The role of efficient causation in Aristotle's philosophy: ensuring the continuity and coherence of the cosmos within a teleological framework

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Chapter 4: How the Relation between Final and Efficient Causation Establishes Aristotle's Unified Explanation of the Universe

In Aristotle's philosophy, final causation explains the *why*—the ultimate purpose or goal of phenomena—while efficient causation explains the *how*—the processes or mechanisms by which those goals are realized. Together, these two causes form a complementary system that bridges purpose and process, ensuring the intelligibility and unity of Aristotle's universe. The relationship between final and efficient causation is one of mutual reinforcement rather than competition. Final causation provides the teleological framework that gives direction to natural processes, while efficient causation actualizes these teleological aims through dynamic causal chains. Efficient causation, therefore, operates as the mechanism that realizes the ends posited by final causation. This relation ensures that the cosmos is not merely purposive but also dynamically interconnected.

Although final causation occupies a central role within Aristotle's teleological framework, its explanatory scope can appear constrained in certain contexts. Natural phenomena such as meteorological events or the behavior of inanimate elements often elude clear teleological interpretation. In such instances, final causation may prove insufficient to fully account for the how or even the why of these occurrences. This apparent limitation highlights the need to integrate efficient causation into Aristotle's explanatory framework, thereby addressing these gaps and ensuring the continuity and coherence of his philosophical system.

In this chapter, I aim to examine how the relationship between final and efficient causation establishes Aristotle's unified explanation of the universe. For the sake of clarity, the discussion is divided into four sections. Section 4.1 explores the relation between final and efficient causation in Aristotle's *Meteor* and *PA*. Section 4.2 analyzes the fundamental role of final causation in Aristotle's unified explanation of the cosmos. Section 4.3 investigates how efficient causation complements the teleological framework provided by the final cause. Section 4.4 explores the commensurability and non-competition between final and efficient causation.

4.1. The Relation between Final and Efficient Cause in *Meteorology*, *De Partibus Animalium* and *Physics*

In this section, I focus on discussing *Meteor* I.9, IV.11, and IV.12, along with *PA* I.1 and II.9, to explore the relationship between Aristotle's efficient and final causes because these texts provide a comprehensive framework for understanding how these two causal principles interact across different domains of nature. In *Meteor*, Aristotle examines inanimate phenomena such as meteorological events and the formation of minerals, where efficient causes dominate but are subtly linked to teleological considerations, illustrating the boundaries of teleology in non-biological contexts. Conversely, in *PA*, Aristotle's causal framework is applied explicitly to biological entities, where final causation is central to explaining the purposive structures and processes of living organisms, complemented by efficient causes. By engaging with these texts, I aim to show how efficient and final causes function in different yet interconnected ways to account for both the mechanisms and purposes of natural phenomena, highlighting their complementary roles and the scope of teleology in Aristotle's philosophy.

4.1.1 The Relation between Final and Efficient Cause in *Meteorology*

Aristotle's Meteorology provides a valuable framework for examining the relationship between efficient and final causes, particularly in the context of natural processes such as meteorological phenomena (e.g., rainfall) and the formation of minerals. While efficient causes dominate the explanations in these discussions, Aristotle's teleological framework remains present, albeit in a more implicit and nuanced form. The passages in *Meteor* I.9, IV.11, and IV.12 reveal the relation between these two causal principles, while also illustrating the boundaries of teleology when applied to inanimate phenomena.

In *Meteor* I.9, Aristotle examines processes such as rain, evaporation, and wind, emphasizing the role of efficient causation in generating these phenomena. He explains that the sun's heat causes water to evaporate, which, upon cooling, condenses into clouds and ultimately falls as rain (*Meteor* I.9, 346b23–347a7). Heat and cold, as fundamental qualities of sublunary elements, are intrinsic to their material composition (and thus relate to material causation), yet they also act as efficient causes in meteorological processes by driving evaporation and condensation. However, Aristotle does not view these processes as mere mechanistic occurrences. He situates them within a broader teleological framework, asserting that rainfall occurs "for the sake of" sustaining life by nourishing plants and animals. Here, final causation complements efficient causation by providing a purposive explanation that aligns these processes with the overarching good of the cosmos. Nevertheless, Aristotle acknowledges the difficulty of consistently applying teleological explanations to meteorological phenomena, particularly when such events—like excessive rainfall or drought—seem to disrupt rather than sustain life. This tension underscores the limits of teleology in inanimate domains.

The focus shifts in *Meteor* IV.11 to the formation of metals and minerals, where efficient causation takes center stage. Aristotle describes how interactions between hot, cold, and the inherent properties of earth and water drive these transformations (*Meteor* IV.11, 390a10–391a5). For instance, the hardening of metals results from the drying and cooling effects of heat, while other combinations of elements yield different substances. Efficient causes thus provide the primary explanatory framework for these processes. Yet, Aristotle's teleological perspective subtly persists. The properties of metals, such as their durability and malleability, serve specific functions within nature or human activity, suggesting that their existence contributes to the stability and utility of the cosmos. These purposes reflect an underlying teleological order, even if it is less explicitly articulated compared to biological contexts.

