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ἀrchαί

AS ORIGENS DO PENSAMENTO OCIDENTAL

THE ORIGINS OF WESTERN THOUGHT

ARTIGO | ARTICLE

On the "Perceptible Bodies" at *De Generatione et Corruptione* II.1

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Abstract: Near the beginning of *De Gen. et Cor.* II.1, Aristotle claims that the generation and corruption of all naturally constituted substances are "not without the perceptible bodies" (328b32-33). It is not clear what he intends by this. In this paper I offer a new interpretation of this assertion. I argue that the assumption behind the usual reading, namely, that these "perceptible bodies" ought to be distinguished from the naturally constituted substances, is flawed,

and that the assertion is best understood as a claim that Aristotle has established in the second half of the first book of the *De Gen. et Cor.*

Keywords: Aristotle, Physics, Generation, Bodies, Perceptibility, Elements, Prime Matter, Contact, Tangibility.

In this paper, I want to talk about a sentence that occurs very near the beginning of Book 2 of Aristotle's *De Generatione et Corruptione*. Here is the sentence, as translated, with slight emendation, by C. J. F. Williams in his 1982 translation for the Clarendon Aristotle series:

> Generation and corruption in the case of all substances which are constituted by nature (πάσαις ταῖς φύσει συνεστώσαις οὐσίαις) do not occur without the perceptible bodies (οὐκ ἄνευ τῶν αἰσθητῶν σωμάτων). (*De Gen. et Cor.* 328b32-33).

Williams, in his commentary, complains that the explanations available in the secondary literature of this sentence are unconvincing;[1] and, as far as I can see, little has been offered in the near forty year interim to change that opinion. But what is the difficulty with the sentence?

The difficulty is this: it is not clear how to understand what Aristotle means by "the perceptible bodies" in this context. Aristotle appears to be saying that these perceptible bodies are necessary or indispensable (οὐκ ἄνευ) for the generation and corruption of all naturally constituted substances.[2] Now, presumably, the naturally constituted substances here are ordinary, familiar, corruptible

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[1] Williams, 1982, p. 152.

[2] The phrase οὐκ ἄνευ indicates a condition the absence of which ensures that an endeavour, process or item will not be successful, completed, or existing. See, e.g., Euripides, *Bacchae* 764, *Iphigenia in Aulis* 809; Xenophon, *Memorabilia* 3.11.17.l.5; Plato *Laws* 811c8.

substances, such as plants and animals.[3] But, of course, such things are perceptible.[4] To what then is Aristotle referring here with the phrase "the perceptible bodies"?

There seem to be two broad possibilities. Either:

A. They too are, or include, ordinary, familiar perceptible bodies, such as plants and animals

Or

B. They are not, and do not include, ordinary, familiar perceptible bodies, such as plants and animals.

Interpretation A might seem the more intuitive; it would be an odd use of the phrase "perceptible bodies" that excluded the most familiar perceptible bodies, like plants and animals. But this interpretation is problematic. In particular, on this interpretation, Aristotle would seem to be stating the obvious at 328a32-33, namely, that the generation and corruption of plants and animals is not without plants and animals. Commentators, both ancient and modern, indeed, have eschewed A, always opting instead for B. In this paper, I want to show that what we must reject is B, and I want to clear away the obstacles to accepting A as the right interpretation.

Now this issue might seem like a fairly minor one. And indeed the problem has not fired the imagination of very many scholars. But it strikes me that how we read this sentence at 328b32-33, and in particular, how we interpret the phrase, "the perceptible bodies", in this instance, is in fact of some significance to how we approach one

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[3] In the widest sense, things constituted by nature are opposed to things that are man-made, i.e., artefacts (*Phys.* II.1 192b12-13, b16; *PA* I.1 639b15-16; *Metaph.* VIII.3 1043b22). Aristotle further distinguishes naturally constituted substances into those that are eternal, and those that are perishable, i.e., plants and animals, at *PA* I.5. Obviously 328b32-33 concerns only the latter, as it is their generation and corruption that is at issue; see, e.g., *Metaph.* XII.1 1069a30-b1, and Joachim, 1922, p. 192. Note that the ancient commentators took the naturally constituted substances in this context to refer to the homoeomerous bodies; see Rashed, 2005, p. 152, with Joachim, 1922, p. 191-193.

[4] As Williams (1982, p. 152) puts it, the naturally constituted substances "surely *are* perceptible bodies" (the italics are his).

of the most controversial, and obscure, passages in Aristotle's natural philosophy. This is because some thirty lines or so after this sentence, Aristotle begins his account of what he calls "the matter of the perceptible bodies" (329a24-25):

> We say that there is some matter of the perceptible bodies (Ἡμεῖς δὲ φαμὲν μὲν εἶναί τινα ὕλην τῶν σωμάτων τῶν αἰσθητῶν), but this is not separate but always with a contrariety, from which the so-called elements (τὰ καλούμενα στοιχεῖα) come to be (329a24f.).

