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ARISTOTLE AND THE PRINCIPLE OF PLENITUDE. THE CASE OF *DE CAELO* A. 12

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In *De Caelo* A. 12. 281a28-b25 Aristotle presents an argument in support of the claim that 'everything that always is, is absolutely indestructible'. Scholars are in agreement about at least one thing: this argument is notoriously difficult to understand. This paper attempts to do a number of things. First, it critically evaluates Lindsay Judson's interpretation of *De Caelo* 281a28-b25, and it then proceeds to offer an alternative reconstruction of this passage. Second, it shows that Aristotle's argument in this stretch of text is indeed problematic, but that the problem with it is not the one identified by Judson. On the basis of this reading of *De Caelo* 281a28-b25, the paper goes on to make the following points: (a) the argument from *De Caelo* A. 12, in conjunction with material from elsewhere in the *corpus*, may be used to show that Aristotle is committed to some version of the *Principle of Plenitude* (= No possibility remains unactualized through an infinity of time) which is applicable to perishable entities – i.e. the entities in the sublunary realm; (b) given that this is the case, then Aristotle's drive to neutralize determinism, in the guise of fatalism (*On Interpretation* 9) and causal determinism (*Metaphysics E.* 3), suffers a serious setback; (c) Aristotle could have easily resolved this problem, had he become aware of it, by correcting the mistake committed in the argument of *De Caelo* A. 12 (281a28-b25).

Keywords: Aristotle – *De Caelo* A. 12 – L. Judson – The Principle of Plenitude – Fatalism – Causal Determinism

I

In *De Caelo* (*DC*) A. 10-12 Aristotle sets out to do two things: (a) refute the Platonic view of the *Timaeus* that the 'universe' (οὐρανός) is generated but it is indestructible and (b) prove that the universe is in fact 'indestructible' (ἄφθαρτος) and 'ungenerated' (ἀγένητος).[1] What we eventually get in *DC* A. 12 is a series of tortuous arguments aimed at establishing the Stagirite's thesis. Some scholars suppose that the line of reasoning developed in this chapter, or at least part of it, is credible.[2] Others, however, are convinced that it is hopelessly flawed.[3]

[1] This rendering of the word οὐρανός, at least within the context of *DC* A, is justified by the textual evidence in *DC* A. 9. 278b18-21. It should also be noted that *DC* A. 12 purports to be giving us a second (more general) argument against Plato's view; the first one is in *DC* A. 3. 270a12ff.

[2] See e.g. Elders 1966, 164ff; Bogen and McGuire 1987; van Rijen 1989, ch. 5, and esp. pp. 87ff.

[3] e.g. Hintikka 1973, 210-213; Judson 1983; Sorabji 1980, ch. 8, esp. pp. 128-130; Williams 1965.

It is not my intention to adjudicate this dispute, i.e. determine whether or not Aristotle succeeds in showing, *contra* Plato, that the universe is both ungenerated and indestructible. What I propose to do here is to focus on the opening section of the puzzle-work which is *DC* A. 12. I mean to examine the passage 281a28-b25 where Aristotle argues that: '... everything that always is, is absolutely indestructible (ἅπαν … τὸ ἀεὶ ὄν ἁπλῶς ἄφθαρτον)'.[4]

As is well known, this stretch of text has acquired notoriety due to the work of J. Hintikka. Hintikka 1973, 96, 107 argues that there is textual evidence (e.g. *Meta.* Θ. 4. 1047b3-6) which suggests that Aristotle endorses the universal applicability of the *Principle of Plenitude*:

T = If something is possible at a time *ti*, then it is actual at *tj* for at least one time *tj* ≥ *ti*.

Furthermore, Hintikka argues that the *corpus* contains ample evidence to support the claim that Aristotle accepts not only ***T***, but also the following variants of it:

***T*1** = That which never is, is impossible (e.g. *Meta*. Θ. 3. 1047a12-14).
***T*2** = What always is, is by necessity (e.g. *DC* A. 12. 281b2-25).
***T*3** = Nothing eternal is contingent (e.g. *Meta*. Θ. 8. 1050b7-8).[5]

These claims have been challenged by a number of recent interpreters. And, the consensus among scholars is that the criticisms are effective.[6]

I intend to show that the prime evidence Hintikka cites for the claim that Aristotle accepts ***T*2**, *DC* 281b2-25, deserves another look. To anticipate briefly, I argue for two things. First, the overall reasoning in *DC* A. 281a28-b25 commits Aristotle, albeit inadvertently, to a certain application of the *Principle of Plenitude* he explicitly rejects elsewhere (e.g. *On Interpretation* 9). And second, given that this is so, Aristotle's struggle to discredit determinism, the general thesis that every future state of affairs is (now) determined/fixed, seems to suffer somewhat of a setback.[7] To facilitate the discussion of these issues, however, we need to provide an exegetically correct account of Aristotle's intended argument in *DC* 281a28-b25.

