

ON ARISTOTLE'S NOTION OF EXISTENCE

JAAKKO HINTIKKA

I

ARISTOTLE AS A DIALECTICIAN. Tom Nagel once wrote a paper on "What is it like to be a bat?" I am tempted to give this paper the somewhat less outlandish title "What would it be like to be Aristotle?" Notwithstanding the lip service some scholars have paid to the peculiarities of Aristotle's ways of thinking as compared with ours, I have seldom felt that a commentator has managed to get inside Aristotle's mind and made us grasp what made Aristotle tick—or, rather, think in the way he did. All too often Aristotle has been treated by twentieth century philosophers as if he were, to borrow an Oxonian phrase, just "a fellow of another college." The reason for such an alienation is not a lack of any intuitive *Einfühlung* or intellectual sympathy in the eighteenth-century sense. It is not a Schelerian failure but a Collingwood-ean one. It is typically a failure to grasp the problem context of Aristotle's thought and to grasp his ultimate presuppositions. In my earlier work, I have sought to identify some of his presuppositions and problems. Only some of them are relevant here. One interesting background feature of Aristotle's thinking about logic, reasoning and the scientific method is that he is considering such matters always in a dialectical context, in the sense of thinking of them on the model of question-answer dialogues not unlike the Socratic *elenchus*. That this was the model of Aristotle's methodology in the *Topics* is of course fairly obvious. Yet what is not usually noted is that Aristotle is still in the two *Analytics* thinking of the scientific method as an interrogative process. What constitutes the bridge between the overtly dialectical framework of the *Topics* and the syllogistic framework of the two *Analytics* is the idea that logical inferences are those answers to

Correspondence to: Department of Philosophy, Boston University, 745 Commonwealth Avenue, Boston, MA 02215

The Review of Metaphysics 52 (June 1999): 779–805. Copyright © 1999 by *The Review of Metaphysics*

questions that are (as we would explain the matter) logically implied by the respondent's earlier answers.

One example should be enough to show this. Right in the middle of explaining the nature of logically necessary inferences Aristotle suddenly catches himself and warns that such inferences are not the only steps of interrogative inquiry.

Yet one might perhaps wonder what purpose there could be in asking [questions] about such items if it is not necessary for the conclusion to be the case—[apparently] you might as well ask an arbitrary question and then state the conclusion. Yet we should ask questions not on the grounds that the conclusion will be necessary because the [earlier] answers make the conclusion necessary, but rather because it is necessary for the person who accepts the proposals [that is, who answers the questions in the proposed way] to state the conclusion—and to state it truly if they hold truly.³

I have modified Barnes' translation here in that I have taken the words διὰ τὰ ἡρωτημένα at 75a25–6 in their most straightforward sense as meaning "because of what was asked earlier," that is, in effect, "because of the earlier answers." As far as Aristotle's "proposals" are concerned, according to him in a propositional question a preferred answer is proposed to the responder; see for example, *Topics* 1.4, especially 101b28–36.

Most recent translators and commentators have had no inkling of what is going on in this passage. Out of desperation, some even try to insert a completely unsupported restriction to merely dialectical reasoning. Yet as soon as we realize that Aristotle is treating the entire inquiry, including deductive steps, as an interrogative process, what he says becomes crystal clear. What he is doing is to think of necessary inferences, too, as question-answer steps in an inquiry. They are the ones where the answer is necessitated by earlier answers. After all the attention he had lavished on such necessitated answers (alias conclusions of syllogisms) in the *Prior Analytics* and in the beginning of *Posterior Analytics*, he realized that he had to remind his audience

³ *Posterior Analytics* 1.6.75a22–7. In quoting *Posterior Analytics*, I have followed, with some changes, Jonathan Barnes' translation in *Aristotle's Posterior Analytics*, 2d ed. (Oxford: Clarendon Press, 1994). Otherwise I have followed mostly Loeb Library translations, such as Hugh Tredennick's translation and commentary in *Aristotle Posterior Analytics*, Loeb Classical Library (1960), with the exception of those instances in which I have tried to use the translations in the Clarendon Aristotle volumes (for example, *Aristotle's Prior and Posterior Analytics*, ed. W. D. Ross [Oxford: Clarendon Press, 1965]).

of the framework in which he was operating, that is, to remind them of the truism that in an interrogative inquiry we also need non-necessitated answers. In such steps, Aristotle might have said, the answer still is necessary *ad hominem*, albeit not *ad argumentum*. By contrast, the quoted passage thus shows vividly is that logical inferences were for Aristotle a subclass of answers to questions. The conclusion of a logical inference was still for him in the *Analytics* an answer to a question.

Another instance of the dialectical character of Aristotelian science is the fact there need not be any one stage of scientific inquiry at which all the first principles have been found so as to be ready to serve as premises of scientific syllogisms. The mistake of thinking that there must be such a stage according to Aristotle might be called the "Euclidean fallacy." It has come about by projecting the Euclidean, not to say Hilbertian, idea of an axiomatic science back to Aristotle. Aristotle discusses the different first principles of a science on different occasions, notably in *Posterior Analytics* 1.2 and 10, but nowhere does he say or imply that there is a stage in the development of a science when those principles are all known to the scientist in such a way that all the rest could be proved syllogistically from those premises, and those premises only. Of course, from the interrogative viewpoint there is little reason to expect that there should exist such a privileged stage. One of the results of the present paper will be evidence to show that Aristotle did not embrace the simple Euclidean model of a science.

Hence an important part of thinking like Aristotle is to think dialectically, that is to say, to think of scientific inquiry as a partly tacit questioning process. Now questions are requests of information, in other words, means of coming to know something new. Since scientific syllogisms are a part of this enterprise, they have a tacit but important epistemic element. Aristotle's syllogistic cannot be expected to be a purely extensional logic. It would be surprising if it did not involve, however implicitly, ingredients that we would identify as belonging to epistemic logic. Thus the dialectical character of scientific inquiry according to Aristotle implies definite suggestions for the interpretation of his syllogistic logic.

