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DUNS SCOTUS, DEMONSTRATION, AND DOCTRINE

William E. Mann

The first question raised in the Prologue to John Duns Scotus's *Commentary on the Sentences of Peter Lombard* is "Whether It Is Necessary for Man in His Present State To Be Supernaturally Inspired With Some Doctrine." Scotus's answer is "Yes," but only after a lenthy discussion of several important epistemological issues connected to understanding and faith. This essay provides some of the background necessary for appreciating Scotus's views. It begins with a discussion of the Aristotelian conception of demonstration, laying emphasis on the distinction between demonstration of a fact and demonstration of the reason for the fact. It then considers the role of authority in generating knowledge that is not demonstrative, the notion of *scientia*, and the difference between Aristotle and Scotus on natural necessity. Special attention is given to Scotus's view on understanding terms, understanding propositions, and being cognitively neutral with respect to a proposition. The essay concludes with a reconstruction of the first of five arguments that Scotus gives for his position. If the reconstruction is correct, then Scotus's argument is even more dependent on revelation than appears initially.

The Prologue of John Duns Scotus's *Commentary on the Sentences of Peter Lombard* takes up the first hefty volume of the critical edition of his works. The first question of the Prologue is "Whether It Is Necessary for Man in His Present State To Be Supernaturally Inspired with Some Doctrine."[1] You will not be surprised to know that the answer is "Yes," nor will you be surprised, if you know that Scotus was called "The Subtle Doctor," to find out that it takes him a while to get to that answer: arguments, counter-arguments, epicyclic arguments, etc., must be examined, defended, or refuted on the way to a determination of the question. You might be surprised, however, to come across the following passage added in the margin early in the Prologue:

> Note that nothing supernatural can be shown by natural reason to be in the wayfarer, nor necessarily required for his perfection; nor can one having it even know it to be in him. Therefore it is impossible here to use natural reason against Aristotle: if it be argued from beliefs, it is not an argument [*ratio*] against the philosopher, since he will not concede a belief as a premise. Hence these arguments made here against him have as one or the other premise a belief or [something] proved from belief; thus they are only theological persuasions, from beliefs to a belief. [¶ 12][2]

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Arguing theology with the converted would seem to have the same comforts and limitations as preaching to the choir. Those with a missionary flair will hanker to have a go at the heathen. If Scotus is right, theology, at least that part of it that depends on revelation, will get nowhere with heathen philosophers. Scotus's project, to show that we need divine inspiration, will succeed only with the faithful, that is, those who already have divine inspiration.[3] And those people, according to Scotus, will not know that they have it. The situation is peculiar. It is as if someone told you that in order to become a great chef, you have to acquire the ability to taste *X*. The same person, who happens to have written *Cooking with X*, further maintains that the non-*X*-tasting chefs deny any claims made about *X* by those who profess to be *X*-tasting chefs, and that even the real *X*-tasting chefs are not aware that they can taste *X*. Confronted with these claims, you might come to have sympathy as never before for verificationism. Although the situation is peculiar, it might be perfectly respectable. There might be independent ways of detecting the presence of *X* and thus of testing the capacities for (unconscious) taste discrimination in chefs. Even so, the case of theology would still be somewhat different. The faithful will insist that there is an independent Someone Who knows exactly who is divinely inspired and who is not, but the faithful will also acknowledge that that being is not in the habit of tipping His hand.

Scotus knew the difference between persuasion and demonstration. Demonstration is rationally compelling; persuasion can do no more than give (nonconclusive) reasons to believe. Scotus did not extend the methodological caveat of ¶ 12 to all theological inquiry. He believed, for example, that God's existence, omniscience, and omnipotence can be demonstrated. That we need divine revelation, in contrast, is indemonstrable. Yet the arguments strewn throughout the Prologue appear to be demonstrations. No doubt that is why Scotus felt obliged to add the contents of ¶12 in the margin. The following remarks can be taken as a prologue to Scotus's Prologue. I attempt to provide the conceptual background necessary for appreciating Scotus's claim that his arguments for the necessity of revelation are not demonstrations. I conclude by applying the conceptual apparatus to the first of Scotus's positive arguments, contained in ¶13.

I. *The Strict and the Loose Aristotelian Conception of Demonstration*

Let us begin by describing "the Aristotelian conception of demonstration"—the ACD, for short—leaving for another time the question whether the definite description has the same accuracy as "the Holy Roman Empire." The ACD is realized when one is able to organize into a deductive hierarchy a body of knowledge about a particular domain, whose contents and boundaries are determined by the terms distinctive of the domain. The hierarchy is founded in a set of axioms, propositions that are necessarily true and imme-

diately evident to anyone capable of understanding the terms contained in them. From the axioms one is able to deduce theorems, propositions that are necessarily true but not immediately evident, by means of inferential patterns that instantiate valid syllogistic moods. The deductive hierarchy, from what is immediately evident to what is less and less evident (but still necessary) is isomorphic to an ontological hierarchy to be found in nature, from what is simple to what is more and more complex. Call this structural feature of the deductive hierarchy—from more evident necessary truths to less evident but equally necessary truths—the *transmission condition*. The notion of being more (or less) evident that is encoded in the transmission condition has at least two independent components, one *ontic* and pertaining primarily to terms, the other *epistemic* and pertaining primarily to propositions.

The ontic component is this: a term, t_1, is ontically more evident than another term, t_2, if and only if t_1 is ontically prior to t_2. The notion of ontic priority is difficult to capture at best, but the following rudimentary remarks are sufficient for our purposes. Consider the proposition that squares are rectangles whose adjacent sides are equal. In it, "rectangle," "adjacent," "side," and "equal [in length]" are all terms that are ontically prior to "square." In general, the term for any species is ontically *posterior* to the terms for its genus and differentia, and also to any terms that are ontically prior to the genus and differentia terms. Thus, a tree of Porphyry is a good place to locate relations of ontic priority. Finally, let us note the following feature about ontic priority. Consider these two propositions:

(1) Every rectangle whose adjacent sides are equal has the sum of its interior angles equal to 360°.

(2) Every square has the sum of its interior angles equal to 360°.

If we were to extend the notion of ontic priority from terms to propositions, we would say that (1) is ontically prior to (2), even though the subject terms in (1) and (2) are necessarily coextensive. This sort of example illustrates the fact that the notion of ontic priority is too fine-grained to be given an analysis solely in extensional terms.[4]

The epistemic component of the transmission condition maintains that if proposition P is a part or the whole of the explanation for proposition Q, then one cannot know that Q without knowing that P. The epistemic component sets a high standard for *epistēmē*, or scientific knowledge. One knows that Q if and only if one knows the explanation for Q, and knowing the explanation for Q requires being able to trace the deductive hierarchy culminating in Q back to its axioms: the axioms themselves are self-explanatory.

The paradigm syllogistic mood is *Barbara LLL*,[5] a first-figure mood whose premises and conclusion are universal affirmative propositions, all of which are necessary:

Necessarily, Every M is P.

Necessarily, Every S is M.

∴ Necessarily, Every S is P.

The terms that fill in for the M, P, and S placeholders (middle term, predicate term of the conclusion, and subject term of the conclusion, respectively) should neither be nor contain names or descriptions of individuals: *epistēmē* is ideally knowledge of the relations between universals.

What I have just described is the *strict* version of the ACD. The strict version is Aristotle's official doctrine, announced in Chapter 2 of Book I of the *Posterior Analytics*. By the time Aristotle reaches Chapter 13, he is willing to relax the fetters. Medieval philosophers like Scotus, following Aristotle's lead, distinguished between *demonstratio quia* and *demonstratio propter quid*, harking back to a distinction, made in Chapter 13, between understanding a fact and understanding the reason for the fact. In a *propter quid* demonstration, the attribute picked out by the syllogism's middle term explains why the attribute referred to by the predicate term of the conclusion applies to the subject of the conclusion. To be somewhat more specific, the middle term of a *propter quid* demonstration will specify the material, formal, efficient, or final cause for the predication exhibited by the conclusion. The medievals described *quia* demonstrations, in contrast, as arguments from effect to cause. In cases in which we are more familiar with an effect than its cause, a proposition designating the effect serves as middle term in a *quia* demonstration whose conclusion is a proposition about the less familiar cause.[6] In Chapter 13, Aristotle is willing to countenance a *loose* version of the ACD, one that admits *quia* demonstrations. Consider the following two *Barbara* syllogisms (with modality prefixed), adapted from Chapter 13:[7]

(S1) *L* Every nontwinkling celestial body is a nearby celestial body.