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[4] *DC* A. 12. 281b25. For some suggestions on how the argument of 281a28-b25 fits within the wider context of *DC* A. (9-)12, see Judson 1983, 233-5.

[5] Hintikka 1973, esp. pp. 96-107. A certain version of Hintikka's position is adopted by Waterlow 1982. Waterlow's position is thoroughly scrutinized by Judson 1983 and van Rijen 1989, 82-88.

[6] See e.g. Gaskin 1995, ch. 7, and esp. pp. 75-8; Sorabji 1980, ch. 8; van Rijen 1984 and 1989, ch. 4. It is lso worth having a look at Judson 1983, esp. pp. 219-20, fn. 9. Judson's criticisms are directed against Waterlow's position, but they work equally well against Hintikka.

[7] As is well known, there are quite a few places in the *corpus* where Aristotle explicitly argues against both causal determinism and logical fatalism; see e.g. *De Interpretatione* 9, *Metaphysics* E. 3 and Θ. 3. For discussions of some of these texts, see e.g. Crivelli 2004, ch. 7 (*DI* 9); Kelsey 2004 (*Meta.* E. 3).

II

Our text may be divided into two sections: *DC* 281a28-b2, where Aristotle makes some preliminary remarks relating to the ensuing argument; *DC* 281b2-25, where we get an argument to the effect that everything that always is, is absolutely indestructible. Here is how the text reads:

> [**281a28**] Having determined these matters, we need to discuss the next. If it is indeed the case [**29**] that some things are capable (δυνατά) both of being and of not-being, then it is necessary to determine a maximum time [**30**] for both their being and their notbeing. I mean the time for which [**31**] the thing is capable of being and for which it is capable of not-being in respect [**32**] of any predicate (λέγω δ' ὂν δυνατὸν τὸ πρᾶγμα εἶναι καὶ ὂν δυνατὸν μὴ εἶναι καθ' ὁποιανοῦν κατηγορίαν); for example, man, pale, three cubits long, or any [**33**] other such thing. For if there is no certain amount of time, but instead it is always [**34**] more than the quantity proposed and there is no time than which it is smaller, then the same thing [**b1**] will be capable of being for an infinite time and also of not-being for another [**2**] infinite time (ἄπειρον ἔσται αὐτὸ χρόνον τὸ δυνατὸν εἶναι, καὶ μὴ εἶναι ἄλλον ἄπειρον). But this is impossible (ἀλλὰ τοῦτ' ἀδύνατον).
>
> [**281b2**] Let this be our starting point: [**3**] 'impossible' (ἀδύνατον) and 'false' do not have the same meaning. One use [**4**] of 'impossible' and 'possible' (δυνατόν), and 'false' and 'true' is [**5**] the hypothetical (ἐξ ὑποθέσεως). I mean, for example, that it is impossible for the triangle to have two [**6**] right angles, given certain assumptions; and (it is possible for the) diagonal to be commensurate with the sides (given certain conditions are fulfilled). There are [**7**] also, however, things which are possible, impossible, false, and true absolutely (ἁπλῶς). [**8**] Now it is not the same for a thing to be absolutelyfalse and to be [**9**] absolutely impossible. For to say of you that you are standing when you are not standing [**10**] is false, but not impossible. Likewise, to say of a man who is playing the lyre, [**11**] but who is not singing, that he is singing is false, but not [**12**] impossible. But, to say that someone is standing and sitting at the same time, or that the diagonal [**13**] is commensurate, is not only false but also impossible. [**14**] It is not the same, then, to assume something false and to assume something impossible. [**15**] And the impossible follows from the impossible. At all events, a person has at the same time [**16**] the capacity of sitting and the capacity of standing, since when he has the former (capacity) [**17**] he also has the other (τοῦ μὲν οὖν καθῆσθαι καὶ ἑστάναι ἅμα ἔχει τὴν δύναμιν, ὅτι ὅτε ἔχει ἐκείνην, καὶ τὴν ἑτέραν). But he does not have these in the sense that he is capable of sitting and standing at the same time, [**18**] but rather at different times (ἀλλ' οὐχ ὥστε ἅμα καθῆσθαι καὶ ἑστάναι, ἀλλ' ἐν ἄλλῳ χρόνῳ). If, however, something has for an unlimited time more than one capacity [**19**] there is no [realizing one] at another time; rather [they will be realized] at the same time (εἰ δὲ τι ἄπειρον χρόνον ἔχει πλειόνων δύναμιν, οὐκ ἔστιν ἐν ἄλλῳ χρόνῳ ἀλλὰ τοῦθ' ἅμα). [**20**] Hence, if something which exists for an unlimited time is destructible, it would have the ca-

pacity [**21**] for not-being (ὥστ᾽ εἴ τι ἄπειρον χρόνον ὂν φθαρτόν ἐστι, δύναμιν ἔχοι ἂν τοῦ μὴ εἶναι). If, then, it exists for an unlimited time, let this [**22**] capacity be realized (εἰ δὴ ἄπειρον χρόνον ἐστίν, ἔστω ὑπάρχον ὃ δύναται). It will, then, at the same time be and not-be [**23**] in actuality (ἅμα ἄρ᾽ ἔσται τε καὶ οὐκ ἔσται κατ᾽ ἐνέργειαν). But this would be false, because something false was assumed. [**24**] But if the assumption were not impossible, the result would not also be impossible. [**25**] Thus, everything that always is, is absolutely indestructible (ἅπαν ἄρα τὸ ἀεὶ ὂν ἁπλῶς ἄφθαρτον).[8]

