

## ARISTOTLE'S CRITICISM OF PLATO'S FIRST PRINCIPLES

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### Introduction

In this paper I will discuss some puzzles about the first principles proposed by Plato and criticized by Aristotle in the course of his typical dialectical process of developing his own first principles in metaphysics. Apparently, Plato's first principles were the highest universals, such as One and Good, which he regarded as the most intelligible and the most real. In contrast to Platonic Forms, however, Aristotle posited substantial particulars (including unmoved movers) as the most real, though not always the most intelligible things; so it was also necessary for him to posit universals as principles of knowledge. It may have been the mathematical sciences that tempted Plato to choose the highest invariants, like the One and the Good, as first principles; whereas biological and physical inquiry probably led Aristotle to pay more attention to individuals which embody specific characteristics that differentiate them from other species. Thus particulars that are numerically one are more substantial for Aristotle, while universals that are generically one are less substantial though more intelligible. Yet his generic principles such as form and matter are almost as general as Plato's One and Good, although Aristotle insists on their specific differentiation, both epistemologically and ontologically. As generic principles, however, they are no more than analogically the same, while they become fully explanatory only when they are specifically differentiated as principles of special sciences, which study distinct genera of things. Thus it seems that Aristotle was implicitly criticizing Plato's completely generic principles when he insists that it is a mistake to cross into another genus of things.

Since Plato's dialogues are not Academic treatises that set out principles of inquiry in any systematic way, there is a special difficulty about discovering his fundamental principles, despite some hints in the dialogues about principles higher than the Forms. In the *Timaeus* (48c2-d4, 53d), for instance, he makes obscure references to more remote cosmological principles that are perhaps accessible only to divine minds. By contrast, Aristotle's treatises explicitly seek the first principles of inquiry for metaphysics and other sciences, such as physics, which Plato does not seem to have accepted as a science. Yet both of these thinkers did acknowledge mathematics as a theoretical science, which provided each of them with inspiration in different ways. Thus mathematics is a crucial nexus for any discussion of the similarities and differences between Plato and Aristotle in their inquiries about first principles. In the *Philebus*, for instance, where Plato posits Limit and Unlimited as elements, one can detect the influence of Pythagoreans like Philolaus, who introduced these as two cosmological principles. By contrast, Aristotle rejects such mathematical principles as irrelevant for natural philosophy, though he accepts the need for physical principles that will play a role similar to that of principles in mathematics. In effect, he adopts a mathematical model of science, while rejecting the related Platonic ontology because he regards physical objects as being more substantial than mathematical entities.<sup>1</sup>

Undoubtedly, both Plato and Aristotle are dealing with an inherited problem of finding starting-points that are secure enough as foundations (both ontological and epistemological) on which to build a dwelling place for the philosophical life. To compound their problem-situation, as inherited from Parmenides and Heraclitus, they faced stiff competition from the so-called Sophists, whose approach was based on commonsense assumptions about knowledge and reality. Taking Socrates as his moral guide, Plato tried to solve the problem of foundations by positing Forms as eternal realities which transcend the flux of sensibles and to which one can look for fixed standards of conduct. But even the theory of Forms faces its own foundational problems, which are explored in the *Parmenides* through a dialectical inquiry into the hypothesis of the One. There are also vague hints in

1. See Cleary (1995) for a detailed discussion of these ontological and cosmological issues.

the *Republic* that the Good is the ultimate hypothesis which may serve as a principle of unity and intelligibility for the Forms, although there is no reference in that dialogue to any corresponding principle of multiplicity.

## 1. Platonic principles

We face a difficult hermeneutical problem in trying to reconcile Aristotle's reports about the One and the Indefinite Dyad with the notable absence from Platonic dialogues of any detailed discussion of the highest principles of being, even though the *Philebus* does discuss Limit and Unlimited as elements of reality. In addition, the *Republic* hints at the existence of a highest principle of reality, which is called the Good. The later Neoplatonic tradition (after Plotinus) tended to identify this principle with the One, which itself was explored as a hypothesis for dialectical inquiry in the *Parmenides*. The interpretive puzzle which still confronts modern commentators is whether all of these Platonic hints add up to a consistent account of first principles that corresponds with Aristotle's reports. I will try to avoid the shoals of controversy by confining myself to the task of comparing what Plato says about Limit and Unlimited in the *Philebus* with what Aristotle reports elsewhere about the One and the Indefinite Dyad. In the course of this inquiry, I will briefly examine the possibility of linking the principle of Limit with the One and the Good in Platonic terms.

Aristoxenus, a member of the Lyceum, recounts Aristotle's story about Plato's infamous "Lecture on the Good", which was attended by some ordinary Athenian citizens who expected to derive some practical benefit from it.<sup>2</sup> Much to their chagrin, however, Plato gave a rather esoteric lecture about mathematics, numbers, geometry, and astronomy; which culminated in the claim that the Good is Unity. To the plain citizens of Athens this claim may have seemed paradoxical because they assumed that there are many human goods, such as health, wealth, power, and happiness.

2. See Aristoxenus, *Harm.* 2.20.16-31.3 (Macran) listed by Ross (1955) among the testimonia for *On the Good*.

Apparently, Aristotle used to tell this story to his own pupils, partly to warn them against misleading advertising for public lectures and partly to take issue with Plato's view, since Aristotle himself shared some of the commonsense assumptions of that original audience. For him it was obvious that the good is spoken of in many ways, and so it is paradoxical to claim that it is identical with unity because that implies that it has only one real meaning. Of course, Aristotle's own considered view is that the good is a *pros hen* equivocal, just like the one, so that he seems to be offering an alternative to the Platonic view when he attributes a primary or focal meaning to both the one and the good. But he does not accept that the meaning is the same in both cases, especially since that meaning was held by the Platonists to be mathematical in character. Later in this paper, I will return to Aristotle's rejection of the mathematical one as a first principle but, first, I want to consider some evidence about Plato's first principles.