In *Meteor* IV.12, Aristotle delves further into the properties and formation of metals and minerals, offering a more detailed account of the interaction between efficient, formal, and final causation. Efficient causation governs the immediate processes of solidification and transformation, such as the effects of heat and moisture on the composition of earth and water (*Meteor* IV.12, 391a5–392a12). For example, the production of iron or other metals depends on the action of

external forces like heat, which activate the matter's inherent potentialities. However, Aristotle also considers formal and final causes in explaining the broader role of these substances. The structural properties of metals, such as strength and durability, arise from their formal cause, which determines their essential nature. These formal properties, in turn, render metals suitable for applications in construction, cutting, and stabilization. Yet Aristotle does not treat metals merely as physical byproducts of natural processes; rather, their existence aligns with the broader purposive order of nature. In this sense, their final cause is not simply their structural suitability but their contribution to the functionality and order of the natural world. Thus, final causation situates these efficient and formal causal processes — operative on matter — within a teleological framework, linking them to the good and structure of the cosmos.

Across these discussions, Aristotle demonstrates a complementary relationship between efficient, formal, and final causes, yet their relative explanatory roles differ depending on the domain of inquiry. Efficient causes explain the immediate mechanisms behind natural phenomena, detailing how processes like evaporation, condensation, and solidification occur. Formal causes contribute by determining the essential nature of substances involved in these formative processes. In biology, final causes provide direct explanations for structures and functions, clarifying their role in the survival and reproduction of living beings. However, in non-living domains such as meteorology and mineralogy, the explanatory role of final causation becomes more abstract and indirect. Aristotle suggests that even these processes are not arbitrary but occur within an ordered cosmos, where natural phenomena exhibit regularity and interconnectedness. Nevertheless, rather than attributing each individual occurrence to a teleological purpose, Aristotle often explains their non-arbitrariness and continuity through chains of efficient causation. As my discussion of *Meteor* IV.12 suggests, by tracing causal connections among seemingly disparate events, one can illustrate how different elements of nature are integrated into a structured whole. This approach allows Aristotle to preserve the intelligibility of the cosmos without necessarily assigning a direct final cause to every phenomenon. A parallel can be drawn with Aristotle's approach in biology. In cases where certain traits or behaviors seem anomalous—such as the large antlers of deer or the brief lifespan of the dayfly—explanation in terms of material, formal, and efficient causes may do. A similar strategy may apply in meteorology

and mineralogy: while final causes may frame the overall order of the cosmos, the intelligibility of specific natural events often relies more heavily on their material and efficient causes. This suggests that, in Aristotle's natural philosophy, purpose (telos) is best understood not as a property of individual inanimate phenomena but as a structural principle that emerges from the causal interconnections governing the cosmos as a whole.

However, these passages also highlight the boundaries of Aristotle's teleological framework. In many cases, efficient causation provides a sufficient explanation for natural processes, leaving final causation more implicit or secondary. For example, while the physical mechanisms of rain formation or metal solidification can be fully explained by the operation of efficient causes, their alignment with a purposive order is less immediately apparent. This limitation becomes especially evident in cases where natural phenomena seem to lack clear alignment with the good, such as destructive weather events or irregularities in mineral formation. Such examples reveal the challenges of extending Aristotle's teleology beyond living organisms to encompass the inanimate realm.

In *Meteor* I.9, IV.11, and IV.12, Aristotle offers a nuanced interconnection of efficient and final causes, balancing mechanistic explanations with a broader teleological vision. While efficient causation dominates the discussion of inanimate processes, final causation ensures that processes in this domain are not divorced from the purposive order of the cosmos. By examining these key passages, Aristotle's causal framework emerges as both adaptable and constrained, reflecting its strengths in unifying natural phenomena while acknowledging the complexities and limits of teleology in explaining the nonliving world.

4.1.2 The Relation between Final and Efficient Cause in *De Partibus Animalium* and *Physics*

Aristotle's account of causality, particularly the relation between efficient and final causes, forms the foundation of his biological investigations in *PA*. In *PA* I.1 and *Phys* II.9, Aristotle demonstrates how these causal principles complement one another in accounting for the processes and purposes inherent in natural entities. While efficient causes explain the mechanisms by which natural phenomena occur, final causes provide the teleological context that makes these mechanisms

intelligible. The question of their compatibility, however, has been the subject of significant scholarly discussion. As Hankinson argues, the challenge lies in reconciling teleological explanations with the material and mechanistic necessities that underlie natural processes.[257] This issue requires careful examination of how Aristotle integrates these causes without reducing one to the other or rendering them incompatible.

