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Nous as the Ground of Aristotle's Metaphysics? -- John J. Cleary

Introduction: This paper explores the implications of Aristotle's puzzling suggestions that the possibility of first philosophy somehow depends on whether part of the soul is separable from material body. My conjecture is that for Aristotle the science of metaphysics depends on a special activity of *nous* that grasps self-identical essences which are objects of first philosophy, as distinct from physics and mathematics. From Aristotle's perspective, of course, it is the existence of such essences that makes metaphysics possible, but it is arguable that without a corresponding mode of cognition this would not be a human science. It is a moot question whether it could be a divine science either, though one can argue that for Aristotle the divine mode of cognition, involving the complete identity of knower and known, represents the ideal to which human noetic activity aspires. Thus, in my title the term 'nous' refers to this higher-level noetic activity, as distinct from the basic noetic activity that is common to all kinds of thinking.

My argumentative strategy will be as follows. I begin with those passages in *Metaphysics* VI & XI where Aristotle makes his division of the theoretical sciences into physics, mathematics, and first philosophy with respect to their different subject-matters. Next I correlate these with psychological passages in *De Anima* which deal with the relation between nous and different kinds of essences. Then I draw some parallels with Aristotle's arguments in *Metaphysics* XII for the existence of an unmoved mover whose activity is purely noetic. Here we find exemplified the perfect identity of *nous* with its object, which is possible for entities that are completely independent of matter and hence are pure actualities. Finally, I return to the earlier books of the *Metaphysics* in order to show that for Aristotle the principles and essences involved in first philosophy are only accessible through noetic insight. In this way I want to suggest that the activity of *nous* is foundational for metaphysics.

Section 1: The Standard Division of the Sciences

*Metaphysics* VI. 1 discusses the possibility of a general science of metaphysics, which inquires about the principles and causes of being qua being. Aristotle's guiding assumption (*Met. 1025b5-7*) is that every theoretical science is concerned with principles and causes, though the special sciences study only a particular genus of being rather than being simpliciter (*ἀπλώς*) or being qua being (*ἐν ἄν). Furthermore, they do not give any account of the whatness (*τό τί έστιν*) of their objects of study but merely assume it or make it clear by perception. Aristotle concludes that such induction is not a demonstration (*ἀπόδειξις*) of substance or of whatness but is rather some other way of making the principles clear. Similarly, the particular sciences say nothing about the 'existence' of the genus they study, since it belongs to the same rational capacity (*διανοία*) to clarify the 'what-it-is' (*τό τί έστιν*) and the 'if-it-is' (*εί έστιν*) of a genus (*Met. 1025b16-18*). This introductory passage leads one to expect that Aristotle's proposed science of metaphysics will clarify these foundational questions which were also discussed in *Posterior Analytics* II.1-2. Such an expectation should guide our interpretation of the rest of *Metaphysics* VI. 1, which deals mainly with methodological questions.

First he discusses the theoretical science of physics, which deals with the sort of being that has in itself a principle of motion and of rest, by contrast with the subject-matter of the practical and productive sciences where the moving principle is either in the agent or in the artist. Physics is also distinguished from other theoretical sciences in that it inquires about the kind of being which is subject to change, and in that it studies substance in the sense of form (ουσία... κατά τον λόγον) for the most part only as inseparable (οὐ χωριστή μόνον) from matter; cf. 1026b26-28. This passage can be read as giving implicit answers to the 'what-it-is' and 'if-it-is' questions with regard to the objects of physics, even though the order of these questions is reversed in the *Posterior Analytics*. So his answer to the 'if-it-is' question here is that definable essences in physics have a mode of being that makes them inseparable from sensible matter. But this, in turn, dictates his answer to the 'what-it-is' question; i.e. that a physical essence typically involves a capacity for undergoing change that is integrally connected with sensible matter.

Therefore Aristotle emphasizes the priority of the 'if-it-is' over the 'what-it-is' question in the following methodological remark:
We must not overlook the mode of being of the essence and the definition of an object of physics, otherwise the inquiry will not achieve anything. (Met. 1025b28-30)

What Aristotle seems to have in mind here is the mode of being (πώς έστί) of the form that is expressed by a definition of the essence (τό τι ήν είναι). Thus the words ού χωριστήν describe the mode of being of physical forms as not separable from sensible matter, and within the same context their meaning is clarified in terms of the subsequent distinction between ‘the snub’ (τὸ συμώ) and ‘the concave’ (τὸ κοίλον). The difference between these definienda is that the snub is bound up with matter (συνειλημμένον μετά τῆς ὀλης), whereas the concave is without sensible matter (δένεν ὀλης αισθητῆς). Thus, he says (Met. 1026a4-5), it is clear how one ought to seek the what-it-is (τδ τί έστι) in physical things and how one ought to define it. In other words, the definition of any natural form coming under the genus of animal or plant must include some reference to change, since it always has matter (ἀεί έχει ὀλην – 1026a3). So the definition reflects the mode of being of the essence insofar as it has a necessary connection with a certain kind of matter; e.g. snubness is always concavity in a nose and the nose is a certain form in flesh and bone. These seem to the relevant grounds for Aristotle’s claim (Met. 1025b27-28) that the science of physics deals for the most part with the kind of essence which, with respect to definition, is inseparable from matter (σύ χωριστήν). For instance, he says (1026a5-6) that physics will study those parts of soul which do not exist without matter (δεν τῆς ὀλης), which implies that some other science must inquire about any parts of soul that are separable from matter. Aristotle thereby suggests that first philosophy deals with the separable part of the soul which he elsewhere called nous.

Within his discussion of the mode of being of physical forms, however, it appears that Aristotle is using χωριστός in a logical sense when he underlines (1025b28-30) the importance for every inquiry of clarifying the mode of being of the essence being studied. For instance, the character of physics as a science is dictated by the fact that it studies natural forms as internal principles of change which are integrally related to certain kinds of matter. By parallel reasoning, perhaps the character of mathematical inquiry may also be determined by the logical relationship which its objects of inquiry have with some kind of matter. Although Aristotle does not spell out any such relationship here, he leaves the possibility open when he says (1025b33-34) that concavity is without sensible matter. From this brief remark it is not clear whether concavity is logically related to another kind of matter or whether it is completely independent of matter. From his preliminary discussion in the relationship between intelligible matter and mathematical forms, the first alternative is at least plausible. Later in VI. 1 (1026a15), for instance, he says that mathematical inquiry is about things which are perhaps not separable but have a mode of being as though in matter (ού χωριστά δε τοις ἀλλ’ ἀοί εν ὀλη). If he is referring to intelligible matter, this might throw a different light on the tripartition of theoretical sciences.

From his preliminary discussion in Metaphysics VI. 1, therefore, we may extract the working hypothesis that Aristotle wants to distinguish between the three theoretical sciences in terms of the relationship which the essences studied by them bear to matter. For instance, physical forms like snubness have a necessary connection with the kind of sensible matter in which they are embodied, and this fact must be reflected in the characteristic definitions of physics. By contrast, some mathematical sciences treat their objects of inquiry qua unchangeable and qua separable (Μάθημα τού ἀλμερόν και τού χωριστοῦ), though Aristotle notes (Met. 1026a7-10) that it is presently unclear whether mathematical objects are unchangeable and separable entities. This remark about mathematics seems to contain an implicit distinction between the material and formal objects; i.e. that while these sciences may treat their (formal) objects as if they were unchanging and separable, this may not reflect the ontological status of their (material) objects. But this ontological inquiry is postponed to Metaphysics XIII. 1-3.

Now it is just at this point in the text that we find the tripartition of the sciences introduced in the following hypothetical manner:

If there is something eternal and unchangeable and separable, then it is obvious that knowledge of it belongs to a theoretical science. Yet it is not physics (because that science is about some changeable things) nor is it mathematics but some science prior to both. For physics deals with
inseparable though not unchangeable things, while some of the mathematical sciences deal with
unchangeable things which perhaps are not separable but are as if in matter. First philosophy, on
the other hand, is about separable and unchangeable things.17

What is clear from the protasis of the introductory conditional is that the character of a science is
determined by the mode of being of its objects, since Aristotle concludes that there must be some
theoretical science dealing with eternal and unchangeable things if these exist.18 Yet this science
cannot be physics, which treats of changing or moving things, nor can it be mathematics but rather some
science that is prior (προτέρας) to both. This claim about the priority of his projected science is rather
surprising because nothing in the previous discussion has prepared us for it.19

For an explanation, therefore, we must look to the subsequent distinction between the theoretical
sciences in terms of their characteristic objects of inquiry. In order to understand that distinction
properly, however, we must take it as being guided by Aristotle's search for the theoretical science
which is most appropriate for dealing with objects that are eternal, unchangeable and separable. It
turns out that physics is the least appropriate because it inquires about objects which are inseparable20
and also changeable.21 By contrast, mathematics seems to be a better candidate because at least some
of these sciences deal with objects which are eternal.22 Aristotle seems doubtful, however, about
whether any mathematical objects satisfy the separability criterion because they appear to have a
mode of being that connects them with some kind of matter. So he concludes that, if there are separable
and unchangeable objects, then there will be a prior science which deals with them.