Traditionally it has been thought that with *this* phrase, "the matter of the perceptible bodies", Aristotle is referring to prime matter, by which we mean, of course, the matter that underlies the elements, and persists through elemental change. Indeed, the passage that this phrase introduces (329a24-25) is often cited as one of the best pieces of evidence that Aristotle is committed to prime matter.[5] But, of course, not everyone agrees, and the interpretation of this passage, and the general question of Aristotle's commitment to prime matter, remains much disputed.[6]

Now, the thing is, what Aristotle intends by "perceptible bodies", when he talks about "the matter of the perceptible bodies", at 329a24, is presumably just what he intends when he uses the same phrase earlier, in the assertion at 328b32-33. A moment's consideration of the way the chapter is structured will confirm this. For, following the assertion at 328b32-33, Aristotle considers what his predecessors posited as the underlying matter of "these" (τούτων δὲ τὴν ὑποκειμένην ὕλην, 328b33-34). But by "these" he must mean "the

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[5] Guthrie (1981, p. 228-229), for instance, insists that the passage is "the best account" of prime matter; Solmsen (1958, p. 248-249) believes that in this passage "*materia prima* is affirmed not once but three times"; likewise for Williams (1982, p. 214) the passage is "clear in its commitment to prime matter". More recently, Frank A. Lewis (2008, p. 124, n. 4) is thinking primarily of this passage when he writes "Aristotle appears committed to this concept of prime matter above all in the early chapters of *GC* 2".

[6] Cf. King, 1956, p. 381-383; Charlton, 1970, p. 132, 135-136; Charlton, 1983, p. 201; Furth, 1988, p. 226; Gill, 1989, p. 243-247.

perceptible bodies".[7] He turns to consider, in other words, what his predecessors posited as *the matter of the perceptible bodies*. And this investigation continues until 329a24. So at 329a24, then, when Aristotle gives us his *own* view about the matter of the perceptible bodies, he evidently wants to contrast his own view about the matter with that of his predecessors. Thus the expression, τὰ αἰσθητὰ σώματα, "the perceptible bodies", must have the same sense on both occasions in which it is used at *De Gen. et Cor.* II.1.

Now what I would like to suggest is that, if we want to be clear about what Aristotle might intend by the *matter* of the perceptible bodies – and thereby make a possible contribution to the debate over prime matter – then it seems to make good sense to try to clarify, firstly, what he intends by the phrase, "the perceptible bodies", in this context. But to do this, then we need to get to grips with the first instance of the phrase, at 328b33. And this is why I think it is important to get clear about Aristotle's assertion at 328b32-33. In this paper, then, I will try to make sense of the assertion at 328b32-33. I won't here draw conclusions about the prime matter issue, other than to say that the results do not seem to promote *either* the traditional view, *nor* most versions of the anti-prime matter view.

I

So let's now consider the two possible interpretations, starting with interpretation B, that is, that "the perceptible bodies" at 328b33 are not ordinary familiar perceptible bodies. Now, if the perceptible bodies are not ordinary familiar perceptible bodies, then what could they be? Before considering the question further, it might be worth taking a moment to emphasise that, whatever the perceptible bodies are in this case, it seems clear that they are perceptible bodies of the sublunary world. Let me explain.

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[7] Taken thus by Joachim, 1922, p. 191; King, 1956, p. 379; Mugler, 1966; Williams, 1982, p. 152; Rashed, 2005.

In general, Aristotle distinguishes two broad classes or kinds of perceptible bodies: those of the sublunary world, which undergo generation and corruption, and the eternal perceptible bodies, the Sun, moon, and stars.[8] Most commentators just assume that the latter kind of perceptible bodies is not involved at *De Gen. et Cor.* II.1.[9] But the heavenly bodies certainly have a role in the generation and corruption of substances, in particular, as efficient causes of the continuity of generation and corruption (*De Gen. et Cor.* II.10 336a32f., 336b15f., b34; cf. *DC* II.3; cf. *Metaph*. XII.5 1071a13-17, *Phys*. II.2 194b13).[10] The assumption is defensible, however. If we look ahead to 329a24-b3, where Aristotle gives his own view of the matter of the perceptible bodies, it is clear that he must be talking about the matter of the perceptible bodies of the sublunary world. For this matter is identified as the matter from which the "so-called elements", τὰ καλούμενα στοιχεῖα, come to be, that is, the elements of the bodies of the sublunary world, fire, air, water, and earth.[11] The eternal perceptible bodies, of course, are composed of a different matter, an immutable element (see, e.g., *DC* I.2 268b26f., *De Gen. et Cor.* II.9 335a33-b5).[12] So when Aristotle uses the phrase τὰ αἰσθητὰ σώματα, in the context of *De Gen. et Cor.* II.1, he does not intend all the perceptible bodies there are; the "perceptible bodies" in question are of the sublunary world only. Now these perceptible bodies can be further divided into *composite* bodies, such as plants and animals, and

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[8] On the distinction between heavenly, or superlunary, and sublunary bodies, and its origin with Aristotle, see Burnet, 1930, p. 27, n. 2; cf. Lloyd, 1968, p. 134f.

[9] Joachim (1922), Williams (1982), Scaltsas (1998), and Rashed (2005) don't even consider the possibility that the heavenly bodies are among the perceptible bodies at 328b33. But cf. Philoponus, *In de gen et cor* 205.34-206.4, and Broadie, 2004, p. 141.

[10] Cf. Frede, 2000, p. 11f.

[11] In general, the phrase τὰ καλούμενα στοιχεῖα is always used to pick out fire, air, water, and earth; see Crowley, 2008, p. 226-227. I follow Joachim (1922, p. 199), Williams (1982, p. 155-156) and Rashed (2005, p. 154) in taking the antecedent of ἐξ ἧς at 329a26, as ὕλην, rather than ἐναντιώσεως, and this seems to be confirmed at 329a29-30. Cf. King, 1956, p. 381; and Mugler's translation of 329a24-26 (Mugler, 1966). See also Broadie, 2004, p. 140, n. 53.

