

Metaphysical Alternatives vs. Alternative Semantics

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Edited by

Alex Hall, Gyula Klima and Timothy Kearns

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INTRODUCTION

TIMOTHY KEARNS

The first professional philosopher whose name I heard was Gyula Klima. When I was a classics major at the University of Texas at Austin, I had a friend who was a physics, mathematics, and philosophy triple major there, and he began telling me about many things that I knew nothing about. One of those things was how exciting Klima's work was, especially his logical systems and his work on Buridan and his efforts to bring the tools of medieval logicians, like ampliation, to the contemporary philosopher. "Ampliation," my undergraduate friend said, "cuts through the problems of analytic philosophy like the McCormick reaper through wheat." The first essay I read of Klima's, in fact the first philosophy paper I read, was on what a scholastic can do in the 21st-century. At that point I was still a classics major and would go on for several more years to do medieval philology and legal history. But, somehow, in my heart, I was convinced by what Klima had articulated in that essay and convinced of its central importance to our time.

I saw what he articulated there as perfectly in accord with what I found later when I read Alastair McIntyre's *After Virtue*. Philosophy was not to be exclusively an academic discipline but rather something that leads us into truth and according to which we seek to live. But even practical life has its technicalities, its precisions, its doubts, its unresolved circles of reasoning and intuition, and these cannot be treated superficially or in an easy way; we must seek precise answers. And a search for such answers is what I saw in Klima's work, a search for these answers against a backdrop of an understanding of philosophy that was both academic and rigorous on the one hand and personal and practical on the other. It is easy to opine about the practical life and how to live and in a certain sense it is also easy to do specialized work in a very narrow sub field (although harder than opining about life, of course). But what is not easy is to do specialized work in a narrow subfield in such a way that that work illuminates and combines with and deepens our broader understanding of things, our personal search for wisdom, and even our practical life.

My reflections on Klima's work ends with this observation: Klima has challenged me personally, never to be content with something fractured, fragmented, or merely easy. Sometimes the only way forward is through rigorous technicalities set within a relentless inquiry into the deepest things. (And to those who teach philosophy let me only add a lesson from my experience learning about Klima as an undergraduate: your students are watching you and following you and you will lead them even if you don't think you are, sometimes even ones you don't know about.)

This volume is meant to honor what Klima has done for the discipline; he is the president and founder of the Society for Medieval Logic and Metaphysics.

Much of Klima's work has centred around issues of logic, epistemology, and metaphysics, and all three of these areas of inquiry come together in the question of what Aristotelian demonstration is and what its fundamental criteria are, the subject of the first essay in this volume. In that paper, Lucas Angioni sketches a new picture of what demonstration is according to Aristotle and compares his picture with that of Aquinas. In his reply, Alex Hall argues that Angioni's picture is not really new after all and broadly accords with how we should understand the Thomistic account of demonstration; but Hall agrees that what Angioni characterizes as the standard scholarly consensus gets one part of the issue wrong. In the second essay, Jason Reed revisits one of Klima's interests in metaphysics, arguments for the existence of God; Reed considers the varieties of cosmological arguments, in particular that of Aquinas and some of his recent critics, notably William Lane Craig, on the issue of uncaused contingents. Domenic D'Ettore next discusses the question of being as first known and its relation to the Thomistic doctrine of analogy. D'Ettore draws on the work of two renaissance Thomists to raise an intriguing question within the Thomistic framework, with which he ends his article: "Specifically, is being, as it is first conceived by the intellect, bound up with or altogether separated from the nature of the concrete material thing (from the phantasm of which the intellect first forms its conception of being)?" In his reply, Klima proposes a strong suggestion for an answer, which is taken up by D'Ettore in his reply to Klima and sketched out a little more, with the promise of further consideration elsewhere. Next, Gregory Doolan raises a question close to the logical and metaphysical core of Klima's work but more in the medieval frame than in that of modern logic: Aquinas says that genus and species are accidents of real being; but, given what accidents are, what does this mean? Doolan outlines his answer; but to this Tomaszewski replies with further questions, especially regarding the notion of species as

it applies to angels; and in reply to this Doolan produces a careful and detailed analysis of six uses of the term “species” in Aquinas. Claude Panaccio continues his conversation with Klima and other authorities on Ockham’s account of intentionality, in particular replying against Klima and aiming to show that Ockham’s externalist account of intentionality does open the way to demon skepticism but does not lead to the contradiction that Klima has claimed it does. Finally, J T Paasch follows Klima’s example and aims to make a rational and natural reconstruction of Ockham’s semantic theory by using the mathematical concept of a presheaf over a branching timeline. Since Ockham builds modalities into the foundations of his system, right alongside the present tense, Paasch argues that we must do this too, and the most natural way, he suggests, is with a precise mathematical structure that treats possibilities in their relations to objects rather than to whole possible worlds. Klima is sympathetic to Paasch’s overall project, although he has reservations about key moves that Paasch makes in the setup of this theory.

This volume promises stimulating reading for anyone interested in key themes from the medieval and contemporary traditions, across logic, epistemology, and metaphysics. It represents just the latest contribution of the Society for Medieval Logic and Metaphysics to these ongoing scholarly debates.