II

Aristotle's Unitarian Concept of Being. Another massive difference between Aristotle's conceptual presuppositions and ours is the absence of the Frege-Russell thesis about the ambiguity of verbs for being like the Greek *einai*. I have dealt with this matter before but it is important enough to be reiterated. Everybody and his sister will agree that verbs like *is* can be used in different ways. Sometimes they express identity, sometimes predication, existence, or subsumption. Yet the Frege-Russell ambiguity thesis goes way beyond merely pointing out this distinction between different uses of *ist* or "*is*" or *estin*. It attributes the distinction to an ambiguity of the single verb, and not for instance to differences between different context of use.

In a way, it is not surprising the Aristotle did not uphold this Frege-Russell ambiguity claim. For to the best of my knowledge no philosopher before the nineteenth century assumed the ambiguity thesis. What I have slowly come to realize is that Aristotle may have been the only early philosopher who consciously considered the ambiguity thesis but rejected it.

If you want evidence for Aristotle's awareness of a possible distinction and for his rejection of it, it should suffice to quote *Metaphysics* Γ, 2.1003b22–30:

Now if *to be* and *to be one* are the same, that is, a single nature, in the sense that they accompany each other as principle and cause, not as being expressed by the same definition (although it makes no difference but rather helps our argument if we understand them in the same sense), since "one man" and "man" as well as "existent man" and "man" are the same thing, in that the reduplication in the statement "he is a man and an existent man" yields no fresh meaning (clearly one cannot distinguish the two either with respect to coming to be or to ceasing to be), and similarly for being one. . . .⁴

I will try to examine in a separate paper Aristotle's reasons for rejecting the Frege-Russell thesis.

It is interesting to see that a part of Aristotle's assimilation of the different Fregean senses to each other is present as early as in *Sophistical Refutations* 6.169a 8–10:

For the same definition (*horos*) applies to "one single thing" and to "the thing" simply; the definition, for example, of "man" and "one single man" is the same, and so, too, with other instances.⁵

⁴ *Metaphysics* Γ, 2.1003b22–30.

It is likewise interesting to see that the identification of "man" and "one man" which is in effect an identification of the predicative and the identificatory senses of being, is not here extended to being in the sense of existence. This extension seems to be a later development in Aristotle's thought.

Further evidence of Aristotle's rejection of the Frege-Russell thesis is easily forthcoming. This rejection means that he was operating with a unitarian concept of being. In the fullest sense, *einai* had to comprise all of the first three Frege-Russell senses of being, that is, predication, existence, and identity. This might seem to be paradoxical, for Aristotle like all sensible logicians must have realized that in some of its uses *einai* might be missing one or two of these components. Yet this would be a serious objection to my interpretation only if the different Frege-Russell senses were for Aristotle different meanings of *einai*. Then the absence of one of them would change the total meaning of this verb. Since the different Frege-Russell senses are for Aristotle only different components of a unitarian meaning one of them could be missing without affecting the basic meaning of the word. To make an instant comparison, the word "athletic" is likely to connote both strength and speed. Yet a weight lifter can be an athlete without being agile, and a sprinter can be fast without being strong. For the Aristotelian unitarian notion of being, it suffices that in principle there always could be the other component senses present, too. In the case of an occurrence of *einai* in Aristotle, the right question to ask is not which Frege-Russell sense he is using the word in, but rather which of the component meanings are present on that particular occasion. The possibility of there being several possible answers to the second question does not make Aristotle's use of the word equivocal. In some case, a missing component force might be restored by means of collateral arguments. Indeed, it will be seen that in the atomic premises of an Aristotelian science the existential sense is initially absent but can be brought in via supplementary arguments.

By calling Aristotle's concept of being unitarian, I do not mean that he did not make distinctions between different uses and even different senses of being other than the Frege-Russell ones. The most prominent of them are the distinction between being in different categories as well as the contrast between potential being and actual being. It is important to realize, however, that these distinctions are not

⁵ *Sophistical Refutations* 6.169a 8–10.

the same as the Frege-Russell distinction between the different meanings of verbs for being.

There may even be additional ingredients in the unitarian notion of being in Aristotle. For one way in which the epistemic ingredient that was surmised in sec. 1 above to be there in Aristotelian syllogisms can raise its head here is to lend the predicative component of Aristotelian *estin* the force of "is *known* to be."

My claim is not belied, either, by the so-called Hermann's rule.⁶ This rule, as you undoubtedly know, is supposed to distinguish the copulative (predicative) *estin* from its other Frege-Russell senses. More fully expressed, the distinction is supposed to be marked by the difference between the enclitic accent, as in ἐστί and the orthodone accent, as in ἔστυ. Even though Hermann's rule has been thoroughly demolished by Charles Kahn, it still seems to enjoy currency among classicists. It may therefore be in order to point out that Aristotle's explicit refusal (in *Metaphysics* Γ, 2.1003b22–30) to construe the distinction as one of meaning provides one more nail—admittedly of a non-philological kind—to the coffin of Gottfried Hermann's rule. Whatever it is that the distinction between the two kinds of accent does, it does not in Aristotle mark a difference between two meanings of *esti*, for there is no such difference. In fact, Herr Hermann was an early nineteenth-century German philologist who created his rule under the influence of (his interpretation of) Kant's distinction between existence and predication. We have much more solid reasons to reject Hermann's rule lock, stock and barrel than to use it to challenge my interpretation of Aristotle's concept of being.

Thus an important part of thinking like Aristotle is to think without relying on the Frege-Russell ambiguity thesis. This is no mean feat, for the ambiguity thesis is built right into the notation of our twentieth-century basic logic, including the received first-order logic. And the use of this logic is one of the mostly firmly entrenched habits of twentieth-century philosophers. When I first challenged the role of this logic as a codification of our actual *Sprachlogik* in the presence of a senior philosopher of language, his reaction was to look at me and to say: "Nothing is sacred in philosophy any longer." Hence one thing we have to do in studying Aristotle's concept of existence is not to foist our contemporary first-order logic on him.

⁶ See Charles H. Kahn, *The Verb 'be' in Ancient Greek*, vol. 6, *The Verb 'Be' and Its Synonyms* (Dordrecht: D. Reidel, 1973), Appendix A.

III

The Inner Tensions of Aristotle's Notion. Indirectly, this logic can nevertheless help us to understand Aristotle's problems with the concepts of being and existence. In the light of hindsight, many of those problems can in fact be traced to the tension between the different Frege-Russell components in Aristotle's unitarian notion of being. More explicitly speaking, an important rationale of the Frege-Russell distinction is that the different senses of being they distinguish exhibit different kinds of logical behavior. For instance, the identity sense is obviously transitive, but the predicative sense is not. In fact, this is the source of one of Aristotle's earliest puzzles about the concept of being.

