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Hylomorphic Teleology in Aristotle's *Physics* II

Discussion of final causality often occurs within a context of consciousness, which is hardly surprising given its indispensible importance for human activity. Yet associating final causality with conscious activity directed toward an end can tempt one to think of teleology as applying only to human acts, with the near-inevitable consequence of denying that non-conscious natural beings have true ends. While in no way suggesting that final causality is *not* essential to human activity, it is the purpose of the present study to show that teleology for Aristotle is much more extensive, encompassing even the relationship between matter and form.

To this end, I draw attention to the following argument in Aristotle's *Physics* II, chapter eight:

> And since "nature" means two things, the matter and the form, of which the latter is the end, and since all the rest is for the sake of the end, the form must be the cause in the sense of "that for the sake of which."[1]

It is my claim that this passage argues for a universal and essential interpretation of final causality. To understand the premises requires a return to Aristotle's treatment of the meaning of nature earlier in book II, specifically his presentation of nature as matter and form in chapter

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[1] Aristotle, *Physics* II, 8, 199a30–32, trans. R. P. Hardie and R. K. Gaye, in *The Basic Works of Aristotle*, ed. R. McKeon (New York: Random House, 1941).

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one. I argue that final causality includes matter's ordering to form and that the argument quoted above highlights the connections between chapter one's presentation of nature as matter and form and chapter eight's defense of final causality. In this way, teleology will be shown to be of central importance to the Aristotelian conception of nature. It is the final causality of matter to form that I refer to as hylomorphic teleology. This is universal (insofar as it extends to every natural subject) and essential (because it results from the *per se* principles of natural beings).

To clarify the meaning of hylomorphic teleology I will contrast my interpretation of chapter eight with that of Wolfgang Wieland regarding the scope and foundation of the final cause. Wieland rejects the claim that teleology is universal in nature, even going so far as to claim that the end of nature need only be a limited reflective concept, neither universally applicable *to* nor ontologically grounded *in* nature. To defend teleology as a universal principle of nature, I will counter an objection raised by Wieland that chance and universal final causality are mutually exclusive. It is my contention that Aristotle's presentation of teleology in chapter eight supports a diverse interpretation of the final cause, one that admits chance events while not sacrificing the intrinsic ordering of matter to form.

Nature as Matter and Form

The brevity of Aristotle's presentation of the ordering of matter to form in chapter eight requires a return to his treatment of the meaning of nature (φύσις) in chapter one. Here, nature is generally defined as "a source (ἀρχῆ) or cause of being moved and of being at rest in that to which it belongs primarily, in virtue of itself and not in virtue of a concomitant attribute" (192b20–23). Aristotle uses nature in this sense later in chapter eight to account for the predictability of nature's acting

for an end and thus intimates that final causality flows from nature taken as an intrinsic principle.[2] Having given this initial definition of nature, he continues to show how nature encompasses both matter (ὕλη) and form (μορφὴ), the two *per se* principles of natural beings already presented in book one, chapter seven.

Throughout his discussion of matter and form, Aristotle compares their relation to potency and act. Matter as that "out of which" a thing comes to be stands in potency to form. Though matter requires form to actually exist, it is not absolutely non-existent. Indeed, Aristotle notes in *Physics* I, 8 that much of the confusion regarding motion and change rises out of seeing matter as non-being rather than a potential for form. Matter as potency requires form in order to actually exist, and prime matter stands in particular need of substantial form. But even when actualized to some extent through substantial form, matter retains its receptivity to further actualization. In this way, matter is a principle of potency but not an inert or static one.[3] Though matter is constitutive of natural beings, its dependence on form leads Aristotle to insist that nature more properly refers to form, that by which a thing exists in actuality. As he explains, "The form indeed is 'nature' rather than the matter; for a thing is more properly said to be what it is when it has attained to fulfillment than when it exists potentially" (193a9–b21). Matter as potency relies on form for actuality. Although nature is both material and formal, Aristotle gives priority to form because it is that toward which matter is ordered for fulfillment. Nature is not identified

[2] See *ibid*., 8, 199b14–26. I discuss this passage in the conclusion of this study.

[3] For this point, see William Wallace, *The Modeling of Nature: Philosophy of Science and Philosophy of Nature in Synthesis* (Washington, DC: The Catholic University of America Press, 1996), 9: "matter, as a basic constituent of all natural entities, is no longer seen as the passive and inert component it was previously thought to be. Rather it is a powerful and potential principle that lies at the base of the most cataclysmic upheavals taking place on our planet . . ."

with matter alone because matter is itself incomplete, requiring form for actualization and intelligibility.

