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THE OTHER PLATONIC PRINCIPLE

I

Greek dualism, the philosophical theory that there are two ultimate principles of reality, did not emerge in response to the fundamental challenge presented to thought by the Eleatic strict logic of being. On the contrary, the Parmenidean position presupposes both the Pythagorean Dualism and the Heracleitean attempt to fuse it with Ionic Monism.

Dualism was developed from the primeval (and practically universal) experience of man when he feels the world as an enlivened being. This implicit belief in the organicity of existence carries with it the understanding that every new thing in reality is a birth, that creation is procreation resulting upon the conjugation of male and female. In the context of fertile logicomythical and symbolic thinking (the "mixed" way of thought according to Aristotle), the model of generation as a sexual act takes powerful hold of human reasoning as part of a general biological construal of reality. Thus the more mythological Hesiodean system, for example, is substituted during the first philosophical awakening of Logos in 6^{th} century B.C., by the Pherecydean account and the various Orphic or Orphicizing cosmogonies. This represented the evolution from religious apprehensions to philosophicoreligious initiations, from mystery halfway to revelation of being.

It is of course not necessary that this process should lead to Dualism. In fact original Orphism represented the first groping articulations of a daring Monism. But one cardinal development projected the concrete experience of copulative production in existence (the biological prototype of the Platonic *γένεσις εἰς οὐσίαν*) to reality in its totality. This accounted for the bifurcation of the beginning of things, at the start of the great chain of being.

And this is where Pythagoreanism took root. Dualism is pretty ubiquitous in human coping with the puzzle of first beginnings. But the distinctive character of Pythagorean dualism reflected the specific understanding of existential duality in explanation of reality. Two fundamental moments constitute this specific understanding. *First*, cosmic duality is at bottom polarity. And, *secondly*, all polarity resolves itself into a basic opposition between πέρας and *ἄπειρον*, limitation and infinitude, definiteness and indefiniteness, determination and indeterminacy. These two moments go naturally hand in hand with a subsequently, though quite early, developed conception of number as of the essence of reality, providing its substance as well as its properties and conditions (Aristotle, *Metaphysica*, A, 986a16-7: *τὸν ἀριθμὸν νομίζοντες* [sc. the Pythagoreans] *ἀρχὴν εἶναι καὶ ὡς ὕλην τοῖς οὖσι καὶ ὡς πάθη τε καὶ ἕξεις*). A typical example of such early developed Pythagoreanism presents the Philolaean system. We ought not, certainly, imagine a high degree of articulation in original Pythagoreanism, either in its metaphysics or in its mathematics (two aspects really of the same reality). The mighty conception was that of being as consisting in (and thus coming to be from) the determination of some underlying indeterminacy.

The aim of theorizing was initially more to explain the perpetual change of reality (which means generation of the new and the extinction of the old) and the specific nature of the things that come to be and pass away – rather than explicitly to account for the fact of their multiplicity. Although, of course, variation presupposes multiplicity. Still when the Parmenidean challenge occurred, the apparatus was ready to be employed in meeting it: dualism was applied to invalidate and cancel the reduction, the *involution* of reality in one being of absolute existence. As this is evidenced by Parmenides himself in the second part of his philosophical speculations. And thus far is Aristotle justified in laying emphasis on this aspect in his diagnosis for the "diversion" to the mathematico-metaphysical first principles; *Metaphysica*, N, 1088b35 sqq.: *πολλὰ μὲν οὖν τὰ αἴτια τῆς ἐπὶ ταύτας τὰς αἰτίας ἐκτροπῆς,* μ ά λ ι σ τ α *δὲ τὸ ἀπορῆσαι* *ἀρχαϊκῶς· ἔδοξε γὰρ αὐτοῖς πάντ᾽ ἔσεσθαι ἓν τὰ ὄντα, αὐτὸ τὸ ὄν, εἰ μή τις λύσει καὶ ὁμόσε βαδιεῖται τῷ Παρμενίδου λόγῳ "οὐ γὰρ μήποτε τοῦτο δαμῇ, εἶναι μὴ ἐόντα", ἀλλ᾽ ἀνάγκη εἶναι τὸ μὴ ὄν δεῖξαι ὅτι ἔστιν· οὕτω γάρ, ἐκ τοῦ ὄντος καὶ* ἄ λ λ ο υ τ ι ν ό ς , *τὰ ὄντα ἔσεσθαι, εἰ πολλά ἐστιν.*

The heightened and rigorous systematization that was the most important general result of the Parmenidean challenge encouraged, and was encouraged by, the increasing mathematization of original Pythagoreanism in the maturer systems of Archytas and Philolaus. Hence it was that Plato took his own Pythagoreanism. From then onwards, the Pythagorean philosophy was principally cultivated in the Early Academy; and thus more traditional (and presumably backward or fundamentalistic) forms of Pythagoreanism were marginalized, ridiculed (in Comedy e.g.) and, finally, extinguished.

Now Aristotle is brilliantly clear as to Plato's Pythagoreanism. And this irrespective of our theories and interpretations concerning the *ἄγραφα δόγματα*, the lecture (or lectures) *περὶ τἀγαθοῦ*, and the relevant evidence from the (later) dialogues. I shall here pursue the subject with reference to the Second Platonic Principle. And shall endeavour to analyse its *function* in order to adequately understand its *nature*. Moving, that is, from (ontological) role to essence. For to be of such and such a nature is to make this and that difference in the world of reality. But let us start by following Aristotle's markers in the inquiry.

II

First, let it be noticed that while the Academic Pythagoreans concurred in holding the One as the first principle of reality, they betrayed conflicting tendencies as to the best way to comprehend the second principle. Perhaps, this is as it should be, in view of the elusive, limitless, nature of the Other Principle. The general description for Platonists and Academics is this, that they held the One to be principle and element of everything, and that from the One *and from something else* number is to be derived; M, 1080b6-8: *σχεδὸν δὲ καὶ οἱ λέγοντες τὸ ἓν ἀρχὴν εἶναι καὶ οὐσίαν καὶ στοιχεῖον πάντων, καὶ ἐκ τούτου* κ α ὶ ἄ λ λ ο υ τ ι ν ὸ ς *εἶναι τὸν ἀριθμόν*, etc. Aristotle rehearses the various views in the beginning of N, 1087b4-27. First comes the Platonic view (as we shall see): the Other Principle is the Unequal Dyad of the Great and the Small. Then Speusippus: the Multitude (*τὸ πλῆθος*). There follow two variations on the Platonic thesis: better to conceive of the Other Principle as the Many and the Few, since the great and small pertain to magnitudes rather than to numbers; or, still better, consider the universal under which both these and other contrarieties of more and less fall, namely *τὸ ὑπερέχον καὶ τὸ ὑπερεχόμενον*. (Aristotle disparages such variations as of a "logical" character, without real, "ontological" meaning). Finally, some thought otherness (*τὸ ἕτερον καὶ τὸ ἄλλο*) to be the required antithesis to the One, if reality is to be generated from the twin first principles.

The common arrogation of the One to the status of the absolutely first principle (in place of the original Pythagorean *Limit(ation)*) stems, I believe, from Plato himself. But this is not my subject here. The fact that Plato's Other Principle did not meet comparable acceptance by his Academics is worthy of notice and study. It is important to understand accurately (within the bounds of historicophilosophical methods) what the *ἑτέρα ἀρχή* was for Plato.

The other Platonic Principle is the (Dyad of the) Great and Small, alias the Indefinite Dyad. A formidable array of perfectly consistent passages makes the acceptance of this doctrine really obligatory. Nor is there any persistent problem in properly understanding the various appellations given to the other Platonic principle in our sources. It is clear that Plato wanted to catch the "essential feature" of the Pythagorean *ἄπειρον*. He found, exactly as he tells us ex professo in his *Philebus*, that the "nature" of indeterminacy resides in the possibility of more and less, i.e. in a field of variation. (The later mathematicised Pythagoreanism is suitably again presupposed). A field of variation can be defined by the polarity which characterises its (ideal) extremes. For instance, the variational field of temperature is conceptualized and governed, by the opposition between hot and cold. Not that there is in concrete *rerum natura* the absolute hot and the absolute cold. But without that polarity we would be unable to comprehend what "more cold" and "more warm" mean, to comprehend the actualities of temperature-variation. Thus the "ideal" opposition is operative in the "real" variation and constitutive of its inherent indeterminacy. (Moving further along this line, we can see how the ontological priority of the polarity makes its terms more real that the reality of the actual variations).

To be noticed, *first*, that this bipolarity of indeterminacy is distinct from the contrariety between determinateness and indeterminacy. The novel opposition *within* indeterminacy reveals the nature of infinity – and in a sense (whose significance will be rendered more precise in the sequel) *delimits* it. Such limitation of limitlessness constitutes the specific character of a given field of variation - what e.g. makes the variational field of hot and cold the temperature field that it is (as against other variational fields, like, say, that of humidity and dryness). The novel step in understanding the nature of infinity is thus of major importance, and it is this move that is emphatically ascribed by Aristotle to Plato; *Metaphysica*, A, 987b25-7: τὸ δὲ ἀντὶ τοῦ ἀπείρου ὡς ἑνὸς δυάδα ποιῆσαι, τὸ δ᾽ ἄπειρον ἐκ μεγάλου καὶ μικροῦ, τοῦτ᾽ ἴδιον (sc. Πλάτωνός ἐστι).

Second to be noticed in this connection is that the definition of indeterminacy that we gained leads us directly to the Other Principle. All variational fields have two things in common beyond their *specific* character: they are constituted by an (ideal) *bipolarity*; and they are actualized as a *more and less* with regard to that bipolarity[1]. The principle of indeterminacy should thus reflect the *oppositional* nature and *quantificational* character of indefiniteness. *The prototype of oppositional bipolarity is duality*. And the most general polarity of a quantificational variation field, the most general polarity of the field of more and less, is the polarity *of the Great and the Small*. Thus (combining the two necessary characters) the principle of indeterminacy is *the Dyad of the Great and the Small*. And this squares very well with both (a) Platonic logic and (b) Platonic doctrine. (a′) In order for the Second Principle to be the polar opposite to the First Principle, it must possess polar opposition primarily and essentially *in itself*, it must *be* the nature of polar opposition. And since (b′) existence is quantificational in essence, the polar opposition constitutive of the Second Principle must have mathematical character. We can see that both conditions concur in finding apt expression in the Dyad of the Great and the Small.

Plato's Other Principle is then the Dyad of the Great and the Small. (*Metaphysica, loc.cit.; ibid.* A, 988a13-4: ὅτι αὕτη [sc. the (in Aristotelian terminology) "ὕλη" as the Other Principle] δυάς ἐστι, τὸ *μέγα καὶ τὸ μικρὸν* [for Plato]; cf. A, 987b20; 988a26; *Physica*, A, 187a19). Aristotle goes so far in emphasising the duality in the nature of indeterminateness, that he speaks of Plato postulating *two ἄπειρα*; *Physica*, Γ, 203a15 sqq.: *Πλάτων δὲ δύο τὰ ἄπειρα, τὸ μέγα καὶ τὸ μικρόν; ibid.* Z, 206b27-29: ...*Πλάτων ...δύο τὰ ἄπειρα ἐποίησεν, ὅτι καὶ ἐπὶ τὴν αὔξην δοκεῖ ὑπερβάλλειν καὶ εἰς ἄπειρον ἰέναι καὶ ἐπὶ τὴν καθαίρεσιν*. The "two *ἄπειρα*" signify the two directions of indefiniteness, towards the small and towards the great, towards zero and towards infinity (so to speak); *Physica*, Γ, 206b27-33:*ἐπεὶ καὶ Πλάτων διὰ τοῦτο δύο τὰ ἄπειρα ἐποίησεν... ποιήσας μέντοι δύο οὐ χρῆται· οὔτε γὰρ ἐν τοῖς ἀριθμοῖς τὸ ἐπὶ τὴν καθαίρεσιν ἄπειρον ὑπάρχει, ἡ γὰρ μονὰς ἐλάχιστον, οὔτε ἐπὶ τὴν αὔξην, μέχρι γὰρ δεκάδος ποιεῖ τὸν ἀριθμόν*. Aristotle's first remark clarifies that the operational concept of number in classical thought was what can be reduced to the series of natural numbers. It is of the essence of *number* that there is a monad. There can be no valid process with the zero as limit. Rational numbers fit in this conceptual framework – but not irrational ones. Irrational numbers therefore are not strictly numbers. *Irrationality is however relative.* On Aristotle's contention, secondly, regarding the privileged status of the Decade in Plato, we shall return later. The passage is incorporated in Aristotle's discussion of the notion of (mathematical) infinity.

The Dyad of the Great and the Small, as principle of Indeterminacy, *is* the *Indefinite* Dyad: it is not the definite dyad, because this consists in two determinate monads. The Indefinite Dyad is the principle of all indefinite variation. The definite dyad is the principle of all determinate duality of monads, as against triplicity, tetraplicity etc. Moreoever, it is the product of the operation of the First Principle on the Second One. (The manner of production will be indicated in the sequel). That the Indefinite Dyad is Plato's Other Principle is testified indirectly but safely by Aristotle in *Metaphysica*, N, 1090b32-1091a5: *οἱ δὲ πρῶτοι δύο τοὺς ἀριθμοὺς ποιήσαντες, τόν τε τῶν εἰδῶν καὶ τὸν μαθηματικόν, οὔτ᾽ εἰρήκασιν οὐδαμῶς οὔτ᾽ ἔχοιεν ἂν εἰπεῖν πῶς καὶ ἐκ τίνος ἔσται ὁ μαθηματικός· ποιοῦσι γὰρ αὐτὸν μεταξὺ τοῦ εἰδητικοῦ καὶ τοῦ αἰσθητοῦ· εἰ μὲν γὰρ ἐκ τοῦ μεγάλου καὶ μικροῦ, ὁ αὐτὸς ἐκείνῳ ἔσται τῷ τῶν ἰδεῶν (ἐξ ἄλλου δέ τινος μικροῦ καὶ μεγάλου τὰ γὰρ μεγέθη ποιεῖ)· εἰ δ᾽ ἕτερόν τι ἐρεῖ πλείω τὰ στοιχεῖα ἐρεῖ. καὶ εἰ ἕν τι ἑκατέρου ἡ ἀρχή, κοινόν τι* *ἐπὶ τούτων ἔσται τὸ ἕν, ζητητέον τε πῶς καὶ ταῦτα πολλὰ τὸ ἕν καὶ ἅμα τὸν ἀριθμὸν γενέσθαι ἄλλως ἢ ἐξ ἑνὸς καὶ* δυάδος ἀορίστου *ἀδύνατον κατ' ἐκεῖνον*. Throughout in this passage it is Platonic doctrine that is criticised. *Οἱ πρῶτοι δύο τοὺς ἀριθμοὺς ποιήσαντες* is certainly Plato. Cf. M, 1086a 11-3: *ὁ δὲ πρῶτος θέμενος* (a) *τὰ εἴδη εἶναι καὶ* (b) *ἀριθμοὺς τὰ εἴδη καὶ* (c) *τὰ μαθηματικὰ εἶναι εὐλόγως ἐχώρισεν*. This is clearly Plato who (a) posited Ideas and (b) considered Ideas to be Numbers and (c) posited (intermediate) mathematicals (i.e. common numbers and magnitudes). Cf. N, 1090a16 sqq.: *οἱ μὲν οὖν τιθέμενοι τὰς ἰδέας εἶναι, καὶ ἀριθμοὺς αὐτὰς εἶναι* etc. Also, N, 1090a4-5: *τῷ μὲν γὰρ ἰδέας τιθεμένῳ παρέχονταί τιν' αἰτίαν τοῖς οὖσιν, εἴπερ ἕκαστος τῶν ἀριθμῶν ἰδέα τις* etc. V. M, 1080b11-14. *Ἐκείνῳ, ποιεῖ, ἐρεῖ* in the above quoted passage N, 1090b32-1091a5 refer to him, sc. Plato. And we learn that *he* maintained that it is imposible to derive number otherwise than from the One and the Indefinite Dyad. In N, 1088a15-6 the indefinite dyad is the one of the Great and Small: *τὴν δυάδα δὲ ἀόριστον ποιοῦντες μεγάλου καὶ μικροῦ*. There is also a structural consideration of Aristotle's analysis and criticism that demonstrates that the Platonic Other Principle is the Indefinite Dyad. In M6 - 8,1083b23 Aristotle examines the view that numbers are principles of being. In M6 he makes a systematic abstract division of all possible forms that such a view could take, and then also correlates these forms to actually held theories in the Old Academy. The abstract classification observes the following schema (1080a15-b5):

A) Number consists of monads[2]

(1) either totally uncombinable to each other
(2) or fully combinable to each other
(3) or partially combinable (with the monads belonging to one number being combinable among themselves and uncombinable to the monads of all other numbers).

B) Number may exist of more than one of the three mentioned (A) kinds.

C) Number may be either separate from the sensible reality or inherent in it and constitutive of it – or one kind of number may be separate (transcendental) and another immanent.

Aristotle maintains (1080b6-8) that those who hold the view (a) that the One is principle and substantial essence and element of all being, and (b) that number is derived from this Principle and from some Other thing (i.e. the (late) Pythagoreans and the Academics), do fall under the above set out schema. (One alternative being impossible and thus left vacant: namely A1; 1080b8-9: *πλὴν τοῦ πάσας τὰς μονάδας εἶναι ἀσυμβλήτους*). He further states that the classification he proposes is exhaustive: *καὶ τοῦτο συμβέβηκεν εὐλόγως· οὐ γὰρ ἐνδέχεται ἔτι ἄλλον τρόπον εἶναι παρὰ τοὺς εἰρημένους* (1080b9-11).

Aristotle then draws the correlations between the theoretical options on the one hand and the actual theories of the Pythagoreans and the Academics on the other.

(I)	1080b11-14:	(Plato) → two kinds of number, one A3 (the Ideas) – one A2, both separate.
(II)	1080b14-16:	(Speusippus) → one kind of number, A2, separate.
(III)	1080b16-21:	Pythagoreans → one kind of number, quasi-A2, immanent and constitutive of sensible reality, consisting not in (arithmetical) monads but in (unit) magnitudes.
(IV)	1080b21-22:	*ἄλλος τις* → one kind of number, A3 (the Ideas).
(V)	1080b22-23	(Xenocrates) → one kind of numbers, A2, identified with the Ideas[3].