For example, "If Coriscus is different from a man, he is different from himself for he is a man," or "If he is different from Socrates, and Socrates is a man. . . ."⁷

Aristotle's solution to such sophisms is not to separate the identity sense of *estin* from the predicative one but to separate the kind of predication that allows *estin* to be transitive from the kinds of predication that does not allow it. The former is in *Sophistical Refutations* identified with essential predication, the latter with accidental one, and sophisms of the kind just quoted are said to be fallacies of accident. Indeed, Aristotle continues the quoted passage as follows:

. . . they say that it has been admitted that Coriscus is different from a man [that is, not a man], because it is an accident that the person from which he said that Coriscus is different is a man.⁸

Of course, Aristotle's point is not that the person different from Coriscus (for example, Socrates) is a man by accident, but rather that "not being Coriscus" is a predicate that does not entail "being a man."

Aristotle struggled with the transitivity problem later, for instance in *On Interpretation*. I will not try to discuss this delicate problem here beyond pointing out that what has been seen brings out an interesting connection between Aristotle's notion of essential predication and the identity sense of *einai*.

Likewise, anybody with a unitarian concept of being will face puzzles concerning the existential component of notion of being. These

⁷*Sophistical Refutations* 5.166b 32–4.

⁸*Sophistical Refutations* 5.166b 34–6.

problems are thrown into a sharper focus by the fact that existence was not expressed by a separate verb but by the absolute construction with *einai*. At first sight, on the unitarian view any occurrence of *einai* might therefore be expected to carry an existential force. Yet that simply is not always the case. In *On Interpretation* 11.21a25–9 Aristotle notes that from

(1) Homer is a poet

we cannot infer

(2) Homer is (that is, exists).

Why not? According to Aristotle the reason is that in (1) Homer is said to be only incidentally—whatever that means.

There has been a considerable discussion among interpreters as to when an inference of the same form as from (1) to (2) is valid according to Aristotle, for instance, an inference from

(3) every B is A

to

(4) every B is (that is, exists).

Aristotle's words suggest that the validity depends on the predications (3) being an essential one. Yet when is it essential? What is his settled view? It seems that a satisfactory answer must depend on the context. Inferences like one from (3) to (4) are justified only after we have shown that A is what it means for B to be, that is, to exist. In virtue of the inextricability of the existential and predicative being from each other this amounts to the question as to what it means to be B, that is, what the essence of B is.

Still another difference between the different Fregean uses or senses of "is" is that the predicative "is" has a contrary, the identificatory one does not. This distinction is seen for example, from *On Interpretation* 11.21a29–32, where Aristotle speaks of predications (κατηγορίας) that do not have contraries and identifies them with καθ' αὐτό predicates.

IV

Aristotle's Treatment of Existence. Now showing what the essences of different beings are is a matter of scientific syllogistic proofs. Hence we are led to ask: How did Aristotle treat existence in the context of a syllogistically structured science?

Aristotle's answer is given in *Posterior Analytics* 2.2. In 2.1 he has distinguished four types of questions that can be raised in science. The two questions concerning particular objects are "if it is" and "what it is." The former is a question of existence, the latter of definition (identity). The question is how these questions get answered in a syllogistic context. In 2.2 Aristotle tells us that all four types of questions concern the middle term, including questions of existence.

We seek, whenever we seek the fact or if it is *haplos*, whether there is or not a middle term for it.⁹

What this means for questions of fact is clear. In order to establish that

(5) every C is A

we have to find a middle B such that the following are true:

(6) every B is A

(7) every C is B.

Yet what could it mean to find a middle term that would prove existence (being *haplos*)? At first sight, knowing that Aristotle (like other competent speakers of the ancient Greek) expressed existence by means of the absolute construction with *estin*, it looks as if what is needed is B such that the following can be established:

(8) every B is (that is, exists)

(7) every C is B.

From these we might then be able to conclude

(9) every C is (that is, exists).

We might call inferences from (7)–(8) to (9) *existential syllogisms*. Basically, reliance on them is the view I want to attribute to Aristotle. However, in the form I have presented this view it is

⁹ *Posterior Analytics* 2.2.89b36–7.

unacceptable. For one thing, there are no such existential syllogisms explicitly present anywhere in Aristotle. So how can this be what he means?

It can be, and I believe that it is, but in a somewhat oblique sense. A syllogism from (7) and (8) to (9) is not acceptable to Aristotle, not because it is not valid, but because it involves in a sense using existence as a predicate. As Aristotle himself puts the same problem in *Posterior Analytics* 2.7.92b12–15:

Next, we say that everything which a thing is must be proved through a demonstration,—except its *ousia*. But existence is not the *ousia* of anything; for the things that existence do not constitute a kind [genus]. There will therefore be a demonstration that the item exists.¹⁰

Since existence thus is not a genus, it cannot operate as a syllogistic major term.

Yet even though purely existential syllogisms are impossible for Aristotle, existential syllogisms can in a sense be present in Aristotle as components of ordinary syllogisms with a major term restricted to some one category. This is the sense in which there will according to Aristotle be a demonstration (*apodeixis*) of existence. What I mean are syllogisms of the following form:

(10) every B is (an extant) A

every C is B

ergo: every C is (an extant) A.

It is in this sense that Aristotle can say that existence is proved by means of a middle term—not alone but as the existential component of an ordinary syllogism. In contrast to (10) the existential force does not carry upwards from the minor premise to the minor term. In other words, the following quasi-syllogism is not valid:

every B is A

every C is (an extant) B

ergo: every C is (an extant) A.

¹⁰ *Posterior Analytics* 2.7.92b12–15.

The tacit role of existential syllogisms in Aristotle has made his views more difficult to interpret than they should be. The precise import of Aristotle's treatment is highly relevant to the subsequent history of the different issues concerning existence. A number of them come up when it is asked: Is existence a predicate? As was seen, for Aristotle existence was not a predicate in the most literal sense, perhaps in the two most literal senses. First, existence could not operate as a syllogistic term, for "being is not genus." As was pointed out, this is why purely existential syllogisms like (10) are not admitted by Aristotle. Second, existence was not expressed predicatively by Aristotle or by the other Greeks of his time, but by the absolute construction with *estin*.

