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Teleology and necessity

D. M. BALME

The chief difficulty that final causes present to modern philosophers lies in reconciling them with what Aristotle calls 'necessity', that is the automatic interactions of the physical elements. It is difficult to see, first, how laws of nature can be directed towards goals and still remain 'necessary'; and, secondly, what could be the author and the means of such direction. The modern cybernetic model, and the concept of elaborate genetic coding, have not altered the problem; they have merely shown that some apparently teleological processes may in fact be necessary outcomes. It is arguable, as we shall see, that in the *GA* Aristotle himself was moving towards such a position. But there is no sign of it in *PA*, nor is there any sign in his writings generally that the relationship between finality and necessity could be a difficulty of the sort that we feel.

The novelty in Aristotle's theory was his insistence that finality is within nature: it is part of the natural process, not imposed upon it by an independent agent like Plato's world soul or Demiourgos. This is what allows him to claim that none of his predecessors had recognized the final cause with any clarity.[1] Anaxagoras called his primary cosmological cause 'Mind', and for this Aristotle likened him to a lone sober man among drunks;[2] Plato offered cosmic teleological causes in the *Timaeus*, *Philebus* and *Laws*; Xenophon argued for the popular belief in providential guidance of natural phenomena.[3] But such constructions are not what Aristotle meant by the final cause. Nor has his natural teleology anything to do with intentionality, the physiology of which in man and animals he explains in *MA*. There is no deliberating or purposing in most animals, he says; and it is by nature alone that roots and leaves grow for the sake of fruit; so that 'clearly the final cause is within the things that come about and exist by nature... It is absurd to deny that a thing comes about for the sake of something simply because one does not see that the cause of the change has deliberated. Art too does not

[1] *Metaph.* A. 988b6–16. [2] *Metaph.* A. 984b17. [3] *Memorabilia* I.4; IV.3.

deliberate. If the art of ship-building were present in the timber, it would be acting like nature... Nature is a cause in this way, namely for the sake of something' (*Ph.* II. 199a20, b26).

In *PA* II–IV Aristotle is occupied with exhibiting finality, but not with explaining how it works – that is to come in *GA*. Here he reviews every kind of tissue and organ found in animals, and argues that each part is as it is for two reasons: it exists for the sake of the animal's functions, while its development is both made possible and conditioned by the necessary actions of the materials out of which it grows. For example, horns grow for the sake of defense; but they grow out of earthy material which is necessarily flowing towards the animal's head; 'nature makes use of it for defense and advantage' (*PA* III. 663b34). In other animals nature uses the same material for teeth instead, which is why horned animals lack the upper incisors, not having enough material for both. While the material possesses the strength and density needed for horns and teeth, its natural action and movement will not produce the shapes and positioning of horns and teeth unless nature causes it to do so. The elements therefore are not absolute causes of the product, but contributory causes (*sunaitia*): 'for fire grows indefinitely so long as there is something to burn, but in everything constituted by nature there is a limit and definition (*logos*) of both size and growth; and these come from soul but not from fire, and from form rather than from matter' (*de An.* II. 416a4). The relationship appears clearly in *GA*: 'Heat and cold may make things hard, soft, tough, brittle, with all the other affections that belong to living things, but cannot go so far as to give them the definition in virtue of which one is now flesh and the other bone... Nature uses both heat and cold, which have power by necessity to do this and that; but in things that come to be the cooling and heating take place for an end;... they make flesh soft partly by necessity and partly not by necessity but for some end' (*GA* II. 734b31, 743a36, b16). The natural actions of the elements, taken by themselves, cannot deliver enough to account for animal parts. They do, however, account for many of the qualities of these parts, including possibly undesirable ones (bone is breakable) and irrelevant side-effects, upon which Aristotle comments: 'True, nature sometimes uses even excess products to advantage, but this does not justify our seeking a final cause in all – but while some things exist for the sake of an end, many other things necessarily come about too because of them' (*PA* IV. 677a17).