Even within the early Academy, it appears that the so-called "generation" of Ideas (including Numbers) out of two principles or elements led to a controversy between the orthodox Platonists and Aristotle, who interpreted it as a temporal genesis; cf. *De Caelo* 279b32-280a10. Like John Findlay (1974, 43), one might side with such Platonists against Aristotle by calling it a "logical genesis" and by comparing it to the modern step-by-step construction of the integral number series through repeated reapplication of certain primitive ideas, definitions, and axioms. In any case, the principles from which the Idea-Numbers are generated are, firstly, Unity itself, i.e. the Ideal Unity present in all numerically conceived Ideas; while the second principle was variously described by Aristotle as the Indefinite Dyad, the Great-and-Small, and the Great and the Small. Since Unity was conceived of as setting bounds to indefinite continuous quantity, it would have been classified as a good within the Pythagorean tradition (cf. *Phil.* 25e-26b). Given that it is setting bounds to the indefinite, Unity is responsible for the generation of the integral numbers, which are associated with order and harmony in the cosmos. In short, the principle of Unity seems to have been linked with the principle of the Good, which appears briefly in the *Phaedo* and *Republic*. Although Plato nowhere makes such an explicit link, yet Aristotle claims that the Platonists did make

it; cf. *Met.* 988a13-15.<sup>3</sup> In the *Philebus*, however, Unity is linked with the Pythagorean principle of Limit.

The second principle used in the Platonic genesis was the indefinite continuum of quantity on which the principle of Unity or Goodness imposed limits. Findlay (1974, 44) claims that it was identical with the Pythagorean principle of the Indefinite or Infinite, but that Plato called it the Great and Small because he wanted to cover the twin possibilities of going on indefinitely in both directions of increase and decrease; cf. *Phy.* 220b27-28. This principle is described in different ways, relative to different dimensions of ideal being; e.g. as Many and Few it provides the plastic material (*ekmageion*) out of which the integral numbers are shaped by the limiting action of Unity (cf. *Met.* 1087b16, 987b34-5); as the Long and Short with reference to lines; as Broad and Narrow with reference to planes; and as Deep and Shallow with reference to solids (cf. *Met.* 992a10-15). One piece of direct evidence from Platonic texts is *Republic* 529d, which refers to the Swift and Slow as an underlying principle of velocity. Findlay (1974, 45) emphasizes that none of these species of the Great and Small belong to the instancial world but rather to the ideal structures of arithmetic and geometry. Yet, if we are to accept Aristotle's evidence (cf. *Phy.* 209b11-17), the Great and Small does appear at the instancial level as *Chôra*. For instance, *Timaeus* 52d-53a describes the pure flux that existed prior to the ordering of the instancial world by determinate forms. Furthermore, in that sensible world, the Great and Small manifests itself in the hot and cold, the moist and dry; i.e., in continua without internal limits. Within the Pythagorean tradition, the Great and Small was regarded as an evil principle, as opposed to the good principle of Unity and Limit.

Let me briefly examine some evidence in Plato's dialogues for his espousal of the Pythagorean principles of Limit and Unlimited, which may be found also in the extant fragments (Frgs. B1-2 DK) of Philolaus. In the *Philebus* (14-16) Plato draws attention to puzzles about

3. This link is reinforced by the later Aristotelian commentators; cf. Simplicius (*in Phys.* 453.25-455.14) who reports that Plato expounded the doctrine of the One and Indefinite Dyad in his discourse(s) on the Good. Alexander (*in Metaph.* 56.33-5, 85.17, 250.17-20, 262.18-26) claims that Plato's teaching about the One and the Indefinite Dyad was recorded in Aristotle's treatise *On the Good*.

the One and the Many, which arise not only at the sensible level but especially at the intelligible level of the Forms. He is confident that such puzzles about limit and un-limited can be handled by his dialectical method, which involves positing a definite number of Ideas between the original one and the infinity of particular things. The maxim guiding Plato's discussion (*Phil.* 18a-b) is that anyone who begins with some unity should **not** turn immediately to the infinite but rather to some definite number (of Ideas); and, conversely, if he begins with the infinite, he should **not** turn immediately to the one but rather try to discover a definite plurality before arriving at the one.

These methodological lessons are subsequently (*Phil.* 18e) applied by Plato to the initial topic in the *Philebus*; namely, whether the life of unconfined pleasure is better than the life of pure wisdom. The discussion is guided (20c-d) by specific criteria that identify the good as perfect and sufficient, such that every intelligent being pursues it, desires it, and wants to possess it. Using these criteria, Socrates concludes (22c-d) that neither the life of mindless pleasure nor the life of wisdom without pleasure are sufficient or desirable as the good life for any intelligent being; so that a mixed life of wisdom and pleasure is preferable to both. But this raises the question about the cause of the mixture, and in this way Plato introduces (23d) intellect (*nous*) as a cause of combination and separation. At this stage, he has all the ingredients or elements that he needs to provide an explanation of the good life.

Before embarking on that discussion, however, Plato uses his dialectical method of collection and division to explore limit and unlimited as basic elements that are manifested as one and many. For instance, the unlimited appears to be a single genus but it is manifested in many variations of the more and the less, such as hotter and colder. It is characteristic of such continua to be without internal limit, and so they are species of the unlimited.<sup>4</sup> Thus, using his method of collection, Plato describes (24e-25a) the single nature of the unlimited in terms of all the things that appear to become more or less. He seems to have doubts about whether the unlimited has a genuinely single nature

4. Simplicius (*in Phys.* 453.25-454.7) reports that Porphyry interpreted the doctrine in this way in his commentary on the *Philebus*; i.e. that Plato classifies the more and the less as belonging to the class of the Unlimited.

because giving it a definite form would make it limited. By contrast, he defines (25a-b) the class of limit with reference to things that do not admit of more and less but rather admit a definite number (arithmos) and measure; cf. *Phil.* 25e. In general, we may conclude that for Plato limit and unlimited are internal elements of the mixture that is produced by an external cause, which is later (30e) identified as Nous. Notably absent from the discussion is any mention of Platonic Forms but they may be implied in references to a demiurgic cause (*Phil.* 27b), which is often identified as a divine craftsman; cf. *Soph.* 265c; *Pol.* 270a, 273b, *Tim.* 28a, 29a, 40c, 41c.