The objective is to reconstruct the argument Aristotle gives in this passage. This I propose to do in two steps. First, I examine briefly the most prominent recent interpretation of *DC* 281b2-25. And second, I present what I take to be the exegetically correct reading of the text.

Judson 1983 maintains that the overall argument of 281b2-25 is problematic.[9] In 281b20-5 Aristotle seems to argue that: (a) if *x*, which exists for an infinite time, is destructible, then *x* must have the power of not-being; (b) let us suppose that *x* realizes its capacity to not-be; (c) this gives rise to an impossibility: at a certain point in time, *x* both exists and does not exist; (d) it follows that whatever exists eternally is *absolutely indestructible*. Aristotle appeals to a principle encountered, among other places, in *Meta*. Θ. 3. 1047a24-6: ‚... a thing is capable of doing something if there is nothing impossible in its having the actuality of that of which it is said to have the capacity'(ἔστι δὲ δυνατὸν τοῦτο ᾧ ἐὰν ὑπάρξῃ ἡ ἐνέργεια οὗ λέγεται ἔχειν τὴν δύναμιν, οὐθὲν ἔσται ἀδύνατον).[10] Putatively, the problem with the argument of 281b20-5 is that the application of this principle, let us call it the '*Modal Procedure Principle*' (***MPP***), fails to yield Aristotle' conclusion. Judson 1983, 230 takes it that:

... all that its application truly shows here is that it is impossible for something to exist always and *also* cease to be; it does not show that the ceasing to be of something that does exist always is without qualification impossible, any more than the sitting man's standing is without qualification impossible. Aristotle here seems to think that this test can be applied to a candidate for possibility *without regard to whether the supposition of its holding requires changes in what else can be taken to be true*. I shall call this the '*insulated realization manoeuvre*', because the realization of the possibility (or the exercise of the capacity) is supposed in complete insulation – causal and logical – from anything else

[8] The translations of the text are based on Leggatt 1995.

[9] What follows is a summary of Judson 1983, 228-231.

[10] One of the usual issues with *Meta*. Θ. 3. 1047a24-6 is that concerning the meaning of the terms 'δυνατόν' and 'ἀδύνατον'. The textual evidence from *DC* A. 12. 281b20-5 and *Meta*. Θ. 4. 1047b9-12, where ***MPP*** is applied, shows that: something has the capacity to φ, i.e. it is δυνατόν for it to φ, just in case nothing impossible (ἀδύνατον) would take place if its capacity (δύναμις) to φ were to be actualized. It seems then that δυνατόν means capable, and that ἀδύνατον means impossible. Or, if you prefer, δυνατόν refers to a feature of a thing, and ἀδύνατον refers to a feature of a state of affairs or a statement.

which is taken to hold.

To understand Judson's objection we need to take a look at the material in 281b2-15, where Aristotle invests some effort to make the distinction between two kinds of modality:

(1) Relative Modality[11]: The Stagirite tells us that 'it is impossible for the triangle to have two right angles, *given certain assumptions*'. As it is evidenced by *DC* 281b2-6, and a number of other passages in the *corpus* (e.g. *Prior Analytics* A. 1. 24b19ff, 10. 30b32ff), Aristotle's intention here is to point out that:

(i) Relative modality is the kind of modality that governs the consequence relation in a deduction.
(ii) A statement *p* (or a state of affairs *S*) may be said to be impossible/ possible/necessary relative to certain conditions that are sufficient or necessary for its derivation (or coming about).

(2) Absolute Modality: For example, it is absolutely impossible for the diagonal of a square to be commensurate with the sides (281b12-13). [For, to assume that the diagonal is commensurate with the sides, is to accept that there is at least one number which is both odd and even.] It seems that Aristotle's point here is this. A statement *p* (= the diagonal is incommensurate with the sides) is absolutely necessary, in the sense that its denial yields a statement which is without qualification impossible; it is a statement that entails a violation of the principle of non-contradiction.[12]