L Every planet is a nontwinkling celestial body.

∴ *L* Every planet is a nearby celestial body.

(S2) *L* Every nearby celestial body is a nontwinkling celestial body.

L Every planet is a nearby celestial body.

∴ *L* Every planet is a nontwinkling celestial body.

(S1) is a *quia* demonstration, a demonstration of the fact that the planets are near Earth. The attribute specified by its middle term, *being a nontwinkling celestial body*, is not the material, formal, efficient, or final cause of the planets' being near and thus does not explain *why* the planets are near. (S2) is a *demonstratio propter quid* whose middle term refers to an attribute, *being a nearby celestial body*, that is either the formal or efficient cause of the planets' not twinkling. Thus only (S2) counts as an explanation, even though

the terms in the major premises of the two syllogisms are convertible. Even if, by Aristotle's lights, the attributes of *being a nontwinkling celestial body* and *being a nearby celestial body* are coextensive, and necessarily so, proper explanation flows in one direction only: the planets' nearness explains their nontwinkling but not *vice versa*.

No doubt it has occurred to you that it cannot be that both (S1) and (S2) satisfy the transmission condition. For the conclusion of (S1) is the minor premise of (S2), and the conclusion of (S2) is the minor premise of (S1). If (S1)'s conclusion is less evident than its minor premise, it follows that (S2)'s conclusion (=the minor premise of (S1)) is *more* evident than (S2)'s minor premise (=the conclusion of (S1)). Analogous remarks hold for the case in which (S2)'s conclusion is less evident than its minor premise. Either (S1) or (S2) might meet the transmission condition, but not both. It will also have occurred to you that for most if not all of us, it *seems* natural to say that the transmission condition is satisfied by (S1), not (S2). It is more obvious to us that the planets are nontwinklers than that they are comparatively near. But if (S2) is the *propter quid* demonstration, then the planets' comparative nearness is more evident than their nontwinkling.[8] The situation may appear to be a case in which the ontic component of the transmission condition conflicts with the epistemic component. Insofar as the ACD is a model for *epistēmē*, it assigns pride of place to (S2), the *propter quid* demonstration, in a fully worked-out theory of celestial mechanics. The *strict* version of the ACD would banish *quia* demonstrations like (S1) from its finished scientific theories by appeal to the ontic component of the transmission condition. It is easy enough to grant that "being nearby" is ontically prior to "being a nontwinkler." Yet it is natural to suppose that the epistemic component of the transmission condition delivers the opposite verdict, for surely we can know that the planets do not twinkle without knowing that they are nearby.

In fact, the epistemic component does *not* deliver that verdict. Recall that it says that if *P* is explanatory of *Q*, then one cannot know that *Q* if one does not know that *P*. Applied to the present case, the epistemic component implies that if the planets' being nearby explains their nontwinkling, then we cannot know that they are nontwinkling if we do not know that they are nearby. But now two questions clamor for attention. Is it not simply the case that this standard for knowledge is unrealistically high? And if Aristotelians want to set the standard that high, what is the point of counting *quia* demonstrations as demonstrations at all, since they fail to meet the standard?

II. *Earlier than Gettier*

To respond to the second question first, I suggest that it is fruitful to think of some *quia* demonstrations as attempts to regiment inferences to the best explanation into the confines of syllogistic form.[9] In the case of (S1), we take

the fact that the planets do not twinkle to be best accounted for by the proposition that they are nearby. If the general hypothesis that constitutes the major premise of (S1) is true, then the planets' nontwinkling is conclusive evidence for their being nearby. But—now to address the first question—*quia* demonstrations that are inferences to the best explanation do not confer *epistēmē*. At a minimum, they confer true belief, but true belief does not count as *epistēmē*. At a maximum, they confer justified true belief, but justified true belief does not count as *epistēmē*. If I am right about this, then you could be in three different cognitive states with regard to a true proposition, other than nescience, doubt, and disbelief. You could believe the true proposition, you could believe it with justification, or you could know it with *epistēmē*. *Quia* demonstrations in the absence of an ability to produce a *propter quid* demonstration can yield the first two cognitive states but not the third.

Let me hasten to say that I do not claim to find all three cognitive states discriminated by Aristotle. As far as I can tell, Aristotle may have thought that, with respect to *quia* demonstrations, the maximum collapses into the minimum. I have found no evidence to suggest that he had a conception of justification that would have allowed for justificatory mechanisms and methods distinct from the ability to produce *propter quid* demonstrations. Thus I cannot disprove the hypotheses that for Aristotle, *epistēmē* = justified true belief and that *quia* demonstrations like (S1), in the absence of corresponding *propter quid* demonstrations like (S2), generate "knowledge" only if knowledge is allowed to extend to (unjustified) true belief. What I am prepared to defend, however, is the proposition that medieval philosophers had reason to sort out the three cognitive states, because they had reason to acknowledge justificatory procedures apart from the procedure of producing a *propter quid* demonstration.

Contrast the following two cases. Think first of Socrates's procedure with Meno's slave in Plato's *Meno*. By the end of Socrates's interrogation, the slave sees that a square having twice the area of a given square has a side whose length is equal to the hypotenuse of the given square. Socrates is careful to point out that although the slave now has true belief about this theorem of geometry, he does not yet have knowledge. The true belief can be converted into knowledge by the same questions being put to him on many occasions and in many ways (*Meno* 85C). This procedure does not obviously satisfy Aristotle's conditions for *epistēmē*, but of course Plato is bent on establishing the doctrine of Recollection, not the validity of epistemic demonstration. It is significant, however, that Socrates and Plato do not regard *Socrates's* knowing the theorem, conducting the interrogation, and eliciting the correct belief as sufficient to convert the slave's belief into knowledge. Authority carries no weight: Plato seems to believe that because some "authorities" are humbugs, and we have no way to sort out the humbugs from

the genuine authorities short of knowing the subject matter for ourselves, to ground any belief in an appeal to authority is to fail to justify it.

The second, contrasting case is provided by Saint Augustine. In *De utilitate credendi* xii, 26 Augustine says that insofar as knowledge requires demonstrative reasoning, one cannot know who one's parents are.[10] Augustine himself believes, on the basis of various relevant authorities, that Patricius is his father and Monica his mother. He regards that belief as justified, both epistemically and morally. Here is a case, then, in which one can have justified true belief but not have knowledge, a case that Augustine regards as illustrating the fact that one can believe on authority what one knows one does not know (xi, 25). As if to underscore the point, when Augustine surveys *De utilitate credendi* thirty-five years later, he acknowledges that we sometimes speak loosely of knowing something which we believe truly and justifiedly on the basis of reliable authority; this use is even sanctioned by Scripture. Nevertheless, there is a strict sense of knowing, one that requires reason and understanding, according to which that cognitive state is not knowledge (*Retractationes* I, xiv, 3).