Aristotle examines in length theory I (Plato) in M7-M8, 1083a17. The conclusion he draws makes it clear that he has in mind the Platonic position throughout that passage: *ὅτι μὲν οὖν, εἴπερ εἰσὶν ἀριθμοὶ αἱ ἰδέαι, οὔτε συμβλητὰς τὰς μονάδας ἁπάσας ἐνδέχεται εἶναι, φανερόν, οὔτε ἀσυμβλήτους ἀλλήλαις οὐδέτερον τῶν τρόπων* (1083a17-20). He goes then on to II (Speusippus), in 1083a20-b1. Then to V (Xenocrates), which theory he calls *ὁ τρίτος τρόπος*, namely *τὸ εἶναι τὸν αὐτὸν ἀριθμὸν τὸν τῶν εἰδῶν καὶ τὸν μαθηματικὸν* (1083b2-3). This he disposes off in a cavalier fashion in 1083b1-8, branding it the worse manner (of conceiving the principles of reality), *χείριστα λέγεται ὁ τρίτος τρόπος* (1083b2). Finally, he treats of the (late) Pythagoreans, theory III (*ὁ τῶν Πυθαγορείων τρόπος*, 1083b8), in 1083b8-19. The recapitualation in 1083b19-23 makes evident the systematic pattern of the foregoing discussion: *εἰ τοίνυν ἀνάγκη μέν, εἴπερ ἐστὶν ἀριθμὸς τῶν ὄντων τι καθ' αὐτό, τούτων εἶναί τινα τῶν εἰρημένων τρόπων, οὐθένα δὲ τούτων ἐνδέχεται, φανερὸν ὡς οὐκ ἔστιν ἀριθμοῦ τις τοιαύτη φύσις οἵαν κατασκευάζουσιν οἱ χωριστὸν ποιοῦντες αὐτόν.*. Which answers to the start of the investigation in 1080a12 sqq.: *καλῶς ἔχει πάλιν θεωρῆσαι τὰ περὶ τοὺς ἀριθμοὺς συμβαίνοντα τοῖς λέγουσιν οὐσίας αὐτοὺς εἶναι χωριστὰς καὶ τῶν ὄντων αἰτίας πρώτας*[4].

A clear indication of the systematic nature of M (and N) lies in that the great development M6 -8,1083b23 answers to the *τρίτη σκέψις* as announced in the beginning of M; (1076a29-32):*ἔτι δὲ πρὸς ἐκείνην δεῖ τὴν σκέψιν ἀπαντᾶν* τὸν πλείω λόγον, *ὅταν ἐπισκοπῶμεν εἰ αἱ οὐσίαι καὶ αἱ ἀρχαὶ τῶν ὄντων ἀριθμὸς καὶ ἰδέαι εἰσίν· μετὰ γὰρ τὰς ἰδέας αὕτη λείπεται* τρίτη σκέψις. The second inquiry (*δευτέρα σκέψις*) has been mentioned just before (1076a26-29): *ἔπειτα μετὰ ταῦτα χωρὶς περὶ τῶν ἰδεῶν αὐτῶν ἁπλῶς καὶ ὅσον νόμου χάριν· τεθρύληται γὰρ τὰ πολλὰ καὶ ὑπὸ τῶν ἐξωτερικῶν λόγων*. This second inquiry is actually carried on in M4-5, in fact just preceding the τρίτη σκέψις. And, furthermore, the *first* investigation is set out in M1 in the following terms (1076a22): *σκεπτέον* πρῶτον *μὲν περὶ τῶν μαθηματικῶν, μηδεμίαν προστιθέντας φύσιν ἄλλην αὐτοῖς, οἷον πότερον ἰδέαι τυγχάνουσιν οὖσαι ἢ οὔ, καὶ πότερον ἀρχαὶ καὶ οὐσίαι τῶν ὄντων ἢ οὔ, ἀλλ' ὡς περὶ μαθηματικῶν μόνον εἴτ' εἰσὶν εἴτε μὴ εἰσί, καὶ εἰ εἰσὶ πῶς εἰσίν*. Which examination is conducted in M2-3.

Finally, the very beginning of M charts a vast plan. There is the question of the substance of sensible reality. This has been treated in the theory of Physics (*μέθοδος τῶν φυσικῶν*) in so far as the material aspect of that reality is concerned, *ὕστερον δὲ* in what concerns its essential actuality; 1076a8-10: *περὶ μὲν οὖν τῆς τῶν αἰσθητῶν οὐσίας εἴρηται τίς ἐστιν, ἐν μὲν τῇ μεθόδῳ τῇ τῶν φυσικῶν περὶ τῆς ὕλης, ὕστερον δὲ περὶ τῆς κατ' ἐνέργειαν. Ὕστερον* must refer to the *μέθοδος "μετὰ τὰ φυσικὰ"*, namely Metaphysics Z, H, Θ (and at the limit Λ). Book I presents his positive views concerning unity and contrariety. Now Aristotle proposes to examine the views held concerning the existence of immovable and eternal substantial being. He claims that two such general views have been propounded: the one claimed transcendental being for mathematicals; the other for the ideas (a16-19). In particular, three theories have specifically been expounded: (a) that there are two kinds of transcendental reality, ideas and mathematical numbers; (b) that the two are one nature; and (c) that there is only one transcendental reality, the mathematical one. (1076a19-22). Clearly (a) corresponds to I (Plato); (b) to V (Xenocrates, *ὁ τρίτος τρόπος*); and (c) to II (Speucippus). This amounts to no less than a systematic criticism of Academic metaphysics, naturally coimplicating in the sequel its source, i.e. (late) Pythagoreanism.

The importance of this clarification of the overall structure in M for our purpose at hand lies in demonstrating that there can be no reasonable doubt that the long analysis in M7 - M8,1083a17 concerns Platonic doctrine. And in fact, when Aristotle criticises the Speusippean position just afterwards, he refers to Plato by name (1083a32), with reference to doctrines of his that he has examined precisely in the preceding section. He mentions the views that there must be a first dyad (which would come *before any duality of indistinguishable monads),* and that (first) numbers are not combinable (1083a31-35). These doctrines relate to such facts as that the definite dyad cannot come from the (original) One and another one, *if the indefinite dyad is the Other Principle*. For if in order to derive duality we needed just another one by the side of the original One, then the second principle must have been another One. But how could another One be differentiated from the First One – if we are moving on the level of first principles?

So the Other Principle must be something *Not One*; v. B, 1001b19-21: *ἀλλὰ μὴν καὶ εἴ τις οὕτως ὑπολαμβάνει ὥστε γενέσθαι, καθάπερ λέγουσί τινες, ἐκ τοῦ ἑνὸς αὐτοῦ* καὶ ἄλλου μὴ ἑνός τινος *τὸν ἀριθμόν*, etc. The τινές are principally Plato. (This ontological logic goes against the notion that since the first principles are contraries, one has to be opposed to (another, distinct, different) one; cf. I, 1055b30 sqq., (*ἐπεὶ δὲ ἓν ἑνὶ ἐναντίον* etc.) a passage to be analysed *infra*). This Platonic Other Principle which has to be a Not-One, is aptly construed as the (Indefinite) Dyad. Thus, on the contrary, the Indefinite Dyad as the Other Principle produces the definite dyad, without thereby bringing forth a triplicity of being, namely the original One and the two monads of the definite dyad. For numbers are uncombinable, and so are their respective monads. Now such argumentations fill exactly the passage M7 - M8,1083a17. (Cf. e.g. 1081b24-26: *καὶ ἡ δυὰς ἔσται ἐκ τοῦ ἑνὸς αὐτοῦ καὶ ἄλλου ἑνός* [i.e. if monads are indiscriminate]· *εἰ δὲ τοῦτο, οὐχ οἷόν τ' εἶναι τὸ ἕτερον στοιχεῖον δυάδα ἀόριστον· μονάδα γὰρ μίαν γεννᾷ ἀλλ' οὐ δυάδα ὡρισμένην*. Cf. B, 1001b4-6).

The Indefinite Dyad is the principle of indeterminacy, of the more and less: it is thus the Indefinite Dyad of the Great and Small in general. Now the field of indeterminacy in general, polarised around the twin power-focuses of the Great and the Small, (conceived, that is, quantificationally and mathematically), can be construed as abstract Inequality susceptible of equalization. To articulate this construal adequately, one has to understand the process by which the (ideal) numbers are generated from the two first principles. But, before this, the very *dualization of infinity* leads to that notion. For the more and less presuppose that which is neither more nor less, i.e. equality as the equal in abstracto (not equal *to something else*).

The Aristotelian Plato certainly construed principles in this way. In the beginning of N (as it is transmitted), Aristotle sets out to examine the view that all (*πάντες*) make the first principles of immovable being to be contrary, just as with the principles of physical being (1087a29-31) – all save Aristotle, that is. He succinctly then goes on to identify the root problem with all Pythagorean and Academic theories of First Principles (1087a31-b4). Since nothing can be ontologically prior to a first principle; and since contraries are opposite determinations of an underlying subject; such antithetical determinations as posited by the mathematical metaphysicians cannot be *first* principles of reality. Aristotle continues with an enumeration and accounts of various forms of metaphysical dualism. He starts with the Speusippean and Platonic theories (1087b4 sqq.): *οἱ δὲ* (sc. all those who ignore what he considers the basic point just stated) *τὸ ἕτερον τῶν ἐναντίων ὕλην ποιοῦσι* – that is they commit the fallacy of taking the substratum as one of the opposite first principles. Aristotle speaks of course here in terms of his own analysis, according to which matter is not opposite to form – rather possession and privation of form are the two contraries, but privation is not a metaphysical principle. (The Aristotelian point expressed with distinctive clarity can be seen in *Physica*, A, 191b35-192a25). Whatever we may think of the real weight of this objection; and of how easily we might subsume it under the head of guarding against "logical" difficulties (*λογικὰς δυσχερείας*) with "logical demonstrations" (*λογικὰς ἀποδείξεις*) as he in the sequel accuses his targets to do (1087b18-21: *διαφέρει δὲ τούτων οὐθὲν ὡς εἰπεῖν πρὸς ἔνια τῶν συμβαινόντων, ἀλλὰ πρὸς τὰς λογικὰς μόνον δυσχερείας, ἃς φυλάττονται διὰ τὸ καὶ λογικὰς φέρειν τὰς ἀποδείξεις*); the Platonic originality here consisted precisely in analysing *ἄπειρον* as a bipolar field of indeterminacy – an *internal* inherently indefinite opposition in *external* opposition to limit and definiteness.

And Aristotle continues: *οἱ δὲ τὸ ἕτερον τῶν ἐναντίων ὕλην ποιοῦσιν, οἱ μὲν* (including Plato) *τῷ ἑνὶ τῷ ἴσῳ* (no need to delete *τῷ ἴσῳ*, it is explanatory) *τὸ ἄνισον, ὡς τοῦτο τὴν τοῦ πλήθους οὖσαν φύσιν, ὁ δὲ* (sc. Speusippus) *τῷ ἑνὶ τὸ πλῆθος (γεννῶνται γὰρ οἱ ἀριθμοὶ τοῖς μὲν* ἐκ τῆς ἀνίσου δυάδος, τοῦ μεγάλου καὶ μικροῦ, *τῷ δ' ἐκ τοῦ πλήθους, ὑπὸ τῆς τοῦ ἑνὸς δὲ οὐσίας ἀμφοῖν)· καὶ γὰρ ὁ τὸ ἄνισον καὶ ἓν λέγων τὰ στοιχεῖα,* τὸ δ' ἄνισον ἐκ μεγάλου καὶ μικροῦ δυάδα, *ὡς ἓν ὄντα τὸ ἄνισον καὶ τὸ μέγα καὶ τὸ μικρὸν λέγει, καὶ οὐ διορίζει ὅτι λόγῳ ἀριθμῷ δ' οὔ· ἀλλὰ μὴν καὶ τὰς ἀρχὰς ἃς στοιχεῖα καλοῦσιν οὐ καλῶς ἀποδιδόασιν, οἱ μὲν τὸ μέγα καὶ τὸ μικρὸν λέγοντες μετὰ τοῦ ἑνός, τρία ταῦτα στοιχεῖα τῶν ἀριθμῶν, τὰ μὲν δύο ὕλην τὸ δ' ἓν τὴν μορφήν* etc. The plural (*οἱ μὲν* 1087b5; *τοῖς μὲν* b7; *οἱ μὲν* b13; *λέγοντες* b14), turns into singular (*ὁ τὸ ἄνισον* etc. b9; λέγει b11; *οὐ διορίζει* b12): Aristotle refers to Plato primarily and his closer followers. The description of the Other Principle involved leaves no doubt about that: *ἐκ τῆς τοῦ ἀνίσου δυάδος, τοῦ μεγάλου καὶ μικροῦ* b7-8; *τὸ δ' ἄνισον ἐκ μεγάλου καὶ μικροῦ δυάδα* b10; and even *οἱ δὲ τὸ ἄνισον ὡς ἕν τι,* τὴν δυάδα δὲ ἀόριστον ποιοῦντες μεγάλου καὶ μικροῦ 1088a15-6 (where there is no need to add *‹ἐκ› μεγάλου καὶ μικροῦ* with Jaeger). Here both tendencies are supposed to be operative, one to consider the other principle as some kind of oneness (since it is *one* other principle), and a second (which is more appropriate) to construe it as inherently dual, and indeed as the original polarity[5].

That Plato, according to Aristotle, identified the (Indefinite) Dyad of the Great and the Small with Inequality is also confirmed by the criticism leveled in *Metaphysica* I 5 and 6 against two views of the (antithetical) first principles, one opposing the One and the Many (treated in I.6), and the other Equality to the Great and Small (criticised in I.5): *ἐπεὶ δὲ ἓν ἑνὶ ἐναντίον, ἀπορήσειεν ἄν τις πῶς ἀντίκειται τὸ ἓν καὶ τὰ πολλά* (Speusippus), *καὶ τὸ ἴσον τῷ μεγάλῳ καὶ τῷ μικρῷ* (Plato), I, 1055b30-2. The point of conceiving of the archetypal contrariety as that between the One as Equal and the (indefinite) Dyad as the Unequal lies in that we ask the *πότερον*-question (essential in establishing contrarieties for Aristotle; 1055b32 sqq.) in the form: *πότερον μεῖζον ἢ ἔλαττον ἢ ἴσον* (1056a3-5). Aristotle draws a line of ("logical", in the sense used depreciatingly by himself) difficulties in establishing the underlying contrariety in this question (b5 sqq.). The equal cannot be opposite to one of the two other terms (greater and smaller). It cannot be opposite to them, for it is certainly opposite to the unequal, and so it would have to be opposite to more than one things (b7-8: *ἔτι τῷ ἀνίσῳ ἐναντίον τὸ ἴσον, ὥστε πλείοσιν ἔσται* [sc. *ἐναντίον τὸ ἴσον*] *ἢ ἑνί*). One may counter that the unequal is just the same with the greater and small (b8-9: *εἰ δὲ τὸ ἄνισον σημαίνει τὸ αὐτὸ ἅμα ἀμφοῖν*); to which Aristotle elsewhere responds that this may well be an indentity in abstract definition, but not a numerical one – the greater cannot be numerically identical with the smaller (1087b11-2, in the passage above quoted). Here, however, Aristotle pursues a different line of criticism. Assuming the identity of Inequality with the Greater and the Smaller will make the Equality, which is one, the opposite of the Greater and the Smaller, which are two – something impossible given the rule that contrary to one can only be (another) one. (Cf. 1055b30: *ἐπεὶ δὲ ἓν ἑνὶ ἐναντίον*). In conclusion, 1056a11: *ἀλλὰ συμβαίνει ἓν δυοῖν ἐναντίον· ὅπερ ἀδύνατον. Far from impossible – in fact really necessary according to the Platonic logic of being.* But the important point in our present connection is that this argumentation, Aristotle observes, strengthens the case of those who maintain that the Unequal is a Dyad; 1056a10-11: *καὶ ἡ ἀπορία βοηθεῖ τοῖς φάσκουσι τὸ ἄνισον δυάδα εἶναι* – i.e. principally Plato. Similarly Plato is principally meant in the criticism addressed by Aristotle to the methods of derivation of number and (geometrical) magnitudes in B, 1001b19-25 (referred to *supra*): the view criticised involves two first opposite principles, the One and something Not-One, which latter is the inequality: *ἐκ τοῦ ἑνὸς αὐτοῦ καὶ ἄλλου μὴ ἑνός τινος... εἴπερ τὸ μὴ ἓν ἡ ἀνισότης* etc.

A fundamental Aristotelian criticism levelled against the specifically Platonic theory of first principles is that it makes the Other Principle a *relative* – a high crime of lèse majesté according to Aristotelian ontological valuations: N, 1088a21 sqq.: *ἔτι δὲ ... καὶ πρός τι ἀνάγκη εἶναι τὸ μέγα καὶ τὸ μικρὸν καὶ ὅσα τοιαῦτα* (like *τὸ ἄνισον*)· *τὸ δὲ πρός τι πάντων ἥκιστα φύσις τις ἢ οὐσία τῶν κατηγοριῶν ἐστὶ καὶ ὑστέρα τοῦ ποιοῦ καὶ ποσοῦ* etc. (no need for the Christ – Ross – Jaeger alterations). This criticism is continued in N, 1089b4 sqq.: *αὕτη γὰρ ἡ παρέκβασις* (namely in effect that they did not distinguish the Aristotelian categories) *αἰτία καὶ τοῦ τὸ ἀντικείμενον ζητοῦντας τῷ ὄντι καὶ τῷ ἑνί, ἐξ οὗ καὶ τούτων τὰ ὄντα,* τὸ πρός τι καὶ τὸ ἄνισον *ὑποθεῖναι, ὃ οὔτ' ἐναντίον οὔτ' ἀπόφασις ἐκείνων, μία δὲ φύσις τῶν ὄντων* (i.e. one *(other)* category of being) *ὥσπερ καὶ τὸ τί* (substance) *καὶ τὸ ποιόν* (quality). *καὶ ζητεῖν ἔδει καὶ τοῦτο, πῶς πολλὰ τὰ πρός τι ἀλλ' οὐχ ἕν· νῦν δὲ πῶς μὲν πολλαὶ μονάδες παρὰ τὸ πρῶτον ἓν ζητεῖται, πῶς δὲ πολλὰ ἄνισα παρὰ τὸ ἄνισον οὐκέτι. καίτοι χρῶνται* (i.e. they employ different kinds of inequality), *καὶ λέγουσι μέγα μικρόν* (the most abstract characterization), *πολὺ ὀλίγον, ἐξ ὧν οἱ ἀριθμοί, μακρὸν βραχύ, ἐξ ὧν τὸ μῆκος, πλατὺ στενόν, ἐξ ὧν τὸ ἐπίπεδον, βαθὺ ταπεινόν, ἐξ ὧν οἱ ὄγκοι· καὶ ἔτι δὴ πλείω εἴδη λέγουσι τοῦ πρός τι* (i.e. of the basic contrariety and inequality)· *τούτοις δὴ τί αἴτιον τοῦ πολλὰ εἶναι;* (Here we further have the decisive clue for our understanding of the Platonic derivation of reality from the first principles; but of this more in the sequel). In fact, if I am right, Plato precisely endeavoured to explain how these varieties of the general indeterminacy came about (*πῶς πολλὰ ἄνισα παρὰ τὸ ἄνισον* – and *τούτοις τί αἴτιον τοῦ πολλὰ εἶναι*), and to use exactly these in order to account for the generation of magnitudes.