Yet if so, if for Aristotle existence was not a predicate, what was the target of the subsequent critics of the view that existence is one? Could they possibly have been criticizing Aristotle? Yes, they could have, for the tradition of "existence as a predicate" is subtler than is usually realized. One way of seeing this is to observe that Kant's famous criticism of existence as a predicate applies to views other than the ones Aristotle did not hold. What Kant argues is that the concept of hundred dollars—sorry, thalers—is not changed in the least if we add the notion of existence to it.

The small word 'is' adds no new predicate, but only serves to posit the predicate *in its relation* to the subject. . . . The content of both must be one and the same; nothing can have been added to the concept, which expresses merely what is possible, by my thinking its object (through the expression 'it is') as given absolutely.¹¹

What this means is that Kant is not only rejecting the view that existence can serve as an independent syllogistic term. (Kant's "absolute givenness" is clearly what is expressed by the absolute construction of verbs for being.) He was also denying that the idea of existence can be part of the force of a syllogistic term, in other words, that it adds something to concepts, presumably including the major terms of syllogisms, when conjoined with them. In other words, proper syllogisms cannot carry any existential force of the kind explained earlier. This Kantian thesis is a modern idea, closely related to the requirement that existence be expressed only by the existential quantifier. (The fact that in non-free logics individual constants carry an existential presup-

¹¹ See Immanuel Kant, *Critique of Pure Reason*, trans. Norman Kemp Smith (London: Macmillan, 1956), A598–602.

position does not make an essential difference here.) This part of Kant's criticism does apply to Aristotle, for it was seen that syllogistic terms could carry an important existential force for him. To what extent Kant was aware of precisely what he was criticizing remains to be investigated. It can be seen however, that Kant's choice of words was not the aptest one in that something subtler was involved than a denial that "existence is a predicate" in the simplest possible sense of the expression.

V

Whence the Asymmetry? In spite of the simplicity of syllogisms like (10), they show us a remarkable thing. From the vantage point of our ordinary twentieth-century logic, syllogisms are at bottom symmetrical with respect to their major and minor premise. What happens is merely that a middle term is inserted between the major term and the middle term. Logically speaking, the two premises should have precisely the same form.

Yet one of the most conspicuous features of Aristotle's logic is that he treats major and minor premises differently. This is the case among other *loci* in his theory of science, which I will discuss in section 7 below. Moreover a similar asymmetry is rampant in Aristotle's modal logic. Yet what are the sources of this asymmetry? One place where it shows up is in epistemic logic.

What it amounts to there is an asymmetry between the potential major premise

$$(11) (\forall x)(B(x) \supset KA(x))$$

and the potential minor premise

$$(12) (\forall x)(C(x) \supset KB(x))$$

where "K" means "it is known that." What I mean by asymmetry is the simple fact of logic that while the epistemic syllogism

$$(13) (\forall x)(B(x) \supset KA(x))$$

$$(\forall x) (C(x) \supset B(x))$$

$$(\forall x) (C(x) \supset KA(x))$$

is valid, the syllogism

$$(14) (\forall x)(B(x) \supset A(x))$$

$$(\forall x) (C(x) \supset KB(x))$$

$$(\forall x) ((C(x) \supset KA(x))$$

is not. Thus according to epistemic logic knowledge (being known) trickles down in a chain of syllogisms from the major premise to the conclusion in each syllogism. This asymmetry matches the asymmetries of Aristotelian modal syllogisms. For according to him only the major premise needs to be necessary in a barbara-type syllogism in order for the conclusion to be necessary. It is also easy to understand why the knowledge operation should attach itself to the consequent of a premise like (11) according to Aristotle. Here it is instructive to think of (11) as an answer to the question "Are all the B's known to be A's?" We have to know what the B's are in order to raise a well-defined question as to whether they are known to be A—or so Aristotle seems to have thought. Moreover from epistemic logic it is seen that this is enough to create the asymmetry in question. Yet why should this translate into a corresponding descent of the existential force? It is clear that for Aristotle we can have knowledge only of what exists. Hence (10) can be considered as a weaker version of (13) and (8) as a weaker sister of (11). And this is merely an instance of a more general way of thinking in Aristotle. Even though it is not easy to say precisely what Aristotle was thinking here, a connection in Aristotle between being known and existing is conspicuous enough. He insists repeatedly that only what exists can be known.¹² Nor is this an idiosyncratic idea on Aristotle's part. Early Greek thinkers, including Plato and Aristotle thought of knowledge as a *dynamis* which is successful when it "hits its object" or "realizes itself in its object."¹³ Here we are dealing with another Collingwoodean presupposition of Aristotle's and Plato's. For the purpose of reaching its object, this object of knowledge must exist. Conversely, if the object of my thought-act exists, then it is tempting to think that this thought-act has succeeded and therefore amounts to knowledge. This comes close to being literally true in the case of existential knowledge claims. If I claim that "A"

¹² See for example, *Posterior Analytics* 1.1.71a24–9; 2.7.92b4–8; cf. 8.93a27–8.

¹³ Cf. Jaakko Hintikka, "Knowledge and Its Objects in Plato," in *Knowledge and the Known* (Dordrecht: D. Reidel, 1974), 1–30.

exists, then if it does, I am right. Aristotle's unitarian conception of being undoubtedly encouraged him to extend this idea to claims of something's being as it is claimed to be in other Frege-Russell senses of being. Hence a transition from the validity of (13) to the validity of (10) would have seemed almost a matter of course for Aristotle. In this way, the role of syllogisms as means of knowledge acquisition and knowledge justification, the conjunction with his unitarian treatment of being, helps to understand Aristotle's trickle-down theory of existence.

VI

Explanations and Examples. According to this theory of Aristotle's, in chains of scientific syllogisms existence is transferred from top down, from more general premises to less general ones. Thus in any one science, it suffices to assume existential force for the major term. As a part of the syllogism, this existential force is transferred to the minor term mediated by the middle term, as (10) shows.