Augustine thus discriminates between justified true belief and knowledge. But he did not, for all of that, scoop Edmund Gettier. One can always distinguish, as Augustine does, justified true belief from knowledge by claiming that the concept of knowledge is equivocal. Gettier-style counterexamples do more than that: they purport to show that knowledge is not justified true belief according to any natural and univocal concept of knowledge. What *is* noteworthy about Augustine's example, in contrast to Plato's, is its reliance on the testimony of authority as a legitimate means of justification. Of course, the reliance on authority is what one would expect to find in a Christian philosopher, for whom Scripture is an authoritative source of revealed truth.[11]

Because of the ubiquity of Aristotle's and Augustine's influence on medieval philosophy, one generally finds scholastic philosophers attempting to show that there is no irresolvable conflict between the two. It might seem as though the onus to achieve harmony between them would have been relieved, especially for a fourteenth-century Franciscan like Scotus, by the Condemnation of 1277, which is generally understood to be a reassertion of Augustinianism and a rejection of Aristotelianism.[12] The closest the Condemnation comes to our present concerns is in condemned proposition 37: "That nothing is to be believed unless it is evident in itself or can be shown from what is evident in itself."[13] If this proposition expresses an error, then we are entitled, perhaps even enjoined, to believe something that is neither evident in itself nor demonstrable from what is evident in itself. But it simply does not follow, nor does the Condemnation suggest that it follows, that we thereby *know* what we are entitled to believe.[14] I suspect that Scotus, looking back at the Condemnation, appreciated the lack of entailment, saw that it gave no reason to

oppose Augustine to Aristotle, and perhaps saw that it conferred some benefit on Christian thought. *Epistēmē* can still be reserved for self-evident truths and *propter quid* demonstrations, while justified true belief can be generated by those *quia* demonstrations that function as inferences to the best explanation.[15] The benefit to Christian thought is this. Christian faith is supposed to be a virtue, which involves, among other things, one's believing things that one cannot know by natural means. If *quia* demonstrations are not knowledge-conferring, they nevertheless may enable the Christian believer to argue for the reasonableness of believing where we cannot prove.

III. *From Episteme to Scientia*

The Latin equivalent of *epistēmē* is *scientia*. There is no single English word that captures perfectly the concept of *scientia* as it is used by scholastic philosophers. "Science" is the obvious English cognate, but our notion of science is narrower than the medieval notion of *scientia*. It would be perfectly natural for Scotus to refer to Perry the mason's *scientia* of brick-laying, but "science" is a dubious translation for two reasons. First, we tend to reserve "science" for certain types of theoretical investigation, not the kinds of activity distinctive of doing and making. We may regard masonry as a craft, perhaps even an art, but it is overly precious to say that masonry is a science. Second, we think of science as a sort of community enterprise with a public product, something like the accumulated theoretical results and hypotheses about the world and its inhabitants, discovered or propounded by the community of scientists. For that reason it would be odd to refer to *Perry's* science of anything: science is not anyone's private property.

It would not be odd, however, to speak of Perry's *knowledge* of masonry, and that fact, placed beside etymological considerations, may encourage us to render *scientia* as "knowledge." The noun *scientia* derives ultimately from the verb *scire*—to know, to be aware that, to know how to—by way of the participial adjective *sciens*—knowledgeable, cognizant, adept. *Scientia* can thus often be translated as "knowledge," perhaps sometimes as "awareness" or "expertise." Even so, "knowledge" does not fully capture the meaning of *scientia*. *Scientia* has a complete declension in the plural. Aquinas, for example, can say that categorically different kinds of knowable things lead to a *diversitatem scientiarum*.[16] Here it is tempting to translate the phrase into the cognate "diversity of sciences," because the phrase "diversity of knowledges" is grammatically deviant. The temptation can be resisted by the interpolation of a type term, resulting in something like "a diversity of [kinds of] knowledge," but the point remains that in this respect, "knowledge" does not behave in the same way that *scientia* does. In common with many other abstract nouns, "knowledge" behaves syntactically like a mass noun, not a count noun, in resisting pluralization, modification by numerical adjectives,

and modification by "many" as opposed to "more" and "much."[17] "Knowledge," unlike "science," thus functions aggregatively, not distributively. There can be many sciences but you cannot have many knowledges. You can, however, acquire more knowledge and you can have knowledge of many things. "Science" and *scientia*, in contrast, function straightforwardly as count nouns.

At the same time, "knowledge" displays its character as an abstract noun and its difference from physical mass nouns in the following way. Consider the relation between the mass noun "gold" and the referring expression "Perry's gold." If Perry has any gold, then Perry's gold comprises a part of the extension of "gold," construed, say, as *the mereological sum of the world's auric regions*. If Perry's gold were annihilated, then the extension of the term "gold" would necessarily be different from what it had been. But the same thing need not happen in the case of the extension of knowledge, construed as *the collective sum of what is known*. If Perry knows nothing that is not also known by others, then Perry's knowledge could be annihilated without thereby diminishing the world's stock of knowledge. (The stock includes practical knowledge. Were the skill of building wooden ships not to be passed on, a part of our collective knowledge would be lost.) Unlike gold, knowledge is a multipliable commodity. Contrary to the hopes of the alchemists, Perry's gold can increase only if the amount of gold that is not Perry's decreases correspondingly. Perry's knowledge can wax, however, without anyone else's knowledge waning.

Allowing for the sort of slippage that we have noted, we can still choose to translate *scientia* as "knowledge." Yet if we keep in mind the high standard set by the strict version of the ACD—in particular, by the epistemic component of the transmission condition—we might be inclined to insist on "understanding" over "knowledge." For according to the strict version, *epistēmē* or *scientia* requires understanding; knowing that *P* requires knowing the explanation for *P*. I suggest that we not give in to that inclination. We can cleave to the strict version, if we wish, using only "knowledge," as long as we remember that what counts as knowledge must conform to the epistemic transmission condition. More to the point, in addition to *scire*, to know, Latin has *intelligere*, to understand. As we shall see, the two verbs function in philosophically important different ways in Scotus's thought.

We have noted that like "knowledge," *scientia* admits of both absolute and relative constructions: there is *scientia* itself and there is Perry's *scientia*. Let us blend that fact in with a distinction, commonly exploited by medieval philosophers, between what is evident in itself and what is evident to us. Loosely following Aquinas's explication of the distinction, we can say that a proposition is evident in itself if it is necessarily true. The paradigm and perhaps only case of a necessarily true proposition for Aquinas is a proposi-

tion in which the attribute denoted by the predicate term of the proposition is a part (or the whole) of the essence of the subject denoted by the subject term.[18] But only some propositions evident in themselves are evident to (all of) us, namely, those whose terms are so elementary that anyone who has any linguistic capacity must understand the terms. Many other propositions evident in themselves will be evident to some but not to others, for example, "Every dodecahedron is a regular solid."

If we think of geometry simply as an axiomatized body of propositions, we will tend to ignore Perry's *scientia* of geometry, and to find little use for the distinction between a proposition's being evident in itself and its being evident to us. We will demand that the axioms be evident in themselves. We will tend to regard the epistemic status (as opposed to the alethic status) of individual theorems, however, as best left to the epistemology, psychology and pedagogy *of* geometry, not as something to be reflected *in* the *scientia* of geometry. After all, from a God's-eye point of view, a proposition is evident in itself just in case it is evident to him. So we might think of axiomatized geometry as giving us a taste—perhaps a faint taste, but a taste nonetheless—of what it is like to know something in the way God knows it.

But Aristotelian medieval philosophers would have insisted that the situation is not as tidy as this account suggests. God has no need of demonstrations, since his knowledge is immediate and noninferential. Demonstrations are specifically human phenomena, the fabrications of intellects that operate under the following constraints. We have limited intellectual acuity and finite memory capacity. Our conceptual repertoire is derived solely from the deliverances of the senses: *nihil est in intellectu quod non prius fuerit in sensu.* Our reasoning is "discursive," proceeding by compounding and dividing (roughly, synthesizing and analyzing) propositions, whose ingredients are syncategorematic terms and the categorematic terms corresponding to concepts, and by making inferences that are functions from those propositions to other propositions. Finally, we are subject to the vagaries of circumstance. Sometimes, like Meno's slave, we enter in the middle of things. Because Socrates has employed the techniques of constructive geometry, the diagonal theorem is clearer to the slave than the theorems that would be necessary to demonstrate it.[19] It would now be good pedagogy to use the theorem as a premise in *quia* demonstrations whose conclusions are some of those other, more elementary theorems, theorems that in fact are immediately or ancestrally necessary for the construction of a *propter quid* demonstration of the theorem the slave already "sees."