Aristotle's understanding of matter as potency ordered to the actuality of form is not explicitly re-stated in *Physics* II, eight. It is, however, the necessary background for understanding the argument for hylomorphic teleology. To summarize, nature is understood as referring to matter and form, *per se* principles of natural beings. It more properly refers to form as the fulfillment and actualization of matter. These are the points from chapter one that Aristotle relies on in chapter eight when arguing for the final causality of matter to form.

At this point, the divisions of final causality made by William Wallace can be of assistance in understanding the ordering of matter to form.[4] The final cause can be understood broadly as (1) terminus, (2) perfection, and (3) intention. Though not directly drawn from the text of chapter eight, I suggest that this terminology can help in understanding the complexity of Aristotelian final causality. Insofar as form actualizes matter it is related to form in the sense of a terminus—that toward which actualization is aimed and terminates. The form can also, I suggest, be related to matter as a final cause in the sense of perfection. Wallace explains that the final cause under the aspect of perfection adds to a terminus a notion that "it is somehow a perfection or good attained through the process."[5] This point is raised—though not elaborated on—by Aristotle in book I, chapter three, when, after giving his fourfold division of causes, states that "for 'that for the sake of which' means what is best and the end of the things that lead up to it" (195a24–25). In chapter seven he further relates the goodness of natural beings to their natures.[6] Following Wallace, then, form taken as the end of natural

[4] *Ibid.*, 16–18.

[5] *Ibid.*, 17.

[6] See *Physics* II, 7, 198b9: "because it is better thus (not without qualification, but with reference to the essential nature in each case)."

movement includes the sense of a terminus, but I suggest that it could also incorporate the notion of perfection insofar as informed matter possesses the perfection of existence to one degree or another.

Hylomorphic Teleology in Physics II, 8

Book II, chapter eight consists of a consideration of doubts about final causality, arguments in favor of it, and lastly a refutation of objections to his claim that nature is "a cause that operates for a purpose" (199a33–b33). The most straightforward division of the arguments in this chapter is three-fold.[7] The first argument reasons that nature is teleological because of chance's inability to account for nature's regularity (198b34–199a8). "Nature" as being what is or happens always or for the most part is contrasted with the infrequency of "chance" (τύχη) and "spontaneity" (αὐτόματον). Seeking to explain the observed order or regularity of the natural world, Aristotle argues as follows: natural events are either the result of final causality or chance. Chance cannot account for the regularity of nature. Therefore, natural events must be the result of final causality.

The second argument (199a8–29) proceeds from the ordering of processes to an end. Again seeking to explain the order of the natural world, Aristotle shows how processes are directed to an end. This argument can be further subdivided into arguments (1) from an analogy between art and nature and (2) the non-deliberative actions of animals. But of importance to my study is the common theme of finality based

[7] In his commentary, Thomas Aquinas interprets this text as consisting of five arguments, yet suggests that one is a clarification and complement to another (see *Commentaria in VIII libros physicorum aristotelis*, Leonine Edition, vol. II [Rome: Commissionis Leoninae, 1882], lib. 2, lectio 13, n. 4: "Potest tamen dici quod haec non est alia ratio a praemissa; sed complementum et explicatio ipsius."). Aristotle himself connects two points made at 199a15 ("This is most obvious in the animals other than man . . .") which I also take as support of a three-fold division.

on the relationship of priority and posteriority in natural and artificial events. To use an artificial example, the stages of laying a foundation, erecting walls, and raising a roof are all ordered for the end of constructing a house. These prior stages are for the sake of an end. This order is not limited by Aristotle to works of art. To use a natural example, oak trees come to be from acorns, from which roots sprout and leaves unfurl into seedlings. The acorn, then, reaches its end when it terminates in a fully-grown oak tree. The acorn is able to become an oak tree because of its potentiality. When it is actualized as an oak tree it has reached its natural end. Indeed, despite drawing an analogy between art and nature, Aristotle is careful to note here that the order of nature need not be deliberative. The arguments of chapter eight show that final causality—including hylomorphic teleology—is a result of nature as an intrinsic principle, and Aristotle takes care to show that the order to an end need not be deliberative.[8]

The third argument, the primary focus of this study, is that there is an order to nature grounded in the material and formal composition of natural beings. Relying on the meaning of nature as material and formal already expounded in the opening chapter of book II, Aristotle argues that matter is for the sake of form and, thus, that form serves as a final cause. To repeat his argument:

> [S]ince "nature" means two things, the matter and the form, of which the latter is the end, and since all the rest is for the sake of the end, the form must be the cause in the sense of "that for the sake of which" (199a30–32).

