Philoponus' Commentary on *Posterior Analytics*, I.1, 71^a17–$^b8$ A Translation

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At the start of the *Posterior Analytics*, Aristotle states that "all teaching (*didaskalia*) and all learning (*mathêsis*) come from preexistent knowledge."[1] In a paper published last year in *Dionysius*,[2] I tried to show that, in his paraphrase of the treatise,[3] Themistius (317–387 AD) understood the word *mathêsis* used by Aristotle in this sentence as denoting both learning through the teaching of someone else, and learning that can occur by personal research and discovery. As I pointed out, this reading runs counter to the opinion of all the other major commentators,[4] who prefer to think that Aristotle is using the word *mathêsis* as a strict correlative of *didaskalia*, so that the term does not denote just any act of acquiring knowledge, but only the ones that come about through the action of a teacher.[5] In antiquity, however, a part of Themistius' interpretation seems to have been picked up by John Philoponus (490–570 AD), who, in his commentary on the *Posterior Analytics*[6] written

1. 71^a1–2.

2. M. Achard, "La paraphrase de Thémistius sur les lignes 71 a 1–11 des *Seconds Analytiques*," *Dionysius* XXIII (2005): 105–16.

3. Edited by M. Wallies, *Themistii. Analyticorum Posteriorum paraphrasis*, CAG V.1 (Berlin, 1900).

4. With the exception of W. Detel (see *Aristoteles Analytica Posteriora. Übersetz und erlaütert von Wolfgang Detel*, vol. II [Berlin, 1993], 23–24).

5. As M. Mignucci puts it: "Alla *didaskalia* è collegata come l'altra faccia del medesimo processo la *mathêsis*" (*L'argomentazione dimostrativa in Aristotele. Commento agli Analitici Secondi I* [Padoue, 1975], 1).

6. Edited by M. Wallies, *Philoponi Ioannis in Aristotelis Analytica Posteriora commentaria cum Anonymo in librum secundum*, CAG XIII.3 (Berlin, 1909). Seven of Philoponus' commentaries on Aristotle are extant (*in Cat*; *in An Pr*; *in An Post*; *in Meteor*; *in GC*; *in DA*; *in Phys*). All these commentaries probably come from the teaching of Philoponus' master, Ammonius son of Hermeias (see H.D. Saffrey, "Ammonios d'Alexandrie," in *Dictionnaire des philosophes antiques* I, ed. R. Goulet [Paris, 1994], 168), but the title of *in An Post*, like those of *in GC* and *in DA*, specifies that the commentary is "from the classes of Ammonius son of Hermeias *with some personal reflections* (*meta tinôn idiôn epistasiôn*)," (1, 2–3).

Dionysius, Vol. XXIV, Dec. 2006, 139–48.

in 529,[7] exposed the idea that Aristotle, after showing, in the first part of chapter I.1 (71^a1–17), that learning through the teaching of someone else requires preexistent knowledge on the part of the learner, was actually trying, in the second part (71^a17–$^b8$), to show that learning by personal discovery also requires this type of knowledge.[8] In working on Philoponus' commentary on this second part of the chapter (12, 4–20, 2), I was struck by the minute and well-developed character of his atypical interpretation, and I thought that it might be of interest to propose a translation of it, especially since, to my knowledge, there is still no translation of any part of Philoponus' commentary in any modern language. As will be seen, Philoponus' lesson is divided, according to the norms of Alexandrian exegesis, into two parts, a *theôria* (12, 4–16, 25) and a *lexis* (16, 26–20, 2).[9] We invite the reader to pay close attention to, among other things, Philoponus' surprising (and slightly unsuccessful) attempt to illustrate one of Aristotle's points with a geometrical problem requiring many steps to be solved (13, 4–26); to his detailed explanation of the difficulty raised in Plato's *Meno* (14, 12–15, 21); to his unambiguous distinction between Meno's difficulty and the difficulty expounded by Aristotle in 71^a31–33[10] (a new difficulty that Philoponus ascribes, probably rightly, to the Sophists [15, 25–27]); to his willingness, demonstrating his qualities as an interpreter, to entertain different readings of the same passage (16, 28–17, 9); and finally, to his remarkably clear explanation of the different senses according to which there can be both knowledge and ignorance of the same thing (see especially 18, 13–21), an explanation that may actually be the very best ever given of this rather subtle aspect of Aristotle's thought.