This trickle-down property is the main peculiarity of Aristotle's treatment of existence which I will focus on in this paper. It requires a number of explanatory comments. First, the idea of existential force has to be understood correctly. In twentieth-century discussions, by existential presuppositions one typically means of assumptions of non-emptiness of different terms. What is meant here by existential presuppositions is the existential force of verbs for being. This is a much more sweeping requirement than the requirement of non-emptiness.

Similar things can arguably be said of necessary being in Aristotle—insofar as it can be distinguished from knowable being. Hence the appearance of the asymmetry in Aristotle's modal logic is only to be expected.

This is also one of the places where we need to appreciate the difference between Aristotle's ways of thinking and ours. Aristotle is not thinking model-theoretically of a fixed domain over which quantifiers range. He is thinking of the information conveyed by an actual utterance of a proposition. If we tried to force Aristotle's treatment into a some sort of model-theoretical frame, we might be tempted to think of a Meinongian universe of possible objects some of which are suddenly assumed ad hoc to be actual. Yet this idea does not by itself ex-

plain the crucial asymmetry which was discussed earlier. Nor is it easy to see what an alternative model theory would look like in realistic detail. In any case, such a model theory is not necessary for the purpose of understanding what Aristotle has in mind, anyway. What it shows that there is no simple way of expressing Aristotelian existential assumptions in a modern logical notation.

Aristotle's treatment of existence in a syllogistic context is connected with his habit of dealing with singular terms and general terms on a par. For instance, Aristotle is clearly thinking of the fallacious inference from (1) and (2) as being on a par with syllogistic inferences involving general terms. Hence, as attributing existence (being *haplos*) to an individual A means for Aristotle the presence of A in actuality, in the same way the proposition "every B is" means for Aristotle that all the (possible) members of the class of B's exist in full reality.

Furthermore, what has been found shows that in a sense existence was a predicate for Aristotle after all. Admittedly, it could not be predicated alone. Yet this is because it was too wide a predicate, so to speak, violating the division of beings into different categories, not because it is not a predicate of sorts. If Aristotle had not had his theory of categories, existence would have been a viable predicate for him. Indeed, existence in some one category should be a genuine predicate for Aristotle, even though he admittedly thought of the existence of each genus characteristic of some particular science as having been introduced by the definition of that genus.

These insights into Aristotle's treatment of existence help to understand several different aspects of his writings. To take an example almost at random, commentators have been puzzled by what Aristotle says in *Posterior Analytics* 2.1–2 about statements of existence (that is, being *haplos*). What he says is that such existential statements are also proved by means of a middle term. The puzzle is prompted by the fact that there are no examples of syllogisms proving existence in the Aristotelian *corpus* and even more by the fact that in the case of substances the question of existence does not seem to turn on the middle terms of the syllogisms. For a substance seems to exist in virtue of what it is itself, not because something else can be predicated of it. This quandary has been discussed among many others by Gómez-

Lobo.¹⁴ I will examine briefly his views as an illustration of the implications of what has been found here. Gómez-Lobo writes as follows:

David Ross confesses openly his perplexity; "But how can εἰ ἔστι or τί ἔστι applied to *substance* be supposed to be concerned with a middle term? A substance does not inhere in anything; there are no two terms between which a middle term is to be found" (Ross 1965, p. 612). H. Tredennick puts forward similar views: "But when he [sc. Aristotle] goes on to say that in every case we are looking for a middle term doubts arise; because it is not obviously true that when we ask whether a substance exists or what it is, we are inquiring for its cause" (Tredennick 1960, p. 11).¹⁵

In brief, there seem to be only two ways out of this dilemma, either to deny that Aristotle is dealing with substances in *Posterior Analytics* 2.1–2 or to deny that he is dealing with existence there. Ross and Tredennick try to take the first way out, Gómez-Lobo the second.

Neither way is in fact correct, for we have here a neat case of *tertium datur*. Even in the case of substances, we have to prove their attributes syllogistically. Moreover as a component of those syllogisms, existential force trickles down from the generic premises through a series of syllogisms, mediated by their middle terms. There is no need of considering Aristotle's εἰ ἔστι statements in *Posterior Analytics* 2.1–2 or elsewhere as elliptical predications or otherwise different from purely existential ones.

Gómez-Lobo defends his interpretation by reference to *Posterior Analytics* 1.1.71a24–7 where Aristotle writes of a triangle:

If you did not know whether there was such-and-such a thing *haplos*, how could you have known that it had two right angles *haplos*?¹⁶

He claims that the logical form of the inference Aristotle contemplates here is

$$(15) (\forall x)(Tx \supset Rx)$$

and the conclusion Ra . Then according to him "the missing particular premise is obviously Ta , 'a is a triangle'." Yet a comparison with passages like *Posterior Analytics* 2.7.92b4–11 tell very strongly against such a reading. Aristotle is in them unmistakably dealing with nonel-

¹⁴ Gómez-Lobo, "The So-called Question of Existence in Aristotle *Posterior Analytics* 2.1–2," *The Review of Metaphysics* 34 (1980): 71–89.

¹⁵ Gómez-Lobo, "The So-called Question of Existence," 73.

¹⁶ *Posterior Analytics* 1.1.71a24–7.

liptical existence assumptions as a prerequisite to genuine knowledge, and by the same token in the passage under scrutiny.

This is strikingly reflected by the fact that in free logic (which is what we must be dealing with here)

$$(16) (\forall x)(Tx \supset Rx)$$

and

$$(17) Ta$$

do not entail Ra except in conjunction with the further premise $(\exists x)(a=x)$ asserting the existence of a . One is thus tempted to turn the logical tables on Gómez-Lobo and to say that from the vantage point of the correct logic the missing premise "obviously" is " a exists," not Ta .

Furthermore, Aristotle's example in *Posterior Analytics* 1.1.71a24–7 is merely an illustration of what he says earlier at 71a11–16 about two ways we can have knowledge:

Of some things we must already believe that they are, of others we must grasp what items spoken about are (and of some things both).¹⁷

This is in turn the distinction between the different basic assumptions of a science that Aristotle makes for example, in *Posterior Analytics* 1.10. There it is clear that what is missing when we do not know that such-and-such item is not *haplos*, is not a premise of what it is like but an existential assumption.