In *PA* I.1, Aristotle establishes the methodological principles that guide his study of living beings, insisting that "In the case of all natural objects, we must inquire not only into their material and efficient causes but also their formal and final causes" (*PA* I.1, 639b11-13). This methodological claim reflects Aristotle's fundamental departure from the pre-Socratic natural philosophers, who focused primarily on material and efficient explanations. By contrast, Aristotle argues that the study of living beings necessarily requires attention to their form (what a thing is) and their final cause (what it is for), because biological phenomena exhibit purposiveness and functional organization that cannot be reduced to material composition or mechanical motion alone. This assertion underscores Aristotle's conviction that biological phenomena cannot be adequately explained by material and mechanistic processes alone; their inherent purposiveness must also be accounted for. And then, Aristotle further refines this principle, emphasizing the centrality of teleological explanations to the study of nature. He states, "to know what a thing is, we must know its purpose" (*PA* I.1, 639b18-19). For Aristotle, the anatomy and behavior of animals are not merely the result of physical processes but reflect functional roles within the organism. For example, teeth are hardened through developmental processes—an efficient cause—but their sharpness and form exist to serve the purpose of cutting and grinding food, which is their final cause. Aristotle elaborates that "what is primary in formula and substance is last in the order of generation" (*PA* II.1, 646a24–30), indicating that material and efficient causes operate as means toward the realization of final causes. However, this realization is not independent of formal causes, which provide the structural and essential blueprint that guides the developmental process. In Aristotle's biological framework, form and function are deeply interwoven: the formal cause defines the essence of an organism's structures, while the final cause explains their purposive organization. This interdependence underscores Aristotle's

[257] Hankinson (1998, 141-143).

methodological commitment to understanding biological entities as teleologically and structurally integrated systems.

The relation between efficient and final causes becomes even more explicit in *PA* I.1, where Aristotle examines the relationship between necessity and purpose in natural processes. He famously declares, "Nature does nothing in vain, but always what is best in view of the possibilities allowed by the essence of each kind of animal." (*PA* I.5, 645a24–27), emphasizing that every part of an organism exists for a specific function. Aristotle criticizes accounts that rely solely on material or efficient causes, arguing that they fail to explain the purposive organization observed in living beings. He writes, "Why are teeth hard and sharp? For the sake of cutting food. Their final cause is what they are 'for the sake of,' but they grow and harden due to the processes of development" (*PA* II.1, 647a25–27). Here Aristotle introduces the general principle that anatomical features in animals exist not by chance, but for a specific purpose, exemplifying his theory of final causality. While this passage articulates the teleological framework in broad terms, the specific functional differentiation of teeth is elaborated later in *PA* III.1 (661b8ff.), where Aristotle explains that incisors are sharp for cutting, whereas molars are broad and flat for grinding. Taken together, these passages encapsulate Aristotle's dual causal explanation: the processes of development account for how teeth come into being (efficient cause), while their differentiated forms and functions are intelligible only in relation to the organism's nutritive needs (final cause).

A pivotal concept in *Phys* II.9 is Aristotle's treatment of necessity, particularly through the notion of "hypothetical necessity." Aristotle explains that while certain material conditions are required for an end to be achieved, these conditions are subordinate to the final cause. For example, "It is necessary that [a saw] be made of iron if it is to perform its function; this necessity is hypothetical, and not as an end is" (*Phys* II.9, 199b33–200a15). Similarly, in biological systems, developmental processes operate under material and efficient necessity but are ultimately directed toward the realization of specific functions. The sharpness of teeth, for instance, is a necessary condition for their ability to cut food, yet this necessity is intelligible only within the teleological framework of their purpose.

Aristotle's methodological commitment in *PA* I.1 and his application of teleology in *Phys* II.9 reveal his overarching view of nature as a purposive and intrinsically organized system. In *PA* I.1, he articulates this idea further by

insisting that biological study must prioritize understanding the purposes of parts and functions. He writes, "We must first grasp the what and the for the sake of which of each part before examining its material and efficient causes" (*PA* I.1, 639b14–18). This passage underscores the importance Aristotle places on first understanding the definition and purpose of a part before delving into its material and efficient causes. This methodological directive aligns with his view that form and purpose—final causes—serve as the organizing principles behind natural phenomena. Without acknowledging these, the study of nature would remain superficial, unable to account for why biological structures are the way they are.

Hankinson underscores the compatibility between efficient and final causes in Aristotle's thought, emphasizing that Aristotle's teleological explanations avoid reductionism by treating final causes as immanent in nature.[258]Aristotle's assertion that "All things which come to be by nature do so either invariably or for the most part" (*Phys* II.8, 198b34–35) reflects his belief that natural regularities demand explanations that account for their directedness toward specific ends. Final causes, as Hankinson notes, do not compete with material and efficient causes but rather incorporate them into a comprehensive explanatory framework.

