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Aristotle's Concept of Nature: Three Tensions

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Abstract And Keywords

The concept of nature (*phusis*) is ubiquitous in Aristotle's work, informing his thinking in physics, metaphysics, biology, ethics, politics, and rhetoric. Much of scholarly attention has focussed on his philosophical analysis of the concept wherein he defines *phusis* as "a principle or cause of change and of remaining the same in that to which it belongs primarily, in virtue of itself and not accidentally" (*Phys*. 192b21-23) and the implications this has in various parts of his philosophy. It has largely gone unnoticed, or unremarked, that this is not the only understanding of *phusis* present in his thinking. This thesis argues that in addition to his philosophical understanding of *phusis*, there is another, pre-theoretic understanding at work.

After unpacking this pre-theoretic understanding, which is best described as 'the natural world,' I argue that there are three tensions stemming from this. First, the natural world is, at times, placed in opposition to the human realm, while at other times, the humans are included as part of nature. Second, nature is considered to be both a static state and a dynamic process of change depending on the context, which prompts Aristotle to claim, in different places, that ageing and dying are both natural and unnatural. Third, nature is treated both as an ideal and as something to be overcome. This thesis attempts to bring to light Aristotle's pre-theoretic understanding of *phusis* and to draw out these three tensions. In the end, I suggest that modern confusions about nature may be informed by considering how they are reflected in the work of the first great thinker about nature, Aristotle.

Keywords: Aristotle, philosophy, ancient Greek philosophy, nature, *phusis*

"For what is Nature? Nature is no great mother who has born us. She is our creation. It is in our brain that she quickens to life. Things are because we see them, and what we see, and how we see it, depends on the arts that have influenced us."

~Oscar Wilde, *The Decay of Lying*

For all who pressed me to continue, even when I no longer wanted to go on.

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Chapter 1

One's ideas must be as broad as Nature if they are to interpret Nature.
~Sherlock Holmes, *A Study in Scarlet*

Section I - What is Nature?

The concept of nature is a powerful one whose force is felt across a broad spectrum of contemporary thought.[1] Consider, if you will, just a few examples. The cry to let free market forces have their way is an appeal to permit nature to run its course without outside, i.e. artificial, interference; the demand for organic products is propped up by a desire for what is 'all natural,' even if that naturalness is no more than a light greenwashing over artificial production methods; arguments about homosexuality are almost inextricably bound up with concern for what is natural or unnatural; environmental groups such as the Green Party or the Sierra Club derive their impetus and attraction from our deep concern with preserving nature; both natural law and natural theology are attempts to derive moral truths from careful observations about the natural world; the 'natural look' is alternately glorified or disparaged depending on the current whims of fashion; and in the recent debate about climate change much of the rhetoric has centred around whether such change results from human actions or natural processes. Without doubt, the concept of nature is a prominent feature of our mental terrain.

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[1] Daniel Dennett tells the story of a card magician named Hilliard who performed an impenetrable trick called 'the tuned deck' (Dennett, 286). The trick was in the name, for it was not a single trick but really a collection of different tricks that yielded the same result. While I will speak of *the* concept of nature, this is for an ease of language, and we should keep in mind that this description may well turn out to be like Hilliard's card trick, i.e., one name that covers several meanings.

Yet for all its force and prominence, the presence of the concept of nature in our thinking paradoxically often goes unnoticed or without remark. In much the same way as the harmonious music of the spheres was said to be unobservable because of its omnipresence, the concept of nature is so widespread that it fades into the background of our thought. Perhaps it is for this reason that deep-lying problems with how we think about nature have largely been overlooked, for, upon closer inspection, the concept is certainly far from crisp and clean.

Let us consider three illustrative examples. The first is drawn from the devastating forest fires that ravaged Yellowstone National Park in 1988. From the park's establishment in 1872 up to the early 1960s, the official policy was to combat aggressively all forest fires in the park regardless of their origin or location. Although this policy was altered, starting in the early 1960s, to permit remote lightning-started fires to burn, by 1988 there yet remained a significant build-up of dried undergrowth in the park, and this, combined with both virtually no rainfall from June through August of that year and unusually high winds, caused several otherwise small fires to grow uncontrollably. By the time November snowfall had extinguished the last fires, over a third of the park's land acreage was "affected to one extent or another by fire."[2]

In this example we may observe a shift in theoretical attitudes about just what nature is. According to the act establishing the American national park service, the service's mandate in overseeing a park is "to conserve the scenery

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[2] The National Interagency Fire Center has published a detailed and accessible guide to wildfire, "Communicator's Guide: Wildland Fire," which can be found on their website at http://www.nifc.gov/preved/comm_guide/wildfire/pdf_index.html. More information about the 1988 Yellowstone fires can be found on pages 154 to 156 of that guide.

and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."[3] Park service officials are explicitly required to conserve natural objects within their parks, but what exactly are to count as 'natural objects' and how are these to be preserved? As we see in the case of the Yellowstone fires, prior to the early 1960s the thinking was that nature was a certain state–the way the park was before human intervention–and the aim was to preserve this state by quickly stamping out any and all forest fires. Starting in the 1960s and crystallized by the 1988 fires, however, the view of what is natural shifted towards a more dynamic understanding. It became recognized that fire plays an integral role in many ecosystems—the cones of a jack pine, for instance, are sealed by resin until the heat of a fire causes them to burst open[4]—and thus fire began to be regarded as a component of a natural cycle whereby forests are intermittently rejuvenated by large conflagrations. The belief that fire should occur from time to time in a healthy forest ecosystem exemplifies a general shift towards viewing nature as a dynamic process rather than a static state. This now has prompted what would have been unthinkable under the old understanding of natural preservation: prescribed burns started by park officials in order to keep a park's ecosystem running naturally.

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[3] The National Park Service Organic Act is available online at http://www.nps.gov/legacy/organic-act.htm.

[4] Approximately ten percent of jack pine cones do open from the sun's heat, but fire is essential to the widespread success of the species' propagation. This is why jack pine are most commonly found in areas with frequent fires. For more, see Michael Henry and Peter Quinby's Ontario Old-Growth Forests, especially pages 157 and 158.

Let us move to a second example. At times, the natural is thought to be synonymous with the good, while the artificial or unnatural is likewise condemned as inferior, hazardous, or immoral. It was, of course, thinking of this kind that prompted many to denounce homosexuality because, in their opinion, it runs contrary to nature, as we may observe in the opening of the following anonymous Latin twelfth century poem:

> A perverse custom it is to prefer boys to girls,
> Since this type of love rebels against nature.
> The wildness of beasts despises and flees this passion.
> No male animal submits to another.[5]

The poet's appeal to the (supposed) behaviour of male animals is here offered as the ideal standard to which human actions should be held. At other times, however, the tables are turned, and it is the natural that is held to be inferior. We can see the tension between these two views in a second anonymous Latin twelfth century poem featuring two mythical figures famous for their beauty, Helen and Ganymede, defending their respective sexual preferences:

> *Helen*: Oh how lovely is love between different sexes,
> When a man favors a woman in a mutual embrace!
> He and she are drawn together by natural attraction:
> Birds, wild animals, boars all enjoy this union.
>
> *Ganymede*: But humans should not be like birds or pigs:
> Humans have reason.
> Peasants, who may as well be called pigs—
> These are the only men who should resort to women.[6]

Helen's appeal to the heterosexual lovemaking of birds, wild animals, and boars, rests on the same underlying premise that nature exemplifies what is perfect,

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[5] Boswell, 389.