The analysis of causes into two kinds, those acting for the sake of an end and those acting by necessity, recalls Plato's *Timaeus* with its

distinction between the two causes Mind and Necessity. In his account, which Plato says is only a 'likely myth', a divine intelligent Demiourgos puts order into a chaotic material. The material consists of air earth fire and water, which have their own powers but act in a 'wandering' manner until directed by Mind; they are the 'contributory cause' (*sunaition*).[4] Aristotle too expresses the distinction between the causes as between necessity and 'the better' or 'the good', although he makes it clearer than Plato does that 'good' is not an extrinsic value-judgment but means the useful or advantageous from the animal's viewpoint.[5] But because the *PA* shows Plato's influence more strongly than the other treatises, and because it does not explain how 'nature' controls the material interactions, nor what it means by 'nature', it has not surprisingly attracted interpretations which make nature into a cosmic and in fact supernatural force.

But these interpretations must be resisted, for there is no room in Aristotle's cosmology for any such force acting upon the sublunary region. The prime mover of the universe has no knowledge of the universe;[6] the stars are moved by causes within the spheres that carry them.[7] If there is 'teleology' in the movements of the heavens (though really this is a misuse of the word), it has no connection with natural teleology on earth.[8] For the stars, sun and planets consist of a separate element, *aithēr*, which does not exist on earth and naturally moves in circles.[9] Their movements cause the earth's seasons, and therefore exert a general influence upon growth, but nothing more detailed.[10] The sublunary elements, air earth fire and water, act teleologically only when they are part of a living body; outside that (for instance in the occurrence of rainstorms) there is no final cause acting on them (*Ph.* II. 198b18). Aristotle confines natural teleology to sublunary life. Each animal contains within itself its own sources of motion and direction (its *archai*, which are potential impulses[11]); these may be triggered by seasonal changes, but are not directed by anything external to themselves. The comparison which Aristotle draws between cycles of events on earth and astronomical cycles is drawn

[4] *Tim.* 46c, 48a.

[5] The useful: *PA* II. 654a19; III. 662a33, b3, 7; IV. 677a16, 678a4–16, 683b37, 684a3, 685a28, 687b29, 691b1; *Resp.* 476a12. Sometimes he gives precedence to 'the valuable' (*timion*: e.g. *PA* II. 658a22; III. 672b20; IV. 687a15). But the part's value derives from its usefulness, not vice versa: *IA* 706b14; *PA* III. 672b15.

[6] *Metaph.* Λ. 1072b18.

[7] *Cael.* II. 289b30.

[8] *Metaph.* Λ. 1072b2.

[9] *Cael.* I.2.

[10] *GC* II. 336a32, 338b3; *GA* IV. 777b28; *Mete.* I. 339a21.

[11] The extent to which nature's sources of motion are 'fresh starts' is discussed in Guthrie 1939: xviii; Ross 1924: lxxxi; Sorabji 1980: 143. See too *Metaph.* E. 1027b11; *Ph.* VIII. 253a11–20, 259b1–16. It is definitory that 'nature is a source of motion in itself' (*Ph.* II. 192b20; *Cael.* III. 301b17; *Metaph.* Θ. 1049b9; *GA* II. 735a3).

for the sake of contrast. The outer stars eternally repeat a perfect circle; sublunary beings, neither eternal nor perfect, tend towards cyclical order through reproduction (which is the individual's attempt to survive), but this tendency is disturbed by the matter's indeterminacy and by the mutual interference of the multifarious *archai*[12]. Therefore when Aristotle says (*Metaph.* Λ. 1072b4, 14) that nature depends upon the prime mover, he is referring to the general cause of motion but not to the individual processes whose direction is determined within the animals themselves. And when he compares the universe with a household in which 'all things are ordered together towards one end' (1075a18), he is not speaking of a control exerted by the prime mover but of a tendency to regularity in all living beings: this tendency is inherent in their natures, which of their own accord follow the regularity of the heavens. But in sublunary beings there is a laxity which prompts the question where is the goodness in nature. Aristotle answers that the contribution made to the common good by the stars is their orderliness, while that made by animals and plants is their cyclical dissolution and reproduction rather than their individual activities. 'For such a source of action (*archē*) in each is their nature' (1075a22), which seems to mean that the nature of the sublunary and superlunary realms respectively makes each act in its own way. The source and nature of animal actions must therefore be explained from the nature of animals.