This relation between efficient and final causes is exemplified in Aristotle's account of biological development and function. Teeth develop through processes that can be described in terms of material and efficient causation, yet their sharpness and hardness exist to fulfill their purpose in cutting food. Without recognizing this purposive dimension, any explanation of their development remains incomplete. Aristotle's framework thus integrates mechanistic and teleological principles, affirming that efficient causes, while indispensable, operate in service of the final causes that provide the ultimate reason for the existence of biological structures.

Moreover, Aristotle's teleological perspective extends beyond individual parts to encompass the organization of entire organisms. He views living beings as integrated wholes, where each part contributes to the organism's survival and flourishing. This holistic view is evident in his claim that "the order of generation is the opposite of the order of being" (*PA* I.1, 640a10–12), meaning that while material and efficient causes precede the realization of form in time, it is the final cause that ultimately determines the organization of these processes. Hankinson

[258] Hankinson (1998, 141-143).

highlights that this inversion of priority reflects Aristotle's non-reductive approach: material interactions are necessary, but their coherence and regularity derive from their purposive orientation toward specific ends.

Ultimately, Aristotle's biological methodology in *PA* I.1 and *Phys* II.8–9 reflects his holistic approach to causation. Final causes, as Hankinson elucidates, are not external impositions but intrinsic to the nature of living beings. By uniting efficient and final causes, Aristotle offers a robust explanatory model that continues to inform contemporary discussions of teleology and causation in both philosophy and biology. Aristotle's insights into the purposive organization of living systems underscore the enduring relevance of his approach, offering a nuanced framework for understanding the interplay between mechanisms and purposes in natural phenomena.

4.2. The Fundamental Role of Final Causation in Aristotle's Unified Explanation of the Universe

Having investigated the relation between final and efficient causation in Aristotle's *Meteor* and *PA*, I divide my investigation of this section into two parts. First, I will examine the fundamental role of Aristotle's final cause with respect to the fact that the final cause is always taken as primary within Aristotle's unified explanation of the universe. Secondly, I will examine the fundamental role of Aristotle's final cause with respect to the fact that the continuous efficient causal chains are directed toward the final cause.

4.2.1 Final Causal Explanation is Always Taken as Primary

By this point, I turn to examine the priority of causes concerning Aristotle's explanation of the natural world[259]. I will first investigate the priority of the final cause over the efficient cause in Aristotle, and then prove why final causal

[259] Some scholars have discussed the priority of final cause over efficient cause in the field of Aristotle's biology, for instance, see Code (1997) and Johnson (2005, 180–182).

explanation is always taken to be the primary.

The evidence of the priority of the final cause over the efficient cause is clarified by Aristotle in his biology:

> For there is a difference between the end or final cause and that which exists for the sake of it; the latter is prior in order of development, the former is prior in essence. Again, that which exists for the sake of the end admits of division into two classes, first the origin of the movement, and then that which is used by the end; I mean, for instance, that which can generate, and that which serves as an instrument to what is generated, for the one of these, that which makes, must exist first.
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> *GA* II.6, 742a19–25 (trans. A. L. Peck)

In this passage, Aristotle makes a distinction between the final cause and efficient cause, and supposes that the final cause is prior to the efficient cause in essence since the final cause is prior and must exist first. In the process of generation, the aim or the purpose must first exist, and therefore the efficient causal chain in this process is capable of being directed toward the final cause. In the generation of living things[260], the male parent and the male parent's seed should be treated as the efficient cause in the generation of living things. Thus, the actual efficient cause in the process is the male parent, and the male parent's seed is an efficient cause in the sense that male parent utilizes the seed to produce future generations because the 'potential form' is inside the seed. But the whole generation procedure of living things is for the sake of a final end, which is the living things' nature. All the processes of generation are for the sake of a final end, and the living thing's form is the end of this process. Indeed, the final cause has priority over the efficient cause since the final end determines the aim of the generation process of living things. Thus, the final cause is presented as the starting point of Aristotle's biological examination. In addition, Aristotle also argues that the final cause must be established before the efficient cause by saying that "the manner of a thing's existence should be stated before its genesis" (*PA* I.1, 640b1–4).

However, although Aristotle did not specify this priority in other parts of his work, there are many demonstrations in his other treatises where the priority of

[260] See e.g., *GA* I.2, 716a4–7; I.20, 729a9–11, 28–31; b9–18.

the final cause over the efficient cause is implied. As discussed above, in the process of generation, Aristotle implies that the final cause is prior to the efficient cause in essence since the final cause is prior in essence and must exist first (*GA* II.6, 742a19–25). Moreover, another typical example is in Aristotle's treatise *Meta*, where he invokes the example of the production of artwork to explain his viewpoint that the final cause is prior to the efficient cause[261], since in every production process of artwork, the artist must first think about the design of the production which determines the final outcome of this procedure. Focusing on the goal, the artist then works to achieve his goal. In this process, the design of the final achievement could be treated as the final cause, for the work of the artist is to finish the final production; while the skills of the artist are the efficient cause, for artists are only able to finish the work through their skills. Hence, it is clear that in this demonstration, the final cause is prior to the efficient cause. Furthermore, when we look to *Nicomachean Ethics*[262], there are many illustrations to prove such a principle in Aristotle's discussion about human's deliberation about what contributes to the end. For instance, in the process of doctor's treatment of patients, the purpose of the doctor is to heal the patient; in the speech activity of an orator, the orator's aim is to convince others; as well as concerning the work of a statesman, the stateman's aim is to produce law and order. In respect to such cases, the end has been set first and concerning the end, people deliberate how and by what means it is to be attained. Aristotle then posits that "what is last in the order of analysis seems to be first in the order of becoming" (*NE* III.3, 1112b22). Truly, the final cause always takes priority over the efficient cause because the function of efficient cause involves a goal-directed process.

