Iγ2: Iota and the attributes of being[1]

Iγ2a: Iota on unity, and consequences for the ἀρχαί

There is no perfect place for discussing Metaphysics Iota, or MN. My main reason for discussing Iota here (and then MN in the next section, Iγ3) is that Iota draws heavily on B, Γ and Δ but not on any subsequent book (although it does refer back to Z for one conclusion), and that Iota is in turn not used in any other book except in N and in one brief and purely negative passage in Λ. By contrast, Λ draws very heavily on Θ, and discussing Iota between Θ and Λ would mean breaking off continuous threads of argument. Of all the books after Δ, Iota is the book most closely connected with Δ, picking up many of the terms discussed in Δ and often in ways that echo and deepen the Δ discussions. Iota is one of two main branches of argument coming out of ΓΔ, investigating unity and its contrary attributes and their causes, while EZHΘ investigate the various senses of being and their causes. (MN are officially about the Academics' unmoved οὐσίαι and their causes, not about universally extended predicates like being and unity; but since most of MN is about numbers and their ἀρχαί, it will naturally be connected with the discussion of the causes of oneness and manyness.) The way that Iota draws on Δ, and uses it to resolve aporiai about the ἀρχαί (and to fill out the program for a universal science from Γ1-2) is paradigmatic for the relation of the whole Metaphysics to Δ, and helps to bring out what Δ is for; the relationship is easier to trace here because Iota, although much shorter than EZHΘ, apparently draws on a broader range of terms from Δ, perhaps also because Aristotle has made the connections more explicit here. In any case, my main interest will be in the place of Iota in the larger argument of the Metaphysics, how Iota uses earlier books and how it supports conclusions (entirely negative conclusions, as it turns out) about the ἀρχαί, and how far its function in the larger argument explains its internal argument-structure.

The implicit view of many authors seems to be that Iota does not, in fact, contribute much to the overall plan. Ross' introduction to his edition of the Metaphysics (much of it also printed as the metaphysics chapter of his book Aristotle), which paraphrases at least the high points of all the other books, manages to skip Iota completely;[2] not that Ross has anything against Iota, but he

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[1]d collect brief accounts of Iota given above, in Iβ2 or Iγ1, d avoid duplication, here or with Iγ2bc. main earlier accounts are in Iβ2ab pp.18-19 at some length (also briefly around p.5) and then in Iγ1ab, a bit more scattered, but esp. in the discussion of Δ6,9-10 around pp.31-3, also a comment about where it goes in the Metaphysics and how I'll treat it in the proem to Iγ1a {which should now be revised}, also more scattered comments where I talk about the functions of Δ in later books (not only Δ6,9-10 but also τέλειον etc., noted that Iota refers back to Δ more than other books), also discussion of the forward promises of Γ2 as referring forward both to Δ and to Iota. also Iβ2ab pp.15-19 has a discussion of texts from Plato on unity as a universal attribute of being, and the regress of unity and being in Parmenides Hypothesis 2, with some promissory notes to Iota (although Iota, unlike Γ2, doesn't seem much interested in the relationship between unity and being); Iβ4 pp.14-15 has some discussion of the one and the others in Parmenides Hypothesis 3; some discussion of B#11 in Iβ3 pp.19-21, maybe touching on dialectical and mathematical uses of the one as ἀρχή, and briefly touching on Aristotle's interpretation of (the historical) Parmenides p.20 and n34, citing some texts but not going into sufficient detail. the account of B#11 in general is probably not detailed enough (there's also some discussion of the being-unity regress further up in my account of B#7); there's further discussion of B#11 in Iβ4, but there exclusively with reference to the meanings of existence καθ' αὑτό or otherwise … note Halper in BACAP for an alternative interpretation of Iota; what is the state of his big book?

[2]a slight exaggeration, in that (i) pp.xxii-xxiii he discusses the question of whether Iota belongs in the Metaphysics and in what order (but nothing about anything Aristotle actually does in Iota), and (ii) he doesn't discuss the contents of α, Δ or (of course) K either, nor has he got that much to say about A (presumably he thinks it is merely historical

discusses in series what he takes to be the key topics of the Metaphysics (ideas and numbers, substance, substratum, essence, universal, actuality and potentiality, theology, etc.), and Iota seems not to have anything to say about them. Joseph Owens, in The Doctrine of Being in the Aristotelian Metaphysics, devotes about a page to Iota (pp.416-7, plus half a page on where Iota goes in the sequence of books, p.99); of course, this is because Owens' book is about being, and Iota does not say much about being, but Owens also thinks that the Metaphysics is about being, and so he must think that Iota is marginal in the Metaphysics. And yet Iota is in fact unusually tightly integrated into the Metaphysics: it has far more back-references to Δ than any other book, it faithfully restates B#11 (Iota 2 1053b9-16), referring back to it explicitly (ἐν τοῖς διαπορήμασιν b10) and giving a solution, and Γ2's promise of a discussion of unity and its contrary attributes is delivered only in Iota. So it is a bit curious when Ross says that Iota is "a more or less self-contained treatise, dealing with the nature of unity and of kindred conceptions," but also "belongs to the main treatise, though somewhat loosely connected with the rest of it" (AM I,xxii-xxiii).[3]

The source of Ross' difficulty is not hard to find. Iota is in fact separate from the account of being in EZHΘ, and more specifically from the account of substance in ZH; and a mistaken reading of the Metaphysics that sees the whole thing as a treatise on being and specifically on substance will have to see Iota as detached from the main body of the Metaphysics.[4] This thought turns up in Ross' curious attempt to move Iota to the end of what he sees as the connected Metaphysics ("ABΓEZHΘMNI," AM I,xxiii), moving it after MN partly because the short account of the one as a measure in N1 does not explicitly refer back to the fuller account in Iota 1-2, but mostly because "otherwise it interrupts the discussion of the nature of substance which is carried on in ZHΘMN" (ibid.). But there is no such continuous discussion of substance, since Θ explicitly sets itself apart from the account of substance (Θ1 1045b27-35, Θ8 1049a27-9, discussed in IIIα1 below), and also the first sentence of N announces a transition from an account of (eternal) substances to an account of their ἀρχαί. The truth is that the theme of substance unifies only ZH, and that the theme of being unifies only the block EZHΘ (governed by Δ7's distinction of the four senses of being). But both EZHΘ and Iota are contributions to the investigation of being and its per se attributes, proposed in Γ1-2 and supported by the clarifications and distinctions of the meanings of being and each of its attributes in Δ, especially Δ6-10. The branch that comes out of especially Δ7-8 on being and substance (supplemented by

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rather than properly philosophical). he has plenty about BΓEZHΘΛMN; in the Aristotle book, it's a continuous paraphrase of the highlights of ABΓEZHΘΛ in sequence (MN have been sacrificed)

[3]Ross is here mainly following Bonitz; see the Zeller paper for different 19th century views about how much of the Metaphysics goes together; also see Iα5 above, with which there's some risk of duplication here; and readers here can be referred back to that section. Frede-Patzig I,29 actually say that Iota is an independent treatise (but maybe they think Aristotle then later tried to integrate it into the whole?). d collect what Jaeger 1912 says: his view is basically that it's a fragment that was supposed to be integrated into the Hauptvorlesung (as opposed to ZHΘ, which were originally completely independent); in 1923 he says very little about Iota and seems throughly confused about it (mostly the paragraph top of p.202 ET, see also p.204). Reale is a bit better, four pages, pp.224-8 ET, and much of what he says is right; but he too has no real interest in the content of the book, only in where it goes in the scheme. in C.D.C. Reeve's Substantial Knowledge: Aristotle's Metaphysics, the index locorum contains not a single passage from Iota

[4]note on Jaeger 1912 on Iota; he's enabled to see its connections with the Hauptvorlesung, where his predescessors had not, because he takes ZHΘ out of the Hauptvorlesung. but we don't have to go that far: we can see that EZHΘ, like Iota, are carrying out branches of the project proposed in ABΓΔ, without making ZHΘ central to the Metaphysics and so supposing that for Iota to be connected to the main project of the Metaphysics it must be connected to those books

Δ12 on δύναμις and so on) leads to EZHΘ, while the branch that comes out of especially Δ6,9-10 on one, many, same, other, different, opposites and contraries (supplemented by Δ16 perfect/complete [τέλειον], Δ22 privation, and so on) leads to Iota: when Iota refers back to "the λόγοι about substance and about being" (Iota 2 1053b17-18) as to a discussion already completed, it is referring back from the branch out of Δ6,9-10 to the branch out of Δ7-8.

Furthermore, as we have seen, both these branches coming out of ΓΔ are contributions to the investigation of ἀρχαί set out in AB: when Γ1 proposes an investigation of being and its per se attributes, it is on the ground that the causes of these maximally universal things will lead to "the ἀρχαί and the highest causes" (1003a26-8). EZHΘI speak most often not in terms of ἀρχαί but of priority, separate or inseparable existence, and so on (Θ1 defines δύναμις as a kind of ἀρχή, 1046a9-11, Iota 1 says that the one is an ἀρχή by being a measure, 1052a20-24, and Iota 7 says that contraries are ἀρχαί in their genus, 1057a2-3, but none of these will turn out to be ἀρχαί in the strict sense). But these conclusions about priority and separability are readily converted into conclusions about the ἀρχαί, and Aristotle does so convert them in ΛMN, where he draws the consequences of the investigations of EZHΘI for the questions about the ἀρχαί raised in AB. In discussing Iota here, and then in discussing ZH in Part II and Θ in Part III, I will try to show how the internal argument-structure is determined by their function in the investigation of ἀρχαί--where, in Iota in particular, this will mean the investigation of Academic claims about the one and about some ἀρχή contrary to the one, which Aristotle will examine in order to reject them. This is not a matter of artificially imposing a perspective from outside on Iota: Iota was never intended as a self-contained treatise, and by referring to B#11 and offering a solution, it is inscribing itself in B's program of resolving aporiai about the ἀρχαί. It is obvious enough that the discussion of unity in Iota 1-2 is all leading up to the anti-Platonic solution of B#11 in Iota 2. And we will see that the rest of the book, Iota 3-10, makes overall sense only as a means to examining, and refuting, Platonic and Academic accounts of an ἀρχή contrary to the one, or of a pair of contrary ἀρχαί such as the great and the small. (It is probably not very controversial that Iota 3-10 does not make overall sense without this Academic perspective; what may need more proof is that it makes sense with it.) A distaste for this murky Academic background leads many readers to ignore IMN and to concentrate on the more positive ZHΘΛ, which seem closer to the concerns of later philosophers. And indeed ignoring IMN is not fatal: most of ZHΘΛ (but not the final chapter, Λ10) can be understood without IMN. But leaving out IMN means leaving out an important part of Aristotle's project, the criticism which provides the motivation for his positive project of replacing earlier ἀρχή-theories in Λ; it also means leaving out excellent examples of Aristotle's argument-strategy in action. And ZHΘΛ are also in large part negative, and are better understood as responses to Academic (and sometimes pre-Socratic) projects than as contributions to later discussions; so that a study of Iota, its use of earlier books and its contribution to solving aporiai about the ἀρχαί--solutions sometimes made explicit only in MN or in Λ10--will give a useful scale-model for understanding ZHΘ, their use of earlier books, their contributions to solving aporiai from B, and their relation to Λ.