But before this, we may gain an idea of what led the Platonic theory of first Principles in a Xenocratean direction. N, 1088b28 sqq.: *εἰσὶ δέ τινες οἳ δυάδα μὲν ἀόριστον ποιοῦσι τὸ μετὰ τοῦ ἑνὸς στοιχεῖον, τὸ δ'* ἄνισον *δυσχεραίνουσι εὐλόγως διὰ τὰ συμβαίνοντα ἀδύνατα· οἷς τοσαῦτα μόνον ἀφῄρηται τῶν δυσχερῶν ὅσα διὰ τὸ ποιεῖν* τὸ ἄνισον καὶ τὸ πρός τι *στοιχεῖον ἀναγκαῖον συμβαίνειν τοῖς λέγουσι· ὅσα δὲ χωρὶς ταύτης τῆς δόξης, ταῦτα κἀκείνοις ὑπάρχειν ἀναγκαῖον,* ἐάν τε τὸν εἰδητικὸν ἀριθμὸν ἐξ αὐτῶν ποιῶσι ἐάν τε τὸν μαθηματικόν. The latter clause refers to Xenocrates: from the One and the Indefinite Dyad[6] he derived number, which as mathematical constituted according to him the identity of the ideas. He dropped the view of the other principle as Inequality of the Greater and Smaller, *and the account of the derivation of number that goes with it*. It cannot be excluded that some who would cling to the Platonic eidetic number as distinct from the mathematical one would differentiate themselves from the complete Platonic account of the Other Principle. To this possibility points M, 1081a23-5: *ἅμα γὰρ αἱ ἐν τῇ δυάδι τῇ πρώτῃ μονάδες γεννῶνται*, εἴτε ὥσπερ ὁ πρῶτος εἰπὼν ἐξ ἀνίσων *(ἰσασθέντων γὰρ ἐγένοντο)* εἴτε ἄλλως, etc. But this again may well refer to a Xenocratean tendency, although the passage occurs in what has been identified as a sustained criticism of the Platonic theory (M7–8,1083a20). On the other hand a Platonist accepting the two orders of number but dissociating himself from an account of the Other Principle which would make of it a *relative*, may just be an (Aristotelian) theoretical possibility. Although, again, it seems that on the fertile ground of the Academy, and under its free climate, all possible positions within the general Pythagorean framework were taken and tried.

III

How was number, and the sequence of graduated reality, derived according to Platonic theory? The last quoted passage testifies to the method of deriving the first dyad. The One acting on the indefinite dyadic inequality of the great and the small equalises its two moments or polarities of indeterminacy, and thus the first definite dyad (of two monads) is produced. In effect, we have to construe the first dyad (= the ideal twoness) as a structure in the ratio 1:1. *Such structural patterns are the (ideal) numbers. And so they are dyad, triad etc., rather than two, three etc.* For we can consistently project this mode of derivation to the following numbers as well. Thus the triad consists in a pattern 1:2 (or 1:1:1); the tetrad in the structure 1:3 (or 1:1:1:1 or 2:2); and so on. It is in this way that we can appreciate the weight Plato laid on the question of whether we numerate one, two, three etc. *by addition* or by (sort of) *division*. (I draw for this reconstruction on the long development M7-M8, 1083a20, which, as I have argued above, is a sustained critique of the Platonic position). The crucial passage runs thus; 1082b28-37: *διὸ καὶ τὸ ἀριθμεῖσαι οὕτως, ἓν δύο, μὴ προσλαμβανομένου πρὸς τῷ ὑπάρχοντι ἀναγκαῖον αὐτοῖς* (i.e. those criticised, i.e. Plato) *λέγειν (οὔτε γὰρ ἡ γένεσις ἔσται ἐκ τῆς ἀορίστου δυάδος, οὔτ' ἰδέαν ἐνδέχεται εἶναι* [if, that is, we enumerate by the addition of a monad]·*ἐνυπάρξει γὰρ ἑτέρα ἰδέα ἐν ἑτέρᾳ, καὶ πάντα τὰ εἴδη ἑνὸς μέρη). διὸ πρὸς μὲν τὴν ὑπόθεσιν ὀρθῶς λέγουσιν, ὅλως δ' οὐκ ὀρθῶς· πολλὰ γὰρ ἀναιροῦσιν. ἐπεὶ τοῦτό γ' αὐτὸ ἔχειν τινὰ φήσουσιν ἀπορίαν, πότερον, ὅταν ἀριθμῶμεν καὶ εἴπωμεν ἓν δύο τρία, προσλαμβάνοντες ἀριθμοῦμεν ἢ κατὰ μερίδας; ποιοῦμεν δὲ ἀμφοτέρως· διὸ γελοῖον ταύτην εἰς τηλικαύτην τῆς οὐσίας ἀνάγειν διαφοράν.* Aristotle claims that the weight laid by Plato on the different modes of enumeration is misplaced and cannot account for such enormous difference in being – this difference constituting the difference between two ontologically separate realms of number, eidetic and mathematical. What Aristotle means by numbering through the "taking in of something else by the side of what already exists" (i.e. through *addition*) is rendered evident by 1081b10-20: *φανερὸν δὲ καὶ ὅτι οὐκ ἐνδέχεται, εἰ ἀσύμβλητοι πᾶσαι αἱ μονάδες, δυάδα εἶναι αὐτὴν* (sc. *αὐτοδυάδα* = eidetic twoness) *καὶ τριάδα* (sc. *αὐτὴν*) *καὶ οὕτω* (sc. eidetically) *τοὺς ἄλλους ἀριθμούς· ἄν τε γὰρ ὦσιν ἀδιάφοροι αἱ μονάδες* (in which case we have the properly mathematical number, v. 1081a5-7) *ἄν τε διαφέρουσαι ἑκάστη ἑκάστης, ἀνάγκη ἀριθμεῖσθαι τὸν ἀριθμὸν κατὰ πρόσθεσιν, οἷον τὴν δυάδα πρὸς τῷ ἑνὶ ἄλλου ἑνὸς προστεθέντος, καὶ τὴν τριάδα ἄλλου ἑνὸς πρὸς τοῖς δυσὶ προστεθέντος, καὶ τὴν τετράδα ὡσαύτως· τούτων δὲ ὄντων ἀδύνατον τὴν γένεσιν εἶναι τῶν ἀριθμῶν ὡς γεννῶσιν* (sc. Plato) *ἐκ τῆς δυάδος καὶ τοῦ ἑνός. μόριον γὰρ γίγνεται ἡ δυὰς τῆς τριάδος καὶ αὕτη τῆς τετράδος, τὸν αὐτὸν δὲ τρόπον συμβαίνει καὶ ἐπὶ τῶν ἐχομένων* (whereas for Plato ideal numbers relate to each other but are not part the one of the others). To the way of addition, there is contrasted the way of division (*κατὰ μερίδας*), in the sense which I explained above: *ideal numbers are structures of quantificational relations, structures of* *ratios*. (This further explains the Pythagorean preoccupation with the analysis of numbers into relations of their parts).

Moreover, Aristotle clearly enough ascribes the derivation of the natural number-series *by addition* of monads, to *mathematical number*, while distinguishing from it the process of generation of ideal numbers. M, 1080a 30-35: *διὸ καὶ ὁ μὲν μαθηματικὸς ἀριθμεῖται μετὰ τὸ ἓν δύο*, πρὸς τῷ ἔμπροσθεν ἑνὶ ἄλλο ἕν, *καὶ τὰ τρία πρὸς τοῖς δυσὶ τούτοις ἄλλο ἕν, καὶ ὁ λοιπὸς δὲ ὡσαύτως· οὗτος δὲ*(sc. eidetic number) μετὰ τὸ ἓν δύο ἕτερα ἄνευ τοῦ ἑνὸς τοῦ πρώτου, καὶ ἡ τριὰς ἄνευ τῆς δυάδος, ὁμοίως δὲ καὶ ὁ ἄλλος ἀριθμός. The Aristotelian formulation in the second part of the passage suffers (cf. *infra*) from his conceptual approach which insists on imputing monadological considerations on the realm of ideal number (obviously for purposes of criticism). But nonetheless, the point is strongly made.

The basic structure of the ideal number n is that of 1 : (n-1). The indefinite dyad of inequality according to the greater and the smaller is determined so that it becomes a definite complex dyad of two parts standing in the definite relation of 1 to n-1. The greater part consists in its turn in the relationship obtaining between two parts standing in the ratio of 1 to n-2. And so on. A reduction sets in, which leads us to the definite *simple* dyad, the first, i.e. the ideal, dyad.

The generation of the ideal numbers comes about, according to this reconstruction, by a *repeated* application of the One to the Indefinite Dyad or Inequality. The indefiniteness of the Great(er) and Small(er) is determined by the One *firstly* in the ration 1:1, *secondly* in the ratio 1:2, *thirdly* in the ratio 1:3, etc. Thus, correspondingly, the Dyad, the Triad, the Tetrad etc. are produced. Notice that the *first* application generates *Twoness*; the *second* application generates *Threeness*, and so on. *That is, the ordinal of the determination has already been produced as a cardinal in the previous step*. And, in the beginning of the process, the ordinal "first" is based on the existence of the first principle, the One, taken as first cardinal. In general, *the cardinal n grounds the ordinal n-th (n^{th} conjugation of the two first principles), which in its turn generates the cardinal n+1*. Just as the terms of the defining ratios for a number involve the number that has been produced at the previous step. Aristotle seems to indicate just this feature in the Platonic generation of numbers when (in arguing for the incompatibility of a certain hypothesis on the nature of monads with Platonic doctrine) he observes that upon that hypothesis (1081a21-3) *οὐ γὰρ ἔσται ἡ δυὰς πρώτη ἐκ τοῦ ἑνὸς καὶ τῆς ἀορίστου δυάδος* (the two Platonic Principles), *ἔπειτα οἱ ἑξῆς ἀριθμοί, ὡς λέγεται δυάς, τριάς, τετράς*. In fact Aristotle goes on in that passage to draw important inferences as to what the serial nature of first number *cannot* be. It cannot consist in a sequence of monads; for the first such monad would be second after the original One (the first principle), then there would follow a second one being third after the primal one and so on; in which case the monads would precede the numbers to which they are appropriated, as for instance there would be a *third* monad before the number *three* (for the second monad in the number two would be the third one reckoning the original one in the count). 1081a29-35: *ἔτι ἐπειδὴ ἔστι πρῶτον μὲν αὐτὸ τὸ ἕν, ἔπειτα τῶν ἄλλων ἔστι τι πρῶτον ἓν δεύτερον δὲ μετ' ἐκεῖνο, καὶ πάλιν τρίτον τὸ δεύτερον μὲν μετὰ τὸ δεύτερον τρίτον δὲ μετὰ τὸ πρῶτον ἕν, - ὥστε πρότεραι ἂν εἶεν αἱ μονάδες ἢ οἱ ἀριθμοὶ ἐξ ὧν λέγονται, οἷον ἐν τῇ δυάδι τρίτη μονὰς ἔσται πρὶν τὰ τρία εἶναι, καὶ ἐν τῇ τριάδι τετάρτη καὶ [ἡ] πέμπτη πρὶν τοὺς ἀριθμοὺς τούτους.* This is then how the generation of (eidetic) number should *not* proceed[7]. My reconstruction avoids just this monadic interpretation of *πρότερον* and *ὕστερον* in the ideal numerical sequence. In fact if we could speak of (improper) monads in the ideal numbers, these monads are generated *simultaneously* (insequentially) within the corresponding eidetic number: for instance, the two monads of the dyad are produced simultaneously with the dyad. 1081a23-4: *ἅμα γὰρ αἱ ἐν τῇ δυάδι τῇ πρώτῃ* (i.e. the ideal dyad, *πρῶτος* for ontological priority) *μονάδες γεννῶνται, εἴτε ὥσπερ ὁ πρῶτος εἰπὼν* (sc. Plato) *ἐξ ἀνίσων (ἰσασθέντων γὰρ ἐγένοντο) εἴτε ἄλλως.*

The *serialization* of the determinations resulting in the sequence of natural numbers preserves the same principles and the same directly involved elements for each and every (ideal) number: namely the One and the Indefinite Dyad. It also sustains the essential and most abstract character of the natural number sequence: that is, precisely, its being the archetypal *sequence*, the very nature of seriality. Thus the ideal number is the one which is constituted by the *πρότερον/ὕστερον* relationship in its abstract self; M, 1080b11-2: *οἱ μὲν οὖν ἀμφοτέρους φασὶν εἶναι τοὺς ἀριθμούς* (hence *Plato*), τὸν μὲν ἔχοντα τὸ πρότερον καὶ ὕστερον τὰς ἰδέας, τὸν δὲ μαθηματικὸν etc. And M, 1080a15-8: *ἀνάγκη δ', εἴπερ ἐστὶν ὁ ἀριθμὸς φύσις τις* καὶ μὴ ἄλλη τίς ἐστιν αὐτοῦ ἡ οὐσία ἀλλὰ τοῦτ' αὐτό, ὥσπερ φασί τινες (Plato preeminently), ἤτοι εἶναι τὸ μὲν πρῶτόν τι αὐτοῦ τὸ δ' ἐχόμενον, ἕτερον ὂν τῷ εἴδει ἕκαστον etc. The (ideal) essence of number consists in exactly its being ordered in an absolute sequence, in its being essentially and constitutively structured according to the *πρότερον/ὕστερον* relationship; and in fact in such a way thus ordered and structured that the terms of the series are completely different, even *in kind*, one from another, being identified and defined *solely by their position in the series* – in contradistinction from the monadic, mathematical number, which represents aggregates of monads with *derived* seriality. For what could it mean that sets of indiscriminate monads are preceding or following in an absolute sequence, unless by reference to number defined in its essence by such seriality? Nothing can be clearer for what is at stake than Aristotle's statement in M, 1080a30-35: *διὸ καὶ ὁ μὲν μαθηματικὸς* (sc. *ἀριθμός*) *ἀριθμεῖται μετὰ τὸ ἓν δύο, πρὸς τῷ ἔμπροσθεν ἑνὶ ἄλλο ἕν, καὶ τὰ τρία πρὸς τοῖς δυσὶ τούτοις ἄλλο ἕν, καὶ ὁ λοιπὸς δὲ ὡσαύτως· οὗτος δὲ* (sc. the ideal number) *μετὰ τὸ ἓν δύο ἕτερα ἄνευ τοῦ ἑνὸς τοῦ πρώτου, καὶ ἡ τριὰς ἄνευ τῆς δυάδος, ὁμοίως δὲ καὶ ὁ ἄλλος ἀριθμός*. And so repeatedly Aristotle emphasises that, if there is to be a derivation of number from the two Platonic principles, two must come immediately after the one, without first having to generate another one by the side of the original one, and so forth in the sequel. Cf. e.g. M, 1081b30-1: *καὶ ἀδύνατον εἶναι πρώτην δυάδα, εἶτ' αὐτὴν τριάδα, ἀνάγκη δ', ἐπείπερ ἔσται τὸ ἓν καὶ ἡ ἀόριστος δυὰς* στοιχεῖα. *Not the monads, but the principles themselves, the One and the Indefinite Dyad, are the (direct) elements of each and every (ideal) number.*

Sequential order is the essence and substance of first, ideal number. *Ordinality is the constitutive nature of cardinality, grounded however in the twin First Principles* – the *first* being the *One*, the *second* being the (indefinite) *Dyad*.

The sequence of determinations yielding the (ideal) numbers is not a temporal one: time has not yet been introduced in the World-schema. It is a logical sequence of succeeding steps in the determination-process. It relates however fittingly to the Pythagorean model of cosmogony (of world creation) as successive limitations of limitlessness. To emphasise the (onto)logical nature of that sequence of steps, we may introduce the notion of modularity. The first application of the One to the Indefinite Dyad gives the (Definite) Dyad. This is the aboriginal determination – and we may call it *modulo 1*. The second step results in the constitution of the Triad, and this is a determination involving the *same* principles but being *modulo 2*. And so on. In general, *the determination of the Indefinite Principle by the One modulo (n-1), gives the (ideal) n-ad as a structure of 1 to (n-1).*

There is a helpful, intuitive sense illustrating this reconstruction. Construing infinity (i.e. indeterminacy) as a polar field of two opposite indeterminate determinables – *in abstracto*, for indefiniteness in general, a polar field of the Great and the Small – makes every determination within the field interpretable as a definite "mixture" of the two ("ideal") polar opposites[8]. For example in the definite Dyad, the Great and the Small enter in equality. In the Triad they enter in (so to speak) one part of the Small and two parts of the Great – resulting in three equal parts, and so on. At each successive application of this determination, the smaller part becomes smaller and smaller, whereas the greater becomes greater and greater. We may put the point in still another affiliated way by saying that the (ideal) numbers consist in a certain relation of parts determined by the appropriate ratio in the mixture of the indefinite elements. This would tend also to explain the fascination of ancient mathematics with the analysis of relations between quantities in terms of ratios of the form 1/n, with an increasing n, e.g. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ etc.

The reconstruction which I propose regarding the nature of the Other Platonic Principle, and the mechanism of the generation of (ideal) numbers, entails the thesis that the two first Principles are *directly* involved in the production and constitution of the (ideal) numbers. This appears to be the specific import of the Aristotelian statement in A, 987b20-2: *ὡς μὲν οὖν ὕλην τὸ μέγα καὶ τὸ μικρὸν* *εἶναι ἀρχάς, ὡς δ' οὐσίαν τὸ ἕν·* ἐξ ἐκείνων γὰρ (sc. from the Great and the Small) κατὰ μέθεξιν τοῦ ἑνὸς τὰ εἴδη εἶναι τοὺς ἀριθμούς (no need to delete *τοὺς ἀριθμοὺς* with Christ and Jaeger, or *τὰ εἴδη* with Gillespie and Ross). And more explicitly in 988a8-13: *φανερὸν δ' ἐκ τῶν εἰρημένων ὅτι δυοῖν αἰτίαιν μόνον κέχρηται* (sc. Plato),*τῇ τε τοῦ τί ἐστι καὶ τῇ κατὰ τὴν ὕλην (τὰ γὰρ εἴδη τοῦ τί ἐστιν αἴτια τοῖς ἄλλοις,* τοῖς δ' εἴδεσι τὸ ἕν *), καὶ τίς ἡ ὕλη ἡ ὑποκειμένη καθ' ἧς τὰ εἴδη μὲν ἐπὶ τῶν αἰσθητῶν* τὸ δ' ἓν ἐν τοῖς εἴδεσι λέγεται, ὅτι αὕτη δυάς ἐστι, τὸ μέγα καὶ τὸ μικρὸν, etc. And v. M, 1081a14-6: *ὁ γὰρ ἀριθμός ἐστιν ἐκ τοῦ ἑνὸς καὶ τῆς δυάδος τῆς ἀορίστου, καὶ* (the Jaegerian *‹αὗται›* here is erroneous) *αἱ ἀρχαὶ καὶ τὰ στοιχεῖα λέγονται τοῦ ἀριθμοῦ εἶναι,* etc.