[8] In this way one can defend Aristotle's view of teleology from charges of imposing human awareness on nature. As Wallace explains, much of the difficulty with teleology "arises from conceiving all final causality as intention or cognitive and not sufficiently distinguishing the cognitive from the terminative or perfective." (*The Modeling of Nature*, 17.)

The brevity of this passage leads some to reject it as an argument for final causality. One objection raised by William Charlton is that "Aristotle is assuming, what he should surely be trying to prove, that the cause of natural things is nature in the sense of form" and thus that Aristotle must only be "pointing out the consequence that nature is form rather than matter."[9] Though I agree that this passage clearly incorporates a consequence of Aristotle's view of nature as matter and form, this is not a reason to reject this passage as an argument. Rather, the relationship between matter and form is not only a consequence of Aristotle's understanding of nature but serves at the same time as the premises for an argument for hylomorphic teleology. Indeed, the argument is only intelligible when read in light of chapter one.

In book II, chapter one, Aristotle shows that nature is matter and form, identifying form with actuality and matter with potentiality; but nature is more properly what is actual; therefore, nature is more properly form. Using the relation between potency and act, he can argue that form is the end of matter and that matter is for the sake of form; form is actuality; actuality is the end of matter; therefore, form is the end of matter. These earlier arguments, then, lay the foundation for his argument for hylomorphic teleology. In book II, chapter eight, Aristotle relies on the conclusions reached concerning the meaning of "nature" to argue concisely that form is an end; an end is a cause "for the sake of which;" therefore, form is a cause "for the sake of which."

This third argument is unlike the first and second arguments of chapter eight defending final causality in its explicit invocation of the principles of nature. Hylomorphic teleology is a consequent of the relation between matter and form, the latter being "that for the sake of which." This argument also differs from the other lines of argumenta-

[9] See William Charlton, *Aristotle's Physics: Book 1 & 2* (Oxford: Clarendon Press, 1970), 49.

tion because of the less obvious nature of hylomorphic teleology. The earlier arguments show how natural events are ordered to an end by beginning with some obvious feature of the natural world. This argument, on the other hand, looks at the ordering of natural beings themselves, an ordering resulting from the principles of nature. In this way, the presentation of arguments reflects the general Aristotelian methodology of beginning with what is more obvious to us before advancing to what is more intelligible in itself.[10] The regularity of natural events and ordering of processes is more obvious to us than the order intrinsic to natural beings.

Yet, one might object, it seems that hylomorphic teleology confuses the distinction drawn between the causes. If matter is ordered to form, it seems that the form alone is sufficient to account for this order. Aristotle himself grants that the causes often coincide with each other in reality.[11] Nature as form is that to which matter tends. But a natural being is ordered to form as something more than a form; matter is ordered to form as an end. Matter and form understood as principles of nature and the relation between potency (identified with matter) and act (identified with form) grants the aspect of final causality to form. This last argument does not supplant the final cause with the formal but instead shows the interconnectedness of the causes. As Aristotle himself

[10] See *Physics* I, 1, 184a16–21: "The natural way of doing this is to start from the things which are more knowable and obvious to us and proceed towards those which are clearer and more knowable by nature; for the same things are not 'knowable relatively to us' and 'knowable' without qualification. So in the present inquiry we must follow this method and advance from what is more obscure by nature, but clearer to us, towards what is more clear and more knowable by nature."

[11] See *Physics* II, 6, esp. 198a21–25: "Now, the causes being four, it is the business of the physicist to know about them all, and if he refers his problems back to all of them, he will assign the 'why' in the way proper to his science—the matter, the form, the mover, 'that for the sake of which'. The last three often coincide; for the 'what' and 'that for the sake of which' are one, while the primary source of motion is the same in species as these (for man generates man), and so too, in general, are all things which cause movement by being themselves moved . . ."

grants immediately before discussing final causality, the form and end are often in reality the same: "for the 'what' and 'that for the sake of which' are one . . ." (198a25 ff.). Matter is ordered to the form under the aspect of final causality. In this way, the final cause is distinct from the formal cause. Because nature is both matter and form, and matter is ordered to form as its fulfillment, nature for Aristotle is essentially teleological.