By this point, it can be seen that the final cause is prior to the efficient cause within Aristotle's explanations since the final cause must be established before the efficient cause can be specified. Furthermore, Aristotle takes the final cause as prior (*PA* I.1, 641b10-24). He supposes that everything which is produced in the universe exists for the sake of something. For just like art is present in the products of art, so in the things themselves there is evidently an analogous cause or principle derived like hotness and coldness from the environing universe. Moreover, Aristotle considers the celestial realm to be generated and maintained by the final cause, and therefore it also can be understood that the living things

[261] See *Meta* VII.7, 1032a11–b29.

[262] See *NE* III.3.

are generated and sustained by the role of the final cause, since order and definiteness are much more plainly manifest in the celestial bodies than in the framework of living things, while change is characteristic of the perishable things of sublunary world. Again, whenever a movement clearly achieves an end without interference, we can recognize that this end functions within a broader teleological structure. In Aristotle's framework, purposes in nature are often nested: a particular function, such as the growth of a plant, serves a larger biological or ecological role. However, this does not immediately entail that all natural purposes must converge into a single, ultimate purpose for the entire cosmos. Instead, Aristotle considers final causes as hierarchically ordered, where each level of organization in nature operates for the sake of something beyond itself. This hierarchy suggests that the natural world as a whole is not random but structured, though the exact nature of its ultimate purpose remains a matter of interpretation. Hence, it seems that whatever is produced in the universe is produced for the sake of a final end since the final cause is always taken as prior in Aristotle.

Accordingly, it can be seen that final causal explanation is taken as the most primary since the final cause is considered as the fundamental basis of the whole universe.

4.2.2 The Continuous Efficient Causal Chains are Directed toward the Final Cause

In order to prove that efficient causal chains are directed toward the final cause, I divide my examination into two parts. First, I will explore the role of the Unmoved Mover which can be not only viewed as a final cause, but also operates as the starting point of all the efficient causal chains in the universe. Secondly, I will examine the specific role of the soul in the field of Aristotle's biology, which performs not only as a final cause, but also as an efficient cause of living things, especially in their generation process.

The first evidence that continuous efficient causal chains are directed towards the final cause is the existence of the first mover. As discussed above, the unmoved first mover performs the function of final cause to unify the universe in *Meta*

XII[263], while in *Phys* VIII[264], it operates the first mover as the primary efficient cause of all the motions in the universe, and therefore the first mover is the starting point of all the continuous efficient causal chains in the universe. In this sense, the continuous efficient causal chains are directed toward a final cause, which is the unmoved first mover in the universe[265]. Moreover, although the first mover is identified as a final cause in *Meta*, there are also some clues in *Meta* which show the coincidence of the final cause and efficient cause with respect to the first mover. For instance, *Meta* XII.6 shows the existence of a primary Unmoved Mover which is the ultimate cause of all the motions in the universe. Aristotle also suggests that final cause and efficient cause coincide by indicating that the first mover can be understood as both kinds of causes[266] (*Meta* XII.10, 1075b8–10). Thus, with respect to the role ascribed to the unmoved first mover, we may conclude that all the continuous efficient causal chains are directed toward the final cause.

Another item of evidence of the continuous efficient causal chains which are directed toward the final cause can be found with respect to the role of the soul in the field of biology. According to Aristotle, on the one hand, the soul is the final cause of living things since nature always does whatever it does for the sake of something which is its end (*DA* II.4, 415b15–20). To that something corresponds in the case of animals the soul and in this it follows the order of nature, and that all natural bodies are organs of the soul. This is true of those that enter into the constitution of plants, and of those which enter into that of animals. This shows that that for the sake of which they are is soul. That for the sake of which has two senses: the end to achieve, and that for the benefit of which. On the other hand, the soul is also the efficient cause of living things as the original source of

[263] For detailed discussions, see chapter 2.2.1.

[264] For detailed discussions, see chapter 3.2.1.