ARISTOTLE AND AQUINAS ON DEMONSTRATION

LUCAS ANGIONI

1. Introduction

Aristotle uses the noun “*apodeixis*” and the verb “*apodeiknumi*” in several ways in his treatises. Beyond the well known uses in the *Analytics*, we also find “*apodeixis*” both in *Rhetorics* and *Poetics*. In *Rhetorics* (e.g., 1394a10, 1394b8), the noun refers to a rhetorical enthymeme, and the verb “*apodeiknumi*” is employed in (e.g.) 1419b14 as picking out a forensic speech in which one of the sides is shown to be right and the opponent is shown to be wrong. In *Poetics* 1450a7, “*apodeiknumi*” has the force of *showing something, making it plain* (similarly in 1450b11 and 1456a37). These wider uses are not my concern here. But it is convenient to emphasise the wide range of uses of those words in Aristotle because, even within the *Analytics*, both the noun “*apodeixis*” and the verb “*apodeiknumi*” are employed to refer to different items. In the *Prior Analytics*, those terms are frequently employed to introduce the notion of a formal proof—usually one with schematic letters—which shows how a conclusion of a given form can be established from proper combinations of premises of a given form. When we find concrete terms instead of schematic letters, “*apodeixis*” and “*apodeiknumi*” usually can be taken as conveying the notion of a sound deduction. Given that each of the two *Analytics* are parts of the same enterprise (whatever that is), and given that Aristotle emphasizes this continuity both in the beginning (*Prior Analytics* II.1, 24a10-11) and in the end (*Posterior Analytics* II.19, 99b15-17), readers might be tempted to conclude that both “*apodeixis*” and “*apodeiknumi*” are used in the same ways in the *Prior* and in the *Posterior Analytics*. However, things are not so tidy.

In the *Prior Analytics*, the main concern when “*apodeixis*” or “*apodeiknumi*” are employed is with establishing the conclusion as a necessary consequence of the premises. Even in more particular occurrences in which examples of concrete true predications have been provided, Aristotle’s main concern is with showing that the conclusion soundly follows from the premises. Now,

in the *Posterior Analytics*, Aristotle sometimes uses “*apodeixis*” and “*apodeiknumi*” for an argument that is nothing more than a sound deduction. But these occurrences are watered down exceptions—they are cases in which “*apodeixis*” and “*apodeiknumi*” have been used more loosely due to the particularities of the discussions at stake.¹ For, in fact, the key notion of *apodeixis* that is central in the *Posterior Analytics* requires more than a merely sound deduction of the conclusion. *Apodeixis* in the *Posterior Analytics* requires, besides other things, the appropriate explanatory factor of the state-of-affairs expressed in the conclusion be captured in the middle term. The main concern narrows down from *establishing that the conclusion is true (from true premises)* to *explaining—in the most appropriate way—why the explanandum is as it is*. In the *Posterior Analytics*, “*apodeixis*” and “*apodeiknumi*” are employed as “terms of art” for syllogisms that express the key notion studied in the treatise, namely, the notion of *having scientific knowledge of something simpliciter* (*epistasthai hekaston haplôs*), which is defined in 71b9-12.

2. The Definition of Scientific Knowledge (71b9-12):

Aristotle presents a definition of scientific knowledge on the basis of two conditions in 71b9-12. A few lines ahead, in 71b17-18, he employs the word “demonstration” (*apodeixis*) to refer to the syllogistic formulation which expresses scientific knowledge. Thus, it is plain that the more demanding notion of demonstration introduced in the *Posterior Analytics* can—or, actually, must—be clarified in the light of the definition of *scientific knowledge*. How could one know what *apodeixis* is, if one does not know what the core notion expressed in an *apodeixis* is?

Aristotle’s definition runs thus:

T1: “We think we have [scientific] knowledge of something—really, not in the sophistical way, on the basis of a concomitant factor—when we think we know of the cause because of which the explanandum holds that it is its cause, and also that it is not possible for it to be otherwise” (71b9-12, my translation).

“Ἐπίστασθαι δὲ οἰόμεθ’ ἕκαστον ἀπλῶς, ἀλλὰ μὴ τὸν σοφιστικὸν τρόπον τὸν κατὰ συμβεβηκός, ὅταν τὴν αἰτίαν οἴωμεθα γινώσκειν δι’ ἣν τὸ πρᾶγμα ἐστίν, ὅτι ἐκείνου αἰτία ἐστί, καὶ μὴ ἐνδέχεσθαι τοῦτ’ ἄλλως ἔχειν” (Text from Ross’ 1949).

¹ See, e.g., I.13, 78a30, 36; I.22, 83a20-21 (as even Philoponus acknowledges, see 239.29-240.11); II.16, 98b11.

When discussing a given definitional statement, in which a subject introduces the *definiendum* and the predicate introduces the *definiens*, we usually give more attention to the *definiens*. That's natural—for we normally know what has been taken as *definiendum* and we want to know how it is that the *definiens* defines it. However, Aristotle's passage has been so discussed—and misunderstood—that my examination will involve a closer-looking discussion of the *definiendum* too.

2.1. Aristotle's *definiendum* in 71b9-12:

Three things require more attention about the *definiendum*:

[1] what exactly has been introduced as *definiendum*, i.e., what Aristotle is concerned with defining;

[2] why the *definiendum* is presented in the way it is presented, i.e., with the particular phrasing found in the Greek;

[3] what the *definiendum* *presupposes* in the backstage in such a way that will affect the choice of elements put into the *definiens* account.

In order to unfold the appropriate answers for these questions, I start with a brief, provisional survey of the two conditions found in the *definiens*. For easiness of reference, let me employ the expression “*epistasthai haplos*” (i.e., knowing [something] simpliciter) to refer to what Aristotle has introduced as *definiendum* in 71b9-12. Aristotle defines the notion of *epistasthai haplos* by means of these two conditions:

[A] the *causal-explanatory* condition: knowledge of the *pragma X* requires knowing that the cause of the *pragma X* is the cause of the *pragma X*.

[B] the *necessity* condition: knowledge of the *pragma X* requires knowing that “it” cannot be otherwise.

