying explanatorily basic attributes. In other words, though writing before Bronstein developed his Socratic Interpretation, these authors anticipate the problem for the Socratic Interpretation which I discuss in the main text above.

basic unless the Genuine Way restriction succeeds in reliably limiting eligible attributes to those that are explanatorily basic. Finally, the Genuine Way restriction succeeds in reliably ruling out non-explanatorily basic features only if being ‘a genuine way of being a kind’ is reliably correlated with being explanatorily basic, but no reason has been given to think this is true. In fact, Bronstein’s claim that there are no ‘abstract, meta-scientific principles or norms of inquiry’ which determine what counts as a ‘correct way’ of dividing a given kind implies that there is no such correlation. Otherwise, it would be an ‘abstract, meta-scientific principle or norm of inquiry’ that D is a genuine way of being a G only if D is an explanatorily basic feature of a species of G.

Here is a concrete example which illustrates the problem. Bronstein offers the following definition of three as an example of a definition reached through the method of division: three is (G) a number which is (D₁) odd, (D₂) prime, and (D₃) prime* (i.e., not the sum of positive integers, excluding one).⁵⁷ Although Bronstein raises some questions as to how we know this is the proper way of ordering the differentiae, he appears to endorse this definition as the result of a correct application of the method of division.⁵⁸ (This definition satisfies the D Attribute and Exhaustive Division restrictions, and it satisfies the other restrictions if these differentiae are properly ordered and genuine ways of being the kind). However, though each of these differentiae are necessary features of three, none of them seems to be an explanatorily basic feature. After all, one can deduce that three is odd, prime,

⁵⁷ See Bronstein 2016: 201. Bronstein gets this definition of three from Aristotle’s discussion in *APo* II.13 96a24–96b14, wherein Aristotle offers this as a definition of three reached using the methods described in *APo* II.13.

⁵⁸ See Bronstein 2016: 208–210. By contrast, Bronstein says that Aristotle’s proposed definition (by division) of human being as *two-footed tame animal* (another example discussed in *APo* II.13) is a toy example rather than a serious attempt to state the basic definition of a human being (see 2016: 205 n.46).

and prime* from a seemingly more basic feature of three, viz., three's being $1+1+1$.⁵⁹ In short, the aforementioned definition of three as a number which is odd, prime, and prime* is reached by an (apparently) correct use of the method of division and yet seems to fail to specify the *basic* essence of three. More generally, the mere fact that a definition has been reached by an (apparently) correct use of the method of division provides no reason to think that the definition can play the explanatory role Aristotle assigns to basic definition. Hence, it's unclear how one could *know* that a definition specifies the basic essence of a kind on the basis of having reached that definition through an (apparently) correct use of the method of division.

In response to this concern, Bronstein could build it into the Genuine Way restriction that only explanatorily basic necessary features of the kind are 'genuine ways of being the kind' and hence eligible to appear in a definition reached by a correct definition by division. However, this response implies that, in order to use this proposed method of division, we must already have a way of knowing which of a kind's necessary features are explanatorily basic. In other words, division would not offer a way to discover the basic essence of a subject-kind which does not require that one already have a way of discerning which of the kind's necessary features are explanatorily basic. But if one were already to have a way of discerning which of the kind's necessary features are explanatorily basic, then one would already have a way of knowing which of the kind's features are part of its basic essence, for a kind's basic essence consists in all and only its explanatorily basic necessary features. But that would mean the method of division is superfluous: a definition reached by employing the method of division will include all and only the explanatorily basic features

⁵⁹ Bolton (1993: 215) makes a similar claim. As Bolton notes, the claim that three is essentially $1+1+1$ is suggested by Aristotle's claim in *Metaph.* M.6 that 'mathematical number consists of undifferentiated units' (1081a19-20).

(and hence basic-essential) features only if one already knows which of the kind's features are explanatorily basic (and hence basic-essential). In short, modifying the Genuine Way restriction in the aforementioned way does not salvage the Socratic Interpretation; instead, it just reinforces the point that the method of division does not itself provide a reliable way to identify which of a kind's features are included in its basic essence.

The same objection applies to the claim that we can discover the basic essences of primary subject-kinds by using the inductive procedure described above. Like the method of division, this inductive procedure does not distinguish explanatorily basic necessary attributes from non-explanatorily basic necessary attributes. Indeed, if one uses this inductive procedure to define a kind, one will include any necessary attribute of the kind in its definition. Hence, if a kind has attributes which are necessary but not explanatorily basic, using this inductive procedure yields a definition of that kind which includes these attributes despite their not being explanatorily basic.

Again, the problem can be illustrated with an example. Consider the primary subject-kind *animal*. Aristotle believes that all animals are necessarily capable of perceiving and capable of desiring. Nonetheless, Aristotle thinks that an animal's perceptual capacity is explanatorily prior to its appetitive capacity: animals are capable of having desires because they are capable of sensing pleasure and pain.⁶⁰ If this is right, then a basic definition of the kind *animal* should not include the attribute *having an appetitive capacity*, since this is a demonstrable attribute, explicable in terms of the more basic attribute of *having a perceptual capacity*. Yet, if we apply Bronstein's inductive procedure, *having an appetitive capacity* will be put into the definition of the kind *animal* since, ex hypothesi, it is a necessary attribute of animal, i.e., all species of animal and all members of the species of animal have an appetitive

⁶⁰ See *DA* II.3 414b1-15.

capacity. In short, this inductive procedure cannot be used to accurately identify a kind's basic definition, for it does not filter the kind's non-explanatorily basic necessary attributes from the kind's explanatorily basic necessary attributes.^{61, 62}

§5.3: The Putative Textual Evidence for the Socratic Interpretation

Proponents of the Socratic Interpretation could concede that the view they attribute to Aristotle is unsatisfactory for the reasons described in the preceding section and yet claim that their interpretation remains the best interpretation of Aristotle's position given what Aristotle says in certain texts. David Bronstein argues that there are two passages in particular which strongly support the Socratic Interpretation and pose serious problems for the Explanationist Interpretation. Contrary to what Bronstein claims, I argue here that these texts (a) do not provide strong support for Bronstein's Socratic Interpretation and (b) can be read in a way which is consistent with the Explanationist Interpretation.

Bronstein's first argument is rooted in a puzzle generated by the following passage in *APo* II.2:

When we seek the fact (*to hoti*) or whether something is without qualification (*to ei estin haplōs*), we are seeking whether or not there is a middle term for it; and when, having to come to know the fact or whether something is... we seek in turn the reason why (*to dia ti*) or what it is (*to ti estin*), we are then seeking what the middle term is... It turns out, therefore, that in all our searches we seek either if there is a

⁶¹ As Bayer observed (long before the publication of Bronstein's book), 'Induction cannot discover principles because it cannot distinguish between what is ultimately explanatory and the properties explained' (1997: 132).

⁶² Bronstein could try to defend the Socratic Interpretation by claiming that, after one defines a subject-kind by induction or division, there is an explanatory check on the results: the definition only succeeds in specifying the basic essence if the kind's *in itself attributes* can be demonstrated to belong to it in virtue of the putative essential features (see Bronstein 2016: 124 and 198). However, this response won't do since the Socratic Interpretation claims that, by using the appropriate method of induction or division, we can come to *know* what the basic essence of a kind is *before* an explanatory check is performed. It is this claim that I am challenging in the main text above. If Bronstein abandons this claim and instead claims that we reach knowledge of what the basic essence of a kind is only *after* completing the aforementioned explanatory check, then his Socratic Interpretation would collapse into a version of the Explanationist Interpretation, albeit one which gave a central place to division and induction in identifying candidate basic definitions, candidates which we would come to *know* are the basic definitions of their definienda only *after* showing they can do the explanatory work that Aristotle requires of such definitions.

middle term or what the middle term is. For the middle term is the cause, and this is what is sought in all these cases. [For example,] is it eclipsed? Is there a cause or not? After these things, knowing that there is a [cause], we seek what it is. (89b37-90a1, 90a5-9, my translation).