Just as Aristotle provides no evidence for supernatural control, so he provides none for a natural force over and above the individual natures of living things. Although he speaks anthropomorphically of nature choosing and guiding and 'doing nothing in vain'[13], he offers no place for an actually hypostatized Dame Nature – any more than do those modern biologists who speak so freely of the 'purpose' of animal structures and indulge in anthropomorphic metaphors like 'information' and 'coding'. Interpreters who have believed that he intended an overall teleological control have pointed to two statements which at face value suggest that the good of some animals is subordinated to the good of others. *PA* IV. 696b26 says: 'Dolphins and selachians have their mouths underneath, and therefore turn on their backs to take their food. Nature seems to have done this not only for the sake of saving other animals (for while they delay in turning over, the others escape), but also to prevent them from suffering the consequences of gluttony; for if they got food too easily they would die of excess. In addition to these reasons, their snout is

[12] *GA* IV. 778a7.

[13] *PA* II. 658a9 and *passim*; even 'God and Nature' *Cael* I. 271a33.

round and thin and therefore not capable of easy division.' But what this account does is to replace a faulty teleological explanation (saving other animals) with a proper one (preventing gluttony); its expression is sarcastic, no doubt because the faulty explanation was of the sort favored by popular providentialists like Xenophon. The other passage is at *Pol.* I. 1256b16, where Aristotle says that plants exist to feed animals, and animals to feed and clothe men.[14] But it is impossible that he could have meant this literally. It comes in a rhetorical and popularizing account of the varieties in natural lifestyle, which argues that man is acting naturally and properly when he dominates other animals. But when Aristotle considers the final cause of living things, he says that the natural philosopher must explain 'how it is better so, not absolutely, but in relation to each thing's being' (*Ph.* II. 198b9). This must rule out the face-value of *Pol.* 1256b16.

Nor does his analysis provide for 'vitalism' or any other 'extra factor' or nisus or conatus within animals.[15] Just as nature is not an independent entity but at most a generalization over the natures of individual beings, so soul is not an independent entity but is the form of the body.[16] It is the body's entelechy, its activity and actualization. In *GA* (as we shall see below) Aristotle equates the soul with 'movements' in the bodily tissues and blood, and because these movements form a self-limiting complex they control the body's constituents, so that the soul is at once the expression and the controller of bodily activity. This important idea is far from the 'mysterious entelechy' that some interpreters have imagined. Nor does Aristotle credit *pneuma* with the special powers that his medical contemporaries postulated. He defines it simply as 'hot air' (*GA* II. 736a1), and confines its role to actions that can be explained from the natural properties of heat and air.[17]

A further difficulty, which has perhaps caused more misunderstanding of Aristotle's biology than any other, is the relation between individual and species. Some of his statements can be taken to imply that individuals may act not for their own good but for that of their kind, and even that the individual's form is the form of the species. The latter view will be examined in my discussion of essentialism.[18] With regard to the former, Aristotle says at *GA* II. 731b35 that the reason why the kind is perpetuated is that the individual achieves

[14] Cf. *Pol.* VII. 1324b41 ('only the eatable should be hunted').
[15] For references to interpretations of this kind, see Sorabji 1980: 170.
[16] *De An.* II.1.
[17] On *pneuma*, see my note at *GA* II. 736a24 (1972: 158). For contrary views, giving a special meaning to *pneuma*, see Peck 1963: App. B; Solmsen 1957: 119.
[18] See ch. 11 below.

through reproduction the only eternality possible for it, namely in form.[19] He never says, however, that reproduction is for the sake of preserving the species, but leaves it that its preservation follows from the individual's attempt to preserve its own form – i.e. to survive. Again, he says that fishes are prolific because they live in a hostile environment and 'nature retrieves the wastage by quantity' (*GA* III. 755a31). Some animals cannot reproduce, but are generated spontaneously (*GA* III.11). In higher animals the sexes are separate because this benefits their intelligence; accordingly, to preserve their kind, nature ensures that enough females are produced even though a female birth is a deviation (*GA* II. 732a2; III. 767b9). What then is 'nature' in this context? The simplest answer is that nature is what is the case: here it is what survives, and the principle underlying it is the survival of those that are fit. This idea was already familiar from Empedocles. When Aristotle criticizes Empedocles at *Ph.* II. 198b29, it is not for saying that the fittest survive but for saying that they became fit by chance and through random material causes; to which Aristotle replies that this is impossible because nature is regular while random outcomes are irregular. Just as the very existence of species requires no deeper cause than the survival of those animals that fit best into a niche, so the preservation of species requires only the survival of the fit. If the fishes were not prolific, they would not survive in sufficient numbers; if the sharks could eat them quicker, they would not escape. This must seem to Aristotle mere common sense, not needing philosophical argument. The real problem is what ensures the reproduction of the individual: how is it that each fit animal produces equally fit offspring, fit to survive? Given that, the rest will follow. This is the problem that *GA* deals with, as will be seen. All the teleological explanations of the animals' parts in *PA*, at whatever level of generality they occur, refer to this individual development and to the individual's advantage: *this* is what benefits it in these circumstances. The explanations from 'nature's economy' refer to the economy within the individual body: the windpipe must be here because the heart is there...[20] What requires explanation, therefore, is how the individual's growth is directed towards these benefits, and what is meant by the 'soul' and 'nature' that control growth.