In this way we can also find an answer to the question posed above as to when an inference like

$$(18) X \text{ is } Y$$

ergo: X is, that is, exists

is valid for Aristotle. The answer is contextual. It depends whether we have reached a stage in our science at which the premise $X \text{ is } Y$ has been linked to the generic premises of that science by a sequence of syllogisms and hence been imbued with the existential force. If we have, Y is the closest thing we can say of X . In typical cases, Y then specifies the species of X . This shows how natural the view is that has been put forward by some scholars that the inference (14) holds just when Y is a species-term, even when it is not the whole truth.

¹⁷ *Posterior Analytics* 1.1.71a11–16.

VII

Existence and Generic Premises. Perhaps the most important single feature of Aristotle's philosophy explained by means of my analysis of his treatment of existence concerns Aristotle's views of the structure of a science and the basic assumptions of a science. They are expounded most fully in *Posterior Analytics* 1.10. To a considerable extent, these views are determined by the nature of the syllogistic logic which Aristotle was presupposing. In that logic, a logical inference (syllogism) proceeds by inserting a middle term between two extremes.¹⁸ From this it follows that the primary premises of a science are the ones mediating the shortest steps in a series of nested terms. I will call them atomic premises. They constitute one class of *arkhai* of a science. Another class is constituted by the general principles of reasoning needed in all sciences.

The *prima facie* puzzling thing is that Aristotle postulates a third class of primary assumptions of a science. I will call them generic premises. Furthermore, they differ in an interesting way from the atomic premises. They even seem to be the only substantive assumptions of a science.

For every demonstrative science has to do with three things: what it posits to be (these form the genus of which it considers the attributes [that belong to their subjects] in itself); and what are called the common axioms, the primitives from which it demonstrates; and thirdly the attributes, of which it assumes what each signifies.¹⁹

Here the common axioms are fairly obviously the general principles of all demonstrations, independent of the science in question, such as the principles of contradiction and excluded middle. For evidence, we can look at *Metaphysics* Γ, and compare what Aristotle says there with his distinction between different *arkhai* of a science in *Posterior Analytics* 1.2 and 10. The "attributes" correspond to atomic premises. Elsewhere Aristotle asserts or implies that all atomic premises are definitions, with the middle term serving as the definiens.²⁰ The second of these passages is especially interesting, in that Aristotle there adds "what is simple" (τα ἀπλυν) to the principles of everything. These "simples" are the generic premises, which are at the same time definitions of the generic terms and postulations of their existence.

¹⁸ Cf. *Posterior Analytics* 1.22.84a36–7.

¹⁹ *Posterior Analytics* 1.10.76b11–16.

²⁰ See *Posterior Analytics* 2.3.90b24–5; 13.96b22–3; 17.99a20–24.

Indeed, if we realize this "exceedingly difficult" (Barnes) section (96b15) becomes much clearer. In sum, clearly Aristotle must have identified the atomic premises with the definitions of the different terms—"attributes" as he calls them—studied in any one science.

The one feature of Aristotle's trichotomy that does not follow from the nature of syllogistic logic as we understand it today is precisely Aristotle's view that all the existential assumptions of a science are vested in the generic premises. Of the widest (generic) terms Aristotle says that scientists "assume these to be and to be *this*."²¹ In contradistinction to generic terms, Aristotle says of the attributes:

As to what are attributes of these in themselves, they assume what each signifies . . . and they prove that they are through the common items and from what has been demonstrated.²²

This is what Aristotle means when he says that in a science we assume the meaning of the attributes.²³ In what sense the other starting-points of a science can also be considered definitions will be indicated below.

Aristotle is obviously assuming that existential assumptions are handed down step by step in a series of nested syllogistic terms ("attributes") starting from the top. The basis of such an assumption, the only reasonable explanation for it, is that Aristotle is treating existence in the context of a syllogistic science in the way I have diagnosed. This treatment is in my view a vital clue to Aristotle's way of thinking about the logic of scientific inquiry.

For if Aristotle treated existence in syllogistic contexts in the way I have argued, then it follows that all the existential assumptions of a science are borne by the major terms of its most general premises.

It is now seen also that even the atomic premises are not merely nominal definitions in the twentieth-century sense, even though Aristotle says that they merely tell us what the terms (attributes) studied in some one science signify. In other words, these definitions are creative, facilitating new conclusions. Indeed, in one sense, they are the most common material premises of scientific syllogisms. They are in fact as numerous (by a factor of) as the conclusions of scientific inferences.²⁴ In brief, definitions in the form of atomic premises represent

²¹ *Posterior Analytics* 76b5–6.

²² *Posterior Analytics* 76b6–10.

²³ *Posterior Analytics* 76b6–10.

²⁴ See *Prior Analytics* 1.25.

for Aristotle a perfectly genuine kind of basic knowledge which is needed in all sciences. If such a conception of definition strikes a twentieth-century reader as strange, it might be instructive for him to recall that in Euclid, too, definitions play an essential role in some of his proofs.²⁵

VIII

Existence and Cause. One of the most interesting consequences of Aristotle's way of treating existence concerns the notion of cause (*aitia*) or explanation (the "why"). In order to see what is involved, consider a minimal (atomic) syllogism of some science or other, say the following:

(19) every B is (an extant) A

every C is B

ergo: every C is (an extant) A.

What is going on in (19)? In it, the middle term B almost literally conveys existence from A to C. Moreover, since (19) was assumed to be an atomic scientific syllogism, B is the last link in a chain of terms that mediate the descent of existential force from generic premises to the particular terms within the scope of the genus in question.

In view of such considerations, it was not only natural but almost inevitable for Aristotle to identify the middle term B as the proximate cause or explanation of C. It is what confers the gift of existence to C. Aristotle's identification of the middle term with the cause is thus little more than a corollary to his treatment of existence.

The peculiarities of Aristotle's views become clearer when we move to consider his notion of first cause. Clearly, as the proximate cause is given by the middle term of an atomic syllogism, so is the first or ultimate cause given by the term from which the existential assumptions trickle down to other terms. These are the most general terms of the different sciences. They are the existential and hence the causal and explanatory foundation of everything.

²⁵ See Ian Muller, *Philosophy of Mathematics and the Deductive Structure in Euclid's Elements* (Cambridge: MIT Press, 1981), 38.