In this passage Aristotle suggests that, in general, we can know that there is a middle term/cause for a fact without yet knowing what the middle term/cause is. For example, after discovering that the moon is eclipsed, one can know that there is a middle term/cause of this fact without knowing what it is (90a8-9). Bronstein then argues that this raises a puzzle: suppose that some attribute P belongs to all instances of a kind S and that one discovers this fact. According to Aristotle, upon discovering this fact, one can also know that there is a cause in virtue of which P belongs to all instances of S. But how can this be? Isn't it the case that for all one knows P is part of S's basic essence, in which case there is no cause in virtue of which P belongs to all instances of S?⁶³

To solve this puzzle, Bronstein claims that in this passage Aristotle is describing a stage of inquiry at which the basic essence of the subject-kind S is already known. If the inquirer already knows what S's basic essence is, then the inquirer already knows, for any P, whether P is part of the basic essence of S. If it is not and one learns that P belongs to all instances of S, then one can infer there is a cause in virtue of which P belongs to all S.⁶⁴ In this case, one would be in a position to know concerning any P which is not part of the basic essence of S and yet belongs (by necessity) to all instances of S that there is a cause of P's belonging to these instances, even if one doesn't yet know what that cause is.

Bronstein argues that the Socratic Interpretation fits well with this reading of *APo* II.2 because the Socratic Interpretation attributes to Aristotle the idea that one can identify

⁶³ For Bronstein's own statement of the puzzle, see Bronstein 2016: 115.

⁶⁴ Bronstein explicitly embraces the assumption all of a subject's non-basic-essential but necessary features are demonstrable (see Bronstein 2016: 115; 47 n.23; 112; and 116 n.10).

the basic essence of a subject-kind without yet having identified how the features which make up that basic essence would explain why the kind has the other, non-basic essential attributes that it does. According to the Socratic Interpretation, one can use induction or division to come know what the basic essence of a subject-kind is and then, *after* having identified the basic essence of a subject-kind in this way, seek to explain why the kind has the other attributes that it does given what one knows is its basic essence. In particular, one can infer that, for any other attribute which necessarily belongs to all instances of that kind, there is some (proximate) middle term which explains why that attribute necessarily belongs to all instances of the kind, even though one may not yet know what that explanatory middle term is. Thus, Bronstein observes, the Socratic Interpretation fits well with his reading of the above passage from *APo* II.2.

Against this reading, it should be noted that there is no textual evidence that Aristotle thinks that an inquirer has prior knowledge of the basic definition of a subject-kind when she inquires whether a fact (*to hoti*) concerning that subject-kind obtains. Consider, for example, Aristotle's discussion of eclipses in *APo* II.2 and *APo* II.8. In both chapters, Aristotle describes an inquirer's progress from knowing *that* the moon is eclipsed (*to hoti*) without knowing what the middle term/cause of this fact is to knowing what the middle term/cause of this fact is. In neither chapter does Aristotle suggest that the inquirer already knows the basic definition of the moon and that it is because the inquirer knows the basic definition of the moon that she can know that there is a cause of the moon's being eclipsed even though she doesn't know what it is. In other words, there is an absence of evidence for the Socratic Interpretation in precisely those chapters where one would expect to find it. More generally, there simply are no texts in which Aristotle indicates that it is our prior knowledge of the subject's basic essence which allows us to know that a certain fact is

explicable through a middle term without knowing what that middle term is. In the many texts in which Aristotle endorses a procedure in which we move from knowledge of the facts to an attempt to explain those facts, he never mentions an intermediate step in which the basic-essential features of the kind are established via some non-explanatory method and the remaining features are inferred to be explicable.⁶⁵

For this reason, *APo* II.2 provides little reason to adopt a Socratic Interpretation over an Explanationist Interpretation, especially given the other evidence for an Explanationist Interpretation discussed in §4.2 above. Nonetheless, Bronstein is right to draw attention to this puzzle and the need for Explanationists to explain how what Aristotle says in this text is consistent with their interpretation. Here is a way for the Explanationist to address this challenge.

First, note that Aristotle's claim that whenever we seek *to hoti* we also seek whether there is an explanatory middle term/cause of this fact does not imply that whenever we discover *to hoti* we also discover that there is an explanatory middle term/cause for this fact. After all, as Aristotle has emphasized, some facts are indemonstrable and hence have no explanatory middle term/cause. What Aristotle claims in *APo* II.2 only commits him to the view that *in some cases* one can know that there is an explanatory middle term/cause for a fact without yet knowing what it is. So the question that needs to be answered is this: how can one know in some cases that there is an explanatory middle term/cause for a fact without yet knowing what it is?

Aristotle never explicitly answers this question, but here is a defensible answer consistent with what he says elsewhere about our experience-based knowledge of the world

⁶⁵ In addition to *APo* II.2 and *APo* II.8, see *APr* I.30 46a17-27; *APo* I.13 78b34-79a6; *PA* I.1 639b6-7 with 639b8-11; and *HA* I.6 491a7-14.

around us. Elsewhere, Aristotle claims that when we know that some feature P belongs to all instances of a kind S, we are justified in presuming that this is not by chance, i.e., that there is some reason why that feature belongs to all instances of the kind.⁶⁶ Since what is better known to us is typically not what is prior by nature, it is typically the case that there is a more basic feature of the kind which explains why P, the feature more familiar to us, belongs to all instances of the kind. Hence, it can reasonably be claimed that upon discovering a fact (*to hoti*) of the sort relevant to scientific inquiry (e.g., that all instances of a kind S have a certain feature P), if we are in a typical case, we can *know* that there is a middle term/cause of this fact even though we do not know yet what it is.⁶⁷ Of course, if it turns out that we are in an atypical case in which what is better known by nature is also better known to us, i.e., a case where the feature more familiar to us, P, turns out to be a basic-essential feature of S, then there will be no such middle term. In these cases, when one discovers that P belongs to all instances of S, one cannot know that there is an explanatory middle term/cause for this fact (since there isn't one). Nonetheless, it still makes sense for one to seek the reason why P belongs to all instances of S.⁶⁸ However, the answer will not be, as it would be in a more typical case, that P belongs to all instances of S because M, a more basic feature, belongs to all instances of S; instead, the answer will be that P belongs to all instances of S because P is part of S's basic essence.

Unlike Bronstein's Socratic solution to the puzzle, this Explanationist-friendly solution has the virtue of explaining why Aristotle gives no attention to the question of *how* we know that a fact is explicable even when we don't know what it is that explains that fact.

⁶⁶ See *Phys.* II.8 198b34-36

⁶⁷ Though he does not address Bronstein's puzzle directly, Bolton suggests a similar understanding of *APo* II.2 when he suggests that 'regular connections' known by experience are 'warrantedly explicable through some middle term and cause' (2017: 234-235).

⁶⁸ Note that 'seeking' (*zēteîn*) need not be understood factively: one can seek what does not exist. Hence, one can seek 'what the middle term is' even in the case of facts where there is no middle term.

Since he holds that we are warranted in presuming that the facts which are better known to us are explicable, no extra reasoning or knowledge is needed for us to know that such a fact has a cause/explanatory middle term. For this reason, he gives no attention to spelling out what extra reasoning or knowledge (e.g., knowledge of what the subject's basic essence is) is needed for us to know this.

I conclude that, contrary to what Bronstein claims, the aforementioned passage from *APo* II.2 does not provide strong grounds for preferring the Socratic Interpretation over the Explanationist Interpretation.

The other text Bronstein claims as strong support for the Socratic Interpretation is *APo* II.13. Aristotle begins this chapter by announcing, 'But let us now discuss how we should hunt out the things predicated in the *ti esti* (*ta en tō ti esti katēgoroumena*)' (96a22-23). Bronstein takes the expression 'the things predicated in the *ti esti*' to refer to the constituents of the basic essence of a kind and, in particular, to the constituents of the basic essence of a *subject-kind*.⁶⁹ Bronstein argues that 'the method [for hunting out the things predicated in the *ti esti*] he [i.e., Aristotle] goes on to recommend is division' since later in the chapter Aristotle remarks that 'divisions made according to differences are useful in this pursuit' (96b25-26) (Bronstein 2016: 196). To further support this reading, Bronstein appeals to a cryptic intervening passage (96b15-25) in the chapter, about which Bronstein claims,

Aristotle identifies a number of stages [in this passage]: divide a genus into its indivisible species; then, obtain the definitions of those species by means of the method of division; then, having defined the genus and the species, study their 'peculiar attributes' (i.e., their in itself accidents). The final stage is crucial to my interpretation. Aristotle means, I take it, that we should explain the in itself accidents by constructing demonstrations, using the genus' or the species' essence as the middle term. This is exactly the order of learning I have suggested is implicit in Aristotle's account in *APo* 2.2: first we discover the essence of a subject-kind, then we explain its other attributes from it. (2016: 124).

⁶⁹ See Bronstein 2016: 196.

Bronstein concludes that Aristotle's discussion in *APo* II.13 shows that Aristotle thinks we can use the method of division outlined in that chapter to identify the basic essences of certain kinds.