It is often said, in surveys of the Metaphysics, that Iota is about unity. It would be more accurate to say that it is about the attributes of being in general (although the connection with being is usually not made explicit, indeed Aristotle may be avoiding a discussion of being): only Iota 1-2 are directly about unity. But it is true that unity has a privileged status, almost coequal with being ("being and one are most of all things predicated universally," Iota 2 1053b20-21; "being is not deprived of unity nor unity of being, but these two are always coextended across all things," Plato Parmenides 144e1-3, etc.). The same privileged status is apparent in Γ2's strategy

for arguing that a single science treats being and its per se attributes: first, a single science treats being, then the science that treats being must also treat its coextensive attribute unity, then the science that treats unity must also treat its opposite plurality, then, finally, all the other attributes can be reduced to unity or plurality. Iota 3 takes up the same reduction to unity and plurality, citing the "written" or "drawn" Division or Selection of Contraries ("as we also wrote/drew [διεγράψαμεν] in the Division of Contraries," 1054a30-31, cp. Γ2 1004a1-2, "we have considered these things in the Selection of Contraries").[5] Iota 1-2 treat unity (picking up from Δ6), while, as we will see, Iota 3-10 concentrate heavily on attributes from the opposite column. Iota 3 gives the general scheme of attributes and discusses the main terms from Δ9-10 (same, other, different, contrary, also like and unlike), and then Iota 4 focuses on contrariety, comparing it with the other modes of opposition from Δ10, inquiring which kinds of opposites have intermediates, and arguing that contrariety is not only perfect/complete [τελεία] difference but also perfect/complete privation, drawing in each case on the relevant chapters of Δ. Iota 5-6 apply this account of contraries and other kinds of opposition to inquire into the modes of opposition between the equal and the great and small and between unity and plurality. Then Iota 7 argues that all intermediates are composed or derived from contraries, and Iota 8-9 investigate otherness in species (picking up especially on Δ10 1018a38-b8), with the final chapter Iota 10 a corollary concluding that corruptible and incorruptible things must be other in species, so that there cannot be an incorruptible Form Man conspecific with corruptible human beings.

In the context of the larger argument, the contribution of Iota 1-2 is to show that there is no one-itself but only, in each genus, an appropriate unit inseparable from the genus, and therefore that the one is not an ἀρχή in the strict sense; likewise the contribution of Iota 3-4 is to show that there can be no otherness or difference or contraries apart from some genus, so that none of these things can be ἀρχαί in the strict sense. The function of Iota 5-6 is clearly negative, in arguing against Platonic and Speusippean theories of the great and small or plurality as an ἀρχή contrary to the one. Iota 7-9 are "positive," but not properly metaphysical (indeed Iota 9 is clearly physical), to the extent that they show how other things are derived from the contrary ἀρχαί-in-a-weak-sense, and even here Aristotle draws the negative corollary Iota 10 against the Forms. And yet readers tend to remember all of Iota as a theory of unity. The reason probably comes from a preconception of how a book like Iota should function in the Metaphysics: just as ZHΘ should survey the modes of being of various things, leading up to the conclusion that only God is being in the fullest sense, so Iota should survey the modes of unity of various things, leading up to the conclusion that only God is one in the fullest sense. But Iota completely fails to satisfy this expectation (as--we shall see later--do ZHΘ). Iota's account of unity, and of various attributes in the other column, is entirely subordinated to an investigation of the ἀρχαί, and the result of that investigation is a negative judgment on Academic theories of the ἀρχαί, not any positive theology. The only passage in Λ which apparently does (implicitly) refer to Iota, Λ7 1072a32-4, makes negative use of its account of unity, apparently to conclude that God is not one; the major use of Iota on unity (again without explicit reference) is N's argument against the one-itself as an ἀρχή. The expectation that Iota should contribute to "theology," or, better put, to archeology, is

[5]presumably much of this goes back to Plato's procedure, in the second part of the Parmenides, for deriving a list of contrary pairs of attributes from unity and plurality: thus the one-being of the second Hypothesis is one and many, whole and parts, limited and unlimited, in itself and in another, at rest and in motion, same and other [ἕτερον], like and unlike, touching and not touching, equal and unequal (greater and smaller in magnitude and also more and fewer in number [note μέτρα mentioned here]), plus having temporal attributes and being knowable and nameable

not wrong, but on unity, as on its opposites, the contribution will be negative, and will be embedded in a context of odd-sounding Academic theories.

From B#11 to Iota 1-2

Unity is at least as important as being in the controversies about the ἀρχαί that Aristotle discusses in Metaphysics B. It is treated as a positive ἀρχή in Plato's Parmenides and in every Academic account that Aristotle mentions, despite all disagreement about whether its contrary privative ἀρχή is the other or plurality or the unequal or the dyad or the infinite or the great and the small. Being may also be an ἀρχή, but unity seems better suited to the role, since it is easier to imagine how other things--in the first instance, numbers--can be derived from unity (or from unity and some contrary) than how they can be derived from being. Being and unity are the most universal things, and so are eternal and prior by Plato's test to everything else, and this makes it plausible that they are ἀρχαί; but "if someone posits the ἀρχαί that seem most of all to be unmoved, [namely] being and the one, then, first, if these do not signify a this and an οὐσία, how will they be separate and καθ᾽ αὑτάς? But we expect the first and eternal ἀρχαί to be of this kind [sc. separate and καθ᾽ αὑτάς]" (K2 1060a36-b3, from the K parallel to B#11, cited Iβ4 above). Thus B#11 raised the aporia "whether being and the one are οὐσίαι of things-that-are, and whether each of these is not, being something else, one or being [καὶ ἑκάτερον αὐτῶν οὐχ ἕτερόν τι ὂν τὸ μὲν ἓν τὸ δὲ ὄν ἐστιν], or whether we must ask what being and the one are, there being some other underlying nature [of which these things are predicated]" (1001a5-8, cited Iβ4): as we saw in Iβ4, Aristotle's point is that if being or the one exists, not because there is something whose nature is just to-be or to-be-one, but because there is some other underlying nature of which being and unity are predicated, then being and unity will be posterior to this underlying nature, and will not themselves be ἀρχαί. Aristotle now restates this aporia, explicitly referring back to B (ἐν τοῖς διαπορήμασιν, 1053b10) and following it very closely, now mentioning only the case of unity and not that of being, at Iota 2 1053b9-16. But he had already answered this aporia in Z16:

> Since one is said in the same way as being, and one [thing] has one οὐσία, and things whose οὐσίαι are numerically one are numerically one, it is clear that neither the one nor being can be the οὐσία of things, just as being-a-στοιχεῖον and being-an-ἀρχή cannot, rather we ask what the ἀρχή is, in order to reduce it to something better known.[6] Being and one are more the οὐσία of these things than ἀρχή and στοιχεῖον and cause,[7] but these too [cannot be οὐσίαι], since nothing else that is common can be an οὐσία either: for the οὐσία belongs to nothing

[6]the reference is back to B#11 1001a12ff, which cite, or refer back to citation and disussion in Iβ4. the point is that, if the one does not exist καθ᾽ αὑτό, to say that something is one is not to say what it is, rather we must ask what it is in the hope of finding some other underlying nature, just as if we are told that something is an ἀρχή, we must ask what it is that is the ἀρχή. cite the bit from N1, if X, ἕτερόν τι ὄν, is X, then X cannot be an ἀρχή, and refer to discussion in Iβ3-4. (Aristotle uses the analogy between being-one and being-ἀρχή or the like elsewhere--Γ2, esp Iota 1). there is presumably a further implication here for the question of the ἀρχή--namely that while the ἀρχή may be one, saying that the ἀρχή is the one is not much more helpful than saying that the ἀρχή is the ἀρχή. Frede-Patzig, unlike Ross, notice the B#11 passage, but they perversely refuse to draw the obvious conclusion. they do not, however, notice the Iota 1 parallel, which should put the matter beyond question--see below

[7]or take "μᾶλλον ... τούτων οὐσία" as "more οὐσία than these"? that seems more natural, but then there's anacoluthon with ἢ later in the line: either τούτων or ἢ would be superfluous

> except to itself[8] and what has it, that of which it is the οὐσία. Again, one [thing] would not be present [ὑπάρχειν] in many [places or subjects] at once, but what is common is present in many [subjects] at once: so it is clear that none of the universals is present separately παρά the individuals. (1040b16-27)