If this tripartite division of theoretical sciences is to remain consistent, however, we must assume
that χωριστός refers to logical separability whenever it is used in this passage. Otherwise, we shall
have to accept Merlan's claim that it is inconsistent because it contains two principles of division, one
epistemological and the other ontological.23 If we take χωριστός in a simple ontological sense,24
Schwegler's conjecture about the text at 1026a14 seems to be correct because the sensible things studied
by physics are usually independent entities.25 This would be consistent with its usage in reference to
mathematical objects when he says (1026a15) that they are perhaps not separable but have a mode of
being as though in matter.

Immediately after the above passage in VI. 1, Aristotle asserts (1026a16-18) that while all causes
are eternal, those connected with the appearances of the divine are especially so. It is not quite clear
what appearances he has in mind, though he may be referring to the visible heavenly bodies since
these were traditionally worshipped as divinities.26 In any case, he concludes that there are three
theoretical sciences, namely, mathematics, physics, and theology. Despite ambiguities in the Greek, it
is reasonable to assume that Aristotle is talking about the heavenly bodies when he says (1026a20)
that the divine (το θειον) is present in things of such a nature if it is present anywhere. This assumption
is borne out by the subsequent claim that the most superior (τιμιωτάτη) science deals with the most
honorable (τιμιώτατον) genus of things and that theology is more choiceworthy (αίρετώτερος) than the
other theoretical sciences.27 The language here suggests that Aristotle accepts some value hierarchy
for these sciences, corresponding to some ontological ranking of their objects, but he does not explain any
further what he has in mind.28

Furthermore, it is not immediately obvious what connection this has with the subsequent (1026a23-
25) aporia about whether first philosophy is general (καθόλου) or whether it is about some particular
genius or about a single nature. The question may have been prompted by a parallel distinction within
the mathematical sciences between particular sciences like geometry and astronomy, which deal with
particular kinds of objects, and universal mathematics which treats of all kinds of quantity. Aristotle's
answer (1026a27-31) takes the form of a double conditional: if there are no other substances besides
those constituted by nature then physics will be the first science, while if there is some unchangeable
substance then knowledge about it will yield first philosophy, and such a science will be universal
precisely because it is first.29 Aristotle characterizes the subject-matter of such a universal science in
terms of being qua being; i.e. both what it is (τι εστι) and the attributes that belong to it qua being.
Apart from the traditional problem of whether this is general or special metaphysics, there remains
also the question about how the mode of being of such essences (i.e. their separation from matter) can
ground the division between theology and astronomy (which also deals with divine entities).30
In this light let us look at the parallel passages in *Metaphysics* XI. 7 which introduces the tripartition of the theoretical sciences in a slightly clearer manner:

Since there is a science of being qua being and separate, we must inquire whether we should posit this to be the same as physics or rather distinct from it. Physics is concerned with things having in themselves a principle of motion, while mathematics is a theoretical science and one that is concerned with things which remain the same but are not separable. Thus, there is a science distinct from these which is concerned with separate and immovable being, if indeed there exists such a substance, that is, one which is separate and immovable, as we shall try to show. The question about the division of the sciences seems to be prompted by the claim that there is some science of being qua being, whose object of inquiry is described as separable. Since it is assumed as obvious that there must be some science of such theoretical objects, the question is formulated as to whether this is identical with physics or distinct from it.

Aristotle addresses the question by considering the characteristic objects of physics; i.e. those beings which have in themselves a principle of change. Although Aristotle does not say so explicitly, one might infer that physics is disqualified as the science of being qua being because its characteristic objects have an internal principle of change that makes them inseparable from matter as the capacity for that change. Of course, it is also possible that physics is ruled out because it deals only with changing beings or with a particular kind of being. In view of the logical descriptions of theoretical objects within the whole passage, however, I think that some implication about the mode of being of objects of physics is being drawn, just as in the case of mathematical objects. For instance, the passage says that mathematics is about things which persist but are not separable. It seems clear from the context that the unchanging character of mathematical objects is being contrasted with changing physical objects. However, as Merlan points out, it is quite unclear whether the description of mathematical objects as not separated means that they are being considered as not separated or that they are actually not separated. Yet, if Aristotle is talking about them as not being separable from intelligible matter, there is a parallel with the objects of physics, since both are universal composites of form and matter.

Therefore about that which can exist apart and is unmovable there is a science different from both of these, if there is a substance of this nature (I mean separable and unmovable), as we shall try to prove there is. And if there is such a kind of things in the world, here must surely be the divine, and this must be the first and most important discipline. Evidently, then, there are three kinds of theoretical sciences -- natural science, mathematics, theology. The class of theoretical sciences is the best, and of these themselves the last named is best; for it deals with the highest of existing things, and each science is called better or worse in virtue of its proper object.

The argumentative strategy here is similar to that found in *Metaphysics* VI.1; i.e. the existence of a distinct science of first philosophy is made to depend on the existence of a separable and immovable being. If such a nature does exist then it will be divine and will constitute the most honourable genus of beings, whose study belongs to the science of theology. Thus it would seem that theology is simply another theoretical science with its own special genus, just like physics and mathematics. But this false impression is corrected by Aristotle's emphasis upon the priority of the divine principle studied by theology, which makes the science universal by virtue of being first among the theoretical sciences. If there were no such substance that is separable and immovable, then physics would be first philosophy and the science of being qua being would study physical forms as its principles. However, since he accepts the existence of supersensible forms which are completely separable from matter, he relegated physics to being 'second' philosophy even though it deals with sensible substances, unlike mathematics which does not deal with substances of any kind.

Section 2: Thinking about the different objects of the sciences

When Aristotle undertakes a systematic study of the soul in the *De Anima*, his guiding assumption is that it has some integral relation to a certain kind of body. For him this makes
psychology a subdiscipline of physics because that science studies forms that are essentially related to appropriate kinds of matter, as reflected in the fact that physical definitions contain some implicit reference to matter. It is from this perspective that he raises the question (DA I.1) of whether any one of the functions or attributes of the soul is peculiar to it as distinct from the body, since this might make it possible for some part of soul to be separated from the body. The best candidate for such a separable part is the faculty of intellect, since it does not appear to have a corresponding physical organ; yet if thought depends on imagination then it may still depend indirectly on body. If, on the other hand, intellect (or any part of it) is completely separate from body then it will be an object of inquiry for first philosophy and not for physics.

In the review of opinions which serves as an essential preliminary to his inquiry, Aristotle gives many indications that he takes very seriously the possibility that intellect may be separate. In De Anima I.2, for instance, he praises Anaxagoras for being the only one to see that Nous must be pure, simple, and unmixed (with body). This should be understood by way of implicit contrast with his criticism in DA I.3 of Plato's concept of a cosmic soul which involves magnitude and circular motion. One of Aristotle's objections is that the (highest?) activity of thinking is more like rest than movement, presumably because it consists in the identity of thought with its object; cf. DA 407a32-33. But the strongest suggestion that Nous may be a separate substance comes in De Anima I.4, where Aristotle says that Nous itself seems to be an independent substance and to be indestructible (408b18-19). Although this is reported as one of the appearances, its reliability seems to be verified later (408b29) when he says that Nous is perhaps something divine and impassive, and hence that it is something other than Nous which perishes when mortal men stop knowing and contemplating. But, on the other hand, there is the problem of how a pure and immaterial Nous can know anything if it is completely impassive. So Aristotle's reports should be understood in terms of a general aporia about the nature and ontological status of Nous. This is confirmed by a parallel passage in De Partibus Animalium I.1 where he raises a puzzle as to whether physics studies all of soul or whether there may be some parts of soul left for first philosophy to study (641a33-36). In order to deepen the puzzle, he gives some reasons to believe that the study of some parts of soul belongs to first philosophy rather than to physics.

In De Anima, however, the science of physics provides the dominant perspective from which he conducts his inquiry about the human soul and its various faculties. For instance, the faculty of sensation is analysed into different forms of perception embodied in appropriate physical organs, and even imagination is given a physical basis in the sense organs; cf. DA III.3. Indeed it is such a physical perspective which guides Aristotle's approach when in DA III.4 he begins to consider the part of the soul by which one knows theoretically and reasons practically. Thus it is appropriate for him to raise again the question of whether that part is separable spatially or merely separable in definition. In order to answer this question, he proposes to consider the differentiae of Nous and to investigate how thinking comes about. Here he talks about Nous in the broadest sense as a capacity for thinking.