Despite the brevity of its presentation, I suggest that the third argument in favor of final causality is the most fundamental and expansive of chapter eight because it argues for teleology based on the hylomorphic composition of natural beings. This passage shows that all natural beings are ordered to an end because of the relation between matter and form, the intrinsic principles of nature. The potency of matter is actualized by form, the latter being the end toward which matter is ordered. Aristotle's presentation of the meaning of nature in book II, chapter one is seen here in chapter eight to be the fundamental source for final causality. The regularity and order of nature results from the principles constituting all natural beings. In this way, the connection between book II, chapter one and chapter eight stands forth clearly.

The diversity of arguments presented in chapter eight evidences the richness of final causality in Aristotle's natural philosophy. Though each concludes that nature is ordered to an end, the individual arguments of chapter eight introduce different emphases. Briefly stated, the first argument proves that nature as occurring "always or for the most part" is not due to chance, but must be the result of final causality. The second argument reveals how, given the order of natural movement, there is finality in nature and also shows that teleology is an order to an end that need not be deliberative. The third and final argument shows that teleology is an essential part of nature by grounding it in matter and form, the intrinsic principles of every natural subject. It is this third argument for final causality that makes clear the tendency of natural

substances toward specified ends that flows directly from the ontological principles of matter and form. Aristotle's presentation of teleology is thus far from a simple or baldly univocal account and allows him to answer a variety of objections to his claim that nature acts for an end.

Though the actualization of form might be impeded by a lack of matter or by matter unsuited to attaining the end, it remains that toward which matter is ordered for its fulfillment. Indeed, Aristotle readily grants in chapter eight that natural ends will not always be attained.[12] The interruption of nature's order to an end does not, however, undo the intrinsic teleology of matter to form nor abolish the fulfillment of form that natural beings actually possess. Teleology is present even when imperfectly realized. As Aristotle continues, if a natural being fails to reach a determinate end this must be through "the corruption of some principle" (199b7) but this does not mean that the principle is non-existent. As he explains in chapter eight, the end of nature is attained only "if there is no impediment" and again, characterizing chance as an incidental cause, emphasizes that "when an event takes place always or for the most part, it is not incidental or by chance. In natural products the sequence is invariable, if there is no impediment" (199b22–25). So, of course, not every acorn flourishes into an oak tree and it is possible that a healthy oak tree be reduced to a stump, but this does not take away the natural order of an acorn to become an oak tree, an order that arises from what an acorn is.

Yet some claim, given the possibility of the end of nature not being attained, that teleology must be limited. Frederick Copleston reminds us that teleology is not "all-pervasive and all-conquering, since matter sometimes obstructs the action of teleology."[13] One should be careful, however, not to conflate universality with necessity, and argue

[12] See esp. *ibid.* II, 8, 199a33–b7.

[13] Frederick Copleston, *A History of Philosophy*, vol. I, part II: *Greece & Rome* (New York: Image Books, 1962), 67.

that because the end might not be achieved that teleology is thereby limited. Form under the aspect of final causality allows the fulfillment or actualization of matter and is "all-pervasive" in that all natural beings have an intrinsic teleology through the order of their ontological principles of matter and form. Teleology taken in the sense of a full attainment of an end is, though, not guaranteed or "all-conquering." Aristotle grants in *Physics* II, 6 that natural events can be "in vain" and in II, 9 takes care to show how the necessity of nature is suppositional. In both cases, though, Aristotle is focused on the means toward an end, not the end itself, showing how—principally on account of a material impediment—an end might not be achieved.[14]

Thus far, I have argued that form must be understood as a final cause. The argument for matter's ordering to form in chapter eight relies on the earlier presentation of nature as matter and form in book II, chapter one. Using the distinction between potency and act, Aristotle shows that nature more-properly refers to form as that which actualizes and fulfills matter. Equipped with this understanding of the principles of nature, Aristotle is able in chapter eight to show that the final cause is an intrinsic and essential part of nature. This argument is of particular value precisely because it is rooted in the principles of nature. Yet as I mentioned at the beginning of this study, this interpretation is not without controversy. In order to shed more light on the meaning of hylo-

[14] In *Physics* II, 6, 197b22–32 Aristotle states that "the means to an end is 'in vain', when it does not effect the end towards which it was the natural means" before relating this to spontaneous events, in which "the thing itself happens in vain. The stone that struck the man did not fall for the purpose of striking him; therefore it fell spontaneously, because it might have fallen by the action of an agent and for the purpose of striking." Likewise at *Physics* II, 9, 200a11–14 he grants that *if* an end is to be achieved, then the means and matter to that end must come to be. To use his examples, a house can come to be only given the existence of materials suitable for home construction. Likewise a saw cannot function as a saw unless made of the appropriate matter. As he concludes, what is necessary in nature "is necessary on a hypothesis; it is not a result necessarily determined by antecedents. Necessity is in the matter, while 'that for the sake of which' is in the definition."

morphic teleology, I will now examine some objections made to universal final causality by Wolfgang Wieland.