[6] Ibid., 385.

good, or proper. In his response, however, Ganymede assumes the fundamentally opposite premise. His argument is that the natural world is unfit to be a model for humanity; humans are meant to rise above what is merely natural through judicious use of reason. In prescribing standards for human behaviour, both Helen and Ganymede call on observations of the natural world, although their estimation of nature's worth is contingent upon the conclusion each wishes to draw.

Our third example underscores the relationship between nature and human activity more closely. Although the natural is routinely opposed to the artificial, upon more critical reflection it becomes clear that the boundary between these two categories is not sharply defined. This may be illustrated by an unusual incident from the golfing world, but first we need to be familiar with several key points concerning the sport's rules. These define 'loose impediments' as "natural objects such as stones, leaves, twigs, branches and the like. . .provided they are not fixed or growing" and 'obstructions' as "anything artificial, including the artificial surfaces and sides of roads and paths."[7] The distinction between these two categories is particularly important when a ball comes to rest in a hazard, like a sand trap, for in such instances a player is permitted to remove an interfering obstruction, i.e., anything artificial, but not a loose impediment, i.e., anything natural. So, for example, if a player's ball comes to rest in a sand trap against a rake, she may remove the rake, but a fallen tree branch in the same situation may not be touched.

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[7] Watson, 12 & 16.

In light of this rule, the following query was sent to the United States Golf Association (USGA), one of two governing bodies responsible for writing and interpreting the rules, for clarification. During a tournament, a player hit his ball into a sand trap where it came to rest against a half-eaten pear, in an area suffering from a distinct dearth of pear trees, we might add. Is the half-eaten pear a natural loose impediment, in which case it must remain where it is, or an artificial obstruction, in which case the player is permitted to remove it?

In its response, the USGA ruled that a pear *always* is a natural object. "The facts that a pear has been half-eaten and there is no pear tree in the vicinity," they wrote, "do not alter the status of the pear."[8] This seems straightforward enough, but the ruling continues by providing further clarification by delineating the conditions under which natural objects should be considered to be converted into artificial ones.

> Loose impediments [i.e., natural objects] may be transformed into obstructions [i.e., artificial objects] through processes of construction or manufacturing. For example, a log (loose impediment) that has been split and has had legs attached to it has been changed by construction into a bench (obstruction). . .[9]

The point of choosing this example is neither to cite the USGA as an authority on the distinction between artificial and natural nor to quibble over whether or not a half-eaten pear is truly natural, but to observe how entirely arbitrary their decision was. Presumably the reasoning behind this decision is that processes like construction or manufacturing involve humans altering something natural so that

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[8] Ibid., 13.

[9] Ibid.

it becomes something it was not previously. But, if splitting a log can remove it from its natural state and transform it into an artificial bench then an equally strong case could be made that biting into a pear causes it to become an artefact as well, for it too has been altered from its natural state by human agency. Perhaps we must instead interpret this decision as focussing not on the *process* of transformation but on the *intent* of the human agent; the intention of the bench maker is to transform the log into a bench, whereas the person eating the pear had no corresponding intention of transforming the pear into anything. But this will not do either, for we could simply shift the focus to the grocer whose intention was to turn the pear into a commercial product through covering it in preservative vegetable wax, shipping it from where it grew to where it could not, and slapping on a bar-coded sticker. I am not sure if a half-eaten pear without a pear tree in sight is natural or not, but the ambiguity of its state illustrates that the categories of natural and artificial are nowhere near as tidy as is commonly assumed, the decisions of the august members of the USGA rules committee notwithstanding.

We have now seen three examples of what we might call messiness with our thinking about nature, although many more could easily be called forth. The obvious question arising from this is why we generally are not more conscious of these difficulties. One reason why this may be the case has already been suggested—the concept's widespread presence allows it to fade into the background of our consciousness—but I strongly suspect there is another factor involved. In her 2008 Massey lectures, Margaret Atwood suggests "the older a recognizable pattern of behaviour is—the longer it's demonstrably been with us—

the more integral it must be to our human-ness."[10] Atwood uses this principle to show the concepts of fairness and reciprocity are deeply ingrained in the human psyche, but her general principle is equally applicable to our inquiry here. The older a concept is, the longer it has demonstrably been with us, the more integral and deeply ingrained it must be in our way of thinking. I propose, furthermore, that the more integral and deeply ingrained an idea is the more likely it is to be overlooked or taken for granted. Now, the concept of nature is ancient indeed, so it should not be surprising if the three difficulties just identified are overlooked. The concept has become so 'second nature,' if you will, that these problems become submerged by familiarity. What is truly interesting is that the confusions associated with our modern understanding of it are present right from the beginning. At the very least, they are right there in the first great, systematic treatment of the concept, Aristotle's.

Section II - Aristotle and Nature

To begin our inquiry into Aristotle's concept of nature we must acknowledge that he was not the first thinker to investigate nature, and for this reason some might question my description of his work as the beginning of our understanding of the concept. Indeed, the Greek word for nature, '*phusis*,'[11] can

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[10] Atwood, 11.

[11] The word '*phusis*' will be used predominantly when discussing Aristotle's views on nature and 'nature' when discussing the concept of nature more generally.

be traced as far back as Homer's *Odyssey*[12] in which the god Hermes explains the *phusis* of the mythical herb moly to mortal Odysseus so that the latter may use it to defend himself from Circe's spells.[13]

> "So spoke Argeiphontes [Hermes], and he gave me [Odysseus] the medicine, which he picked out of the ground, and he explained the nature [*phusis*] of it to me. It was black at the root, but with a milky flower. The gods call it moly. It is hard for mortal men to dig up, but the gods have power to do all things (*Odyssey*, X 303-306)."[14]

Here, in the earliest extant example of the word, Homer uses it to refer to the characteristics of the mythical moly plant: it has a black root and white flower, is difficult to dig, and is called 'moly.' Before Odysseus is capable of harnessing moly's powers to defend himself from the undignified porcine fate suffered by the rest of his men, he must first possess knowledge of the plant, and this in turn requires that he understand its nature, its *phusis*.