As Bronstein observes, Aristotle does not explain in 96b15-25 how we come to know the basic essence of the genus which we're supposed to divide so as to arrive at basic definitions of the underlying species of that genus. Bronstein argues that Aristotle answers this question at the end of the chapter, at 97b7-15, where Aristotle outlines the inductive procedure described above and says that 'if the things we've gotten hold of [have something that is] the same... we arrive at a single account; for this will be the definition of the object (*tau pragmatos horismos*)' (97b11-14, Bronstein translation). Again, Bronstein takes Aristotle's claim to be that, by employing this inductive procedure, we can reach not just *a definition* (*logos, horismos*) of a primary subject-kind but in fact a *basic definition* of that primary subject-kind, i.e., a definition which specifies all and only its explanatorily basic necessary attributes.⁷⁰

Though an admirable effort to make sense of a very difficult chapter, Bronstein's reading of *APo* II.13 does not withstand scrutiny. To begin, there is no evidence that Aristotle intends the methods of division and induction described in *APo* II.13 to be used to define *only* subject-kinds. On the contrary, to illustrate the latter procedure, Aristotle uses the attribute *great-souled* (*megalopsuchia*) as his example (see 97b16-25): *great-souled* is clearly not a subject-kind, let alone a primary subject-kind. Likewise, in Bronstein's other supporting passage (96b15-25), Aristotle says that the definiendum's genus may be 'among the quantities or qualities,' which again suggests that the procedure he is describing does not apply only to subject-kinds. The fact that the definitional procedures described in *APo* II.13 are not restricted only to subject-kinds is a serious problem for Bronstein's Socratic

⁷⁰ For Bronstein's discussion of this, see Bronstein 2016: 219-222.

Interpretation since that interpretation relies on the idea that Aristotle distinguishes the way in which the basic definitions of subject-kinds are discovered from the way in which the definitions of attributes are discovered. Bronstein agrees with standard Explanationists in thinking that in the chapters leading up to *APo* II.13, viz., *APo* II.8-10, Aristotle offers an explanation-based procedure for coming to know essences, but Bronstein claims that this procedure only applies to the case of attributes and that Aristotle offers an alternative procedure for subject-kinds in *APo* II.13.⁷¹ But since there is clear textual evidence that the definitional procedures in *APo* II.13 are applied to attributes and not just subject-kinds, this overall reading of *APo* II is not well-supported.

The crucial question we need to ask in interpreting *APo* II.13 is this: can the methods of division and induction described in this chapter reliably yield accurate accounts of their definienda's basic essences? In the previous section (§5.2), I argued that neither method can be used to distinguish a kind's explanatorily basic necessary features from its other necessary features and that, for that reason, neither can be used to reliably identify what the basic essence of a kind is. Yet, in *APo* II.13, Aristotle says that 'divisions made according to differences are useful in this pursuit' (96b25-26), where the pursuit in question seems to be that of seeking 'the things predicated in the *ti esti*' (96a22-23). The crucial question, then, is this: how are the procedures described in *APo* II.13 useful in our search for 'the things predicated in the *ti esti*'?

Now is not the place to defend a particular interpretation of *APo* II.13. Other Explanationists have already offered Explanationist-friendly interpretations of the chapter (including the cryptic 96b15-25) and bolstered these interpretations by showing how they fit

⁷¹ See Bronstein 2016: 145-146 and 196.

with Aristotle's discussions of division elsewhere in his corpus.⁷² What these interpretations share in common is the denial that the method of division outlined in the chapter (or the inductive procedure discussed at 97b7-15) is meant to yield the *basic* definition of a kind. Instead, these interpretations claim that Aristotle's position is that these methods can be used to identify a preliminary definition of a kind which is useful in our efforts to identify the basic definition of that kind. Rather than defend a particular one of these interpretations, I shall instead answer a general objection which Bronstein raises against any Explanationist-friendly interpretation of this sort.

Bronstein's objection is this: the language used in *APo* II.13 implies that the definitional procedures described therein are intended to yield the basic definition of the relevant definiendum rather than some non-basic definition of it. We have already seen that Bronstein takes 'the things predicated in what something is' (*ta en tō ti esti kategōroumena*)' (96a22-23; cf. 97a24-25) to refer to the basic essence of a kind. As further evidence for this view, Bronstein adverts to fact that Aristotle says that the definitional procedures described in *APo* II.13 yield the '*ousia*' of the definiendum (96a34-35, 96b6, 96b12, 97a13), which Bronstein again takes to refer to the basic essence of the definiendum. Putting this all together, Bronstein concludes, '[T]he result of division, properly employed, is not a preliminary account, which fails to state the species' complete essence, or an *explanandum* for which we then seek the *explanans*. Rather, division gets us the [basic] essence; indeed, properly employed, it must' (2016: 198).

⁷² See in particular Bolton 1993; Charles 2000: chs.9-10; Lennox 1987; Lennox, 1991; and Lennox 2014. Lennox does not discuss *APo* II.13 directly, though his comments on *APo* II.14 and related discussions in *APr* and the biological works suggest a way of understanding the use of the procedure of division (and induction) described in *APo* II.13.

However, there is good reason to think that Bronstein is wrong about this. While it is clear that the procedures described in *APo* II.13 are intended to yield some kind of definition, it cannot be inferred from the fact that they are intended to yield ‘the things predicated in the *ti esti*’ and the kind’s ‘*ousia*’ that they are therefore meant to yield *basic* definitions, i.e., definitions which are principles. Indeed, as I show below, Aristotle uses these expressions (‘things predicated in the *ti esti*’ and ‘the *ousia*’) to refer to features which can be predicated as a genus or differentia of a subject where there is no presumption that such ‘defining’ features are explanatorily basic and hence part of the subject’s *basic* definition.

Consider first the expression ‘the things predicated in the *ti esti*’: Aristotle’s first use of this expression in the *Analytics* occurs in *APr* I.27, where he writes, ‘We must distinguish, among the things which are consequent on a given subject, those which are predicated *in the ti esti* (*en tō ti esti*), those which are predicated as *propria* (*idia*), and those which are predicated as *accidents* (*bōs sumbebēkota*)’ (43b6-8, my translation). As Robert Bolton (1993: 214) has observed, this passage shows that Aristotle uses the expression ‘the things predicated in the *ti esti*’ to refer to the genus and differentiae of something as contrasted with its *propria* and accidents. This observation is confirmed by Aristotle’s similar use of this expression in the *Topics* (see 102a31-34, 120b21-29, 122a5-6, 132b35ff, and 153a15-22), a use to which Aristotle himself adverts in *APo* II.13 (see 97a23-228; cf. 96a24-a35). Hence, the fact that the methods described in *APo* II.13 are useful for identifying ‘the things predicated in the *ti esti*’ implies only that they are useful for identifying a kind’s genus and differentiae. There is no presumption that these features are explanatorily basic and hence part of the kind’s *basic* essence. The genus *animal*, for example, is ‘predicated in the *ti esti*’ of the kind *human being* (i.e., *animal* is the genus of the species *human being* and hence suitable for inclusion in a definition of a human being reached by employing the method of division) even though it is

not an explanatorily basic fact about human beings that they are animals (rather, human beings are animals because they have sensitive souls).

Likewise, the fact that a definition of the sort described in *APo* II.13 is said to provide the '*ousia*' of its definiendum does not imply that it specifies its definiendum's basic essence. Instead, as Charles has observed, in *APo* I.23 83a39ff Aristotle says that genus and differentiae are predicated as (part of) the *ousia* of something (Charles 2000: 224). This use of '*ousia*' matches Aristotle's use of the expression 'things predicated in the *ti esti*.' Again, when '*ousia*' is used in this way, the contrast is not between a kind's basic essence and its non-basic-essential attributes but rather between the *ousia* of something (i.e., its genus and differentiae) and things which are accidental to it (*ta sumbebekota*) (see 83a24-29). Again, there is no presumption that any feature which is part of the *ousia* of the kind is explanatorily basic and hence part of the kind's basic definition or essence.⁷³

In fact, other texts confirm that at least some of the differentiae of a kind, i.e., features which are parts of the kind's '*ousia*' (in the aforementioned sense) and are 'predicated in its *ti esti*' (in the aforementioned sense), can belong to it in virtue of more explanatorily basic features.⁷⁴ Most notably, in the chapter immediately following *APo* II.13, Aristotle clarifies that 'divisions' (*diareseis*) are useful because they help us 'to grasp problems' (*to echein ta problemata*) (98a1-2). Aristotle uses the term 'problem' (*problēma*) to refer to a target of scientific explanation, a fact (*to hoti*) for which we can seek *why it is* (*dia ti*).⁷⁵ Hence,

⁷³ That there is no such presumption is supported by the fact that in *APo* II.13 Aristotle claims that a definition by division specifies the *ousia* of a kind K if the definition is coextensive with the kind, i.e., if all and only the entities which have that set of defining features are instances of the kind (see 96b6-14). This is not a sufficient condition for being a *basic* definition. To be a *basic* definition, a definition must be not just coextensive with its definiendum but also such that it includes only explanatorily basic features of its definiendum. The fact that Aristotle here treats coextensiveness with the definiendum as sufficient condition for a definition to specify the '*ousia*' of the definiendum suggests that he is not using '*ousia*' here to refer to the kind's basic essence.