The clearest application of these two Platonic principles is to be found in the realm of mathematical numbers, where an indeterminate assembly of units needs to be delimited so as to exist and be known as definite and discrete numbers. The unlimited and homogeneous character of these units is what permits them to be combined into assemblages in whatever way we please; cf. *Rep.* 525; *Theaet.* 185c-d. There may be infinitely many such mathematical numbers, which are unknowable qua infinite, so the task of theoretical (as distinct from pragmatic) arithmetic is to discover arrangements of these assemblages that will bring their indefinite multiplicity under the ordering of well-defined properties. For example, the most general classification of numbers is made into odd and even, and then into square and oblong, which can be classified under sameness (in figure) and difference. In this way, *Philebus* 25a-b can talk about the ultimate elements of number in terms of sameness and otherness, equal and unequal, limit and unlimited. The being of a number becomes intelligible as a determinate number through its membership in a kind that is derivable from these principles or elements. The most comprehensive kinds of number are the odd and the even; cf. *Pol.* 262e, *Phd.* 104a, *Laws* 895e. Oddness is uniquely characteristic of number, since it involves an indivisible unit being left over in any division; whereas evenness is common to both numbers and divisible magnitudes. Thus, within the Pythagorean tradition, oddness was associated with limit, whereas evenness was linked with the unlimited. Consequently, in Greek arithmetic, specific numbers were characterized in terms of such generic features; e.g. odd times odd, even times even, or odd times even. It is against this

mathematical background that we should understand Plato's choice of Limit and Unlimited as principles, and Aristotle's criticism of them.<sup>5</sup>

## 2. Puzzles about Plato's Principles

As part of his general criticism of predecessors in *Physics* I.9, Aristotle specifically faults Plato for his inadequate account of the principles of nature. For instance, he says that Plato failed to develop adequately the notion of substratum or matter, though he did touch upon it in his account of how things come into being from non-being. According to Aristotle, Plato's Receptacle in the *Timaeus* is also a dyad called the great and small, which is identical with non-being; cf. *Phy.* 192a7-8. Of course, this interpretation of Plato is rather forced and some scholars like Cherniss (1944 & 1945) have dismissed it as thoroughly wrongheaded. But, as Mueller (1987, 248) points out, it is unlikely that Aristotle is completely mistaken when he uses his own concept of matter to describe Plato's Receptacle, since it may be described as a kind of material principle.<sup>6</sup> Furthermore, Aristotle invokes the notion of matter when discussing Platonic principles in *Metaphysics* XIII-XIV, though one might wonder whether it makes any sense when applied to intelligible objects like mathematical and Forms. Yet Happ (1971, 257-58) has shown that a wide range of meanings are involved in Aristotle's use of the term "hyle". Mueller (1987) thinks that, when Aristotle refers to one of the Platonic principles as non-being, he is using his own terminology rather than Plato's. For instance, in *Physics* I.9, when Aristotle identifies the great and small with non-being, he seems to be thinking of the Receptacle as part of Plato's solution to the problem of how what-is comes to be from what-is-not. Thus Aristotle appears to be artificially linking the account of the Receptacle in the *Timaeus* with the analysis of motion in terms of non-being in Plato's *Sophist*.

5. The combination of these two principles may be seen as implicit in one of the standard Greek definitions of number as "definite plurality", where One corresponds to the definite form while plurality corresponds to the Indefinite Dyad.

6. Claghorn (1954, 13) identifies the Platonic Chôra with Aristotelian prime matter, but Happ (1971, 121-30) is rightly more circumspect about any such identification, since there are many differences between the Receptacle and prime matter, despite the fact that both are indeterminate.

But it was precisely such forced interpretations of Plato that led to Aristotle's own conception of first principles and their explanatory function within his cosmology and metaphysics. In *Metaphysics* III, Aristotle explores a number of aporiai concerning first principles; for example, whether the principles of perishable and imperishable things are the same or not (1000a5-1001a3). Aristotle claims that this aporia has been overlooked both by his contemporaries and predecessors, which implies that he will use it to launch objections against their views. If the principles are the same, he asks, how is it that some things are perishable while others are imperishable, and what is the reason for the difference? While dismissing the myths of Hesiod as unworthy of attention, Aristotle addresses (1000a19) a similar question to those predecessors who use a demonstrative logos: How come that eternal and perishable beings are derived from the same principles? Aristotle considers it unreasonable that these people fail to mention a cause, and he concludes that the principles and causes of such things are not the same. He concedes (1000b17 ff.) that Empedocles is at least consistent in making all things perishable, except for the basic elements. But that merely raises the same aporia: why are some things perishable and others not, if they are composed of the same elements? Aristotle thinks that all these objections may indicate that the principles are not the same for all things.

In *Metaphysics* III 4 (1001a4 ff.), Aristotle describes as the most difficult task of all to solve the following aporia: whether being and one are really the substances of beings (*ousiai tôn ontôn*). Madigan (1999, 108-9) notes that it remains unclear whether any actual thinkers held his composite view or whether it is an amalgam put together by Aristotle for his own dialectical purposes. For instance, *Metaphysics* I 6 speaks of the one as a substance and source of numbers, but it does not mention being (to on) as a substance or principle. *Metaphysics* 988b12 refers to people who speak of one and being as the good, but it is unclear whether "one is the good" and "being is the good" are two competing accounts of the good or two versions of the same account.

In support of the view that one and being are substances, Aristotle provides (1001a19-29) the *reductio ad absurdum* argument that if one and being are not substances, no other universal exists. The reason is that if the most universal predicates of all, namely, one and being, are not substances then the fact of being predicated of other things does

not justify a claim to exist alongside particulars (*Met.* 999a19-21); so no universal has any claim to exist alongside particulars. In addition, he argues (1001a24-7) that if one is not a substance, then number is not a separated nature among beings, which is also taken to be absurd (from a Platonic viewpoint?). The argument assumes dialectically that numbers have separate existence, that one is the principle of numbers, and that a number is a collection of units.

In summary (1001a27-9): If there is a one itself and a being itself, then the *ousia*, substance or essence of one is to be (simply) one, and the *ousia* of being is to be (simply) being. The reason is that nothing different is predicated of them universally, but rather they are predicated of themselves. Since one and being are the highest universals (1001a21-2, 998b20-1), there is nothing of wider extension available to be predicated of them. On the other hand, if there is a being itself and one itself, then all things are one, and there is no plurality, which is just as absurd as the monism of Parmenides. Here (1001b1-4) Aristotle confronts the Platonists with the following dilemma: (a) If one is not a substance, then number cannot be a substance. This is taken to be absurd (for the Platonists) because one must exist as a substance in order to serve as a principle of number. (b) If one is a substance, however, this rules out plurality, which is also absurd. So this is similar to the aporia about being, since Aristotle treats the thesis that one is a substance as equivalent to the thesis that One Itself exists.