It follows that the sense of the vexed passage 987b33 – 988a7 (sandwiched between the two above mentioned passages), has to be understood in conformity with *their* meaning. It runs thus: ...*τὸ δὲ δυάδα ποιῆσαι* (sc. Plato) *τὴν ἑτέραν φύσιν διὰ* τὸ τοὺς ἀριθμοὺς ἔξω τῶν πρώτων *εὐφυῶς ἐξ αὐτῆς γεννᾶσθαι ὥσπερ ἔκ τινος ἐκμαγείου. καίτοι συμβαίνει γ' ἐναντίως· οὐ γὰρ εὔλογον οὕτως. οἱ μὲν γὰρ ἐκ τῆς ὕλης πολλὰ ποιοῦσιν,* τὸ δ' εἶδος ἅπαξ γεννᾷ μόνον, *φαίνεται δ' ἐκ μιᾶς ὕλης μία τράπεζα, ὁ δὲ τὸ εἶδος ἐπιφέρων εἷς ὢν πολλὰς ποιεῖ. ὁμοίως δ' ἔχει καὶ τὸ ἄρρεν πρὸς τὸ θῆλυ· τὸ μὲν γὰρ ὑπὸ μιᾶς πληροῦται ὀχείας, τὸ δ' ἄρρεν πολλὰ πληροῖ· καίτοι ταῦτα* μιμήματα (the Pythagorean – Platonic view according to Aristotle) *τῶν ἀρχῶν ἐκείνων ἐστίν*. Obviously, the Aristotelian criticism is addressed to a view (repeatedly referred to by Aristotle) according to which (a series of) numbers are generated by the duplication of already constituted numbers. The mechanism consists in the action of an already constructed number, say n, on the Indefinite Dyad, resulting in the production of 2n: the Indefinite Dyad is essentially a *δυοποιός* factor (*τοῦ γὰρ ληφθέντος ἦν δυοποιός* as Aristotle explains M, 1082a14-5); and in this way, more generally, *ποσοποιός, a quantifying factor* (1083a13-4: *ἡ δὲ* [sc. the Other Principle] *ποσοποιόν· τοῦ γὰρ πολλὰ τὰ ὄντα εἶναι αἰτία αὕτη ἡ φύσις*). Aristotle here criticises this *constructionist* conception on the ground that it runs counter to the observable instances of the implied general rule. This rule (in Aristotelian terminology) would be that the material principle (the

Indefinite Dyad) is the same in the various products (numbers), the difference in the formal principle (τὸ εἶδος, the "preexisting" number) accounting for the difference in the products (subsequent numbers). Experience, in artifacts and natural procreation, teaches the contrary: that it is the material principle that explains the difference in the product or offspring.

This mechanism of number-production does not satisfy the condition that both the "formal" and the "material" principles are the same for all (and not for *some*, as in the underlying account) eidetic numbers. Thus such mechanism cannot pertain to the derivation of the eidetic numbers. Which Aristotle renders evident by qualifying the kind of number so generable by the phrase ἔξω τῶν πρώτων. Πρῶτος ἀριθμός in this connection (as standardly in such contexts) is the ideal number. Platonism is defined by the view that the first in a series of same-similar entities is the archetype of them all (in the way that the Polycleitean κιονόκρανον in Epidaurus was the exemplary master-work, according to which the other ones were fashioned). Besides, for the common interpretation, ἔξω τῶν πρώτων is inaccurate: we need ἔξω τῶν περιττῶν (as Ross emphasised) – at least[9].

We are left therefore with an Aristotelian speculation in this matter, not with a report. Aristotle diagnoses that the adoption of the (Indefinite) Dyad by Plato as the Second Principle (in place, and as an analysis, of the "amorphous" Pythagorean Infinity) was prompted by the fact that the dyad is an appropriate matrix (ἐκμαγεῖον) by reason of its duplicatory function in the realm of *mathematical number*: the one, raised to its power (δύναμις), is still 1 (1x1 = 1); two is the first number whose power generates something different from itself – it has the power to augment.

Now it is true that the question regarding the generation of the ideal numbers is complicated in M, N with arguments which appear to essentially presuppose throughout the duplicational function of the (indefinite) dyad, as this is manifested in the realm of the mathematical number. But such arguments stem from Aristotle's main strategy in his criticism of Academic positions in this area, which strategy centrally involves the issue of the *monads* and their mutual compatibility or otherwise. Number, of whatever complexion, for Aristotle is essentially monadic[10]. *On my reconstruction of the*

Platonic theory on the other hand, there can be simply no question of proper monads on the level of eidetic number[11]. Monads, dyads, triads etc. in plurality exist on the level of mathematical number. In ideal number there is the One, the Dyad, the Triad etc. alone. We can there only speak of the *δυὰς αὐτή*, or *πρώτη δυάς* etc. M, 1081b8-10: *οἱ δὲ* (sc. Plato) *ποιοῦσι μονάδα μὲν καὶ ἓν πρῶτον, δεύτερον δὲ καὶ τρίτον οὐκέτι, καὶ δυάδα πρώτην, δευτέραν δὲ καὶ τρίτην οὐκέτι.* Which passage also clarifies that for Plato the ideal monad is identical with the One as principle and element of being. As element, it may be said to be "*in*" the (ideal) numbers. And in this special sense, we may conceive of ideal number as monadic as well. But there obviously exists an ontological and categorial difference between the monadicity of the ideal number and that of the mathematical one. Ideal numbers are strictly speaking not monadic: they are *ἀσύμβλητοι* one to another. In criticising the Speusippean theory, Aristotle argues (*Metaphysica,* M, 1083a20-35) against the view that points the One as first principle and then has, on the level of the mathematical number, many *ones* (*τὰ ἕνα* – a Speusippean expression), and many dyads, and many triads etc., but no *πρώτη δυάς* (or *αὐτὴ δυάς*, i.e. ideal dyad) etc. If so, he maintains, neither can a *πρῶτον ἕν* exist as principle. And he concludes (1083a31-5): *εἰ δέ ἐστι τὸ ἓν ἀρχή, ἀνάγκη μᾶλλον ὥσπερ* Π λ ά τ ω ν *ἔλεγεν τὰ περὶ τοὺς ἀριθμούς, καὶ εἶναι δυάδα πρώτην καὶ τριάδα,* κ α ὶ ο ὐ σ υ μ β λ η τ ο ὺ ς ε ἶ ν α ι τ ο ὺ ς ἀ ρ ι θ μ ο ὺ ς π ρ ὸ ς ἀ λ λ ή λ ο υ ς. Ideal numbers themselves are incommensurable to each other – not their "monads". *In fact, the doctrine of ἀσύμβλητοι* μ ο ν ά δ ε ς *is ascribed by Aristotle to Xenocrates.* It is the idea that the monads of the two are different from the monads of the three etc. The view is very typical of Xenocrates, in that it makes of a mathematical concept an unmathematical use. In this sence it is on a par with positing indivisible lines, another Xenocratean artifact. And these features are explicitly combined by Aristotle, 1080b28-30: *οἱ δὲ τὰ μαθηματικά* (sc. *λέγουσι*), *οὐ μαθηματικῶς δέ· οὐ γὰρ τέμνεσθαι οὔτε μέγεθος πᾶν εἰς μεγέθη,* ο ὔ θ ' ὁ π ο ι α σ ο ῦ ν μ ο ν ά δ α ς δ υ ά δ α ε ἶ ν α ι (not any two monads form a dyad). Clearly this is the *χείριστος τρόπος* (1083b2) of theorizing about numbers. It follows that Aristotle, by insisting on the monadicity of "all" number, as a conceptual prerequisite of his Platonic criticism, clarifies at most the drive stemming from Platonic theory that led to the Xenocratean "Platonism". Plato would have nothing of this.

The Platonic generation of numbers is not a generation of monads, which *then* are collected into groups of two, three etc. It is a generation from the two principles of the sequence Dyad, Triad etc. M, 1081a21-3: *οὐ γὰρ ἔσται* (sc. if monads are totally incombinable, *ἀσύμβλητοι*) ἡ δυὰς πρώτη ἐκ τοῦ ἑνὸς καὶ τῆς ἀορίστου δυάδος, ἔπειτα οἱ ἑξῆς ἀριθμοί, ὡς λέγεται δυάς, τριάς, τετράς. V. 1081b30-2: *καὶ ἀδύνατον εἶναι* (according to views characterised by a monadic constitution of number) *πρώτην δυάδα,* εἶτ' *αὐτὴν τριάδα. ἀνάγκη* δ', ἐπείπερ ἔσται τὸ ἓν καὶ ἡ ἀόριστος δυὰς στοιχεῖα. And so in 1084b36 – 1085a1: Plato denied that the monads in the Dyad are prior ontologically to the Dyad itself. On the contrary he held that the first derivation from the One and the Indefinite Dyad is precisely the (definite) Dyad:... *ὥστε προτέρα ἂν εἴη ἑκατέρα ἡ μονὰς τῆς δυάδος.* οὔ φασι δέ· γεννῶσι γοῦν τὴν δυάδα πρῶτον. This, then, is the Platonic account. Not the monads are elements of ideal number, but the two first principles, which directly constitute each ideal number through an appropriate determination of the Indefinite Dyad by the One. As Aristotle definitively put it (1081b6-8): *ἅμα δ' ἀμφότερα λέγειν, μονάδα τε μετὰ τὸ ἓν πρώτην εἶναι καὶ δευτέραν, καὶ δυάδα πρώτην, ἀδύνατον.* To which Aristotle adds the above quoted statement, b8-10: *οἱ δὲ* [sc. Plato] *ποιοῦσι μονάδα μὲν καὶ ἓν πρῶτον, δεύτερον δὲ καὶ τρίτον οὐκέτι, καὶ δυάδα πρώτην, δευτέραν δὲ καὶ τρίτην οὐκέτι.* If there immediately follows upon the principles a series of monads, the generation of the eidetic numbers (*δυὰς πρώτη* etc.) directly from the principles is rendered impossible – we should say otiose, as with Speusippus. More generally, a derivation of eidetic numbers which will make monads or preceding numbers to enter indiscriminately in the constitution of the succeeding ones is inadmissible; 1081b17-20: *τούτων δὲ ὄντων* (generation of number *by addition*) *ἀδύνατον τὴν γένεσιν εἶναι τῶν ἀριθμῶν ὡς γεννῶσιν* (sc. Plato) *ἐκ τῆς δυάδος καὶ τοῦ ἑνός· μόριον γὰρ γίγνεται ἡ δυὰς τῆς τριάδος καὶ αὕτη τῆς τετράδος, τὸν αὐτὸν δὲ τρόπον συμβαίνει καὶ ἐπὶ τῶν ἐχομένων.*

There are, however, insistent passages where Aristotle seems to countenance in so many words a derivational process which crucially involves the generation of even numbers (and more strictly of the powers of two) by the operation of the *definite* dyad on the indefinite one, then of the tetrad on the indefinite dyad, etc. i.e. by the duplicational constructionist program[12]. One such passage occurs in A, and I have disposed of that above. But another occurs in the immediate sequel to that where the clarification above obtained occurs. M, 1081b21 sqq.: *ἀλλ᾿ ἐκ τῆς δυάδος τῆς πρώτης καὶ τῆς ἀορίστου δυάδος ἐγίγνετο ἡ τετράς,* δύο δυάδες παρ᾿ αὐτὴν τὴν δυάδα· *εἰ δὲ μή, μόριον ἔσται* (sc. *τῆς τετράδος*) *αὐτὴ ἡ δυὰς, ἑτέρα δὲ προσέσται μία δυάς. καὶ ἡ δυὰς ἔσται ἐκ τοῦ ἑνὸς αὐτοῦ καὶ ἄλλου ἑνός· εἰ δὲ τοῦτο, οὐχ οἷόν τ᾿ εἶναι τὸ ἕτερον στοιχεῖον δυάδα ἀόριστον· μονάδα γὰρ μίαν γεννᾷ ἀλλ᾿ οὐ δυάδα ὡρισμένην.* If both the two dyads of the tetrad were not different from the eidetic dyad, then we would need just another dyad by the side of the eidetic one in order to produce the tetrad. By the same token, we would need another monad, by the side of the One, in order to have the eidetic dyad. But then the Other Principle could not have been the Indefinite Dyad, but rather an *Indefinite Monad*, so to speak (cf. the formulas *ἓν ἑνὶ ἐναντίον, ἐξ ἄλλου ἑνός τινος*): for it would help generate (another) definite monad[13]. Now this leaves us with the initial statement of the current passage, namely that the dyads of the tetrad are different from the Dyad itself. But Aristotle betrays himself. He has argued repeatedly that the derivation of eidetic number cannot come about by a process of addition of monads or of preceding numbers, for this would entail precisely the incorporation of previously produced numbers in the constitution of the following ones, with the impossibilities regarding the Platonic first Principles that such constructionist processes and constitutions would entail. Here, however, he observes that the novel supposition as well leads to impossibilities. The two monads in the Dyad are distinct from the One; the two dyads in the Tetrad are distinct from the Dyad; etc. But then how on the level of eidetic number could we have multiplicity of ideal numbers, multiplicity of identical exemplars or instances of the exemplar existing on the very ground of paradeigmaticity, i.e. of the exclusion of instancing? 1081b27 sqq.: ἔτι παρ᾿ αὐτὴν τὴν τριάδα καὶ αὐτὴν τὴν δυάδα πῶς ἔσονται ἄλλαι τριάδες καὶ δυάδες; καὶ τίνα τρόπον ἐκ προτέρων μονάδων καὶ ὑστέρων σύγκειν ται; *πάντα γὰρ ταῦτ' ‹ἄτοπά› ἐστι καὶ πλασματώδη, καὶ ἀδύνατον εἶναι πρώτην δυάδα, εἶτ' αὐτὴν τριάδα. ἀνάγκη δ', ἐπείπερ ἔσται τὸ ἓν καὶ ἡ ἀόριστος δυὰς στοιχεῖα.* We need a mode of derivation that will create directly from the first principles the sequence of the natural numbers as ideal, unique exemplars. No possibility of idea and (of its) instances exists on the eidetic order of number. What Aristotle does with his criticism of Academic, and esp. Platonic, positions by concentrating on the question of the nature of the monads that have, according to him, to be involved, is itself rather *πλασματῶδες*, as he defines it: *λέγω δὲ πλασματῶδες τὸ πρὸς ὑπόθεσιν βεβιασμένον*, 1082b3-4.

It is improper therefore to speak of many dyads, triads etc. in the case of the *πρῶτος ἀριθμός*, of eidetic number. The view, thus, that the tetrad comes from the application of the definite dyad on the indefinite dyad cannot be Platonic – despite the fact that Aristotle countenances the ascription by referring to that view in connection with his examination of Plato's doctrines in A and in the long passage of M above identified. Cf. also there, 1082a11-5: *ἀλλὰ μὴν καὶ ἀνάγκη γε μὴ ἐκ τῶν τυχουσῶν δυάδων τὴν τετράδα συγκεῖσθαι· ἡ γὰρ ἀόριστος δυάς, ὥς φασι, λαβοῦσα τὴν ὡρισμένην δυάδα δύο δυάδας ἐποίησεν· τοῦ γὰρ ληφθέντος ἦν δυοποιός.* Plato cannot belong to those who say so (*ὥς φασι*), (despite the fact that this passage occurs within the large section where a sustained critique of Platonic doctrine is undertaken) for the reasons above explained, and also for reasons having to do with the generation of geometrical magnitudes (to be mentioned *infra*). The view in principle fits in with some Xenocratean conception, which will tend to coalesce (and confuse) eidetic and mathematical number.

On the other hand, there must be a sense in which oneness enters into duality, oneness and duality into triplicity etc. Oneness enters into each ideal number, since this latter consists in a relationship in the ratio of 1 to this – minus – one. And all preceding numbers enter into each (ideal) number, under multiple relationships forming its overall structure. But all this does not make many ones or many twos etc. Repeated applications ("conjugations") of the One on the Indefinite Dyad structure the latter's indeterminacy by imposing more and more complex order on it. The process of determinations is a process of articulation of being, and this is the sense in which being is derived from the first principles. To conclude from this structuring development to the multiplicities involved in mathematical number, is to commit (from the Platonic perspective) the Xenocratean fallacy. And Aristotle, while being keen in condemning Xenocratean positions as the worst *τρόπος* of metaphysical construal of reality, he utilises Xenocratean tendencies in criticising Platonic doctrine.

But before moving to the subsequent ontological steps in the creation of reality, let us see what a mathematical approach to the construction of numbers would lead us to. In a passage criticising Platonic theory (N, 1090b32-1091a12; v. at the beginning of the passage: *οἱ δὲ πρῶτοι δύο τοὺς ἀριθμοὺς ποιήσαντες*, i.e. the eidetic and the mathematical number, hence Plato), Aristotle comments that the second principle (the Dyad of the Great and the Small) cannot be taken to generate but the powers of 2. As he colourfully puts it (1091a9-12): *φαίνεται δὲ καὶ αὐτὰ τὰ στοιχεῖα τὸ μέγα καὶ τὸ μικρὸν βοᾶν ὡς ἑλκόμενα (!)·* οὐ δύναται γὰρ οὐδαμῶς γεννῆσαι τὸν ἀριθμὸν ἀλλ' ἢ τὸν ἀφ' ἑνὸς διπλασιαζόμενον, i.e. 2, 4, 8, 16 etc. What then of the other numbers? We are fortunately told about this in a significant passage, found in a section of general criticism of Academic positions (M, 1083b23-1086a21; that is to the end of M, according to the way some divided M and N). The passage runs thus (1084a3-7): *ἡ δὲ γένεσις τῶν ἀριθμῶν ἢ περιττοῦ ἀριθμοῦ ἢ ἀρτίου ἀεί ἐστιν· ὡδὶ μὲν τοῦ ἑνὸς εἰς τὸν ἄρτιον πίπτοντος περιττός* (a), *ὡδὶ δὲ τῆς μὲν δυάδος ἐμπιπτούσης ὁ ἀφ' ἑνὸς διπλασιαζόμενος* (b), *ὡδὶ δὲ τῶν περιττῶν ὁ ἄλλος ἄρτιος* (c). (b) refers to the above mentioned process of duplication, starting with 1, which yields 2 and the powers of 2. (c) presupposes the existence of the odd numbers, in which case by duplication again the other even numbers (*ἄλλος ἄρτιος*), beyond the powers of 2, are generated. (a) explains the generation of the odd numbers: the one "falls upon" (in a certain sense) an already produced even number and thus the appropriate odd number (greater by one from the even number involved) is constituted. Just before, Aristotle mentions the view that the One is "in the middle" of the odd number; 1083b29-30: *ἀλλὰ διὰ τοῦτο ἴσως αὐτὸ τὸ ἓν ποιοῦσιν ἐν τῷ περιττῷ μέσον*[14].

Now this constructionist schema enables us trivially to generate the "set" of natural numbers, *but cannot be the Platonic process of derivation for the ideal numbers.* 1) It assumes two different operations: one additive (the one combining to an even number); the other multiplicative (duplication). 2) The one cannot enter additively into the constitution of the number; this could only be envisaged for the Speusippean τὰ ἕνα. (The one is a factor in the constitution of number as principle and element, not as identifiable repeatable part). Cf. M, 1084a36-7: *διὸ τὸ ἓν τὸ περιττόν· εἰ γὰρ ἐν τῇ τριάδι, πῶς ἡ πεντὰς περιττόν;* 3) *Crucially*, it does not yield the natural series, 2, 3, 4 etc. *in that sequence.* For once 2 is constituted, duplication can proceed irrespective of what happens with the odd numbers. *Does, therefore, 4 or 3 come after 2?* (The schema looks like being rather akin to Speusippean views, with their supposedly manifest incogruousness, or rather incoherence, in the structuring of reality). No constructionist model for the series of the natural numbers can be valid unless it explains their *essential* sequence. For this sequence is constitutive of their nature, at least in the "prime" numbers, *τοὺς πρώτους*, i.e. ideal, numbers.