⁷⁴ See *HA* I.6 491a7-14 and *PA* I.5 645b1-3. For discussion of these passages, see Lennox 1987.

⁷⁵ For a thorough discussion of this point, see Lennox 1994 and 2014.

Aristotle's discussion in *APo* II.14 implies that differentiae used in definitions by division are explicable features, not explanatorily basic features. In fact, Aristotle goes on to suggest in *APo* II.14 that 'divisions' help us grasp problems by helping us identify when a differentiating feature of a target kind is shared by other species of a common genus, i.e., when the feature belongs not just to all instances of the target kind but also to all instances of a more general kind. This is useful because it will put us in a better position to identify the 'reason why' (*dia ti*) the feature belongs to our target kind, viz., the feature belongs to the target kind because the target kind is a species of a more general kind.⁷⁶

Of course, the explanation doesn't end here. We have here what Lennox calls a 'type A explanation,' i.e., an explanation which identifies the most general kind such that the feature belongs to every instance of that kind. We still need to consider the 'type B explanation,' i.e., why the feature belongs to all instances of that more general kind.⁷⁷ This distinction is touched upon in *APo* II.17 and reemphasized in *APo* II.18. Consider an example discussed at 99a21-29: here Aristotle observes that the feature *leaf-shedding* belongs to a more general kind (viz., *broad-leaved plant*) than *vine* or *fig* and hence belongs to *vine* or *fig* in virtue of their being species of this more general kind ('there will be first a middle term in the one direction (that all are such-and-such)' (99a26-27)). At the same time, there is still a middle term which explains why all plants of this more general kind shed their leaves, e.g., they shed their leaves because their 'sap solidifies, or something of the sort' (99a27-28). It is for this reason that division is said to 'help us grasp problems': by helping us recognize that leaf-shedding is not proper to vines but is shared in common by several species of plants, it

⁷⁶ See the related *APo* I.4 73b33-74a4 and I.5 74a36-74b4. Similar interpretations of this point are offered in Charles 2000: 239-245; Lennox 1987; and Lennox 2014. It's notable that Bronstein does not discuss *APo* II.14 in his book and hence says nothing explain how his Socratic Interpretation of *APo* II.13 fits with the subsequent discussion in *APo* II.14.

⁷⁷ See Lennox 1987: 93. See also Bolton 1987: 139 and 1993: 212-213.

helps us recognize that the scientific problem is not primarily *why do vines shed their leaves* but instead *why is that all plants of this more general kind shed their leaves?* In doing so, it aids us by directing us to look for a cause among the features shared by all plants of that more general kind (*broad-leaved plant*) rather than among the features unique to vines.

In short, contrary to what Bronstein suggests, there is no good reason to think that the definitional procedures described in *APo* II.13 are meant to yield *basic* definitions rather than preliminary accounts which are useful in our effort to explain why kinds have the features that they do. In fact, as I have just indicated, Aristotle subsequent discussion in *APo* II.14-18 points to a different use for division, one in which it helps us identify the reason why a kind has certain features by identifying the level of generality at which to look for the explanation of why the target kind's has those features.

§6: An Enriched Explanation Interpretation

§6.1: Introductory Remarks

The core epistemological claim of the Explanationist Interpretation is that we can come to know what a kind's basic essence is by identifying what feature(s) of the kind ultimately explain why it has certain other necessary but non-basic-essential features, including in particular certain *in itself accidents* (*kath' hauto sumbebēkota*). I argued in §4.3 that this epistemological thesis fits neatly with a non-epistemological thesis at the heart of Aristotle's non-modal theory of essence, viz., the idea that the basic essential feature(s) of a kind are those which ultimately explain why the kind has the *in itself accidents* that it does. Moreover, in §4.2 I argued that there are several methodological passages in which Aristotle recommends that one can discover the principles of a science, including the basic definitions of the kinds studied by that science, by seeking the explanations for the facts initially known (by experience) to characterize the relevant kinds, including facts about the *in itself accidents* of these kinds. At the same time, I mentioned in §4.2 that several prominent Explanationists have argued that Aristotle's discussion in *APo* II, especially *APo* II.2 and *APo* II.8, provides strong evidence for this Explanationist Interpretation of his epistemology of essence.⁷⁸ Here I argue that this assessment of what Aristotle claims in *APo* II.2 and II.8 is incorrect and that in fact Aristotle proposes in these texts a distinct, albeit complementary, thesis about how it is that a kind's basic essence can be 'made clear' (*dēlon*). After showing that there are these two distinct elements in Aristotle's epistemology of essence, I go on to offer an account of how these two elements fit together, proposing what I call an 'Enriched Explanationist Interpretation' of Aristotle's epistemology of essence.

⁷⁸ See Bolton 1987: 130-146; Bolton 1991: 10-11; Charles 2000: 197-204; Charles 2010: 286-292; Charles 2014: 16-18; and Lennox 2001: 161-162.

§6.2: *APo* II.2 and II.8: An Alternative to the Standard Explanationist Story

Building on ideas put forward in *APo* II.2, in *APo* II.8 Aristotle attempts to explain, in the case of kinds which have ‘causes other than themselves’ (see 93a5-6, 93b18-19, and 93b21-28; see also 88a5-8), ‘...how the essence (*to ti esti*) is grasped (*lambanetai*) and comes to be known (*gignetai gnōrimon*)’ (93b15-16). Later, I’ll return to the issue of just what distinction Aristotle has in mind in restricting his attention to kinds which have ‘causes other than themselves.’ For now, I focus on the key claim of the chapter, which is that, for such kinds, though ‘it [i.e., the kind’s essence] is not deduced or demonstrated, nonetheless it is made clear through deduction and demonstration (*dēlon mentoi dia sullogismou kai di’ apodeikseōs*)’ (93b17-18).

Through a demonstration of what? One might expect the answer to be ‘through a demonstration of the kind’s *in itself accidents*,’ i.e., by explaining why the kind has the *in itself accidents* that it does. As I observed in §4.2, this claim is strongly supported by other methodological passages in Aristotle’s corpus, especially the aforementioned *DA* I.1 passage in which Aristotle claims that

[K]nowing the [in itself] accidents [of something] contributes in great part (*sumballetai mega meros*) to knowing [its] essence (*pros to eidenai to ti estin*). For whenever we are able to give an account in conformity to what is apparent concerning all or most of its [in itself] accidents, at that time we will be able to speak best about the essence (*ousia*). For in every demonstration [concerning a given kind] the essence (*to ti esti*) [of that kind] is a principle (*arche*). Hence, whichever definitions are not such that [our] knowing (*gnōrizēin*) the [in itself] accidents (*ta sumbebēkota*) follows [from our knowing the definitions] but instead do not even make it easy [for us] to form a plausible conjecture about these [i.e., its in itself accidents], it’s clear that all [these definitions] are stated in a dialectical and empty manner. (402b21-403a2, my translation).

Several prominent proponents of the Explanationist Interpretation claim that in *APo* II.2 and *APo* II.8 Aristotle outlines a similar procedure for coming to know essences, a procedure in which one starts with an initial account of a kind which defines it by reference

to one or more of its explicable, *in itself* features and then identifies other, more basic features of the kind which explain why it has the explicable features specified in the initial account. The process is repeated until one reaches what one takes to be the explanatorily basic necessary feature(s) of the kind, feature(s) which are such that their belonging to the kind is not explained by any prior, more basic features of the kind.⁷⁹

But, as I will now argue, this reading of *APo* II.2 and II.8 mischaracterizes what Aristotle is up to in these chapters. The key epistemological claim of these chapters is not the idea, put forward in *DA* I.1, that we can come to know what a kind's basic essence is by explaining why it has the other, non-essential features that it does. Instead, the key epistemological claim of these chapters is that, in the case of kinds which have 'causes other than themselves,' we can make clear what a kind's basic essence is by making clear 'the kind's cause.' Moreover, the key non-epistemological claim about essence in these chapters is not that the basic essence of a kind explains why it has the *in itself accidents* that it does; rather, it is the claim that, in the case of a kind which has 'a cause other than itself,' the kind's cause is included in its basic essence.