From his analysis of perception as a receptive capacity, he infers that if thinking is analogous to perceiving then it will consist in being acted upon by an object of thought. On the basis of this analogy he concludes that the thinking part of the soul must be impassive but yet receptive of form, while being potentially like this form though not actually like it. The parallel with perception suggests that if the noetic faculty had its own peculiar form then it would hinder the faithful reception of other forms, just as a jaundiced eye will not give a true perception of colour. Hence the intellect must be nothing more than a capacity like each of the sense faculties, but since it must be capable of thinking all things (and is not confined to a narrow range of objects like the senses) it must be even more like a pure capacity. So Aristotle concludes that the part of the soul called Nous, whereby the soul thinks, is nothing actual before it thinks. Furthermore, he says, it is not reasonable for it to be mixed with body, otherwise it might acquire some particular quality or have some corresponding organ as does each of the sense faculties. This is the significance of his adoption of the word 'unmixed' from Anaxagoras who used it to describe Nous as a ruling power which is completely distinct from the universal mixture. Yet it is from Plato that he quotes with approval the description of soul as a 'place of forms', while pointing out that this applies only to the part of the soul that thinks and, furthermore, that these forms are present only potentially and not actually. In his typical dialectical fashion, he tries to reconcile the quite different perspectives of Anaxagoras and of Plato within his own unique view on the proper
differentiae of *nous*. By means of this philosophical compromise, Aristotle is able to resist the Presocratic tendency to assimilate thinking and perceiving.40

From such a perspective he can make a clear distinction between the types of impassivity to be found in sense and intellect, respectively. If the eye is exposed to a very intense colour (e.g. if one looks directly at the sun) then it temporarily loses its power to see and may be permanently damaged. By contrast, after exposure to a very intense object of thought, the intellect is not less but more able to think about less intelligible objects. Aristotle's explanation is that whereas the perceptive faculties are not independent of body, the intellect is separate or separable (χωριστός). Michael Wedin (1988) reads this in a minimalist fashion as saying only that the intellect does not depend directly on any physical organ that might be damaged like the eye or the ear. He refuses to accept that the passage provides any support for a transcendent view of intellect, especially within *DA* III.4 where there is not yet a distinction between receptive and productive *nous*. Such a refusal is consistent with Wedin's functionalist interpretation of Aristotle's claim that soul is the form of a living body, though it is not obvious that the same interpretation can be applied to intellect since it is said to be independent of body.

Furthermore, an important difference between sense and intellect is that the latter appears to be self-activating in a way that is not true for a sense faculty, which is always activated by an external sensible object. For instance, the scientist who has acquired a stock of concepts is capable of thinking these voluntarily, apparently without any external stimulus. While Aristotle accepts that both the process of perception and the acquisition of new concepts may be described as types of qualitative change, he insists that the transition from the possession to the use of knowledge must be characterized as a preservation rather than a destruction of the potency; cf. *DA* II.5. By contrast with qualitative change, which is merely an incomplete actuality (άτελης ἐνέργεια), the instantaneous transition from potential to actual thinking is a complete fulfilment (έντελεχεία). Aristotle stresses that the scientific intellect is still a potency but at a higher level than the mere potency to acquire these concepts. It is precisely the fact that it remains a potency at this level which requires the introduction of the productive intellect as a principle of actuality at *DA* III.5. Yet the only hint of this in III.4 is the claim that the intellect is able to think itself at the higher level of potency.41

In line with Aristotle's intentionalist psychology, however, the main difference between sense and intellect is to be found in their respective objects; namely sensible things like water and flesh, and their intelligible essences. In this way Aristotle differentiates the sense faculty, by which the soul judges (κρίνει) the ratio of sensible qualities which constitutes flesh, from the intellect by which it judges (κρίνει) the essence of flesh. Similarly in the case of mathematical objects like a straight line, the way in which the soul grasps the essence of straightness is different from that by which it judges the straight line. Presumably Aristotle is talking here about mathematical particulars as embodied either in sensible objects or diagrams, since they are distinguished from universal essences as captured in definitions. But if he is talking about universal mathematical composites then he may be referring to the intellect in two different dispositions, just as the bent line is related to itself when straightened.

From my point of view, however, the most noteworthy feature of this parallel between physical and mathematical objects is that they are both contrasted with objects which are identical with their essences. The latter type of objects (examples of which are not given here) are not distinct from their essences, so that they are grasped by one faculty in the same disposition. It seems to be the existence of such pure essences that leads him to the general conclusion that, insofar as there is a separation of things from their matter, there is a corresponding difference in the operations of the intellect. The implication here is that essences which are separated from matter are grasped in a different way by the intellect. In terms of the line simile, we might say that the mind gazes 'straight' at such essences, whereas through perception and imagination it looks 'crookedly' at forms in matter. In the absence of illustrations, however, it remains unclear whether Aristotle had in mind all essences that can be separated from matter by the intellect or merely the essences of things like highest genera and transcendentals that can be understood without reference to matter.

Subsequently in *DA* III.4 (429b22 ff.) Aristotle considers the question of whether the mind can think if it is simple and impassive, so that it has nothing in common with anything else that can act on it. This aporia (mentioned already in *DA* I.2) is heightened by contrasting the Anaxagorean concept of *nous* as completely separate with the Presocratic view of mind as being constituted from the same elements as the objects that materially affect it in the process of thinking. In order to disarm the
physical misconception upon which the aporia is based, he refers to another sense of being acted upon in virtue of something common (i.e. the form) which enables the mind to be in a way potentially all things but actually none of them until it thinks. By means of his famous simile of a blank tablet on which nothing is yet written, Aristotle introduces the concept of 
ous as a pure potentiality prior to its thinking. This concept enables him to resolve the aporia by avoiding both total difference between 
ous and its objects (per Anaxagoras) and complete sameness in the view of other Presocratics.

It is the same set of contrasting views which produce the second aporia (429b26) as to whether intellect can think itself. On the one hand, Anaxagoras holds that it is the only intelligible object that makes other things intelligible, whereas the physiologists think that 
ous must be mixed with something material in order to be recognized. Aristotle’s solution is to say that intellect thinks itself in much the same way as it thinks its intelligible objects because, when its objects are themselves without matter, there is an identity between that which thinks (το νοον) and that which is thought (το νοομενον). By contrast, in the case of compound things having matter, intelligible objects are present in them only potentially. This corresponds quite well to his epistemological view that universals are embodied in sensible things, so that one must become acquainted with them through perception and experience; cf. *Posterior Analytics* I.18, II.19. Such a process of acquiring intelligible objects as the raw material for thinking is necessary for human beings but it may be alien to the divine mind, which does not change from a state of ignorance to that of knowledge. In view of this contrast, therefore, one may ask whether the human soul has any divine element, even in its highest activity of ‘preserving’ concepts already acquired by contemplating them.

This question prompts a more mundane reading of *DA* III.5, which begins by drawing a parallel between 
ous and all natural things. The basis for this parallel is plainly that soul belongs among these natural things, and so it is reasonable to expect that it will have parts related as passive matter and active agent, just as in the case of artificial things art is related to its appropriate material. However, Aristotle infers that these differences will also be present in that part of the soul called 
ous. Since it is unclear whether or not 
ous belongs among natural things, the necessity of this inference is not obvious; unless it follows from the purely logical fact that every potentiality begs a corresponding actuality, just as in his analysis of self-motion. Indeed this seems to be the point of Aristotle’s claim that corresponding to the intellect which becomes all things (and so is potential) there is another intellect which makes all things. By means of the analogy with light, he suggests that the productive intellect is an active disposition that enables potentially intelligible objects to be actually thought, just as light facilitates the conversion of potential to actual colours. But his next step goes far beyond what the analogy warrants when he claims that this productive intellect is separate (χωριστός) and impassive (ἀπαθής) and unmixed (αμιγής), since it is an activity by its very nature. Here he is not appealing to an empirical analogy but rather to a metaphysical principle when he explains that that which acts is always superior to that which is affected.

But even that principle does not seem to justify the conclusion that the productive intellect is alone immortal and eternal when it has separated itself (χωρισθεις) and becomes its true self. It is not quite clear what kind of separation Aristotle has in mind here, since the aorist participle suggests that the separation has taken place in time, and so it would not be applicable to divine intelligences that have always been without matter. If it means a spatial (κατὰ μέγεθος) separation from matter, however, that would imply that productive intellect was first involved with matter and later separated. But it is also possible for it to refer to a conceptual (κατὰ λόγον) separation from receptive intellect, which is made in order to consider it as just what it is (ὅπερ ἐστι). If this is the case then there is no real basis for treating it as a separate substance like the divine mind. But an obstacle to this interpretation is that Aristotle seems to claim that the productive intellect is not intermittent in its activity, despite the obviously episodic character of human thinking. In general, therefore, it is hard to resist the traditional interpretations, which rely on Aristotle’s statement about the productive intellect alone being immortal and eternal. But how can we reconcile this transcendent perspective with the psychological (and hence natural) perspective that has prevailed so far in *DA* III.4-5?

One possible way is to explore some hints in *DA* III.6 concerning what A.C. Lloyd (1970) has called ‘non-discursive thought’. In Aristotle’s discussion, the best candidate for this appears to be what he calls thinking about indivisibles, which excludes the possibility of error, as distinct from thinking about combinations of notions where error is possible. To illustrate the former, Aristotle mentions
(430a16) the indivisible in quantity and the indivisible in form. As an example of the latter, he uses the synthesis of concepts that involves the incommensurable and the diagonal. The point of the contrast is to distinguish unities which the mind receives directly in noesis from those unities which the mind itself synthesizes in dianoia. According to *Metaphysics* X.1 (1052a30-34), the things whose noesis is one are the indivisible in number or the particular, and the indivisible in form, which is indivisible in understanding and knowledge. But sensible and mathematical composites are indivisible in number, while their essences are indivisible in form. Thus *DA* III.6 seems to be resuming the discussion (in *DA* III.4) of the different ways in which the soul grasps composite particulars and their essences. However, most of *DA* III.6 is given over to discussing unities which result from dianoetic synthesis or division; e.g. propositions, privations and genera. For instance, the point as a division of the line is thought in the same way as a privation like evil, which is known by the negation of a positive quality like good. In order to grasp these objects of thought, the mind must be potentially identical with their contraries.