A possible source for the relative uncertainty in Aristotle's references regarding the Platonic theory of the derivation of numbers may be found in the observation of a big lacuna in Plato's system, which has to do with the absence of an adequate account of the generation of the *mathematical* number. This may explain some confusion in the attempts on the part of Platonists to analyse the generation of the sequence of natural numbers. But I would not overplay this card, although Aristotle is emphatic about the omission. N, 1090b32-1091a5: *οἱ δὲ πρῶτοι δύο τοὺς ἀριθμοὺς ποιήσαντες, τόν τε τῶν εἰδῶν καὶ τὸν μαθηματικόν* (hence certainly Plato), οὔτ' εἰρήκασιν οὐδαμῶς οὔτ' ἔχοιεν ἂν εἰπεῖν πῶς καὶ ἐκ τίνος ἔσται ὁ μαθηματικός. *ποιοῦσι γὰρ αὐτὸν μεταξὺ τοῦ εἰδητικοῦ καὶ τοῦ αἰσθητοῦ.* εἰ μὲν γὰρ ἐκ τοῦ μεγάλου καὶ τοῦ μικροῦ, ὁ αὐτὸς ἐκείνῳ ἔσται τῷ τῶν ἰδεῶν (ἐξ ἄλλου δέ τινος μικροῦ καὶ μεγάλου τὰ γὰρ μεγέθη ποιεῖ [no need for any change]*). εἰ δ' ἕτερόν τι ἐρεῖ, πλείω τὰ στοιχεῖα ἐρεῖ. καὶ εἰ ἓν τι ἑκατέρου ἡ ἀρχή, κοινόν τι ἐπὶ τούτων ἔσται τὸ ἕν, ζητητέον τε πῶς καὶ ταῦτα πολλὰ τὸ ἓν καὶ τὸ ἅμα τὸν ἀριθμὸν γενέσθαι ἄλλως ἢ ἐξ ἑνὸς καὶ δυάδος ἀορί-*

στου ἀδύνατον κατ' ἐκεῖνον. The singular (*ποιεῖ, ἐρεῖ, κατ' ἐκεῖνον*) leaves no doubt as to the identity of the theory. (The often repeated formula "impossible for number to be generated otherwise than from the One and the Indefinite Dyad" must have been a kind of Platonic catchword). The difficulty to account for *both* the eidetic and the mathematical number from the first principles appears to be, according to Aristotle, behind the drive for a Xenocratean theory; 1086a5-11: *οἱ δὲ τὰ εἴδη βουλόμενοι ἅμα καὶ ἀριθμοὺς ποιεῖν,* ο ὐ χ ὁ ρ ῶ ν τ ε ς δ έ, ε ἰ τ ὰ ς ἀ ρ χ ὰ ς τ ι ς τ α ύ τ α ς θ ή σ ε - τ α ι, π ῶ ς ἔ σ τ α ι ὁ μ α θ η μ α τ ι κ ὸ ς ἀ ρ ι θ μ ὸ ς π α ρ ὰ τ ὸ ν ε ἰ δ η τ ι κ ό ν, *τὸν αὐτὸν εἰδητικὸν καὶ μαθηματικὸν ἐποίησαν ἀριθμὸν τῷ λόγῳ, ἐπεὶ ἔργῳ γε ἀνῄρηται ὁ μαθηματικὸς (ἰδίας γὰρ καὶ οὐ μαθηματικὰς ὑποθέσεις λέγουσιν).*

It is not rhetorical that Aristotle maintains that Plato not only did not explain the generation of the mathematical number, but has not the theoretical framework in his system to explain it adequately. Nor is it in vain that Aristotle combines the question concerning the derivation of the mathematical number with that concerning the derivation of the geometricals, geometrical magnitudes. To appreciate the difficulty involved let it be assumed, as it should be according to the basic *ἔκθεσις* – doctrine, that the definite dyad is the "formal" cause of the multitude of existing dyads. But it is also normally taken by Platonists as the formal cause of one-dimensional spatial extension, of length. *Prima facie*, these two views seem to clash. Of course, there are other factors that would have to be taken into account, for instance the possibility of a difference in the "material", in the other principle. But the problem noticed by Aristotle helps us to articulate the appropriate answer – as so often.

IV

Concerning the derivation of magnitudes we possess two secure pillars, the one relating to their *"formal"*, the other to their *"material"* principle (in Aristotelian terminology).

1) A, 992a10-13: *βουλόμενοι δὲ τὰς οὐσίας ἀνάγειν εἰς τὰς ἀρχὰς μήκη μὲν τίθεμεν ἐκ βραχέος καὶ μακροῦ,* ἔ κ τ ι ν ο ς μ ι κ ρ ο ῦ κ α ὶ μ ε γ ά λ ο υ, *καὶ ἐπίπεδον ἐκ πλατέος καὶ στε-*

νοῦ, σῶμα δ' ἐκ βαθέος καὶ ταπεινοῦ. (The first person plural makes virtually certain that Plato is meant here: *Aristotle speaks as a Platonist, and could not speak as anything else from the Academy*). The crucial point is: ἔκ τινος *μικροῦ καὶ μεγάλου*. There are *kinds* of the Great and the Small, as Aristotle explains in a similar passage; M, 1085a7-14: *ὁμοίως δὲ καὶ περὶ τῶν ὕστερον γενῶν τοῦ ἀριθμοῦ* (i.e. about magnitudes) *συμβαίνει τὰ δυσχερῆ, γραμμῆς τε καὶ ἐπιπέδου καὶ σώματος. οἱ μὲν γὰρ* (sc. Plato) ἐκ τῶν εἰδῶν *τοῦ μεγάλου καὶ τοῦ μικροῦ ποιοῦσιν, οἷον ἐκ μακροῦ μὲν καὶ βραχέος τὰ μήκη, πλατέος δὲ καὶ στενοῦ τὰ ἐπίπεδα, ἐκ βαθέος δὲ καὶ ταπεινοῦ τοὺς ὄγκους·* ταῦτα δέ ἐστιν εἴδη τοῦ μεγάλου καὶ τοῦ μικροῦ. *Τὴν δὲ κατὰ τὸ ἓν ἀρχὴν ἄλλοι ἄλλως τιθέασι τῶν τοιούτων.* Cf. Alexander Aphrodisiensis, *in Metaph.* 117.23-118.1 (*Περὶ Φιλοσοφίας* Fr. 11b ed. Ross). And again, N, 1089b11-5: *καίτοι χρῶνται καὶ λέγουσι μέγα μικρόν, πολὺ ὀλίγον, ἐξ ὧν οἱ ἀριθμοί, μακρὸν βραχύ, ἐξ ὧν τὸ μῆκος, πλατὺ στενόν, ἐξ ὧν τὸ ἐπίπεδον, βαθὺ ταπεινόν, ἐξ ὧν οἱ ὄγκοι· καὶ ἔτι δὴ πλείω εἴδη λέγουσι τοῦ πρός τι· τούτοις δὴ τί αἴτιον τοῦ πολλὰ εἶναι;* We are precisely understanding what is the cause of their multiplicity. (Notice in particular here the distinction between *μέγα μικρόν* and *πολὺ ὀλίγον*. The former polarity is the Other First Principle – and that yields ideal number. From *πολὺ ὀλίγον* there comes *ἀριθμὸς* we are told. This must be mathematical number, then. In fact the phrazing suggests precisely as much: *μέγα μικρόν, πολὺ ὀλίγον, ἐξ ὧν οἱ ἀριθμοί*. I.e. the eidetic number from the former contrariety, the mathematical number from the latter one. But such view of a possible Platonist (which would try to accommodate the existence of mathematical number separate both from the ideal one and from the arithmetics of geometrical magnitudes), is not sustainable for Plato: there is nothing between the One and the definite Dyad to account for it as its formal principle – see *infra*. Some, however, substituted the *πολύ - ὀλίγον* contrariety for the Platonic one of the *μέγα - μικρόν*, sublating it to the position of the second ultimate principle; v. N, 1087b16-7, a passage quoted above in the beginning). This reference to kinds of Great and Small alerts us, more generally, to the fact of the existence of *definite* kinds of infinity, of indefiniteness. There is e.g. length and temperature – referring to the respective fields of specific indeterminacy; and all the various, but determined, fields of indeterminacy, i.e. of infinities, that are collected in *Philebus* under the head of the *ἄπειρον*, and with the mark of the susceptibility of more and less. "*Definite indeterminacies*" gives the clue to the conceptual articulation needed: *these must be already the outcome of a relative determination of the other principle*. The length as a certain kind of limitlessness susceptible of concrete limitation must be the product of a previous operation involving the second principle - *that of absolute indeterminacy*. This operation generates *a kind of indeterminacy*: one-dimensional extentionality. This, according to the general pattern, is polarised; and apt terms for this polarity are the short and long. Another relative determination of the Other Principle yields the two-dimensional extension; and apt terms for the polarity constituting this definite kind of indeterminacy are broad and narrow. And so on. The reason why these various specific indeterminacies are correlated resides in the relationship of their respective "formal" principles, as we shall see. And this renders otiose the criticism (of a "logical", not ontological, nature) which Aristotle applies to the Platonic doctrine in this respect (992b13-19: *οὐθένα δ' ἔχειν λόγον οὐδὲ τὰ μετὰ τοὺς ἀριθμοὺς μήκη τε καὶ ἐπίπεδα καὶ στερεά, οὔτε ὅπως ἔστιν ἢ ἔσται οὔτε τίνα ἔχει δύναμιν· ταῦτα γὰρ οὔτε εἴδη οἷόν τε εἶναι (οὐ γάρ εἰσιν ἀριθμοί) οὔτε τὰ μεταξὺ (μαθηματικὰ γὰρ ἐκεῖνα) οὔτε τὰ φθαρτά, ἀλλὰ πάλιν τέταρτον ἄλλο φαίνεται τοῦτό τι γένος)*. That there are different "formal" principles in such relative determinations of the Other Principle is alluded to by Aristotle's expression τὴν κατὰ τὸ ἕν ἀρχήν (1085a13): the principle *corresponding* to the first absolute principle. Aristotle also allows for some difference of opinion among Platonists as to what is the appropriate "formal" principle in each case in the process of the constitution of three-dimensional extension. In any case the theory expounded in the passage 1085a9-31 belongs to Plato. It is the same with the one found in the corresponding passage from A. Its author separated the One and the Numbers (a26-7). And what follows (1085a31-1085b34) refers to Speusippus; with a recapitulation involving all three Academic *τρόποι* presented in the sequel 1085b34-1086a21.

2) In order to produce the three spatial dimensions as extentional determinable indeterminacy we can draw from what has already been derived in the order of reality, besides the two ultimate and first

principles. By way of "material" principle we have only the Other First Principle, i.e. the Indefinite Dyad of the Inequality of the Great and the Small. On the other hand, we can turn to the constructed series of Ideal Numbers for "formal" principles. It is, however, natural to take the *dyad* as the "formal" principle for lines; for there are *two* terms that form the line-polarity, i.e. short and long, the one tending to the infinitely small, the other to the infinitely large in one-dimensional extentionality. (Other considerations are more germane to modern notions of linearity. Like that there are two sides and directions in each line. Also, that two points define a straight line; and two parameters define quantitatively a line: a reference point of origin and a unit of measurement. And two parameters that define a position on a line). Similarly, it is fitting to assume the *Triad* as the "formal" principle for surfaces; since there is the "movement", so to speak, of a line that generates a surface, and there can be more or less of such "movement", which is expressed by the polarity of broad and narrow. (Cf. *De anima* A, 409a3-4: *ἔτι δ᾽ ἐπεί φασι κινηθεῖσαν γραμμὴν ἐπίπεδον ποιεῖν* etc.). Not that this is alien to the polarity of long and short. *The sense is that the new polarity presupposes the former one, just as the structure constituting the triad involves the one constituting the dyad.* And so for the three-dimensional space. Which is what in effect Aristotle testifies, N, 1090b20-24: *τοῖς δὲ τὰς ἰδέας τιθεμένοις τοῦτο μὲν ἐκφεύγει - ποιοῦσι γὰρ τὰ μεγέθη ἐκ τῆς ὕλης καὶ ἀριθμοῦ, ἐκ μὲν τῆς δυάδος τὰ μήκη, ἐκ τριάδος δ᾽ ἴσως τὰ ἐπίπεδα, ἐκ δὲ τῆς τετράδος τὰ στερεά, ἢ καὶ ἐξ ἄλλων ἀριθμῶν· διαφέρει γὰρ οὐθέν.* (The reference is to Plato, as I have argued elsewhere)[15].

That the dyad is the "formal" principle of length and linearity is normal for a Platonist. So *De anima*, Γ, 429b18-20: *πάλιν δ᾽ ἐπὶ τῶν ἐν ἀφαιρέσει ὄντων τὸ εὐθὺ ὡς τὸ σιμόν· μετὰ συνεχοῦς γάρ· τὸ δὲ τί ἦν εἶναι, εἰ ἔστιν ἕτερον τὸ εὐθεῖ εἶναι καὶ τὸ εὐθύ, ἄλλο· ἔστω γὰρ δυάς.* The essence of linearity is the dyad; but the line is dyad-in-more-and-less, a composite nature with a "formal" and a "material" element or factor. The point recurs elsewhere, appropriately where Aristotle treats of the compound substance. Very clearly, H, 1043a29-36: *δεῖ δὲ μὴ ἀγνοεῖν ὅτι ἐνίοτε λανθάνει πότερον σημαίνει τὸ ὄνομα τὴν σύνθετον οὐσίαν ἢ τὴν ἐνέργειαν καὶ τὴν μορφήν, οἷον ἡ οἰκία πότερον σημεῖον τοῦ κοινοῦ ὅτι σκέπασμα ἐκ πλίνθων* *καὶ λίθων ὡδὶ κειμένων, ἢ τῆς ἐνεργείας καὶ τοῦ εἴδους ὅτι σκέπασμα, καὶ γραμμὴ πότερον δυὰς ἐν μήκει ἢ ὅ, τι δυάς, καὶ ζῷον πότερον ψυχὴ ἐν σώματι ἢ ψυχή· αὕτη γὰρ οὐσία καὶ ἐνέργεια σώματός τινος*. Again, and in the same context (how far does the definition of the essence of a thing involves an account of its material element), Z, 1036b12-17: *καὶ ἀνάγουσι πάντα εἰς τοὺς ἀριθμούς, καὶ γραμμῆς τὸν λόγον τὸν τῶν δύο εἶναί φασιν. καὶ τῶν τὰς ἰδέας λεγόντων οἱ μὲν αὐτογραμμὴν τὴν δυάδα, οἱ δὲ τὸ εἶδος τῆς γραμμῆς* (i.e. the dyad forming already the indefiniteness into one-dimensional extentionality)· *ἔνια μὲν γὰρ εἶναι ταὐτὰ τὸ εἶδος (οἷον δυάδα καὶ εἶδος δυάδος), ἐπὶ γραμμῆς δὲ οὐκέτι*. (Which alludes to the initially noticed difficulty: *if the dyad is the idea of all dualities, how can it also be the essence of linearity?*).

In *De anima* A, 404b18-21 we find the Platonic construction of the idea of animality, of the self-animal (for the time when Aristotle considered himself an Academician and hence, necessarily, a Platonist): *ὁμοίως δὲ καὶ ἐν τοῖς περὶ φιλοσοφίας λεγομένοις* (similarly to the relevant doctrine in *Timaeus*) *διωρίσθη, αὐτὸ μὲν τὸ ζῷον ἐξ αὐτῆς τὴν τοῦ ἑνὸς ἰδέας καὶ τοῦ πρώτου μήκους καὶ πλάτους καὶ βάθους, τὰ δ' ἄλλα ὁμοιοτρόπως*. Cf. *Leges*, 894A: *γίγνεται δὴ πάντων γένεσις, ἡνίκ' ἂν τί πάθος ᾖ; δῆλον ὡς ὁπόταν ἀρχὴ* [i.e. an indivisible line, not a point (as with Speusippus)] *λαβοῦσα αὔξην εἰς τὴν δευτέραν ἔλθῃ μετάβασιν* [sc. to the second dimension, i.e. becomes surface] *καὶ ἀπὸ ταύτης εἰς τὴν πλησίον* [sc. *εἰς τὴν τρίτην μετάβασιν*, to the third dimension], *καὶ μέχρι τριῶν ἐλθοῦσα αἴσθησιν σχῇ τοῖς αἰσθανομένοις*. Maybe three-dimensionality constituted *is* a perceptible body; or, perhaps, we require the idea of five to endow a body with perceptibility. On the whole I incline to the first alternative; after all, according to the Pythagoreans, colour *was* shape or surface). The first length is the length-itself or the idea of linearity, i.e. the ideal number 2. The first breadth is the idea of surface, i.e. the ideal number 3. The first depth is the idea of three-dimensional body, i.e. the ideal number 4. These three eidetic numbers, together with the One (*ἡ τοῦ ἑνὸς ἰδέα*)[16], represent the Pythagorean τετρακτύς, prototype of the decade, idea of animality[17]. And this is how ideas of things are constituted: *τὰ δ' ἄλλα ὁμοιοτρόπως*. For (404b27): *εἴδη δ' οἱ ἀριθμοὶ οὗτοι τῶν πραγμάτων*.