While use of the word predates Aristotle, so too do philosophical investigations about the concept. As our philosopher himself describes, the pre-Socratic natural philosophers, the *phusikoi*, "thought that they alone were

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[12] Dating Homer is notoriously difficult, but for our purposes here, general as they are, the entry in the *Oxford Classical Dictionary* on Homer will suffice. This describes how "there is some agreement to date the poems in the second half of the 8th cent. BC. . .the *Odyssey* about 725" which would place the first surviving use of '*phusis*' some 340 years before Aristotle's birth. Even G.S. Kirk's conservative estimate that "the main stage of large-scale composition was completed for both [Homeric] poems before 700 B.C., or perhaps very soon afterwards in the case of the *Odyssey*" (Kirk, 301) would mean that use of '*phusis*' predates Aristotle by about three centuries.

[13] For an explanation of the significance of Homer's use of '*phusis*' instead of the metrically possible alternates '*eidos*,' '*morphē*,' or '*phuē*,' see Naddaf, 13-14.

[14] I have borrowed Richmond Lattimore's translation. The Greek text is as follows:
ὣς ἄρα φωνήσας πόρε φάρμαχον ἀργειφόντης
ἐκ γαίης ἐρύσας καί μοι φύσιν αὐτοῦ ἔδειξε.
ῥίζῃ μὲν μέλαν ἔσχε, γάλακτι δὲ εἴκελον ἄνθος:
μῶλυ δέ μιν καλέουσι θεοί: χαλεπὸν δέ τ'ὀρύσσειν
ἀνδράσι γε θνητοῖσι, θεοὶ δέ τε πάντα δύνανται.

inquiring about the whole of nature and of being"[15] (*Metaph.* 1005a33).[16] One can also point to many examples demonstrating that Plato too is well aware of the concept of nature: his response to Callicles' claim that nature shows the better should have a larger share than the worse (*Gorgias* 483d-484c) and his extended investigation into the natural names for things in *Cratylus* are only two of them. But '*phusis'* is used only once in Homer, and, of course, his work includes no philosophical analysis of the concept. All but a few fragments of the work of the *phusikoi* have been lost, and of those that remain many have only been preserved through, and thus coloured by, Aristotle's own thinking. Finally, Plato's primary interest lies with the world of the Forms, not the natural world, so while he employs the concept in analysing other ideas, it receives no sustained analysis of its own.

On the other hand, *phusis* features prominently throughout the Aristotelian *corpus*, of which a sizeable portion has been preserved, and his interest is

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[15] Unless otherwise indicated, translations of Aristotle's work are taken from the Jonathan Barnes edition of *The Complete Works of Aristotle.*

[16] Aristotle's thinking about nature was surely influenced in no small part by the pre-Socratics, who wrote extensively about *phusis*. As Guthrie notes, "Throughout antiquity the title 'On Nature' (περὶ φύσεως) was given indiscriminately to the writings of the Presocratics" (Guthrie, *The Earlier Presocratics and the Pythagoreans*, 73), although these titles were probably not used by the authors themselves (Nadaf, 16; Kirk, Raven, and Schoffield, 102-103). There is some debate about what *phusis* means in this context; in his survey of the literature Naddaf identifies four candidates: primordial matter; process; primordial matter and process; and origin, process, and result (Naddaf, 17-22). In defending the last option, Naddaf concludes that "the expression *historia peri phuseōs* was a true history of the universe from its origins to the present. The history most certainly includes the origins of mankind" (Naddaf, 28-29). Aristotle seems to have considered these natural philosophers (*phusikoi*) to have been giving an account of the natural world, and he says that the *phusikoi* studied: the first principle (*Phys.* 184b15-17), the manner in which qualitative change is possible (*Phys*. 186a18-20), coming into being in general (*Phys*. 187a27-29), respiration (*Resp*. 470b6), how like is brought to like (*GA* 741b10), embryology (*GA* 741b38), the reproduction of weasels, ravens, and ibises (*GA 7*56b14-18), the whole of nature (*Metaph*. 1005a32-35), and cosmology (*Metaph*. 1071b27). What the study of *phusis* entailed was, in this way, already delineated by those who had written 'On Nature', and this surely coloured Aristotle's understanding of the concept.

especially piqued by the natural world. The Aristotelian corpus contains numerous books on the topics of both biology and natural phenomena including one devoted exclusively to the topic of nature itself. Even though he was not the first to use the term, the first to analyse its associated concept, or the earliest thinker making significant use of the concept whose work is substantially preserved, Aristotle is the first to attempt a systematic analysis and to employ the concept so broadly. Like so many other ideas, our thinking about nature is a legacy of his. This is not to say that Aristotle is the only thinker to have had significant impact on how we think about nature; the Stoics, in antiquity, had much to say on the subject, and it is something of a preoccupation in the later Renaissance, as shown, for example, in the work of Francis Bacon.[17] In the end, it matters little whether he is the source of the confusion about nature or he merely inherited it. Our thinking about nature derives, in no small part, from his, and, as we shall see, his concept of *phusis* lacked clarity. Thus, since confusion is incorporated into the concept at its source, it is unsurprising to find that confusion remains at the very heart of our modern thinking about nature. To sort out our own puzzlement, therefore, I suggest that we must make a return to its beginning and sort out how Aristotle thought about nature.

But first let us appreciate the extent to which the concept of *phusis* pervades Aristotle's thinking, for it truly is remarkable. This is, of course, most apparent in the *Physics* where his explicit aim is to investigate the principles of

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[17] For another account of how our understanding of nature has been shaped, Lynn White Jr.'s "The Historical Roots of Our Ecological Crisis" provides a careful survey of the manner in which Christian theology has influenced Western views of nature.

the science of nature (τῆς περὶ φύσεως ἐπιστήμης) (*Phys*. I.1, 184a14-15), but by no means does this exhaust the list of passages where *phusis* features prominently. For example, his biological works are inundated by explicit analogies comparing *phusis* to an intelligent craftsman, e.g., *phusis* is portrayed as laying down a network of veins and arteries throughout the body in the same fashion as a gardener might lay out a series of canals to provide irrigation from a central water source (*Part. An.* III.5, 668a14-22). Implicit examples are equally ubiquitous, such as his adoption of the general principle that "nature allots each weapon, offensive and defensive alike, to those animals that can use it" (*Part. An.* III.1, 661b29-30). These uses may be expected, but *phusis* plays an important role in places beyond the biological works as well. For example, in *De Anima* he famously defines the soul as "an actuality of the first kind of a natural body having life potentially in it" (*De An.* II.1, 412a28). Additionally, a distinction is drawn between legal and natural justice in the *Nicomachean Ethics* (*Eth. Nic.* V.7, 1134b18-1135a6), while some forms of slavery are defended in the *Politics* on the grounds that they are natural (*Pol.* I.V). Even in the *Rhetoric*, whose topic is as far removed from nature as I can imagine, Aristotle maintains that "[neither] can counsel be given about the whole class of things which may or may not take place; for this class includes some good things that occur naturally, and some that occur by accident; and about these it is useless to offer counsel" (*Rhet*. I.4, 1359a33-36). Clearly the concept of nature is prominent, widespread, and deeply ingrained throughout the Aristotelian *corpus*.