This is the context for Aristotle's puzzling remark (430b24-26) that if there is something which has no contrary then it thinks itself and is in activity and separate (αυτο εαυτο γινωσκει και ενεργεια εστι κατ χωριστον). Although the remark is a conditional, it seems to describe a possible activity of the human mind. Yet Hicks (1907, p. 523) assumes that it applies to the divine mind, since it echoes so closely the description of divine activity in *Metaphysics* XII.9.

But there are reasons to doubt this assumption when Aristotle goes on to explain that thinking of essences does not involve predication (and hence the possibility of falsehood), and so is always infallibly true. The parallel with the proper objects of perception which are grasped without error establishes that thinking of immaterial objects involves the quite mundane activity of grasping essences. Presumably this qualifies as non-propositional thought only because an essence does not involve predicating an attribute of a different subject, since it is rather a statement of identity and so is grasped infallibly or not at all. But this hardly seems to qualify as divine thinking, since the essences involved may belong to composite things and so are 'without matter' only in the mind, just like the form of a table in the mind of a craftsman. So these passages in *De Anima* do not have a transcendent perspective on *nous*, and to find such a perspective we must turn to *Metaphysics* XII.

Section 3: Nous as Supersensible Substance

There is a clear parallel between the transitions from the physical to the metaphysical found both in *De Anima* III.4-6 and in *Metaphysics* XII. In *Metaphysics* XII. 7, for instance, Aristotle draws metaphysical implications from the physical argument that there must be something which moves other things without itself being moved; i.e. that it is an eternal thing, a substance, and an activity. This constitutes an answer to the leading questions for his inquiry, namely, whether or not there is a supersensible substance and what is its mode of being. Yet his more immediate concern is to find a model for the action of an unmoved mover that will avoid an unwanted implication of motion through contact; i.e. that the mover is itself moved by reaction. Without an alternative to the mechanical model of motion, he cannot justify the postulation of an unmoved mover. While this problem appears to remain unresolved in *Physics* VIII, *Metaphysics* XII. 7 proposes an alternative model for the action of an unmoved mover:

And this is the way in which the object of desire or the intelligible object moves, namely, without itself being moved. Of these, the primary objects are the same; for the object of appetite is that which appears to be beautiful, and the primary object of rational desire is that which is really beautiful. We desire because it appears rather than it appears because we desire it, since the principle (of action) is thought. We should notice that both an object of desire (το όρεκτον) and an intelligible object (το νοητον) function in this alternative model as things that can move other things without themselves being moved. Indeed Aristotle thinks that such objects are identical in the case of the firsts (τα πρωτα) for each class of object; i.e. whatever is supremely desirable is also of the highest intelligibility. This is an important claim which Aristotle tries to defend by distinguishing (1072a27-28) first between a lower object of desire (ηθομοιητον), which appears to be beautiful (το φαινομενον καλον), and the primary object of wish (βουλητον πρωτον), which really is beautiful (το δι καλον). We might reformulate this distinction as follows: the object of the sensible appetite is what appears pleasing to
the senses, whereas the object of rational desire is what is objectively beautiful. Thus the unity and consistency of rational appetite is dictated by its single object, while the multiplicity and inconsistency of sensory appetite is also governed by its many and diverse objects. As Aristotle says, "we desire because it seems rather than it seems because we desire". In line with his general theory of cognition, logical and ontological priority is given to the object of desire. Although Aristotle adds that thinking is the starting-point (ἀρχή), he does not give it primacy over the object of thought. The crucial point for his subsequent argument is that the beautiful (or the noble or the fine) is also prior to our desire for it, since it is by becoming conscious of the beautiful that we are led to desire it.

Aristotle's major task is to establish the identity of the primary object of desire with the primary intelligible object. Drawing on his psychology, he first claims that the intellect is moved by the intelligible object, and then refers to some table (συστοιχία) of objects which are intelligible in themselves (καθ’ αὐτήν). According to this table, substance is primary (ἡ ύστερ πρῶτη) and, within the category of substance, that is primary which has a mode of being that is simple and in activity (ἡ ὁμολη καὶ κατ’ ἐνέργειαν). This is consistent with Metaphysics VII where substance is held to be prior in every important sense and, even within the category of substance itself, substantial form is given both ontological and epistemological primacy. In XII. 7, however, Aristotle introduces a kind of substance apart from sensibles which is immaterial, utterly simple, and a pure activity. He is careful to explain (1072a32-34) that the simplicity he attributes to such primary substances is not the same as unity, because that signifies a measure (μέτρον) whereas simplicity indicates a mode of being (πᾶς ἔχον). Therefore, within the table of things which are intelligible per se, absolute primacy is given to the kind of substance which is completely simple and in a state of pure activity.

But Aristotle has not yet established the identity of the primary intelligible with the primary object of desire, which has only been shown (1072a27-28) to be an intelligible object; i.e. what is really noble or beautiful. This seems to be the point of his claim (1072a34-35) that the beautiful or what is choiceworthy by itself (τὸ δὲ αὐτὸ αἰρετὸν) belongs in the same table of intelligibles. In fact, the crucial nexus is established through the assertion (1072a35-b1) that the best thing (ἀριστόν) is always the first (τὸ πρῶτον), at least by analogy. In other words, Aristotle claims that there is at least an analogous identity between the most choiceworthy thing and the primary intelligible. But, as we can see from Metaphysics XII. 4 & 5, he needs to establish their complete identity in nous for it to play the role which he assigns to the unmoved mover in his model of the universe.

For this purpose one of his most important claims is that what is really noble or beautiful is the primary object of rational desire. Behind this claim lies the distinction between different kinds of desire, one of which may be described as rational wish by contrast with irrational desire, which acts contrary to reason; cf. DA 433a22-26. Thus the priority of rational over irrational desire is dictated by the superiority of the object of rational desire (i.e. what is really beautiful or noble) over the object of irrational desire (i.e. what only appears to be so). Such priority is both ontological and gnoseological, since thought must grasp these objects as good before we are moved to action. So Aristotle treats objects of choice as if they were ordered in a series at whose apex stands the highest good or what is truly noble. Similarly, in the metaphysical sphere, he envisages an ordered series of intelligible objects with substance at its apex. Despite his own distinction between the theoretical and practical spheres (e.g. EN VI.7), Aristotle connects these two series so as to produce an identity between their respective first members. At the level of divine being, Aristotle overrides his standard distinction between practical and theoretical thinking, so that divine contemplation becomes the highest form of praxis.

It appears, however, that divine thinking has special characteristics which are not shared by human thinking, except perhaps in its highest form as contemplation. This shared form of human and divine thinking seems to be what Aristotle has in mind when he says (1072b18-19) that thinking per se is of the best per se and that thinking in the highest degree is of the best in the highest degree. Such divine thinking has for its object not any apparent good but absolutely the best and most noble thing, which is none other than the Unmoved Mover itself. Thus qua intellect this Mover thinks itself when it participates in thinking, since something becomes intelligible through touching and thinking (νοήτω δὲ γίνεται θυγάτηρ καὶ νοῦς). The result of divine thinking, therefore, is that the intellect and the intelligible object are identical (ταύτων νοῦς καὶ νοητόν).

By implicit contrast with the human intellect which is capable of receiving all intelligible forms, Aristotle claims (1072b23-24) that the actual possession of intelligible objects appears to be divine.
(θείον), and that the contemplation of such objects is the most pleasant and the best activity. The first claim might be justified in terms of the priority (and hence superiority) of activity over capacity, along with the previous identification of pure activity with the Unmoved Mover. But the second claim implicitly appeals to three hierarchies whose first members coincide in that wondrous fashion which Aristotle found so aesthetically pleasing that he declares the highest activity of the mind to be the best and the most pleasurable. Drawing upon our intermittent experience of this privileged activity of contemplation, Aristotle concludes (1072b24-26) that if the divine exists in this way eternally then this is cause for wonder (θαυμαστόν), but since the mode of being of the divine is better, this is even more wondrous (θαυμασιώτερον). If philosophy begins in wonder, it also seems to culminate in wonder at the mode of being of the divine, which finds a pale imitation in our own activity of contemplation.