[12] See also Broadie, 2004, p. 141.

their constituent elements, the *simple* bodies. And this raises the next question: is Aristotle referring at 328b32-3 to *all* sublunary perceptible bodies, i.e., composite *and* simple bodies, or to some only, i.e., composite *or* simple bodies?

The most common answer in the secondary literature is that the perceptible bodies, in the context of *De Gen. et Cor.* II.1 are the simple bodies, or so-called elements, fire, air, water, and earth; or at the very least include the simple bodies. It already seems to be the view among the ancient commentators that the perceptible bodies are to be exclusively identified as the simple bodies.[13] This was the view also of Zabarella, the 16th century Aristotelian commentator, who claimed to be following Aquinas and Averroes.[14] Modern scholars, while usually silent about the assertion at 328b32-3 itself, reveal something of their views in what they say about the "matter of the perceptible bodies", at 329a24-25. And it is clear that the majority opinion is that, in the latter passage, Aristotle is presenting his view of the matter ultimately underlying all (sublunary) perceptible bodies, but most immediately the simple bodies fire, air, water, and earth.[15] Indeed fire, air, water, and earth are sometimes dubbed the "*primary* perceptible bodies", [16] while the phrase "potentially perceptible body" at 329a33 has been taken to be equivalent to "what is potentially an *element*".[17]

Certainly there is much to say for this interpretation. For one thing, the simple bodies fire, air, water, and earth are, evidently, *bodies*, and thus by definition perceptible (*Cat.* 8a1; *GC* II.1 329a10-12; *DA* III.12 434b12; cf. *Phys.* VII.2 244b5). And, of course, at *De*

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[13] Rashed, 2005, p. 152.

[14] Reported by Joachim, 1922, p. 191.

[15] See, e.g., Solmsen, 1958, p. 245; McMullin, 1965, p. 206, n. 47; Jones, 1974, p. 499, n. 21; Robinson, 1974, p. 182; Graham, 1987, p. 476, n. 5; Furth, 1988, p. 226.

[16] A phrase used by Joachim, 1922, p. 198-199; and Longrigg, 1993, p. 154; cf. King, 1956, p. 379, n. 27; Guthrie, 1981, p. 229. Admittedly Aristotle does refer to the elements as "the primary bodies" (τὰ σώματα τὰ πρῶτα) at 329a28-29.

[17] Thus Gill (1989, p. 247) writes that "the actually perceptible bodies are the four elements"; she presumably means *in this context*. See also Loux, 1991, p. 243, n. 8; de Haas, 1997, p. 71-72; Broadie, 2004, p. 140-141 & n. 59.

Gen. et Cor. II.2, Aristotle distinguishes the simple bodies according to perceptible characteristics. Moreover, the simple bodies are intrinsically involved in the generation and corruption of corruptible composite substances. Aristotle clearly says at *De Gen. et Cor.* II.1 that changes in the primary things (τὰ πρῶτα), by which he presumably intends the simple, or primary, bodies, result in the generation and corruption of things (329a5-8). In other words, it is clear that the generation and corruption of naturally constituted substances do not occur without the simple bodies and the changes that they undergo (cf. *De Long.* 2 465a13f.; see also *DC* I.12 283b21). Nevertheless, this interpretation gives rise to some serious problems.

The most obvious problem is that, if the perceptible bodies are the simple bodies, then Aristotle's survey of his predecessors' views at 328b33-329a2 becomes incoherent. He writes:

> Some say that the underlying matter of these[18] is one, positing for instance, air or fire or some intermediate between these […] others say it is more than one, some saying fire and earth, others take these and also air as a third, and still others add water to these to make four, like Empedocles.

But if the perceptible bodies are fire, air, water, and earth, then Aristotle would appear to be suggesting that his predecessors named one or more of fire, air, water, and earth as the matter of the *elements* fire, air, water, and earth. Empedocles, for instance, would appear to be credited with the view that the four elements serve as the matter of the four elements.[19] For the survey of his predecessors' views to be coherent, it seems we must distinguish between the elements and the perceptible bodies in question.

Another difficulty is that it is never really explained by those who claim that "the perceptible bodies" at 328b33 are the simple bodies, or the so-called elements, why Aristotle would suddenly and without warning refer to the elements as "the perceptible bodies". This

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[18] Taking τούτων as referring to the perceptible bodies; see n. 7 above.

[19] See Williams, 1982, p. 152.

complaint has all the more force given that, in the line immediately preceding the assertion at 328b32-33, Aristotle says: "It remains to consider the *so-called elements"* (328b32). It would surely have been more natural for Aristotle to maintain this way of referring to fire, air, water, and earth, and say that "the generation and corruption of all naturally constituted substances are not without the *so-called elements*".