7. See L.S.B. MacCoull, "A New Look at the Career of John Philoponus," *Journal of Early Christian Studies* 3 (1995): 57.

8. This unique characteristic of Philoponus' exegesis was seen by W. Detel, *Aristoteles Analytica Posteriora*, vol. II, 16. R. Sorabji had already observed that "Philoponus' commentaries [on the *Prior* and *Posterior Analytics*] often record interesting views […] which are not preserved, or not fully, by his predecessors" ("John Philoponus," in *Philoponus and the Rejection of Aristotelian Science*, ed. R. Sorabji [London, 1987], 37).

9. On this method of exposition, see A.Ph. Segonds, *Proclus. Sur le* Premier Alcibiade *de Platon*, vol. I [Paris, 1985], XLIV). The *theôria* is an explanatory preface: it "proposes a [general] analysis of a section of Aristotle's text, by presenting its subjects and its main difficulties, without going into the details of the literal exegesis." The literal exegesis is given in the *lexis*, "where the section of the text examined in the *theôria* is divided into parts of various lengths" (C. Luna, *Trois études sur la tradition des commentaires anciens* [Leiden, 2001], 104).

10. The difference between these two difficulties is usually blurred by modern commentators, who, following M. Mignucci (*L'argomentazione dimostrativa in Aristotele* 14–15), seem to think instead that Aristotle is considering *two solutions* to the *same* difficulty (see W. Detel, *Aristoteles Analytica Posteriora*, vol. II, 36 and J. Barnes, *Aristotle. Posterior Analytics* [Oxford, 1994^2], 89).

p. $71^{a}17$ It is possible to know by knowing some things beforehand [12, 5] and by getting knowledge of other things at the same time.

Having said that all teaching and all learning[11] come from preexistent knowledge, Aristotle now proposes to say, and to show, that discovery itself comes from preexistent knowledge. For since we acquire intellectual knowledge either by teaching and learning or by searching and [12, 10] discovering, and since it is necessary in each of these ways that we acquire knowledge from some things known beforehand, for this reason, having shown one of the ways of acquiring knowledge,[12] he passes to the remaining one, in order that it becomes clear that all intellectual knowledge, whether acquired by teaching and learning or by searching and discovering, comes from some things known beforehand. But before speaking about discovering, [12, 15] he proposes to give explanations about knowing, treating it as something quite general, as we will show along the way.

There are two ways of knowing. The first one is when, having already come to know something, we run into it again, if forgetfulness has not taken hold of us. For example, when having seen someone before, we see him again, having the memory of him, we say that we know him. However, if forgetfulness takes hold of us and we later [12, 20] regain our earlier knowledge of the person, such a process is not called "knowing" but "remembering." This is one way of knowing. The second way is when, having the notion of the universal, we run into some particular thing that we have not seen before, and we fit this particular thing to the universal that we know. For example, if someone should see a particular magnetic stone attracting [12, 25] iron, if he does not know beforehand that every stone of this kind attracts iron, it is not said that such a man knows that the stone is magnetic, but he shall first learn, if he gets a teacher, that every magnetic stone attracts iron. But if he knows this beforehand, when he runs into a particular magnetic stone, he knows immediately that it falls under this universal form. [13, 1] These are the two ways of knowing.

11. Let us point out once again that Philoponus, like most commentators, thinks that Aristotle, in *An Post* I.1, is using the noun *mathêsis* as a strict correlative of *didaskalia*, so that the term does not denote just any act of acquiring knowledge, but only the ones that come about through the teaching of someone else. This explains why, in the next sentence, he goes on to present "learning" (*mathêsis*) and "discovering" as two mutually exclusive processes.