But there is a problem about divine thinking which is taken up in Metaphysics XII. 9 in the form of a special aporia about divine nous and its objects. Several conflicting possibilities are considered in turn. 1) If it is thinking of nothing then it is no better than a sleeping person, and this would be absurd for the divine. 2) It may be thinking of something else on which it depends, but that would make it a potency and not the best substance. Yet if nous were only a potency, then it is likely that its thinking would be laborious and that its intentional object would be more noble than itself. But this is implausible for divine nous, which is the best thing in the universe and so must think itself. Its self-reflexive activity is described (1074b34) as “thought thinking of thinking” (νόησις νοήσεως νόησις). By means of this famous formulation, Aristotle implicitly differentiates divine from human thinking, since the latter may be of objects more noble than itself (e.g. the divine) and it is often laborious. Indeed from our human perspective divine thinking is exceptional because all of our cognitive activities have something else as their objects, so that we are aware of the activities themselves only by the way (έν παρέργω). Aristotle’s answer to this possible objection is to cite the case of theoretical objects that are without matter (άνευ ήλης), since thinking is there identical with the object thought. That answer suggests that there are human analogues to divine thinking which make it less alien to our experience. This is borne out by the final puzzle about whether the object of divine thought is a composite. If this is the case then thinking will involve a transition from one part of the object to the other, and this would introduce change into the divine nous. The alternative is that the divine mind thinks indivisible objects that are without matter, since these would involve no transition in thinking. Thus in thinking about indivisible objects (or essences without matter) the human mind is most like the divine. But even then we can only think these objects for a limited period of time before we tire, whereas the divine mind is thinking itself throughout eternity without changing its object and without fatigue. So divine thinking represents the ideal of perpetual identity between nous and its object, which the human mind can only sporadically reach in the highest activity of nous, namely in contemplation. Finally, let me briefly explore the implications of this ideal for Aristotle’s own science of metaphysics.

Section 4: Foundationalism in Aristotle’s Metaphysics

Aristotle’s logical analysis of the structure of any science leads him inexorably towards foundationalism, despite the dialectical background to his notion of the syllogism. For him the starting-point of a syllogism is an assumption, whether that be taken for granted in a dialectical syllogism or whether it be simply asserted as true in a categorical syllogism. Thus a dialectician may acquire his premisses by adopting a generally accepted view, but a scientist requires premisses that are self-evidently true, and it is not clear how he is to acquire them. Despite doubts that have been raised recently about the traditional answer, it is clear that nous must be the cognitive faculty by which these first principles are acquired even if that is the result of intellectual habituation. What is involved is an intuitive grasp of an immediate connection between subject and predicate, since a mediated connection would involve the discursive or syllogistic process of finding a middle term. It is quite significant that Aristotle seems to assume that substances must provide the basis for such immediate connections which are usually expressed in definitions.

Let us briefly consider what it means for him to make definition a starting-point for science. In Posterior Analytics II.1, Aristotle makes a general distinction between two different kinds of inquiry depending on whether the leading question is simple or compound. In the latter case the question is whether some predicate may be applied to a different subject and why; e.g. whether or not the sun is eclipsed, and if so what is the reason for it. But in the case of a simple question one asks whether
something exists and, if so, what it is; e.g. whether man exists and what man is. Thus the simple question asks about substance and essence.

To show that this distinction between simple and compound questions is not confined to the Posterior Analytics, one can appeal to Metaphysics Zeta 17 where Aristotle says that whoever searches for the why of something is always inquiring why something applies to something else; e.g. why the man is musical. By contrast, whoever wishes to know why a thing in itself is itself does not search for anything (different) because the object of inquiry is already known to him as something that exists and he merely seeks the essence that is identical with it (1041a27-28). With regard to such simple objects neither instruction nor inquiry is possible but rather some other way of discovery (1041b9-11). Although Aristotle does not identify this way, one may conjecture that it must be noetic insight.

In connection with definition, Aristotle considers a number of problems connected with its reference, its unity and its existential implications. With regard to the problem of reference, it is not always clear that the terms of the definition indicate the essence; e.g. 'biped animal' is not an adequate definition of man because it also applies to other species of animal. In Posterior Analytics II.13, Aristotle resolves the problem by specifying that the essence is indicated by a combination of attributes that belong of necessity only to this indivisible species. Similarly, the second problem about the unity of definition is solved by appealing to the method of division to show that the last differentia makes the others superfluous by including them all even up to the genus. This solution is fleshed out in Metaphysics Zeta 12 with a matter/form analysis which likens the genus to matter (potency) that is only brought to actual existence by the species.

But this leaves unresolved the third problem as to how we know that the definition answers to any reality. For instance, mathematicians assume that objects exist which correspond to their primitive definitions, while proving the existence of other objects about which they make demonstrations. So the problem can be reduced to the question of how we know that anything corresponds in reality to the primitive terms that make up the definitions in any discipline. In the case of physics, Aristotle seems inclined to rely on sense perception to guarantee the existence of objective correlates to such primitive terms as 'hot' and 'cold', 'wet' and 'dry'. His views on the existence of mathematical objects are much more complicated, since both sense and intellect combine in verifying the correlates to terms such as 'point', 'line', 'plane' and even 'solid'. But at least Aristotle gives some attention to the mode of being of mathematical objects, whereas the existence of the objects of metaphysics seems to be taken for granted, presumably because the existence of substance is taken to be self-evident. With historical hindsight, we can see that this is a very problematical assumption but perhaps Aristotle did not see it as a problem. I think that the reason for this is to be found in his epistemological theory about the direct contact between noetic insight and reality.

In Metaphysics Gamma 1, Aristotle introduces a science of being qua being which inquires about the attributes of being in itself, by contrast with special sciences like mathematics which study only a part of being. In making such an inquiry into the highest principles of being, Aristotle explicitly assumes that there is a definite nature to which they belong per se. Furthermore, the fact that being is a προς εν equivocal involves a reference to substance which is the primary case of being. One implication (1004a2) which Aristotle draws from this is that there are as many parts of philosophy as there are kinds of substance; so that there must be a first philosophy and another following from it. When he refers to mathematics by way of parallel, presumably he means that universal mathematics is prior to the special sciences like arithmetic, which itself is prior to geometry and to the so-called 'mixed' sciences. It is with reference to substance as a primary subject that the philosopher explains each predicate in terms of how it is related to it. Therefore he claims that philosophy provides universal knowledge as to what belongs to being qua being, whereas dialectic merely raises questions about this topic.

In answer to the dialectical puzzle as to whether the same science studies both primary being and the axioms of being qua being, Aristotle says that this is certainly not the business of special sciences like physics, even though some physicists have considered nature as a whole. He insists that there is someone higher than the physicist who conducts a more inclusive investigation into the axioms as well as into primary being. Thus it is the business of this first philosopher to inquire about the most established principle about which it is impossible to be mistaken, since it is best-known (γνωριμωτάτη) and non-hypothetical (ἀνυπόθετον) because it is presupposed by all other knowledge.
This is the principle of non-contradiction which is formulated by Aristotle as a principle of being rather than as a logical axiom. Of course, it is also a principle of logic and of epistemology but one should note that he gives primacy to its ontological formulation. Despite the tradition about Heraclitus, Aristotle insists that no one can believe the same thing to be and not to be at the same time and in the same respect. Therefore this axiom functions as a first principle of demonstration that is presupposed rather than explicitly stated as a premiss. Those who demand a demonstration of such a principle are accused of being lacking in education (presumably in analytics), since such a demand leads to an infinite regress. However, Aristotle does think it possible to prove the principle by means of refutation, if the opponent will make any definite statement. Even if he only says a word with a determinate meaning, one can show that he is presupposing the principle; otherwise the possibility of discourse would be completely undermined, since words would have no fixed meaning. For instance, Aristotle points out (1007a1 ff.) that 'being a man' and 'not being a man' have different meanings, even if one adds an infinity of accidental attributes. Those who argue from accidents tend to undermine the substance (οὐσία) and essence (τὸ τι ἦν εἶναι) of things. But if there is something which is being a man (ὅπερ ἄνθρωπον εἶναι), it cannot be not-man because it has a single meaning as the substance of something. Therefore substance provides the first point of reference or the subject for all accidental predicates.

The question which Aristotle never addresses directly in Metaphysics Gamma is how one is to grasp substance as subject of predicates if it is not something that can be demonstrated. But I think it can be raised indirectly in connection with Gamma 5 where he discusses the claim of Protagoras that the same thing can both be and not be. Although this may appear to be a purely sophistic claim, Aristotle notes that some people are genuinely puzzled because sometimes visible things give rise to contraries; e.g. they may be both big and small. These people take the compresence of contraries to be an elementary fact of experience, since they assume that nothing comes to be from not-being. He concedes that in one way they are right because the same thing can have contrary attributes potentially, though not actually. However, such people are misled by their assumption that intelligence (φρονήσις) is identical with sense perception, which implies that the appearances are true. As an antidote to this assumption, Aristotle proposes (1009a36) that we ask them to accept that there is another type of primary being which is not subject to generation or destruction. Even if sensible things are subject to change of all kinds, there remains the form (εἶδος) by which we know them. It is by means of such arguments from knowledge that Aristotle intends to persuade these people of the existence of an immovable nature (ἀκίνητος τις φύσις). Just as perceptible forms are the subject for all accidental predicates.