⁷⁹ Consider, for example, Bolton's summary of what he takes to be the main claim of *APo* II.8-10:

(1) We normally begin with a definition or account of the kind which is our object of inquiry which exhibits the features or manifestations of it which are perceptually most accessible. Typically, such features are not fundamental features of the kind in terms of which others can be explained, but rather explicable by reference to the more fundamental ones and, thus, features which figure in 'conclusions of demonstrations'. (2) Inquiry proceeds by moving from an understanding of something based on a definition of this sort to an understanding where we have an account or definition which exhibits why the thing has the characteristics which figure in the former type of definition. (3) We continue our inquiry to determine whether there is yet a further account or definition which explains the features already used to explain the features initially grasped, and so on, until we have a definition based on the feature or features most basic from the point of view of explanation. (1987: 145-146).

For similar claims, see Charles 2000: 202-203 with 195 and 216; Lennox 2001: 161-2; and McKirahan 1992: 268.

To see this, consider more closely what Aristotle says in *APo* II.2 and II.8. In *APo* II.2, Aristotle claims that to seek something's (basic) essence is to seek its cause (*aition*) (see 90a1 with 90a5-6) and that 'to know what something's essence is is the same as to know why it exists (*to ti estin eidenai tauto esti kai dia ti estin*)' (90a31-32). In *APo* II.8, Aristotle fills out this picture by making clear what kind of knowledge is required for one to be in a position to seek the basic essence and cause of a kind. In particular, Aristotle claims that we are in a position to inquire (*zētein*) about a kind's basic essence only when we know *in a non-accidental way* that the kind exists (see 93a21-29). Knowing in a non-accidental way that the kind exists requires that we

grasp something of the thing itself, e.g., of thunder, that there exists a certain kind of noise in the clouds; of an eclipse, that there exists a certain kind of loss of light; of a human being, that there exists a certain kind of animal; and of a soul, that there exists something which moves itself. (93a21-24, my translation).

In other words, to be in a position to seek the basic essence of a kind, one must have encountered some instances of the kind and have a grasp of some of its *in itself* (*kath' hauto*) features ('something of the thing itself'), on the basis of which one can offer a preliminary account of the kind, e.g., thunder is a certain kind of noise in the clouds, an eclipse is a certain kind of loss of light from the moon, etc.

Crucially, Aristotle does not go on to claim, as one might expect given the discussion in *DA* I.1, that one can make clear the basic essence of the kind by identifying the reason why the kind has the features initially known to characterize it. Instead, he claims that we can make clear the basic essence of the kind by identifying the cause of the occurrence of the kind so characterized. Thus, for example, Aristotle's claim is not that we can come to know what the basic essence of thunder is by explaining why thunder has the feature of being (a certain kind of) noise (*pave* Lennox (2001: 162) and Charles (2000: 214)) or that we can come to know what the basic essence of an eclipse is by explaining why an eclipse has the feature

of occurring to the moon (*pace* Charles (2000: 246)). Instead, Aristotle's claim is that we can make clear what kind of noise thunder is, i.e., the basic essence of thunder, by making clear why the clouds produce that kind of noise (i.e., the kind of noise which is thunder) (see 93b7-14, 93b39-94a5). Similarly, in the eclipse example, Aristotle's claim is that we can make clear what kind of loss of light an eclipse is, i.e., the basic essence of an eclipse, by identifying why the moon undergoes that kind of loss of light (i.e., the kind of loss of light which is an eclipse) (see 93a29-32, 90a14-18; cf. 87b39-88a2).⁸⁰

But what about the example in which Aristotle suggests that one can make clear the basic essence of an eclipse by identifying the cause of the moon's failure to cast shadows when there is nothing between the moon and the earth (see *APo* II.8 93a37-b7)? I concede that it is an *in itself accident* of an eclipse that an eclipse involves the moon's not casting shadows even when there is nothing between it and the earth. Still, Aristotle does not say in *APo* II.8 that we can make clear the basic essence of an eclipse by explaining *why an eclipse* has this feature (as one might expect given what he says in *DA* I.1). Instead, Aristotle says that we can make clear the essence of an eclipse by explaining why the moon fails to cast shadows even when there is nothing between the moon and the earth. In other words, though the *in itself accident* helps characterize the kind of loss of light which an eclipse is, Aristotle never suggests in *APo* II.8 that the target *explanandum* is why an eclipse (the kind whose basic essence we are trying to make clear) has the *in itself accidents* that it does. Instead, Aristotle's claim is that we can make clear the basic essence of a kind by identifying the

⁸⁰ Bronstein makes a similar point (though without noting that other authors have mistakenly suggested otherwise): 'Thunder just is a noise in the clouds; there is no reason why it is. The question of scientific interest is why is there thunder (i.e., a certain type of noise) in the clouds?' (2016: 140). Charles (2000: 198-199) seems to recognize this when he notes that what is explained in *APo* II.8 is not why *Noise in the clouds belongs to Thunder* but why *Such and Such Kind of Noise (i.e., Thunder) belongs to the Clouds*, but he then goes on to (mistakenly) suggest that part of what is explained is 'why it [i.e., thunder] is noisy' (202) and 'why thunder has the other genuine (or *per se*) features it has' among which he includes 'being a noise' (214). Lennox (2001: 162) makes a similar error.

kind's cause. The point of this 'failure to cast shadows' case is that, in looking for the kind's cause, we may start with an initial account of the kind which characterizes it in terms of one of its *in itself accidents* and seek to identify the cause of the kind by identifying the cause of something characterized in terms of those accidents. In short, though knowledge of a kind's *in itself accidents* has a role to play in the epistemological story described in these chapters, the role that this knowledge plays differs from the role that it plays in the epistemological story of *DA* I.1.

The epistemological thesis of *APo* II.2 and II.8, viz., that we can make clear or advance our knowledge of what a kind's essence is by identifying the kind's cause, is backed by a non-epistemological thesis about essence introduced in *APo* II.2 and clarified in *APo* II.8. The non-epistemological thesis is that, in the case of a kind which has 'a cause other than itself,' the kind's cause is included in its basic essence.⁸¹ Thus, for example, the cause of an eclipse is included in the basic essence of an eclipse: an eclipse is essentially a loss of light from the moon due to the obstruction of the earth; it is part of the basic essence of an eclipse that it is (efficiently) caused by the obstruction of the earth (see 90a14-18). Likewise, the cause of thunder is included in the basic essence of thunder: thunder is essentially a noise due to the quenching of fire in clouds; it is part of the basic essence of thunder that it is (efficiently) caused by the quenching of fire in clouds (see 93b39-94a5). This non-epistemological thesis about the basic essences of kinds which have 'causes other than

⁸¹ Sometimes Aristotle says that the kind's cause *is* its essence rather than that the kind's essence includes its cause (see 90a15). For example, Aristotle says at 93b7 that the essence of an eclipse is 'an obstruction by the earth' and at 93b8 that the essence of thunder is 'a quenching of fire in a cloud.' But though Aristotle sometimes speaks this way, his more careful way of putting his view is that the essence of a kind includes its cause. Thus, for example, elsewhere he says not that thunder is essentially a quenching of fire in clouds but rather that thunder is essentially a noise due to the quenching of fire in clouds (see 93b39-94a5). Likewise, elsewhere he says not that an eclipse is essentially an obstruction by the earth but rather that an eclipse is essentially a loss of light from the moon due to the obstruction of the earth (see 90a14-18). For further discussion of this issue, see Charles 2010: 288 n.4 and Charles 2014: 17 n.29.

themselves' is what paves the way for the aforementioned epistemological thesis. If we know that the basic essence of a kind includes its cause, it follows that if we do not already know the kind's cause, we can advance our knowledge of the kind's basic essence by identifying the kind's cause and then including the identified cause in our account of the kind's basic essence.

With these points in place, let us now return to an issue put off earlier, namely, the question of just what kinds Aristotle has in mind when he refers to kinds which have 'causes other than themselves.' David Bronstein argues that Aristotle has in mind 'attribute-kinds', i.e., kinds whose instances inhere in or belong to other things: 'Eclipse, thunder, leaf-shedding, and 2R are all states or conditions or affections – in general, attributes – that inhere in or belong to their respective subjects because of some cause' (2016: 99-100).