The goal of the strict version of the ACD is the sequential arrangement of a body of knowledge into axioms and *propter quid* demonstrations, in such a way that any subsequent part is explained by earlier parts. One indicator of the untidiness of human epistemological affairs is that in the rough-and-tum-

ble of individual learning, the goal is not attained until some time after the process of learning has begun: every epistemological Felix Unger was once an Oscar Madison. The loose version of the ACD, with its tolerance of *quia* demonstrations, is equipped to cope at least partially with this contingency. Even so, both the strict and the loose versions appear to share a common assumption—that the goal of demonstration is to induce in humans perfect understanding of the relevant subject matter. The distinction between what is evident in itself and what is evident to us does not by itself conflict with that goal. One could believe, after all, that there can be a sort of division of noetic labor. Even if not every proposition will ever be evident to everybody, even if some proposition will never be evident to anybody, one might believe nevertheless that with enough diligence, every proposition could be *made* evident to somebody or other. Suppose, however, that there is some body of knowledge which human diligence is constitutionally insufficient to make evident. Suppose, moreover, that this body of knowledge is crucially important to humans. What happens then?

IV. *Deviant Demonstrations and Understanding Understanding*

Consider the following syllogisms in *Barbara*, each purporting to be a *propter quid* demonstration:

(S3) Every rectangle is a parallelogram.
Every square is a rectangle.
∴ Every square is a parallelogram.

(S4) Every carnivore has incisors.
Every dog is a carnivore.
∴ Every dog has incisors.[20]

(S5) Every created intelligence is a contingent being.
Every subordinate separated substance is a created intelligence.
∴ Every subordinate separated substance is a contingent being.[21]

Recall that in order for a syllogism to conform to the strict version of the ACD, its premises must be necessarily true and immediately evident, while its conclusion must be necessarily true but not immediately evident. Setting aside concerns about the conclusions of these syllogisms, we can still inquire about the status of their premises. It appears that Scotus supposes that Euclidean geometry is the paradigm of the triumph of the ACD.[22] So (S3), the first of the three specimen syllogisms, should pass Aristotelian and Scotistic muster: its premises would be supposed to be necessarily true and immediately evident to anyone who understands their terms.

Aristotle and Scotus part company on (S4). For Aristotle, (S4) is on all fours with (S3); for Scotus it is not. The difference between Aristotle and Scotus would not be revealed merely by one's asking them whether the premises of (S4) are necessary. Scotus as well as Aristotle would assent to their necessity. The difference between them would emerge, however, if one pressed Scotus to elaborate on the type of necessity possessed by (S4)'s premises. Scotus knew that the Condemnation of 1277 had condemned the proposition "That the simply impossible cannot come about from God or from another agent," adding that the proposition is in error "if 'according to nature' is understood of 'impossible'."[23] The effect of this and related condemned propositions was to promote God's omnipotence in such a way that what might be called "natural necessity" was subject to God's power. For someone like Scotus, the truths of geometry cannot be altered, not even by an omnipotent being. Nevertheless, the regularities governing the created natural world are the outcome of the will of a supremely powerful being. Since the world has been created, and is not an everlasting Aristotelian cosmos populated by everlasting species, it is natural to suppose that God had maximal discretionary power at his creative disposal, up to the threshold of logical impossibility.

What then of the premises comprising (S4)? Scotus can acknowledge that they are naturally necessary, that is, that they are so pervasive that no natural operation or process is a violation of them, and any exception to them could come about only through supernatural agency. Scotus may suppose that given the way the world works, all carnivores have incisors and all canines are carnivores. He may suppose further that the universality exhibited by these premises is not simply the result of historical or accidental features of the world, unlike the accidental universality of "Every extant panda is herbivorous."[24] At the same time, however, he can insist that the natural necessities were instituted by divine fiat and that an omnipotent God could have instituted different regularities—ones that allowed for incisorless carnivores and herbivorous canines—because there is no logical contradiction in these notions. Thus the premises of (S4) are naturally necessary but logically contingent.

It is hard to see how a syllogism like (S5) could have fallen into Aristotle's ken, if only because the notion of a *created* being would have been alien to him. It is clear from ¶ 41 that Scotus regards syllogisms like (S5) as failing to confer *scientia*. (S5) is not a *propter quid* demonstration, because subordinate separated substances are not beings that we can come to know by natural means, and so we have no natural reason to assent to (S5)'s minor premise. But then neither can (S5) be construed as a *quia* demonstration from effect to cause: if the minor premise is not familiar to us, we cannot take the conclusion to be the best explanation for its familiarity. Scotus draws a general moral in ¶ 41. If we were to rely exclusively on natural experience in making our inferences about the so-called separated substances, we would follow the

ancients in making the wrong inferences. We would conclude, for example, as they did, that the subordinate separated substances are everlasting and necessary, rather than contingent beings with a temporal origin.

In ¶ 42 Scotus anticipates an objection to the claim that we cannot in principle have *scientia* of a syllogism like (S5). Scotus's presentation of his imagined opponent's argument can be cast into syllogistic form:

(S6) Every necessary proposition whose terms we have come to know naturally is a proposition that we can comprehend naturally.

Every necessary revealed proposition is a necessary proposition whose terms we have come to know naturally.

∴ Every necessary revealed proposition is a proposition that we can comprehend naturally.[25]

(S6)'s major premise expresses the intuitively appealing idea that if the terms of a proposition are in our conceptual repertoire, then we have all we need to know in order to understand the proposition. After all, knowing the proposition's syncategorematic terms will enable us to understand its structure while knowing its categorematic terms will enable us to understand its content. What else, we might ask, could possibly be required in order for us to understand the proposition? One might therefore expect Scotus to grant the major premise of (S6) and attack instead the minor premise. But in fact, Scotus offers, in ¶ 44, a consideration in favor of the minor premise that he never rejects. Believer and nonbeliever alike understand the same proposition when the one affirms and the other denies "God is triune." If this were not so, the dispute between them would be merely verbal. It is not as if the believer has a supernatural understanding of the proposition that the nonbeliever lacks. It is rather that the believer believes the same proposition that the nonbeliever does not believe, and that both of them know the proposition's terms on the same naturally-acquired conceptual base.[26]

Since Scotus does not reject (S6)'s minor premise, he must reject the major, the premise that seemed initially more intuitively appealing than the minor. ¶ 46 provides an example offered in refutation of this major premise. Suppose that Boso's conceptual storehouse lacks the concept of a geometrical triangle. Boso does have the concepts of geometrical figure (abstracted, say, from quadrangles and the like) and of priority or firstness in a series (abstracted from the positive integers). Then, according to Scotus,

> Although that [person's] understanding could form this proposition, "Some figure is first," because it can grasp its terms, nevertheless, that formed proposition will be neutral for it, because that [proposition] is mediate, included in that immediate [proposition], "A triangle is first in this way." And because it cannot understand that immediate [proposition], since [it can]not [grasp] its terms, therefore it cannot know the mediate [proposition], which only has its evidentness from the immediate [proposition].[27]

If you are like me, you acquired your concept of a coniferous tree from examples of pines and spruces and your concept of a deciduous tree from examples of maples and oaks. Armed with just that experiential basis and confronted with the proposition, "Some coniferous tree is deciduous," you and I would have understood it. I would have denied the proposition; in fact, I once did. Being more cognitively responsible than I, you would have neither believed nor disbelieved the proposition. Upon our discovery of the larch, we would now come to understand the proposition, "A larch is a deciduous conifer," which grounds the truth of the original proposition. If concept *A* is grounded in our experience in a way unconnected to the way in which concept *B* is grounded, then it can happen that although we understand a proposition containing both *A* and *B*, the proposition is "neutral" for us. That is, we are not rationally in a position either to affirm or to deny the proposition. As the triangle and larch examples show, we can lack access to another proposition that would either justify or refute the original proposition, because we lack access to a concept contained in the other proposition.