Aristotle's whole treatment of the principle of non-contradiction is therefore dictated by certain assumptions about the priority of being over thinking which appear to undermine my thesis about the foundational role of nous in his metaphysics. But I think that appearances are deceptive in the case of substance, since it is a primary intelligible which is identical with the mind which grasps it. We should notice in this connection that Aristotle plans to persuade Protagorean relativists that there exists an immovable nature by asking them to accept that there is another type of primary being besides sensible things. The reason for the general perplexity that leads to such relativism, according to Aristotle (1010a2 ff.) is the natural assumption that only sensible things exist in which an indeterminate nature (i.e. matter) lends itself to continual change. Even if this assumption makes their ideas about continual flux plausible, there still remains the permanent forms by which one knows things (1010a25). Furthermore, as Aristotle points out (1010a26 ff.), these people only pay attention to the changing sublunary realm and ignore the most important part of the universe; namely the superlunary realm and its invisible unmoved movers. He repeats (1010a32-34) that one must show (δεικτέω) and persuade (πειστέω) them that there is such an immovable nature. Even if he is talking about lessons in physics and astronomy, how else is he going to achieve this except by calling upon their noetic insight into substance as the permanent basis for all meaningful discourse?

A similar problem arises for Aristotle in explaining how the mind grasps essences, since these are also first principles of science. The traditional interpretation of his view of essence is that it is a universal property or cluster of properties that belong essentially to an object, and so make it what it is. These essential properties are captured in a definition, and thereby the object becomes knowable, since knowledge is only of the universal. Although this conventional Aristotelian doctrine looks well-founded, it has been challenged recently by scholars who argue that essence must be particular rather than universal if it is to explain how primary substance is particular.\textsuperscript{57} As we can see from Metaphysics
III.6. Aristotle himself was aware of the difficulty as to whether essences are universal or particular. His formulation of this aporia goes as follows: If they are universal, they will not be substances, since what is common is a 'such' and not a 'this'. On the other hand, if essences are particulars they will not be knowable, since knowledge is of the universal.

The standard way of making this aporia disappear is to say that individual composite substances are known through their universal forms or essences. Yet that will hardly do because Aristotle considers form or essence to be a primary substance, and so it cannot be universal, as Zeta 13 shows. On the other hand, there is the epistemological consideration that definition and knowledge are of universals. In fact, Aristotle resolves the aporia in *Metaphysics* XIII.10 by distinguishing between actual knowledge, which is of the individual, and potential knowledge, which is of the universal. While this establishes the possibility of knowing individual forms or essences, it remains unclear whether or not these can be defined. At *Metaphysics* VII.15,1039b27 ff. Aristotle declares that individual sensible substances can neither be defined nor demonstrated because they are perishable and they contain matter which is indefinite and unknowable. Indeed, he rejects the possibility of defining any individuals, even if they are eternal and unique individuals like the sun, since every definition is common (1040b1). But this lands him in a difficulty about how there can be any definition or knowledge of sensible substances.

His way out of the difficulty is to deny that the composite substance as a whole is the object of definition, since it contains matter which is indefinite, while insisting that it is definable in terms of its form or essence. Such a definition is made with reference to its primary substance or its "indwelling form" (το είδος το ¿vóv); cf. 1037a24-30. But this qualifies as a definition of the composite substance, since it makes it 'what it is' when combined with matter. Of course, one must distinguish between the composite man and the essence of man, though this is not necessary in the case of things which are identical with their essences; e.g. soul and the essence of soul are the same; cf. *Met.* VII.6 & VIII.3.

Aristotle takes the view that individuals are both ontologically and epistemologically prior to universals, even though definitions are in principle universal and knowledge is of the universal. This creates the impasse which he resolves in *Metaphysics* XIII.10 by distinguishing actual knowledge of the individual from potential knowledge of the universal. In this way particular principles can be known, and the principles of substances can be particulars. Aristotle draws an explicit parallel between modes of knowledge and of reality: potential knowledge like matter is universal and indefinite, and so its object is universal and indefinite; whereas actual knowledge is definite and has a definite object. This parallel between knowledge and reality cuts very deep, since it is based on a realism of direct contact. For instance, universals which are predicated of composite entities themselves have a composite structure; i.e. they have a material aspect taken universally (e.g. wooden casket). Similarly, universal essences correspond to universal species as indeterminate objects of potential knowledge. By contrast, actual knowledge is determinate and its objects are individual and determinate; e.g. the grammarian contemplates this A.

But, in view of Aristotle's model of scientific knowledge in the *Posterior Analytics*, it seems more likely that the principles of the special sciences are universals and hence are the objects of potential knowledge. This appears to be the case for the sciences of mathematics and physics which study forms that are either bound up with sensible or intelligible matter. Proper definitions in these sciences must reflect the mode of being of these essences, and so they include both form and matter taken universally; e.g. snubness is concavity in a nose, or line is twoness in one dimension. By contrast, the science of substance has a first principle which is an individual; i.e. an unmoved mover as an eternal substance and pure actuality, which is also a moving principle of the natural world. Since it is an individual rather than a universal, it is grasped by actual knowledge and its essence is identical with itself.

Conclusion: Implications for Aristotle's science of metaphysics

If the argument of this paper is even plausible, it has some implications for our understanding of the science of metaphysics, as Aristotle conceives of it. The most important is that his first philosophy is a kind of theology which concerns itself with the highest and most admirable being in the universe, which he characterizes generally as an unmoved mover that engages in unceasing noetic activity. It is the existence of such a divine entity, whose essential nature may be described in terms of *nous*, that guarantees the existence of a theoretical science distinct from physics. But theology or first philosophy is also possible for human beings because their intellectual activity imitates that of the
divine, insofar as human *nous* can be completely identical with essences without matter. Since these essences are primary substances, however, the science can also be described as being about substance or even about being qua being. But the inquiry about sensible substance that we find in the central books of the *Metaphysics* is regarded by Aristotle as a preliminary inquiry because his ultimate purpose is to discover whether it is possible to have the sort of absolutely separate substances that would make theology possible. At the end of Zeta 2, for instance, he indicates that a preliminary inquiry into the meaning of substance is needed in order to judge whether or not there are substances separate from sensible things, as the Platonists held. Although he rejects their views about supersensible substance, the goal of his *Metaphysics* is to establish that there exists a different kind of substance that functions as the coping stone in the whole edifice of his own cosmology.

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Endnotes

1. I have added a question mark to my original title which was given as a promissory note on which I had hoped to deliver, though now I doubt whether I can produce convincing textual evidence for my conjecture. I also regret using the term 'ground' because it suggests something more profound than what I had intended; namely, that Aristotle is a foundationalist with regard to the science of metaphysics.

2. A parallel passage in *Metaphysics* IV. 1 distinguishes metaphysics from particular sciences like mathematics on the basis that it studies being qua being in a universal manner (καθόλου), whereas they cut off parts of being and study the attributes that belong to their particular subject-genera; cf. 1003a21-26. But Aristotle goes on to insist that there must be some nature (φύσις) to which the highest principles belong *per se* and not accidentally, in order for there to be a single science of being qua being. See also *Met. XI* 3 where the universality of first philosophy is stressed by contrast with physics and mathematics.

3. Given the ambiguity of the Greek word order here, 'induction' may be taken as a general way of referring to some or all of the ways of obtaining principles for the particular sciences. When taken in this way, the passage says that induction is not a demonstration of the whatisness but rather an alternative way of making it clear; cf. *EN VI* 1.3, 1139b27-31. The triteness of this conclusion however makes one consider the possibility that 'induction' may refer to his previous survey of different ways of positing first principles. This reading seems confirmed by the parallel passage in *Met. XI* 7, 1064a7-10. See *EE VII* 3, 1248b25-6 for a similar use of 'induction' with reference to a survey of cases.

4. Joseph Owens (1962, p. 288) thinks that Aristotle distinguishes the science of Being qua Being from the other sciences by virtue of the fact that they only demonstrate accidents, and not the Entity or 'what-is'. So he takes Aristotle to mean that this science will "demonstrate" Entity, despite his disclaimers about the possibility of demonstrating first principles; cf. *Apost. II* 7, 92b10-14. But I think it is clear that Aristotle does not think of metaphysics as being demonstrative in the sense of the *Analytics*, given that part of its task is to discuss the principles of the special sciences and common principles which are described as "unhypothetical" (ἀνυπόθετον); cf. *Met. IV* 3 & *XI* 4.

5. Following Ross (1924 i, 354) in his reading of this difficult passage. The Platonic justification for differentiating some sciences as theoretical was that they contemplated the eternal Ideas or Intermediates, as distinct from the sensible and changing things of this world. But Aristotle makes a science of such changing things possible by distinguishing between the material and formal objects of physics as he does here. One of his reasons for calling physics a theoretical, rather than a practical or productive science, is that it seeks 'the why' (τὸ διότι) by means of causes and principles (such as 'whatnesses') and not just the fact (τί> δτι) or the how; cf. *EN* 1095a5 ff. In brief, the aim of a theoretical science is knowledge, while that of a practical science is action; cf. *Met. 993b30*.

6. Thus I take *Metaphysics* VI. 1 to be differentiating between theoretical sciences in terms of the mode of being of the essences, as determined by their relationship to some kind of matter. In VII. 6, with regard to the question of whether each thing and its essence are the same or different, Aristotle emphasizes that knowledge of each thing involves knowing its essence; cf. 1031b5-6, 18-21. Within the same context, he concludes (1032a4-5) that each primary and self-subsistent thing (such as Platonic Forms were held to be) is one and the same as its essence. This means that such essences can be known by first philosophy without reference to any material substratum, by contrast with physical and mathematical essences which involve some reference to matter either by addition or subtraction.
7. This independence must be logical or conceptual because Aristotle does not believe that there is a Form of Concavity Itself which is ontologically separate from its instantiations in the sensible world; cf. *Metaphysics* VII. 13-15. But Schwegler (1847-48 iii ad loc.) takes 'the concave' to represent an object of metaphysics by contrast with 'the snub' which is clearly an object of physics. This seems plausible but it is difficult to reconcile with the fact that 'the concave' is a typical mathematical object.