Bronstein contrasts these attribute-kinds with what he calls 'subject-kinds':

Aristotle distinguishes two main types of definable entity and two types of essence by which they are respectively defined. The first type of definable entity is what I call a 'subject-kind' (e.g., line, triangle, animal, human being). These are natural kinds (species and genera) whose individual members are primary substances (e.g., Socrates) or substance-like entities (e.g., this particular triangle)...The second type of definable entity is a demonstrable attribute of a subject-kind. (2016: 45-46).

On Bronstein's view, 'all and only subject-kinds have causes that are the same and all and only demonstrable attributes have causes that are different' (2016: 135). Hence, on Bronstein's view, Aristotle's epistemological claim in *APo* II.2 and II.8 (i.e., the claim that, in the case of a kind which has a 'cause other than itself,' we can make clear or come to know what the kind's basic essence is by identifying the kind's cause) concerns attribute-kinds only (2016: 135-137).⁸²

⁸² Goldin (1996: 126-136) and Ross (1949: 633) defend similar views.

But Aristotle's remarks in *APo* II.9 undermine Bronstein's claims. In *APo* II.9, Aristotle contrasts kinds which have 'causes other than themselves' with those kinds which are

immediates and principles (*amesa kai archai*), concerning which one must hypothesize or make clear in some other way both what it is [i.e., its essence] and that it is (just as the arithmetician does, for she hypothesizes both what a unit is [i.e., its essence] and that there are units). (93b22-25, my translation).⁸³

Here Aristotle alludes to a distinction drawn in *APo* I between (a) kinds which are such that one must 'hypothesize' (*hypothesthai*) or 'assume' (*lambanein*) that they are and (b) kinds which are such that their existence is demonstrable.⁸⁴ But this distinction is not equivalent to a distinction between attribute-kinds and subject-kinds, for there are subject-kinds among the kinds whose existence is demonstrable. Thus, for example, in *APo* I.10 Aristotle writes,

I call 'principles' in relation to each kind those [things] of which it is not possible to prove that it is. On the one hand, what the primaries and what the things composed of them (*ta prōta kai ta ek toutōn*) signify [i.e., the definitions, or accounts of the essences, of the primaries and the things composed of them] is assumed. On other hand, *that it is* must be assumed for the principles but proved for the rest. For example, we must assume what a unit is [i.e., the essence of a unit] or what the straight is [i.e., the essence of the straight] and what a triangle is [i.e., the essence of a triangle]; and while [we must assume] that the unit and magnitude exist, we must prove the existence of the other things [e.g., triangle]. (76a31-36, my translation).

Notice that here the subject-kind *triangle* is included among those which are such that their existence is demonstrable. Indeed, Bronstein himself concedes this:

The distinction between unit and triangle is clear. Unit is a primary whose existence is indemonstrable and assumed as a principle (a hypothesis) in the relevant science

⁸³ The Greek here is difficult to construe and has been understood in different ways by different commentators. I follow Bronstein (2016: 137, n.14) and Charles (2000: 274-5, n.2) in thinking that Aristotle is referring to *entities* with essences, not 'cases of what a thing is' (for this latter view, see Bolton 1987: 142), when he refers to 'the immediates and principles, concerning which one must hypothesize or make clear in some other way both what it is [i.e., its essence] and that it is (just as the arithmetician does, for she hypothesizes both what a unit is [i.e., its essence] and that there are units)' (93b22-25, my translation). Indeed, Aristotle's example, *a unit*, is an example of an entity whose existence and essence is hypothesized, not an example of a 'case of what a thing is.' More generally, it doesn't make sense for Aristotle to say that, in some cases, one must hypothesize the 'what it is' (i.e., the essence) of a 'case of what a thing is,' for a 'case of what a thing is' doesn't have a 'what it is' (i.e., an essence).

⁸⁴ In addition to *APo* I.10 76a31-36 (cited in the main text above), see *APo* I.10 76b3-11; *APo* I.2 72a14-24; *APo* I.1 71a11-17; and *APo* II.7 92b12-16.

(arithmetic). Triangle, on the other hand, is a non-primary whose existence is demonstrated in the relevant science. (2016: 172).

Again, in *APo* II.7, Aristotle writes, '[T]he geometer assumes what triangle signifies [i.e., what the essence of a triangle is] but proves [i.e., demonstrates] that it exists' (92b15-16, my translation).

Hence, when Aristotle speaks of the kinds which have 'causes other than themselves,' he has in mind not attributes specifically but any kind which is such that its existence is demonstrable. This of course fits with what we have seen is Aristotle's claim in *APo* II.2 and II.8, namely, that a kind which has a 'cause other than itself' is such that there is some cause of its being, i.e., some middle term through which one can demonstrate that it exists (see especially *APo* II.2 90a1-11). For example, as we have seen, in *APo* II.2 and II.8 Aristotle maintains that one can demonstrate that there is an eclipse, i.e., explain why an eclipse (a certain kind of loss of light from the moon) occurs, by specifying its cause, viz., the obstruction of the earth. Moreover, though all of Aristotle's examples in *APo* II.2 and II.8 are examples of attribute-kinds, in *Metaph.* VII.17 he applies the same idea to subject-kinds, using as his examples the kind *house* and the kind *human being*:

One is particularly liable not to recognize what is being sought in things not predicated one of another, as when it is asked what a man is [i.e., what is the essence of a human being], because the question is simply put and does not distinguish these things as being that. But we must articulate our question before we ask it... And since the existence of the thing must already be given, it is clear that the question must be why the matter is so-and-so. For instance, the question may be 'Why are these things here a house?' (and the answer is 'Because what being is for a house [i.e., the essence of a house] belongs to them'), or it may be 'Why is this thing here a man?', or 'Why is this body in this state a man?' So what is sought is the cause by which the matter is so-and-so, i.e., the form. (1041a32-b3, b4-b8, Bostock translation).⁸⁵

⁸⁵ For other texts in which Aristotle describes the form of a substance as a 'cause of its being,' see *Metaph.* V.8 1017b14-16, *DA* II.4 415b12-13, and *Metaph.* H.2 1043a2-7.

This brings me to a final point about kinds which have ‘causes other than themselves.’ In *APo* II.8, Aristotle gives two examples in which the identified cause is an *efficient* cause: an eclipse is essentially a loss of light from the moon due to, i.e., *efficiently caused by*, the obstruction of the earth; thunder is essentially a noise due to, i.e., *efficiently caused by*, the quenching of fire in clouds. But elsewhere, when Aristotle brings to bear his four-cause explanatory framework, he indicates that he believes other types of causes can serve as ‘the cause’ of a kind. For example, again in *Metaph.* VII.17, Aristotle writes,

So what one asks is why it is that one thing belongs to another. (It must be evident that it does belong, otherwise nothing is being asked at all). Thus one may ask why it thunders, for this is to ask why a noise is produced in the clouds, and in this way what is sought is one thing predicated of another. And one may ask why these things here (e.g., bricks and stones) are a house. It is clear, then, that what is sought is the cause – and this is the what-being-is [i.e., the essence], to speak logically – which in some cases is that for the sake of which the thing exists (as presumably in the case of a house or a bed), while in some cases it is that which first began the change; for this latter is also a cause. (1041a23-a30, Bostock translation).

Here Aristotle implies that in the case of some kinds (e.g., in the case of the kind *house* or the kind *bed*) the cause sought is a *final cause*, whereas in other cases (e.g., the case of the kind *eclipse* or the kind *thunder*) the cause sought is an *efficient* cause. For example, while thunder is essentially a noise due to, i.e., *efficiently caused by*, the quenching of fire in clouds, a house is essentially bricks and stones (or some durable stuff) arranged for the sake of sheltering people and possessions (see *Metaph.* H.2 1043a14-19 for a definition of house along these lines).