In most standard views, Condition [A] has been understood in the following way. There is a more general item in the backstage: knowledge in general. But knowledge, in general, does not need to involve an explanatory grasp. One can know a good deal of plain things without knowing their explanations. However, Aristotle happens to be concerned with a superior form of knowledge, which basically involves grasping the explanations. Actually, Condition [A] is taken as *making the point* that a superior form of knowledge—expert or scientific knowledge—involves grasping the explanations. Besides, as it is possible for someone to grasp the item that

happens to be the cause of *X* without realizing that it is the cause of *X*, Aristotle stresses that one must grasp the item in question *as the cause of X*.

This interpretation invites one to take Condition [B] as an independent addition with no intrinsic connection with Condition [A].² Thus, most standard accounts take the pronoun “it” (“*touto*” in 71b12) as referring back to the state-of-affairs to be explained, *X* (the *pragma*, which is also the referent of “*hekaston*” in 71b9). By understanding the reference of the pronoun in this way, we get the thesis that the “objects” of scientific knowledge, namely, the states-of-affairs that come to be expressed in the conclusions of demonstrations, are necessary. Given that those states-of-affairs have a predicative structure (and their linguistic expression is a predication), the thesis we thus attain is that the predicative tie holding between the subject and the predicate of the conclusion is necessary, and the predication is necessarily true (whatever that means in a more fine-grained analysis of modalities and of the semantics of predication)³.

However, I do not agree that those interpretations capture what is the exact message Aristotle introduces with Conditions [A] and [B]. Attention is needed here. In order to identify what I am disagreeing with, let me summarize the core of the standard interpretations in the following italicized catch phrases below:

—Condition [A]: Aristotle stresses that the higher form of knowledge taken as definiendum in 71b9-12 *involves grasping the cause of X as cause of X*.

—Condition [B]: Aristotle stresses that the higher form of knowledge taken as definiendum in 71b9-12 *involves knowing that X is necessary*.

An important distinction is usually overlooked in the literature: one question is whether the content of the italicized phrases above are accepted by Aristotle, or not; another question is whether those italicized phrases represent the exact point Aristotle is making in 71b9-12, or not. I do agree that Aristotle accepts the content of both phrases: scientific knowledge involves both *grasping the cause of X as cause of X* and *knowing that X is necessary* (with the exception of the “*for the most part*” truths). But I do not agree that the content of those catch phrases represent the point Aristotle *is introducing* in 71b9-12. Rather, the content of those phrases represents theoretical stances that Aristotle *presupposes in the backstage* of 71b9-12,

² See Barnes 1993, p. 92 (see my criticism in Angioni 2020, p. 233-4).

³ There is no room here to provide a more fine-grained analysis of modalities and of the semantics of predication. For discussion of these issues, see Malink 2013.

whereas the points Aristotle is actually introducing in that passage are more particular and more demanding.

Thus, before spelling out how I understand Conditions [A] and [B] themselves, I need to explain what Aristotle presupposes in the backstage of 71b9-12. And, in order to see what Aristotle presupposes in the backstage, I will return to the definiendum itself and to the three questions I raised before.

2.1.1. “*Epistasthai*”:

Let me start with the first of those questions:

[1] what exactly has been introduced as definiendum? I.e., what is Aristotle concerned with defining?

At a general level, there is a consensus among scholars devoted to deciphering the *Posterior Analytics*: Aristotle’s definiendum is not the *general notion of knowledge*, but something more specific, namely, a higher form of knowledge scholars have been calling “scientific (or expert) knowledge” or “scientific (or expert) understanding”.⁴ So far, so good.

But saying that Aristotle’s definiendum is scientific (or expert) knowledge or understanding is still too general. Recent scholarly discussion—influenced by Burnyeat (1981)—has adopted the view that the notion of scientific knowledge Aristotle is trying to define should be taken as equivalent to a *holistic* understanding an expert has over the *whole domain* of a given discipline. This interpretive trend believes that Aristotle’s key purpose in the *Posterior Analytics* consists in examining the epistemic attitude an expert has to *every* proposition belonging to a given scientific domain.⁵

Again, extra attention is needed. For, I do not deny that Aristotle accepts things this interpretive trend ascribes to him in general. Several things scholars have been saying about the notion of “scientific understanding” as a “holistic mastery over the domain of a given discipline” turn out to be true. But I *do deny* that this notion of “holistic understanding” is the right interpretation of what Aristotle is *introducing* in T1. Aristotle’s driving

⁴ See Ross 1949, p. 507; Bronstein 2016, p. 35-36; McKirahan 1992, p. 22. For a different view, see Ferejohn 2013, p. 64-66.

⁵ See Burnyeat 1981, p. 97 and 99 (“an account of the conditions *for a proposition to belong to a body of systematic knowledge* like geometry”); Bronstein 2016, p. 125; Gasser-Wingate 2021, p. 16-19.

question in 71b9-12 does not amount to something like this: “what is it for an expert to have the *overarching mastery over the whole domain*?”. Several things Aristotle says here and there in the *Posterior Analytics* display some theoretical stances concerning this question. But Aristotle’s driving question in 71b9-12 is something more particular, and his focus is narrower than the whole domain of a scientific discipline. First of all, Aristotle already presupposes in 71b9-12 that *epistasthai* is a higher form of knowledge that essentially depends on the capability to provide reasonably successful explanations of the phenomena in a given domain. Thus, this presupposition is not the point he is introducing. Rather, Aristotle is centrally concerned with the conditions for *full success* in the activity of expert explanation—in opposition to false appearances of success that, despite being not really successful, display a significant number of credentials. But, most important of all, Aristotle’s focus—instead of being the whole domain of a scientific discipline—turns out to be each explanandum itself. Thus, his central question in 71b9-12—instead of being “what it is for an expert to have the *overarching mastery over the whole domain*”—is rather the following: “what it is for an expert to reach *full success in the explanation of a given explanandum*”.⁶

In order to flesh out these claims, I will address the two remaining questions about the definiendum:

[2] why the definiendum is presented in the way it is presented, i.e., with the particular phrasing found in the Greek;

[3] what the definiendum *presupposes* in the backstage in such a way that will affect the choice of elements put into the definiens account.