It is worth highlighting this difficulty, as it is a problem faced by all attempts to identify τὰ αἰσθητὰ σώματα at 328b33 with any restricted or determinate set of perceptible bodies. For any claim that Aristotle intends to refer to this or that particular *kind* of perceptible bodies at 328b33 ought to explain *why*, instead of specifying clearly which particular kind of perceptible bodies he has in mind, Aristotle uses the rather more general phrase "the perceptible bodies". Of course, one explanation might be that Aristotle *doesn't* intend to pick out *only* the simple bodies, but rather a wider group of bodies that includes the simple bodies. One could, for instance, take the perceptible bodies to *include* the simple bodies, but also, say, the composite parts of naturally constituted substances, i.e., the homoeomerous and anhomoeomerous parts. In other words, to identify the perceptible bodies as the *matter* of composite substances.[20]

And yet even this "weaker" claim is dubious. For there are good contextual reasons to think that the simple bodies are not included among the perceptible bodies in question *at all*. Consider again the assertion at 328b32-33:

> It remains to consider the so-called elements of bodies. For (γὰρ) the generation and corruption of naturally constituted substances are not without the perceptible bodies.

Evidently the aim at the beginning of *De Gen. et Cor.* II is to investigate the so-called elements of bodies, and the problematic

[20] Joachim (1922, p. 192-193) appears to hold this view. Cf. Scaltsas, 1998.

assertion would appear to be offered as the reason *why* we ought now to consider the so-called elements of bodies.[21]

But what are these bodies, at line b31-32, the elements of which we are now to consider? Presumably they are "the perceptible bodies" of line b33, upon which the generation and corruption of naturally constituted substances depend. What Aristotle is saying, in other words, is that since generation and corruption do not take place without the perceptible bodies, then we must consider the so-called elements *of these perceptible bodies*. Now this is significant, because if Aristotle intends to inquire into the elements of the perceptible bodies, then the perceptible bodies *must be things that have elements*.

In other words, the perceptible bodies at 328b33 must be things that can be analysed into more basic constituents, which is to say that the perceptible bodies at 328b33 are *composites*. Another way of putting this is to say that the perceptible bodies in question have matter, and indeed Aristotle proceeds by considering what his predecessors identified as the matter of the perceptible bodies (328b33-329a5, again taking τούτων to refer to the perceptible bodies). The very fact that he turns to consider the matter of the perceptible bodies leaves no doubt that the perceptible bodies in question are composites, of matter and form (as is obvious at 329a24f.). It follows that fire, air, water, and earth, insofar as they are elements or constituents of bodies, cannot be identified with, nor included among, the perceptible bodies at 328b33. For they are precisely the *elements* of these perceptible bodies, not the perceptible bodies themselves.

Further support for this conclusion is available at *De Gen. et Cor.* II.2, where Aristotle proposes to investigate "the principles of perceptible body" (329b7). Now this, of course, is not a new investigation, but rather the beginning of the investigation into the so-called elements of (perceptible) bodies: he refers to principles

[21] This point is sometimes obscured in translation. Williams (1982), omits translating the conjunction γὰρ, and begins the assertion on a new paragraph, as does Forster (1955) in his Loeb translation.

(ἀρχαί), but, as he says at 329a5-8, στοιχεῖα and ἀρχαί are both good names for the primary things whose changes entail generation and corruption (cf. 329b3-4). What this once again implies is that the set of things that make up the extension of the phrase "the perceptible bodies", in this context, do not include the elements; rather these "perceptible bodies" are things that can be analysed into elements. Once more we are obliged to presume a distinction between the perceptible bodies in the context of *De Gen. et Cor* II.1, and the so-called elements, or simple bodies.

Finally, looking ahead to the discussion at 329a24f., Aristotle says that there is a matter of the perceptible bodies, "from which the so-called elements come to be".[22] But why would he say this, if the latter were, or were included among, the perceptible bodies? One would think that it goes without saying that the matter of something is that from which the thing comes to be (see, e.g., *Phys.* II.3 194b23-26). Those who take the perceptible bodies in question to include the simple bodies rarely offer a reason *why* Aristotle would feel it necessary to make this apparently obvious point, beyond the suggestion that he wants to emphasise that *every* perceptible body, i.e., including the simple bodies (the "primary" perceptible bodies), comes to be from some underlying matter.[23] But Aristotle then proceeds to indicate that separate accounts are necessary of the matter of the perceptible bodies, and of the matter from which the elements, or simple bodies, come to be (329a27-29). For he says that a more accurate account of the former has been given elsewhere (probably *Physics* I.7),[24] and that now, in the *De Gen. et Cor.*, an account must be given of the latter.

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[22] See n. 11.

[23] See, e.g., Joachim, 1922, p. 198. Cf. Williams, 1982, p. 156.

[24] Those who think that Aristotle is referring to *Physics* I.7 (or generally I.6-9) at 329a27 include, e.g., Philoponus, *In de gen et cor* 210.25; Joachim, 1922, p. 198-199; Charlton, 1970, p. 70, 131, 135; Charlton, 1983, p. 201-202; Miller, 1978, p. 110; Graham, 1987, p. 478; Furth, 1988, p. 226; Gill, 1989, p. 244; de Haas, 1997, p. 71. King (1956, p. 382, n. 32) and Williams (1982, p. 155-156) are notable dissenters.

Since the matter is held to be the same for both (a24-26), and the *way* (τρόπον, 329a27-29) in which the perceptible bodies and the primary bodies come to be is apparently the same, the difference between, and the consequent need for separate accounts for, these subjects, would appear to be due to a difference between the class of things referred to here as "the perceptible bodies", and the simple or *primary* bodies (τὰ σώματα τὰ πρῶτα). Once again, the former, then, does not appear to be identical with, *nor even to include*, the latter.