In 281b20-5 Aristotle utilizes ***MPP*** to test whether *x*, which exists for ever, is destructible. If we suppose that *x* has the capacity to not-be, and that this capacity gets realized, then impossibility arises: *x* exists and does not exist at one and the same time. Thus, the Stagirite concludes that *x* is (absolutely) indestructible. According to Judson, however, it should be obvious that this argument is fallacious. If the supposition were simply that *x* realizes its capacity to not-be, then no impossibility would result. The statement '*x* does not exist' does not express an impossibility. What *does* seem to entail the contradiction Aristotle identifies is the actualization of *x*'s capacity to not-be *while being everlasting*. If this is right, Judson tells us, then Aristotle fails to prove his conclusion. The argument of 281b20-5 seems to establish that it is impossible for *x* to exist always *and also cease to be*. To use the terminology of 281b2-6, the Stagirite's argument proves that the actualization of *x*'s capacity to not-be *relative* to *x*'s never ceasing to be entails a contradiction; hence, *x* cannot have the capacity to not-be while being everlasting. Yet, in the conclusion of the argument Aristotle explicitly asserts that *x* is 'absolutely indestructible'.

Is this a fair assessment of Aristotle's argument? van Rijen 1989, 81-82 notes that Judson's interpretation requires us to make an unpalatable assumption. In 281b2-15 Aristotle goes to great lengths to highlight the distinction between absolute and relative modality. Yet, if Judson is right we have to accept that in 281b20-5 Aristotle simply forgets

[11] I use 'relative possibility/impossibility' for what Aristotle calls the 'hypothetical' (ἐξ ὑποθέσεως) use of 'possible' and 'impossible'.

[12] The above, (1) and (2), is only a rough guide to the notions of absolute and relative modality. For a more detailed discussion of these issues, see van Rijen 1989, ch. 3, and esp. pp. 31-50.

this distinction immediately after he has acknowledged it. van Rijen's point is certainly not misguided. At the same time, however, we have to concede that Judson is correct to point out that: (a) the argument of 281b20-4 appears to show the impossibility of *x*'s ceasing to be *while being everlasting*, and (b) in the conclusion of the argument at 281b25 Aristotle asserts that *x* is absolutely indestructible. Hence, if van Rijen's objection is to carry any weight, we need to actually show that, despite appearances to the contrary, Aristotle does not commit the blunder of forgetting his own distinction between relative and absolute modality.

The question we need to address is whether Judson's reading of 28ab25 is correct. In *Meta*. Θ. 8. 1050b6-28, Aristotle supposes that the 'everlasting things' (τὰ ἀΐδια) in the universe are 'prior in substance' (πρότερα τῇ οὐσίᾳ) to those things that are 'perishable/transient' (φθαρτά).[13] In this same discussion, the Stagirite makes a familiar point: everlasting things are 'absolutely indestructible' (ἁπλῶς ἄφθαρτα) (1050b16). *Meta*. Θ. 8 makes it clear that the expressions 'absolutely indestructible' and 'absolutely destructible' are there used in a very specific sense. As we are told:

> (1) A transient thing may be said to be 'absolutely destructible' (ἁπλῶς φθαρτόν), since it is subject to substantial change. In other words, it can cease to be.
> (2) An everlasting thing, as opposed to a transient one, is 'absolutely indestructible'. It cannot ever cease to be the kind of substance it is. Or, if you prefer, it cannot ever cease to be.[14]

In light of the above, it is plausible to assume that the expression ἁπλῶς ἄφθαρτον at *DC* 281b25 has the meaning specified in *Meta*. Θ. 8. That is to say, it is reasonable to assume that in the context of *DC* 281b25 this expression is not intended to indicate that it is absolutely impossible, as opposed to relatively impossible, for an entity *x* to be destroyed. Rather, it is meant to be shorthand for the claim that things which exist eternally cannot ever cease to be.

The suggestion here is that ἁπλῶς ἄφθαρτον at 281b25 need not be taken to refer to absolute modality, as proposed by Judson. It may be taken to refer to the fact that everlasting things, as opposed to transient ones, are not subject to substantial change. If this much is right, then we are entitled to suppose that Aristotle's aim in 281b20-5 is *not* to establish that it is absolutely impossible for *x* to be destroyed. To be more specific, if the suggested reading of ἁπλῶς ἄφθαρτον is accepted, then we may assume that the Stagirite's intention in 281b20-5 is to simply give an argument for the claim that: given that *x* is everlasting, then it cannot ever cease to exist. Hence, we may defuse Judson's criticism of the argument in 281b20-5.

What remains to be seen, of course, is how we are supposed to read *DC* 281a28-b25. I turn to this task next.

In 281a28-b2 Aristotle makes some preparatory remarks for the discussion in 281b2-

[13] For two discussions of the issue of priority in *Meta.* Θ. 8 and the *corpus* in general, see Makin 2003 and

[14] *Meta*. 1050b6ff. For further discussion of (1) and (2), see Ross 1958, 259, 265.

25. He tells us that if *x* is capable of being *F* and of being not-*F*, then there must be a maximal stretch of time for the exercise of these capacities (281a28-33).[15] He then proceeds to justify the introduction of this condition. If we put no limit to the duration of *x*'s being *F*, as well as to its being not-*F*, then an unacceptable conclusion follows. We will be forced to admit that *x* is *F* for an unlimited time and that it is not-*F* for another unlimited time (281a33-b2). Aristotle notes this is impossible (281b2).