2.1.2. “*Epistasthai hekaston*”:

The phrasing of the definiendum starts with “*epistasthai hekaston haplos*”—then it is enhanced with a foil: “*me ton sophistikon tropon ton kata sumbebekos*”. I will start with “*epistasthai*”. As it normally happens

⁶ Burnyeat 1981, p. 100, came closer to this view, despite favouring the holistic interpretation: “There is that use of the phrase [*sc. knows*] in which a man said to possess scientific knowledge is a man who knows, is familiar with, a whole science or branch of knowledge: ‘He knows mechanics’, ‘He knows calculus’. But *Aristotle is concerned with the cognitive state such a man has to particular propositions within the science*, as comes out when he distinguishes unqualified ἐπιστήμη *with respect to a theorem of a science* from various qualified or accidental versions of ἐπιστήμη *in relation to the same theorem*” (my italics).

with expressions in any language, “*epistasthai*” is used in several ways, according to each context. Now, in the context of 71b9-12, “*epistasthai*” is used to refer to that higher kind of knowledge that essentially depends on a reasonable degree of success in explaining the phenomena in a given domain. In other words, “*epistasthai*” by itself (without considering the adverb “*haplôs*” in the same line) refers to *expert knowledge* understood in general terms as a competence that centrally depends on the successful explanation of the phenomena in a given domain.

This should not come as a surprise. After all, the use of “*epistasthai*” and related expressions, such as “*episteme*”, “*hoi epistemonēs*”, and so on, to refer to expert knowledge outlined as a capacity to provide explanations in a given domain is quite common in Aristotle’s works.⁷ Shortly I will flesh out this claim with the examination of the other elements in 71b9-12. For the time being, let me stress the following consequence. If the use of “*epistasthai*” itself already encodes the notion of expert knowledge outlined in the way I propose, then Aristotle does not need to *make the point* that the highest manifestation of that form of knowledge requires grasping the explanatory factor of X as explanatory factor of X. For, indeed, providing an explanation is (by definition) identifying an explanatory factor of a given explanandum X as an explanatory factor of X. This shows the importance of my question [3] above. In fact, identifying what presuppositions the occurrence of “*epistasthai*” encodes in 71b9 put us in a better position to understand Aristotle’s choice of elements in the definiens account.

That said, I proceed to the next steps. Aristotle’s phrasing narrows down his definiendum. First, the addition of “*hekaston*” leads us from the general notion of expert knowledge (outlined as a capacity to provide explanations *in general* in a given domain) to the more particular notion of providing the explanation of a *given explanandum* within a discipline; next, the addition of the adverb “*haplôs*” leads us from this notion of providing the explanation of a *given explanandum* within a discipline to the stricter notion of providing the *fully successful explanation of a given explanandum within a discipline*.

The pronoun “*hekaston*” is really important here. First, in this context, it stands for the same thing referred to by the word “*pragma*” in 71b11, namely, that of which an explanatory factor is asked (and must be provided),

⁷ This general notion of expert knowledge can be tracked in (e.g.) *Metaphysics* I.1 (especially 981a24-b6), VI.1-2 (especially 1025b4-13, 1026b4-14, 1027a19-26), XI.7, 1063b36-1064a10; *Sophistical Refutations* 9, 11 (esp. 170a22ff., 172a15-16ff.). For a useful approach, see Coope 2021, p. 110.

and which will be expressed as the conclusion of the demonstration (see 71b22)—in short, “*hekaston*” in this context stands for a given explanandum within a given discipline. Besides, “*hekaston*” has a distributive force equivalent to this: “for any specific explanandum an expert can come to know within a given discipline”. Nothing in the context indicates that “*hekaston*” would license the holistic interpretation, as if knowing *each thing* could be taken as equivalent to knowing *all things together in their systematic web*. Therefore, what Aristotle is introducing as definiendum does not respond to these questions:

—What is it for an expert to have the *overarching mastery over the whole domain*? What is the epistemic attitude an expert has towards *every proposition* belonging to a scientific domain (including those propositions which are not explananda)?

It rather corresponds to the following question:

—What is it for an expert to have the explanation *of a given explanandum* within a given discipline?

2.1.3. “*Epistasthai hekaston haplôs*”:

There is common agreement about one thing concerning the adverb “*haplos*” in 71b9: it indicates a *higher* level of knowledge. From mere “*epistasthai*” (without “*haplôs*”) to “*epistasthai haplôs*”, there is an upgrade. However, there is disagreement concerning the *termini* of that upgrade. In what follows, the level “[0]” indicates mere “*epistasthai*” without “*haplôs*”, that is, in other words, it indicates what Aristotle presupposes as background for a better contrast highlighting the notion to be defined; on the other hand, level “[1]” indicates “*epistasthai haplôs*”, which introduces the definiendum itself. Thus, most interpretations understand the upgrade according to the following schema:

[0]— “*epistasthai*” = knowledge in general;

[1]— “*epistasthai haplos*” = expert knowledge.