[265] Many scholars hold the view of the coincidence of final cause and efficient cause with respect to the first mover. For instance, the viewpoint that the tendency towards 'first mover' can be found on all levels of the cosmos in Aristotle is asserted by Furley (2002, 69–70) in his discussion about the activities of first mover, where he argues that all causes in the universe originate in the Unmoved Mover. As David (2000, 175) points out in his commentaries on *Meta* XII.10, all things are related by a single chain of pure efficient cause, transmitted downwards from the prime mover, the sublunary things being also related to this chain directly though the Sun's daily and annual orbits. Furthermore, in Michel's (2000, 152–153) interpretation of *Meta* XII. 4, he considers the first mover as the first efficient cause in the universe and emphasizes the first mover is the unique starting-point of all efficient causal series. Johnson (2005, 253–254) also agrees that Aristotle frequently talks about combination of causes, and it is reasonable to allow that the first mover be considered 'both an efficient and a final cause'.

[266] See Ross (1997, 258).

locomotion (*DA* II.4, 415b22–24). Aristotle notes that this capacity, however, does not belong to all living things. But change of quantity and change of quality are also due to the soul. Perception is held to be a qualitative alteration, and nothing except what has soul in it is capable of perception. The same holds for growth and decay; nothing grows or decays naturally except what feeds itself, and nothing feeds itself except what has a share of life in it. More specially, in the generation process of living things, the soul acts not only as a final cause, but also as an efficient cause. Soul is a final cause in the process of coming into being for all living bodies, which is clearly demonstrated by Aristotle[267]. Moreover, Aristotle puts forth the idea that there are different kinds of soul in different levels of living things, where higher living things possess more complex capacities and faculties. As for plants, their capacities are merely nutrition and reproduction, hence the end of plants consists in growth and reproduction in respect of the function of the soul they have. For the animals, they not only have the function of nutrition and reproduction, but also have higher functions of appetite, perception and locomotion, so the end of the life of animals is perception and movement. Human beings possess all the functions of animals and plants, plus the capacity of deliberation, which is their end or purpose. Thus, Aristotle presents his conception of soul as a final cause of living things.

Moreover, although Aristotle did not point out explicitly that soul is the efficient cause in the generation process of living things, the living things' soul operates as the efficient cause of their generation, taking into account that he considers the vital heat as the embodiment of the soul[268]. Therefore, the role of the soul as an efficient cause in the generation and development of living things is considered to determinate their forms. More specifically, each living thing is endowed with a nature which is causally responsible for its development, and in the stage of a living thing's development, which is from embryo, infant, child,

[267] For detailed discussions, see chapter 2.5.1.

[268] According to Aristotle, the offspring is endowed with its form from a male parent, through the vital heat it had received during the concoction in the male's body, informing the matter provided by the female (the menstruation). The male semen informs a similar situation of female substance: the offspring are males who are very similar to the male parent. Therefore, the condition under which this happens is that the semen carries enough vital heat to fully grasp the relatively cold female matter: the greatest vital heat thus generates in the matter the most perfect form, that of the father. And since the vital heat functions as the embodiment of the soul, the soul is the efficient cause in the generation in living things. For detailed discussion, see chapter 3.5. See also Code (1999) on soul as an efficient cause in Aristotle's embryology.

adult, and so on, soul enables matter to constitute their nature; otherwise, the living things could not live and develop. As we have seen, the most typical example of role of the soul as an efficient cause is in vital heat's role in the formative process by which semen acts on menstruation (*GA* IV.3, 767b17–21; 768a21–27). According to Aristotle, the offspring is endowed with its form from a male parent, through the vital heat it received during the concoction in the male's body, informing the matter provided by the female (the menstrual fluid). The male semen informs a similar situation of female substance: the offspring are males who are very similar to the male parent. The condition under which this happens is that the semen carries enough vital heat to fully grasp the relatively cold female matter: the greatest vital heat thus generates in the matter the most perfect form, that of the father. Therefore, the vital heat, which is considered as the embodiment of the soul, performs as an efficient cause in the formative process of living things. Moreover, Aristotle clearly supposes the coincidence of final cause and efficient cause with respect to the soul in the generation of animals[269]. The soul is considered to be the efficient cause in the procedure of the generation of animals because it is the whole soul or some part of it that constitutes the nature of a living thing. And the soul is also the final cause because it is the presence of the soul that enables matter to organize a living thing and makes living things become alive. Hence, the soul is an efficient cause in the process of generation and development of living things, in order to make a living thing as it is. Furthermore, the soul is a final cause in the production process of living things, for the nature of living things is determined by the soul. In this sense, it can be concluded that the continuous efficient causal chains are directed toward the final cause with respect to the soul. And it is also clear that the first mover and the soul can be seen both as final cause and efficient cause.

Accordingly, the unmoved first mover unifies the universe as a final cause, and also constitutes the starting point of all the continuous efficient causal chains in the universe; while the soul operates as the efficient cause in the generation of living things, and also performs the function of final cause in this process, since the soul determines the nature of living things.

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[269] See *PA* I.1, 641a25–31. See also Johnson (2005, 254–255), who indicates that Aristotle combines the efficient cause and final cause in his argument of the soul, and this combination of causes is interesting for the causes are different but with respect to the soul they are combined.