8. From an historical perspective, the choice of 'the snub' as a paradigmatic physical form may represent Aristotle's little joke at the expense of the Platonists, perhaps reminding them that Socrates never separated the universal. I am indebted to H.-G. Gadamer (1980, p. 212) for this suggestion.

9. It seems to be this logical connection which gives rise to the difficulties associated with definitions 'by addition' which Aristotle discusses in *Metaphysics* VII. 4-6. While he insists that definition and essence in the primary and simple sense belong to substance (which would be studied by metaphysics), he concedes (1030b25-26) that there is a secondary sense in which composite things like a snub nose can have a definable essence. Consult Hare (1979) for a good discussion of these issues concerning the definition of natural things.

10. By contrast, recent accounts of χωριστός emphasize its ontological sense as a criterion of substance, whether it is interpreted as 'independent existence' (Fine 1984) or as 'outside the ontological boundaries of' (Morrison 1985). But these senses are not quite appropriate for a discussion of theoretical objects, and so I regard the logical sense as being more relevant for discussions of definition and knowledge. Furthermore, on the meaning of χωριστός, I accept Fine's reasons for taking it to involve an implicit modal claim, so that it is better translated as 'separable' rather than 'separate', as Morrison would have it.

11. At *Metaphysics* XI.4, Aristotle says that mathematics cuts off a part of its proper matter (ὤλη) and conducts an inquiry about such things as lines or angles or numbers. By contrast with philosophy, it does not study them qua being but rather qua continuous in either one, or two, or three dimensions. Here Aristotle seems to be using ὤλη in the sense of subject-matter, which is closely linked with dimensional continuity in the case of geometry. Of course, as Aubenque (1962, pp. 40 ff.) points out, doubts about the authenticity of *Metaphysics* Kappa are simply reinforced by such unusual usage, as well as by the identification of the science of being qua being with first philosophy and with theology.

12. Among the puzzles listed in *Metaphysics* XI.1, there is one which asks which science should explore the puzzles concerning the matter of mathematical objects (περί τῆς τῶν μαθηματικῶν ὤλης); cf. 1059b14 ff. Aristotle goes on to explain that this cannot be the task of physics since its whole subject-matter is concerned with things which have an internal principle of motion and rest. Nor can it be dealt with by the science of analytics, since that concerns itself exclusively with proof and knowledge. Therefore, he concludes, the puzzles about mathematical matter must be considered by first philosophy; cf. also XI.4.

13. William Charlton (1980, p. 174) thinks that Aristotle was wrong to apply his matter / form explanation in terms of actuality and potentiality to mathematical forms, since 'triangle' seems to be a universal rather than a composite of matter and form.

14. My hypothesis is not indebted to the Thomistic theory of separation (metaphysics), combined with two degrees of abstraction (physics & mathematics), though I would not rule this out as a possible interpretation of Aristotle's text; cf. Thomas Aquinas, 'On the Division of the Theoretical Sciences' = Q. V. from *Expositio super Librum Boethii De Trinitate*. But I would discount Mansion's (1945) interpretation in terms of three degrees of abstraction, since he fails to account for the fact that Aristotle's use of abstraction terminology is confined to mathematical objects; cf. Cleary 1985.

15. Instead of ἀ χωριστός here Schwegler proposes that we read μη χωριστός, presumably by way of parallel with 1026a15 where some mathematical sciences are said to study unchanging but not separate things that are perhaps as if in matter. But Ross (1924i, p. 355) rightly rejects the proposal, though he does not see that the same presupposition also underlies the other emendation of Schwegler's which he accepts.

16. Both Jaeger and Ross have bracketed this explanatory clause in their editions, presumably as a marginal note that does not fit well with the structure of the whole sentence. While the clause could be an interpolation, one suspects that the editors' decision to bracket it is influenced by their acceptance of Schwegler's reading of the subsequent sentence.

18. Halper (1989, p. 7) argues that Aristotle is not trying to establish the existence or nature of the objects of metaphysics (hence the hypothetical form of argument) but rather is offering an indirect a fortiori argument for theology as theoretical, while taking physics and mathematics to be theoretical.

19. Drawing on Metaphysics VII & XII, together with the Physics, Kirwan (1971, p. 187) gives some Aristotelian reasons for holding changeless and separate things to be prior; i.e. they are concrete individuals which are also substances, as well as being unmoved movers. But the first two reasons could also be used to argue for the priority of physical objects and, in any case, none of them is mentioned here in support of Aristotle's claim about the priority of the science of such objects. Perhaps this claim can be clarified with reference to Metaphysics IV. 2 where Aristotle says that there are as many parts of philosophy as there are spheres of being, so that among them it is necessary that there should be something first (τινα πρώτην) and something subsequent (ἐξ οὗ πρώτην); cf. 1004a2 ff. Significantly, Merlan (1954, p. 60) cites this passage (along with Physics II.7, 198a29-31) as evidence that Aristotle accepted Plato's tripartition of being, though I think it is more likely to reflect his own mature ontological views.

20. I am reading ἀκόρμοντα with the best MSS tradition (codds. & Alc), despite the fact that Schwager's (1847-48) emendation (χωριστά) is widely accepted by modern editors like Christ, Ross & Jaeger. Against this emendation, see Apelt (1891, p. 231), Cousin (1940, pp. 495-6), Trepanier (1946, pp. 206-9), Owens (1962², p. 296n44), di Napoli (1953, p. 180), Wundt (1953, p. 49), Decarie (1954, pp. 466-8), Halper (1989, pp. 258-59), and Zekl (1990, p. 85n94).

21. Merlan (1954, p. 71-2) argues against Decarie's translation of μὲν ἀλλ' ὀόκ as "et non" on the grounds that it ignores the sense of contrast which originally led scholars to reject the MSS reading of ἀκόρμοντα. Similarly, Ross (1924 i, p. 355) thinks that the balance of the sentence demands Schwager's emendation, otherwise it would contain a false antithesis. But Apelt (1891, p. 231) had already given a good defence of the traditional reading by arguing for a different contrast in the passage between the objects of first philosophy (separate and unchanging) and those of physics (inseparable and changing) together with those of mathematics (unchanging but not separable). Thus, as Decarie (1954, pp. 466-8) points out, the general contrast would be between objects that are completely separable from matter and those which are not. Incidentally, Barnes' (1984) revision of Ross' translation of Metaphysics seems to return to the manuscript reading for this passage. It is also grammatically possible to read ἀκόρμοντα because, as Denniston (1934, p. 21) shows, ἀλλά is not always adversative, even with μὲν. By contrast, Happ (1971, p. 566n26) accepts Schwager's emendation as an improvement on the MSS reading from the linguistic and contextual point of view, and he refers to Merlan's treatment as definitive, even though it involves taking χωριστά in two different senses within the same context. It is clear that Schwager's emendation was motivated by the Categories view of substance when he paraphrases as follows: "... aber während es, die Physik mit Einseldingen zu thun hat aber mit beweglichen (περὶ χωριστά μὲν ἀλλ' οόκ ακοίντα), hat es die Mathematik mit Unbeweglichen zu thun, das jedoch nicht als Einzelwesen, als χωριστάν, sondern an der Materie existiert. Im Gegensatz gegen beide hat nun die Metaphysik Einzelwesen, und zwar unveränderliche und ewige zu ihrem Gegenstand, nämliche die Gottheit (woher ihr Name θεολογική)".

22. Perhaps it is significant that Aristotle is careful to distinguish between the mode of being of objects for the different mathematical sciences, especially since he asserts elsewhere (Met. 1073b3-8) that astronomy deals with sensible but eternal substances, whereas arithmetic and geometry do not deal with any substances. Thus, contrary to my logical interpretation, his carefully qualified remarks seem to involve an ontological meaning for χωριστά, especially in the case of heavenly bodies and their prime movers. But I argue that the logical relationship that a given form has to matter is what determines the ontological status of the (formal) object of the relevant science. For instance, the heavenly bodies may be the material objects of all three theoretical sciences; i.e. of physics in so far as they move in perfect circles because of aether, of mathematics in so far as they embody geometrical forms, of philosophy in so far as they are eternal substances.

23. For instance, H. Happ (1971, p. 566) accepts Merlan's treatment of this passage as definitive, even though it assumes that Aristotle shifted his viewpoint without notice from ratione essendi (τι ρέιναι) for physics and metaphysics to ratione cognoscendi (τι ρέιναι) for mathematics.

24. At Metaphysics VIII.1, 1042a28-31, Aristotle distinguishes χωριστάν ἀπάλλας as the mode of being of a sensible composite from λόγον χωριστάν, which is the mode of being of the form; i.e. the substance according to definition. Given the absence of this distinction from VI. 1, one might think (with Fine 1984)
that in its unqualified use χωριστός always has an ontological sense; cf. Met. XIII.10, 1086b14-20. But the most appropriate sense for a discussion of the objects of theoretical sciences is probably logical separability, since these objects are essences rather than individual composite things.