Now, such an interpretation is on the right track, but something more is needed. On my interpretation, the notion of knowledge in general is not even in the backstage, and the upgrade must be understood in this way:

[0]— “*epistasthai*” = expert knowledge in general;

[1]— “*epistasthai haplos*” = *highest level* expert knowledge.⁸

As I said, Aristotle uses “*epistasthai*” in many ways. One of those ways is precisely to indicate expert knowledge, understood in general outlines on the basis of one distinctive feature, namely: knowing the explanations of the relevant states of affairs in the domain of the discipline. (And the same holds for “*eidenai*” too). This is where it becomes really important to have an adequate grasp of the foil Aristotle employs in the introduction of the definiendum in 71b9-12, namely, the *sophistical way* of *epistasthai*. Now, sophists are essentially driven by the purpose of producing a false semblance of being knowledgeable.⁹ But what being knowledgeable amounts to depends on each context. Thus, different kinds of sophistical arguments will aim at producing a false semblance of (what we nowadays call) validity, a false semblance of sound deduction, or a false semblance of expert demonstration. Now, since *epistasthai* in the context of 71b9-12 is taken as the general ability to provide reasonably successful explanations in a given domain, it is reasonable to take the “sophistical way” as an attempt to produce seemingly successful explanations—in a word, explanations that will seem to be successful (because they have some important credentials) but actually fail to be so—and they fail because they are based on presumed explanatory factors that merely accompany the explanandum without being fully responsive to it.

Thus, I submit that the upgrade in 71b9-12 must be understood in the following way:¹⁰

[0] “*epistasthai [hekaston]*” = expert knowledge in general = knowing the causes of a given explanandum.

[1] “*epistasthai [hekaston] haplos*” = *highest level* expert knowledge = knowing the fully successful causes of a given explanandum.

And [1] is enhanced by the foil:

⁸ For the time being, I put “*hekaston*” aside to get a better clarification of the “upgrade issue” itself.

⁹ See *Sophistical Refutations* 165a31, 172b10-11; *Metaphysics* 1004b18-25; *Rhetorics* 1355b16-21. For discussion of this point, see Angioni 2023a; Striker 1996, p. 9; Dorion 1995, p. 212; Fait 2007, p. 104–105. For the translation of 165a31 in terms of “appear to be knowledgeable”, see Hasper 2013, p. 14.

¹⁰ Once the “upgrade issue” has been clarified, I now reintegrate the “*hekaston*” element into it.

[1*] “*sophistikos tropos*” = the sophistical attempt to produce a semblance of a fully successful explanation of a given explanandum.

3. *The foil: the sophistical way of imitating expert knowledge:*

This scenario concerning the definiendum (with [0], [1] and [1*]) significantly affects how the definiens part of T1 should be understood. Let me start with Condition [A]. Aristotle’s decisive presupposition in T1 is *not* that knowledge in general might not involve an explanatory claim, as if his definition in 71b9-12 were centrally engaged with *introducing* the point that a higher form of knowledge, “expert knowledge”, *does involve (and is centrally characterised by) grasping the explanations*. Note, again, that I do not deny that Aristotle accepts the content of both the presupposition and the point. Aristotle accepts that knowledge in general might not involve an explanatory claim. Aristotle also accepts that a higher form of knowledge—expert knowledge—*does* involve, and is centrally characterised by, grasping the explanations. However, my claim is that both the presupposition and the point being introduced in T1 are different from what standard interpretations take them to be. Aristotle’s central concern is situated in a more advanced perspective. What has standardly been taken as Aristotle’s official point turns out to be, rather, his presupposition in the context of T1: he presupposes in the background the notion of expert knowledge, in general, as centrally characterized by the capacity of giving reasonably successful explanations in a given domain. Next, the official point Aristotle *introduces* in T1 is something more specific, and stronger, than the general notion of expert knowledge:

[0] *Presupposition*: expert knowledge, a higher form of knowledge, does involve (and is centrally characterised by) grasping the explanations—as everybody knows (and the sophists know that too).

[1] *Official point being introduced*: but full success in expert knowledge—expert knowledge is its highest form—requires a *specific* kind of explanation.

From this perspective, we can explain *not only* why Aristotle presents the definiendum with the peculiar phrasing found in the text, *but also* why Aristotle presents the two conditions in the definiens account in the way he has phrased them.

I have already explored the first part of the peculiar phrasing in which Aristotle presents the definiendum. Now I turn to the second part, the “sophistical way”, which is introduced as a foil designed to enhance the

higher form of expert explanatory knowledge signaled by the adverb “*haplōs*”. Let us consider the phrase again (with a special concern with the italicized parts):

“Knowing each thing—*really, not in the sophisticated way, on the basis of a concomitant factor*”. (Greek: ἀπλῶς, ἀλλὰ μὴ τὸν σοφιστικὸν τρόπον τὸν κατὰ συμβεβηκότος).

The “*kata sumbebekos*” clause, which clarifies what particular kind of *sophistical procedure* Aristotle is talking about here, does not range over the relation between a knower and a cognitive state, as is commonly assumed. The “*kata sumbebekos*” clause is used here in a way that is also found in several other passages. First of all, the preposition “*kata*” has the causal-explanatory force that asks for a translation like “on the basis of”, “in virtue of” or a similar expression. Besides, the employment of “*sumbebekos*” here has nothing to do with contingent, or incidental, predicates (e.g., being fat is a contingent, incidental predicate, of human beings). The item called “*sumbebekos*” is called a *sumbebekos* under the specific aspect under which it is considered *in each context*. Actually, this context-sensitivity is always the case with “*sumbebekos*”. In *Metaphysics* 981a18-20, for instance, *being a human* is a *sumbebekos* of Socrates because Socrates is considered under the particular aspect of being *something to be healed by a doctor*. If the doctor asks for more information about Socrates in order to determine the course of his medical intervention, he would not be satisfied if someone tells him that Socrates is a human being. Although being a human is an essential attribute of Socrates, it is not decisively important to determine the doctor’s examination and course of action. The doctor asks for something more specific, and relevantly informative in the context, such as whether Socrates had other diseases, what his condition is in general, what his dietary routine is, etc. Now, in the context of 71b9-12 (as in several others), the aspect under which a given *pragma* is envisioned is explanation, or even the most appropriate explanation: the identification of the primary explanatory factor that brings the explanatory story to its perfection inasmuch as it attains full responsiveness to what the explanandum is in itself. This is a very demanding standard for explanation. Any other explanatory factor that fails to attain full responsiveness to what the explanandum is in itself can thereby be counted as a *sumbebekos*—even when it delivers a sound deduction of the conclusion, or even when it delivers some contribution to the explanatory story without bringing it to its