12. In $71^{a}1$–17.

Aristotle says that discovery happens according to the second way, i.e., when first running into some observable particular things that we do not know beforehand, we will have knowledge of them from some more universal things that we already know. For example, if upon isosceles [13, 5] triangle ΑΒΓ we draw the line ΑΔ from the top to the base ΒΓ, so that it cuts the base in two, and that necessarily two triangles ΑΒΔ and ΑΔΓ are created, then if it was asked of us to find out whether the two triangles which were created, that is ΑΒΔ and ΑΔΓ, are equal or not, [13, 10] we will discover the answer by applying the question to some other more universal theorems that we already know. Since we know beforehand that the angles of isosceles triangles next to the base are equal to one another, and that if two triangles have two sides of one [13, 15] equal to two sides of the other, each equal to each, and also have the angle comprehended under the equal straight lines of one equal to the corresponding angle of the other triangle, they will have the base equal to the base, and the triangle will be equal to the triangle, and the remaining angles will be equal to the remaining angles, each to each, under which the equal [13, 20] sides extend. In the case we have in front of us, because triangle ΑΒΓ is isosceles, the angle under ΑΒΓ is equal to the angle under ΑΓΒ, and the two sides of one are equal to the two sides of the other (that is, the side ΑΒ is equal to the side ΑΓ because the triangle is isosceles, and the side ΒΔ is equal to the side ΔΓ because base ΒΓ has been cut in two by the line ΑΔ). It is obvious that the whole triangle ΑΒΔ is equal to the whole triangle ΑΔΓ, [13, 25] and that the remaining angles are equal to the remaining angles, that is, the angle under ΑΔΒ is equal to the angle under ΑΔΓ, and the angle under ΔΑΒ equal to the angle under ΔΑΓ. We can say that we have searched for and discovered this theorem from previously established theorems; because we have applied the case in front of us to the theorems already laid down, we have gained knowledge of the theorem. The same is true in every case, so I will shorten my explanation. Of course it must be known that when I say that [13, 30] knowledge comes from some universals that are known beforehand, I do not say "more universal," as we say that the genus is "more universal" than the species, but simply that it comes from some [14, 1] other universal theorems.

For this reason, we say that knowledge is more universal than discovery, because discovery happens only according to the second way of knowing, when we fit the things that we search for to things agreed upon, but knowledge is viewed in many ways, since it happens also in the first [14, 5] way. I am not saying, however, that knowing and discovering are the same, but rather that in the way in which the second way of knowing happens, discovery happens in the same way. But the two differ in that knowing happens without research, and if ignorance does not come first, one will fit the particular to the universal; but discovery happens when ignorance does come first, and with research. Thus it has been shown that all [14, 10] intellectual knowledge, whether through teaching and learning or through searching and discovering, comes to us from some things that we already know.

From this, Aristotle also solves the difficulty raised in the *Meno*. In these pages[13] Socrates proposes to search for a theorem and orders someone, who cannot do it, to define virtue. Socrates then says [14, 15] that if we search, we will thoroughly discover. Meno doubts this claim and pretends that discovery is not possible at all. For the thing that is searched for, he says, must either be known beforehand, or not. If a thing is not known beforehand, we would not be able to know, if we come across it, that it is the thing for which we are searching. If we did not know Socrates, we would not be able, when we meet him, to recognize him, but if [14, 20] we already know him, we would not say that we search for, nor that we discover, him whom we already know. Therefore, it is totally impossible either to search for something or to discover it. In response to these arguments, Socrates, guiding Meno's slave and questioning him, made him discover a theorem that he did not previously know: i.e. the fact that the square drawn from the diagonal of a square is twice as large as [14, 25] the square from which comes the diagonal. The proof goes like this: one draws square ΑΒΓΔ and draws its diagonal, which is the diagonal ΑΔ, and draws from the side ΒΔ the square ΒΖΔΕ, and from ΑΒ another square, ΑΒΗΘ, and from ΒΘ another one, ΒΖΘΙ. Thus, it is obvious that each of the sides of square ΑΒΓΔ is equal [14, 30] to the sides of the other square, ΒΖΔΕ. In the same way, [15, 1] each of the sides of ΑΒΗΘ is equal to the sides of ΒΖΘΙ, and to make it short, another square is put along the diagonal of the first square, i.e. the diagonals of the rest of the squares are linked, that is, ΑΘ, ΘΖ, ΖΔ, ΔΑ. Thus, it is obvious that the [15, 5] square ΓΕΗΙ is four times as large as the square ΑΒΓΔ, for three squares equal to ΑΒΓΔ have been put next to it. Indeed, since the four squares are equal, ΓΕΗΙ is four times as large as one square among them. The servant agrees with this from the drawing. And [15, 10] since the diagonals divide each of the four squares drawn into two equal triangles (this is because with every four-sided figure the diagonal divides it in two), each of the eight triangles is equal to each of the remaining ones. So that the [15, 15] square ΓΕΗΙ is twice as large as the square ΑΔΖΘ, for it contains the other four triangles, and square ΓΕΗΙ is four times as large as square ΑΒΓΔ. Therefore the square ΑΔΖΘ, the one drawn from the diagonal ΑΔ, is twice as large as square ΑΒΓΔ, which is precisely what was necessary to prove. Thus Socrates, through his questioning, made

13. 80^{d}5–^{e}5.