It seems that what Aristotle is trying to say in 281a28-b2 is this. If we are to maintain that *x* has both the capacity to be *F and* the capacity to be not-*F*, where each of these capacities is for an unlimited time, then we have to accept that it must be possible for *x* to realize *F*, and that it must also be possible for *x* to realize not-*F*. If we are to truthfully assert that *x* has both of the aforementioned opposite capacities, then it must be the case that it is possible for *x* to be *F* for an unlimited time, *and* that it is possible for it to be not-*F* for an(other) unlimited time. When we assume these capacities actualized, though, we see that impossibility ensues.

van Rijen 1989, 92 supposes that the best we can do here is to assume that Aristotle never provides a real justification for the conclusion at 281b2. But this is not quite right. At 281a33-4, the Stagirite tells us that a stretch of time is unlimited if it is larger than all other stretches of time, and smaller than no stretch of time. Thus, if there were two distinct unlimited stretches of time each one would have to be larger than the other. This is obviously impossible. An entity *A* can't be larger than another, *B*, while *B* is larger than *A*. This must be what Aristotle has in mind when he states that there *cannot* be two distinct stretches of unlimited time. It cannot be the case that *a* is *F* for an unlimited time and that it is not-*F* for another unlimited time. Hence, the Stagirite's conclusion would seem to follow. If *x* has the capacity to be *F and* the capacity to be not-*F*, then there *must* be one maximal stretch of time for the exercise of these capacities.

The discussion in 281a28-b2 supports two claims. First, there appears to be an underlying assumption which is a *sine qua non* for the development of the thought in this passage: if an entity *x* has capacities for opposites, for being *F* and for being not-*F*, then it must be possible for each of them to be realized. And second, given this assumption, it follows that *x* cannot have opposite capacities each of which is for a different unlimited time – for the reasons just explained. To determine how all this fits into the wider context of 281a28-b25 we have to proceed with the analysis of 281b2-25.

In 281b15-18, Aristotle tells us that:

(1) A man can possess simultaneously the two (opposite) capacities of sitting and stan- ding (281b15-7).

(2) To accept (1) is *not* to accept that it is possible for a man to sit-while-standing. Rather, it is to accept that a man can possess both the capacity to sit and the capacity to stand, in the sense that he can sit at one time and he can stand at another time

[15] It should be noted that 281a28-b2 is essentially a continuation of the discussion in *DC* A. 11. 281a7-17.

(281b17-8).[16]

Take an entity *x* and two opposite capacities which are for a limited time, the capacity to be *F* for a limited time, and the capacity to be not-*F* for a limited time. If *x* is to be said to have both of these, then it must be possible for *x* to be *F* (for a limited time), and it must also be possible for *x* to be not-*F* (for a limited time). Clearly *x* can have both of these capacities. This is attested by the fact that if we suppose that *x* realizes them both, *but at different times*, then no impossibility results.

Having stated this much, Aristotle goes on to tell us that: 'If, however, something has for an unlimited time more than one capacity there is no [realizing one] at another time; rather [they will be realized] at the same time' (εἰ δέ τι ἄπειρον χρόνον ἔχει πλειόνων δύναμιν, οὐκ ἔστιν ἐν ἄλλῳ χρόνῳ ἀλλὰ τοῦθ' ἅμα) (281b18-19).[17] Aristotle's point here is something along the following lines. Let us suppose that an entity *x* has the capacity to be *F* for an unlimited time as well as the capacity to be not-*F* for the same stretch of unlimited time. Furthermore, keep in mind the underlying assumption that if something is to be said to have capacities for opposites, then it must be possible for both of them to be realized. The test for determining whether *x* has the aforementioned capacities is ***MPP***. If it is possible for *x* to realize each of its opposite capacities, it should do so within the same stretch of unlimited time. This is so because, as was argued at 281a28-b2, there cannot be alternative stretches of infinite time. But to say that (a) there is only one stretch of infinite time, and (b) *x* realizes both its capacity to be *F* (for an unlimited time) *and* its capacity to be not-*F* (for the same stretch of unlimited time), gives rise to impossibility. It turns out that *x* is at one and the same time both *F* and not-*F*. Hence, it follows that *x* cannot have opposite capacities that are for the same stretch of unlimited time.