And, indeed, Iota now clearly refers back to Z16's solution of the aporia: "if no universal can be an οὐσία, as has been said in the λόγοι about οὐσία and being, nor can this itself [sc. being?] be an οὐσία as some one thing beside [παρά] the many[9] (for it is common), but only a predicate, clearly neither can the one [be such an οὐσία]: for being and one are most of all things predicated universally" (Iota 2 1053b16-21). So we may wonder why Aristotle feels the need to take up the aporia again in Iota 1-2. The answer seems to be that the one can function as an ἀρχή in two different ways. In the first way, because "one," like "being," is necessarily predicated of everything else that exists, the one is something like a genus present in the λόγος of everything else, and nothing else can exist without the one's existing. In a second way, however, the one is specifically the ἀρχή or starting-point of the number-sequence, and the numbers are perhaps in some way generated from it: we might explain this by saying that since number is a "plurality of units [πλῆθος μονάδων]" (Iota 1 1053a30, cf. Z13 1039a12) and a unit is "just some one [ὅπερ ἕν τι]" (B#11 1001a26-7), or since a number is "plurality measured by [a] one [πλῆθος ἑνὶ μετρητόν]" (Iota 6 1057a3-4), number is therefore composed out of ones, and the one or ones are constituent στοιχεῖα of numbers. Aristotle is already distinguishing these two functions of the one as an ἀρχή in B#11 when he argues first that if the one and being are not οὐσίαι, none of the other universals will be οὐσίαι (1001a19-24), and then that if the one is not an οὐσία, the numbers will not exist separately either (1001a24-7). Now an Academic account of the ἀρχαί might well combine these two functions of the one: for instance, we might use the universality of the one to argue by Plato's test that the one is the first of all things, but then, in trying to generate other things out of this ἀρχή, we might use it in the first instance to generate the numbers, and then generate other things out of these. However, there may be tensions in combining these two functions:

> How is the one an ἀρχή? By being indivisible, they say. But the universal is indivisible, and so is the particular and στοιχεῖον, but in different ways, the former in λόγος [i.e. by not being divisible into parts prior to it in λόγος, such as genus and differentia] and the latter in time [i.e. by not being divisible into parts prior to it in time, such as material constituents].[10] So in which way is the one an ἀρχή? For, as has been said, the right angle seems to be prior to the acute angle [sc. in λόγος] and the acute angle also seems to be prior to the right angle [sc. in time], and each of these is one. They make the one an ἀρχή in both ways, but this is impossible: for in the former way [it is an ἀρχή] as form and οὐσία, in the latter way as a part and as matter .... The cause of the resulting error is that they were seeking [the ἀρχή] simultaneously out of the mathematical disciplines and

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[8]reading ἄλλ᾽ ἢ αὐτῇ A^b Bonitz Ross FP, or possibly ἄλλ᾽ ἢ αὐτῇ M Christ Jaeger against EJ

[9]reading, with Bonitz and Ross (but without great confidence) the text of EJ, οὐδ᾽ αὐτὸ τοῦτο οὐσίαν ὡς ἕν τι παρὰ τὰ πολλὰ δυνατὸν εἶναι. A^bM and a variant reported in E have οὐσία for οὐσίαν, making it the referent of αὐτὸ τοῦτο. Jaeger, following Bywater, adds ὅτι before the whole clause

[10]add note clarifying/justifying the brackets; perhaps refer to discussion in Iγ3? … the justification is partly from 1084b7-9 on the ways that the right or the acute angle is prior

> out of universal λόγοι, so that out of the mathematical disciplines they posited the one and the ἀρχή as a point (for the unit is a point without position ...), but on account of seeking universally they said that what is predicated is one, and is a part in this way [sc. as a part of the λόγος rather than as a material constituent]. But these cannot hold simultaneously of the same thing. (M8 1084b13-20, 23-7, 30-32)[11]

In Metaphysics Iota, in so far as it is devoted to the one, Aristotle is chiefly interested in examining the foundations of the claim of the one to be an ἀρχή in the second way, as a constituent στοιχεῖον. For this purpose the crucial descriptions of the one are that it is indivisible (as στοιχεῖα in general are, according to Δ3) and that it is a measure: "in all these [various genera that have measures] the measure and ἀρχή is something one and indivisible" (Iota 1 1052b31-2). It is of course especially numbers which must be composed of indivisible constituents, and which must be "measured" by them in the technical mathematical sense in which X is measured by Y iff X is the sum of finitely many equal constituents each equal to Y (e.g. "a prime number is [a number] measured only by the unit," Euclid Elements VIIdef12, and cf. Metaphysics Δ25 1023b12-17).[12] While Iota is not officially about numbers--Iota is about unity and plurality and the other attributes of being that are derived from them, while numbers and their ἀρχαί get their official treatment in MN--it will be clear that much of Iota is motivated by the problems about numbers that were raised already in B#11 and will not be finally resolved until MN: this motivation will be clear not only in Iota 1-2 but also in Iota 6 on the opposition between one and many, and Iota 5 on the opposition between the equal and the great and small.

From Δ6 to Iota 1: the one as indivisible and as measure

Aristotle officially addresses B#11 only in Iota 2. Iota 1 secures the foundations for solving the aporia by reviewing the account of unity in Δ6 (explicitly cited: τὸ ἓν ὅτι μὲν λέγεται πολλαχῶς, ἐν τοῖς περὶ τοῦ ποσαχῶς διῃρημένοις εἴρηται πρότερον, Iota 1 1052a15-16), and trying to show what things are one, and what it is for them to be one. Iota 1 draws very heavily on Δ6, compressing and systematizing its results, but the proportions are very different in Iota 1 from what they were in Δ6, because everything is being adapted to the end of solving B#11, explaining how the one is an ἀρχή, and showing that it is not an ἀρχή in the strict sense. Δ6 starts by weeding out things that are called one per accidens and showing how they derive from things that are called one per se (1015b16-34); then surveys different kinds of things that are called one per se and shows that each of them is so called because it is in some way indivisible or undivided [ἀδιαίρετον] or is somehow related to something that is ἀδιαίρετον (1015b34-1016b17); then much more briefly says that what it is to be one is to be a measure and an ἀρχή of numbers, with different ἀρχαί measuring different genera (1016b17-23); then says that each thing that is one (each kind of measure?) is ἀδιαίρετον either quantitatively (i.e., roughly, spatially) or in species, spelled out by distinguishing one in number, in species, in genus or by analogy (1016b23-1017a3), and finally notes that "many" will be said in different senses opposed to the different senses of "one" (1017a3-6).[13] In Iota 1 Aristotle immediately dismisses

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[11] for discussion and any textual issues see Iγ3

[12] are there better refs in the definitions of Elements VII?

[13] while the logical connections between these sections toward the end of Δ6 are not easy to follow, it seems that after "the one is not the same in all genera" (1016b21), the μὲν γάρ in b21, on different kinds of units, is picked up

things called one per accidens (1052a18-19), summarizes the results from Δ6 on the different ways that things are called one per se by being somehow ἀδιαίρετα (from the beginning of the chapter, Iota 1 1052a15, to 1052b1), and then spends the greater bulk of the chapter (1052b1-1053b8) developing the thesis that to be a one is to be a measure, at far greater length than in Δ6, in order to use it in solving B#11 in Iota 2. It will help if we look back to Δ6 for Aristotle's methods of supporting his claim that what is one per se is in some way ἀδιαίρετον. But this claim, so expressed, he shares with Plato; the emphasis in Iota 1 will fall on the disagreements with Plato both about what things are one and about what it is to be one, which will support the conclusion of Iota 2 that the one cannot exist by itself, but always as predicated of some other underlying nature and inseparable from the genus of which it is a measure. And his development of the ways that the many are opposed to the one, in Iota 3 1054a20-29 and Iota 6, will undermine Academic theses that the many (or, as will emerge from Iota 3-5, anything else) is a second ἀρχή existing by itself contrary to the one.

It is a striking feature of Δ6 that it insists on going back and forth between 1-place and 2-place uses of "one," as Δ7 goes back and forth between 1-place and 2-place uses of ὄν or ἔστιν. We may not find this so surprising in Δ7, but this is because we too (following e.g. Frege or Russell) recognize 1- and 2-place uses of "is" as equally fundamental, whereas we might not recognize "X and Y are one" as having any such fundamental status. But many of the examples in Δ6 are in this form: Coriscus and the musical are one; these logs are one (by being glued together); wine and olive oil are one, because they both (according to Timaeus 59e6-60a5) have water as their ultimate ὑποκείμενον; horse and dog are one in genus, while any two horses are one in species. Indeed, Aristotle seems to think that a sentence "Z is one" can generally be rewritten as "X and Y are one" (or "X and Y and W are one," or however many terms there may be), where X and Y are the things that are Z: "it is the same to say that Coriscus and the musical are one and that musical Coriscus [is one]" (1015b18-19).[14] We might describe "Coriscus and the musical are one" as an identity statement (taking "the musical" as an incomplete definite description), but not all of Aristotle's examples of "X and Y are one" can be analyzed so straightforwardly: in some examples X and Y are the same thing under different descriptions, but in (for instance) the example of the logs, X and Y are parts of the same thing.[15] But Aristotle treats all these examples as parallel, and in all cases he thinks that "X and Y are one" can be equally expressed as "Z is one": Coriscus and the musical are one iff musical Coriscus is one, the logs are one iff the house

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by "πανταχοῦ δὲ τὸ ἓν ἢ τῷ πόσῳ ἢ τῷ εἴδει ἀδιαίρετον" (b23-4), so that the unit-measures of b17-23 will be divided into those that are indivisible in quantity and those that are indivisible in species (or more generally in λόγος?); then the μὲν οὖν in b24, on different ways of being quantitatively indivisible, details the former, and then is picked up by the ἔτι δέ in b31, on unity in number, species, genus and analogy, detailing the latter

[14]the text says this explicitly if with Jaeger (following an imperative--"adde"--of Bonitz {but does Bonitz really mean "insert," or just "supply"?}), we read ταὐτὸ γὰρ εἰπεῖν Κορίσκος καὶ τὸ μουσικὸν <ἓν> καὶ Κορίσκος μουσικός, following what may be either a quote or a paraphrase in Alexander (Alexander, however, understands it differently: "it is the same to say that Coriscus and musical are one and that the musical occurs [συμβέβηκεν] to Coriscus, and that Coriscus [is] musical"--I think this is wrong given that Aristotle is supposed to be explaining what he has just said, "one is said in one way per accidens, in another way per se: per accidens,like Coriscus and the musical, and musical Coriscus"). if with Ross (probably rightly) we keep the text of the manuscripts, then (i) either we simply understand "ἕν" as the implicit predicate of "Coriscus and the musical" (and of "musical Coriscus"), or (ii) we translate "for it is the same to say 'Coriscus and the musical' and 'musical Coriscus'", in which case the point of the observation is that it is therefore the same to say "Coriscus and the musical are one" and "musical Coriscus is one" (so Ross takes it). so the basic point is the same on any of what I think are the three live options {Kirwan ad loc. discusses yet more possibilities}

[15]see Kirwan's discussion p.134

or whatever is built out of them is one, wine and oil and so on are one iff liquids are one (1016a22), or to give examples that do not require plural nouns, red wine and white wine are one iff wine is one (cp. 1016a20-21), horse and dog are one iff animal is one. This grouping of heterogeneous examples makes best sense against the background of Academic and "sophistic" discussions of "the problem of the one and the many": thus Philebus 14c1-15c3 distinguishes three different one-many problems, how Protarchus can be both one and also many by being large and white and so on (and large and small in different relations), how Protarchus can be both one and also many physical parts, and how a species- (or genus-)form can be one although also present in many individuals (or in many species).[16] In each case there is supposed to be an aporia or apparent contradiction, which we might try to resolve by distinguishing different senses of "one" and "many"; and three of Aristotle's types of examples, musical Coriscus, the logs, and horse and dog (or two horses) correspond immediately to the Philebus' examples.[17] In all cases, the question "how are the many one" encourages the equivalence between "how is Z [e.g. Protarchus or Animal] one" and "how are X and Y (and so on) one."