[15, 20] Meno's slave discover a theorem that he did not previously know, leading him to the thing that was searched for from some things agreed upon beforehand. As a consequence, things concerning knowledge that come to us through searching and discovering are gained from things that are known beforehand; and it is not necessary that the man who is searching, or more exactly who is discovering, knows and learns the same things, but it is possible to search [15, 25] for some things and to make the discovery of these things from other things agreed upon beforehand. And there will be no room for Meno's difficulty, which suppresses the possibility of discovery, nor for the difficulty raised by the Sophists, which suppresses the possibility of knowing some universal, in the following way. They hide, for example, a triangle under their hand, and they ask: "Do you know that the two sides of every triangle are greater than the remaining side?" When we answer [15, 30] "yes," they show the triangle and say: "But you did not know that this was a triangle, and if you did not know that this was a triangle, neither did you know that it has its [16, 1] two sides greater than its remaining side. So you both knew and did not know the same thing, which is impossible." Now certain people, who do not solve these problems well, say that everything that they know to be a triangle they know to have two sides greater than the remaining one: and thus also in similar cases. [16, 5] Aristotle accuses them of trying to solve the difficulties of the sophists in an incorrect way, for nowhere, in the theorems, have we granted this point, i.e., "what you know is a triangle," or "what you know is a square," but we are speaking generally of every triangle or of every square. And, having criticized them, he himself gives the true solution, relying on things already said, namely that there is nothing strange in knowing the same thing in one way and [16, 10] not knowing it in another. For, concerning the triangle hidden in the hand, I know according to the universal that it has its two sides larger than its remaining side, but I do not yet know that particular triangle itself. In the same way, we also know every man by means of the universal, but we are ignorant of individual men. Again, knowing in general that no mule is pregnant, we are deceived when we see all of a sudden a mule whose stomach is swelled out, and [16, 15] we think that it is pregnant, because we are not applying the particular to the universal. And conversely, it is possible to know something according to the particular, but to be ignorant of it according to the universal. For example, someone may know that the two sides of this isosceles triangle are greater than its remaining side (for even the man without education is not ignorant), but he may not know that this is true of every triangle. So he knows the particular, but not the universal. And not only in this way is it possible [16, 20] to know something and not to know it, but also according to the mode of knowing. For it is possible that, knowing something directly, we do not know it by *reductio per impossibile*,

and vice versa. For example, the fact that the diagonal is incommensurable with the side has been proven *per impossibile* by the geometer, but among philosophers, some have also tried to prove this fact directly. So it is possible, when we know a theorem by means of a proof *per impossibile*, [16, 25] to be ignorant of it by a direct proof.

p. 71ᵃ17 It is possible to know by knowing some things beforehand and by getting knowledge of other things at the same time.

It is possible to apply both of these possibilities to the two ways of knowing, each possibility with each way, and both with the second way, as follows. "It is possible to know [16, 30] by knowing some things beforehand." This can fit with the first [17, 1] way, according to which we know something, having gained knowledge of it beforehand. "And by getting knowledge of other things at the same time." This fits with the second way, according to which we know something just when we run into it, not having gained the knowledge of it beforehand, by applying it to the universal. And both fit with the second way as follows. [17, 5] "It is possible to know by knowing some things beforehand," i.e., the universals, "and by getting knowledge of other things at the same time," i.e., the particulars, of which we are said to gain knowledge when we run into them for the first time, by applying them to universals that we know beforehand. The examples have been brought forward with reference to the second way.

[17, 10] p. 71ᵃ20 That this thing in the semicircle is a triangle, one has known at the same time that he did the induction.