Boso is conceptually impoverished with respect to triangles; you and I were once victims of larchlessness. These deficiencies are remedied by a sufficiently rich dose of the right kinds of natural experience. When we encounter (S5), however, no amount of natural experience will be enough to warrant our acceptance or rejection of most propositions about subordinate separated substances. We can acquire the concepts of subordination, separateness, and contingency by natural means and still never be in a position to know naturally that it is necessarily the case that every subordinate separated substance is contingent. Thus does Scotus reject the major premise of (S6).

These Scotistic passages are no less interesting for what they presuppose than for what they say. Note first that ¶ 46 depends on a distinction between *intelligere* (to understand) and *scire*. Boso understands the proposition, "Some figure is first" (*S*), but neither knows the proposition to be true nor knows it to be false. In contrast, Boso neither understands nor knows the proposition, "A triangle is first" (*T*), as long as Boso lacks the concept of a triangle. *S* is neutral for Boso's understanding because it could only be known by Boso's knowing *T*, which "includes" *S*. I take it that *T* includes *S* only if *T*, perhaps in conjunction with some other necessarily true propositions such as "Triangles are figures," entails *S*.[28] So Boso's understanding is neutral with regard to *S* because the only way in which Boso could know *S*'s truth-value is by knowing the truth of *T*, but Boso cannot know the truth of *T* if he cannot understand *T*, and Boso cannot understand *T* if he lacks the geometer's concept of a triangle. It is not just that *T* entails *S*: Scotus claims that the only cognitive access that a person could have to *S* is through knowing and thus understanding *T*.

Consider now Scotus's deployment of *intelligere* and *comprehendere*, along

with their cognates. It is tempting to translate both verbs as "understand," and I have used the noun "understanding" to translate *intellectus*.[29] I suggest that we resist the temptation, availing ourselves of the etymologically equivalent "comprehend" for *comprehendere*. Norman Kretzmann's analysis of Augustine's influential views on faith and understanding identifies Augustine's use of *intelligere* with "assent to a proposition in virtue of its having been clarified or supported (or both) by one's reason on the basis of analysis and argument."[30] This sense of *intelligere*, as rational propositional assent, is conceptually as close as you please to Scotus's use of *comprehendere* in (S6) in ¶ 42.[31] But Scotus's use of *intelligere* in ¶ 46 does not correspond to rational propositional assent. Boso understands the proposition, "Some figure is first," but is not in a position rationally to assent to or dissent from it. As Scotus puts it, the proposition is neutral for Boso. Thus, although comprehending a proposition entails knowing it, we have already seen that understanding a proposition, in the sense specified by ¶ 46, does not entail knowing it.

The notion of neutrality is important to Scotus. It crops up again at the beginning of his resolution of the main question, whether it is necessary for man in his present state to be supernaturally inspired with some doctrine. In ¶ 57, Scotus says:

> I respond therefore to the question first by distinguishing in what ways something may be called supernatural. For a receptive power is related to the act which it receives or to the agent from which it receives. In the first way the power itself is natural, or violent, or neutral. It is called natural if it is naturally inclined, violent if it is against a natural inclination of the patient, neutral if it is neither naturally inclined toward that form which it receives nor to the opposite. Now in this relation there is no supernaturalness. But when a receptive [power] is related to an agent from which it receives a form, then there is naturalness when the receptive [power] is related to the kind of agent that is set by nature to impress such a form on such a patient, but [there is] supernaturalness when it is related to an agent whose form is not naturally impressed onto that patient.[32]

The idiom of a receptive power receiving a form might suggest that Scotus has in mind only sense perception.[33] It is clear from his subsequent discussion, however, that he means to include—indeed, focus on—the case of the understanding entertaining propositions ("complexes," ¶ 62). Even when our senses and understanding are functioning optimally, Scotus says (in ¶ 62), "many propositions will remain unknown to us and neutral to us, the knowledge of which is necessary for us."[34] The understanding is naturally inclined to accept the proposition that the planets do not twinkle. Perhaps "violence" occurs when the understanding is confronted with absurdities, such as (to borrow a favorite medieval example) "A goat-stag exists." But left to its own natural devices, the understanding should remain neutral with respect to

"Every subordinate separated substance is a created intelligence." In all of these cases, "there is no supernaturalness;" the understanding is behaving as it naturally apt to behave. A natural agent can only instill natural knowledge in us. Supernatural inspiration can only come about through a supernatural agent working on the understanding. But, as Scotus explicitly claims in ¶ 65, a supernatural agent can infuse both natural knowledge—you might have learned your geometry from an angel—and supernatural knowledge, say, that God is triune.

Syllogism (S5), then, is not a Scotistic demonstration. (S5) cannot produce *scientia* in us because its minor premise is not naturally evident to any of us. As far as our natural understanding is concerned, we should regard the minor premise as neutral, even though we understand all its terms. If genuine faith can only come about by divine inspiration, then a person of faith might have justified true belief with respect to the minor premise. Even so, that cognitive state will not be *scientia*.

V. *A Rude Awakening*

Having issued the caveat contained in ¶ 12, Scotus proceeds immediately to present a series of five arguments in refutation of the philosophers' opinion that we have no need for supernatural knowledge.[35] We might have expected Scotus's arguments to emulate Aristotelian demonstrations as much as possible while obeying the constraints alluded to in ¶ 12. All five arguments deserve detailed analysis, but on some other occasion. I want, however, to look at the structure of the first argument in order to provide some idea of how far removed it is from the Aristotelian ideal of demonstration.

The first argument is deployed in ¶¶ 13-16. These sections have the following structure. The major premise, which is announced at the beginning of ¶ 13, is immediately followed by an argument to which the major premise is supposed to be the conclusion. At the end of ¶ 13, the minor premise is presented and the conclusion drawn. ¶ 14 offers a kind of empirical consideration for the truth of the minor premise. ¶ 15 purports to establish the minor premise by reason. In ¶ 16 Scotus argues concessively for the truth of the minor premise. The syllogism comprising the argument is this:

> [Major premise] For every being that acts through knowledge, a distinct knowledge of its end is necessary.
>
> [Minor premise] Man cannot know his end distinctly from natural things.
>
> ∴ Some supernatural knowledge about this [his end] is necessary for him.[36]

Afire with Aristotelianism and steeped in terminist logic, we might attempt to cast the argument into syllogistic form. But we encounter difficulties the moment we start. The major premise, by definition, contains the term that takes predicate place in the conclusion. But if we take the necessity expressed

in the major premise to be *de dicto*, then it would be natural for us to recast Scotus's version of it as an "A" or universal affirmative proposition:

> (It is necessary that) Every being that acts through knowledge is a being that has a distinct knowledge of its end.

Construed in this way, however, it is hard to see how either term, *being that acts through knowledge* or *being that has a distinct knowledge of its end*, can be plausibly located in the conclusion. Moreover, a glance at the minor premise might suggest that we interpret it as a *de dicto* necessary "E" or universal negative proposition:

> (It is necessary that) No person is a being that knows its end distinctly from natural things.

Caught up in this interpretive mode, we might then rearrange the conclusion so that it comes out as:

> (It is necessary that) Every person is a being that knows its end [distinctly?] from supernatural things.

But if we interpret Scotus's argument in this way, we saddle Scotus with a howler. A valid syllogism must have three terms: this construction has five. Closely related to this abundance of terms is the fact that the predicate term in the conclusion, *being that knows its end from supernatural things*, appears nowhere in what Scotus calls the major premise, or, for that matter, in the so-called minor premise. A valid syllogism with a negative premise must have a negative conclusion: this syllogism has a negative premise and a positive conclusion. It will not help to change the minor premise from negative to positive,

> (It is necessary that) Every person is a being that knows its end from supernatural things,

for either this is a violation of Scotus's strictures in ¶ 12 or it simply *is* the conclusion. And if we try altering the conclusion from positive to negative,

> (It is necessary that) No person is a being that knows its end from natural things,

we just end up with something identical to the minor premise.