Consider now the opening statement of 281b20-5: '... if something which exists for an unlimited time is destructible, it would have the capacity for not-being' (... εἰ τι ἄπειρον χρόνον ὂν φθαρτόν ἐστι, δύναμιν ἔχοι ἄν τοῦ μὴ εἶναι). The line of thought Aristotle advances here is akin to that encountered in 281b15-19. Suppose that *x* is an entity that exists eternally. The question is whether *x* is destructible. As Aristotle notes, if *x* is destructible, then it must have the capacity to not-be (at some point in time). He then proceeds to tell us that the test for determining whether or not *x* has such a capacity is the familiar one. That is, we are going to have to consider whether it is possible for *x* to not-be at some point in time (281b21-22). Aristotle's contention is that if we assume *x* to realize its capacity to not-be, while being everlasting, then a contradiction ensues (281b21-3). To be more specific, his claim is that the application of ***MPP*** shows that there will be a time at which *x* both is and is not. He concludes that whatever is everlasting is indestructible (281b25).[18]

The language of 281b20-5 makes it clear that Aristotle's aim in this passage is to

[16] On these two points, (1) & (2), see also *Sophistical Refutations* 166a23-31.

[17] Compare this translation of 281b18-19 with the ones in: Leggatt 1995, 101 and Stocks [in Barnes (ed)] 1985, 467.

[18] Compare the argument in 281b20-5 with the discussion in *On Interpretation*. 12. 21b10-22.

show that the actualization of *x*'s capacity to not-be (at some time), where *x* is assumed to be incorruptible, entails an obvious contradiction. More specifically, it ought to be clear that his concern in our passage is to show the falsity of a statement of the form '*pt*inf & *M*~*pt*1'.[19] What we need to consider next is the central question concerning 281b20-5: Is the argument in this passage a good one?

The argument of 281b20-5 contains one serious logical error. As was just noted, the Stagirite takes it that what is under consideration in 281b20-5 is a statement of the form '*pt*inf & *M*~*pt*1'. By utilizing ***MPP*** he contends to show that this statement is false. He argues that: the truth of '*pt*inf & *M*~*pt*1' is dependent on the consistency of '*pt*inf & ~*pt*1'; it is clear that the latter statement is contradictory; hence, it follows that '*pt*inf & *M*~*pt*1' is false. The argument goes wrong, however, in that the consistency of '*pt*inf & ~*pt*1' is not a necessary condition for the truth of '*pt*inf & *M*~*pt*1' but for the truth of '*Npt*inf & *M*~*pt*1'. Aristotle begins with the assumption that *x* is an everlasting entity. He proceeds to pose the question of whether *x* can possess the capacity to not-be (at some point in time), while being everlasting. His claim is that the application of ***MPP*** shows that if we assume that *x* realizes the capacity to not-be then a contradiction results, namely, there is a time at which *x* both is and is not. Thus, he concludes that *x*, which exists everlastingly, cannot ever cease to be. What Aristotle fails to see is that although *x* is assumed to be everlasting, i.e. it is in the process of exercising its capacity to be for an infinite time, there is still the possibility that the exercise of this capacity may be interrupted. And if this is so, then it is also true to assert that *x*, although everlasting still has the capacity to be destroyed. In other words, although *x* is assumed to be everlasting it is still possible for it to be destroyed. If this is right, then it would seem that the inconsistency of '*x* is everlasting and *x* does not exist at some time *t*1' is *not* a sufficient condition for the falsehood of '*x* exists eternally and it is possible for *x* to not-be at some time *t*1'. The inconsistency of this first statement is a sufficient condition for the falsehood of the statement 'it is necessary that *x* is everlasting and it is possible for *x* to not-be at some time *t*1'. The error in the argument in 281b20-5 is that Aristotle confuses '*pt*inf & *M*~*pt*1' with '*Npt*inf & *M*~*pt*1'. And given the nature of the mistake, it would seem that the argument fails to establish its conclusion: whatever exists eternally is indestructible.

In the final analysis, the argument in 281b20-5 is flawed. What remains to be seen, is how this argument affects the discussion concerning Aristotle's commitment to the *Principle of Plenitude*.

III

As already noted, Hintikka contends that Aristotle is committed to the *universal* applicability of the *Principle of Plenitude*, i.e. the thesis ***T*** along with its variants. What makes this claim significant in discussions of Aristotle is the fact that if it is accepted, then we have no choice but to admit that he is also committed to determinism. Very

[19] A brief note on notation: (a) *M* = 'it is possible that', (b) *N* = 'it is necessary that', (c) *pt*inf = any statement asserting that *x* is *F* for an infinite time, and (d) *pt*1 = any statement asserting that *x* is *F* at a certain particular time (*t*1).

briefly, the suggestion here is that determinism may be shown to follow from the *Principle of Plenitude* as follows:

(1) Assume that M (p at $t1$).
(2) Show that ~ M (~p at $t1$).
(3) Assume that M (~p at $t1$).
(4) From (1), p at $t1$.
(5) From (3), ~p at $t1$.
(6) Therefore, ~ M (~p at $t1$).
(7) Therefore, N (p at $t1$).
(8) Therefore, M (p at $t1$) ' N (p at $t1$).[20]

If Hintikka is right, then it would seem that Aristotle's well-known effort to refute determinism (in the guise of logical fatalism and causal determinism) suffers a significant blow.[21; 22]

It is now the consensus among scholars that Hintikka's thesis is problematic. It has been argued that the textual evidence shows conclusively that Aristotle refuses to apply ***T*** to things of finite duration. For example, in *On Interpretation* 9. 19a9-18 he explicitly states that there is a distinction to be made between things which are everactive/ imperishable and perishable/transient things like a cloak. A cloak is such that it is capable of being cut up, even if it never will be. In other words, Aristotle maintains that the realm of non-eternal things is occupied by (some) entities that have capacities that may never be realized. He is not prepared to accept that the (entire) realm of perishable entities falls under the purview of the *Principle of Plenitude*, i.e. ***T***. Hence, it is fair to conclude that he supposes that this is a realm that is not governed by determinism.