In this sentence, Aristotle says "did the induction" instead of "ran into it through sense-perception," since knowledge by means of particulars is called "induction," and we know the particulars through sensation. And instead of saying "in some hand," he says "in the semicircle." [17, 15] So the person knew the triangle escaping his attention as a triangle through the universal, but he came to know this particular triangle through induction, not from some things that were previously established. For all cases of sensible knowledge that we do not call "acquaintance," but simply "knowledge," are of this kind. Nevertheless, that the triangle has its three angles equal to two right angles,[14] he knew even without induction by virtue of having present in himself beforehand [17, 20] the universal principle, i.e., "every triangle has its three angles equal to

14. Here and in the following, the sentence "the triangle has its three angles equal to two right angles" is short for "the triangle has the sum of its interior angles equal to two right angles."

two right angles." Thus, as soon as I knew that it was a triangle, I knew also immediately that it had its three angles equal to two right angles.

p. 71a21 For the learning of some things happens in this way, and the last term is not known through the middle term.

[17, 25] Aristotle has moved to the next point, i.e., that we learn some things not because we apply them to others, but because, as soon as we run into them, we get our first knowledge of them, for example, that this is a triangle, or a circle, or some other thing, which we are not said to know, but to learn for the first time. These things are all particulars [18, 1] (this is what he himself clearly says by "all the things that, at this moment, happen to be particulars, and are not said of some subject"). Nevertheless, when seeing the triangle, we conclude that it has its three angles equal to two right angles, we are said to know this because we are fitting it to the universal by means of some middle term. [18, 5] For example: every triangle has its three angles equal to two right angles; this is a triangle; therefore, this has its three angles equal to two right angles. It must be stressed that Aristotle has said that knowing through sense-perception is learning. This is in keeping with the fact that, in the opening lines, when he said "all teaching and all learning," he added a qualification and said "intellectual," for one kind of learning is also through sense-perception. For, through [18, 10] inductions, we know only the particulars, and not the universals.

p. 71a24 Before an induction is done, or a syllogism is grasped, it should presumably be said that in one sense there is knowledge, and in another there is not.

That is, before we run into the hidden triangle through sense-perception, we are said to know it in a certain way, by virtue of the fact that we know that every [18, 15] triangle has its three angles equal to two right angles; for it is obvious that it is also through this capacity that we have come to know the hidden triangle. However, in another way we are ignorant, because we do not know at all if what is hidden is a triangle; for if we do not know that it is a triangle, it is obvious that we do not know either if it has its three angles equal to two right angles. So the intellect knew beforehand through the universal that every triangle has its three angles equal to two right angles, [18, 20] but that what is hidden in the semicircle is a triangle, it did not know. This is why the intellect did not know either if it had its three angles equal to two right angles.

p. 71a29 Otherwise, the difficulty raised in the *Meno* will result.

He says that if this were not true, i.e., precisely what we have said, that it is possible both to know and not to know the same thing (I mean, to know it according to the universal, but to be ignorant of it according to the particular), [18, 25] then the difficulty raised in the *Meno* will take place, a difficulty that we have already described, because we have anticipated it.

[19, 1] p. 71a31 Do you know or not that every pair is even?

After saying that we will not solve the problem like this, i.e., just like some who tried to solve it in an incorrect way, Aristotle first sets out the difficulty, and then their alleged solution to it, and thus his own.

[19, 5] p. 71b5 But nothing, I presume, prevents one from knowing in a way, and not knowing in another, that which he is learning.

From here on, Aristotle sets out the real solution, according to which there is nothing that prevents not knowing in one way, and knowing in another, if one happens to know according to the universal, but to be ignorant according to the particular, or vice versa. [19, 10] It is also possible to know by means of a proof *per impossibile*, but not by a direct proof, or vice versa.

p. 71b7 For what is absurd is not that one knows in a certain way what he is learning, but that he knows it insofar as and in the way in which he is learning it.

"Insofar as he is learning it" means either "according to the universal" or "according to the particular." For if one learns something as a particular, it is possible that he knows this same thing which he is learning as a universal. [19, 15] In the same way, if one learns something as a universal, it is not impossible that he knows that which he is learning as a particular. And if one is ignorant in actuality, it is not odd that he potentially knows. However, to know the same thing and not to know it in the same respect counts as an impossible thing. "And in the way in which he is learning it" means "according to the mode of knowing." For if one learns something by a direct proof, it is impossible that [20, 1] he knows it beforehand according to the mode of a direct proof (and similarly, if he learns according to the mode of proof *per impossibile*).