As we would expect if the cases are seriously to be treated as parallel, the sentence "this log and that log are one" can be rewritten as an identity statement, as "Coriscus and the musical are one" can be rewritten as "Coriscus is identical with the musical [thing]": it will have to take the form "the ***** including this log is identical with the ***** including that log," supplying some appropriate concept-word. In this example the appropriate concept is perhaps "maximal continuous body" or "maximal body that moves together as a whole."[18] So when "this log and that log are one" is rewritten in the form "Z is one," the predicate "one" is contextually equivalent to something like "(maximal) continuous body"--"this log and that log are a continuous body" or "this log and that log are [part of] a maximal continuous body"--and this kind of result, for Aristotle, is why the enterprise of going back and forth between 1-place and 2-place contexts is analytically fruitful. But Iota 1, in reviewing the results of Δ6, makes no mention of 2-place uses of "one": such uses were collected in Δ6 only as a means to an end. Thus Iota 1 sums up the results of Δ6 1015b34-1016b17 by saying that everything that is said to be one per se (1052a15-19) is so by being one of four things, "the continuous by nature and the whole and the individual and the universal" (1052a34-6). This can happen in various ways, which Aristotle describes in more detail in Δ6 than in Iota 1. Thus to say that these logs are one is to say that they together, or they together with yet other things, are some one thing, where for this thing to be one is roughly for it to be a (maximal) continuous body, or one that moves together when tugged; but this thing is one (and so these things are one) in a stronger sense if it moves together by nature rather than because it has been glued or tied together, and in a stronger sense if it has the form of a whole, presumably with a distinctive motion or activity as a whole beyond the motions or activities of the parts (Δ6 1015b36-1016a17, 1016b11-17, cp. Iota 1 1052a19-28). Likewise when X and Y are one e.g. in species or genus: horse and dog are one in

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[16]cross-reference to other discussions of easy and hard one-many problems: Iβ4c, IIγ, IIδ-ε?

[17]cp. Physics I,2-3 and discussion above (Iβ4c?). note that these could be (and were) restated as examples of being or of sameness, equivalences which are noted in Δ6,7,9

[18]I'm using "maximal" as mathematicians do: a maximal continuous body is a continuous body which is not part of any larger continuous body. thus the left half of the table is a non-maximal continuous body, but the table as a whole is a maximal continuous body (since the larger body consisting of the table together with the floor or the air in the room is not continuous, being united only by "contact" [ἁφή]). Aristotle has no word equivalent to "maximal" in this modern technical sense, and normally just says "continuous [body or whatever]," although I think probably in many contexts where he uses this term he would accept "maximal continuous body" if offered to him as a paraphrase. I will not make any big deal about this

genus if they together, or they together with yet other things, are some one thing, the genus animal, which has a single λόγος or single concept [νόησις] applying to both X and Y and thus not dividing X from Y (Δ6 1016a32-b6, cp. Iota 1 1052a29-30).[19] The shared λόγος or concept could be one as of something one in number or in species or in genus or by analogy, which Iota 1 sums up merely as "indivisible in species or number" (1052a31) or "the individual and the universal" (1052a35-6). But in Iota 1 what Aristotle is interested in "collecting" is that in all of these cases, whatever is called one is so called on account of something which is in some way undivided or indivisible--either physically, as in the case of "the continuous by nature and the whole," or in λόγος, as in the case of "the individual and the universal" (so 1052a34-b1).[20]

Aristotle is here taking up and justifying up to a point, but will also be challenging, Plato's understanding of the one as the indivisible. This comes up for Plato notably in Republic VII, in discussing the disciplines which are useful in turning the soul from sensible to intelligible realities, because they concern some F which the senses are not sufficient to grasp, since everything which the senses report to be F they also report to be not-F. Arithmetic, as done by mathematicians rather than in practical applications, is such a discipline, because the mathematician deals with "numbers ... in which the one ... is equal, each one to every other one and not differing [i.e. not larger or smaller] by even a little, and having no parts within itself" (Republic VII 526a1-5),[21] and in defense of these equal and indivisible units, "if someone tries to cut the one itself in λόγος, they laugh at him and will not accept it, rather if you break it up they will multiply it [i.e. if you try to talk about the two halves of one of their units, they will speak instead of two units], taking care lest the one should appear [/turn out] to be not one but many parts" (525d9-e4). Thus by the mathematicians' standards the "ones" and the "numbers" revealed by sensation are not truly ones and numbers, since "we see the same thing simultaneously as one and as infinite in plurality" (525a4-5). Plato is here presupposing, and attributing to the mathematicians, that in so far as something is many, or is divisible into many parts, it is not genuinely one. Plato seems to take this basic strategy for arguing that things that appear one are not really one, and thus also that what appear to be finite collections of units are really infinite, from Zeno Fr. 1, which argues that, if there are many things, each of these things will have magnitude and will therefore have parts spatially separated from other parts, and each of these parts in turn will have magnitude and so ad infinitum, so that the things that are will be infinite. But where Zeno argues that there can be no one without magnitude (if something has no magnitude, then adding it to things would not make them any greater, and so it would be not one but nothing, Fr. 2), Plato uses the divisibility of sensible units, together with the assumption that arithmetic must be about something, to conclude that there is a pure one separate from sensible things. He is willing to grant that a divisible thing is one, but it is also many, indeed infinite in plurality, and the only way it can have these contrary attributes is if it is not one by nature but

[19] contrast Ross' confused note on Iota 1 1052a35

[20] perhaps note on the puzzling ὥσθ᾽ ἓν ἂν εἴη πρῶτον τὸ ταῖς οὐσίας αἴτιον τοῦ ἑνός (1052a33-4), on which I doubt Ross' construal--does this apply just to things undivided in species, or to both sides of the opposition? perhaps in both cases there's a cause of unity which is primarily one, either an individual or a universal; see how others take it. this passage becomes important for Fârâbî and Averroes, see my paper on them

[21] for the equality and non-difference of the units of mathematical (as opposed to physical) numbers, see also Philebus 56de, which quote here (harmonize with citation below). note also the seventh Hypothesis of the Parmenides where the others deprived of participation in the one (because the one is hypothesized not to exist) appear to be one but are in fact unlimited in multitude

rather participates in a one-itself which is not also many.[22] Now Aristotle too sometimes speaks as if "one" were equivalent to "indivisible": "the one and the many are opposed in several ways: in one way, the one and the many are opposed as indivisible and divisible: for what is either divided or divisible [ἢ διῃρημένον ἢ διαιρετόν] is called a plurality, and what is indivisible or not divided [ἀδιαίρετον ἢ μὴ διῃρημένον] is called one" (Iota 3 1054a20-23, cf. Iota 6 1057a12-17). But Δ6 says that what it is to be one is to be a measure and an ἀρχή of numbers (1016b17-23), rather than to be indivisible or undivided, and Iota picks this up in order to show that the Zenonian or Platonic arguments do not in fact lead to a one-itself.

As already noted, Iota 1 very much expands Δ6's few lines on what it is to be one: "we must recognize that 'what kinds of things are said to be one' and 'what is it to be one,[23] and what is its λόγος' are not to be taken as equivalent" (Iota 1 1052b1-3), and then the rest of the chapter expands on what it is to be one--on the formal cause, to these indivisible or undivided things, of their being one. We need to do this in order to address B#11, where if being and the one exist in the way that Plato and the Pythagoreans say they do (i.e. καθ᾽ αὑτά, as they must if they are to be ἀρχαί), then "being and the one are not something else [οὐχ ἕτερόν τι], but this is their nature, so that their οὐσία is just to be being or to be one [ὡς οὔσης τῆς οὐσίας αὐτοῦ τοῦ ἑνὶ εἶναι καὶ ὄντι]" (1001a10-12).[24] If their οὐσία is not just to be being or one, then although any given ἀρχή X will be and be one, there will be a distinction between the ἀρχή X, i.e. what it is that is being or one, and what it is for it to be being or one, and so it will not be the being or one that is the ἀρχή, but rather being and one will be predicated of some other underlying nature, and this will be more properly the ἀρχή.[25] But if, as Aristotle says, to be one is "to be the first measure of each genus" (Iota 1 1052b18), then, since "measure" is a πρός τι, and "τὸ πρός τι is least of all a φύσις or οὐσία, out of all the categories, and posterior to ποιόν and ποσόν ... for nothing is either great or small, either many or few, or in general πρός τι, which is not ἕτερόν τι ὄν many or few or great or small or πρός τι" (N1 1088a22-24, 27-9, cited Iβ4 above), it follows that to-be-one must always be predicated of some underlying nature and cannot itself constitute an οὐσία; and therefore, in particular, it cannot be an ἀρχή. An Academic might reply that this is only a semantic issue, that Aristotle is just choosing to use "one" to mean "first measure" when other philosophers use it to mean "indivisible," and that the indivisible will still be the underlying nature. But Aristotle will reject this too, for several reasons. First, while the units that serve as the first measure for each genus will be in some respect indivisible or undivided and equal, or at least can be treated as such, they need not be entirely indivisible or equal; often a genus does not contain entirely indivisible and equal units, and yet we can and must measure it by some unit within the genus, and are not led, as Plato thinks, to some pure unit outside the genus. Second, since "ἀδιαίρετον" signifies a privation, it too cannot exist καθ᾽ αὑτό, but must always be