At this point, allow me to pause to allay a potentially serious concern. Some scholars may worry that my claim–Aristotle's concept of nature features prominently across his work–runs afoul of one of his most central doctrines, his prohibition against *metabasis*, the application of the axioms or conclusions of one science to another. As he writes in *Posterior Analytics* I.7, "one cannot, therefore, prove anything by crossing from another genus—e.g. something geometrical by arithmetic" (*An. Post.* 75a38). With regards to my claim, I take it the worry would be something like the following. The Aristotelian science devoted to studying nature is laid out in the *Physics*. The conclusions he draws about nature there, however, cannot be applied to his other sciences–such as his biology, ethics, politics, and rhetoric–without violating the prohibition against *metabasis*. On this argument, therefore, there cannot be a single concept of nature extending throughout Aristotle's complete work. At most there could be a particular one for each individual science.

One potential route out of this difficulty might be to avail ourselves of the exception Aristotle permits to this rule, namely that the principles of a higher science may be applied to a subordinate one, as in the case of using geometrical principles in the study of optics. We might, therefore, attempt to argue that the other sciences mentioned are subordinate to physics and because of this the concept of *phusis* articulated in the *Physics* may be applied to each of these as well. It is unclear, however, that this approach will get us very far, for while it *may* work for the case of biology, it is hard to see how ethics, politics or rhetoric could

be considered subordinate to physics. Given its limited prospects for success, this argument will not be advanced further.

Instead, I intend to propose an alternative solution, which, as an added benefit, will help to clarify the specific nature of my project. In *Posterior Analytics* I.7, all that is specifically forbidden is crossing either the *conclusion* (*sumperasma*) or the *axioms* (*axiōmatai*) of one science with another. In other words, Aristotle's concern is to reject the possibility of applying specific technical aspects of one science to another. To borrow a modern example, this rule would prohibit the application of the principles of evolutionary biology to social history, a wise prohibition as we have discovered. But this rule does not preclude the possibility that the same *general concept* may appear in different sciences. For example, a concept like 'weakness' may crop up in widely different fields: in economics where it may be used to describe a company with negative growth and limited cash reserves, or in biology where it is selected against by evolution, or in the study of composition where it may function as a plot device. Yet even when used across these different fields the concept of weakness maintains its focal meaning. Because the idea of weakness is fundamental to how we view the world, its application to a broad range of disciplines is neither surprising nor unreasonable. I propose that the concept of *phusis* in Aristotle's philosophy functions in the same manner.[18]

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[18] It is also worth noting that it is not unheard of for Aristotle explicitly to violate his own prohibition. For example, one of the central arguments in *Pol.* I.2 is founded on the principle that 'nature makes nothing in vain' (*Pol.* 1253a7-18), a principle borrowed from his biology. (See, for example, *IA* ch. 2, 704b11-15 where Aristotle describes the phrase 'nature makes nothing in vain' as one of "the principles we are accustomed constantly to use for our *scientific investigation of nature,*" emphasis added.) Its use is given no further justification in the *Politics* than that this principle is the sort of thing "we [i.e., Aristotle and his school] say [*phamen*]" (*Pol*. 1253a9).

There is precedent for reading Aristotle in this way. At the end of the nineteenth century, the German scholar Edmund Hardy described the importance of *phusis* to Aristotle's thinking in the following way:

> The concept which Aristotle never lost sight of, and which is almost as prominent in the *Ethics* and *Politics* as in the *Physics* proper, was that of φύσις. It is by means of this principle that difficulties are solved and contradictions removed; it is through its aid that higher points of view are reached, and it always remained, for Aristotle, the most certain, though at the same time the most mysterious of all concepts.[19]

Following Hardy, J.D. Logan finds that it is "quite evident" that Aristotle's "philosophical concept of φύσις must have been more or less definitely before his mind in his detailed and systematic study of Physics, Ethics, Politics, and Psychology."[20] While I will refrain from going as far as Logan's suggestion that Aristotle had one *philosophical* concept of *phusis* in mind throughout his physics, ethics, politics and psychology—not least of all for the reason that this comes dangerously close to violating Aristotle's proscription against *metabasis*—I will argue that there is a general concept of nature underlying his thinking throughout his work.

My aim here, therefore, is to sort out what this general concept looks like for Aristotle and to show the difficulties inherent in it, difficulties that still infect our own modern understanding. I will begin, in this chapter, by arguing why we should think there is a general concept of *phusis* to be found throughout Aristotle's work. To that end, I will first discuss the etymology of *phusis* as a means of drawing out the general meaning of the concept. Secondly, I will

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[19] Logan, 33.

[20] Ibid.

examine Aristotle's technical discussion of the concept found in *Physics* II.1 and *Metaphysics* Δ.4. Thirdly, I will show how these technical discussions of *phusis* betray a deeper, general way of conceiving of *phusis*. Finally, this chapter concludes with the identification of three principal tensions present in this general conception of *phusis*, which will eventually be explored more fully in later chapters.

*Section III - Etymology of '*Phusis'[21]

Let us begin our investigation of Aristotle's concept of *phusis* by tracing the history of the word itself. '*Phusis*' is considered to be derived ultimately from the Indo-European root **bheu-, *bheuə-*.[22] According to Julius Pokorny, the original meaning of **bheu-* was "to grow" or "to flourish" or, perhaps, "to swell." Since growth and flourishing are closely tied to the existence of living things, the meaning of **bheu-* thus evolved to describe existence itself, and so **bheu-* came also to mean "to come to be, to become, to be" and often the related "to live or dwell." Thus, it often serves as the root of existential verbs in Indo-European languages. For example, it is the root of the Saskrit *bhávati* ("is, there is, it happens"), the root of the Latin perfect active indicative of "to be," *fúī,* the root of the Anglo-Saxon *bēo* ("I am"), and the root of the Old Irish *buith* and the Lithuanian *búti* both of which mean "to be." Additionally, it is the root of many

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[21] I would like especially to thank Bonnie MacLachlan for her help in navigating the world of Indo-European etymology. Her help has been invaluable, but the fault for any errors that remain lies with me.

[22] The analysis of **bheu-* in the next two paragraphs is base on the work of Julius Pokorny, Indogermanisches Etymologishes Wörterbuch. vol. 1, 146-150.

words tied to living and living well such as the Old Indian *bhúti-ḥ* (“being, prospering”) and *bhāvayati* (“lavish care upon”), the Armenian *busanim* (“spring forth”), the Albanian *buj, bûj* (“to stay overnight”), the Gothic *bauan* (“to live, reside”), and the Old Icelandic *būa* (“to live, reside”).