Scholars are also in agreement that Hintikka's claims are not entirely misplaced. They agree that all the passages Hintikka cites for versions of the *Principle of Plenitude*, i.e. ***T*-*T*3**, fail to show that any of these theses pertain to transient things. Yet they note that most of these passages confirm that Aristotle is prepared to accept that the contested principle, and especially theses ***T*** and ***T*2**, is applicable to cases pertaining to things everlasting, e.g. the sun and the rest of the heavenly bodies.

The textual evidence confirms that Aristotle acknowledges that the idea that what is always true is necessarily true, and the idea that what is possible is at some time actual, are applicable to things everlasting.[23] Two of the many pieces of text that seem to support this much are *Generation and Corruption* B. 11. 338a1-3 and *Physics* Γ. 4. 203b30. In the first of these texts Aristotle affirms ***T*2**: what is always the case, such as the sun's eternal

[20] For a more detailed discussion of (1)-(8), see Hintikka 1977, 32ff.

[21] See fn. 7.

[22] Hintikka acknowledges that Aristotle's pronouncements throughout the *corpus* make it clear enough that he wants to defend indeterminism. At the same time, however, he argues that it is equally clear that the Stagirite adopts a number of claims about modality which actually force him to accept the *Principle of Plenitude* and consequently determinism. For further details on this point, see Hintikka 1977.

[23] I take it, along with other interpreters, that 'what is always true is necessarily true' and 'what is everlasting is a necessary existent' are just instances of the more general ***T*2** (= what always is, is of necessity).

motion in a circle, is of necessity. And in the second, he states that '... in the case of eternal things what may be is', which appears to be an endorsement of the claim that ***T*** is applicable to things that are everlasting.[24]

It is not my intention to challenge the interpretive orthodoxy on the issues sketched out above. As was indicated in part **I**, however, the material in *DC* 281b20-5, i.e. Aristotle's argument for ***T*2**, has some important ramifications for the overall discussion of the *Principle of Plenitude* and the problem of determinism within the *corpus*.

It is important to acknowledge that *DC* 281b20-5 gives us the material needed to construct an argument for ***T*1** (= that which never is, is impossible).[25] Consider *x* which has the capacity to be not-*F* eternally, in the sense that it now realizes this capacity. Can *x* also possess the capacity to be *F* (at some point in time)? To answer the question at hand we may appeal to the strategy Aristotle uses throughout *DC* 281a28-b25. We may test whether *x* can possess the capacity to be *F*, while being everlastingly no*t*-*F*, by applying ***MPP***. If we assume that *x* realizes the capacity to be *F* we will end up with a contradiction. There will be a time at which *x* is both not-*F* and *F*. Hence, we may conclude that whatever is everlastingly not-*F* cannot be *F* (at some point in time).

How does the point just made affect the discussion concerning the *Principle of Plenitude*? The overall textual evidence indicates that Aristotle is perfectly happy to admit that this principle is applicable to things everlasting. The issue we need to consider here, though, is whether Aristotle can maintain that ***T*1**, like ***T***, may be said to be exclusively applicable to such entities.

Sorabji 1980, 130 makes two interesting points. First, Aristotle concedes that negative properties may attach everlastingly to transient things. And second, this claim is certainly an embarrassment to his view that the *Principle of Plenitude* is only applicable to transient things. There is textual evidence that Aristotle is prepared to concede the following. Take the case of a cloak. This cloak has the capacity to be cut up, although it may never be cut up. Now, suppose that the cloak gets burnt up before somebody gets the chance to cut it up. As Sorabji points out, Aristotle's view is that the cloak may be said to have the negative property of not being cut up during its lifetime, and that it retains this property even after it gets burnt.[26]

Why is this significant? Evidently, the argument we have constructed out of the material in *DC* 281b20-25 is not part of an empty philosophical exercise. This material, as we have seen, is subject to an extension which shows that Aristotle is committed to ***T*1**. This time around, however, we cannot restrict the applicability of this thesis to things everlasting. As was just noted, Aristotle is prepared to acknowledge that (a) there are transient things that have negative properties in their lifetime, and (b) at least some of

[24] Note that Aristotle does not provide us with any concrete examples that illustrate how he thinks ***T*** is meant to be applied to everlasting things.