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[22]and, as Plato will argue in the third and seventh Hypotheses of the Parmenides, the underlying nature, temporally or logically prior to its participation in the one, must be a pure infinite plurality. note that participation in contrary forms such as unity and plurality is Socrates' solution to Zeno's arguments in the Parmenides; at least here Zenonian arguments (although we're not told exactly what the arguments were) are used to motivate positing a pure one-itself. (then, of course, difficulties arise showing that this one must also be many--using arguments often somehow modelled on Zeno's arguments about sensible things)

[23]τὸ ἑνὶ εἶναι EJM Ross Jaeger correct against τὸ ἓν εἶναι A^b

[24]cited in Iβ4, see discussion of textual problems there

[25]If the ἀρχή of all things cannot have anything prior to it, it would be impossible for the ἀρχή, being something else, to be an ἀρχή [ἀδύνατον ἂν εἴη τὴν ἀρχὴν ἕτερόν τι οὖσαν εἶναι ἀρχήν]; for instance, if someone said that white, not quâ something else but quâ white, is an ἀρχή, but that nonetheless it is said of some underlying thing, and, being something else, is white [εἶναι μέντοι καθ᾽ ὑποκειμένου καὶ ἕτερόν τι ὂν λευκὸν εἶναι]: for that [other underlying thing] will be prior (N1 1087a31-36, cited and discussed Iβ4 above)

predicated of some positive underlying nature; and, furthermore, this will be a different nature for each genus, not something whose nature is just to be one, in any possible sense of "one."[26]

Thus Aristotle says in Iota 1, after collecting the per se senses of "one" and noting that they are all said through being in some way ἀδιαίρετον:

> For the one is said in so many ways, and each thing[27] to which any of these ways belongs is one; but being one will sometimes be [being] one of these,[28] and sometimes something else which is closer to the name [sc. "one"], while these are closer to its force [δύναμις, i.e. its application].[29] It is as if we had to speak about στοιχεῖον and cause in such as way as both to distinguish among the things [πράγματα, i.e. the things which are in fact στοιχεῖα and causes] and also to give the definition of the term. For in one way fire is [a] στοιχεῖον (and perhaps it is also in itself the infinite or something else like this),[30] but in another way it is not, since being-fire and being-a-στοιχεῖον are not the same. Rather fire, as a certain thing [πρᾶγμα] and nature, is a στοιχεῖον, but the name [sc. "στοιχεῖον"] signifies that this belongs [συμβεβηκέναι] to it, [namely] that something is out of it as [out of] a primary constituent.[31] So too with "cause" and "one" and all such things [as with "στοιχεῖον"]. Whence also to be one is to be indivisible …

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[26]objection: Aristotle says in Iota 3 1054a26-9 that "ἀδιαίρετον" is expressed as an alpha-privative from "διαιρετόν" "because plurality and the divisible are more readily perceived by the senses [μᾶλλον αἰσθητόν] than the indivisible, so that plurality is prior in λόγος to the indivisible on account of sensation": so perhaps in the language of the gods "ἀδιαίρετον" is a positive notion and "διαιρετόν" is expressed as an alpha-privative. I'll come back to all these issues in Iγ2c, but anyway I think this is wrong: "ἀδιαίρετον" is just intrinsically a privative notion, a non-privative term in the language of the gods couldn't be equivalent to our "ἀδιαίρετον", what would be expressed positively in the language of the gods would be the underlying nature of the things which are in fact indivisible; and this won't be a single nature, but different natures in each genus in which there are indivisibles

[27]bracketing τούτων with Jaeger (who says, apparently through misreading Bonitz' apparatus, that he is following Bonitz; the same false report of Bonitz is in Ross) {earlier in 1052b4, Bonitz and Ross say A^b omits τὸ before ἕν; Jaeger is silent. haven't yet checked A^b, but M does omit it, so probably A^b does too}

[28]taking τὸ δὲ ἑνὶ εἶναι ὁτὲ μὲν τούτων τινὶ ἔσται (EJ) to be short for ... τὸ τούτων τινὶ εἶναι ἔσται, or, as Jaeger suggests, expanding A^b's ... τὸ τούτων τινὶ ἔσται into ... τὸ τούτων τινὶ εἶναι ἔσται. the other option is to translate the text of EJ as "being-one will sometimes belong to one of these, and sometimes to something else ...." (so the pseudo-Alexander). this would make sense, but it is hard to see what the other thing would be to which being-one would belong (ps-Alexander takes it to be the measure, which he takes to be intermediate between the essence on the one hand and continuous-whole-individual-universal on the other), and the parallel at 1052b15-19 seems to require the first interpretation. M does not have A^b's τὸ before τούτων

[29]ὀνόματί ἐστι· τῇ δυνάμει EJ; ὀνόματι ἢ δυνάμει A^b; ὀνόματί ἐστι· δυνάμει M. against Bonitz II,416 and Centrone p.24, following the ps.-Alexander, who want to take [τῇ] δυνάμει as adverbial, the various kinds of ἀδιαίρετα are potentially one, the measure is necessarily one, or they're the ὑποκείμενον that's capable of receiving unity. Ross is closer to right, but not quite … d check Ross' references, for this sense of "δύναμις", to Lysias 10.7 and Cratylus 394b3: I know some later texts

[30]ἔστι δ᾽ ἴσως καθ᾽ αὐτὸ καὶ τὸ ἄπειρον ἤ τι ἄλλο τοιοῦτον (Christ silently deletes the καί, but it is apparently in all manuscripts). I take this to mean that perhaps the underlying nature is not fire but rather e.g. the infinite, of which fire would be a πάθος, in which case we can contrast being-a-στοιχεῖον with being-infinite rather than with being-fire. Ross takes Aristotle to mean that perhaps the infinite or the like is a στοιχεῖον in itself, but I don't see what the "in itself" would add: it doesn't make sense to suggest that the infinite, unlike fire, could be intrinsically and not merely relationally a στοιχεῖον. (Thomas solves the difficulty by taking "the infinite in itself," i.e. "what is intrinsically infinite," as the subject of "is an element," which is impossible given the word-order in the Greek)

[31]i.e. and thus "στοιχεῖον" signifies a relation, whereas "fire" (or whatever it turns out to be) signifies the underlying nature

> [various cases listed] … but especially to be the first measure[32] of each genus, and most properly of quantity: from there it has been extended to the other [genera or categories]. (1052b3-20)[33]

Here "first measure" is closer to the name "one" and "ἀδιαίρετον" or its subtypes are closer to the things which are one. We might just have drawn a twofold distinction between the ὑποκείμενα which are one, i.e. fire and so on, and the essence which is the formal cause of their being one; but we can also cut more finely. Being indivisible, and its subtypes, are in a sense the essence of one and the cause to the ὑποκείμενα of their being one, but Aristotle now says that even the indivisible and its subtypes have gone some of the way in the direction of the ὑποκείμενα; there is a further formal cause of being one to these things, namely that they are all in some way the first measure of some genus, that is, something that we can count with. It is <u>because</u> the one is a first measure that it is also indivisible: "the one is indivisible for this reason, because the first of each [domain of] things is indivisible" (1053a20-21). The point is not that "first measure" is closer to the lexical meaning of "one" and "ἀδιαίρετον" is deeper or closer to the essence of what we have to study: rather, "first measure" gives what it is to be one, and will be the main focus of study in Iota 1-2, but it does not exist καθ᾽ αὑτό but only as a predicate of the indivisible, which in turn exists only as a predicate of some other underlying nature.[34] In comparing "one" with "στοιχεῖον" Aristotle is drawing on a point he had made in the passage of Z16 cited above (1040b16-27), that being an ἀρχή or being a στοιχεῖον cannot be the οὐσία of anything, and that this is why we cannot answer the question "what is the ἀρχή" by saying that it is the ἀρχή; Z16 argues that "being" and "one" also cannot be the οὐσίαι of the things (and it follows, although Z16 does make this explicit, that they also cannot be correct answers to "what is the ἀρχή"). In Z the ground for this conclusion was simply that "being" and "one" are universals; Iota (while repeating this argument, Iota 2 1053b16-24, there citing Z) adds here the more specific ground that to be one is to be a measure, and to be a measure is a relation to a thing measured, and, like every relation, does not exist καθ᾽ αὑτό but is always predicated of some other underlying nature. To support this point, Iota calls up Z16's parallel between being one and being an ἀρχή or being a στοιχεῖον, but now not simply to note that being one shares some logical features with being an ἀρχή or being a στοιχεῖον, such as being universal or being relative, which make it incorrect to say of any οὐσία (or in particular of the ἀρχή) that it is the one, i.e. that its nature is just being one. Rather it turns out, much more precisely, that being one, i.e. being a measure, just is one way of being an ἀρχή, and in particular of being a στοιχεῖον.