Additionally, **bheu-* is the root of many nouns tied to the earth, home, wealth, and plants. For instance, the Old Indian *bhú* and the Albanian *bōtë* both mean “earth” or “world.” Some cognates refer not to the world in its entirety but to one’s habitation on a smaller scale. For example, the Old Indian *būd,* Albanian *bäne*, Old Irish *baile*, and Old Icelandic *būd* all mean “home,” while the Old Indian *bútas* denotes a house and the Old Icelandic *būde* refers to a hut. On top of that, derivatives in Old Indian (*bhūmán*), Old Irish (*baë*), and Old Icelandic (*bōdel*) have the meanings of “wealth,” “value,” and “fortune” respectively. Finally, **bheu-* often serves as the root of words connected with plants such as the Armenian *busoy* (“shoot, herb, plant”), Old Icelandic *būan*, which can mean either “to dwell” or “to farm,” the Anglo-Saxon *bēam* (“tree”), and the Old Church Slavonic *bylьje* (“plant”).[23]

So we see that the focal meaning of the root **bheu-* was one of growing, flourishing, and swelling. Obviously these processes are closely linked to life and procreation, and so the root and many of its derivatives functioned as an existential verb. In many languages, **bheu-* was a source of words naming things

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[23] Although the main groups of derivatives of **bheu-* have been covered here, the list of meanings described in these two paragraphs should not be considered to be exhaustive. **Bheu-* also forms the root of words meaning, among other things, “human,” “joy,” “sorrow,” “ghost,” and “oblivion.” Since derivatives with these meanings occur with significantly less frequency and regularity across Indo-European languages, they should not be considered to be central to understanding the term’s meaning, and thus they are not considered any further here.

that are closely tied both to the source of life, e.g., the earth, and to living things, specifically plants. **Bheu-*'s connection to wealth is less overt, but presumably it rests on the ancient view that the earth is the source of wealth, both crops and precious metals and gems. We see this exemplified, for example, by the Greek belief that, as the god of the underworld, Pluto's divine portfolio included the sphere of wealth. Overall, **bheu-* and its derivatives signified the origin and subsequent development of life. One almost cannot help but have in mind here an image of a seedling, swollen with moisture, striving towards maturity.

For reasons of simplicity, I have thus far avoided any mention of how this root became incorporated into Greek, preferring instead to present an overall view of its meaning by tracing its development in other languages. Having done so, we are now equipped to examine where the story picks up in Greek. In this respect, Pokorny describes how **bheu-* forms the basis of *phu*-stem words such as: *phuō* (in the transitive meaning "to bring forth, produce" and in the intransitive meaning "to grow, spring up, arise"), *phuton* ("plant, tree"), *phuē* ("fine growth, noble stature"), *phuma* ("a growth, tumour"), *phulon* ("race, tribe"), *phulē* ("race, tribe, clan"), and, of course, *phusis*. In addition, it is the root of *phō*-stem words, including: *phōleos* ("a hole, den"), *phōleuō* ("to lurk in a hole or den"), and *phōlis* ("an animal's scale").[24] As seen in others of the Indo-European languages we have considered, *phu*-stem Greek words retain **bheu-*'s focal meaning of 'growth.' This is obvious in the case of words like *phuō*, *phuma*, and *phuton*, but it is also at the heart of *phulon* and *phulē*, which describe groups of people

[24] Pokorny, 147.

stemming from a common origin of birth.[25] Extrapolating from its cognates, therefore, we should expect that *phusis* will likewise carry a similar sense.

As Pierre Chantraine suggests, '*phusis*' is derived from **bheu*- through the verb *phuomai* ("to grow, to be born, to produce"). Following Emile Benveniste, he thus defines *phusis* as the "completion of a becoming, [or] nature in so far as it is realized with all its properties,"[26] for Greek words ending in *-sis* signify "the abstract notion of the process conceived as an objective realization."[27] Simply put, therefore, '*phusis*' was used to refer to the process and completion of a thing's growth, birth, or production. But the full story is significantly more complicated than this. In his work *Les mots de la famille de ΦΥΩ en grec ancien*, André Burger traces the use and development of '*phusis*' from its first appearance in Homer until it enters common parlance by the end of the fifth century BCE.[28] He argues that originally the word was adopted from mystical language—recall, for example, its use in Homer—where it meant something like "the vital energy of plants" into medical writings where it retained the fundamental sense of "growth" it receives from *phuomai*.[29] From there, it entered philosophy as a technical term where it referred to "creative energy," "origin," or "birth,

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[25] *Phō*-stem words, on the other hand, pick up on the meaning of 'home' that we encountered in the Old Indian *būd,* Albanian *bäne*, Old Irish *baile*, and Old Icelandic *būd*. In Greek, however, the focus seems to be more heavily placed on the habitations of animals instead of homes constructed by humans.

[26] Chantraine, p 1234 (my translation). The original line reads, "accomplissement (effectué) d'un devenir; nature en tant qu'elle est réalisée, avec toutes ses propriétés." Chantraine himself has adopted the definition from Emile Benveniste's *Noms d'agent et noms d'actions en Indo-Européen*, 78-9.

[27] Benveniste, 80. Translation borrowed from Naddaf,11.

[28] Burger, 27-54.

[29] Ibid., 47.

creation."[30] Burger notes, however, that in the fifth century the meaning was "deeply transformed" through its adoption by the tragedians and especially the Sophists, both of whom used *phusis* to describe that which is opposed to "an institution, something established."[31] It was at this time, according to Burger, that *phusis* became a morally charged term,[32] but, at the same time, "by entering the ordinary vocabulary, the technically precise term *phusis* became a general theme of civilization"[33] and the term likewise "lost much of its precision."[34]

It is not unfair to say, therefore, that by the time Aristotle inherited the term in the fourth century, the meaning of '*phusis*' could be described as disorganized at the very least. Although still maintaining the original meaning of "growth," or "a thing as it is when it has completed its process of growth," it had also acquired a moral aspect. For example, Euripides writes in the *Hippolytus*:

> *Aidōs* tends [this garden] with river-like dew,
> So that those who have not been trained,
> But who have received, in their nature, chastity in all things equally,
> These may pick the flowers; the wicked cannot by divine decree.[35]

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[30] Ibid. For more on the history of *phusis* in philosophy before Aristotle, see note 16.

[31] Ibid., 49.

[32] Ibid.

[33] Ibid., 50.

[34] Ibid., 49.

[35] *Hippolytus,* lines 78-81 (text taken from Kovacs' Loeb edition, translation mine).
Αἰδὼς δὲ ποταμίαισι κηπεύει δρόσοις,
ὅσοις διδακτὸν μηδὲν ἀλλ' ἐν τῇ φύσει
τὸ σωφρονεῖν εἴληχεν ἐς τὰ πάνθ' ὁμῶς,
τούτοις δρέπεσθαι, τοῖς κακοῖσι δ' οὐ θέμις.
Some editions separate lines 78 and 79 by a colon, making the latter three lines an independent sentence. My translation, however, follows the more common, and sensible, practice of treating all four lines together. See W.S. Barrett's edition of the *Hippolytus* for further discussion on this point.