4.3 The Role of Efficient Causation in Complementing the Teleological Framework of the Final Cause

While final causation is central to Aristotle's teleological framework, its explanatory power is limited to the why of the nature of the universe and natural phenomena. This limitation makes clear the importance of efficient causation within Aristotle's explanatory framework to realize the coherence of his system.

The relationship between efficient and final causation is best understood as one of distinction and complementarity. Final causation provides the overarching purpose that unifies the cosmos, through which all entities and processes are directed toward the good. It ensures that the natural world operates with a sense of order and purpose, offering a teleological rationale for its existence. Efficient causation, on the other hand, supplies the dynamic mechanisms necessary to actualize the purposes outlined by final causation. Efficient explanation shows how motion and change propagate across time and space, thereby ensuring that the cosmos functions as a coherent and interconnected whole.

Efficient causation achieves this coherence by establishing continuous causal chains that link all entities and phenomena across the cosmos. These chains, originating from the first mover, extend through both the inanimate and animate realms, creating a network of interconnections that underpins the universe's coherence. Thus, efficient causation is not merely a supplementary mechanism but a vital explanatory principle that complements the teleological orientation of final causation.[270]

Aristotle's cosmological framework exemplifies this interconnection. The first

[270] Byrne (2018, 98–100) comments that an efficient cause must be adequate to produce the beneficial effect by means of its own causal powers before it can be understood to be directed to that end, for every efficient cause can be made to produce a good result in the right context. Although I agree with his view that the efficient cause is sufficient to produce these effects by its own power, I tend to disagree with his view that every efficient cause can be made to produce a good result in the right context. Aristotle uses the term 'beneficial' to explain final, not efficient cause. In my interpretation, Aristotle utilizes the efficient cause to explain chains of interaction in terms of physical coherence, which is different from the function of his final cause.

mover, as the ultimate final cause, serves as the object of desire that motivates all motion in the universe. It does so without itself being moved, thereby establishing the overarching teleological order of the cosmos. Simultaneously, as first mover it functions as the origin of efficient causal chains that sustain the continuity of motion. It causes the movement of the outermost celestial sphere, which transmits motion to adjacent heavenly bodies. These cascading interactions create a network of efficient causal chains that connect the celestial and sublunary worlds, ensuring the physical coherence of the cosmos.

In the sublunary realm, efficient causation governs the motion of the four terrestrial elements—earth, water, air, and fire. This motion ultimately derives from vital heat, which is generated by the Sun. According to Aristotle, the Sun itself is composed of aether, the fifth element, and is eternally moved by the First Unmoved Mover. As the primary celestial body influencing the sublunary world, the Sun's motion initiates the natural transformations and cyclical processes governing terrestrial phenomena. These elements interact to form cohesive causal chains that bridge the celestial and terrestrial realms, maintaining the interdependence of the cosmos. Meteorological phenomena, such as evaporation, condensation, and precipitation, also depend on the motion of the Sun and other heavenly bodies. These motions drive weather patterns in the sublunary world, creating efficient causal chains that connect celestial and terrestrial activities. By elucidating these processes, efficient causation ensures the coherence of the inanimate world within Aristotle's teleological framework.

The animate world further illustrates the complementarity of efficient and final causation. Aristotle attributes the generation and sustenance of life to the efficient causation of vital heat, which is produced by the Sun and serves as the formative principle of living beings. In animals, vital heat is distributed throughout the body via blood vessels, with pneuma acting as the medium that transports and sustains it. Pneuma, a substance generated through the interaction of vital heat and blood, carries vital heat to all parts of the body, ensuring the organism's functioning and coherence (*GA* II.6, 742a9–20). In reproduction, pneuma in semen transmits the generative power necessary for fertility (*GA* II.3, 736b30ff). These processes demonstrate how continuous efficient causal chains link biological phenomena to the broader causal framework of the cosmos.

Efficient causation ensures the continuity and coherence of the universe by linking disparate phenomena through continuous causal chains. These chains

sustain motion and change while integrating the physical and biological realms into a unified system. By addressing the mechanisms through which processes unfold, efficient causation serves the teleological framework of final causation in providing a comprehensive account of Aristotle's cosmos.

Final causation directs natural processes toward their ultimate purpose or good. Efficient causation, however, ensures that these purposes are realized by instigating the dynamic processes that connect and sustain the universe across time and space. This relation between final and efficient causation underscores the unity of Aristotle's explanatory framework. While final causation provides the teleological rationale for the universe's order, efficient causation ensures its dynamic continuity by linking disparate phenomena through continuous causal chains, also in those cases where teleological causation is less apparent or seems to be lacking. These chains integrate the celestial and sublunary realms, as well as the inanimate and animate worlds, into a cohesive system. By addressing both purpose and process, Aristotle's philosophy avoids reductionism, offering a holistic account of the natural world.