Aristotle has already (1001a29-b1) argued that if there is Being Itself and One Itself, there cannot be anything else alongside being and one. Now (1001b4-6), in support of that conclusion, he asks a rhetorical question: From what, besides the one, will another one be derived? Madigan (1999, 113) fills out the line of argument as follows: "if there is a one itself, then plurality must derive either from one or from something different from one; but plurality cannot derive from one; hence plurality must derive from something different than one. But plurality must either be individual ones or else pluralities composed of one; hence plurality cannot derive from something different than one". But there exists a plurality of things, hence it is false to claim that there is One Itself. Yet Platonists might say (1001b17-25) that they derive plurality not from one alone, but from one and a dyad that is not itself derived from one.

At *Metaphysics* 1001b19-24 Aristotle may be referring to such a generation of mathematical objects from two principles when he argues as follows: If number and magnitude are generated from one and something not one, why is the product sometimes a number (arithmos) and sometime a magnitude (megethos)? Aristotle seems to suggest that the thesis that one is a principle of numbers is incompatible with the thesis that one is a co-principle of magnitude. Here the derivation of magnitudes is construed not as a simple addition or composition of ones, but as a kind of generation in which two principles, one and something else called "inequality" (anisotês – b23) cooperate to produce magnitudes. Madigan (1999, 115) suggests that "inequality" may be the Platonic dyad of great and small (*Met.* 987b20-1, 988a13-14, 988a26; *Phy.* 187a17, 203a15-16, 209b35-210a2), which is also called "unequal" (*Met.* 1075a33, 1087b5, 1088b28-33, 1089b4-11, 1091b30-2, 1092a35-b2) and as the dyad of the unequal of the great and small (*Met.* 1087b7-12). It is possible that some Platonists either recognized two distinct dyads or else described the one dyad in two different ways; i.e. the many and few as the principles of number (*Met.* 1087b16, 1088a18-19, 1088b5-6, 1089b11-12, 992a16-17), the great and small (or species of the great and small) as the principle of magnitudes (*Met.* 1088a19, 1088b6-8, 1089b12-14).

### 3. Aristotle's criticism of the Platonic principles

In *Metaphysics* XIV Aristotle launches a sustained attack on the principles of reality that are posited by Plato and his Academic colleagues, such as Speusippus and Xenocrates. Given the character of his polemical method, it is difficult in some cases to distinguish their views from one another, but for our purposes here I will take it that the One and Indefinite Dyad (and variations thereof) are specifically Platonic principles.<sup>7</sup> At the beginning of *Metaphysics* XIII, Aristotle introduces the question of whether the substance and principles of things are numbers and Ideas, but the question which he subsequently discusses is: What are the principles (elements or causes) of separate Ideas and

7. Theophrastus, *Metaphysics* 6a14-6b22, refers to Plato as one of those thinkers who posit the One and Indefinite Dyad as principles.

mathematicals? Just as in the first book of the *Physics*, he complains that all of his predecessors (including the Platonists) tended to posit contraries as principles. For instance, Speusippus is reported to have posited one and plurality as the principles of mathematical number, while Plato posited one and the indefinite dyad as the principles of ideal numbers.

In effect, Aristotle's general criticism is that neither of these are suitable as principles because they are attributes of something else rather than independent substances. For instance, he argues that it is a mistake to posit such contraries as principles because some other subject is always prior to them, yet nothing else should be prior to principles. Aristotle's implicit assumption here seems to be that principles must be absolutely prior, just as substances are prior. Drawing on his own *Categories* (3b24-7), he claims that a substance has no contraries, and concludes that contraries cannot serve as principles that are independent of everything else. Having set out his stall, as it were, Aristotle goes on to show that the Platonists do posit contraries as principles, whether it be the Unequal that is opposite to the Equal (or the One), or plurality that is contrary to the One. He reports that some people (Plato?) say that the Unequal is the Dyad, consisting of the Great and Small. From this he infers (rather oddly) that there are three elements of number; the first two being Great and Small (which he describes as matter) and third being the One (described as form). In any case, from among those who posit contraries as principles, he finds most plausible the view of Speusippus that One and Plurality are the elements of number.

In summary, Aristotle has strong objections to treating the One as an independent principle or as a substance. His view is that one signifies a measure of something else as an underlying subject, so that the One by itself cannot be the substance of some thing. He thinks this is obvious from the definition of one as a measure of some plurality, and that is why number also signifies a measured plurality or a plurality of measures. From his own perspective on the one, he criticizes those who posit the Unequal as something one, and the Dyad as something indefinite consisting of the great and small. His general criticism is that such people are saying things that are remote from common sense and even from what is possible. The first reason he gives is that great and small are attributes or accidents of number and magnitudes, just

like the odd and the even, rather than being themselves underlying subjects. Secondly, great and small are relations, which are the least substantial of all the categories, being posterior to both quality and quantity. As evidence for the lack of substantiality of relations, Aristotle cites the fact that they are not subject to generation or destruction, nor are they in motion in any genuine sense. By contrast, the matter of each thing, and so also its substance, must be potentially that into which it will change; whereas a relation is neither potentially nor actually a substance. So Aristotle concludes that it is absurd for the Platonists to posit non-substances as prior to substances.

Specifically, Aristotle charges (1088a21 ff.) Plato with being mistaken in positing the great-and-small as a principle, since it must be a relative with less of a claim to reality than quality or quantity. Within this straightforward appeal to his own categories, perhaps there is an implicit appeal to the Academic distinction between *kath' hautou* and *pros ti* entities, since that would give the objection a better dialectical basis. Be that as it may, Aristotle argues that the relative (i.e. the great-and-small) is a characteristic of quantity, and not of matter, since there is some other subject for the relative in general along with its parts and forms. The crucial ontological point is that relatives like the great-and-small, the many-and-few, have a dependent mode of being as belonging to something else, rather than an independent mode of being as self-subsisting entities. We recall that this is also how Aristotle formulated the aporia from *Metaphysics* III about whether One has an independent or dependent mode of being.