By this point *phusis* had also begun to be set in opposition to established institutions, as we can see in the distinction drawn by the Sophists between *phusis* and *nomos* (convention).[36] (The reasoning underlying this shift surely rests on differentiating between that which grows and that which is created by humanity.) Reflecting this confusion, Liddell and Scott's lexicon records no fewer than seven general groups of meanings for *phusis*, some of which in turn receive further subdivision.[37] Although it was generally tied to the idea of growth, the concept of *phusis* was complicated by shifting the emphasis to bring out further meanings, a process parallel to how its root **bheu-* came to include many different senses all tied to the focal meaning of growth and flourishing. As a result the meaning of *phusis* was a mess by the fourth century, a mess that Aristotle recognized and attempted to sort out. Our focus now shifts towards determining how successful he was.

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[36] For a thorough description and analysis of the conflict between those who upheld *nomos* and those who defended *phusis* see W.K.C. Guthrie's influential *The Sophists*, 55-134.

[37] The meanings identified by Liddell and Scott are: 1. "origin," 2. "the natural form or constitution of a person or thing" including the senses "nature, constitution," "outward form, appearance," "constitution, temperament" in medical writing, or when referring to the mind "one's nature, character," 3. "the regular order of nature," 4. "creature," 5. "kind, sort, species," 6. "sex." In addition, they create a separate category specifically for its use within philosophy in which they identify four distinct uses: "nature as an originating power," the "elementary substance," "the creation, 'Nature'," and the "Pythagorean name for two." With respect to its philosophical usage, Aristotle is identified as using *phusis* in the first two ways only, i.e. "*phusis* is said to be the first movement in each of the natural things" (*Metaph*. 1014b16, translation mine) and "*phusis* is said to be the elements of natural things" (*Metaph*. 1014b33, translation mine). Admittedly, Aristotle's obvious omission from the list of writers who employ the word with its third usage, "creation, 'Nature'" may be *prima facie* problematic for my interpretation. I will argue below, however, that Aristotle's usage of *phusis* includes this meaning as well.

Section IV - Aristotle's Explicit Discussion of Phusis

By tracing the development of the meaning of '*phusis,*' we have observed how the word came to carry a number of different meanings by the fourth century. The logical next step is to examine how Aristotle in particular defines the term, as his definition shows his awareness of the term's ambiguity. For this, of course, the *locus classicus* is his discussion in *Physics* II.1 where he defines *phusis* as "a principle [*archē*] or cause [*aitia*] of change and of remaining the same in that to which it belongs primarily, in virtue of itself and not accidentally" (*Phys*. 192b21-23, trans. modified).[38] Although this passage ranks easily among the very most famous of Aristotle's writings and is familiar to any Aristotelian scholar, and most undergraduate philosophy students for that matter, its importance to this project merits devoting some time to unpacking it further. *Phusis* is here defined by Aristotle as an internal principle of change and remaining the same. For example, each of the four classical elements has an internal principle directing it to move towards its proper place in the universe, and this is Aristotle's explanation for why earth moves down toward the universe's centre while fire moves out toward its edges. The *phusis* of earth, therefore, is to move towards the centre of the universe, and it will do so unless prevented by an outside force.

The added qualification that this internal principle must belong to a thing "in virtue of itself and not accidentally" is a standard Aristotelian turn. After all, *everything* has an internal principle of change by virtue of its material makeup.

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[38] I will refer to this as Aristotle's philosophical understanding of nature. The term comes from remarks Lennox makes about philosophical analysis and reflections on the concept of nature (see Chapter two, Section II). This is to distinguish this from the pre-theoretic understanding of nature which will be developed below.

Aristotle considers a cloak, for example, to have an internal principle compelling its movement towards the centre of the universe, unless otherwise prevented, but this impulse stems from the cloak's being woven from a heavy earthen material; it is not a feature of a cloak *per se*. The difference between natural objects, like the four elements, and artefacts, like cloaks, is that the former *properly* have an internal principle of change, while such a principle belongs to the latter only incidentally.

On the face of it, this definition demarcates a clear line between the natural and artificial; natural objects are those that change themselves while artefacts require something to change them. This definition, however, has provoked significant debate, for it is unclear, upon closer inspection, how we should understand what it means to be an internal principle of this sort. In a recent article, Sean Kelsey argues that we must read *archē* in this passage as analogous to a kind of authority.[39] Before making his case for this, however, the first half of Kelsey's paper is devoted to analyzing the two more traditional interpretations of Aristotle's description of natural objects: (i) they possess a peculiar kind of efficient cause, specifically one that is internal to them, and (ii) they are natural because their forms are responsible for their movements. Because of this analysis, Kelsey's work is an excellent springboard for our own discussion here, so let us examine what he says, beginning with the two traditional understandings of how *phusis* may be an internal principle of change.

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[39] Sean Kelsey, "Aristotle's Definition of Nature."

The first, and most intuitive, understanding treats *phusis* as an efficient cause. On this reading, natural objects are distinguished from artefacts in that the former are agents of their own changes, whereas the latter are changed by something external. For example, an oak causes its own growth, but an axe requires someone to swing it before it can chop.[40] Thus, when Aristotle writes that a natural object "has within itself" such a principle (*Phys.* 192b14), he means that a natural object is natural precisely because it is the efficient cause of its own change. In other words, the cause of its changing is within itself; the change is not caused by an outside force. In addition to being intuitive, this interpretation, as Kelsey notes, can also boast of a long history tracing back at least as far as Simplicius (c. 490 - c. 560 CE), who writes in his commentary on the *Physics* that "by source he [Aristotle] means the efficient cause."[41] Given this interpretation's intuitiveness as well as its long tradition in the commentators, there is good reason to read Aristotle's definition of *phusis* as referring to an internal efficient cause.

Nevertheless, this understanding faces serious challenges. *Physics* II.1 opens with a list of natural objects–animals and their parts, plants, and the four elements (*Phys.* 192b10-11)–but many of these are not the efficient cause of all of their changes, not even those considered natural. As Kelsey shows, the

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[40] We have already seen how an axe could be considered to be the internal source of *some* of its changes, i.e., insofar as it is a heavy thing it will cause itself to move downwards. But all of its 'axish' changes, however, require an external efficient cause. But furthermore, neither is a tree the cause of all of its movements. For example, the tree could be felled by a woodsman's axe, in which case its falling would be externally caused. But, just as artefacts may be the cause of some of their movements, natural objects must be the source of their natural movements, not all movements.

[41] Simplicius, *On Aristotle's Physics*, 264.10.

movement of the elements to their proper places in the universe is natural but Aristotle considers this movement to be externally caused; water boiling, although natural, requires for its efficient cause an external source of heat; and the efficient cause of an animal's perception, which is a natural change within an organism, lies in the object perceived and not the perceiver, e.g., when I see an oak tree, it is the tree, not I, that is the cause of the image in my mind.[42] In light of these problems, therefore, it seems that when Aristotle describes *phusis* as an internal principle of change and rest he cannot mean that it is an efficient cause.