perfection.¹¹ The item called “*sumbebekos*” can be (on the level of predications) any kind of predicate; for, what matters (and is decisive for calling it *sumbebekos*) is that, as an explanatory factor (on the level of the explanatory syllogism in which it has been chosen as middle term), that item—although it *comes together* with the state-of-affairs targeted as explanandum—is not *the most important factor for the full success of the explanatory story*.

Now, selecting a wrong explanatory factor is a kind of mistake that a serious expert can sometimes make. Indeed, experts can fail in their attempts, and a reasonable number of failures does not turn an expert into a non-expert. However, an explanatory factor that is not fully successful but has a *seductive appearance* of being so can be manipulated by sophists—those more ambitious sophists who aim at producing an appearance of scientific expertise. This is, precisely, what motivates Aristotle’s points in T1.

Remember what I have said about T1:

[0]- *Presupposition*: expert knowledge, a higher form of knowledge, does involve (and is centrally characterised by) grasping explanations.

[1]- *Official point being introduced*: *fully successful* expert knowledge—expert knowledge in its highest form—involves a *specific kind* of explanation.

Therefore, what Aristotle is trying to define in T1 is not merely expert knowledge on a general level, or expert knowledge taken in block as a holistic understanding of a domain. What he is trying to define is *fully successful expert knowledge of a given explanandum* in a given domain, in contrast with *seductive, but unreal* appearances of expert knowledge, as produced by higher-level sophists.¹² Aristotle is trying to define what it is

¹¹ A *sumbebekos* can even be a “common (i.e., too generic) factor” that nonetheless gets its “credentials” from rendering premises that are not only true, but also immediate and primary (in one of the uses of those two words). Sophists like to employ *sumbebekota* of this type because their “credentials” make it likely for them to produce what the sophists want to produce: an appearance of scientific demonstration. That is Aristotle’s decisive message from *An. Post.* I.9. See Angioni 2016, p. 144, 150-4, 161.

¹² E.g., Bryson (as described in *Posterior Analytics* I.9); the arguments reported in I.5, 74a25-34; the procedure of selecting as explanatory principles propositions that are true, and turn out to have some credentials for the explanation, but lack full explanatory appropriateness (as reported in I.6, 74b21-26). For more details, see Angioni 2023a.

for a *real expert* to have full success in the explanation of a given explanandum. His central concern is the fully appropriate explanation of a given explanandum, *in contrast with* mere appearances of fully successful explanations—those which operate on the basis of concomitant factors satisfying some “credentials”.

4. Back to Conditions [A] and [B] in the *definiens* account:

Now I turn to the two conditions in the *definiens* part of T1.

4.1. [A] The causal-explanatory condition.

Regarding the *causal-explanatory* condition, we must remark that Aristotle has not stated something *true but generic* like this:

“We have expert knowledge of *X* when we know the cause of *X*”;

That sentence is true. My contention here is that Aristotle’s phrasing is more informative. Aristotle has stated something *more emphatic*:

“We have expert knowledge of *X* when we know, about the cause of *X*, that it is *its* cause”.

The accusative “*ten aitian*” in 71b10 is proleptic and should not mislead us into thinking that Aristotle had in mind the more generic statement (instead of the more emphatic one). The proleptic construal consists in taking in advance the subject of the *that*-clause which actually complements the verb (“*ginoskein*”). That subject is proleptically taken as if it were the direct object of “*ginoskein*”, and the effect of such a syntax is to highlight that the cause is the presupposed subject of the central statement introduced by the *that*-clause. Hence, translations such as Barnes’ (which I follow in that part of T1) are completely felicitous in terms of syntax: “when we think we know *of the explanation* because of which the object holds *that it is its explanation*”.

But, actually, a closer examination is still needed, for one might agree with all these remarks about the proleptic construal and, accordingly, reject the generic statement while still sticking to the interpretation I mentioned before, namely:

—Standard interpretation of Condition [A]: the expert must know the cause of *X as cause of X*.

Now, the problem with the statement preferred by the standard interpretation is that it was already encoded in the employment of “*epistasthai*” in 71b9. As I said, the particular occurrence of “*epistasthai*” in 71b9 encodes Aristotle’s presupposition: expert knowledge, in general, is basically characterized by the capacity to provide reasonably successful explanations of the phenomena in a given domain. Now, providing a reasonably successful explanation of a given explanandum exactly consists in identifying the *aitia* of that explanandum *as the aitia of that explanandum*. So, the statement preferred by the standard interpretation is not any more needed in the definiens part of T1: for it has been already taken as a basic presupposition in the phrasing of the definiendum.

Actually, Aristotle has stated something *more emphatic*:

“We have expert knowledge of *X* when we know, about the cause of *X*, that it is *its* cause—in other words, that it explanatorily belongs to *X* in a perfect match”.