Much more could be said about how the account in *APo* II.2 and *APo* II.8 connects with Aristotle’s four-cause explanatory framework or with what Aristotle says in *Metaph.* VII.17 and related passages, but I set aside such complications here.⁸⁶ Instead, what I wish

⁸⁶ Another text relevant here is *APo* II.11, where Aristotle observes that there are four types of cause (94a21) and goes on to suggest, for example, that some kinds have a final cause, e.g., a house is for the sake of protecting people and their possessions (see 94b10-11). For one attempt to explain how Aristotle’s discussion

to emphasize is that, whatever the types of causes invoked, the procedure described in *APo* II.2 and II.8 is one in which one ‘makes clear’ or comes to know the basic essence of a kind by identifying *the kind’s cause* rather than the cause of the kind’s having the in itself accidents that it does. In the case of attribute-kinds like eclipse or thunder, this means identifying why the attribute-kind, or rather instances of the attribute-kind, inhere in or characterize some subject, e.g., why the moon undergoes an eclipse (i.e., a certain kind of loss of light), why the clouds produce thunder (i.e., a certain kind of noise), etc. In the case of subject-kinds like human being or house, this means identifying what makes a subject (perhaps characterized as such and such matter) an instance of the kind, e.g., why these things (e.g., bricks and stones) are a house, why this thing is a human being, etc. (Here it may be helpful to note that for a subject-kind to exist just is for there be to instances of that kind, and hence to

in *APo* II.2 and II.8 fits with his four-cause explanatory framework and with *Metaph.* VII.17 and related passages, see Charles 2000: ch.11 and Charles 2010. However, I note that because Charles understands *APo* II.2 and *APo* II.8 differently than I do, what he proposes is not quite what I would propose. Thus, for example, when discussing the example of a *house* mentioned in *Metaph.* VII.17, Charles takes Aristotle’s claim to be that we can make clear the essence of a house by making clear the cause (in this case, a final cause) which explains why the matter of a house is arranged a certain way, viz., the matter is arranged this way for the sake of protecting goods and people (see Charles 2010: 310-312). Charles goes on to describe this claim as the claim that ‘the (basic) essence...will be knowable in virtue of its being the specific final cause of the kind’s possession of its other properties. As in *Analytics* B.8-10, one can grasp something as a basic essence in virtue of seeing it as the fundamental cause’ (314). Here Charles runs together what I have been arguing are two distinct ideas about essence: (1) the idea that the essence of a kind includes its cause and (2) the idea that the essence of a kind is explanatory of why it has certain other necessary features (e.g., its *in itself accidents*). In contrast with what Charles maintains, I maintain that Aristotle’s claim in *Metaph.* VII.17 is that we can make clear the essence of a house by making clear *the cause (in this case, the final cause) of a house*, just as we can make clear the essence of thunder by making clear the cause (in this case, the efficient cause) of thunder. Of course, in accord with claim (2) about essence, the fact that houses are essentially for the sake of protecting people and their possessions is explanatory of why houses have certain other features, e.g., why houses are made of bricks and stones (or, more generally, durable stuff), just as the fact that eclipses are essentially caused by the interposition of the earth between the sun and the moon explains why eclipses have certain other features, e.g., why eclipses recur periodically. But just as Aristotle does not say in *APo* II.2 and II.8 that we can make clear the essence of an eclipse by making clear why an eclipse has the other, *in itself* features that it does but rather that we can make clear the essence of an eclipse by identifying the cause of an eclipse, i.e., the cause of the moon’s undergoing a certain kind of loss light (the kind of loss of light which just is an eclipse), which in this case is an *efficient* cause, likewise in *Metaph.* VII.17 Aristotle does not say that we can make clear the essence of a house by making clear why it has the other, *in itself* features that it does but rather that we can make clear the essence of a house by identifying the cause of a house, i.e., ‘why these things here (e.g., bricks and stones) are a house,’ which in this case is a *final* cause (see 1041a26-27, b5-6). This is not to say Aristotle does not think the essence of a house is explanatory of why houses have certain other, *in itself* features but only that, as in *APo* II.2 and II.8, in *Metaph.* VII.17 this is not the thesis about essence with which Aristotle is primarily concerned.

explain or demonstrate the existence of a subject-kind is just to explain why there are instances of that kind, i.e., what makes such and such things instances of that kind).⁸⁷

Crucially, in either case, this is a different claim than the one found in *DA* I.1, where Aristotle suggests that one can make clear or come to know the basic essence of a kind not by identifying the cause of the kind but rather by identifying the cause of the kind's in itself accidents, i.e., why the kind has such and such necessary but non-essential features.

§6.3: An Enriched Explanation Interpretation

In the preceding section, I argued that Aristotle makes two distinct non-epistemological claims about basic essences. On the one hand, Aristotle holds that the basic essential features of a kind can be distinguished from its non-basic-essential but necessary features by virtue of the former's explanatory role: the basic essence *E* of a kind is not only a necessary feature of the kind but also such that (a) *E* does not belong to any instance of the kind in virtue of other features of the kind belonging to that instance and (b) at least some of the other necessary features of the kind (viz., its *in itself accidents*) belong to its instances (at

⁸⁷ Against this, one might raise the following worry: doesn't Aristotle suggest in *Metaph.* VII.17 that inquiring into why a member of a kind is of that kind is 'like inquiring into nothing at all?' (see 1041a14-22). In response, I note that the chapter suggests that asking 'why is a *K* a *K*?' is like inquiring into nothing at all, not that asking 'why is this sort of thing a *K*?' is like inquiring into nothing at all. In fact, the chapter seems to raise questions of just that form, e.g., 'Why are these things here a house?' or 'Why is this thing here a human being?' (see 1041b5-7).

Now one can press whether this really is a case of asking why something is a member of a kind on the grounds that Aristotle seems to think the question really is 'why is such and such matter a *K*?' (see 1041b5, b7-8). Some authors (e.g., Bostock 1994: 244) claim that the matter in question is not itself a member of the kind but rather only the matter of a member of the kind. But I'm inclined to disagree with this idea. The question 'Why is *S* a *K*?' presupposes that *S* is a *K*. For example, the question 'Why are these things here a house?' presupposes that these things are a house, and the question 'Why is this thing here a human being?' presupposes that this thing here is a human being. In fact, Aristotle himself makes this point when he notes that 'the existence of the thing must already be given' (1041b4-5): if we ask 'Why is *S* a *K*?', it must already be given that *S* is a *K*; indeed, earlier Aristotle says if we ask why *K* belongs to *S*, 'it must be evident that it does belong' (see 1041a23). Hence, contrary to what some authors (e.g., Bostock 1994: 244) suggest, whatever '*S*' refers to, it is something which can be aptly characterized as 'a *K*', i.e., an instance of the kind *K*. (I note that this claim is compatible with it being the case that *S* is not actually a *K* except insofar as *what-being-is-for-a-K* belongs to *S*).

least in part) because E belongs to those instances. On the other hand, Aristotle claims that in the case of kinds which have ‘causes other than themselves,’ the basic essence of a kind includes its cause.

Moreover, I have argued that each of these non-epistemological claims about basic essences opens the way for a distinct epistemological claim about basic essences, each of which can be found in evidence in Aristotle’s texts. On the one hand, the idea that the basic essence of a kind is what explains why it has the *in itself accidents* that it does opens the way for the epistemological claim, discussed in *DA* I.1, that one can make clear what a kind’s basic essence is by identifying what feature(s) of the kind explain why it has the *in itself accidents* that it does. On the other hand, the idea that, for some kinds, the basic essence of a kind includes its cause opens the way for the distinct epistemological claim, discussed in *APo* II.2 and II.8, that one can make clear what a kind’s basic essence is by identifying the kind’s cause.

At this point, one might well wonder how, if at all, these two distinct non-epistemological claims and corresponding epistemological claims fit together. In what follows, I suggest that the two strands can be unified in what I call an ‘Enriched Explanationist Interpretation’ of Aristotle’s epistemology of essence.

Consider first the two non-epistemological claims about basic essences. Two important results follow from the combination of these claims. First, if a kind is such that it has a cause other than itself, then not only is the cause part of the kind’s basic essence but also the fact that the kind’s instances are caused in this way is an indemonstrable fact. Thus, for example, the fact that an eclipse is due to the obstruction of the earth is an indemonstrable fact about eclipses; it is not the case that there are some other feature(s) of an eclipse such that the fact that an eclipse is due to the obstruction of the earth can be

explained by reference to these other features. Second, it also follows from the combination of the two theses that if a kind has a cause other than itself, then the fact that it has this cause plays a role in explaining why it has the other characteristic but non-basic-essential features (e.g., the *in itself accidents*) that it does. Thus, for example, the fact that an eclipse is due to the obstruction of the earth plays a role in explaining why an eclipse involves a circular black spot which gradually overtakes the whole surface of the moon. Likewise, the fact that thunder is due to the quenching of fire plays a role in explaining why thunder involves the booming sound that it does and why thunder is preceded by lightning.