If this is evident, it is evident too that one cannot demonstrate the proper principles of anything; for those will be principles of everything, and understanding of them will be sovereign over everything. . . . For you understand better if you know from the higher causes; for you know from what is prior when you know from uncaused causes.²⁶

Here the contrast with modern views is striking. For us, the first cause is a particular event, so to speak the big bang, the kick that started all the different causal chains rolling. Such an ultimate cause would be an event, or perhaps an initial state à la Laplace, but not a universal truth. (If you believe in the law of everything's return, alias the ergodicity of the universe, the initial state might not even play any explanatory role.) There is nothing here that would yield the most general laws a superior status. Hence the causal role Aristotle assigns to the most general truths and terms of any one science has to be explained. Moreover the obvious explanation is the status of such terms as the source of all existential force *apud* Aristotle. By connecting with each other the idea of universality and first cause, that is, of God, Aristotle's treatment of existence deeply influenced subsequent history of philosophy.

IX

Existence and Scientific Inquiry. Aristotle's theory of science with its threefold distinction between kinds of three principles can nevertheless be seen to lead him into a *prima facie* conflict with his conception of knowledge. For Aristotle the notion of knowledge is in a sense a goal-directed one. We know something only when our thinking hits its object. Accordingly, genuine knowledge must be knowledge of something existing, for it cannot reach or "hit" an object that does not exist.

Yet this seems to violate directly Aristotle's idea that the atomic premises of a science do not carry an existential commitment. Such premises are mere definitions. They are supposed to tell us what the terms involved mean, in other words, what it is to be something. Yet they do not carry existential force. Hence we can scarcely be said to know "what it is," that is, to know those atomic premises in the full sense of the term if we do not even know that their terms exist. Hence

²⁶ *Posterior Analytics* 1.9.76a16–20.

in the actual process of scientific inquiry we cannot simply start from atomic premises. Those premises could support scientific conclusions when they are tied together in a linear sequence of syllogisms only if they had existential force.

This Aristotelian requirement may be considered a special case of his idea that in a full-fledged notion being there must be all the different Frege-Russell senses present, including the existential one.

Again, how will you prove what a thing is? For it is necessary for anyone who knows what a man or anything else is to know too that it is (for of that which is not, no one knows what it is—[you may know] what a name signifies when I say goatstag, but it is impossible to know what a goatstag is).²⁷

Yet an atomic premise does not *per se* guarantee that its terms exist. Hence it cannot represent a full-fledged knowledge even of what its terms are. Yet how can it then serve as a primitive premise of any scientific syllogism? Obviously it cannot, and obviously therefore the actual procedure in science (even in its syllogistic part) is more complex than a mere piling up of minimal syllogisms.

The same problem can be formulated in terms of what is required of a definition or an account of what a thing is. Merely specifying what a term signifies is not enough. One has also to know that the definiendum exists. Or, rather, we are dealing with two different senses of definition. We might call them type one and type two definitions. The former are sometimes referred to as nominal definitions and the latter real definitions. What Aristotle means is nevertheless a far cry from what the terms “nominal definition” and “real definition” have meant in subsequent history of philosophy and logic. For, as we have seen, even type one definitions can act as syllogistic premises, they are creative, and represent genuine knowledge about reality.

Through this distinction the precise treatment of the concept of existence becomes highly relevant to yet another part of Aristotle's thought, namely, his theory of definition.

Of course there is a third type of definition (“type three definition”). This is because in the case of the widest (generic) term that serves to specify the field of a science type one and type two definitions coincide. Aristotle describes type three definitions by saying that

²⁷ *Posterior Analytics* 2.7.92b4–8.

The definition of immediates is an undemonstrable positing of what they are.²⁸

Definitions of type three are obviously intended to be the generic premises of the different sciences. The word "undemonstrable" might nevertheless seem very strange here. For all first principles of science are undemonstrable, including the generic premises. Likewise, the term "immediate" strikes a false note, for atomic premises (type one definitions) are also immediate, even in a more obvious sense.

Hence Aristotle cannot solve all his problems merely by distinguishing the three types of definitions from each other. The main problem that remains is the following: If we are to use primary atomic premises in scientific syllogisms for the purpose of obtaining knowledge in the full sense of the word, these syllogisms must be able to establish existence and not only *Sosein*. For this purpose, atomic premises apparently must be type two definitions. Yet what is given to us as starting-points (*arkhai*) of atomic syllogisms in each science are merely type one definitions. Hence we must somehow bring the existential force down from the generic premises to bear on atomic premises before we can use them as premises of proper scientific syllogisms.

Aristotle's self-confessed difficulty thus is precisely that atomic premises, even though they can serve as definitions (of type I) of what something is, cannot yield knowledge that what is defined exists

So will the definer prove if not what a triangle is? Yet then he will know by definition what it is and yet not know if it exists; and this is impossible.²⁹

Aristotle's discussion of this problem has prompted an extensive interpretational literature which will not be reviewed here.³⁰ The situation is fundamentally quite simple, once it is realized what his problem was.

Aristotle's solution explained primarily in *Posterior Analytics* 2.8. It is an application of his treatment of the notion of existence in a syllogistic context as I have diagnosed it. This solution is in effect to point out that existence is carried down by any old chain of syllogisms, even before this chain has been analyzed into minimal (atomic)

²⁸ *Posterior Analytics* 2.10.94a9–10.

²⁹ *Posterior Analytics* 2.7.92b17–18.

³⁰ See, for example, Owen Goldin, *Explaining an Eclipse* (Ann Arbor: University of Michigan Press), 1996.

steps and therefore before we have reached an explanation (the why). This kind of knowledge of existence without knowing the why is what Aristotle illustrates by "incidentally knowing that a thing is" at 93a22 and 25. Thus we can come to know that something is both in the predicative and the existential sense without yet knowing the why it is. One need not know "what a thing is", either, for knowing what it is goes together with the cause or explanation, that is, with the why provided by the middle term of a minimal syllogism.

Aristotle's own explanation runs as follows:

When we discover it, we know at the same time the fact and the reason why—if we proceed through immediate premises. Otherwise we know the fact but not the reason.³¹

Aristotle's example is a lunar eclipse. The quoted passage continues by reference to it.