The second traditional understanding reads Aristotle's definition of *phusis* as identifying natural objects by the fact that "they move in the particular ways they do thanks ultimately to facts about them, and in particular about their form or kind."[43] For example, that one animal barks while a second meows results from the difference between the forms of each, canine and feline respectively. Of course, the changes of artefacts are likewise governed by their forms–e.g., an axe's form ensures it will chop rather than pound–so proponents of this reading locate the difference between artefacts and natural objects in the position of their respective forms. An artefact's form is originally located in the mind of the artisan, not in the artefact itself, whereas a natural object is the source of its own form; its form belongs to it primarily. Consider, for example, the production of an axehead. Before it is formed, a smith must have in mind the final form of the iron; if he merely strikes blindly, the result will be nothing more than a misshapen lump of

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[42] Kelsey, 61-62.

[43] Ibid., 66.

iron. In contrast, an oak's form was present within the acorn even before it sprouted. On this reading, therefore, Aristotle's distinction between natural and artificial objects rests on the location of the form of each.

Kelsey criticizes this reading for "miss[ing] the point. . .which was precisely to translate this difference in 'location' into a difference we can understand, by explicating it in terms of a difference that surfaces in explanation: in explaining natural movement we appeal ultimately to the form or kind of the thing moving, while in explaining other kinds of movement we do not."[44] We can put the problem this way. To explain the cause of the proper movements of natural objects–let us say the pattern of an oak's leaves–we point to its form. The form of the oak causes the tree's leaves to grow in a whorled pattern, whereas if the tree had a different form, like that of a maple, its leaves would be arranged in what is technically referred to as an alternate pattern. The difficulty is that this holds equally true for artefacts as well; an axe's form dictates its chopping ability. When explaining why a thing moves as it does, we point to its form, regardless of whether the object is natural or artificial.

In my opinion, Kelsey's dismissal of this interpretation is too hasty, for two reasons. First, it neglects an apparent endorsement of this view by Aristotle himself, who writes, "The form indeed is nature rather than the matter; for a thing is more properly said to be what it is when it exists in actuality than when it exists potentially" (*Phys.* II.1, 193b7-8). Secondly, the source of an object's form may not be relevant to explaining all of its changes, but a strong case could be made

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[44] Ibid., 68.

that it is integral to explaining its most crucial change, creation. For example, the form of 'oak' is already present within the acorn, but the form of 'axe head' must come from the smith. In a sense, the subsequent changes of both the tree and the axe depend upon their creation, so there is a temptation to place added importance on their genesis. In this way, the location of the *source* of an object's form by being a necessary condition for all further movement is a difference that surfaces in explanation; explanations of why a thing behaves a certain way can be traced to why that thing is. Recall that the etymology of '*phusis*' revealed the concept to be caught up with the concept of genesis and growth, so it would not be unusual for Aristotle's focus to be directed there.

In the end, however, I do not believe this interpretation will meet with success, for it runs squarely into a serious problem of its own. Thus far we have considered the source of an oak to be an acorn, but, of course this is an oversimplification. After all, an acorn depends upon another tree for its existence. In this way, the source of the form of the oak tree is external to it, coming from its parent tree. This sort of thinking is clearly evident in Aristotle's famous description of the father being the source of an offspring's form, while the mother's role is to contribute the matter (*GA* II.3, 737a21-25). In this way, the form of the offspring is originally within its father, in much the same way that the form of the artefact was originally in the artisan's mind.

Thus neither of the two traditional readings of Aristotle's definition of *phusis* in *Physics* II.1—that nature is either an efficient cause or a form—is successful. In their place, Kelsey argues for a third possibility. In order to understand what it

means for *phusis* to be a principle (*archē*), Kelsey turns to the great Aristotelian dictionary, *Metaphysics* Δ. There one of the ways something may be said to be an *archē* is by governing or ruling over another. An *archē* can be "that by whose choice that which is moved is moved and that which changes changes, e.g. the magistracies in cities, and oligarchies and monarchies and tyrannies, are called principles [*archai*]" (*Metaph.* Δ.1, 1013a10-14). To flesh this out, Kelsey draws upon Aristotle's remarks in the *Politics* distinguishing between what Kelsey calls 'despotic authority,' what masters have over slaves, and 'non-despotic authority,' exemplified by both the power held by some citizens over others in a democratic society and the power of a physician over his patient. The difference between these two types of authority lies in who benefits from each, for while despotic authority benefits the ruler, non-despotic authority is employed for the sake of the ruled. While it is the master, and not the slave, who lives the good life to which the slave contributes, it is the patient, and not the doctor, who recovers his health by following the medical orders. Adopting Kelsey's terminology, the proper subject of the benefit generated by despotic authority is the ruler, whereas the proper subject of the benefit generated by non-despotic authority is the one who is ruled. Kelsey proposes that we should understand Aristotle's description of *phusis* as an *archē* in this way. Natural objects are those that are the proper subjects of their own movements while the proper subject of an artefact's movement is something else.

Kelsey's proposal is elegant and certainly very clever, but I would like to suggest that it too is not without its own share of difficulties. To see this, let us

consider a typical Aristotelian example of an artefact, a cloak, but let us choose for our example not a recently woven cloak, but one that is old and tattered instead. Let us stipulate, without argument, that a cloak's function is to provide protection from cold and rain, so on Kelsey's view, therefore, a cloak is an artefact precisely because the proper subject of the protection it provides is external; it is the wearer of the cloak that receives its protection. But notice that our cloak in its threadbare state provides no such protection; cold cuts right through, and rain soaks the wearer unimpeded. Can it still be said that the wearer is the proper subject of the cloak's functioning? In fact, it is not even clear that it retains a function! But, surely a tattered cloak is still an artificial object in spite of the lack of an other to be the proper subject of its functioning, or the potential lack of a function altogether.

The most promising approach for defending Kelsey's view against this challenge rests upon the observation that although the threadbare cloak no longer can perform its function, a cloak in general possesses a *normal* function. Indeed, it is only in reference to this normal function of a cloak that we understand what the threadbare cloak is lacking. It might be argued in light of this that one must consider the cloak over the whole of its career, and in this regard the cloak does have a function, of which it is not the proper subject. This strikes me as the most plausible route for defending Kelsey's reading, but I do not think it is ultimately successful. It runs afoul of the well-known Aristotelian principle that when a thing has lost its ability to perform its essential, i.e., normal, function it ceases to be that thing. For example, an eye that has lost the capability for sight,

Aristotle says, is no longer said to be an eye, except homonymously, like the eye of a statue (*De An.* II.1, 412b20-21, cf. *Part. An.* I.1, 640b35-641a5). Kelsey's view, therefore, cannot be salvaged by appealing to an artefact's normal function, for when an artefact loses its capability to perform this function it ceases to be an artefact of that type.[45] Nevertheless, broken artefacts surely cannot be said to be natural; they must still be considered artificial. Since an object, like a threadbare cloak, may still be considered to be artificial without an external proper subject of its functioning, Kelsey's view should not be accepted, at least not without further refinement.