The combination of the two non-epistemological claims about essence also has consequences for each of the aforementioned epistemological claims. On the one hand, the non-epistemological claim that the basic essence of a kind includes the kind's cause, if there is one, implies that the epistemological claim in *DA* I.1 can be expanded with the suggestion that one investigate whether the kind is such that its instances are all caused in a certain way and, if so, whether the fact that they are caused in that way can be used to explain why they have the *in itself accidents* that they do. Thus, for example, in the case of an eclipse, the suggestion is that, in looking to explain why eclipses have the *in itself accidents* that they do (e.g., why eclipses involve a circular black spot which gradually overtakes the whole surface of the moon), one consider what the cause of an eclipse is and whether the fact that an eclipse is caused in that way can be used to explain why eclipses have such features. On the other hand, the non-epistemological claim that the basic essence of a kind is explanatory of why the kind has the *in itself accidents* that it does implies that the epistemological claim in *APo* II.2 and II.8 can be supplemented by the idea that, in looking for the cause of a kind, one should look for something which can play a role in explaining why it has the *in itself accidents* that it does. Thus, for example, in looking to identify the cause of an eclipse, one must look

for something which can explain why eclipses have the characteristic but non-basic-essential features that they do. Indeed, the hypothesis that an eclipse is caused by the *obstruction of the earth* rather than by, say, the rotation of the moon or the destruction of the moon (see *APo* II.8 93b5-6) is confirmed by the fact that, unlike the latter hypotheses, the former can explain why eclipses have the particular *in itself accidents* that they do, e.g., why an eclipse involves a circular black spot which gradually overtakes the whole surface of the moon and why an eclipse is something which recurs periodically.

In summary, the combination of Aristotle's two non-epistemological claims about basic essences provides the basis for what I call an 'Enriched Explanationist Interpretation' of Aristotle's epistemology of essence. The core insight of the Explanationist Interpretation is retained: one can identify what a kind's basic essence is by identifying what feature(s) of the kind ultimately explain why it has the *in itself accidents* that it does. However, Aristotle's additional non-epistemological thesis provides a way to develop the original Explanationist proposal. In looking to identify what feature(s) of a kind ultimately explain why it has the *in itself accidents* that it does, one should consider whether the kind has a cause other than itself, for if it does, then the cause is to be included in the basic essence which ultimately explains why it has the *in itself accidents* that it does. On the other hand, in looking to identify such a cause, one must attend to whether the proposed cause can play a role in explaining why the kind has the *in itself accidents* that it does. If it cannot, one has some evidence that one has misidentified the kind's cause, for the kind's cause must be something which would explain the occurrence of something which has those *in itself accidents*.

§7: Conclusion

This essay has offered a systematic discussion of the three main interpretations of the epistemology of essence proposed in Aristotle's *Analytics* and related methodological passages outside the *Analytics*. I have argued that the Socratic and Intuitionist Interpretations face decisive problems arising from their lack of fit with the explanatory role Aristotle assigns to basic essences. By contrast, the Explanationist Interpretation fits well with Aristotle's views on the explanatory role of basic essences. I have also shown that there is strong textual evidence in favor of the Explanationist Interpretation and that the textual arguments given for the Socratic and Intuitionist Interpretations do not in fact provide strong support for those interpretations. At the same time, in the previous section I argued that standard Explanationists have erred in their assessment of Aristotle's claims in *APo* II.2 and II.8. Instead of recapitulating the same Explanationist story found elsewhere (e.g., in *DA* I.1), in these texts Aristotle introduces a different element in his theory of essence, a non-epistemological thesis about the connection between a kind's essence and its cause which forms the basis for my Enriched Explanationist Interpretation of Aristotle epistemology of essence. Before concluding, I wish to highlight here the relevance of the preceding discussion to Aristotle scholarship in general and to contemporary discussions of essentialism.

On the one hand, clarifying Aristotle's views on how we come to know essences (and other principles) is a crucial task for Aristotle scholarship. Much of Aristotle's philosophical and scientific writing is aimed at identifying principles, especially essences (e.g., the essence of soul, the essence of substance, etc.). Whatever Aristotle's epistemology of principles turn out to be, we should expect it to inform the methodology of his scientific and philosophical treatises. Hence, if we want to understand the procedures and methods

deployed in those treatises (e.g., appeals to the *phainomena*, applications of the method of division, etc.), we need think about what role in general Aristotle assigns to these procedures in scientific inquiry. If the arguments of this dissertation are correct, we should expect to find the justification for the principles Aristotle posits in their purported ability to explain the facts with which the investigation is concerned. Moreover, if we find Aristotle employing the method of division to define a kind, we should not expect the resulting definition to be a definition which Aristotle thinks is the definiendum's basic definition, i.e., a definition which is meant to pick out the kind's explanatorily basic necessary features and serve as a principle within the relevant science.

On the other hand, it is also important to highlight some limitations of the preceding discussion. I have focused on the epistemology of essence proposed by Aristotle in his *Analytics* and certain other methodological passages outside the *Analytics*. Though I have argued that the epistemology of essence proposed in these methodological texts is Explanationist, I have not shown that the procedures actually employed in Aristotle's philosophical and scientific treatises fit the Explanationist procedure recommended in these methodological texts. A related limitation of this paper is that it does not address the question of what role, if any, Aristotle takes *dialectic* to play in the discovery of principles.⁸⁸ Many commentators have maintained that Aristotle employs dialectical reasoning to establish results in his philosophical treatises, including principles such as the definition of *place* reached in *Phys.* IV.1-5.⁸⁹ To properly address the question of how dialectical reasoning can help us establish principles would require a careful analysis of Aristotle's account of

⁸⁸ For evidence that Aristotle thinks *dialectic* can be useful in this regard, see *Topics* I.2 101a36-b4.

⁸⁹ See the references in n.6 above. For discussion of the example of *place* in *Phys.* IV.1-5, see Owen 1986/1961: 241-244 and Owen 1986/1970: 155. In contrast to Owen, Bolton (1987: 164-166; 1991) argues that Aristotle uses dialectical reasoning in the *Physics* (and in particular in the discussion of *place* in *Phys.* IV.1-5) not as an alternative to the Explanationist programme but as an aid to carrying out the Explanationist programme.

dialectical reasoning, discussion of the relationship between perceptual *phainomena* and dialectical *phainomena* (i.e., *endoxa*), and engaging the general issue of what the relationship is between the ‘dialectical’ mode of inquiry described primarily in the *Topics* and the ‘scientific’ mode of inquiry described primarily in the *Analytics*.⁹⁰ For now, I claim to have shown only that the epistemology of essence recommended by Aristotle for ‘scientific’ inquiry is Explanationist rather than Intuitionist or Socratic.

In addition to being relevant to Aristotle’s scholarship in general, this paper’s discussion of Aristotle’s epistemology of essence is also relevant to contemporary work on the topic. I noted at the outset of this essay that there has been relatively little discussion of the epistemology of essence in contemporary philosophy and, of the relatively few pieces written on the topic, none addresses the history of the topic. Hence, contemporary work on the epistemology of essence could benefit from considering historically influential discussions of this issue.

More specifically, my discussion of the need for fit between one’s account of how essences are known and one’s account of what essences are offers a specific lesson for contemporary essentialists. The lesson involves a novel instance of an ‘integration challenge’ of the sort discussed by Christopher Peacocke. Peacocke writes,

In a number of diverse areas of philosophy, we face a common problem. The problem is one of reconciliation. We have to reconcile a plausible account of what is involved in the truth of statements of a given kind with a credible account of how we can know those statements, when we know them. (1999: 1).⁹¹

For example, the mathematical platonist faces the challenge of explaining how it is that we have the knowledge that we have of mathematical truths given her view that these truths

⁹⁰ For an Explanationist-friendly discussion of the relationship between dialectic and analytical methods in Aristotle, see Bolton 1987; Bolton 1990; and Bolton 1991.

⁹¹ For further discussion of this idea, see Peacocke 1997.

concern independently existing abstract objects with which we have no causal contact. In a similar vein, the Lewisian modal realist faces the challenge of explaining how it is that we know certain necessary truths given his view that these truths concern independently existing concrete objects with which we have no causal contact.

The novel integration challenge that I have in mind is the challenge of integrating one's view of what is involved in some feature(s) being (part of) the essence of a kind with one's account of how it is that we can discover what the essence of a kind is. Thus, for example, if one thinks (as Aristotle does) that the (basic) essence of a kind includes all and only its explanatorily basic necessary features, then the procedure by which we come to know a kind's (basic) essence must be one which can distinguish a kind's explanatorily basic necessary features from its other features. It was argued above that neither the Intuitionist account nor the Socratic account of Aristotle's epistemology of essence describes such a procedure and hence that neither offers an epistemology of essence which fits with Aristotle's conception of essence. By contrast, the Explanationist procedure is well-suited to distinguish a kind's explanatorily basic necessary features from its other features and hence fits with Aristotle's conception of essence. Though the concern of this paper has been Aristotle's essentialism, the point generalizes to other forms of essentialism: one's account of how we can know what a thing's essence is must be integrated with one's view of what is for something to be the essence of that thing, whatever that should turn out to be.

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