I suggest that we start over. A simple-minded approach to the conclusion is to identify its deep-structure predicate term with its surface-structure predicate term, namely, *is necessary for him*. Somewhat more precisely, we might take the predicate term to be *is necessary for one*. In this case the necessity is *de re*, and if we read this interpretation back into the major premise, we will construe it quite differently, as an "I" or particular affirmative proposition:

> Some distinct knowledge of one's end is necessary for every being that acts through knowledge.

The predicate is quantified, and so the proposition as a whole is multiply quantified. I propose, however, for present purposes, to treat the predicate term as a unit. This interpretation of the major premise in turn then suggests a refinement on the conclusion:

> Some supernatural knowledge of one's end is necessary for every being that acts through knowledge.

We now have given Scotus justification for calling his major premise the major premise. Can we furnish him with a valid syllogism? That depends on what we can make of the minor premise. In fact, we now know what the minor premise must be if the syllogism is to be valid. The major premise is of the form,

> Some D is N,

while the conclusion is of the form,

> Some S is N.

The minor premise must then contain the terms "D" and "S." "D" is the middle term, and if the syllogism is valid, "D" must be distributed. Since the minor premise cannot be negative (given that the conclusion is positive), and since "D" must be distributed, the only way a valid syllogism can be formed is if the minor premise is of the form,

> Every D is S.

If we make the appropriate substitutions, we end up with the syntactically anomalous

> Every distinct knowledge of one's end is supernatural knowledge of one's end.

We have seen that in some respects, "knowledge" behaves as if it were a mass noun, not a count noun. We can replace the distributive "Every" with the agglomerative "All:"

> (3) All distinct knowledge of one's end is supernatural knowledge of one's end.

What connection is there between this proposition and Scotus's minor premise, "Man cannot know his end distinctly from natural things?" We can get from Scotus's minor premise to proposition (3) if we assume that Scotus's minor is tantamount to

> (4) All distinct knowledge of one's end is not natural knowledge of one's end,

and if we assume that

> (5) All nonnatural knowledge of one's end is supernatural knowledge of one's end.[37]

Even if you were happy enough to attribute (5) to Scotus, based, perhaps, on his discussion in ¶¶ 57-65, you will want to point out the ambiguity of proposition (4). It wavers between

(4′) Not all distinct knowledge of one's end is natural knowledge of one's end

and

(4*) All distinct knowledge of one's end is nonnatural knowledge of one's end.

(4′) is the more cautious interpretation of Scotus's minor premise, but (4*) is needed if we are to get to (3), and (3) is needed if we are to supply Scotus with a valid syllogism. I propose to leave (4*) unchallenged, if only for the reason that whatever reservations you may have about (4*) will be equally applicable to (3).

The reconstructed syllogism for ¶ 13, then, is this:

(S7) Some distinct knowledge of one's end is necessary for every being that acts through knowledge.

All distinct knowledge of one's end is supernatural knowledge of one's end.

∴ Some supernatural knowledge of one's end is necessary for every being that acts through knowledge.

(S7) is a valid instance of the third-figure *Disamis*, not the canonical first-figure *Barbara*. Moreover, as ¶ 12 predicted, heathen philosophers will find themselves able to be unimpressed by the credentials of the minor premise. What about the major? Scotus thinks that an argument is needed to establish its credentials. The argument he provides in ¶ 13, however, is puzzling. Here is the text.

> Every being that acts for the sake of an end acts from a desire for the end; every being that acts *per se* acts for the sake of an end; therefore every being that acts *per se* desires, in its way, the end. Therefore, just as for a natural being that acts, a desire is necessary for the end for the sake of which it should act, so for a being that acts through knowledge (which is also a being that acts *per se*, from Book II of the *Physics*), a desire is necessary for its end for the sake of which it should act.[38]

The first sentence can be converted into a well-behaved *Barbara* syllogism:

(S8) Every being that acts for the sake of an end acts from a desire for the end.

Every being that acts *per se* is a being that acts for the sake of an end.

∴ Every being that acts *per se* acts from a desire for the end.

The conclusion of (S8) does not entail the major premise of (S7). The second sentence in the passage from ¶ 13 carries the argument further, insofar as it makes explicit the claim that a being that acts through knowledge is a being that acts *per se*. That proposition, coupled with the conclusion of (S8), entails the claim that every being that acts through knowledge acts from a desire for the end. Consider now the incomplete syllogism that takes this claim as one of its premises and has for its conclusion the major premise of (S7):

> Every being that acts through knowledge acts from a desire for the end.
>
> [Unknown premise.]
>
> ∴ Some distinct knowledge of one's end is necessary for every being that acts through knowledge.

As it stands, this syllogism *manque* already has four terms. Since we are trying to see how Scotus proposes to get to the conclusion that is in turn the major premise of (S7), we should leave the conclusion untouched and bring the known premise in line with it:

> Some desire for the end is necessary for every being that acts through knowledge.
>
> [Unknown premise.]
>
> ∴ Some distinct knowledge of one's end is necessary for every being that acts through knowledge.

We now have an incomplete syllogism with the following form:

> Some A is N.
>
> [Unknown premise.]
>
> ∴ Some D is N.

The unknown premise is thus the minor premise, and it must be compounded out of "A" and "D," with "A" the middle term. Moreover, "A" must be distributed in the unknown premise (since "A" is not distributed in the major premise) and the unknown premise must be positive. The only proposition that will fill that bill is "Every A is D." The finished syllogism is thus another example of *Disamis*:

> (S9) Some desire for the end is necessary for every being that acts through knowledge.
>
> Every desire for the end is distinct knowledge of one's end.
>
> ∴ Some distinct knowledge of one's end is necessary for every being that acts through knowledge.

An immediate and understandable response to (S9) is to say that the minor premise is obviously false, and that we should not attribute it to Scotus unless

its attribution is unavoidable. The problem is that the attribution of it, or of other propositions that entail it, seems to be unavoidable if we are going to bridge the gap validly between the desire mentioned in the major premise and the knowledge referred to in the conclusion. It is tempting to try to defend the spirit if not the letter of (S9) along the following lines. For any being that acts at all, there is some desire for the goal of that action that will figure in the explanation of the action; *a fortiori* for that special class of beings who act through knowledge. Suppose now that there is a supernatural end for beings that act through knowledge. These beings cannot desire that supernatural end if they have no beliefs whatsoever about it. For these beings, desires are typically propositional in content. Any proposition that is doxastically neutral for them cannot, by itself, have any effect on their desires. (In my pre-larch days, I assented to "No coniferous tree is deciduous," even though the proposition was neutral for me. My assent was simply willful and does not constitute a counterexample to the thesis. It is not the proposition that affected my desires, but rather my desires, perhaps in conjunction with some of my beliefs, that brought about my attitude toward the proposition.) In virtue of disclosing supernatural information, the important propositions about their ultimate supernatural end would remain forever neutral for these beings if they were not vouchsafed some revelatory knowledge, construed, be it remembered, merely as justified true belief. Thus, as the conclusion of (S9) maintains, these beings need some knowledge of their end.

This sketch of a defense of (S9) is laden with claims that stand in need of further examination, but even if the claims are true, they apply only to a contracted version of (S9):

(S9′) Some desire for the [supernatural] end is necessary for every being that acts through knowledge.

Every desire for the [supernatural] end requires distinct knowledge of one's end.

∴ Some distinct knowledge of one's end is necessary for every being that acts through knowledge.

To be sure, (S9′) yields the right conclusion, that is, the major premise of (S7). Note, however, that the minor premise has been modified in two ways in passing from (S9) to (S9′). The canonical relation of predication has been replaced with a requirement relation. That relation, or some other relation of necessary concomitance very much like it, is necessary in order to avoid the literal identification, made in the minor premise of (S9), of desires with items of knowledge. This modification may be no more cause for alarm than the relation of possession that occurs in the major premise and conclusion of (S4). But it may also prompt the thought that the logical structure of (S9′) is really beyond that of a categorical syllogism.