To be one is, in the first instance, "to be the first measure of each genus, and most properly of quantity: from there it has been extended to the other [genera or categories]" (1052b18-20).[35] Measure is a πρός τι, to be a measure is always to be the measure of something, and indeed (as Aristotle will explicitly recall at Iota 6 1056b32-1057a1), the relation of measure to thing measured was one of the basic kinds of πρός τι distinguished in Δ15. As Iota 1 here says, "[a]

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[32]issues about nominative/dative, in "the," "first," and "measure," but nothing much seems to turn on it

[33]some minor textual issues besides the larger one above: πράγματι etc. b12, τό/τῷ b13. Ross and Jaeger agree on all of these, perhaps they're not worth noting (E's extra ὅλον is not)

[34]note against the idea that the measure is closer to the name "one" <u>because it is most indivisible</u> (so Centrone p.24). on the contrary the measure is closer to the name/essence <u>than the indivisible is</u>: something that is (in some respect) indivisible is one because indivisibles serve well as measures

[35]for the priority of quantity (and, as we will see, especially <u>discrete</u> quantity) in this connection, cp. Δ13, where a quantum is "what is divisible into constituents [ἐνυπάρχοντα] each of such a nature as to be ἕν τι καὶ τόδε τι" (1020a7-8)

measure is that by which quantity is known [or: by which it is known how much {something is}]; and quantity quâ quantity is known either by [a] one or by [a] number, and every number is known by [a] one, so that every quantity is known, quâ quantity, by the one, and that by which [as a] first [thing] quantities are known, just this is one; whence the one is the ἀρχή of number quâ number" (1052b20-24).[36] Indeed, the one defined as a first measure, and thus as a first means of knowledge, will certainly fall under Δ1's general account of ἀρχαί: "it is common to all ἀρχαί to be the first thing whence [a given thing] either is or comes-to-be or is known" (1013a17-19).[37] Furthermore, when "measure" is used in its proper sense, and not metaphorically as by Protagoras, a measure is not only an ἀρχή but more particularly a στοιχεῖον, i.e. a first constituent [ἐνυπάρχον]: recall from above that in mathematics X is measured by Y iff X is the sum of finitely many equal constituents each equal to Y, in which case the measure Y (or measures equal to Y) must be a constituent present in X; and this is the sense in which number is "plurality measured by [a] one" (Iota 6 1057a3-4, cited above). Reflection on mathematical and especially arithmetical practice--which Aristotle, like Plato, takes as authoritative in determining the concept of the one--leads Aristotle to conclude that what it is to be one is most properly to be a first measure, rather than to be indivisible, although the things that are one will be things that are indivisible or are taken as indivisible. This means that what is essential to the one is to be what someone can count with, just as what is essential to number [ἀριθμός] is that it is the result of such counting [ἀριθμεῖν]. To see how this might work, and why indivisibles would work best as first measures of things, start by considering the case of pure numbers (e.g. a five that is just five, or five ones, not five somethings with some other underlying nature), on the hypothesis that such numbers exist. The one is not the only measure of numbers: for instance, two is a measure of ten, and it can be used to count ten (two, four, six, eight, ten), and thus to know how much any given ten is (namely, that it is ten). But the one is the first measure of numbers (any number that is measured by two is also measured by one, but not vice versa), and it is the measure of the first numbers ("a first [πρῶτος, i.e. prime] number is [a number] measured only by the unit," Euclid Elements VIIdef12, as opposed to a composite number, which is measured by some number, def14); the one is thus the only thing that is the measure of all numbers, and so it is the ἀρχή of numbers as such, where the two is the ἀρχή only of the even numbers.

A pure one that is the first measure of pure numbers would, of course, be indivisible. And we can tease out two reasons why an indivisible would be an appropriate first measure of its genus. First, if X is indivisible, it will be a measure of everything in its genus of quantity: Y cannot escape being measured by X, either by being less than X (for if Y is less than X, Y will fall short of X when they are juxtaposed, and so X will be divisible, into a part that is equal to Y and a part by which it exceeds Y) or by falling in between two multiples of X (for if Y is greater than nX but less than (n+1)X, then when Y is juxtaposed with the sum of n+1 measures equal to X, Y will exceed the sum of the first n measures by some quantity Z, and the sum of all n+1 measures will exceed Y by some quantity W, and the last measure will be divisible into a part equal to Z and the excess W). By contrast, if X is divisible (e.g. if it is not a one but a number), then there are things in its genus that will escape being measured by it, such as any part of X, or the sum of any part of X with any multiple of X (e.g., if X is two, any odd number). For a second reason why indivisibles are appropriate first measures, it helps to go back to our passages from the

[36] only real text-issue is about the ποσὰ in 1052b23 … Bonitz prints it but thinks it should be deleted

[37] so Aristotle argues in Δ6 ("being-one is the ἀρχή of being-some-number, for the first measure is an ἀρχή; for that by which [as a] first [thing] we know [sc. which is, by definition, an ἀρχή], is the first measure of each genus; so the one is the ἀρχή of the knowable with regard to each thing," 1016b17-21)

Republic and Philebus: the mathematician deals with "numbers ... in which the one ... is equal, each one to every other one and not differing [i.e. not larger or smaller] by even a little, and having no parts within itself" (Republic VII 526a1-5); ordinary people "count unequal units of numerical things, like two armies or two cows, two of the smallest or of the largest of things," but philosophical arithmeticians "would not agree with them until one posits [units in which] no unit differs from [i.e. is larger or smaller than] each any other unit of the myriads [of units]" (Philebus 56d9-e3).[38] For X to be usable as a measure, we need many X's which are equal measures, because only in this way can we use X to know how much some quantity Y is: if I determine that Y is three measures, but those measures are not all equal, then Y may be more or less than some other quantity which is also three measures. But if, as the Republic suggests, I choose a measure "having no parts within itself," then it will also be "equal, each one to every other one and not differing [i.e. not larger or smaller] by even a little": if X and Z are both indivisible, they must be equal, since if X were greater than Z it would be divisible into a part equal to Z and a part by which it exceeds Z, and likewise if Z were greater than X. Of course, while it is true that all units of pure numbers (unlike the cows and sheep which are the units of herds) are indivisible and therefore equal, it is also true that all fives of pure numbers (i.e. all wholes of five units of pure numbers) are equal without being indivisible. But the reason why all the fives are equal is that all the units are equal, and the reason why all the units are equal is that they are indivisible--so that, again, an indivisible unit is an appropriate first measure and ἀρχή of the things in its genus inasmuch as it is known how much they are.

Of course, all this works only in the case of discrete quantities: it is only here that there is a precise first measure, and only here that there is a precise one. In a given genus of continuous quantities (lines, surfaces, solids) we might describe its indivisibles (respectively points, lines, surfaces) as measuring it (e.g. perhaps a point measures a line by how much time it takes it to traverse that line), and Aristotle may be thinking of something like this at Δ6 1016b23-31, but this use of "measure" is metaphorical, since however many points you may take cannot equal a line and cannot say how much the line is.[39] Taking "measure" in the proper sense, no genus of continuous quantities can be measured by anything that is truly indivisible, and this means also that they have no first measure that measures them all precisely. This is for two reasons: first, because lengths (say) are divisible ad infinitum, the length X cannot be the measure of every length, both because it cannot measure a length Y that is less than X, and because it cannot measure a length nX+Y that falls between two multiples of X. Second, no length can measure all lengths, because no length can measure two incommensurable lengths, such as (in Aristotle's favorite example, mentioned here 1053a17-18) the side and diagonal of a square.[40] Iota 1 notes two strategies that we can use to measure some genus of continuous quantities imprecisely in the absence of a precise "one." First, we may choose a measure X which though not truly indivisible is indivisible as far as sensation can detect (1053a5), so that if Y is less than X we cannot perceive Y in the first place, and so that nX+Y can be measured by X, not precisely but as far as sensation can detect, since we cannot perceive the difference between nX+Y and nX. Second and perhaps more surprisingly, we can take two (or more) measures, say X and Y, which though not

[38]harmonize with earlier mention of this passage. there passage is difficult, due partly to typical late-Plato games with word-order and the like (also the syntax of καταριθμοῦνται is abnormal according to LSJ; is it possible to do something more precise with τῶν περὶ ἀριθμῶν?), and I am not sure of my translation, but Dorothea Frede's translation must be wrong on several points

[39]even the traversal-time cannot say how much a line is: it can tell us only that line X is to line Y as the traversal-time of X is to the traversal-time of Y, and so allow us to infer how much X is if we know how much Y is

[40]or, conceivably, of a regular pentagon: note on this somewhere, once and for all, with ref to von Fritz

truly equal are equal as far as sensation can detect, so that anything greater than X and Y can be measured by X and Y in combination, mX+nY (and perhaps sensation cannot detect anything smaller than X and Y). As Aristotle notes (1053a14-16), this is what happens in harmonics. We might hope that the octave and the fifth would be measured by some common measure--perhaps an octave is twelve semitones and a fifth is seven semitones (this would have the desirable result that the octave and the fifth would have a common multiple, so that the cycle of fifths would close, and we could give a complete tuning system in which we could move a fifth up or down from any note, and could use the fifths to determine every note). Philolaus in effect used the Euclidean mutual subtraction algorithm to try to find such a common measure: subtract a fifth from an octave to yield a fourth, subtract a fourth from a fifth to yield a tone, subtract two tones from a fourth to yield a diesis.[41] Now a diesis is sometimes called a "semitone," and if two dieseis were exactly a tone, then the diesis would be the common measure of all the intervals we have mentioned (and the fifth would be seven dieseis, and the octave would be twelve dieseis). In truth, however, a diesis is slightly less than half a tone: so the remainder when a diesis is subtracted from a tone, the "apotome," is slightly more than a diesis (and when a diesis is subtracted from an apotome, the remainder is a "comma," equal to the excess of six tones over an octave, and since these intervals are in fact incommensurable we can go on indefinitely).[42] As Aristotle says here, "the measure is not always numerically one, rather sometimes there are several, as the dieseis [i.e. what Philolaus calls diesis and apotome] are two, not to hearing but in λόγος" (1053a14-16). All the intervals of the diatonic scale, including the tone, fourth, fifth and octave, can be measured by the diesis and apotome in combination; the diesis and apotome are indistinguishable to hearing, but it is better to take these two imperceptibly unequal measures, which together precisely measure all the other intervals, than to take just the diesis as an imprecise measure, because while two dieseis will not be audibly distinct from a tone, twelve dieseis will be audibly (and horribly) distinct from an octave.[43]