Perhaps it is worth emphasising here that whether or not Aristotle is, in general, prepared to call the simple bodies "perceptible bodies" is not in doubt. Clearly he is. What is in question, rather, is whether or not the simple bodies are, or are among, the things to which Aristotle refers by the expression τὰ αἰσθητὰ σώματα in the context of *De Gen. et Cor.* II.1. And it seems that they are not. But this isn't a unique use by Aristotle of the expression τὰ αἰσθητὰ σώματα: in a number of texts we find a distinction between elements, or simple bodies, and things described as "the perceptible bodies" (*Metaph.* XII.1 1069a30-33; XII.4 1070b10-19; XIV.3 1090a32-35; cf. I.8 989b31-990a18; *Phys.* IV.1 209a14-17). [25] So clearly there are occasions when Aristotle wants to distinguish between simple bodies and other kinds of bodies, i.e., composites, and on these occasions, or some of them, he refers to the latter as perceptible bodies, τὰ αἰσθητὰ σώματα.

II

Interpretation B, then ought to be rejected. Now this seems to point us towards interpretation A. For it seems fairly safe to say that, if the perceptible bodies are not, nor do they include, simple bodies, then they *must* be composites. For bodies are either simple or composite (*DC* I.2 268b26-27; I.5 271b17-19; see also III.7 306b1;

[25] It is not even a distinction specific to Aristotle: cf. Alexander Polyhistor's distinction between the perceptible bodies (τὰ αἰσθητα σωμάτα), and the elements fire, air, water, and earth, in his discussion of the principles of the Pythagoreans (DL 8.24; DK58 B1a, DK11 6-7).

DA I.5 410b8-9; III.12 413b9-10; *Phys.* IV.1 209a14-15). Moreover, as I said earlier, "A" seems the more intuitive of the two interpretations.

Yet it is extremely difficult to find advocates of this interpretation. Why? The problem with interpretation A, it seems, is that it would appear to render the assertion trivial and uninformative: for if the expressions "naturally constituted substances" and "the perceptible bodies" both designate the same things, i.e., corruptible composite substances, such as plants and animals, then Aristotle would appear to be saying no more than that the most significant changes that corruptible composite substances undergo necessarily involve corruptible composite substances. And this would seem to be stating the obvious. In other words, interpretation A lacks explanatory value.

Some scholars openly admit that this is the motivation behind their rejections of the A interpretation. Theodore Scaltsas, for instance, complains that such an interpretation of the perceptible bodies would not explain *why* the generation and corruption of the naturally constituted substances are not without the perceptible bodies. If the assertion is to have explanatory value, he writes, "clearly a differentiation is required", i.e., between the naturally constituted substances and the perceptible bodies in question. [26]

To this we might respond in two ways. The first response is to point out that, even if it *were* correct to say that the assertion at 328b32-33 lacks explanatory value under interpretation A, it need not follow that this *must* be the wrong interpretation. For it would still be the case that the assertion, so understood, expresses a truth, albeit a trivial one. Perhaps, indeed, one might suggest that Aristotle, for dialectical purposes, is intentionally saying something fairly obvious and uncontroversial, offering a somewhat commonplace remark with

[26] See Scaltsas, 1998.

which he would expect his contemporaries, and in principle even his predecessors, readily to agree.[27]

The second response is to deny that the assertion lacks explanatory value under interpretation A, and thus to reject this charge of triviality. One way of making this case is to suggest we take it to be analogous to Aristotle's frequent remark "man begets man". This is another claim that, on the face of it, may appear somewhat uninformative. But what Aristotle intends by this, of course, is that there must be substances of a certain kind, or nature, if substances of that kind are to come into being (cf. *Metaph.* VII.8 1033b29-32; VII.9 1034b16-18; VII.7 1032a15-25; *PA* I.1 640a22-26, b4-13). The assertion at 328b32-33, if we understand the phrases "naturally constituted substances" and "perceptible bodies" to be interchangeable, might thus be taken as a variation, or generalisation, of this claim. Indeed Aristotle has already invoked this principle earlier in the *De Gen. et Cor.* (I.5 320b17-20; cf. II.6 333b7-9, b13-18). Taken this way, the assertion implies an interpretation of "the perceptible bodies" in question, i.e., corruptible composite substances, as the primary substances in the world, upon which other things are ontologically dependent (see *Phys*. I.2 184a31-1), and with reference to which other things and processes, e.g., change, must be explained.[28] If this point is reckoned to be so tediously familiar as to be uninformative, then we are in danger of losing sight of the original philosophical milieu in which Aristotle is working.

Be that as it may, it is doubtful that *this* is Aristotle's point at 328b32-33. One of the difficulties we noted above regarding the identification of the perceptible bodies at 328b33 as the simple bodies is again applicable here. The problem is that, if "the perceptible bodies" and "the naturally constituted substances" *are* different

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[27] For Cleary (1995, p. 138), Aristotle is working within a "framework of shared agreement […] there is a consensus about the necessity [of perceptible bodies] for the formation of compound natural substances". Cf. Broadie, 2004, p. 140.

[28] See, e.g., *Metaph.* XII.5 1071a2, where Aristotle says that change in general is not without substance (τῶν οὐσιῶν ἄνευ οὐκ ἔστι); cf. *De Gen. et Cor*. I.3 318b33-319a14, *Metaph.* VII 1042b1-3; XII 1069b9-11.

expressions designating the same things, then we require a reason why, in the space of one line, Aristotle uses first one and then the other expression. Indeed, if the assertion is supposed to be making a point analogous to that expressed by the remark "man begets man", it would surely be more natural to stick to one, or the other, expression, than to switch between them; to say, e.g., "the generation and corruption of *naturally constituted substances* are not without *naturally constituted substances*". But Aristotle doesn't say this, and that he does not say this is probably sufficient to undermine the analogy.