25. This is how Chen (1964, p. 52) reads the passage but he avoids the problem by positing what he calls "universal concretes" as the immediate objects of physics, citing Metaphysics VII. 10-11 as his authority. In giving the latter reference, Chen is on the right track but his acceptance of Schwegler's emendation leads him to accuse Aristotle of a "typical" Platonic duplication of reality.

26. Kirwan (1971, p. 187) thinks that this passage refers to the heavenly bodies (as in Physics II.4, 196a33-34) which are caused to move eternally and invariably by the spheres; cf. Met. 1072a19, 1073b3. But Kirwan fails to notice that this reference to objects of astronomy poses a problem for his account of the tripartition of theoretical sciences according to the ontological status of their objects.

27. There are striking parallels with some fragments from the Protrepticus (e.g. Fr 11 Ross) which talk about the theoretical sciences as the highest activity of man, whose ultimate happiness consists in the contemplation of the heavens, according to both Pythagoras and Anaxagoras.

28. Perhaps the point can be clarified somewhat by reference to Nicomachean Ethics VI, 7, 1141a9 ff where Aristotle describes wisdom as most precise (ἀκριβεστάτη), since it combines intelligence (νοῦς) and scientific knowledge (ἐπιστήμη) in grasping the most exalted objects (τῶν τιμιωτάτων). Subsequently, he rejects as absurd the view that either political science or prudence constitutes such superior knowledge, because mankind is not the highest thing (τὸ ἄριστον) in the universe. The string of superlatives in this passage also suggests that the value of a science for Aristotle is directly correlated with the ranking of its objects in some cosmological hierarchy. Thus, for instance, theology would be the highest science because the divine is prior to everything. See also Topics VIII.1, 157a9-10 & Protrepticus (Fr 6 & 7 Ross) where knowledge of the most honourable things is called wisdom.

29. The primary kind of being (i.e. God as separate and immovable) studied by theology is merely a final cause of motion and not a formal cause for other beings in the universe, so that the priority relation in question cannot be definitional though it may be ontological; cf. Cleary 1988. Ultimately, for Aristotle the unity and universality of the science of theology depends on the fact that 'being' is a προς ἐν equivocal and that 'substance' is its primary meaning; cf. Ferejohn 1980.

30. At Metaphysics VIII. 4 (1044b2 ff) Aristotle seems to touch on this problem when he distinguishes between the different accounts of causes to be given for destructible as distinct from eternal sensible substances. In the case of the latter, he suggests that they may have either no matter or such matter as can be moved only with respect to place. Thus the objects of astronomy, as being related to a special kind of matter, can be distinguished from objects of theology, which are not related to any kind of matter. This may explain why Aristotle describes astronomy as the most physical of the mathematical sciences; cf. Physics II. 2.

31. Despite the many doubts that have been raised about the authenticity of Metaphysics Kappa, I tend to agree with John Rist (1989) that it is an early (and genuine) work.


33. The difficulty of this phrase has prompted some people to question the authenticity of Book Kappa. Assuming this to be an early and genuine work, however, Chen (1961) emends the received text (ἐπιστήμη τοῦ δντος ἢ δὲ καὶ χωριστόν) to give the phrase a plausible reading (ἐπιστήμη τοῦ δντος ἢ μένον καὶ χωριστόν) within its context. In addition, Chen (1976, p. 444n44) defends his interpretation of χωριστόν as absolute separation, against the suggestion that separation from matter is meant. However, if Merlan (1954, p. 178) is right that 'being-as-such' and 'unmoved and separated' are phrases used by Aristotle to designate an incorporeal sphere of being studied by metaphysics, then Chen's emendation is unnecessary. But this would mean that metaphysics is identical with theology, and that it is a special science like physics; whereas the science of being qua being is universal and covers physical as well as incorporeal substances. Thus, pace Apostle, χωριστόν should be translated as 'separable' rather than as 'separate'.

34. περὶ τά κινήσεως ἔχοντι ἀρχήν ἐν σύνεσι έστιν — Met. 1064a31-32. In a previous passage (1064a10 ff), physics is distinguished from practical and productive sciences because its objects have in themselves a principle of motion or change, whereas actions and artefacts have external movers. This makes it a theoretical science by virtue of its different goal; i.e. understanding rather than doing or making. Just as in Book VI, it is clear that Aristotle regards this classification of sciences as exhaustive.
35. Cf. Met. VII.7, 1032a20-22; XI.4, 1061b2-30. At PA 641a35 ff. Aristotle raises the question of whether it belongs to natural science to speak about all of soul or only about some parts of it. He adds that, if its task is to speak about all, there will be no philosophy beyond natural science. This seems to imply that physics is a kind of philosophy, and this is confirmed elsewhere (Met. 1037a15, PA 653a9) when he calls it 'second philosophy'; cf. also Met. 1005b1, Phy. 192a36, 194b9.

36. This contrast might be better understood in terms of the different causes with which each science must deal; e.g. mathematics considers only a formal cause, whereas physics must also deal with material and final causes which bring with them the potentiality for change and the goal of such change; cf. Phy. II.7, 198a14-20. Aristotle views matter as a potency for being and non-being, and so as essential for every form of becoming; cf. Met. VII.7, 1032a20-22.

37. Merlan (1954, p. 72) and Happ (1971, p. 566) think that Aristotle first introduced the distinction between the material and formal object in response to Plato’s assumption of a strict correspondence between a science and its object.


39. By means of his own distinction between potentiality and actuality, Aristotle here neatly reconciles two conflicting views about human cognition; i.e. that it functions as 'like to like' (most Presocratics and Plato) or as 'like to unlike' (some Presocratics, including Anaxagoras). This solution is quite typical of Aristotle's desire to negotiate a compromise between two conflicting parties, just as an arbitrator does in a judicial context; cf. Metaphysics III.1.

40. Lowe (1983) has argued that one of the principal aims of DA III.4 is to differentiate clearly between thinking and perceiving, despite the general parallels between them that provide the guiding framework for Aristotle's own inquiry.

41. At DA II.1 Aristotle distinguishes between two types of actuality; i.e. that of scientific knowledge (ός ἐπιστήμη) and that of contemplation (ός θεώρειν); cf. 412a11-12, a21-22. Perhaps we may regard the internal illumination of productive nous as Aristotle's answer to Plato's model of the soul as a passive receptacle for receiving the active Ideas from outside through the illumination of the Idea of the Good; cf. Republic VI.

42. Yet perhaps a human nous that has been separated from the composite of soul and body can satisfy the normal conditions for a part to be separable from a whole: (1) it must be able to exist as an individual outside the whole and (2) when separated it must exist as the same entity that it was within the whole. At 430a22 διότι οὐχ is difficult and was questioned by some ancient commentators, though οὐχ is accepted by the majority as fitting better with the general context. The nearest parallel at 431a2-3 shows that Aristotle is insisting on all things being caused by something that has complete actuality (ἐντελεχεία), and this favours the inclusion of οὐχ. 43. There is also the famous remark in Generation of Animals (737a) about nous coming 'from outdoors' (θύραθεν) and being divine, as its actuality cannot have anything in common with the actuality of a physical body. Although this remark would fit with the simile of light for productive nous, it is noteworthy that the distinction is not found there.


47. Cf. Gen. An. 768b16-25 which says that every moving agent, with the exception of the first mover, is reciprocally moved by that which it moves. There is a reference to a treatise on 'acting and being acted upon' which is not extant but which also seems to be mentioned at Gen. & Corr. 324a25 ff.

48. B. Manuwald (1989) gives some persuasive reasons as to why Aristotle does not specify the type of causality exercised by the first mover; e.g. that his argumentative strategy is simply to establish that there must be such an unmoved mover, even if one correctly posits a self-mover as the cause of motion.


50. Stephen Menn (1992) has recently argued convincingly that the positive essence of the Prime Mover may be described in terms of Nous and Good-Itself (but not the Form of the Good).

51. όρεγόμεθα δέ διότι δοκεΐ μάλλον ή δοκεϊ διότι όρεγόμεθα — Met. 1072a29.

52. In answer to a question about the ἀρχή of change in the soul at EE VIII.2, Aristotle draws a parallel with the way in which god moves the whole universe. He explains that it is in the same way that the divine element in us moves everything, yet the ἀρχή of reason is not reason itself but rather something superior, namely, the divine.
53. Cf. Met. VII.1, 16, & 17. See also IX. 8, 1050b2 ff.
54. Textual support can be found in passages that declare the good in the category of substance to be Nous and God (ὁ νοῦς καὶ ὁ θεός); cf. EE 1217b26-34 & EN 1096a23-29. Cf. also Pol. 1287a28 & Met. 1075b11.
55. The puzzle seems to be generated from the conflict between the reported fact that nous is the most divine of the phainomena and the question of what sort of object it could have if that is the case.
56. Burnyeat (1981) argues that a faculty for intuitive discovery is unnecessary because induction leads us to knowledge of first principles, and Aristotle does not have the Humean problem about making a leap from inductive evidence to knowledge.
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