Lastly, at the opposite extreme from cosmic and overall teleology is the Kantian view that a teleological explanation is only an 'as-if' account: the final cause is a useful Reflexionsbegriff, but does not

[19] Cf. *de An.* II. 415a29; *GC* II. 336b30; and my note in 1972: 96.
[20] *PA* III. 665a7. Other examples in ch. 11 below, 300 n. 49.

actually exist.[21] Those who take this view hold that Aristotle's intention was to pick out the apparently teleological sequences because they draw attention to significant parts of the material-efficient process; but that process itself brings about the full result, and is scientifically explanatory without teleology. They hold that Aristotle indicates this by saying that every cybernetic process is also due to necessity, meaning that it is part of one physical interaction. The value of the teleological explanation then becomes purely heuristic. But this interpretation encounters two serious difficulties. First, as we have seen, Aristotle did not regard the automatic physical interaction as capable of producing animal tissues and organs; for when the elements act without being used by nature or soul, they do not impose limit and definition upon themselves.[22] This conception is hardly applicable to modern physical laws, which are envisaged as quantitatively precise on the observable scale in nature. Secondly, Aristotle always presents the four causes as four separate factors in a causal situation (*Ph.* II.3). They are not one factor plus three alternative descriptions or views of it. Nor does 'cause' (*aitia*) mean merely explanation, for which his word is *logos* or *apodeixis*. Modern translators, haunted by Hume, sometimes prefer 'explanation' to 'cause', but this risks a vicious ambiguity; for in Aristotle's usage explanations and reasons given are words and thoughts, whereas causes are objective things and events. Therefore if the efficient cause is one objective factor in nature, so too is the final cause another one.

If finality is not directed by an 'extra factor', whether within each animal separately or operating upon nature overall, and if it is not directed towards the good of anything other than the individual animal, it can only be part of the animal's natural growth. As such, the place for its explanation is the *GA*, and there indeed we find it. Aristotle explains how the animal inherits and reproduces its parents' forms. The sire implants his own form into the fetal matter (uterine blood, which itself has the dam's form implanted to a lesser degree – a complication which need not concern our present argument[23]). Actual form is the form of the matter at a given moment, therefore at conception the implanted form is simple; but it is potentially diverse, and it diversifies as the fetus grows. This is a logical analysis, which Aristotle now translates into physiological terms. The sperm

[21] For this view see Nussbaum 1978: 59–99; Wieland 1962: 261.
[22] *De An.* II. 416a15; *GA* II. 734b31.
[23] For a fuller outline of the account of generation see ch. 11 below, 293–4.

is secreted out of blood at the moment when the blood is being diversified within the sire's body into his parts and tissues.[24] The 'movements' or continuing changes (*kinēseis*) that the blood contains are transmitted to the sperm and thence to the uterine blood. These movements, like those in an automaton after it has been set going, become more complex and so bring about the progressive formation of the matter into tissues and parts. Nothing else but movements is transmitted to the fetus; for the sperm and its *pneuma* (the vehicle of the movements) evaporate;[25] moreover some animals transmit no sperm at all but simply movements directly implanted.[26] Now what the sire transmits is in fact soul,[27] which is therefore to be identified with the movements. At first it is merely nutritive soul in actuality, but potentially within it are the latent movements of sensitive soul, which become actualized in bodily parts as growth proceeds. From conception, therefore, the soul-movements are potentially the adult soul. At *GA* II. 740b29 Aristotle says:

> The capability (*dunamis*) of the nutritive soul, just as later on in the actual animals and plants it makes growth out of food by using heat and cold as instruments (for its movements take place in them, and each part is formed according to a certain definition), so too from the beginning it forms the natural object that is coming to be... And this [*sc.* nutritive soul] is the nature of every one, present in plants and animals alike. The other parts of the soul are present in some but not in others.