V

I propose therefore the following overall schema[18]
for the derivation of reality from the First Platonic Principles:

One ↔ Indefinite Dyad, the Inequality of the Great and the Small
(successive generation of the ideal numbers as structures of ratios)

Dyad,	Triad,	Tetrad	Pentad etc.
↕	↕	↕	↕
Indefinite Dyad	Indefinite Dyad	Indefinite Dyad	Indefinite Dyad
⇓	⇓	⇓	⇓
length = one-dimensional extension (The Long and Short)	breadth (involving length) = two-dimensional extension (The Broad and Narrow)	depth (involving length and breadth) = three-dimensional extension = space (The Deep and Shallow)	some specific field of variation
↕	↕	↕	↕
Dyad, Triad, etc.	Dyad, Triad, etc.	Dyad, Triad, etc.	Dyad, Triad, etc.
⇓	⇓	⇓	⇓
organized, metric 1-d extension-definite lines	organized, metric surface-definite figures	organized, metric space-definite mathematical bodies	organised, quantified specific field of varation (i.e. one endowed with a *metric* and a *norm*)

VI

Through the identification of the Idea of Animality (*αὐτὸ τὸ ζῷον*) with the Decade as product of the *τετρακτύς*, we enter the stranger ground of the Platonic theory about the multiplicity of ideal number. It is to be expected that an indefinite augmentation of monads, and some sort of an infinitude of numbers, would be improper for the well-ordered ideal world without careful qualification. The primacy of the numbers in the first decade provide a means of checking that limitlessness from unwarrantedly intruding into the realm of true being. However, Aristotle's declaration in *Physica*, Γ, 206b32-3 to the explicit effect that Plato *μέχρι γὰρ δεκάδος ποιεῖ τὸν ἀριθμόν*, should be taken cautiously, in the sense not of denying ideal numbers following the Decade, but of ascribing some sort of superadded derivativeness to their existence. Otherwise, we would not have sufficient number of ideas to account for the variety of the sensible world; *Metaphysica*, M, 1084a12-7: *ἀλλὰ μὴν εἰ μέχρι τῆς δεκάδος ὁ ἀριθμός, ὥσπερ τινές φασιν, πρῶτον μὲν ταχὺ ἐπιλείψει τὰ εἴδη - οἷον εἰ ἔστιν ἡ τριὰς αὐτοάνθρωπος, τὶς ἔσται ἀριθμὸς αὐτόϊππος; αὐτὸ γὰρ ἕκαστος ἀριθμὸς μέχρι δεκάδος· ἀνάγκη δὴ τῶν ἐν τούτοις ἀριθμῶν τινὰ εἶναι (οὐσίαι γὰρ καὶ ἰδέαι οὗτοι)· ἀλλ' ὅμως ἐπιλείψει· τὰ τοῦ ζῴου γὰρ εἴδη ὑπερέξει* – let alone the rest of natural existence which requires ideal substantiation. The τινές here is Plato; the upholder of the classical theory of ideas is meant. For those who posit ideas (according to Aristotle), construe them essentially as numbers. V. Λ, 1073a17-23: *οἱ μὲν γὰρ περὶ τὰς ἰδέας ὑπόληψις* οὐδεμίαν ἔχει σκέψιν ἰδίαν (ἀριθμοὺς γὰρ λέγουσι τὰς ἰδέας οἱ λέγοντες ἰδέας)[19]· *περὶ δὲ τῶν ἀριθμῶν* ὁτὲ μὲν *ὡς περὶ ἀπείρων λέγουσι, ὁτὲ δὲ ὡς μέχρι δεκάδος ὡρισμένων* (hence the caution necessary and the qualified sense in which we may take the Aristotelian affirmation that Plato *μέχρι δεκάδος ποιεῖ τὸν ἀριθμόν*)· *δι' ἣν δ' αἰτίαν τοσοῦτον τὸ πλῆθος τῶν ἀριθμῶν, οὐδὲν λέγεται μετὰ σπουδῆς ἀποδεικτικῆς. ἡμῖν δ' ἐκ τῶν ὑποκειμένων καὶ διωρισμένων λεκτέον.* Here we are on more articulate ground. Numbers (and not merely the mathematical, since the subject in this passage is eidetic number) are in a sense indefinite, in another sense limited for Plato. With the Decad, the great structures of the world-order, and the corresponding fundamental factors of all existence, have been generated and basic creation concluded and terminated. (After all, the really intended sense of the Aristotelian statement that Plato *μέχρι δεκάδος* ποιεῖ *τὸν ἀριθμόν*, may well be that Plato *derived* (eidetic) number only so far as the Decad). An indication to this effect, we gain in M, 1084a29-b2: *ἔτι ἄτοπον εἰ ὁ ἀριθμὸς ὁ μέχρι τῆς δεκάδος μᾶλλόν τι ὂν* <*ἢ τὸ ἕν*, *ὃ*> *καὶ εἶδος αὐτῆς τῆς δεκάδος, καίτοι τοῦ μὲν οὐκ ἔστι γένεσις ὡς ἑνός, τῆς δ' ἔστιν.* (Numbers up to the Decad and the Decad itself would be of higher ontological status than the first principle itself (namely the One) which is the "form" of these numbers, if the One generated them, while the Decad remained in splendid abstinence from such procreational processes. The product would have had superior ontological status relative to its own cause). *πειρῶνται δ' ὡς τοῦ μέχρι τῆς δεκάδος τελείου ὄντος ἀριθμοῦ. γεννῶσι γοῦν τὰ ἑπόμενα, οἷον τὸ κενόν, ἀναλογίαν, τὸ περιττόν, τὰ ἄλλα τὰ τοιαῦτα* [i.e. basic factors and structures] *ἐντός τῆς δεκάδος. τὰ μὲν γὰρ ταῖς ἀρχαῖς ἀποδιδόασιν, οἷον κίνησιν στάσιν, ἀγαθὸν κακόν, τὰ δ' ἄλλα τοῖς ἀριθμοῖς. διὸ τὸ ἓν τὸ περιττόν· εἰ γὰρ ἐν τῇ τριάδι, πῶς ἡ πεντὰς περιττόν; ἔτι τὰ μεγέθη* [the reading of A^b *τὰ μετὰ πάθη* perhaps should be adopted: substantialized attributes (in Aristotelian parlance) that "follow" the arithmetical ones would be meant, preeminently geometrical parameters] *καὶ ὅσα τοιαῦτα μέχρι ποσοῦ, οἷον ἡ πρώτη γραμμὴ ἄτομος* (i.e. *ἡ μονάς ἐστιν ἡ γραμμὴ ἡ ἄτομος*, as Bonitz understood it, the unit is the indivisible line, not the point), *εἶτα δυάς, εἶτα καὶ ταῦτα μέχρι δεκάδος.*

Some realities are (directly?) ascribed to the principles, without requiring their interplay and conjugation. Aristotle mentions two corresponding pairs: *κίνησις στάσις* and *ἀγαθὸν κακόν*. The latter opposition was certainly identified with the Ur-antithesis according to Plato, as we can check for both of its terms (cf. A, 988a14-5). Presumably, the former one as well. (Consequently, there is "movement" and "rest" in all realms of reality; cf. A, 992b7-9). Eudemus confirms that Plato identified movement with the Great and the Small (ap. Simplicius, *Phys.* 431.6,13). Here belongs K, 1066a10-2: otherness, inequality, non-being are essentially the same principle as movement. Non-being corresponds for Plato to the Great and the Small, *Physica* A, 192a6-8[20].

To the Aristotelian passage, the Theophrastean one should be compared. *Metaphysica*, III, 6a23-b22; esp. for Plato 6a23-b5 and b11-5. There is, of course, no clash between the two sections. In the second one Theophrastus observes that: (a) in the way of *presupposition* Plato seems to reduce everything to the principles, by linking up everything to the ideas, these to numbers, and these finally to the principles; and (b) in the way of *derivation* he proceeds only *so far*, till he reaches the very general framework of existence, i.e. till he deduces the above mentioned (*τῶν εἰρημένων*) fundamental factors of reality. What the said factors are we learn in the former passage: *νῦν* *δ' οἵ γε πολλοὶ μέχρι τινὸς ἐλθόντες καταπαύονται, καθάπερ καὶ οἱ τὸ ἓν καὶ τὴν ἀόριστον δυάδα ποιοῦντες* (i.e. Plato, as also the contrasting mention of (Speusippus and) *Xenocrates* in the sequel makes patent)· *τοὺς γὰρ ἀριθμοὺς γεννήσαντες καὶ τὰ ἐπίπεδα καὶ τὰ σώματα σχεδὸν τὰ ἄλλα παραλείπουσιν πλὴν ὅσον ἐφαπτόμενοι καὶ τοσοῦτο μόνον δηλοῦντες, ὅτι τὰ μὲν ἀπὸ τῆς ἀορίστου δυάδος, οἷον τόπος καὶ κενὸν καὶ ἄπειρον, τὰ δ' ὑπὸ τῶν ἀριθμῶν καὶ τοῦ ἑνός, οἷον ψυχὴ καὶ ἄλλ' ἄττα - χρόνον δ' ἅμα καὶ οὐρανὸν* (sc. in *Timaeus*) *καὶ ἕτερα δὴ πλείω, τοῦ δ' οὐρανοῦ πέρι καὶ τῶν λοιπῶν οὐδεμίαν ἔτι ποιοῦνται μνείαν*. *Place*, we shall see, is indeed the material principle of the sensible world (as in the *Timaeus*, again): it is "a kind" of the Great and the Small, although it is produced by the operation of the ideal numbers on (pure) three-dimensional extension or space – itself produced by the operation of the Tetrad on the Indefinite Dyad. *Vacuum* (*Void*) is unoccupied place, i.e. bodiless extension of the sensible world. (Although the Pythagoreans assumed the existence of void in the realm of numbers – or of the immanent essence of things – as well, as that which delimits from the outside their identity; *Physica* 213b27). *Infinity* in this connection is indefiniteness in the sensible world again, I would argue.

Soulness would be produced with the Pendad, and, finally, the whole sensible world would be construed as the instantiation of the Decad – complete being. As we might proceed to more specific realities, higher numbers would no doubt be required; something to be in any case expected, since nothing exists vainly in reality. But in the Decad every fundamental feature of reality has been accounted for. To this extent ideal numbers may be said (loosely) to be included within the Decad. And in this (loose) sense, Theophrastus could say that Plato referred back things to ideas, ideas to numbers and numbers to principle. Looseness in thought and expression not to be strictly countenanced, at least for Plato – if not for Xenocratean tendencies.

The notion that some restriction of fundamental numberhood to the Decad was Pythagorean doctrine is unfounded. The work excerpted by Photius in his *Bibliotheca* cod. 249 is obviously drawing on Platonic and Academic theories (it belongs to the Hellenistic Neo-Pythagorean tracts). Thus, its statement that the Pythagoreans held that *ὁ δὲ ἀριθμὸς συμπληροῦται τοῖς δέκα* (439a5 Bekker) has to be taken in that perspective; besides it simply signifies the fundamentality of the decad in our numerative systems. The same holds true for the passage in *Theologoumena Arithmetica*, 80.10-6 ed. De Falco. And again similarly for the statement on Theon Smyrnaeus, *Expositio rerum mathematicarum ad legendum Platonem utilium*, p. 99.17-8 Hiller: *πάντα μὲν γὰρ τὸν ἀριθμὸν εἰς δεκάδα ἤγαγον, ἐπειδὴ ὑπὲρ δεκάδα οὐδείς ἐστιν ἀριθμός, ἐν τῇ αὐξήσει πάλιν ἡμῶν ὑποστρεφόντων ἐπὶ μονάδα καὶ δυάδα καὶ τοὺς ἑξῆς* etc. (Even the formulations are parallel in these passages). They may stem from Speusippean expositions; the accounts in Theon 93.17 sqq. sound in general Speusippean (emphasis, e.g. on *στιγμή*, point).

VII

There remain two main issues to complete the fundamental picture of my proposed reconstruction of Platonic doctrine. *First*, the Aristotelian emphatic affirmation that Plato not only did not adequately account for the mathematical number, but, radically more, that he could not possibly account for it as he lacked the appropriate explanatory framework and the conceptual means to effect it: *οἱ δὲ πρῶτοι δύο τοὺς ἀριθμοὺς ποιήσαντες τόν τε τῶν εἰδῶν καὶ τὸν μαθηματικόν, οὔτ᾽ εἰρήκασιν οὐδαμῶς* ο ὔ τ ᾽ ἔ χ ο ι ε ν ἂ ν ε ἰ π ε ῖ ν π ῶ ς κ α ὶ ἐ κ τ ί ν ο ς ἔ σ τ α ι ὁ μ α θ η μ α τ ι κ ό ς etc. (N, 1090b32-5). And, *second*, the Aristotelian equally emphatic distinction between Space and the Indefinite Dyad as “material” principles of reality, the one advanced by Plato in the *Timaeus*, the other in the context of the *ἄγραφα δόγματα*.

A) Mathematical number seems to precede ontologically (to be presupposed essentially and logically by) the geometrical magnitudes, even, of course, the one-dimensional extensionality. Now linearity comes from the (definite) Dyad and the Indefinite Dyad as “formal” and “material” principles and elements respectively. Before them, there is only the One and the Indefinite Dyad: but from these, the ultimate principles, the ideal, *not* the mathematical, number is generated. Cf. N, 1090b35-1091a1, immediately following the above quoted passage: *ποιοῦσι γὰρ αὐτὸν* (sc. mathematical number) *μεταξὺ τοῦ εἰδητικοῦ καὶ τοῦ αἰσθητοῦ· εἰ μὲν γὰρ ἐκ τοῦ μεγάλου καὶ τοῦ μικροῦ, ὁ αὐτὸς ἐκείνῳ* (sc. *τῷ Πλάτωνι*) *ἔσται τῷ τῶν ἰδεῶν (ἐξ ἄλλου δέ τινος μικροῦ καὶ μεγάλου τὰ γὰρ μεγέθη ποιεῖ).* That is, such arrangement would differentiate mathematical number from geometrical magnitudes, but would identify ideal and mathematical number (Speusippus or Xenocrates, i.e., in a sense, either by identifying the former with the latter, or the latter with the former), as noticed. If Plato would say that the second principle involved in the derivation of mathematical number is not the ultimate Indefinite Dyad, but a *kind* of that indeterminacy, similarly with what happens in the case of the "material" principle of extensionality, what would the status of that other Other Principle be? Suppose that it were the Many and the Few (*τὸ πολὺ καὶ τὸ ὀλίγον*), as indirectly attested for such a capacity and function in an above quoted passage (Cf. N, 1087b16-7; 1089b11-2). This principle could not be derived in the way that the Long and Short was generated: for this involved as principles the definite Dyad and the Indefinite Dyad; before the which there is only the One, and we are back to the identity of ideal and mathematical number. If then the "material" principle of mathematical number could not be derived from the ultimate principles, it would have to be independently posited; to which impossibility Aristotle refers in the succinct statement that follows: *εἰ δ᾽ ἕτερόν τι ἐρεῖ* (from the Great and the Small), *πλείω τὰ στοιχεῖα ἐρεῖ*. This leaves us with the theoretical possibility that, while the "material" principle for the ideal and the mathematical number is the same, yet their "formal" principles are different. But in this case another *one* would have to be assumed to account for the mathematical number, and still another *one* preceding in abstract unity those two ones (i.e. the original first principle, and the one which would play the role of "formal" principle for mathematical number), – and what could account for such *multiplicity* of *the first* principle? Not to mention that the firm foundation of all Platonic interpretation in the theory of principles (namely that it is impossible to generate number otherwise than from the One and the Indefinite Dyad) would be completely invalidated. Which all is what follows in the Aristotelian passage commented upon: *καὶ εἰ ἕν τι ἑκατέρου ἡ ἀρχή, κοινόν τι ἐπὶ τούτων ἔσται τὸ ἕν, ζητητέον τε πῶς καὶ ταῦτα πολλὰ τὸ ἓν καὶ ἅμα τὸν ἀριθμὸν γενέσθαι ἄλλως ἢ ἐξ ἑνὸς καὶ δυάδος ἀορίστου ἀδύνατον κατ᾽ ἐκεῖνον* (Plato, conclusively). 1091a2-5.

Aristotle's complaint fits in nicely, and confirms, my reconstruction of Platonic doctrine. There is indeed no place in this schema for a *separate* derivation of mathematical number. Not that this would bother the Pythagorean Plato. He did not give ontological status to points. And he did not stand in great need of *monads in, or without, place*. What he required were *units*. And these were implicit *in the metric of dimensionality*. Down to Euclid arithmetic simply reflected the metric character of extension. *Arithmetic is nothing but the metric structure of geometry*. (Arithmetic is geometrical, as the slogan goes). We can see that from the Pythagorean position (emphatically attested by Aristotle) that numbers were extended entities, there is a short step to the Platonic theory, an articulate version of the Pythagorean insight.

One more attested feature of Platonic theory fits in nicely with my reconstruction. Plato, Aristotle tells us, combatted the existence of points, as a merely geometrical doctrine without real (and philosophical) foundation. A, 992a20-2: *τούτῳ μὲν οὖν τῷ γένει* (i.e. the genus of points) *καὶ διεμάχετο Πλάτων ὡς ὄντι γεωμετρικῷ δόγματι, ἀλλ' ἐκάλει ἀρχὴν γραμμῆς - τοῦτο δὲ πολλάκις ἐτίθει - τὰς ἀτόμους γραμμάς*. (Aristotle is speaking as a Platonist, at any rate as a member of the Academy, as is evident from the sequel. Plato must have died soon before, v. *διεμάχετο, ἐκάλει, ἐτίθει*). In fact, the comment by which Aristotle introduces this testimony proves the reason for Plato's opposition; 992a19-20: *ἔτι αἱ στιγμαὶ* ἐκ τίνος *ἐνυπάρξουσι* (in the lines etc.); the preposition *ἐκ* is used immediately before to refer to the relationship of lines, surfaces, bodies to their corresponding "material" principle; e.g. *μήκη μὲν τίθεμεν* (sc. *we*, Platonists or Academicians, Aristotle included) *ἐκ βραχέος καὶ μακροῦ, ἔκ τινος μικροῦ καὶ μεγάλου* etc. So the question is: from what material principle would we derive points, if points existed in *rerum natura?* Nothing suitable appears to be available. Short and Long are needed to generate length. Great and Small are required to obtain (ideal) numbers. What could be there, to account for points – for monads-in-position? Nothing. Just as nothing is there to account for arithmetical monads in isolation. The doctrine of the nonexistence of points is also assumed in M, 1084a37-b2: *ἔτι τὰ μεγέθη καὶ ὅσα τοιαῦτα μέχρι ποσοῦ, οἷον* ἡ πρώτη γραμμή, ‹ἡ› ἄτομος, (this being the unit, *μονάς*) *εἶτα καὶ ταῦτα μέχρι δεκάδος*[21]. What are the *τοιαῦτα*? *Quantified* fundamental variables of the world -order. – Speusippus notoriously correlated the one to the point, the two to the line, the three to the triangle (basic two-dimensional figure), the four to pyramis (basic three-dimensional figure or mathematical body); v. Fr. 28.34-5 Tarán. And more clearly to the point *ibid.* 61-2: πρώτη μὲν γὰρ ἀρχὴ εἰς μέγεθος στιγμή, δευτέρα γραμμή, τρίτη ἐπιφάνεια, τέταρτον στερεόν. (Speusippus' reading of the *Laws* passage above quoted). The Speusippean theory of the generation of magnitudes is reported and criticised by Aristotle in M, 1085a31-b4; 1085b27-31. The principles for this order of reality are the point and another "material" factor (or three other such factors) *like* the πλῆθος, albeit not the πλῆθος itself, rather the distance, τὸ διάστημα, *dimensions of extensionality*. Xenocrates reverted to Platonic orthodoxy in respect to the doctrine of indivisible lines.

Three possible puzzles require perhaps attention:

A1) Are there ideas of geometrical magnitudes? Indeed there are. The Dyad, Triad, Tetrad for the three dimensions of extensionality (compoundingly meant). Other ideal numbers for specific structures as determinations of extensionality.

A2) Are not the Dyad, Triad etc. ideas for all dualities, triplicites etc. and not just for the dimensions of extensionality? Indeed they are. But there is linear polarity in every duality; and a surfacial indeterminacy in every triplicity; and so on. After all, it is correct, but rather trivial, and formal-logical, to say that the essential idea of linearity is the line-in-itself. Whereas it is substantial, and profoundly useful, being ontological, to say that the essential idea of linearity is the dyad – provided that this is so *realiter*. The "classical" theory of Ideas is but a methodological step (as insisted upon by the Platonic Socrates again and again) towards the theory of Ideal Numbers.

A3) What do we need the intermediates for? But we do not primarily need them: they are just existents. (Ocham's razor falls under its own edge: it is superfluous). Then what is their role in the cosmic "economy"? *They are the necessary means of the in-formation of the world according to the ideal numericity of being. Determination in this world proceeds through geometry: number enters into it through, and with, space (extensionality); arithmetic is the metric of extension.*

The further question concerning the *separate* existence of the mathematical intermediates over and above the immanent mathematical structures of this sensible world is better to be treated in the context of the second remaining issue, that of the relationship between Timaean space and the "unwritten" Dyad of the Great and Small.