Wolfgang Wieland on the Scope and Foundation of the Final Cause

In his work on *The Aristotelian Physics,* Wolfgang Wieland raises the "Problem of Teleology."[15] Readily granting that final causality is of great importance to the Aristotelian study of nature, he nonetheless attempts to refute several aspects of the "traditional" interpretation of final causality that accords a pre-eminence to the end of nature. As he explains, final causality depends on material, formal, and efficient causality; thus reminding us that "goal (*telos*) or purpose (*hou heneka*) is only *one* of the four causes" and chiding those who attribute an "inflated" importance to the final cause.[16] Wieland's thesis, he plainly tells us, is that "teleology certainly plays an important role in Aristotle's science; but that it is simply not that universal cosmic principle that it became in the course of time."[17]

Of concern to Wieland is that the traditional emphasizing of the end of nature runs the risk of theologizing or anthropomorphizing final causality.[18] Yet Aristotle's rejection of a theological basis for teleology, Wieland argues, shows that the final cause has been exaggerated and that it was not meant to be understood as universal by the Philoso-

[15] Wolfgang Wieland, *Die aristotelische Physik: Untersuchungen über die Grundlegung der Naturwissenschaft und die sprachlichen Bedingungen der Prinzipienforschung bei Aristoteles* (Göttingen: Vandenhoeck & Ruprecht, 1992). Chapter 16 of this work, the section of relevance to my paper, appears in English as "The Problem of Teleology," trans. Malcolm Schofield, in *Articles on Aristotle*, vol. 1: *Science*, ed. Jonathan Barnes, Malcolm Schofield, Richard Sorabji (London: Duckworth, 1975).

[16] Wieland, "The Problem of Teleology," 146 and 148.

[17] *Ibid.*, 142.

[18] *Ibid.*, 155–157.

pher.[19] The question of whether or not finality can be used to prove the existence of God lies beyond the scope and intention of my present study. Of concern is Wieland's rejection of the ordering of matter to form and his limitation of teleology.

> On no account should one ascribe to matter as such any power which could be given definite content—striving in a 'teleological manner' towards perfection in form . . . Aristotle never attributes to matter as such a hidden active power. But if, in spite of this, a teleology inherent in matter is fathered upon him, it is of course only a short step to the conception of a world perfectly ordered throughout in a teleological manner, a conception which has remained linked with Aristotle's name in the tradition right down to the present day . . .[20]

To counter this assertion, two of Wieland's primary objections to universal final causality must be answered. First, the dependency of final causality on other causes and conditions. Second, the purported exclusion of chance within a universally ordered natural world.[21]

In regard to this first objection, I have already shown that final causality in nature flows from the intrinsic principles of matter and form. Granted, the final cause depends on the other causes in order to be attained (as Aristotle explains in book II, chapter nine) but this dependence does not make the end subordinate to them. To return to the example of an acorn, an oak tree is not subordinated to the acorn because it relies on it to come to be. To say that the final cause of the acorn depends on its matter, form, and efficient causes is true, because

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[19] *Ibid.*, 157.

[20] *Ibid.*, 150.

[21] *Ibid.*, 149: "[I]t is precisely the *lack of self-sufficiency* which characterises the final goal that is shown here; each is *dependent upon conditions* which it cannot itself bring about but which for their part do not lead to it automatically. This *lack of self-sufficiency* which characterises each *telos* is, like the possibility of chance, an important argument against the hypothesis of a universal teleological ordering."

without the proper matter and conditions an oak tree cannot sprout, but these causes of the acorn are nonetheless ordered to the acorn's end.

To answer his second objection, Aristotle's view of chance must first be presented. Although chance is clearly of importance in the first argument for final causality, it does not negate hylomorphic teleology argued for in the third argument. Nonetheless, Wieland objects,

> Were teleology a universal cosmic principle, there would be no such thing as chance. But since there *are* according to Aristotle chance events and accidental causes, we must seek to understand the principle of teleology from the beginning in such a way that it does not just leave open the possibility of chance, but actually requires it.[22]

Chance has already made an appearance in my study within the context of the first argument for final causality in chapter eight. To answer the objection raised here, however, now requires a better understanding of the role of chance within *Physics* II.