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[41]references in Elements VII and X and description of the algorithm, conventionally called "Euclidean" but much older, and more important in earlier mathematics (refs to Becker and the Topics): if two or more quantities of the same type have a common measure, the method will find their greatest common measure, and if they have no common measure, the method will proceed ad infinitum, with the subtrahends becoming smaller than any assigned quantity. if applied to numbers it will always terminate and always yield a number; if applied to a relatively prime set of number it will yield the unit. in the musical case, the method applied to the octave and the fifth will not terminate, because the intervals are "incommensurable," where this can be explained here by saying that there is no x, m, n such that $x^m = 2$ and $x^n = 3/2$

[42]references to Philolaus B6, and the attached testimonium from Boethius which Huffman calls "6b," and A26. it is possible that the terms "apotome" and "comma," which Boethius attributes to Philolaus, are post-Philolaic, but (as Barker notes) the way B6 defines the diesis does suggest that Philolaus knows it is not precisely half a tone, in which case the determinations of the apotome and comma are the natural next step. later writers call the Philolaic diesis the λεῖμμα ("part left over," perhaps already implicit at Timaeus 36b), allowing "diesis" to be used for something more generic

[43]Ross' attempt, in his note to1053a15; to make this refer to Aristoxenian rather than Philolaic music theory, makes nonsense of the passage. Aristotle is talking about two incommensurable measures used to measure a single scale (as in what he immediately goes on to say about the side and the diagonal), not about two commensurable measures (for which the single common measure could perfectly well be substituted) used to measure different scales. (Bonitz is also confused, in a different way; if Bonitz had said what Ross falsely reports him as saying, Bonitz would have been right). Ross' translation "quarter-tone" (he is thinking of the enharmonic diesis) is disastrous: much better to say "semitone" (the Philolaic diesis and apotome can be called the minor and major semitone respectively, even if strictly "semitone" should be reserved for half a tone). Barker Greek Musical Writings v.2 p.73 n17 sees the problem but not the solution. (the modern well-tempered scale takes a single semitone, one-twelfth of an octave, as its measure, and we do not usually hear the discrepancies, but this solution is not available within standard Greek music theory, for which all intervals must be ratios of integers; it is more in the Aristoxenian spirit. also note Republic VII

Iota 1's discussion of continuous quantities and musical intervals may seem like a distraction from the metaphysical issues about the one. But in fact these strategies of measurement, measuring quantities imprecisely by a single first measure or measuring them precisely by several imprecisely equal first measures, allow Aristotle to avoid Plato's conclusion in Republic VII, that if there is no entirely indivisible unit within sensible things (such as visible magnitudes or musical intervals), then any sensible "one" will be no more indivisible than divisible, thus no more one than many, and therefore that it can be one only by participating in a pure one beyond the sensible domain. Aristotle avoids this by saying that to be one is not to be indivisible but to be a measure: a cow is one, not because it is indivisible (which it is not, or not without some rider attached), but because of the relation it stands in to herds of cattle, namely that it is the first measure by which they can be counted. Because a cow is divisible, it can also be many, because it can in turn be measured by its parts, but this is no more contradictory than for the same cow to be both a mother and a daughter.[44] Certainly, for a cow to be a good first measure of herds of cattle it should be more-or-less indivisible, so that they can be treated as if indivisible, like a diesis or even a foot-length ("in lines they use the foot-length as indivisible," Iota 1 1052b33); cows should also be more-or-less equal, so that they can be treated as if equal, again like dieseis. "Small group of cows" is not a good unit for measuring herds of cattle, chiefly because such groups are seriously unequal; "pair of cows" is not a good unit either, because, although pairs of cows are about as equal as cows are, they are divisible, in such a way that not every herd of cattle can be measured by pairs of cows (some herds contain odd numbers of cows), and "pair of cows" is not the first measure of the entire genus "herd of cattle." But the equality and the indivisibility do not have to be perfect for the thing to be one. We might say that ones must be functionally equal and indivisible, that is, equal and indivisible in their role as units by which something is measured: Aristotle puts it by saying that "the one is indivisible either simpliciter or quâ one" (Iota 1 1053b7-8).[45] Being functionally equal cannot be reduced to being approximately equal. It may be true that cows are approximately equal in weight, and therefore that this group of five cows is approximately equal in weight to that group of five cows. But there is another sense in which the two groups of cows are exactly equal, not in weight but in number of cows, and in this sense each cow, quâ one, must be exactly equal to every other cow. Presumably Aristotle would say that the two groups of cows, or a group of five cows and a group of five armies, are equal in number because they have the same relation to their measures, and that the two cows, or a cow and an army, are equal as ones because they have the same function as measures in relation to the things they measure. By determining the essence of numbers from the act of counting, and the essence of the one from its relation to numbers, as the unit of counting, Aristotle tries to respond to the challenge of Republic VII and show how things can have precise numbers, about which arithmetical statements can be precisely true, without containing things that are indivisible

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531 on attempts to find the smallest interval by hearing). also: note Iota on two measures for incommensurable things like the side and the diagonal (whether he means of a square or of a regular pentagon): these might be generated by a mutual subtraction procedure, e.g. we could take the side and diagonal of the nth successively generated pentagon as measures, and express the sides and diagonals of all the larger pentagons as sums of these

[44] as he will say in Iota 6, one and many are opposed as correlatives, not as contraries; see Iγ2c. note tension with texts elsewhere (Z13, Physics I,2), where Aristotle does seem to treat "one" and "many" as contraries, so that something such as a whole of parts which is both one and many can be so only by being actually one and potentially many. for discussion of the ways in which one and many are opposed see Iγ2c below

[45] note also the example of division into things indivisible in species but not in number, such as the spoken vowel α, which will have a first half and a second half, qualitatively the same; but it can still be used as a unit of measure or composition alongside other vowels, or other phonemes

simpliciter; and he does perhaps as well as can be done without the Fregean insistence that number-predicates are second-order, that five is not the number of the herd H but of the predicate "is a cow in herd H."[46]

Consequences: against the one as an ἀρχή

The main lesson Aristotle draws from all this in Iota 1 is that "the measure is always homogeneous [συγγενές] [with the things it measures]" (1053a24-5), in such a way that continuous quantities are always measured by continuous quantities, which are never entirely indivisible, while a number, being a "plurality of units" (a30), is measured by a unit [μονάς], which is entirely indivisible. To say that each genus is measured by a homogeneous measure is to say both, negatively, that it cannot be measured by something heterogeneous, and positively, that homogeneous measures are sufficient, even if they are only imperfectly indivisible or equal. This is supposed to have immediate consequences for B#11, to which Aristotle turns in Iota 2. The first half of Iota 2 (1053b9-28, together with 1054a13-19 at the end), after carefully restating B#11 with explicit reference back to B, repeats (from B and from Z) the standard general arguments to show either that no universal is a substance, or that being and unity, which are not genera but things said non-univocally across the categories, exist not separately or καθ᾽ αὑτά but only as predicates of some other underlying nature.[47],[48] However, the second half of the chapter (1053b28-1054a13) gives considerations that are specific to the one, and specific to the role of the one as a "mathematical" rather than a "dialectical" ἀρχή, that is, as a measure and constituent στοιχεῖον of numbers rather than as a universal predicate of all things; and they begin from the conclusion of Iota 1 that the measure is homogeneous with the genus it measures. Thus as Aristotle now says, working through several parallel examples, "if [all] the things-that-are were melodies, they would be a number, but a number of dieseis, and their οὐσία would not be number; and the one would be something whose οὐσία is not one but diesis" (Iota 2 1053b34-1054a1). Aristotle's examples here are all from non-substance genera which are objects of (more or less) mathematical sciences, in which we can specify some unit στοιχεῖον and work up to knowledge of the complexes; but he uses these examples to argue inductively that "the same account holds in the other genera too, so that if in passions and qualities and quantities and motions there are numbers and a one in all things, but the number is a number of somethings and the one is one something, and this [sc. being one] is not its οὐσία, then it must be like this also in

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[46]Plato may have the last laugh, since on current views of mathematical foundations "five is the number of the predicate 'is a cow in herd H'" is equivalent to "the set of cows in herd H has cardinality five," where the set of cows in herd H is presumably the mereological sum of the singleton sets {C} for each C a cow in herd H, and where the singleton set {C} is a mysterious indivisible posit, no matter how divisible C itself is. see Iγ3 for discussion

[47]within this text maybe note what seems to be a misundertanding underlying Ross' translation of 1053b13-15 (on γνωριμωτέρως), and note the textual issue about πῶς in b14 (Ross may be right in deleting it, but it seems better to read it as enclitic with Jaeger following Schwegler)

[48]note implication for Berti's question, in his essay in the Centrone volume, whether according to Iota 1-2 "one" is said in many ways (as we would expect from Δ6) or is univocal (as seems to be implied by Iota 1's talk of the essence of one--but of course this talk is also in Δ6). the answer is that all other senses of "one" are somehow derivative from the essence of one, which is to be a first measure; but that this "essence" is not univocal but analogous, since "measure" is a πρός τι, what makes X and Y each "one" isn't something intrinsic that they share, but a shared relation that they stand in to different things. "one" thus has the same as ἐνέργεια and δύναμις as discussed in Θ6 and Λ4-5

the case of substances: for it is the same way in all cases" (1054a4-9).[49] Presumably the case of substances is the most important, because the one will be much more plausible as the first ἀρχή, and as an ἀρχή which is itself a substance, if it is thought to be the ἀρχή not merely of melodies or polygons or the like, but of substances as well (whether of substances and accidents equally, or of substances primarily and thus indirectly of accidents). To the extent that the one is functioning as a mathematical rather than dialectical ἀρχή, this will happen only if (as least some relevant kind of) substances are numbers, and indeed many Academics think that the highest kind of substance (perhaps these are Forms, perhaps not) are numbers. Recall that in B#11 one argument that the one must exist καθ᾽ αὑτό had been that "if the one is not a substance, it is clear that number too will not be a separate nature of beings: for a number is units, and a unit is what is just one" (1001a24-7). Aristotle now, while not choosing to contest the claim that substances are numbers (in H3 he tries his own reduction of substances--as definitions--to numbers, 1043b32-1044a14), argues that even if they are numbers, they are not pure numbers made out of pure units; rather, in the case of substances as in every other case, the one will have some particular underlying nature homogeneous with the genus it is measuring. Perhaps this is not supposed to rule out the possibility that there are <u>some</u> pure units, although they will not be the ἀρχαί-as-measures of anything not homogenous with them, since he has said at Iota 1 1053a21-30 that a number or plurality of units is measured by a unit which is entirely indivisible; and if a pure one is the ἀρχή-as-measure of pure numbers, and if other things are in some other way dependent on these pure numbers, then a pure one might be <u>indirectly</u> the ἀρχή of all things. Discussion of this possibility will have to wait until MN, but it is clear from Aristotle's analysis of unity in Iota 1-2 that unity cannot be the οὐσία of anything, so that even if there are <u>perfect</u> units they will always be said of some underlying subject. Perhaps, then, there are <u>accidents</u> of unity, in the category of quantity, which are just pure unities although always unities <u>of</u> something, and perhaps there can be many such unities (and so numbers composed of them) because they are individuated by their underlying subjects.[50] But if so the one will still not exist καθ αὑτό, as a substance, in the sense of B#11; and it will be dependent on substances and so will not be an ἀρχή.