The complaint, then, that the identification of the perceptible bodies with the naturally constituted substances at 328b32-33 does not explain *why* Aristotle says that the generation and corruption of the latter do not occur without the former, is a serious one, and a real obstacle to our interpretation of what the phrase "the perceptible bodies" means at 328b33. There is another way, however, to deny that the assertion at 328b32-33 is uninformative, if the expressions "naturally constituted substances" and "the perceptible bodies" both designate the same things. One may be led to think that the assertion is uninformative on the presumption that, if they have the same reference, then the expressions ought to be interchangeable in the assertion. But to think this is to neglect the possibility that, to put the point in Fregean terms, the expressions capture different "modes of presentation" of that which is designated. In other words, the expressions, in this context, may have the same "reference" (*Bedeutung*), i.e., *corruptible composite substances*, but different senses – the sense of the expression being that in which the mode of presentation is contained.[29]

Let me explain. If we replace one phrase with the other, and say, e.g., that the generation and corruption of naturally constituted substances are not without *naturally constituted substances*, then this may indeed appear to be a somewhat trivial statement. But the *thought*, or *sense*, expressed by *this* statement is not the same as that

[29] Cf. Frege, 1892, p. 32.

expressed by the assertion at 328b32-33. For what Aristotle says is that the generation and corruption of naturally constituted substances are not without the *perceptible bodies*. Perhaps, then, the point Aristotle wants to make is that there is something about the *perceptibility* of perceptible bodies, something about what being perceptible entails, that explains why such bodies are necessary for the generation and corruption of naturally constituted substances. Indeed this point would justify the investigation of the elements, because this feature is due to the elements, in particular, the properties that the elements contribute to the perceptible bodies.

In other words, if the generation and corruption of naturally constituted substances are not without the perceptible bodies, and this is so precisely because the latter are *perceptible*, then, if we want to understand why and how these changes occur, it makes sense to look into the causes of the perceptibility of these bodies, i.e., their elements or principles. And this indeed is how Aristotle proceeds at *De Gen. et Cor*. II.2-3. For there Aristotle examines the perceptible characteristics of body qua body or "body insofar as it is a body".[30] These, he explains, are the *tangible* contrarieties hot and cold, dry and wet, from which the others are derived (329b10-18). These contrarieties are then identified as the differentiae of the elements (II.3 330b6; see also *DA* II.11 423b27; *Sens*. 6 445b23; cf. *Phys.* VII.2 244b5). Presumably, then, it is by virtue of being *tangible* that perceptible bodies are necessary for generation and corruption.

So a more profitable way to approach the assertion at 328b32-33, then, is to focus not upon the issue of *what* these perceptible bodies are, but rather upon Aristotle's description of the items in question as *perceptible bodies*. But why might perceptibility, or in particular, *tangibility*, be thought crucial to explaining generation and corruption? The answer to this is, I believe, available in the last five chapters of the first book of *De Gen. et Cor*., especially chapter 6. This is because what Aristotle makes clear, in *De Gen. et Cor*. I.6, is that the possibility of contact, and thus of things that are capable of

[30] See Joachim, 1922, p. 201; Williams, 1982, p. 157.

contact, is a necessary condition for the generation and corruption of naturally constituted substances. And this is because generation and corruption seem to involve mixture and alteration: but "mixing" and alteration are not possible unless there is *something* that acts and *something* that is affected (322b9-11). But acting and being affected are themselves changes that cannot occur unless the things that act on and are affected by other things are in *contact* with each other (b22-25, b26-29; cf. *Phys*. VII.2 245a2-5). Thus mixture, as with alteration, presupposes things which act on and affect each other, which *in turn* presupposes that these things are in contact.

Hence it is clear that things that are capable of being in contact, or to which contact belongs, are a necessary condition for the generation and corruption of things. But what is contact, and what things are capable of being in contact with each other? Contact, Aristotle explains, at *De Gen. et Cor*. I.6, belongs in the strict sense (κυρίως) to things that have position (θέσις), and position belongs to things that are in place (τόπος, 322b32-323a1). Now since they occupy place, he continues, all things that are in contact with each other will have weight, that is, be heavy or light, (323a6-9).[31] But things that possess heaviness or lightness are things that are capable of acting and being affected (323a9-10). Hence Aristotle offers a fuller account of contact, and the things that are capable of contact:

> it is clear that the things that are naturally able to be in contact with each other are those separate things of magnitude whose extremities are together and which are capable of moving and being moved by each other (323a9-11).

Now this account restricts contact, properly speaking, to physical or natural bodies, as opposed to mathematical entities.[32] Aristotle is

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[31] On the suggestion that bodies may be *both* heavy and light, see discussion in Williams, 1982, p. 114-115. Cf. *DC* I.3 269b26-28; IV.4 311a22, a29-31.