As additional evidence that a relative is least of all substantial, Aristotle cites (1088a29 ff.) the fact that relatives are not subject to change in any of the usual ways; i.e., generation and corruption, alteration, growth, or locomotion. In the case of relatives, by contrast, a thing can be greater or less or equal without itself undergoing change, if another thing that is compared to it changes in quantity. For Aristotle the association of such accidental change with relatives is a sign that they have less claim to reality than categorical entities that suffer essential change; cf. *Phy.* 225b11-13. I find it significant that a similar "change test" is used in *Metaphysics* III to undermine the substantiality of mathematical entities; cf. *Met.* 1002a28-b11.

In *Metaphysics* XIV 2, however, Aristotle raises a general question about whether it is possible for eternal things to be composed

of elements. Perhaps, as Annas (1976, 199) suggests, he is overloading a casual Platonic suggestion with meaning, since he wants to emphasize the ontological difference between eternal and corruptible substances. Thus, by taking literally the Platonic language of "generation" from elements, he can mount an effective dialectical offensive against what he regards as a mistaken approach to eternal entities. We know from *De caelo* I.10 that the question of whether such language is to be taken literally or metaphorically was one which divided Aristotle from more orthodox Platonists like Xenocrates within the Academy. Behind the dispute about language, however, lies the issue of whether Plato's mathematical cosmology gives the correct picture of the universe, but especially of the relationship between sensible and supersensible substances. Therefore, the objections made in XIV 2 against talk of the principles as elements provide a natural introduction to Aristotle's own views in *Metaphysics* XII on the true nature of supersensible substance.

From his own (superior) perspective on supersensible substance, Aristotle critically reviews (1088b28 ff.) mistaken proposals for the first principles of such substances. For instance, he reports that some people posit the Indefinite Dyad as an element along with One because they are aware of the difficulties associated with positing the Unequal as a principle. Presumably, he means the difficulties which he had previously raised about positing a relative as a principle of substance. Yet he insists that they avoid only the difficulties arising from making such a relative entity an element, since all the other difficulties apply to their principles also, whether they use them to produce Forms or mathematical numbers.

In his general diagnosis of where the Platonists have gone wrong in the search for the principles of supersensible substance, Aristotle identifies (1088b35 ff.) their old-fashioned approach to the problem as the basic cause of their error. They accepted that all existing things would be simply one thing, Being Itself, unless they could refute the Parmenidean argument against plurality based on the impossibility of not-being. So they thought it necessary to show that what-is-not (i.e. not-being) exists in some way, in order that a multiplicity of things can emerge from being and from something else. If Aristotle is referring to Plato's *Sophist*, Annas (1976, p. 201) suspects him of a misunderstanding because the arguments canvassed here are not to be found in that dialogue, although it quotes the same Parmenidean

passage. But perhaps Aristotle is simply giving an historical reconstruction of Plato's motivation for positing Being and Not-Being as principles of plurality and change.

#### 4. Aristotle's Principles of Sensible Substance

In view of its self-contained character, *Metaphysics* XII may be the best place to look for Aristotle's own account of the first principles of the visible cosmos. It is partly due to his dispute with the Platonists about first principles that in XII 2 & 3 Aristotle makes a brief survey of the principles, causes, and elements of sensible substance whose distinguishing characteristic is that it is changeable. Here he seems to be drawing on treatises like *Physics* I, since he asserts without argument that the appropriate principles are the contraries (ta enantia) and something that remains (hupomenei) throughout the change; i.e. matter (hylê). In specific terms, these principles are different for each kind of change with respect to whatness, quality, quantity, and place. Yet there is a general and analogical sense in which all changing things have the same principles, as Aristotle says in Lambda 4.

In his terse introduction to this inquiry about substance, which Aristotle gives in XII 1, it is noteworthy that he calls on some Presocratic thinkers to witness to the priority of substance and its principles; cf. *Met.* 1069a25-6. Although they might have described their subject-matter as "what is", he insists that they were inquiring into the principles and causes of substance, presumably because it is prior to all the other categories of being. Similarly, the Platonists are reported by Aristotle to have posited the genera of things as principles, and to have made them more substantial than the substances of which they are the genera; cf. *Met.* 1069a27-8. In this way, the Platonists too are presented as inquiring into the principles of substances. But the crucial point for Aristotle's whole inquiry in XII is that he also assumes, along with the Platonists, that the principles and causes of substances must themselves be substances because a non-substance cannot be prior to a substance; cf. *Met.* 1073a36. Thus his inquiry into the principles and causes of substances must also involve an inquiry into the kinds of substances which can play the role of being

principles and causes of other substances.<sup>8</sup> This is a key point for his dispute with the Platonists.

In XII 1, Aristotle also considers two possible ways in which the universe might exist either (a) as some kind of whole, or (b) as a series in which substance is prior. What is implicitly excluded here is that the universe might consist of a series of disconnected genera, each with its own set of principles. This is the cosmological view which Aristotle subsequently (in XII 10) attributes to Speusippus, while deriding it as episodic like a bad tragedy. The dispute over the unity of the cosmos is closely related to the question about the principle of goodness, as we can see from XII 7 (1072b30-4) where Aristotle again criticizes Speusippus for holding that the good emerges only as the cosmos unfolds. In XII 10 (1075a11) Aristotle returns to this issue by asking how the good is contained in the universe; i.e. whether as something separate or as the order of the parts or as both. However, before we can understand Aristotle's own response to this question, we must consider his views on the principles of sensible substance.

Since being is spoken of in two major senses, according to Aristotle (1069b15 ff.), a single description of all changes can be given in terms of the transition from potential to actual being. Under the category of quality, for instance, one can say that a thing changes from being potentially white to being actually white. This way of speaking enables Aristotle to bypass the Parmenidean prohibition against generation from not-Being. Indeed he is so comfortable with this old philosophical ghost that he distinguishes (1069b26 ff.) three senses of "not-being", including matter. Since all things that change have matter, non-being plays a role in Aristotle's ontology under several different guises; i.e. potential being, privation, and matter.