The pronoun “*ekeinou*” (captured by “its” in the translation) is the center of the *that*-clause that actually delivers the message of Condition [A]. The translation as “its” inevitably waters down the message. In order to grasp Aristotle’s full message, it is helpful to consider what is the underlying question Condition [A] is addressing. The standard interpretation would be excellent, if Aristotle’s central focus were the epistemological state of the expert:

—has the item *B* (which really is the *aitia* of the *pragma X*) been grasped as the (or “an”) explanatory factor of *X*?

I have already given my reasons to reject that option. Next, consider the following option:

—does the item *B* (introduced as *aitia* of the *pragma X*) really apply to *X* as an explanatory factor?

On a more fine-grained analysis, this question can be narrowed down according to more specific issues, but all of them will only be concerned with *one* direction of the explanatory relation. The explanatory factor (as such) provided in the explanation is the “given” (so to speak), and the question asks whether that factor really does some explanatory work in relation to *X*. This is a legitimate question, and Aristotle is surely concerned with it. But my contention is that Aristotle’s underlying question is even

more specific. Thus, by contrast, consider the following option for understanding Aristotle's underlying question:

—what is the item *B* (really) the cause of?

In this question, that *B* does deliver an explanatory work in relation to *X* is taken as a given. What, more particularly, the question really asks is whether *B* relates to *X* in a strict correlation involving the fullest explanatory appropriateness. The stronger message thus delivered can be captured in the following paraphrase:

“We have expert knowledge of *X* when we know, about *B*, the cause of *X*, that *B* is **the cause of *X*** and **of nothing else (relevantly different from *X*)**”.¹³

Another paraphrase, more generous to the reader, can be the following:

“We have expert knowledge of *X* when we know, concerning *B*, the cause of *X*, that *X*—and **nothing else (relevantly different from *X*)**—is what *B* fully appropriately explains, in the sense of bringing its explanatory story to its perfection by being fully responsive to what *X* really is in itself”.

That is to say: Condition [A] requires a one-to-one, fully appropriate correlation between *B* (the cause) and *X* (the targeted explanandum).

4.2. [B] *The necessity condition.*

It is on this previous ground that Condition [B] naturally emerges.¹⁴ Instead of being an addition with no intrinsic connection with Condition [A], Condition [B] actually presupposes Condition [A] and gives it a further specification. The referent of the pronoun “*touto*” in 71b12 is not “*pragma*” in the previous line, but rather the *hoti*-clause that actually expresses Condition [A]. Thus, Aristotle is actually stating that, in order to have *full success* in the explanation of a given explanandum in a given discipline, an expert must know not only the one-to-one, fully appropriate explanatory connection between *X* and its cause, but also that this fully appropriate explanatory connection cannot be otherwise. Condition [B] can be expanded

¹³ Mure's translation in 1924 went in the right track: “as the cause of that fact and of no other”.

¹⁴ By “naturally” here I have in mind what is sometimes expressed by Aristotle with adverbial expressions such as “*kata phusin*” or “*phusei*”, especially in the biological treatises, which I paraphrase in this way: “by the same growing process resulting in one and the same articulated structure”.

into several aspects. First of all, in the real world, it is the item *B* that necessarily *makes the explanandum what it is* (and no other item, relevantly different from *B*, could be an “alternative” decisive factor making the explanandum what it is). Second, given that *B* and its appropriate explanandum are correlated in this way, no other premises can explain that same explanandum in the fully appropriate way, except the premises that present *B* as *the* explanatory factor decisively making the explanandum what it is. Finally, given that having a targeted explanandum individuates a demonstration (in the sense that the demonstration of *why the property of having its angles sum to two right angles is attributed to triangles* is different from the demonstration of *why the property of having its angles sum to four right angles is attributed to squares*), and given that each explanandum can only be explained with full success by its fully appropriate explanatory factor, *a demonstration itself is necessary*, because it cannot be otherwise, i.e., it cannot have parts different from the parts it has, for it cannot shift its explanandum without becoming a different demonstration, and its explanandum can only be explained with complete success by the premises that present *B* as *the* explanatory factor decisively making the explanandum what it is.¹⁵

Therefore, the so called “necessity condition” in T1 basically ranges over the explanatory connection. What Condition [B] actually conveys is the message that the appropriate, one-to-one explanatory correlation between *X* and its cause is such that cannot be otherwise in the sense that any other cause would never deliver the fully appropriate explanation of *X*, and any other explanandum (relevantly different from *X*) would never be appropriately explained by the same cause.¹⁶ Since appropriate explanations capture what is there in the real world, the content of my last sentence can be reformulated in this way: no other factor in the real world could be the fully decisive factor in making *X* what *X* is, and no other explanandum (relevantly

¹⁵ This last sentence packs the content of Angioni 2023b.

¹⁶ The necessity condition will be cashed out later in the *APo* in terms of *per se* predication, such that it will be clear that the necessity ranging over the *explanans-explanandum* relation is essence-based. Aristotle’s point is that the (most decisive, ultimate) explanatory middle term must grasp the essence (or part of the essence) of the major term, the attribute to be explained. But the further cashing-out of the necessity condition is not my present concern here.

different from X) could be made what it is by the same factor that makes X what X is.¹⁷

5. *Demonstration*:

A few lines after the definition of expert knowledge, we read:

T2: “I state that we know through demonstration” (71b17).

“Φαμὲν δὲ καὶ δι’ ἀποδείξεως εἰδέναι”.

Given that “demonstration” is said in many ways, Aristotle helpfully clarifies what he has in mind when using that word here:

T3: “By ‘demonstration’ I mean [*sc.* here] a syllogism that expresses knowledge. By ‘that expresses knowledge’ I mean the syllogism on the basis of which we have [expert] knowledge—by the fact that we master it [*sc.*, the content of the syllogism]” (71b17-19, my translation).