[32] See Williams, 1982, p. 115. Aristotle occasionally appears to countenance mathematical *bodies* (*Metaph.* I.8 990a15-16; cf. V.13 1020a14, XI.1 1059a38-b2, with 1059b9-14), but, strictly speaking, he does not think that there are such bodies as opposed to natural bodies.

keen to make this contrast because there is, as he admits, some sense in which mathematical entities may be said to be in position, and thus in place, and hence in contact (323a1-3).[33] But mathematical entities are neither heavy nor light. At *Metaphysics* XIV.3, for instance, Aristotle complains that the Pythagoreans compose the natural bodies (τὰ φυσικὰ σώματα) out of numbers, with the result that things that are heavy or light are composed of things that are neither heavy nor light (1090a32-34; cf. *DC* III.1 300a14-19; cf. 299b14-15). Thus Aristotle concludes *De Gen. et Cor.* I.6 by saying that he has defined contact as far as "natural things" (τὰ φυσικὰ) are concerned (323a33-34).

But, of course, "natural things", or natural bodies, are *perceptible bodies*. Being perceptible is the most obvious characteristic of natural bodies.[34] Aristotle often uses the descriptions "natural bodies" and "perceptible bodies" interchangeably. At *De Gen. et Cor.* II.5 332a4, for instance, he refers to "the matter of *natural* bodies" (τῶν φυσικῶν σωμάτων ὕλη); this is clearly the same thing as "the matter of the *perceptible* bodies" (ὕλην τῶν σωμάτων τῶν αἰσθητῶν) at II.1, 329a24-25. [35] And, at *Metaphysics* XIV.3, after criticising the Pythagoreans for composing natural bodies out of numbers, Aristotle concludes that they must be talking about some other kind of bodies, but not the perceptible bodies (ἀλλ" οὐ τῶν αἰσθητῶν, 1090a32-35). It seems then that the things that are capable of contact are perceptible bodies.

This, indeed, is clear if we consider the conditions that something must meet to be something that is capable of being in contact. To be thus capable, a thing must occupy place; but nothing that is not a

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[33] See Joachim, 1922, p. 143-144.

[34] Cf. Granger, 2000, p. 421: "Foremost in [Aristotle's] mind when he considers natural objects is their perceptibility […] [it is] the fundamental point in his thought about natural objects".

[35] Cf. *DC* I.9 278b22-23, where Aristotle says that the universe, understood as all body or matter within the extreme circumference (278b18-21), "necessarily consists of all natural and perceptible body (τοῦ φυσικοῦ καὶ τοῦ αἰσθητοῦ σώματος). I think we can take καὶ here to be explicative; cf. 278b7-9, 279a8-9.

perceptible body can occupy place (*DC* I.7 275b6-7, b11; *Phys.* III.5 205a10, 205b31, b35; IV.1 208b28). If something occupies place, it follows, as we have seen, that it is either heavy or light or both; Aristotle says that every perceptible body has weight or lightness (*DC* III.1 299a26; *Phys.* III.5 205b26). In particular, whatever is *tangible*, or perceptible to touch, has weight or lightness (*Phys.* IV.7 213b34-a2, 214a8-9, 214a7-8). Indeed, Aristotle says that whatever is heavy must be hard or soft, i.e., tangible (*DC* III.1 299b11-12, b13-14); and he names heavy and light, and hard and soft, among the tangible contrarieties of body (*De Gen. et Cor.* II.2 329b19). Hence anything that is heavy or light is a tangible, and so perceptible, body. Furthermore Aristotle says that things that possess heaviness or lightness are capable of acting or being affected (323a9-10); but every perceptible body has the power to act or to be affected, or both (*DC* I.7 275b5-6). For the differentiae of the elements of perceptible bodies, hot and cold, dry and wet, are respectively active and passive, such that possession of these, in the appropriate ratios, renders the bearer either active or passive (*De Gen. et Cor.* II.1 329b24-32, *Meteor* IV.1 378b12-26, b31-34). [36] In general, for Aristotle, perceptible things are moving, or *changing*, things (κινούμενα), and vice-versa; so something that is changeable is perceptible, while something that does not change is imperceptible.[37]

Having made it clear that contact, and thus mixing and action and passion, apply to natural things (*De Gen. et Cor.* I.6 323a33-34), Aristotle begins *De Gen. et Cor.* II.1 with the summary of the discussion in the preceding five chapters: "we have discussed how mixing, contact, action and being affected belong to *things which are*

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[36] Since all bodies are constituted out of the four elements (*De Gen. et Cor.* II.8), all bodies will be more or less hot or cold, more or less dry or wet (*Meteor.* IV.8 384b28-30); see Alexander *In Meteor. 4* 213,5f. Of course, bodies have other tangible properties, but each of these, Aristotle thinks, can be traced back to these two primary contrarieties.

[37] See, e.g., *Metaph.* I.8 989b29-33; with Granger, 2000, p. 421; and *Metaph.* XII.1 1069b3. Plato had already stressed the point that whatever is perceptible is subject to change (see, e.g., *Phaedo* 78d-79a), as Aristotle himself reports (*Metaph.* I.6 987a33-34, b6-7).

subject to change by nature" (κατὰ φύσιν, 328b26). Things which are subject to change by nature are perceptible bodies; hence mixing, contact, action and being affected belong to the perceptible bodies. With this in hand, let's summarise Aristotle's reasons for discussing contact:

(i) The generation and corruption of things are thought to involve mixing, or alteration.

(ii) Mixing and alteration are impossible without action and affection.

(iii) The generation and corruption of things are impossible without action and affection (i, ii).

(iv) Action and affection are impossible without things that are capable of being in contact with each other.

(v) The generation and corruption of things are impossible without things that are capable of being in contact with each other (iii, iv).