But it would be a mistake to treat any of these as self-subsistent entities, or even as logically determined, without reference to actual being or form which is a primary reality for Aristotle just as much as it was for Plato, even though they disagree about how this form should be defined and understood. At the end of XII 2 (1069b32-34), for instance, Aristotle draws upon the conclusions of *Physics* I for the causes (aitia) and principles (archai) of changing things. Two of these are the

8. See M. Frede's (2000) introduction to *Metaphysics* XII and his remarks on XII 1.



contraries, privation (*sterêsis*) and form (*eidos*), whereas the third is matter (*hylê*). In order to see why a summary of physical principles is given by way of preamble to the metaphysical inquiry proposed for *Metaphysics* XII, it is worth recalling that Aristotle also appeals to such a schema of principles in XIV 1-2, so as to pass judgment on the Academic proposals for principles of supersensible substance.

Having outlined the roles of matter and form at different levels of reality, Aristotle begins XII 4 by summarizing his thesis as follows. In one sense the causes and principles of distinct things are different, but in another sense they are the same, though only in a general and analogical sense. He refers back to the *aporia* as to whether the principles and elements of substances, of relations, and of each of the other categories, are the same or different. On the one hand, if they were the same for all, this seems to be absurd because both relations and substances would have to come from the same elements. But there is nothing common (*koinon*) beyond (*para*) substances and the other categories, although the elements would have to be prior to the things of which they are elements. It would appear, both from its language and content, that this argument is aimed directly at Plato.<sup>9</sup>

His second argument (1070b3-4) is more ambiguous, perhaps on account of its brevity. Aristotle argues that substances are not the elements of relations, nor can relations themselves be the elements of substance. The implicit rationale seems to be that, if relations were the elements of substance (as Plato held?), then they would be prior in existence to substances, which is impossible according to his categories because relations are dependent attributes of substance. On the other hand, relations cannot be composed of substances because such a composite would be itself a substance, which is again contrary to his categories.

In his third argument (1070b4 ff.), Aristotle argues generally against the possibility that the same elements might be the elements of all things. Perhaps he has in mind especially such Platonic principles as unity and being, which he describes as intelligible presumably because they are so universal as not to be accessible to sense perception. We might reconstruct his argument as follows: suppose that either unity

or being is an element of a compound, then the compound (BA) differs from each of the elements (A and B). But the compound itself has a certain unity, and it is a certain kind of being; so it would seem to follow that the compound itself is an element, which is absurd. Aristotle's general aporetic conclusion goes as follows: No element can be either a substance or a relation. But it must be one or the other. Hence not all things have the same elements.

But then he offers (1070b10 ff.) a classic Aristotelian compromise: In one sense all things have the same elements but in another sense they do not. For instance, there are specific principles and elements of sensible things, such as the hot and the cold, and a suitable material subject; whereas there are quite different elements and principles of other things like mathematical objects. Therefore, Aristotle concludes, the elements and principles of all things cannot be the same except by analogy; just as one might say that there are three principles, such as form, privation, and matter. But even these typically physical principles are different for distinct genera; e.g. in the case of colors, they are white, black, and surface; whereas in the case of day and night, they are light, darkness, and air.

Having introduced (1070b22) the distinction between elements and principles, Aristotle summarizes his discussion by counting three elements, taken analogically, and four causes or principles. Of course, the three elements are different when applied to different genera, as is the "first cause" which functions as a distinct moving cause for different things; e.g. the medical art is the moving cause in cases where health, disease, and the body are the elements. In addition to all these, Aristotle now mentions a cause which moves all things, as being first of all things. This seems to be a reference to the Prime Mover, which is the ultimate mover of everything in the universe. Perhaps this helps to explain Aristotle's discussion of different ways of numbering the causes and principles, though it renders more puzzling the absence of any mention of final causes from his list of principles.

Given that this chapter is concerned with the reduction of causes and principles, it is rather odd that he should not even mention the identity of formal and final causes for a fully actualized living thing. Instead he identifies the proximate efficient cause with the formal cause, which is a legitimate move at the specific but not at the individual level; cf. *Phy.* 198a26 ff. Finally, he distinguishes the ultimate efficient

9. M. Crubellier (2000) also claims Aristotle's use of the term *stoicheion* here must be taken as an implicit reference to some Platonic view of principles that is being refuted.

cause from both of these, without explaining how this is a principle or cause of sensible substances. Perhaps this is just an anticipatory remark which Aristotle intends to explain later in his discussion of an unmoved mover. Whether or not this is so, I think that the proper perspective from which to view the remark is established by the leading question of XII 4 & 5; i.e. whether the principles and causes of everything are the same or different. When interpreted from that viewpoint, it may count as supporting evidence for the position that, in an important sense, they are the same for everything.

In support of this interpretation is the fact that, immediately afterwards at the beginning of XII 5 (1070b36 ff.), Aristotle returns to this leading question by way of the distinction between things that are separate (*chôrista*) and things that are not separate, the former of which are substances. By assuming the primacy of substance, Aristotle constructs a new argument for the same-ness of principles and causes for all things. Although the argument is so brief as almost to defy analysis, it deserves careful attention because of its importance for subsequent claims. While it is obviously based on the distinction between non-separated things and separated substances, it is unclear how Aristotle concludes from this that the causes of all things are the same, even though he explains that attributes and motions could not exist without substances. The brevity of his explanation suggests that Aristotle is appealing to a familiar criterion which will clinch the argument; namely, the criterion of priority formulated in terms of non-reciprocal dependence; cf. *Met.* 1019a1-4.<sup>10</sup>

As it stands, we might reconstruct the bare bones of the argument as follows:

1. Since they are substances, separated entities differ from non-separated entities;
2. But non-separated entities cannot exist without substances;
3. Therefore the causes of all things are the same.