[25] The discussion in this and the next couple of paragraphs is loosely based on some remarks found in Sorabji 1980, 129-130.

[26] Sorabji notes that the claim that Aristotle allows for transient things to possess negative properties after they have ceased to exist, is supported by the evidence in *Categories* 10. 13b26-35 and *On Interpretation* 3. 16b11-15.

these transient things retain their negative properties even after they have gone out of existence. If this is so, we can see that a cloak can have everlastingly the property of not being cut up. Given that it has this property, then it is plausible to assert that in the whole of time the cloak in question will not be cut up. There is no time left at which the capacity to be cut up can be actualized. We may then conclude that if it is everlastingly true that the cloak has the property of not being being cut up, then it is impossible for it to be cut up. Hence, it is not just that *DC* 281b20-5 seems to give rise to an argument that has as its conclusion ***T*1**. Unfortunately the collective textual evidence shows that Aristotle is committed to the claim that this thesis, which is a variant of the *Principle of Plenitude*, is applicable to things transient.

What makes things particularly difficult for Aristotle s task to refute determinism is this. He attempts to block determinism by refusing to admit the applicability of ***T*** to transient things. Yet, we have just seen that we have all the textual evidence we need to show that Aristotle may be forced to accept that ***T*1** is applicable to things transient. Add to this the fact that ***T*1** is the contrapositive of ***T***, and it turns out that what we have at hand is an obvious tension in the Stagirite's efforts to refute determinism.

Gaskin 1995, 60-61 has made an attempt to rescue Aristotle from this problem. He argues that the point Sorabji draws our attention to poses no real difficulties for the Stagirite. He urges us to note that it is only at the moment that the cloak passes out of existence, without having been cut up, that it becomes everlastingly true, and thus necessary, that it neither was nor is nor will be cut up. Gaskin's claim is that ***T*1** may be said to be applicable to a transient thing *x* only after the relevant possibilities have been closed off for it. For example, we can say that the cloak has everlastingly the property to not be cut up, and that it is impossible for it to be cut up, only after the cloak has passed out of existence. During its lifetime, however, it still had the capacity to be cut up, and thus it was not impossible for it to be cut up. Hence, Gaskin concludes, it appears that Aristotle can still reject the applicability of the *Principle of Plenitude* to perishable things that have *genuine* future possibilities.

DC 281b20-25 shows that Gaskin's argument is unsatisfactory. The key is in the way the argument is set up in this passage. It is certainly true to say that this cloak here has the capacity to be cut up, as well as the capacity to not be cut up. Nevertheless, it is also true that Aristotle acknowledges that a transient thing may have negative properties that attach to it everlastingly. This is all we need to get the extension of the argument in *DC* A. 12 started. Let us suppose that it is true that this cloak has the capacity to not be cut up for ever, in the sense that it is now exercising this capacity. Can it simultaneously possess the capacity to be cut up? The answer is to be provided by applying ***MPP***. The application of this principle shows that the cloak cannot have the capacity to be cut up. Hence, it would seem to follow that the cloak has everlastingly the capacity to not be cut up, and thus it cannot be cut up.

The question that remains to be answered, of course, is whether this spells the beginning of the end for Aristotle's struggle against determinism. I think that all we can do at this point is resort to conjecture. It seems that the Stagirite is not aware of the possible extension of the argument of *DC* 281b20-5 that yields ***T*1**. And, it is certainly clear that he is not aware of the fact that his views concerning negative properties may be used to show

that this version of the *Principle of Plenitude* is applicable to things transient. If he had been aware of all this, then he would have seen the strain this line of thought puts on his effort to preserve indeterminism in the realm of transient things. I suspect that if he were to become aware of this problem, then his response would be something along these lines. The argument purporting to show that ***T*1** applies to things transient begins with the assumption that this cloak here is such that it has the property to never be cut up. Then, it proceeds to apply ***MPP*** to show that the cloak cannot possibly be cut up. It should be obvious, however, that the cloak's exercising of the capacity to never be cut up may be interrupted. So, all that the application of ***MPP*** can really show is that the following statement is false: 'this cloak here is such that it is *necessary* for it to never be cut up, and it is possible for it to be cut up'. And hopefully, if Aristotle could see this much, then he would also see that a similar problem plagues the argument of *DC* 281b20-5 which purports to show that 'what always is, is of necessity'.

What we need to keep in mind here is that the discussion in the last paragraph ventures in the realm of conjecture. The true facts are these. In *DC* 281b20-5 Aristotle gives us a bad argument for the thesis that (***T*2** =) 'whatever always is, is of necessity'. This bad argument may be appropriately extended to yield the thesis (***T*1** =) 'what never is, is impossible', which seems to cause a problem for Aristotle's drive to refute fatalism. And the bottom line is that *DC* 281b20-5 contains a blunder which ultimately causes trouble for his drive to refute determinism.

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Notes that may identify the author:

Fn. # 7:

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