Chance in Physics II

Chance is presented by Aristotle in book II, chapters 4–6 directly before his account of final causality. This order is of great importance to Wieland because of his insistence that teleology can only be understood when one presupposes chance. As he explains,

> [I]t is worth bearing in mind that Aristotle first discusses teleology in the *Physics* in a sequel to the investigation of chance. This sequence is not fortuitous; to reverse it is to run the risk of misunderstanding the essential point. *The fact is that Aristotle's theory of teleology cannot be understood properly unless it is taken to presuppose his doctrine of chance.*[23]

[22] *Ibid.*, 144.

[23] *Ibid.*, 143. Emphasis in the original.

Elsewhere Wieland grants that when one speaks of chance events one is already "implicitly thinking with teleological concepts," but he then immediately explains that these "teleological concepts" need only be concepts of reflection, not a *real* principle of nature.[24] In this way, however, Wieland begins to sever the end of nature from its ontological foundation in the material and formal principles of nature. I will refute this claim below. Of present concern is to show that chance does not disallow an interpretation of the final cause resulting from matter's ordering to form. Indeed, chance is of central concern in the first argument for final causality, but there Aristotle explicitly rejects chance as accounting for the regularity of nature.

The reason for Aristotle's rejection is found in his view of chance as an accidental cause. Granting that chance and fortune are sometimes counted among the causes, Aristotle defends the reality of chance while not including it among the fourfold division of causes. Simply put, chance is defined as "an incidental cause in the sphere of those actions for the sake of something which involves purpose" (197a5–8). Chance is the result of two independent lines of final causality incidentally intersecting. The chance happening that they terminate in is outside their own ends. For example, Betty goes to a café to study. Bob meanwhile is already at the café eating breakfast. Seeing Bob was not Betty's purpose in choosing to go to that café at that time, nor was Bob breakfasting there with the end of seeing Betty. Their meeting, because it falls outside of the ends they were seeking, is a chance event, an incidental intersection of two lines of causality.[25] Because chance is

[24] *Ibid.*, 146.

[25] Of course, Bob or Betty or both *could* attend the same café with the wish of seeing the other, but such a meeting would not be the result of chance. One always runs the risk of being "accidentally" run into when study or breakfasting habits occur "always or for the most part." By that same token, were Betty or Bob to become "regulars" at this particular café then meeting the other would no longer—strictly speaking—be the result of chance.

an incidental cause, it does not hold always or for the most part. Although each event was ordered to an end, the intersection is an incidental meeting of two distinct lines of causality. In the opening of his discussion of chance, Aristotle immediately eliminates chance as the cause of what happens always or for the most part, a point clearly invoked in the first argument for final causality in chapter 8.[26]

Wieland's account of "chance" (τύχη) tends to treat it as synonymous with "spontaneity" (αὐτόματον).[27] Though the latter is, I grant, what seems to be what is often meant when "chance" is used in common parlance, this conflation masks the complexity of Aristotle's account. Chance is placed within the sphere of intentionality (such as the case of Bob and Betty) while spontaneity is the broader term, accounting even for non-intentional events.[28] For Wieland, one can ascribe a kind of hypothetical "as-if" (*als ob*) teleology to chance events. As he explains, with chance an apparent teleology is present when "a goal is reached, although there was no intention to reach it as such. So this goal proves to be accidental, as it were, reached via the intention to reach another goal."[29] Characterizing the incidental conjunction as a goal in this way, however, bestows too much of finality to chance. Each of the caused events *are* for an end: Betty went to the café to study while Bob went there to breakfast. Their meeting is not a goal that was attained, but a coincidence that happened. Of course, each *could* go to the café with the purpose of seeing the other, but that is not the case here and—

[26] *Physics* II, 5, 196b10–16: "First then we observe that some things always come to pass in the same way, and others for the most part. It is clearly of neither of these that chance is said to be the cause, nor can the 'effect of chance' be identified with any of the things that come to pass by necessity and always, or for the most part. But as there is a third class of events besides these two—events which all say are 'by chance'—it is plain that there is such a thing as chance and spontaneity; for we know that things of this kind are due to chance and that things due to chance are of this kind."

[27] See Wieland, "The Problem of Teleology," 144.

[28] See *Physics* II, 6, 197b36–198a21.

[29] Wieland, "The Problem of Teleology," 144.

were they to do so—their meeting would no longer be by chance. Describing chance as an "as-if" teleology ignores both the finality of the intersecting lines of causality and—more importantly—that the intersections of chance are incidental.