By establishing continuous causal chains, efficient causation bridges the inanimate and animate realms, realizing the unity and order of Aristotle's cosmos. By integrating efficient causation into the teleological framework of final causation, Aristotle achieves a comprehensive understanding of the natural world, balancing purpose and process in a harmonious whole.

In conclusion, the relation between final and efficient causation is foundational to Aristotle's unified explanation of the universe. Final causation draws natural processes toward their ultimate purposes, while efficient causation actualizes these purposes through dynamic mechanisms. Together, they form a complementary system that ensures the continuity and coherence of the cosmos, integrating the celestial and terrestrial, the inanimate and animate, into a unified whole. By demonstrating the interplay between purpose and process, Aristotle's philosophy provides a comprehensive framework that balances teleological aims with the physical realities of motion and change, establishing the unity and intelligibility of his universe.

4.4 The Commensurability and Non-competition between Final and Efficient Causation

Because efficient and final causation operate at distinct explanatory levels—one addressing the mechanics of change and the other addressing its purpose—they do not compete but rather complement each other. Efficient causation provides the means by which ends are achieved, while final causation offers the rationale that underlies those means. Together, they ensure the intelligibility of the phenomena they explain.

The commensurability of efficient and final causation lies in their mutual reinforcement. Final causes orient efficient causes, ensuring that their activity is directed toward specific ends. Conversely, efficient causes actualize these ends, serving as the mechanisms through which final causes are realized. For example, the heart's efficient activity of circulating blood makes sense only in light of its final cause, which is the sustenance of life. Neither form of causation can function independently: efficient causation is purposive because of its being oriented toward the final cause, while the final cause is actualized through efficient causation.

In Aristotle's cosmology, this interconnectedness becomes especially clear. The Unmoved Mover, as the ultimate final cause, provides the purpose for all motion in the universe. At the same time, efficient causes—such as the movements of celestial spheres—sustain the continuity of motion by actualizing the principles set forth by the final cause. This relationship demonstrates how efficient causation, while mechanistic in its operation, is fundamentally aligned with the teleological structure of the cosmos. Far from competing with final causation, efficient causation ensures the continuity and coherence of the universe by fulfilling its teleological aims.

Although efficient and final causation are always integrated, their explanatory emphasis shifts depending on the context. In phenomena where the teleological orientation is evident—such as biological processes—the final cause provides the overarching framework, while efficient causation operates as the mechanism that realizes the purpose. For instance, the process of blood circulation can be

explained by the heart's efficient activity, but this activity is only fully intelligible when understood as directed toward the final goal of sustaining life.

Conversely, in fields like meteorology or the motion of inanimate elements, efficient causation often plays a more prominent role. Processes such as rainfall, evaporation, or the movement of fire and earth can be explained mechanistically through efficient causes, even when their final causes are less apparent. However, this does not mean that efficient causation operates independently of final causation: it rather actualizes the teleological framework by ensuring the continuity of natural processes, even in cases where the overarching purpose is difficult to discern. This adaptability highlights the commensurability of these causes, as efficient causation reinforces the broader teleological framework without replacing or undermining it.

Efficient causation is indispensable for maintaining the continuity and coherence of Aristotle's universe. It provides the means by which motion and change occur, ensuring the actualization of potentialities across time and space. However, its role is always embedded within the purposive structure established by final causation. Final causation supplies the telos or purpose that directs natural processes, while efficient causation actualizes these purposes through specific mechanisms that may be operative also where teleological causation is less apparent or seems to be lacking. Together, they form a unified explanatory system that preserves the intelligibility and order of the cosmos.

This interconnection is critical to the central theme of this thesis, which explores the role of efficient causation in Aristotle's philosophy. While efficient causation is often associated with mechanistic explanations, it cannot be fully understood without acknowledging its alignment with final causation. By operating within a teleological framework, efficient causation not only explains the mechanics of change but also ensures the coherence of Aristotle's universe. The commensurability of efficient and final causation demonstrates that Aristotle's causal system is not fragmented or competitive but a holistic approach to understanding the natural world's continuity and purposiveness.

Therefore, for the grounding of unity, unity in Aristotle's cosmos arises from the harmonious relation between efficient and final causation: efficient causal chains connect disparate phenomena across space and time, ensuring the coherence of the cosmos as a unified whole (spatial and temporal continuity); while final causation ensures that all processes and entities are directed toward the

good, grounding the cosmos's purpose and intelligibility (teleological integrity). Efficient causation thus guarantees the dynamic coherence of the cosmos, while final causation provides its teleological coherence. Together, they uphold the cosmos as both a continuous and purposeful reality. And the relation between efficient and final causation in Aristotle's philosophy demonstrates their commensurability and distinct contributions to explaining the unity of the cosmos. Final causation provides the teleological grounding, while efficient causation ensures dynamic continuity, also in cases where teleological explanations may appear insufficient. This relation avoids explanatory competition, instead forming an integrated framework that explains the cosmos as a unified, continuous, and intelligible whole.