Moon, C, eclipse A, not being able to produce a shadow although nothing visible is between us and it B. If B . . . holds of C, and A being eclipsed, holds of B, then it is plain *that* it is eclipsed but not yet *why*; and we know *that* there is an eclipse but we do not know what it is.³²

There is a scholarly problem here in that in the crucial sentence at 93a36 a number of texts read, not δι' αμέσων, but διὰ μέσων, giving it the sense of "if we proceed through middle terms." Indeed this is how Barnes³³ translates the passage, appealing to "most MSS." This majority all belongs to the same tradition, however, and hence do not provide independent evidence for each other. In contrast there is a MS, namely, Waitz's n (Ambrosianus 490), which represents an independent tradition and which gives the reading adopted here.³⁴ The question is any case decided by the sense of Aristotle's words, which is incompatible with the Barnes translation.

We should not be puzzled by the fact that Aristotle seems to be contrasting with each other knowledge that and knowledge *why*, not knowledge of atomic premises and knowledge of the existence of their terms. Aristotle points out in so many words that knowledge of existence and knowledge of facts are analogous; they are both explained by means of a middle term.³⁵ This analogy is in turn rooted in

³¹ *Posterior Analytics* 2.8.93a35–7.

³² *Posterior Analytics* 2.8.93a37–b3.

³³ Barnes, *Aristotle's Posterior Analytics*, 57.

³⁴ W. D. Ross, *Aristotle's Prior and Posterior Analytics*, 87–8.

³⁵ See *Posterior Analytics* 2.2, especially 90a6–14.

Aristotle's treating the existential and predicative senses of *estin* on a par.

Thus there can be two kinds of syllogistic demonstrations going on in an Aristotelian science. On the one hand, there are demonstrations from type two definitions. They are the proper scientific syllogisms. They must proceed by the minimal (shortest) syllogistic steps. On the other hand, preliminary to such demonstrations there are syllogisms lending the existential force to atomic premises. These syllogisms need not be analyzed down to their shortest possible steps. Such syllogisms have as their conclusions potential atomic premises. They restore the existential force of those premises, but they do not demonstrate them as definitions, as answers to why-questions. For that purpose, a demonstration through minimal syllogistic steps is needed. For the "why" is given only by the middle terms of a chain of immediate syllogisms.

This explains also Aristotle's choice of words at *Posterior Analytics* 2.10.94a9–10 (cf. above). Those words assume a natural meaning if they can be taken to refer to the existential component of the premises of scientific syllogisms. For this component is undemonstrable only in the case of generic premises, whereas in all the other primary premises it is mediated by preliminary nonimmediate syllogisms.

Thus Aristotle's problem in *Posterior Analytics* 2.8 is not just that one can be aware of a fact but not of its reason or that atomic syllogistic premises (type I definitions) can be true but not incapable of establishing existential conclusions. It is not that run-of-the-mill syllogisms cannot provide an explanation unless they are atomic. His problem can only be appreciated against his treatment of existence outlined in this paper. It is due to the fact that in this treatment atomic premises cannot serve as premises of fully scientific inferences before they somehow receive the existential force that only the generic premises of a science automatically have.

Here my diagnosis of Aristotle's way of dealing with existence helps to solve another major problem of Aristotelian interpretation. At the same time, Aristotle's theory of definitions of different kinds is a vivid example of what was said earlier about the interrogative structure of Aristotelian epistemology and methodology. What has now been seen implies that there literally is no stage of our knowledge of a science (apud Aristotle) when we have reached all (and only) the first principles of a science so that all that is needed henceforth is merely to draw logical conclusions from them. For it was seen that before

proper scientific conclusions can be drawn from atomic premises, they must receive an existential force by means of other syllogistic inferences from primary premises of a science. And Aristotle's account shows that the premises of such preliminary syllogisms typically are not atomic, that is, not among the first principles of a science.

This discrepancy between Aristotle and Euclid is seen to be an unavoidable consequence of Aristotle's characteristic assumptions in his logic of science. As a result of these assumptions, the structure of the actual dialectical unfolding of an Aristotelian science is more complicated than has usually been realized.

One such apparent complication is that Aristotle in *Posterior Analytics* 7–8 clearly envisages two different kinds of syllogistic inferences being carried out in a given science. There are on the one hand the syllogisms that prove existence.

There will therefore be a demonstration that the item exists. And this is what the sciences as a matter of fact do: a geometer assumes what triangle means and proves that triangles exist.³⁶

Now such demonstrations must establish existence, that is, be like (7)–(9). But they do not establish the why or what the item in question is. That can be established only by chains of atomic syllogisms.

We can now go back to another one of our earlier questions. One of them was: When does a proposition like

(20) every B is A

entail according to Aristotle

(21) every B is (that is, exists)?

The answer can now be seen to depend, not merely on the terms B and A, but on the stage of inquiry which we have reached. If (20) has been reached by a sequence of syllogisms from the generic premises of a science (not necessarily by a sequence of atomic or minimal inferences), we can conclude (21) without further ado, if not, we cannot. This can presumably be extended to all purported inferences from "B is A" to "B exists," such as from (1) to (2) or from (3) to (4) above.

Some general remarks may still be in order concerning the structure of an Aristotelian science and its several ingredients. In another (forthcoming) paper I have emphasized that according to Aristotle

³⁶ *Posterior Analytics* 2.7.92b14–16.

general relationships between forms—presumably represented by the terms of a scientific syllogism—can in principle be ascertained as it were by thought-experiments, that is, by realizing the relevant forms in our mind by thinking of it. This implies that the problem of finding the definitory characterizations that manifest themselves in the form of atomic premises is essentially one of concept formation, of forming the relevant forms from the materials provided in the last instance by sense-perception. Thus atomic premises are also obtained in a sense from experience, but only in a secondary sense, namely, in the sense that the terms (concepts) that they involve must in the last analysis be derivable from sense-experience.

In contrast, it is the task of ascertaining which forms are instantiated outside the mind that requires an extra empirical input—or else proof of assumptions that have an existential force.

These observations throw some more light on the different ingredients of an Aristotelian science. It shows why the existential component of scientific syllogisms had the significance it had for Aristotle. A much greater part of the empirical content of a scientific proposition (premise in a sequence of scientific syllogisms) resides in its existential force than it does for us post-Fregean philosophers. Among other things, this helps to understand the attention paid to the role of existential assumptions by Aristotle in *Posterior Analytics* 2.3–10.

Boston University