The minor premise has been altered in a second way, to make explicit that it applies only to desires for the supernatural end. (The modification induces a corresponding modification in the major premise.) In most cases, to the extent to which desires are dependent on cognitive states, the states need only be belief-states, not necessarily knowledge-states. A desire for our supernatural end depends on our having beliefs about that end. Since the acquisition of those beliefs depends on divine inspiration, it can be safely assumed that the beliefs that are the product of divine inspiration—and not, say, self-delusion—are true and justified. Thus, if we genuinely desire our genuine supernatural end, then we have knowledge of it, but our knowledge is not demonstrative; and, as Scotus insists in ¶ 12, as long as we are wayfarers we will not know that we have that knowledge.

It is obvious by now that insofar as (S9′) traffics in premises whose truth could only be known by revelation, (S9′) is a syllogism that will not be accepted by heathen philosophers, even though they might have accepted (S9′)'s conclusion as an item of purely natural knowledge. If the status of the conclusion of (S9′) is nonetheless tainted by the status of its premises, then, because it is the major premise of (S7), it turns out that neither premise of (S7) is an item of natural knowledge. In that case the distance between Scotus's argument and the arguments acceptable to the heathen philosophers is greater than may have first appeared.

I am keenly aware that it might be possible to produce a more adequate interpretation of Scotus's first argument. Scotus's other four arguments also await analysis. For various reasons, philosophers have devoted considerable energy to lay bare the views on faith and reason held by Augustine, Aquinas, Luther, even Gabriel Biel and John Locke. I wish to offer a plea on behalf of John Duns Scotus. Philosophers reflecting on the connections and tensions between faith and understanding will find that his views will repay the investment made in coming to understand them.[39]

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NOTES

1. John Duns Scotus, *Opera Omnia*, vol. 1 (Vatican City: Typis Polyglottis Vaticanis, 1950), p. 1. Citations are to the numbered paragraphs in this edition. All translations are mine. Allan Wolter has an English translation of the first question of the Prologue in "Duns Scotus on the Necessity of Revealed Knowledge," *Franciscan Studies*, 11 (1951), pp. 231-272. Nathaniel Micklem provides a paraphrase-*cum*-commentary of the same question in his *Reason and Revelation: A Question from Duns Scotus* (Edinburgh: Nelson, 1953). Micklem's book does not make use of the critical Latin edition.

2. *Nota, nullum supernaturale potest ratione naturali ostendi inesse viatori, nec necessario requiri ad perfectionem eius; nec etiam habens potest cognoscere illud sibi*

inesse. Igitur impossibile est hic contra Aristotelem uti ratione naturali: si arguatur ex creditis, non est ratio contra philosophum, quia praemissam creditam non concedet. Unde istae rationes hic factae contra ipsum alteram praemissam habent creditam vel probatum ex credito; ideo non sunt nisi persuasiones theologicae, ex creditis ad creditum.

The Scotistic Commission accepted ¶ 12 as authentic, even though it is a marginal addition not appearing in every manuscript. The edition used by Micklem does not contain the material in ¶ 12.

3. I assume that faith is a virtue divinely infused.

4. Not all relations of ontic priority need involve genera, species, and differentiae. Terence Irwin points out that for Aristotle, "the fact that p is prior to the truth of the statement that p, because the fact explains the truth of the statement and the converse is not true." See Terence Irwin, *Aristotle's First Principles* (Oxford: Clarendon Press, 1988), p. 124.

5. The notation is from Storrs McCall, *Aristotle's Modal Syllogisms* (Amsterdam: North-Holland Publishing Company, 1963), p. 6.

6. Scotus in particular regards both types of demonstrations as legitimate demonstrations. To cite one salient example: according to Scotus, the proposition that God is omnipotent is demonstrable *propter quid*, and the proposition that God's omnipotence extends mediately or immediately to every state of affairs that can be caused is demonstrable by a *quia* demonstration. See John Duns Scotus, *God and Creatures: The Quodlibetal Questions*, translated by Felix Alluntis and Allan B. Wolter (Princeton, N. J.: Princeton University Press, 1975), Question Seven, pp. 163-164 and subsequent discussion. For a defense of the legitimacy of *quia* demonstrations in Scotus, see Allan B. Wolter, "The 'Theologism' of Duns Scotus," as reprinted in Wolter's *The Philosophical Theology of John Duns Scotus*, edited by Marilyn McCord Adams (Ithaca, N. Y.: Cornell University Press, 1990), pp. 215-224.

7. Jonathan Barnes observes about Chapter 13 that *quia* demonstrations "are not, strictly speaking, cases of understanding at all; perhaps with ordinary usage in mind, Aristotle is here countenancing a weaker sense of 'understand' than his official one." See Jonathan Barnes, *Aristotle's Posterior Analytics* (Oxford: Clarendon Press, 1975), p. 149; and Irwin, *loc. cit.* I shall concentrate on one kind of case of a distinction between *quia* and *propter quid* demonstrations, without suggesting that this is the only kind of case that Aristotle had in mind.

8. The case of (S1) and (S2) illustrates, among other things, the point that we cannot give an adequate account of the ACD solely in proof-theoretical terms. Proof theory is consciously designed to be purely syntactic, with no taint of semantics, pragmatics, or epistemology. A *quia* demonstration is on all fours with a *propter quid* demonstration insofar as the former's premises and conclusion are every bit as necessary as the latter's. If, from a proof-theoretical point of view, we are latitudinarian enough to say that a theory is closed under logical entailment, then all the consequences of its axioms are parts of the theory. Since the conclusion of (S1) is necessary, it follows from the null set of axioms, and thus (S1) itself, as much as (S2), counts as part of the theory of celestial mechanics. To restrict the theory exclusively to *Barbara LLL* entailments will not sort out (S1) from (S2): if (S2) is a part of celestial mechanics and if the terms in (S2)'s major premise are convertible, then (S1) is also a part of celestial mechanics.

9. I do not wish to claim that all *quia* demonstrations are inferences to the best explanation. The case seems most persuasive when, as with (S1) and (S2), the major premise is convertible. Consider this example, adapted from Barnes, *op. cit.*, p. 150:

Every marsupial is a mammal.

Every wallaby is a marsupial.

∴ Every wallaby is a mammal.

If we suppose that being a marsupial does not explain why the wallaby is a mammal, this syllogism is not a *propter quid* demonstration. The syllogism is a demonstration of the fact that wallabies are mammals, but the wallaby's being a mammal is not an explanation of its being a marsupial. (Note that the major premise does not convert.)

Irwin points out, in effect, that the epistemic component of the transmission condition precludes inferences to the best explanation from conferring *epistēmē*. See Irwin, *op. cit.*, pp. 124-125.

10. On this passage and related issues concerning Augustine's attitude to authority as a source of justified belief, see Gareth B. Matthews, *Thought's Ego in Augustine and Descartes* (Ithaca, N.Y.: Cornell University Press, 1992), chap. 11.

11. See *Confessions*, VI, 5.

12. For a balanced study of this issue, see John F. Wippel, "The Condemnation of 1270 and 1277 at Paris," *The Journal of Medieval and Renaissance Studies*, 7 (1977), pp. 169-201.

13. *Quod nichil est credendum, nisi per se notum, vel ex per se notis possit declarari.* Henricus Denifle and Aemilio Chatelain (eds.), *Chartularium Universitatis Parisiensis*, vol. 1 (Paris: Delalain, 1889), p. 545.

14. It is thus misleading to claim, in commenting on proposition 37, that "The view that the canons of demonstrative science cannot provide the sole criteria for *knowledge* found redoubtable advocates in Scotus and later in Ockham." Eileen Serene, "Demonstrative Science," in Norman Kretzmann, Anthony Kenny, and Jan Pinborg (eds.), *The Cambridge History of Later Medieval Philosophy* (Cambridge: Cambridge University Press, 1982), pp. 507-508, emphasis added.