In this skeletal form the argument is a complete *non sequitur*, since the conclusion does not have any terms in common with the putative "premises". To flesh out the argument, one would need to

establish that the causes of separated and non-separated things are the same. Yet, even if one could assume that the substance / accident distinction is identical with the separation / non-separation one, one must still prove that the causes of substances are the same as the causes of accidents. Thus, if the argument as it stands is to go through, one must look to the second premiss for such a step. This would mean that the criterion of non-reciprocal dependence justifies not only the claim that substance is ontologically prior to attributes but also the claim that the causes of substances are the causes of accidents. At this point perhaps we should recall from XII 4 the *aporia* about whether or not the things whose causes are the same are themselves the same. If one answers in the affirmative then one is faced with the absurd result that substances and accidents are the same. While Aristotle does not repeat this *aporia* in XII 5, I think it is hovering in the background. This is what must be resolved if he is to make good on his claim that the principles and causes of substance apply to all things. It is interesting to notice the examples of such causes and principles that he proposes rather tentatively in XII 5 (1071a2-3), when he suggests things like soul and body, or intellect and desire and body. Since he treats living things as paradigmatic sensible substances, it is not surprising to find him choosing their material and formal causes as his leading examples. But in XII 5 we are given no explanation as to how these causes are to be taken as the causes of everything.

Perhaps we can look for a hint in the subsequent passage (1071a3 ff.) which says that there is another way by analogy in which the principles of everything are the same. We could read this as implying that the previous discussion of causes has also been about sameness by analogy, and so, by following Aristotle's own procedure closely, we may bring out the previous meaning of sameness through comparison with analogical sameness. In fact, the discussion of principles and elements and causes in XII 4 (1070b16-19) has already established one way in which they are the same by analogy; i.e. when one speaks generally of three principles; form, privation, and matter. I think it must be by comparison with this way that Aristotle introduces actuality and potentiality as *another* way of treating principles as the same by analogy. Just as form and matter have the same relationship but different terms in distinct genera, so also potentiality and actuality lend themselves to

10. See Cleary (1988) for discussion of many senses of priority in Aristotle.

the relationships of identity and difference that are necessary for the concept of proportional analogy.<sup>11</sup>

In some cases, Aristotle says (1071a6-7), the same thing is at one time actual (*energeiai*) and at another time potential (*dunamei*). The examples given of such cases are wine, flesh, and man, but I think that the last two are to be taken as distinct entities, each of which is at one time potential and at another time actual. Thus, prior to the constitution of flesh from its material elements, they are potentially flesh and then they become actually flesh when these elements have been structured according to the appropriate ratio. Aristotle further clarifies what he has in mind by correlating the potentiality-actuality distinction with the division of the causes in his previous chapter. He says that the state of actuality is appropriate both to the composite and to the form, if the latter is separated (*chôriston*). By contrast, he claims (1071a7-11) that matter is in a state of potentiality because this is the thing which is capable of becoming informed by the form or its privation. The logic of this set of correlations seems to dictate that both form and privation be counted as actualities, in contrast to matter which is always a potentiality. While it may appear rather odd to treat privation as an actuality, this is quite consistent with the division of the formal cause in XII 4. Furthermore, the examples of privation adduced by Aristotle make this idea more plausible when we notice that both are forms, i.e. darkness & disease.

After outlining one way in which potentiality and actuality differ for the same thing, Aristotle proceeds to sketch another way in which they differ; i.e. for things whose matter is not the same. In this case the form is not the same either, so that actuality differs on two counts from potentiality. A better example is needed to illustrate this, but let us take "man" as Aristotle does in both cases. In the first case, we have the same kind of matter (e.g. flesh & bones) existing at one time in a state of potentiality (e.g. as an embryo or young child) and at another time in a state of actuality (e.g. as a fully grown human). But, in the second case, we have a different matter (e.g. elements like fire and earth) and a different proper form. Here the actuality of the form is to be found in something different outside; e.g. the father in the case of the child.

11. See Cleary (1998) for clarification of Aristotle's coinage of term "actuality" as correlative of "potentiality".

Although this suggests that the form as actuality is still the same in kind, Aristotle claims that the actuality may even be different in kind; e.g. the Sun and its oblique course. But he is careful to point out that these latter are moving causes (*kinounta*) of man and not either material or formal causes, since they are not of the same kind. Still, given that man is the proximate moving cause of man, we might call them remote moving causes since they serve as links in the chain of causality that goes back to the Prime Movers as ultimate cause.

I think it is significant for the point of his argument that Aristotle inserts here (1071a17ff.) a caution about illegitimate types of universalizing. One must see, he warns, that causes may be spoken of universally (*katholou*) in one way but not in another. This warning is relevant for the leading question of his present inquiry; namely, whether the principles and causes of all things are the same or different. We recall that in XII 4 (1070a31-32) he introduced a sense in which they are the same, if one speaks universally and analogically. But now he seems to be advising caution in how one speaks universally about causes, if one wishes to avoid a Platonic error in talking about the sameness of causes. Thus Aristotle is adamant that, in every case, the primary principles (*prôtai archai*) are, on the one hand, the primary "this" (*todi*) which is actual and, on the other hand, something else which is potential. He argues that such principles cannot be universals because the principle of an individual is another individual. While conceding that one may speak universally of "man" as a principle, he denies that there is any such person as the universal man. Given Aristotle's fondness for the Third Man argument, I think we may take him to be making an anti-Platonic point here. Although it is possible to speak generally about man generating man, it is actually an individual such as Peleus who is the moving cause of another individual like Achilles or, schematically, the principle of *this* BA is *this* B. Such a formulation would appear to fit the material cause better, yet the anti-Platonic point is clear when Aristotle insists (1071a23) that, speaking generally (*holôs*), B is the principle of BA without qualification (*haplôs*). The point is that only particular substances may be spoken of without qualification as principles and causes, whereas universals or Forms must be carefully qualified if they are called "causes" or "principles".

At this stage of his inquiry, Aristotle begins (1071a24 ff.) to draw some conclusions from his discussion of the question of whether the

principles and elements of things are the same or different. For things like colors, sounds, and quantities which fall into other genera besides substance, the causes and elements of substances are not the same except by analogy. And even within the same genus of things they are different, not specifically but individually. The examples which Aristotle gives here to illustrate this latter claim seem to involve the individuation of forms, as well as of matter. He says (1071a27-28), for instance, that your (*sê*) matter and form and moving cause are different from mine (*emê*), even though they are the same in general definition. Thus we seem to be left with the unpromising conclusion that in a general and analogical sense the principles and elements of everything are the same, while they are very different in the important specific (and most real) senses.