B) Aristotle maintains in *Metaphysica* A, 6 that the Other Platonic Principle (which, according to his conceptual framework, is the material factor in existence) was the same substrate in the world of forms (= ideal numbers) and in the sensible world. 987b18-25: *ἐπεὶ δ' αἴτια τὰ εἴδη τοῖς ἄλλοις, τἀκείνων στοιχεῖα πάντων ᾠήθη τῶν ὄντων εἶναι στοιχεῖα. ὡς μὲν οὖν ὕλην τὸ μέγα καὶ τὸ μικρὸν εἶναι ἀρχάς, ὡς δ' οὐσίαν τὸ ἕν· ἐξ ἐκείνων γὰρ κατὰ μέθεξιν τοῦ ἑνὸς τὰ εἴδη εἶναι τοὺς ἀριθμούς, τὸ μέντοι γε ἓν οὐσίαν εἶναι... καὶ τὸ τοὺς ἀριθμοὺς αἰτίους εἶναι τοῖς ἄλλοις τῆς οὐσίας ὡσαύτως ἐκείνοις* (sc. *τοῖς Πυθαγορείοις ἔλεγε*). What is then the material principle of this world (whose formal principle is (ideal) numbers), is explicitly explained in 988a8-14: *φανερὸν δ' ἐκ τῶν εἰρημένων ὅτι δυοῖν αἰτίαιν μόνον κέχρηται* (sc. Plato), *τῇ τε τοῦ τί ἐστι καὶ τῇ κατὰ τὴν ὕλην (τὰ γὰρ εἴδη τοῦ τί ἐστιν αἴτια τοῖς ἄλλοις, τοῖς δ' εἴδεσι τὸ ἕν),* κ α ὶ τ ί ς ἡ ὕ λ η ἡ ὑ π ο κ ε ι μ έ ν η κ α θ ' ἧ ς τ ὰ ε ἴ δ η μ ὲ ν ἐ π ὶ τ ῶ ν α ἰ σ θ η τ ῶ ν τ ὸ δ ' ἓ ν ἐ ν τ ο ῖ ς ε ἴ δ ε σ ι λ έ γ ε τ α ι , *ὅτι αὕτη δυάς ἐστι, τὸ μέγα καὶ τὸ μικρόν* etc.

It seems as clear-cut as possible. And this is confirmed really in *Physica* Δ, 2, where he diagnoses a discrepancy on the part of Plato concerning a related aspect of the second ultimate principle. In the *ἄγραφα δόγματα* Plato, he tells us, maintained that the *receptacle* of "formal" being (i.e. the "material" principle in Aristotelian terminology), the *μεταληπτικόν* or *μεθεκτικόν*, is the Great and the Small. Otherwise (*ἄλλον δὲ τρόπον*) in *Timaeus*: here the receptacle is identified to space (*χώρα*): *διὸ καὶ Πλάτων τὴν ὕλην καὶ τὴν χώραν ταὐτόν φησιν εἶναι ἐν τῷ Τιμαίῳ·* τ ὸ γ ὰ ρ *μεταληπτικὸν καὶ τὴν χώραν ἓν καὶ ταὐτόν.* ἄ λ λ ο ν δ ὲ τ ρ ό π ο ν *ἐκεῖ τε λέγων τὸ μεταληπτικὸν καὶ ἐν τοῖς λεγομένοις ἀγράφοις δόγμασιν* etc. And so in 209b35-210a2: *εἴτε τοῦ μεγάλου καὶ τοῦ μικροῦ ὄντος τοῦ μεθεκτικοῦ, εἴτε τῆς ὕλης, ὥσπερ ἐν τῷ Τιμαίῳ γέγραφεν.* (By implication the former view is that expressed in the *ἄγραφα δόγματα*).

Moreover, for Aristotle, whichever of the two distinct interpretations of the receptacle (= *μεταληπτικόν*) one assumes, he is committed to the doctrine of the identity of the receptacle with *place* (*τόπος*). *Physica,* 209b35-210a2: *εἴπερ τὸ μεθεκτικὸν ὁ τόπος, εἴτε τοῦ μεγάλου καὶ τοῦ μικροῦ ὄντος τοῦ μεθεκτικοῦ* (as in the *ἄγραφα δόγματα*), *εἴτε τῆς ὕλης, ὥσπερ ἐν τῷ Τιμαίῳ γέγραφεν*. And the same in 209b13-6: *ἄλλον δὲ τρόπον ἐκεῖ* (in the *Timaeus*) *τε λέγων τὸ μεταληπτικὸν καὶ ἐν τοῖς λεγομένοις ἀγράφοις δόγμασιν, ὅμως τὸν τόπον καὶ τὴν χώραν τὸ αὐτὸ ἀπεφήνατο*. Here the common inference from both alternative interpretations is that space and place are identical. The basic notion to be deduced is that *the matter of a thing is just its place*. This identity is taken as explaining the mysterious nature of place; 209b16-7: *λέγουσι μὲν γὰρ πάντες εἶναί τι τὸν τόπον, τί δ᾽ ἐστίν, οὗτος* (sc. Plato) *μόνος ἐπεχείρησεν εἰπεῖν*. And both passages occur in the context of Aristotle's own painstaking analysis of *place*.

Whether one accepts that the receptacle is the Great and Small or the Space, one is bound to the view that place is the receptacle. That this is Aristotle's sense becomes apparent when one notices that the next question that should be asked in this connection if that was the case, is exactly the one Aristotle asks in this precisely connection; 209b33-5: *Πλάτωνι μέντοι λεκτέον, εἰ δεῖ παρεκβάντας εἰπεῖν, διὰ τί οὐκ ἐν τόπῳ τὰ εἴδη καὶ οἱ ἀριθμοί, εἴπερ τὸ μεθεκτικὸν ὁ τόπος* etc. (Of course, for Plato, ideas and ideal numbers are certainly not in place – things of becoming are in place; *Timaeus*, 52a8-b6).

We can understand how the difficulty is supposed to work in the *Timaeus*. If the receptacle is place, the participated entities must be in place. (No real problem for Plato, if one gets over a literal enough sense of participation, *and construes sensible things on the analogy of images in a mirror*. But let us skip this (in)famously debated controversy). On the other hand, why, if the receptacle is the Great and the Small, should the ideas-numbers be in place? Only if, to begin with, the *Great and Small is essentially spatial extension*. Which would make the intelligible and sensible matter one and the same. And then the ideas-numbers would have to be in space (and, thus, in place: *ὅμως τὸν τόπον καὶ τὴν χώραν τὸ αὐτὸ ἀπεφήνατο*, 209b15-6), in a much stronger sense than previously, *i.e. in themselves as well, irrespective of participation.*

It follows, therefore, that in *Physica* Δ, 2, (just as in *Metaphysica* A, 6)[22] Aristotle holds the view that the Platonic Second Principle is the same in the world of ideal, as well as of sensible, reality[23]. But this would have been disastrous for Plato's *πραγματεία περὶ πρώτων ἀρχῶν*. It would (among other things) characteristically rightaway eliminate the ontological status for the intermediate reality – just as Aristotle in effect complains that the Platonic theory is really committed to.

Now in my above proposed schema for the derivation of reality from the twin first principles, there are clearly distinguished three basic levels of reality, clearly separate one from another.

1) High level of ideal numbers (true being). Principles: One and the Indefinite Dyad.
2) Intermediate level of mathematicals (line – surface – space as abstract three-dimentional extension). Principles: Dyad, Triad, Tetrad (plus the other ideal numbers) and the Indefinite Dyad.
3) Lower level of sensible reality (becoming). Principles: Ideal numbers and positional space, i.e. place.

In the space of Level 2 there is no here and there (as there is no temporal before and after). Thus on that level, an isosceles right angle triangle with unit sides cannot be multiplied in virtue of its occupying different *places*. Such triangle is a space-structure, unique of sorts, which can be distinguished from another (*the same*) one, only by reason of different *structural* connections within larger wholes or lesser parts. "When" the other specific indeterminacies, beyond extensionality, are "introduced" into the reality, *here* and *there* become distinguishable and space becomes *placed*. Aristotle notices the distinction, (although he implicitly accuses Plato of confusing it); N, 1092a17-20: *ἄτοπον δὲ καὶ τὸ τόπον ἅμα τοῖς στερεοῖς τοῖς μαθηματικοῖς ποιῆσαι* (on the contrary, according to my reconstruction)· *ὁ μὲν γὰρ τόπος τῶν καθ' ἕκαστον ἴδιος*, διὸ χωριστὰ τόπῳ, τὰ δὲ μαθηματικὰ οὐ πού etc. This significantly occurs in a passage criticising Speusippean theory (1092a11-21). Plato is exempt from this indiscrimination. *Place* *belongs to the sensible world, and this explains why the mathematicals are separate from the sensible mathematical structures.* Now place (*this* or *that* space) is the receptacle for *this* or *that* (thing); *just as Plato explains in the Timaeus.* Which dialogue thus is brought into nice harmony to the *ἄγραφα δόγματα*, *pace Aristotelian inquietudes.*

That space and place are distinct from the Platonic Other Principle, the Indefinite Dyad (contra Aristotelem) is evidenced by Theophrast, *Metaphysica*, III, 6a24-b5. [In this passage Platonic doctrine is summarily described. The reference is to *οἱ τὸ ἓν καὶ τὴν ἀόριστον δυάδα ποιοῦντες* (a24-5); there follows mention of Speucippus (6b6), of others (*ibid.*), of Xenocrates (6b7), of Hestiaeus (6b10). Then Plato is adverted to by name, with an explicit reference back (*τῶν εἰρημένων* b15) to what was described in the said passage as systematic inadequacy]. We read in 6a24 sqq.: *...καθάπερ καὶ οἱ τὸ ἓν καὶ τὴν ἀόριστον δυάδα ποιοῦντες* (sc. Plato)· *τοὺς γὰρ ἀριθμοὺς γεννήσαντες καὶ τὰ ἐπίπεδα καὶ τὰ σώματα σχεδὸν τὰ ἄλλα παραλείπουσιν πλὴν ὅσον ἐφαπτόμενοι καὶ τοσοῦτον μόνον δηλοῦντες,* ὅτι τὰ μὲν ἀπὸ τῆς ἀορίστου δυάδος, οἷον τόπος καὶ κενὸν καὶ ἄπειρον, *τὰ δ' ἀπὸ τῶν ἀριθμῶν καὶ τοῦ ἑνός, οἷον ψυχὴ καὶ ἄλλ' ἄττα· χρόνον δ' ἅμα καὶ οὐρανὸν καὶ ἕτερα δὴ πλείω* (as in the *Timaeus*), *τοῦ δ' οὐρανοῦ πέρι καὶ τῶν λοιπῶν οὐδεμίαν ἔτι ποιοῦνται μνείαν.* In view of my reconstruction, the description *ὅτι τὰ μὲν ... καὶ ἄλλ' ἄττα* is loose. But one gets the point. Theophrastus comes back to Plato in 6b11 sqq.: *Πλάτων μὲν οὖν ἐν τῷ ἀνάγειν εἰς τὰς ἀρχὰς δόξειεν ἂν ἅπτεσθαι* (cf. *ἐφαπτόμενοι*, 6a27) *τῶν ἄλλων εἰς τὰς ἰδέας ἀνάπτων, ταύτας δ' εἰς τοὺς ἀριθμούς, ἐκ δὲ τούτων εἰς τὰς ἀρχάς, εἶτα* κατὰ τὴν γένεσιν *μέχρι τῶν εἰρημένων.* The last clause refers either to the *derivation* of being from the first principles in general, in which case the reference back is to the entire preceding passage (6a25-b5); or it refers to *γένεσις* proper, i.e. the world of becoming, in which case one is led back to the derivation of (world-) soul, and the world and time, as in the *Timaeus.* The expression *μέχρι τῶν εἰρημένων* would suggest the second alternative more naturally. – A last point in the present connection: we need not worry about some series (principles – numbers – ideas – etc.) postulated by Theophrast here. The meaning is simpler, that the ideas were reduced to numbers;

or more specialized and technical, that the numbers are somehow encapsulated in the (first) decade.

And by way of a concluding poignant corollary.

B1) It may appear by now that the superior strata of reality involve more indeterminacy than the inferior ones. As we move downwards in the ladder of reality, indeterminacy is more and more "diluted"; it is severely circumscribed. Determination becomes more and more specific and complex. Yet this more pronounced (in a sense) definiteness comes with a certain variability and instability (then changefulness). The more determinate reality becomes, the more complex, the more in flux it turns. *Simpler being is exempt from mutability by leaving possibilities of determination open*. Once one such real potentiality is realized, the unrealized ones antagonize it for actualization. In effect, the higher the realm, the more determin*able* it reveals itself to be; the lower it is, the more determin*ate* it shows itself. And this rule affects not only the orders of reality in so far as their appropriate Other Principle is concerned; its repercussions are felt by the first principle itself. The One, according to the strict logical tenour of the theory, despite being the absolute determinateness, is, in a sense, more determin*able* than the determinateness of a concrete thing or event. The definiteness of the Principle is absolute, but allows for many mutually exclusive forms; while the definiteness of the concrete reality, having excluded all other competing potentialities, is absolute in a different but potent sense. We get a glimpse here of the source of the Aristotelian fundamental polarity potentiality-actuality; as well as of the outgrown speculations on determination by the Neoplatonists, esp. the late ones of the Athenian School. (The issue, as an important metaphysical subject, is well emphasised by Theophrastus, *Metaphysica*, IV, 6b23-7a19. And also VI, 8a8-20).

But directly relevant here is the complain that, according to the Platonic *πραγματεία*, the nearer to the principles reality is, the *"worse"* it is. N, 1091b35-1092a3: *συμβαίνει δὴ πάντα τὰ ὄντα μετέχειν τοῦ κακοῦ ἔξω ἑνὸς αὐτοῦ τοῦ ἑνός, καὶ μᾶλλον ἀκράτου μετέχειν τοὺς ἀριθμοὺς* ἢ τὰ μεγέθη, καὶ τὸ κακὸν τοῦ ἀγαθοῦ χώραν εἶναι, *καὶ μετέχειν καὶ ὀρέγεσθαι τοῦ φθαρτικοῦ· φθαρτικὸν γὰρ τοῦ ἐναντίου τὸ ἐναντίον*. And so Theophrastus, *Metaphysica*, IX, 11a27-b12. Particularly, 11a27b7: *Πλάτων δὲ καὶ οἱ Πυθαγόρειοι μακρὰν τὴν ἀπόστασιν* (sc. *ποιοῦσιν*, between the first principles and the lower strata of reality), *ἐπιμιμεῖσθαι γ' ἐθέλειν ἅπαντα. καίτοι καθάπερ ἀντίθεσίν τινα ποιοῦσιν* (participle) *τῆς ἀορίστου δυάδος καὶ τοῦ ἑνός, ἐν ᾗ* (sc. in the Indefinite Dyad) *καὶ τὸ ἄπειρον καὶ τὸ ἄτακτον καὶ πᾶσα ὡς εἰπεῖν ἀμορφία καθ' αὑτήν, ὅλως [δ'] οὐχ οἷόν τε ἄνευ ταύτης τὴν τοῦ ὅλου φύσιν* (sc. *εἶναι* - which perhaps may be added), *ἀλλ' οἷον ἰσομοιρεῖν ἢ καὶ ὑπερέχειν τῆς ἑτέρας· ᾗ καὶ τὰς ἀρχὰς ἐναντίας*. Speusippus and Aristotle evolved theories partly in response to this predicament. Aristotle directly refers to Speusippus' solution in the same context; 1091b31-5: ...*καὶ τὸ ἐναντίον στοιχεῖον, εἴτε πλῆθος ὂν* (Speusippus) *εἴτε τὸ ἄνισον καὶ μέγα καὶ μικρόν* (Plato), *τὸ κακὸν αὐτό· (διόπερ ὁ μὲν* (sc. Speusippus) *ἔφευγε τὸ ἀγαθὸν προσάπτειν τῷ ἑνὶ ὡς ἀναγκαῖον ὄν, ἐπειδὴ ἐξ ἐναντίων ἡ γένεσις, τὸ κακὸν τὴν τοῦ πλήθους φύσιν εἶναι· οἱ δὲ* (Plato and other Platonists) *λέγουσι τὸ ἄνισον τὴν τοῦ κακοῦ φύσιν)· συμβαίνει δὴ* etc. (as above)[24].

The Speusippean solution had an unwanted byproduct: it made the good to be preciously little in the world (v. Fr 83 Tarán = Theophrastus, *Metaphysica*, 11a18-26. Cf. Fr. 84 Tarán), being reserved for the last perfection in the development of reality out of the first principles. (His good was not even *νοῦς*; v. Fr. 58 Tarán). So good is the optimal ("median") determination in each field of variation. (Cf. Fr. 84 Tarán). Which is genuinely Platonic. As often (I would say systematically), Speusippus' theories were meant by him as explanations-interpretations (at varying mixture) of Plato's positions. Even his flagbearer theory of the One and the Multitude as first principles may simply reflect *Philebus* 16c9, and what lies behind these words: *ἐξ* ἑνὸς *καὶ* πολλῶν *ὄντων τῶν ἀεὶ λεγομένων εἶναι, πέρας δὲ καὶ ἀπειρίαν ἐν αὑτοῖς σύμφυτον ἐχόντων* etc.

NOTES

1. Aristotle reached the same position by an analysis of opposition (*ἐναντιότης*). Cf. *Met.* I, 4, 1055a3 sqq.: *ἐπεὶ δὲ διαφέρειν ἐνδέχεται ἀλλήλων τὰ διαφέροντα* πλεῖον καὶ ἔλαττον, *ἔστι τις καὶ μεγίστη διαφορά, καὶ ταύτην λέγω ἐναντίωσιν... τοῖς δ' εἴδει διαφέρουσιν αἱ γενέσεις ἐκ τῶν ἐναντίων εἰσὶν ὡς ἐσχάτων,* τὸ δὲ τῶν ἐσχάτων διάστημα μέγιστον, *ὥστε καὶ τὸ τῶν ἐναντίων... ὅτι μὲν οὖν ἡ ἐναντιότης ἐστὶ διαφορὰ τέλειος, ἐκ τούτων δῆλον... οὐκ ἐνδέχεται ἑνὶ πλείω ἐναντία εἶναι (οὔτε γὰρ τοῦ ἐσχάτου ἐσχατώτερον εἴη ἄν τι, οὔτε τοῦ ἑνὸς διαστήματος πλείω δυοῖν ἔσχατα), ὅλως τε εἰ ἔστιν ἡ ἐναντιότης διαφορά,* ἡ δὲ διαφορὰ δυοῖν, *ὥστε καὶ ἡ τέλειος... πρώτη δὲ ἐναντίωσις ἕξις καὶ στέρησίς ἐστιν· οὐ πᾶσα δὲ στέρησις... ἀλλ' ἥτις ἂν τελεία ᾖ.*
2. A basic Aristotelian tenet, in tune with actual mathematics. V, *infra* p. 25. However well this may apply to Speusippean and (in an distorted way) Xenocratean mathematical metaphysics, the doctrine, I argue, is incoherent with the Platonic conception of eidetic number, its nature and derivation.
3. Keeping, that is, the transmitted text as it stands: *ἄλλος δέ τις* (IV) *τὸν πρῶτον ἀριθμὸν τὸν τῶν εἰδῶν ἕνα εἶναι, ἔνιοι δὲ* (V) *καὶ τὸν μαθηματικὸν τὸν αὐτὸν τοῦτον εἶναι.* Now IV poses a serious difficulty. Not so much in that there is here then a unique reference to some theory nowhere else attested in Aristotle (who in his classifications of the relevant criticised views he standardly employs a quadruple division into Platonic, Speusippean, Xenocratean and Pythagorean doctrines). But rather the problem lies in that we are then bound to admit a theory which accepted ideal number *only*, to the exclusion of the existence of mathematical number. If one wanted to avoid such an unattractive hypothesis, one might emend, e.g. by adopting Jaeger's conjecture. Or, we should perhaps read: ... *τὸν τῶν εἰδῶν ἕνα εἶναι, εἶναι δὲ καὶ τὸν μαθηματικὸν τὸν αὐτὸν τοῦτον [εἶναι].* This would make one and not two theories referred to by Aristotle here, in fact the Xenocratean one, which gives four in all basic views, conformably to regular Aristotelian practice. This is neat, but we cannot be sure of it. After all, view IV might have been conceivably held by some *Eleatic Pythagorean, perhaps a Pythagorean Friend of the Forms*: eidetic numbers are the only true reality; the sensible world either does not really exist or is somehow constituted by ideal numbers without the need of a realm of intermediate objects (i.e. mathematicals). The possibility of such a viewpoint cannot be excluded, and so we should better stick to the transmitted text. In fact, moreover, this theory would simply make explicit

what is involved in Plato's constitutive inability to account for the mathematical number, as above explained.