As noted above, Iota 1-2 have not explicitly discussed the question of the ἀρχαί, except in the broad sense in which every measure is an ἀρχή of the genus it measures (implicit at Iota 1 1052b20, μέτρον καὶ ἀρχή b32), and in which therefore "the one is the ἀρχή of number <u>quâ</u> number" (1052b23-4). But, as we know, Aristotle's argument in Iota 1 is leading up to Iota 2's resolution of the B#11 question whether the one exists καθ᾽ αὑτό, and his reason for asking whether the one exists καθ᾽ αὑτό is to determine whether it can be an ἀρχή in the strictest sense (as the K parallel makes explicit, 1060a36-b12). In explicating Aristotle's intentions in Iota 1-2, I have not hesitated to speak of ἀρχαί. But it is <u>Metaphysics</u> MN, especially N, that explicitly addresses the question of the ἀρχαί and draws the intended consequences of the lines of argument from Iota. MN will get their proper discussion in Iγ3 below, but it will help here to look briefly ahead at the passage most closely linked to Iota 1-2, in N1.

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[49]there are several textual issues here, of which the possibly serious ones are with τὸ ἓν τὶ ἕν in a7 (different MSS write different things for the last word) and τοῦτο αὐτὸ or αὐτοῦ ἡ οὐσία in a8, where it seems fairly clear to me (contra Jaeger) that αὐτοῦ is right. M agrees with A^b throughout this passage

[50]there is in fact considerable controversy among medieval Aristotelians about this, Avicenna saying that these units are the accidents of individual unity that attach to any essence once it exists <u>in re</u>, Averroes agreeing that these units are accidents of unity but saying that they depend on acts of cognition; see my paper on this

Metaphysics MN in general are examining Academic projects of first describing a domain of eternally unmoved οὐσίαι and then searching for their ἀρχαί; N more specifically is examining claims that some domain of eternally unmoved οὐσίαι, usually described in mathematical terms, are derived from a pair of contrary ἀρχαί, the one and something contrary to the one. Within this larger argument, N1 1087b33-1088a14 argues against the one as an ἀρχή, applying the conclusions about unity that we have seen in Iota 1-2, and it helps to make clear what the goal of Iota 1-2 had been, namely to undermine Academic theories of the one as an ἀρχή.

> It is clear that "one" signifies a measure. And in everything there is something else that underlies, as in a scale a diesis, in size a finger[-breadth] or a foot or something like this, in rhythm a beat or a syllable, and likewise in heaviness some determinate weight, and ["one" is said] of all of these in the same way, in qualities [signifying] a quality, in quantities a quantity; and the measure is indivisible, some in form, some as far as sensation goes; so that the one is not some substance καθ᾽ αὑτό. And this is reasonable: for "one" signifies that it is a measure of some plurality, and "number" that it is a measured plurality and a plurality of measures (and thus also it is reasonable that the one is not a number, for neither is the measure measures; rather both the measure and the one are an ἀρχή [of a measured plurality, rather than being themselves such a plurality]). And the measure must always be something that is the same for all, e.g. if the measure is a horse [what is measured must be horses], and if a man, then men.[51] If [the things to be measured or counted are] man and horse and god, [the measure will be] perhaps animal, and the number of them will be animals [i.e. man and horse and god are three animals]. If [the things to be measured or counted are] man and white and walking, these will least of all have a number, since they all belong to numerically one and the same thing, but they will have a number of genera, or of some other such common term. (1087b33-1088a14)

Now while Ross' only reason for moving Iota to after MN (apart from the mistaken idea that Iota would be interrupting a connected discussion of substance in ZHΘMN) was that this passage does not refer back to "the fuller treatment of unity" in Iota (AM I,xxiii), I would say that the N1 paragraph is not merely less "full" than Iota 1-2, but so compressed as to be both unsupported and almost unintelligible except to someone who has already worked through Iota. The situation is similar to passages in Λ which might be taken either as shorter parallels to, or as deliberate reminders of, passages in ZHΘ: I will argue that they are better taken as brief reminders of the arguments made earlier in ZHΘ, recalling their conclusions and applying them to the question of the ἀρχαί, as indeed becomes certain when Λ6 refers back to Θ8 with an explicit εἴρηται (1072a4, discussed IIIα1 below). N1 seems to be drawing on Iota in a very similar way. In a sense, the present passage of N1 does not add anything beyond Iota 1-2; it does not even say anything explicitly about ἀρχαί, except in the loose sense in which Aristotle accepts (here as in Iota) that the one is the ἀρχή of numbers. However, the context of N1, which begins by announcing a discussion of ἀρχαί, argues that the ἀρχαί in the strict sense (κυρίως, 1087b4) cannot be contraries because contraries are what they are ἕτερόν τι ὄν and therefore presuppose something prior, and then goes on to survey views hypothesizing the one and something else as ἀρχαί, makes it perfectly clear that, in arguing that "the one is not some substance καθ᾽ αὑτό",

[51] note textual issue (see Jaeger's apparatus); d go through all text-issues of this paragraph either here or in Iγ3

its purpose is to eliminate the one as an ἀρχή the strict sense. Since this was the purpose of Iota 1-2 all along, reminding the reader of the conclusions of those earlier arguments is enough to make the point.

The conclusions of Iota seem to be applied to the question of the ἀρχαί, not only in MN, but also once in Λ; but again the application is negative. This is at Λ7 1072a32-4. In context, Aristotle has been saying that thought and desire (and specifically the thought and desire that lead to the motions of the heavens) are moved by the intelligible object, and that what is intelligible per se is the positive "column" [συστοιχία] in a Pythagorean-inspired table of opposites, and that "of this [column], substance is the first, and, of this, the simple and κατ᾽ ἐνέργειαν [i.e. immaterial, sc. substance is first]" (1072a30-32); he then adds, explaining his choice of the word "simple" rather than "one," that "the one and the simple are not the same: 'one' signifies a measure, whereas 'simple' [signifies the thing] itself in a certain state" (1072a32-4).[52] The implication is that "one" does not signify the thing itself in a certain state, but rather signifies a relation, since being a measure is being in a certain relation to the things measured. So being one is certainly not the οὐσία of the ἀρχή that moves the heavens. Indeed, since we know from Iota (and from N, which apparently precedes Λ in Aristotle's intended order) that the measure is homogeneous with the things it measures, and since the first mover is not homogeneous with anything that it might measure, it seems that it cannot be a one at all (it is unique in its species, Λ8 1074a31-8, so cannot combine with conspecific units to measure other things). The οὐσία of the ἀρχή will not be simplicity either, because simplicity, while non-relational, is privative, a lack of composition; rather, the οὐσία of the ἀρχή will be ἐνέργεια (Λ6 1071b19-20), and a particular kind of ἐνέργεια (it is νόησις, and so on), and it is because its οὐσία is ἐνέργεια that it must be simple, because any composition would imply δύναμις (so Λ9, and N2 1088b14-28). But simplicity, being intrinsic to the ἀρχή, is closer to its οὐσία than unity is, and Aristotle seems to imply that unity does not belong to it at all.[53] Thus besides the negative consequences drawn from Iota in MN for the questions of the ἀρχαί and of immaterial substance, the only consequence of Iota drawn in Λ is equally negative, and is the direct contrary of the theological significance that many readers expect Iota to have, namely to show that God is one in the strongest sense, and that other things are each one only derivatively from God.

Aristotle's analysis of unity in Iota 1-2 will have consequences not only for Academic claims about the one as an ἀρχή, but also for Academic claims about an ἀρχή contrary to the one, and especially for Speusippus, who posits plurality as the ἀρχή contrary to the one. This application will depend on the analysis of contrariety and its distinction from other forms of opposition in Iota 3-4; we will discuss this analysis in the following section Iγ2b, and come back to the consequences for Academic ἀρχαί, drawn in Iota 5-6 and connected parts of MN, in Iγ2c. But especially in the discussion of unity and plurality in Iota 6 (implicitly against Speusippus) it will be clear not only that he is drawing on the analysis of Iota 1-2, but that this was one of the aims of that analysis. Unity and plurality can be opposed in two ways, depending on how we understand unity; if we take "one" as "first measure" and plurality as what it measures, then unity and plurality are not contraries, but correlatives; if we take "one" as "indivisible" and plurality as what is divisible, then unity is the privation of plurality. (Plurality in the sense of what exceeds in plurality will be contrary not to unity but to fewness.) Neither result will be welcome to

[52]for some minor textual issues see IIIγ1

[53]but note Iota texts on the sense in which one can be opposed to many not as correlative but as privative, i.e. as undividied/indivisible to divided/divisible. in that sense "one" would apply to the ἀρχή, and would be equivalent to "simple" (perhaps this is worth bringing up into the text)

Aristotle's Academic opponents, and he will conclude that unity and plurality are not an acceptable pair of ἀρχαί on either construal. The plausibility of the one as an ἀρχή (and as part of a pair of contrary ἀρχαί) turns on supposing that unity is both positive and intrinsic to the thing of which it is predicated; once Aristotle has distinguished it into the concept of the first measure, which is positive but relational, and the concept of the indivisible, which is intrinsic but privative, its claim to be the ἀρχή dissolves.