Such a conclusion is unpromising because it does not lead to the unifying vision of the cosmos which we might have expected from a first philosophy that is also a theology. Yet I think that we may still find some hint of that vision if we examine carefully the concluding passage of XII 5:

Thus, to inquire what are the principles or the elements of substances and of relations and of qualities, or whether they are the same or distinct, clearly this is possible for each of these in view of the fact that the terms are used in many senses; but when the senses have been distinguished, the principles and the elements are not the same but distinct, unless they are taken in a certain sense and are to include all things. In one sense, they are the same by analogy, in view of the fact that there is matter, form, privations, and a moving cause; and in another sense, the causes of substances are in some manner the causes of all, in view of the fact that when substances are destroyed all other things are destroyed. Moreover, the first thing which exists as actuality is the cause of all. On the other hand, there are first causes which are distinct if, being contraries, they are spoken of neither as genera nor in many senses; and, in the same way, there are first causes which are distinct as matter. We have stated, then, what the principles of sensible things are and how many they are, and in what sense they are the same and in what sense distinct.<sup>12</sup>

Perhaps referring here to an *aporia* facing the Platonists, Aristotle accepts the legitimacy of asking a general question about whether the

12. Cf. *Met.* 1071a29-b2 : translation by Apostle 1966.

principles and elements of all things are the same. But it is not immediately clear how this is related to the claim that each of these terms (i.e. principle and element) is said in many ways (*pollachôs legomenon*).<sup>13</sup> Aristotle seems to have in mind that such terms mean different things for different genera, so that when these senses are distinguished the principles and elements are not the same but different; cf. 1071a32. But if these terms were simply ambiguous in different categories, there would be no real ground for saying that, in some sense, the principles and elements are the same for all. However, Aristotle must find some basis for a general inquiry into the principles and elements of being qua being, although that particular formulation of the subject-matter is not used in XII.

In the above passage, I find at least two (if not three) attempts to ground a general inquiry into the principles and elements of all things. The first (1071a33) consists of a summary of what has already been established in XII 4 & 5; i.e. that in some analogous fashion the principles and elements of all things are the same. This analogous sameness trades on the fact that one can speak generally (*katholou*) about matter, form, privation, and moving cause in different genera. When one specifies the principles in each category, however, they turn out to be different even though the identity of the relationship is retained, just as the same proportion may be said to hold between ratios that are filled out in different ways. The second attempt at finding a way in which the principles of all things are the same has also been canvassed previously at the beginning of XII 5. This way rests on the claim that, in some sense, one can take the causes of substances to be the causes of all things.

In my analysis of that previous passage, I argued that this claim is justified in terms of the natural priority of substance and I think we can find the same justification repeated here (1071a35) in the formulaic phrase "*hoti anaireitai anairoumenôn*". Within the present context I take this phrase to mean that when substance is destroyed then beings in other categories are also destroyed with it. Ironically enough, Aristotle

13. It can hardly be the case that the phrase *pollachôs legomenon* was also used by Plato, as Elders (1972, p. 134) suggests, since Aristotle cites the many senses of "good" and of "being" as objections against Platonic claims that seem to depend on these being univocal concepts.

is here appealing to a criterion of natural priority inherited from Plato; cf. *Met.* 1019a1-4. The fact that priority is crucial to the argument is confirmed by his remark (1071a36) about the first thing being in a state of actuality (to prôton entelecheiai). Although it is not quite clear how this fits in with the claim that the causes of substance are the causes of all things, we can make a plausible conjecture by linking the priority of substance with the fact that terms like “principle” and “element” are said in many ways.

As it is used here, the phrase “pollachôs legomenon” means that these terms are simply ambiguous in different genera, by contrast with univocal terms within a single genus. From parallel passages, however, we know it could also mean that, even though they have different senses (like the term “medical”), all of these senses refer back to one central meaning. Therefore, I think that the third possibility hinted at by Aristotle here is that terms like “principle” and “element” can have the logical structure of *pros hen* equivocals of “focal meanings”.<sup>14</sup> The principal or primary meaning of such terms as form, privation, and matter, is given with reference to substance and this, in turn, determines their application within other categories. In the present context, the significance of focal meaning is not simply its unifying linguistic function but rather its deep metaphysical implications for Aristotle. With regard to the leading question of XII 4 & 5, it provides an alternative way (other than proportional analogy) in which the principles and causes of all things can be the same. Since the inquiry is about being, whose central and focal meaning is substance, then the principles and causes of substance range over all the categories of being.

## Conclusion

A parallel solution can be found in *Metaphysics* VI 1 (1026a30-31) where Aristotle claims that first philosophy is both a particular science and also universal precisely because it is first. It is a peculiar characteristic of the logical structure called a *pros hen* equivocal that

14. The terminology is that of G.E.L. Owen (1965). For Aristotle’s treatment of “principle” and “element” as transcendentals, along with “being” and “unity”, see *Metaphysics* X 1-2.

its primary instance is both particular and universal.<sup>15</sup> This has an important bearing on the perennial problem in Aristotelian scholarship about whether the special science of theology can be integrated into a general science of being qua being. Despite the absence of this description of metaphysics from XII, I think there is some evidence that such a conception is present in both the analogical and focal meanings of being. For instance, these two meanings are presented as two ways in which we can say that the principles and causes of all things are the same. While the analogical sameness of the principles seems to hold only in a general manner, it would appear that *pros hen* sameness holds for both particular and universal. The latter kind of sameness provides the crucial connection between theology and general ontology, even though Aristotle does not here spell out the details. Still, I think that this is the perspective from which we should view XII 6 with its sudden transition to an inquiry into supersensible substance. Since Aristotle does not stop to explain this transition, commentators have often been puzzled as to how the previous inquiry into the principles of sensible substance fits in with what follows. The conclusion of XII 5 contains a typical survey of his results about the principles of sensible things; i.e. what they are and how many, how they are the same and how they are different. The ongoing task for Aristotelian scholars is to explain the fact that he uses these conclusions as if they were stepping-stones into the realm of supersensible substances.<sup>16</sup>

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15. Cf. Cleary 1987 & 1988 for a more extended defense of this claim. See also Halper (1987) for a similar claim about the primary case of being for Aristotle.

16. This also provides a very clear contrast with Plato in the *Republic* where mathematical hypotheses are said to function as “stepping-stones” into the realm of supersensible Forms; cf. *Rep.* 510-11.

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