Because chance is incidental it cannot account for the regularity of nature. Aristotle's account of chance shows that chance is only intelligible in light of *per se* causal connections for an end. He strongly states that chance cannot be the cause of anything "without qualification" precisely because chance is not self-explanatory (197a13–14). A chance event is qualified precisely with reference to the teleological context. This does not mean, of course, that chance is banished from the natural world. In the first argument of chapter eight, Aristotle clearly grants that chance events occur, but insists that they stop short of explaining the order of nature. Although Wieland invokes chance as excluding universal final causality, this is not the position of Aristotle. Chance is used in the first argument *in defense* of final causality, not to limit it. As I have already shown, the incidental causality of chance is only intelligible when viewed in light of Aristotle's full account of final causality. Chance does not dispense with the ordering of hylomorphic teleology nor does it limit this essential ordering. Were there no real end, then chance would cease to exist as well. Wieland's claim that final causality presupposes the doctrine of chance simply reverses the subordination of chance to final causality.

The Ontological Source for Hylomorphic Teleology

Having rejected that final causality is universal, Wieland then reduces the end of nature to a reflective concept (*Reflexionsbegriff*). As he puts this, "Teleology obtains only within the world, not in connection with the world as a whole. *Telos* is thus a concept of reflection, which can be meaningfully applied only to *particular* states of af-

fairs."[30] The distinction between individual natural beings or particular states of affairs and nature as a whole introduces a point foreign to the discussion of final causality in chapter eight and does not vitiate Aristotle's claim for the teleology of nature. This is because final causality is a result of nature understood as an intrinsic principle. Individual natural beings are precisely those beings having a principle of this sort. As Aristotle himself notes, "[N]ature always implies a subject in which it inheres" (192b34). Nature as a whole always implies individuals, which are themselves subject to teleology because of their hylomorphic composition.

The teleology of individual natural beings can be extended to include Wieland's understanding of nature generally because individual ordering to an end is a consequence of nature as instantiated in individuals. "Nature as a whole" (*die Welt im Ganzen*) can correspond to Aristotle's general definition of nature as "a source or cause of being moved and of being at rest in that to which it belongs primarily, in virtue of itself and not in virtue of a concomitant attribute" (192b20). Individual natural facts (*einzelne Sachverhalte*), on the other hand, refers to things "which have a principle of this kind" (192b32). This distinction decidedly does not, however, lead necessarily to a limited interpretation of teleology.

Of greater concern is Wieland's conceptualization of the end of nature. As I have shown, nature is essentially teleological, flowing from matter and form as *per se* principles of nature. Yet following his discussion of chance, Wieland is content to make the end a reflective concept that one can invoke in natural investigations but that need not be real or actual. Such a view disregards the claim that the form is a final cause because form is not a mere concept for Aristotle. Wieland's conceptualization abandons nature as the ontological source for the final cause.

[30] *Ibid.*, 159.

Reducing final causality in this way, he makes the end a category or reflective concept to be used as a mere aid in natural investigation. As he explains,

> [T]eleology is for Aristotle not itself a further object of investigation, but a category, a concept of reflection, with whose aid natural things should be explored. On *how* exactly teleological connections in nature are regulated, Aristotle gives no information; the doctrine of natural teleology is by reason of its methodological stance not in a position to give any such information.[31]

Viewing teleology in this way severs it from its foundation in the principles of nature. Yet, as has been shown, the ordering of matter to form as an end is part of the hylomorphic composition of natural beings themselves. It is not imposed on them from without nor is it used merely conceptually by the natural philosopher in his investigations.

The hylomorphic teleology argued for at 199a30–32 relies on Aristotle's understanding of the ontological composition of natural beings. It is nature understood as form that is the end "for the sake of which."[32] Making the end a reflective tool in natural investigation ignores the reality of nature as form. The end of nature is not merely a reflective concept and Wieland's claim that teleology is a reflective concept betrays a simplistic account of final causality that does a disservice to the richness of Aristotle's presentation. The actuality and fulfillment of nature as form shows that the final cause is more than a conceptual tool.[33] Aristotle's reasoning for hylomorphic teleology depends on the

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[31] *Ibid.*, 152.

[32] See also Aristotle's earlier claim in *Physics* II, 2, esp. 194a27–33: "['T]hat for the sake of which', or the end, belongs to the same department of knowledge as the means. But the nature is the end or 'that for the sake of which'. For if a thing undergoes a continuous change and there is a stage which is last, this stage is the end or 'that for the sake of which'."