4. The four basic *modes* of conceiving immovable, changeless substance, are basic staple of the Aristotelian analysis of Pythagoreanism, Platonism and Old Academy. Cf. Λ, 1069a33-6: *ἄλλη δὲ ἀκίνητος* (sc. *οὐσία*), *καὶ ταύτην φασί τινες εἶναι χωριστήν, οἱ μὲν* (Plato) *εἰς δύο διαιροῦντες, οἱ δὲ* (Xenocrates) *εἰς μίαν φύσιν τιθέντες τὰ εἴδη καὶ τὰ μαθηματικά, οἱ δὲ* (Speusippus) *τὰ μαθηματικὰ μόνον τούτων*. The fourth τρόπος would be the Pythagorean, which did not separate changeless substance (i.e. extended number) from the changing world.
5. Aristotle often combines in his critique Plato and Speusippus, the two first heads of the Academy: cf. e.g. the passage just quoted N, 1087b4 sqq.; also Λ, 1075a32-4: *οἱ δὲ τὸ ἕτερον τῶν ἐναντίων ὕλην ποιοῦσιν, ὥσπερ οἱ τὸ ἄνισον τῷ ἴσῳ ἢ τῷ ἑνὶ τὰ πολλά;* cf. I, 1055b30-2 to be quoted below; also N, 1091b31-2: *καὶ τὸ ἐναντίον στοιχεῖον, εἴτε πλῆθος ὂν εἴτε τὸ ἄνισον καὶ μέγα καὶ μικρόν* etc.; further N, 1092a35-b1: *ἐπεὶ τοίνυν τὸ ἓν ὁ μὲν τῷ πλήθει ὡς ἐναντίον τίθησιν, ὁ δὲ τῷ ἀνίσῳ, ὡς ἴσῳ τῷ ἑνὶ χρώμενος* etc. In such passages Inequality enters as the other Principle for the Platonic theory. The want of Xenocratean doctrine in such passages may well indicate a time of composition preceding the Xenocratean Scholarchate. So, particularly emphatic, in I.
6. But the ascription of the Indefinite Dyad to Xenocrates (as well) is somehow overplayed. If he did cling to it, he would seem to do so out of reverence for Plato. We are told that his Other (second) God was characterised as *Dyad*. And he preferred calling the Other Principle *τὸ ἀέναον*, the Everflowing, Everchanging. It would seem that the Indefinite Dyad is strictly a Platonic *ἴδιον*, perhaps an essential feature. No doubt there would have existed some Academics who might faithfully adhere to it. But no, it seems, major ones.
7. One could drop in that view (unacceptable from the Platonic standpoint) entirely the essential seriality of number and conceive it as set (collection) of units. This might be the Speusippean position (with monads = *τὰ ἕνα*), or something which Speusippus was logically forced to accept.
8. Aristotle himself argues for such construal in his own theory of opposition (*ἐναντίωσις*). V. I, 7; 1057a18: *ἐπεὶ δὲ τῶν ἐναντίων ἐνδέχεται εἶναί τι μεταξὺ καὶ ἐνίων ἔστιν,* ἀ ν ά γ κ η ἐ κ τ ῶ ν ἐ ν α ν τ ί ω ν ε ἶ ν α ι τ ὰ μ ε τ α ξ ύ . 1057b2: *εἰ δ᾽ ἐστὶν ἐν ταὐτῷ γένει τὰ μεταξύ, ὥσπερ δέδεικται, καὶ μεταξὺ ἐναντίων,* ἐ ν ά γ κ η α ὐ τ ὰ σ υ γ κ ε ῖ σ θ α ι ἐ κ τ ο ύ τ ω ν τ ῶ ν ἐ ν α ν τ ί ω ν . 1057b23 sqq.: *ἐκ δὲ τῶν ἐναντίων γίγνεταί τι ὥστ᾽ ἔσται μεταβολὴ εἰς τοῦτο πρὶν ἢ εἰς αὐτά·* ἑ κ α τ έ ρ ο υ γ ὰ ρ κ α ὶ ἧ τ τ ο ν ἔ σ τ α ι κ α ὶ μ ᾶ λ λ ο ν . *μεταξὺ ἄρα ἔσται καὶ τοῦτο τῶν ἐναντίων. καὶ τἆλλα ἄρα* π ά ν τ α σ ύ ν -

θετα τὰ μεταξύ. τὸ γὰρ τοῦ μὲν μᾶλλον τοῦ δ' ἧττον *σύνθετόν πως ἐξ ἐκείνων ὧν λέγεται εἶναι τοῦ μὲν μᾶλλον τοῦ δ' ἧττον. ἐπεὶ δ' οὐκ ἔστιν ἕτερα πρότερα ὁμογενῆ τῶν ἐναντίων,* ἅπαντ' ἂν ἐκ τῶν ἐναντίων εἴη τὰ μεταξύ, ὥστε καὶ τὰ κάτω πάντα, καὶ τἀναντία καὶ τὰ μεταξύ, *ἐκ τῶν* πρώτων ἐναντίων *ἔσονται. ὅτι μὲν οὖν τὰ μεταξὺ ἔν τε ταὐτῷ γένει πάντα καὶ μεταξὺ ἐναντίων καὶ* σύγκειται ἐκ τῶν ἐναντίων *πάντα δῆλον.* For Aristotle there is no disctinction between ideal opposites (*τὰ πρῶτα ἐναντία*) and corresponding real elements that constitute sensible (this-wordly) reality (*τὰ κάτω πάντα*). The principles in each case are the operative elements in the composition of sensible things.

9. For Stenzel's interpretation (*ἔξω τῶν πρώτων* = excepting the One and the Dyad) not much can be said. One is not a number. – For the case of the odd numbers, v. *Met.* 1091a23-24: *τοῦ μὲν οὖν περιττοῦ γένεσιν οὔ φασιν, ὡς δηλονότι τοῦ ἀρτίου οὔσης γενέσεως.*
10. V. *supra* p. 8. Cf. I, *Met.* 1053a30: *ὁ δ' ἀριθμὸς πλῆθος μονάδων.* (Cf. the preceding analysis, 1052b14-1053a30).So, B, 1001a26-7: *ὁ μὲν γὰρ ἀριθμὸς μονάδες, ἡ δὲ μονὰς ὅπερ ἕν τί ἐστιν.* Cf. 1001b4: *ἐκ τίνος γὰρ παρὰ τὸ ἓν ἔσται αὐτὸ ἄλλο ἕν; ἀνάγκη γὰρ μὴ ἓν εἶναι·* ἅπαντα δὲ τὰ ὄντα ἢ ἓν ἢ πολλὰ ὧν ἓν ἕκαστον.
11. Of course Aristotle maintains (*Met.* 1080b30-1): *μοναδικοὺς δὲ τοὺς ἀριθμοὺς εἶναι πάντες τιθέασι, πλὴν τῶν Πυθαγορείων, ὅσοι τὸ ἓν στοιχεῖον καὶ ἀρχήν φασιν εἶναι τῶν ὄντων· ἐκεῖνοι δ' ἔχοντας μέγεθος.* This *πάντες* may include Plato *only* by an overextention of the meaning of monadic number. Aristotle betrays himself in 1083b16-7: *ἀλλὰ μὴν ὅ γ' ἀριθμητικὸς ἀριθμὸς μοναδικός ἐστιν.* "Arithmetical, to be sure (*ὅ γε*), number is monadic".
12. In such a program odd numbers are either left out ungenerated (1091a23-4); or explained by means of a *different* process, where the one additively transforms an even number into its following odd (v. *infra*, pp. 30-1). All this talk cannot in effect but refer to mathematical number.
13. The Speusippean *πλῆθος* as the Other Principle is worse off in this connection: for it would entail the logically simultaneous generation of the indefinite multitude of monads – a supposition flawed in two at least basic respects: *first*, it would cancel the successive derivation of numbers, i.e. it would contradict the essential *seriality* of number which requires the successive generation of numbers; and, *secondly*, it would necessitate the actual existence of infinity, i.e. the complete reality of indefiniteness as such.
14. Though, again, not quite! If the One was in an odd number right in its "middle", how could it also be in another odd number, in fact in all (!) odd

numbers? Cf. 1084a36-7 quoted immediately below. Better to say that the One constitutes *τὸ περιττὸν αὐτό*.

15. V. A.L. Pierris, "The Metaphysics of Politics in the *Politeia*, *Politikos* and *Nomoi* Dialogue Groups", n. 29, in A. Havlicek, F. Karfik (eds.) *The Republic and the Laws of Plato* (Proceedings of the First Symposium Platonicum Pragense), 1998, pp. 136-7. The aporematic treatment of the question regarding the generation of (geometrical) magnitudes in B4, 1001b19-25 points unmistakeably in the same direction. Aristotle finds difficulty with those who derive number from the One and *ἄλλου μὴ ἑνός τινος* – hence with Plato, as the assumption of *ἀνισότης* for the status of the Other Principle (b23) makes certain. Why is it, Aristotle wonders, that from these ultimate principles in one case there come the numbers, in another magnitudes? (*ἀλλὰ μὴν καὶ εἴ τις οὕτως ὑπολαμβάνει ὥστε γενέσθαι, καθάπερ λέγουσί τινες* (sc. (chiefly) Plato), *ἐκ τοῦ ἑνὸς αὐτοῦ καὶ ἄλλου μὴ ἑνός τινος τὸν ἀριθμόν, οὐθὲν ἧττον ζητητέον διὰ τί καὶ πῶς ὁτὲ μὲν ἀριθμὸς ὁτὲ δὲ μέγεθος ἔσται τὸ γενόμενον, εἴπερ τὸ μὴ ἓν ἡ ἀνισότης καὶ ἡ αὐτὴ φύσις ἦν*. And he concludes (b24-5): *οὔτε γὰρ ὅπως ἐξ ἑνὸς καὶ ταύτης οὔτε ὅπως ἐξ ἀριθμοῦ τινὸς καὶ ταύτης γένοιτ' ἂν τὰ μεγέθη, δῆλον*. Certainly, it would be unclear how both numbers and magnitudes could be derived directly from the same two principles. *But the other alternative he gives is the way to the solution of the difficulty*. On the other hand, Aristotle here means that he finds defective the specific derivation of the magnitudes according to Platonic doctrine.
16. The expression *ἰδέα τοῦ ἑνὸς* should put at rest the vast amount of inquietude felt, e.g., with regard to the *Idea* of Goodness in the *Republic*, which still is *ἐπέκεινα οὐσίας*, *beyond the world of ideas* and a cause of being. The problem is "logical", in Aristotle's depreciatory sense. The One is principle of (ideal) number. And yet it is the first of it. But then the first-x is x-in-itself, the very idea of x-ness: it is the essence and cause of all x's. This is why Aristotle makes such an ontological fuss with his notion of *πρὸς ἓν λέγεσθαι*.
17. The view that we hear in connection with Speusippus, that the soul is the *ἰδέα τοῦ πάντῃ διαστατοῦ* would make 4 to be the essence of soulness. If we drop the term *ἰδέα*, this could conceivably be Speusippean doctrine but for his alleged segregation (principle-wise and essence-wise) of the different realms of existence. For various reasons, the view cannot be Platonic. I would propose that it reflects the preoccupations of somebody holding on to the "classical" theory of ideas even to the detriment of the theory of principles and of Pythagoreanism. A *φίλος τῶν εἰδῶν*?
18. This schema articulates Platonically what Aristotle as Platonist (at the time when he wrote I, under the Speusippean Scholarchate) maintains, that all

oppositions are reducible to the principal one between the One and *the Many*; 1055b26: *ὥστε φανερὸν ὅτι ἀεὶ θάτερον τῶν ἐναντίων λέγεται κατὰ στέρησιν· ἀπόχρη δὲ κἂν τὰ πρῶτα καὶ τὰ γένη τῶν ἐναντίων, οἷον τὸ ἓν καὶ τὰ πολλά·* τὰ γὰρ ἄλλα εἰς ταῦτα ἀνάγεται. But he does not explain how is this reduction achieved. V. I, 1057b29 sqq.: *ἐπεὶ δ' οὐκ ἔστιν ἕτερα πρότερα ὁμογενῆ τῶν ἐναντίων, ἅπαντ' ἂν ἐκ τῶν ἐναντίων εἴη τὰ μεταξύ,* ὥστε καὶ τὰ κάτω πάντα, *καὶ τἀναντία καὶ τὰ μεταξύ, ἐκ τῶν πρώτων ἐναντίων ἔσονται.* (The *κάτω πάντα*: very Platonic indeed!).

19. In fact, however, the "classical" theory of ideas, made (so to speak) to a degree independent of its Pythagorean framework of stabilization, led some of its adherents so much astray as to become inconsequent to the first principles by literally following it. So much we are left to assume by Aristotle in M, 1079a14-9, together with an extremely important example: *ὅλως τε ἀναιροῦσιν οἱ περὶ τῶν εἰδῶν λόγοι ἃ μᾶλλον βούλονται εἶναι οἱ λέγοντες εἴδη τοῦ τὰς ἰδέας εἶναι· συμβαίνει γὰρ μὴ εἶναι πρῶτον τὴν δυάδα ἀλλὰ τὸν ἀριθμὸν καὶ τούτου τὸ πρός τι καὶ τοῦτο τοῦ καθ' αὑτό,* καὶ πάνθ' ὅσα τινες ἀκολουθήσαντες ταῖς περὶ τῶν εἰδῶν δόξαις ἠναντιώθησαν ταῖς ἀρχαῖς. In A 990b17-22, Aristotle has almost verbally the same passage but with a significant difference: now it is *we* who maintain that there exist ideas, *ὅλως τε ἀναιροῦσιν οἱ περὶ τῶν εἰδῶν λόγοι ἃ μᾶλλον εἶναι* βουλόμεθα *οἱ λέγοντες εἴδη τοῦ τὰς ἰδέας εἶναι* etc. In A Aristotle speaks as an Academician, embroiled in intraacademic disputations and debates.
20. To the One belongs sameness, similarity, equality; the opposites to the *πλῆθος*, I, 1054a29 sqq.: *ἔστι δὲ τοῦ μὲν ἑνός, ὥσπερ ἐν τῇ διαιρέσει τῶν ἐναντίων διεγράψαμεν, τὸ ταυτὸ καὶ ὅμοιον καὶ ἴσον, τοῦ δὲ* πλήθους *τὸ ἕτερον καὶ ἀνόμοιον καὶ ἄνισον.* (In the time of I, Aristotle seems to be in the Academy under the Scholarchate of Speusippus).
21. In a quotation of the same passage *supra* I have retained the mss. reading and interpreted it with Bonitz. Both renderings are possible – and the philosophical interpretation of the statement involved is independent of whichever we opt for.
22. Cf. N, 1091b30-1092a5: *ταῦτά τε δὴ συμβαίνει ἄτοπα* (i.e. if the first principle is identified with the Good), *καὶ τὸ ἐναντίον στοιχεῖον, τὸ κακὸν αὐτό* (*διόπερ ὁ μὲν* – sc. Speusippus – *ἔφευγε τὸ ἀγαθὸν προσάπτειν τῷ ἑνὶ ὡς ἀναγκαῖον ὄν, ἐπειδὴ ἐξ ἐναντίων ἡ γένεσις, τὸ κακὸν τὴν τοῦ πλήθους φύσιν εἶναι· οἱ δὲ* – sc. Plato and the orthodox Platonists – *λέγουσι τὸ ἄνισον τὴν τοῦ κακοῦ φύσιν*)*· συμβαίνει δὴ πάντα τὰ ὄντα μετέχειν τοῦ κακοῦ ἔξω ἑνὸς αὐτοῦ τοῦ ἑνός,* καὶ μᾶλλον ἀκράτου μετέχειν τοὺς ἀριθμοὺς ἢ τὰ μεγέθη (and, *a fortiori*,

than the sensible things which are further removed from the ultimate first principes), *καὶ τὸ κακὸν τοῦ ἀγαθοῦ* χ ώ ρ α ν *εἶναι, καὶ μετέχειν καὶ ὀρέγεσθαι τοῦ φθαρτικοῦ· φθαρτικὸν γὰρ τοῦ ἐναντίου τὸ ἐναντίον. καὶ εἰ ὥσπερ ἐλέγομεν ὅτι ἡ ὕλη ἐστὶ τὸ δυνάμει ἕκαστον, οἷον πυρὸς τοῦ ἐνεργείᾳ τὸ δυνάμει πῦρ, τὸ κακὸν ἔσται αὐτὸ τὸ δυνάμει ἀγαθόν.*. Here the identification of the second principle with the receptacle is implicitly presupposed.

23. One might argue that in this direction also points the fact that for Plato the receptacle is being (quasi-) comprehended by a kind of *νόθος λογισμός*: *such must be the understanding of indeterminacy and indefiniteness*. But an appropriate relationship between two principles of inteterminacy will also save the phenomena.
24. To which latter statement, Syrianus exclaims (936b10-5 Usener): *εὐφήμει· τὸ γὰρ ἄνισον ὃ ἐπὶ τῆς αἰτίας τῶν ὄντων παρελάμβανον πρεσβύτερον ὂν καὶ τῆς ἐν τοῖς γένεσι τοῦ ὄντος ἑτερότητος* (i.e. of the otherness in the ideal world) *οὐ μόνον πανάριστον ἔλεγον εἶναι, ἀλλὰ καὶ τῶν παναρίστων γεννητικώτατον. εἰ δέ γε πρὸς τοῖς ἐσχάτοις καὶ ἐνύλοις ἐστί τι παρ᾽ αὐτοῖς ἄνισον κακιζόμενον, οὐδὲν τοῦτο πρὸς τὴν γεννητικὴν τοῦ πλήθους αἰτίαν, εἰ μὴ ὅτι ἐκεῖθέν πως καὶ τοῦτο*. How exactly «*πως*» is the substantial problem, to which I have tried to provide an adequate solution.