This is Aristotle's physiological account of the teleological control which soul and nature exert. It shows the sense in which he says 'Nature is spoken of in two ways, as matter and as being; the latter is also nature as moving cause and as end; and such, in the animals, is either its whole soul or some part of it' (*PA* I. 641a27). In this context soul and nature are used synonymously to stand for a self-limiting complex of physiological interactions or 'movements' which control the body's development in conformity with the inherited parental forms.[28] In this way form and teleological direction are imposed by 'nature' upon the primary actions of the elements. The resulting complex interactions are 'reducible' to the primary actions of the elements only in the trivial sense that they consist of them, as a polygon consists of lines and angles, but not in the sense that they come about because of those primary actions and would have resulted automatically. The latter reduction was proposed by Epicurus, who argued that random atomic movements would sometimes throw up enclosed and self-limiting complexes; these

[24] *GA* I. 726b10; II. 737a18. [25] *GA* II. 737a11. [26] *GA* I. 729b27, 730b10.
[27] *GA* II. 735a5, 737a32.
[28] Potentiality in the sperm: *PA* I. 640a23, 642a1. Control of growth by soul-movements: *GA* II.1; II.3; II.4 740a8, 630.

would give off similar groups and so account for the reproduction of successful animals. Epicurus treated the problem too lightly in his haste to be rid of teleology (which he apparently understood only in a crude providential sense). Aristotle, like Plato and probably all the ancients, sees the primary actions of the elements as quantitatively indeterminate until limit is imposed upon them. If limit is naturally imposed, not at random but regularly and usually, it must come from a pre-existing source; this he interprets as an enclosed system of movements in air earth fire and water; and the only place where it can be is in the parent. In the long and brilliant argument of *GA* he assembles the evidence for this, and disposes of alternative theories. It is summed up in the cardinal principle that 'a man begets a man'. It follows (ironically, in view of later criticism) that the approach to a quantitative science, which is always more visible in Aristotle than in the atomists, is owed to his teleology. He shows this, for instance, when explaining why animals produce several embryos rather than one big one:

> The fetus is formed out of spermatic material which is not indeterminate in quantity;... there must be a proportion between the male and female contributions;... for there is a limit set upon the capability of the material that is acted upon, and of the heat that acts upon it;... the product is a precise quantity out of a precise quantity (*poson ti ek posou tinos*). (*GA* IV. 772a2, 17, 29)

This idea of quantitative proportion often appears.[29] Nature's works are 'ordered and defined' (*GA* V. 778b4).

This is why the relation between teleology and necessity does not present a logical problem to Aristotle as it does to us. He sees the alternative to teleology not as a universal order mechanically determined by a nexus of physical causes and effect, in which each effect is both itself determinate and the cause of a further predictable effect, but as a chaos from which nothing amenable to scientific explanation could emerge.[30] The elements act in their own natural ways, but the actions are unlimited. This is the sense of the 'indeterminacy' (*aoristia*) that Aristotle attributes to proximate matter (*GA* IV. 778a6). It does not mean uncertain quality of action, nor an inscrutable intractability as some have suggested, but simply that the matter has not yet been formally determined into a precise state. The production of an animal therefore requires two material processes, which are of course combined in nature: there must be the primary actions of the elements, and there must be a limiting movement.

[29] *GA* I. 723a29, 727b11, 729a17; IV. 767a16, 772a17.
[30] *PA* I. 641b15; *Ph.* II. 198b35.

The primary actions are 'necessary' in the sense that they are necessitated by the nature of the elements, and themselves necessitate certain consequences. But they are also necessary in the sense that they are contributory causes without which the production could not take place. To express this, Aristotle borrows from his logical terminology the phrase 'on a hypothesis' (*ex hupotheseos*):[31] on the hypothesis that there will be this goal, such-and-such actions are necessary. In this sense necessity applies both to the primary material actions and to the limiting movement. At *Ph.* II. 199b34 he says:

> Is the necessity 'on a hypothesis', or is it in fact absolute? Some suppose that the necessary exists in things that come-to-be in the way that one might think that a wall had come about necessarily because heavy things naturally go down and light things go up, so that the stones and foundations went to the bottom, the soil above them, and the timber to the top as being the lightest. Now the wall did not come about without these things, but nevertheless it was not because of them, except as matter, but for the sake of giving protection. Similarly with everything else that has a final cause: it is not without things that have a necessary nature, but on the other hand it is not because of them except as matter;... the necessary is in the matter, but the final cause is in the definition... (200a30) Clearly, then, the necessary in natural things is that which is spoken of as matter and the movements in it.