[33] In his critique of Wieland's conceptualization, Charlton emphasizes Aristotle's grounding of teleology in nature. While it is a mistake, he holds, "to suppose that Aristotle's account of nature is teleological throughout" it is no less wrong "to suppose that

relation between matter and form in terms of potency and actuality. Form as the natural terminus and actualization of matter is its end, and this relationship holds throughout nature.

Conclusion

By way of conclusion, I now return to a passage that follows the arguments for final causality in chapter eight. Answering the one who might deny that nature acts for an end, Aristotle states that

> [T]he person who asserts this entirely does away with 'nature' and what exists 'by nature'. For those things are natural which, by a continuous movement originated from an internal principle, arrive at some completion: the same completion is not reached from every principle; nor any chance completion, but always the tendency in each is towards the same end, if there is no impediment. The end and the means towards it may come about by chance. . . . This is incidental, for chance is an incidental cause, as I remarked before. But when an event takes place always or for the most part, it is not incidental or by chance. In natural products the sequence is invariable, if there is no impediment.[34]

This passage unites several of the points I have sought to highlight in this study. First, that final causality is of central importance to Aristotle's account of nature and that, thus, the one who denies it "does away with nature." Second, that natural beings arrive at completion on account of nature, an intrinsic principle understood in terms of matter and

where Aristotle thinks teleological explanation appropriate, he is not committed to holding that there is a basis for it *in re*." Interestingly, despite rejecting 199a30–32 as an argument, Charlton holds that the ontological basis for teleology is form. As he continues to explain, "the form of a thing is for Aristotle very much of a reality—is, indeed, what has the best claim to the title of 'reality'. If we ourselves shrink from saying that dispositions like a craftsman's skill are mere concepts of reflection to which nothing corresponds in the craftsman, Aristotle would resist even more strongly a similar suggestion about nature as form." (*Aristotle's Physics*, 121.)

[34] *Physics* II, 8, 199b14–26.

form. Third, that the end being actually attained is not guaranteed, for in natural demonstration one assumes the end but there can be impediments to its fulfillment. Fourth, that chance as an incidental cause cannot account for the regularity of nature.

In contrast to the interpretation of Wolfgang Wieland, I have shown that the argument for hylomorphic teleology in chapter eight unifies the second book of the *Physics* by returning to chapter one's presentation of nature as matter and form, but more properly as form. Rooting final causality in the principles of nature reveals its fundamental importance for Aristotle's view of nature and book II, chapter eight is consequently of great importance to the *Physics* as a whole. Aristotle's account of final causality is intricate and expansive, proceeding along various lines of argumentation aimed at showing nature's order to an end. The passage of 199a30–32 underscores the relation between teleology and Aristotle's understanding of nature as matter and form. In this way, it concludes with an emphasis on the essential ordering of natural beings. Teleology is thus shown to be universal, but not invincible, for the ordering of matter to form does not necessitate a full actualization.

The major objections I have made to Wieland are his limitation of final causality and his conceptualization of the end of nature. In his view, causality must be understood in light of chance and need only be a reflective concept applicable to individual natural beings. Thus universal or essential final causality is explicitly banished from the natural world. Yet as has been shown, Wieland's dismissal of the "traditional" interpretation of teleology largely ignores Aristotle's treatment of nature in chapter one when considering the final cause in chapter eight. Severing the final cause from its ontological foundation in nature, he thus greatly reduces the scope of teleology and in so doing strikes at the heart of the Aristotelian conception of nature.

Hylomorphic Teleology in Aristotle's *Physics* II

SUMMARY

This study draws attention to the ordering of matter and form argued for in Aristotle's *Physics* II, 8 (199a30–32). This argument for hylomorphic teleology relies on the presentation of nature earlier in *Physics* II, 1. In this way, it highlights the connections between chapter one's account of nature as matter and form and chapter eight's defense of final causality. Grounding final causality in the principles of nature reveals its central importance for Aristotle's view of nature. To clarify the meaning of hylomorphic teleology I contrast my interpretation of Aristotle with that of Wolfgang Wieland regarding the scope and foundation of the final cause, countering his claim that chance and universal final causality are mutually exclusive. I contend that the presentation of teleology in chapter eight supports a diverse interpretation of the final cause, one that admits chance events while not sacrificing the intrinsic ordering of matter to form.

KEYWORDS

Aristotle, nature, matter, form, hylomorphism, teleology, hylomorphic teleology, Wolfgang Wieland, chance, final causality.

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