“ἀπόδειξιν δὲ λέγω συλλογισμόν ἐπιστημονικόν. ἐπιστημονικόν δὲ λέγω καθ’ ὃν τῷ ἔχειν αὐτὸν ἐπιστάμεθα”.

Demonstration is a syllogism that *expresses* episteme (i.e., *epistasthai hekaston haplos*, the cognitive achievement that has been defined in T1). Now, *epistasthai hekaston haplos* has been defined in terms of knowing that the fully appropriate explanation of a given explanandum X is really its fully appropriate explanation—one that cannot be otherwise etc. Therefore, it follows that demonstration is a syllogism that *expresses* the knowledge that the fully appropriate explanation of a given explanandum X is really its fully appropriate explanation—one that cannot be otherwise etc. In other words, the knowledge expressed in a demonstration—the knowledge involved in mastering the content of a demonstration—essentially depends on Condition [A] and Condition [B].

Now, given all the information we have about syllogisms and explanation in the *Analytics*, it is fair to infer that a demonstration is a sound syllogism in which the two following characteristics are found:

—[a] a given explanandum X has been selected as the target;

¹⁷ For a different view, see Mignucci 2007, p. 151, 162; Mendelsohn 2023 (who also provides extensive discussion). More details about my views and the dialectic with the standard view can be found in Angioni 2020.

—[b] a given explanatory factor is presented as middle term (rendering the two premises).

About [a], the information we have from *APo* II.1-2 (besides other passages) is sufficient to settle the idea that the explanandum selected as targeted conclusion in a scientific demonstration is a state-of-affairs that the expert already knows as *true*. Thus, merely establishing that *X* holds (or merely establishing that the conclusion expressing *X* is true) cannot be taken as the most important task of a demonstration (as understood in the *Posterior Analytics*). Even if, for some problematic state-of-affairs, it might be the case that a demonstration establishes *that it holds* (i.e., establishes the *hoti*), that task is not *what essentially characterizes demonstrations* according to the theory unfolded in the *Posterior Analytics*. Rather, what essentially characterizes a demonstration is the task of presenting the (appropriate, unique, necessary) explanation (*dioti*) of a state-of-affairs previously known to hold (*hoti*).

About [b], the analysis I have provided of Aristotle's definition of expert knowledge in T1 is sufficient to settle the thesis that a demonstration—one that *really* deserves that name—has a middle term that encapsulates the fully appropriate explanatory factor of the targeted explanandum *X*. In other words, a fully successful demonstration has a middle term that brings the explanatory story to its perfection by being fully responsive to what the explanandum really is in itself—a middle term that can be called the “explanatorily necessary” (cf. 75a13). Although Aristotle uses “*apodeixis*”—even in the *Posterior Analytics*—in looser ways which accommodate the less strict notion of sound deduction, the notion of demonstration that becomes central in the *Posterior Analytics* consists in a syllogism (mostly in *Barbara*) in which the middle term is the fully appropriate explanatory factor of the state-of-affairs expressed in the conclusion.¹⁸

6. Aquinas on demonstration:

Just a few words about how Aquinas can, or should, be understood concerning the questions raised by my interpretation.

First of all, Aquinas sides with those that take demonstration as a concept more demanding than a merely sound deduction—and, therefore, he is far from adopting the logicist standpoint that actually ignores how important the notion of explanatory appropriateness is for demonstrations. See this passage (all the quoted passages come from the *Commentary to the*

¹⁸ For a similar view on what is an Aristotelian demonstration, see Mendell 1998.

Posterior Analytics, Lecture 4, “On the nature of the demonstrative syllogism”):

T4: “First, he asserts that scientific knowing is the end of a demonstrative syllogism or is its effect, since to know scientifically seems to be nothing less than to *understand* the truth of a conclusion through demonstration” (L.4, n.9).

On its own, this passage is still underdetermined in relation to how much weight is put in the notion of full explanatory appropriateness. However, there are two passages very interesting in this respect:

T5: “to know something scientifically is to know it *completely*, which means to apprehend its truth *perfectly*. For the principles of a thing’s being are the same as those of its truth, as is stated in *Metaphysics* II. Therefore, the scientific knower, if he is to know perfectly, must know *the cause of the thing known*” (L.4, n.5).

T6: “since the propositions of a demonstration are causes of the conclusion, they must be its *proper* principles. For effects require *proportionate* causes” (L.4, n. 11).

In T5, Aquinas retrieves from *Metaphysics* II the important notion of truth applied not only to the predicative ingredients of demonstrations (i.e., premises and conclusions considered in themselves) but also to the explanatory connection itself. The importance of this point cannot be overlooked. “True” applied to an explanatory connection actually delivers the notion of a fully appropriate explanatory connection.

In T6, we find both the notion of “*proper* principles”—probably mirroring Aristotle’s claims in 71b22-23, 72a5-7—and the requirement that causes be *proportionate* to their effects. “Being proportionate” is not so far away from the notion of being correlated in a one-to-one, fully commensurate connection. Furthermore, another idea stemming from T5 is important: the requirement of knowing something *completely*, as equivalent to apprehending its truth *perfectly*, is not so far away from the notion of an ultimately decisive explanatory factor that brings the explanatory story to its perfection by being fully responsive to what the explanandum is in itself. Thus, I would say that Aquinas’ interpretation of Condition [A] seems to be close to mine.

However, from all I can guess, Aquinas seems to side with the traditional interpretation of the necessity condition (Condition [B]) in T1. Besides, another important question is how Aquinas understands the definiendum itself. It is not so clear to me what would be Aquinas’ answer to this

question: what, exactly, was Aristotle trying to define in T1: expert knowledge, in general; or fully successful expert knowledge of a given explanandum (contrasted with the “sophistical demonstrations”)?

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