In saying that the material movements have their own necessary nature but are also necessitated on the hypothesis of the production, Aristotle would seem to imply one of two alternatives. The first, which would be trivial, is that if we hypothesize that a wall will be built, we may infer that wall-materials must first be assembled. This is the heuristic interpretation. The other alternative is that the materials are open to selection and control towards an end. This is the clear sense of the biology, and seems to influence Aristotle to speak at one point as though 'necessary on a hypothesis' covered all natural necessity:

> There are then these two causes, the for-the-sake-of-which and the of-necessity – for many things come about of necessity. Perhaps the question might arise as to what kind of necessity is meant by those who say 'of necessity'. For neither of the two modes defined in our philosophical treatises can be present. In things that have coming-to-be, however, there is the third kind. For we say that food is a necessary thing not according to either of those modes but in that it is impossible to be without it. This is as it were 'on a hypothesis'. For just as there is a necessity that the axe be hard, since one must cut with it, and, if hard, that it be of bronze or iron, so too since the body is an instrument (for each of its parts is for the sake of something, and so is the body as a whole), therefore there is a necessity that it be such a thing and made of such things if that end is to be. (*PA* I. 642a1)

[31] *APr.* I. 45b16; *APo.* I. 72b15, 83b39; II. 92a7. The extension of this to natural science appears at *GC* II. 337b22–6. Generally, to distinguish contingent from unconditional: *Pol.* VII. 1332a10. Cf. Bonitz *Index s.v. hupothesis*.

The two modes distinguished in the 'philosophical treatises'[32] are evidently (i) movement necessitated by a natural state, as when a stone falls, (ii) movement necessitated by force, as when a stone is thrown up. Probably this extreme statement means that the proximate matter would not be present and active at all, were it not that a process of living nature was taking place (eating, digestion, etc.).[33] But apart from these two discussions Aristotle does not refer to 'hypothetical necessity' in his biology, but only to 'necessity'.[34] That he means necessity to cover both hypothetical and absolute necessity is clear in the little model explanation at the end of *PA* I.1 (642a31):

> Exposition should be as follows: for example, breathing exists for the sake of this, while that comes to be of necessity because of those. Necessity signifies sometimes that if there is to be that for the sake of which, these must necessarily be present; and sometimes that this is their state and nature. For the hot necessarily goes out and comes in again when it meets resistance, and the air must flow in; so much is already necessitated.

Such an analysis would seem possible only because Aristotle regards the elementary actions as quantitatively undetermined when left to themselves. They are modified in the direction of natural goals. The modification is not an automatic interaction reducible to the primary actions of the elements, but is imposed upon them by the pre-established soul-movements. Nevertheless these limiting movements are movements only of the elements, and could therefore be regarded as an additional part of the whole efficient cause – taken in a wider sense than Aristotle uses. For what he is saying is that there is a cybernetic control in biological processes over and above the simple actions of air earth fire and water, but still consisting only of their interactions within the complex. It is only a step, in theory, to a quantitative analysis of such controls. But of course it demands a very long step from the state of observational science in his day. Meanwhile the significance of his analysis is his insistence that this control exists within nature itself, and so must come into the scientific account.

[32] An uncertain reference, possibly *APo.* II. 94b36. The account at *Metaph.* Δ.5 has been suggested (John Cooper, ch. 9 above, 259–60) but seems to me less close.

[33] Cooper, ch. 9 above, interprets it in this way, I think rightly. But this is not enough to 'reconcile necessity with teleology' as Cooper argues, for it still remains to be shown how nature brings the proximate matter to the goal-like state and position. I agree with Cooper in rejecting my former attempt (1972: 76) to subsume all 'necessity' within living bodies under 'hypothetical necessity'. *PA* I. 642a1 is the only passage that suggests it; moreover Aristotle's use of 'hypothetical' in this context is rare, whereas in the huge majority of cases he speaks only of 'necessity' and clearly refers to the automatic interactions of the primary powers.

[34] *De Somno* 455b26 is a rare exception.