15. Wolter claims that *quia* demonstrations for Scotus do confer knowledge, because they really do argue from cause to effect. "The cause in question is not the precise reason *why the predicate inheres* in the subject, but *why we know* that the predicate is so affirmed. We are dealing here with logical, not ontological principles, with the order of knowledge, not with the order of nature." ("The 'Theologism' of Duns Scotus," in Adams, *op. cit.*, p. 221, emphasis in original.) Wolter's depiction would appear to beg the question whether we *do* have knowledge in this case. Moreover, a syllogism that explains why we know that *P* is a syllogism *about* the science that incorporates *P* but is not a syllogism *in* the science of *P*. We know that there are nine planets in our solar system because of the development of telescopes. The history and optical theory of telescopes, however, is not a part of celestial mechanics. On Wolter's view, every *quia* demonstration changes the subject from a domain of inquiry to a meta-domain whose subject matter is our knowledge of the original domain. (Think of the difference between a Hilbertian textbook in geometry and a journal devoted to the investigation of the structure of human geometrical thought and the most effective ways of teaching geometry.) Wolter's account may thus allow *quia*

demonstrations to confer knowledge, but not knowledge of the same subject. My account keeps the subject matter fixed, but denies that *quia* demonstrations confer knowledge, construed as *epistēmē*.

16. Saint Thomas Aquinas, *Summa Theologiae*, Ia, Q. 1, a. 1, *ad* 2.

17. English mass nouns also resist the indefinite article unless accompanied by a type term or measure term. "The bottle contains a wine" is deviant, but not "The bottle contains a Burgundy wine" nor "The bottle contains a liter of wine." "A knowledge of Latin is useful" is permissible, but seems to be merely a stylistic variation of "Knowledge of Latin is useful."

18. *Summa Theologiae*, Ia, Q. 2, a. 1.

19. It is ironic that the two most famous examples of geometrical enlightenment in philosophical literature have the opposite effect on their subjects. Reading first a theorem well into Euclid's *Elements*, Hobbes said "By God, this is impossible!" He then worked his way backwards in the *Elements* until he saw the theorem's necessity. Meno's slave's reaction, emphatically not based on working his way backwards, is "By God, this is necessary!"

20. The example is Jonathan Barnes's, not Aristotle's. "This points to the problem: for in the whole of the Aristotelian corpus there is not, as far as I am aware, a single perfect example of a demonstration." Jonathan Barnes, "Aristotle's Theory of Demonstration," as reprinted in Jonathan Barnes, Malcolm Schofield, and Richard Sorabji (eds.), *Articles on Aristotle: 1. Science* (London: Duckworth, 1975), pp. 65-87, esp. p. 66.

21. This example is suggested by remarks that Scotus makes in ¶ 41.

22. It is no accident that Scotus chooses a geometrical example to illustrate the point he wants to make in ¶ 46, to be discussed below.

23. *Quod impossibile simpliciter non potest fieri a Deo, vel ab agente alio.—Error, si de impossibili secundum naturam intelligatur.* Denifle and Chatelain, *op. cit.*, p. 552 (proposition 147).

24. The species panda apparently began its career as an omnivorous animal, but long ago came to specialize on bamboo. See Stephen Jay Gould, *The Panda's Thumb* (New York: W. W. Norton, 1980), essay 1.

25. *Quorum necessariorum cognoscimus terminos naturaliter, et illa possumus naturaliter comprehendere; sed omnium necessariorum revelatorum terminos naturaliter cognoscimus; ergo etc.* Scotus does not attach any modal conditions to the middle term. Nothing in our discussion will depend on whether we must actually have come to know the terms of a proposition or whether simply being able to know them is sufficient.

26. Scotus might have added that it is the believer's faith in and the nonbeliever's rejection of the same proposition on the same *natural* grounds that accounts for the believer's cognitive state being meritorious while the nonbeliever's state is not. But he did not. To have injected that specifically theological observation into the context of ¶ 44 would have needlessly muddied the dialectical waters.

27. *Iste intellectus licet posset formare compositionem hanc 'aliqua figura est prima', quia terminos eius potest apprehendere, tamen illa compositio formata erit sibi neutra, quia ista est mediata, inclusa in ista immediata 'triangulus est sic primus'; et quia hanc*

immediatam non potest intelligere, quia nec terminos eius, ideo non potest mediatam scire, quae ex hac immediata tantum habet evidentiam.

Wolter translates the text from "*et quia hanc immediatam*" forward as "But he would be unable to know this immediate proposition because he cannot grasp its terms. Therefore, he is not able to understand the mediate proposition, which can be known from the immediate proposition alone." ("Duns Scotus on the Necessity of Revealed Knowledge," p. 255.) As I shall argue below, by translating *intelligere* as "to know" and *scire* as "to understand," Wolter obliterates a distinction Scotus has taken pains to make.

28. Although *T*'s thus entailing *S* is necessary for *S*'s being included in *T*, that condition is sufficient. For present purposes, we can safely ignore the question. We might attempt to link the two propositions by means of a syllogism:

Some triangle is first.

Every triangle is a figure.

∴ Some figure is first.

This syllogism is a valid third-figure case of *Disamis*. But the first, or major, premise seems to be a dubious translation of "A triangle is first:" the premise suggests the falsehood that some *particular* triangle is first. We might then try:

Every triangle is first.

Every triangle is a figure.

∴ Some figure is first.

This is a case of a valid syllogism in *Darapti*.

29. Recall, as I am certain Scotus would, Anselm's famous *Proslogion* II slogan, *Quidquid intelligitur in intellectu est.*

30. Norman Kretzmann, "Faith Seeks, Understanding Finds: Augustine's Charter for Christian Philosophy," in *Christian Philosophy*, ed. Thomas P. Flint (Notre Dame, Ind.: University of Notre Dame Press, 1990), p. 6.

31. I assume that Kretzmann's characterization of Agustine's *intelligere* and Scotus's notion of *comprehendere* entail assent only to *true* propositions.

32. *Ad quaestionem igitur respondeo, primo distinguendo quomodo aliquid dicatur supernaturale. Potentia enim receptiva comparatur ad actum quem recipit, vel ad agentem a quo recipit. Primo modo ipsa est potentia naturalis, vel violenta, vel neutra. Naturalis dicitur si naturaliter inclinetur, violenta si sit contra naturalem inclinationem passi, neutra si neque inclinetur naturaliter ad illam forman quam recipit neque ad oppositam. In hac autem comparatione nulla est supernaturalitas. Sed comparando receptivum ad agens a quo recipit formam, tunc est naturalitas quando receptivum comparatur ad tale agens quod natum est naturaliter imprimere talem forman in tali passo, supernaturalitas autem quando comparatur ad agens quod non est naturaliter impressivum illius formae in illud passum.*

33. Micklem interprets the passage in this way. See Micklem, *op. cit.*, p. 37.

34. *Multae complexiones remanebunt nobis ignotae et nobis neutrae quarum cognitio est nobis necessaria.*

35. The five arguments are discussed in ¶¶ 13-53. In ¶ 53 Scotus gives his reasons for regarding the fourth and fifth arguments as weaker than the first three.

36. *Omni agenti per cognitionem necessaria est distincta cognitio sui finis. . . . Sed homo non potest scire ex naturalibus finem suum distincte; igitur necessaria est sibi de hoc aliqua cognitio supernaturalis.*

37. Micklem is aware that there is a gap connected somehow with the minor premise, but says, mystifyingly, that "the minor premise is in two parts: man is a rational agent, and man does not know his end" (Micklem, *op. cit.*, p. 9).

38. *Omne agens propter finem agit ex appetitu finis; omne per se agens agit propter finem; igitur omne per se agens suo modo appetit finem. Igitur sicut agenti naturali est necessarius appetitus finis propter quem debet agere, ita agenti per cognitionem—quod etiam est per se agens, ex II Physicorum—necessarius est appetitus sui finis propter quem debet agere.*

39. I thank Derk Pereboom for comments on an earlier version of this paper.