Or, the generation and corruption of things are *not without* things that are capable of being in contact with each other. These things are the perceptible bodies. Thus:

(vi) The generation and corruption of things are not without the perceptible bodies.

And if we take "things" to be substances constituted by nature, i.e., the things of which generation and corruption are applicable without qualification (*Phys.* I.7 190a31-33), then

(vii) The generation and corruption of naturally constituted substances are not without the perceptible bodies.

Here, then, is the explanation of the assertion at 328b32-33. It seems that, in saying that the generation and corruption of naturally constituted substances are not without the *perceptible bodies*, Aristotle is putting into a nutshell the findings of *De Gen. et Cor.* I.6 to I.10. For the prerequisites for generation and corruption are things that are capable of being in contact with each other, because without

such things there is no action and affection, and no mixing: and therefore no generation and corruption. The things that are capable of being in contact must be in place, which entails that they have perceptible, in particular tangible, qualities. Thus the things capable of being in contact with each other are perceptible bodies. Hence the generation and corruption of naturally constituted substances are not without the perceptible bodies.

It seems clear, then, that the reason why Aristotle says that the generation and corruption of naturally constituted substances is impossible without perceptible bodies is because the perceptible bodies in question have certain capabilities by virtue of being perceptible, in particular, *tangible*. Most crucial is that they are capable of contact in the strict sense of mutual or reciprocal contact, for which it is necessary that they occupy place, which entails that they are heavy or light, and hence can act on and be affected by each other. Note that these conditions incidentally support the argument made earlier, that the eternal perceptible bodies are not among those perceptible bodies in question at *De Gen. et Cor.* II.1. This is because the superlunary bodies are said to be neither heavy nor light (*DC* I.3 270a5-6), and since the things that are heavy or light are perceptible by touch, i.e., tangible (see *De Gen. et Cor.* II.2 329b7-8, 329b19), it would appear that the heavenly bodies do not possess tangible qualities.[38] Thus Joachim rightly points out that these conditions are "satisfied only by the bodies of the Lower Cosmos", as opposed to heavenly bodies.[39] I think we can go a little further, however, and say that these conditions are satisfied only by the *composite* bodies of the sublunary world.

Thus interpretation A is vindicated: the phrase "the perceptible bodies" at *De Gen. et Cor.* II.1 picks out the same things as the naturally constituted substances, that is the ordinary familiar substances of the sublunary world. But, to repeat an earlier point, the

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[38] Rashed, 2005, p. 154-155, with 130f.; and Joachim, 1922, p. 142-143. See also *DC* II.7 289b20-21, with I.3 270a12-35.

[39] Joachim, 1922, p. 147.

key to understanding the assertion, however, is that it is *not* insofar as they are *naturally constituted substances* that the composite bodies of the sublunary world are the things without which the generation and corruption of naturally constituted substances do not take place, but rather insofar as they are *perceptible*.

III

Some concluding remarks. On the interpretation I have offered, it is clear that the assertion at 328b32-33 is something Aristotle has established by argument. We might go further, and recognise that the assertion indicates Aristotle's distance from certain rival points of view. For Aristotle complains that other philosophers, while making use of notions such as aggregation and segregation and alteration to explain generation and corruption, fail to see clearly what these notions are dependent upon, i.e., bodies that occupy place and are capable of mutual contact, and hence of altering and being altered (*De Gen. et Cor.* I.6 322b5f.); that is, perceptible bodies. Hence they choose principles and elements of perceptible bodies that are inadequate for the task, for instance, the *apeiron*, a body without perceptible contrariety (329a8-13), or indivisibles, whether planes (Plato) or solids (atomists).

Of the latter, Aristotle points out that such things are incapable of acting upon or being affected by each other (*De Gen. et Cor.* I.8 325b36-326a3), since their differences are not due to tangible characteristics (326a3-8). Thus they seem incapable of mutual contact (323a29-326b5), and therefore generation and corruption is rendered impossible. Likewise, the problem with Plato's theory of indivisible planes and surfaces is that such elements can only compose solids, i.e., mathematical entities, and nothing more; "they do not even attempt", Aristotle complains, "to generate any affection from them" (316a2-4, cf. I.5 320b14-17; *DC* III.1 299a17-18).

So, far from expressing something trivially empty, or dialectically commonplace,[40] the assertion at 328b32-3 reflects a fairly sophisticated position regarding the presuppositions for the possibility of generation and corruption. It reveals that a certain stance has been adopted regarding the kind of investigation that Aristotle believes is appropriate to the study of nature, i.e., a physical, rather than a mathematical, explanation.[41]

One final issue: what are the implications of this interpretation of the phrase "the perceptible bodies" at 328b33 for the interpretation of the phrase at 329a24, "the *matter* of the perceptible bodies"? Well, if my explanation of the assertion at 328b32-3 is correct, then the matter of the perceptible bodies can be understood as the matter of those things that are capable of contact – things that occupy place, are tangible, and can undergo alteration. And if such bodies are as I have argued, i.e., corruptible composite substances, then the matter of the perceptible bodies can be understood as the matter of *corruptible composite substances*. But what is the matter of these substances? That is a question I shall leave for another day: suffice to say it is not obvious that it is prime matter, nor the elements, nor the contraries hot, cold, dry, and wet.[42]

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[40] See n. 27 above.

[41] Cf. *De Gen. et Cor.* I.2 316a5-14. See also Hussey, 1983, p. xxxiii-xxxv; Cleary, 1995, p. 135.

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