We seem, therefore, to be at a bit of a loss. The challenge was to understand Aristotle's description of *phusis* as "a principle or cause of change and of remaining the same in that to which it belongs primarily" (*Phys*. II.1, 192b21-22). Kelsey demonstrates that the two traditional understandings are lacking, and I have suggested the proposal he offers in their stead does not account for all artificial objects. *Phusis* cannot be understood as an efficient cause, for natural objects can be moved naturally by external efficient causes. It cannot refer to the form of a natural object, for an artefact's form likewise explains its peculiar movements. Finally, we cannot take Kelsey's suggestion that natural objects are those which are the proper subjects of their functions, for this reading breaks down precisely at the point when artefacts do. To understand what Aristotle means, therefore, we are going to have to do a little more digging.

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[45] This is not to say that an artefact cannot 'return to nature,' so to speak. It is reasonable to suggest that the dust into which the cloak will eventually degrade is natural. There is, however, a significant period of time between when a cloak can no longer perform its function as a cloak and when it eventually degrades into dust. It is this intervening time that I take to be problematic for Kelsey's view.

In order to understand how Aristotle understood *archē*, Kelsey turned to *Metaphysics* Δ.1 where Aristotle defines the term. Three chapters later, however, Aristotle defines '*phusis.*' Following his usual practice, he begins by listing the word's common uses, five in all. Adopting Ross' gloss they are: (i) "the genesis of growing things," (ii) "the part from which growth begins," (iii) "the internal principle of movement in natural objects," (iv) "the unshaped and unchanging matter" from which natural, or possibly unnatural, objects are produced,[46] and (v) the substance (*ousia*) of natural objects.[47] From an analysis of these five meanings, Aristotle concludes that:

> "from what has been said, then, it is plain that nature in the primary and strict sense is the substance [*ousia*] of things which have in themselves, as such, a source [*archē*] of movement. . .and nature [*phusis*] in this sense is the source of the movement of natural objects,

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[46] Our sources disagree here on whether Aristotle is describing natural objects or unnatural objects. EJ and Al. & Asc. read τῶν φύσει ὄντων but A^b has τῶν μὴ φύσει ὄντων. The example given by Aristotle in explanation—that of the bronze which makes up a statue—lends support to the latter version. Further support comes from Aristotle's remark just below that it is for this reason also that the elements of natural objects are said to be their nature (*Metaph.* Δ .4, 1014b32). But, Ross follows EJ based on the supporting evidence that Alexander's and Asclepius' commentaries match. Ross explains away the apparent inconsistency between describing the objects as natural and the apparent unnaturalness of the statue in the example by saying that "*qua bronze* it [the statue] does exist by nature." Furthermore, Ross explains Aristotle's remark at 1014b32 by claiming that Aristotle has simply "forgotten" that he has already described the statue as natural. Further complicating issues is that Barnes, in his standard edition, has emended Ross' translation to follow A^b.
To preserve the consistency of the argument, I think it preferable to adopt A^b on this point. Ross' suggestion, while possible, is weak, for it seems unlikely that Aristotle would have let such a key point as to whether or not he was describing a statue as natural slip his mind over the course of only five lines. It may be helpful to compare with *Physics* II.1, 193a10-12 where Aristotle gives beds and statues as examples of natural objects. In his commentary, here too Ross suggests that Aristotle must be thinking that qua being made of wood or bronze these are natural. Ross defends himself here by claiming that "we cannot suppose Aristotle to define φύσις by reference to things that are *not* φύσει" (Ross, *Aristotle's Physics*, 502). But, this overlooks the fact that Aristotle frequently explains natural things as if they are like artificial things, cf. *Part. An.* III.5, 668a22. Ultimately, however, for my purposes in this work, it will matter little which manuscript's reading we adopt. Both result in the same problem, as shown below.

[47] Ross, *Aristotle's Metaphysics*, 295. For reasons of consistency, I translate '*ousia*' in (v) as 'substance' instead of 'essence' as Ross does.

> being present in them somehow, either potentially or actually" (*Metaph.* Δ .4, 1015a13-19).

So, according to this definition *phusis* is the substance of things that are able to move themselves, and it is the source of their movement.

This definition and that offered in *Physics* II.1 are strikingly similar, as both consider *phusis* to be the source of change present within a natural object. The most significant difference between them is that while the *Physics* passage identifies *phusis* as the *archē* or *aitia* of movement the *Metaphysics* passage takes the further step of identifying this principle as the substance (*ousia*) of natural things. Identifying the *archē* as a natural object's substance, however, fails to shed much light on the matter, for determining precisely what Aristotle means by 'substance' is notoriously difficult. Furthermore, the candidates he considers in *Metaphysics* Z, form and matter, are already discussed in *Physics* II. 1, where Aristotle concluded that "the form indeed is nature rather than the matter" (*Phys*. 193b7). In any case, by describing *phusis* as an *archē*, the *Metaphysics* passage does little to illuminate the questions remaining from the *Physics* definition–what does it mean for *phusis* to be a principle of change? We came looking for answers but have run squarely up against the same question.

But we should not be too quick to abandon this passage, for even if Aristotle's comments here mirror those in *Physics* II.1, we can still glean a crucial insight into his thinking by a close reading of what he has written. We have already described Aristotle's list of the five common uses of '*phusis*,' but uses three through five bear closer inspection: (iii) nature is said to be "the source from which the primary movement in *each natural object* [ἐν ἑκάστῳ τῶν φύσει

ὄντων] is present in virtue of its own essence" (*Metaph*. 1014b18-20); (iv) nature is said to be "the primary matter of which *any non-natural object* [τι τῶν μὴ φύσει ὄντων] consists or out of which it is made" (*Metaph*. 1014b26-27);[48] (v) nature is said to be "the substance of *natural objects* [τῶν φύσει ὄντων]" (*Metaph*. 1014b36). Notice that in each of these cases, *phusis* is defined through reference to natural (*phusei*) objects. Nature is the source of a natural object's movement, or the matter from which an unnatural object is made, or the substance of natural objects. This is true too for the definition of *phusis* that Aristotle derives from these common uses that nature "is the source of the movement of natural objects [τῶν φύσει ὄντων]" (*Metaph*. 1015a17-18). This is very strange, for it means that in order for us to know how nature is defined we must first understand what it means to be natural. But how can we know what it means to be natural if we first do not already know what nature is? This conundrum, I propose, cuts right to the heart of Aristotle's thinking about nature, revealing a deep assumption he has made. Surely he would not have been unaware of the apparent circularity of these definitions; that is far too simple a mistake. Instead, he appears to take for granted that there is a class of natural objects. Nature is then defined by picking out a common feature among these.

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[48] Adopting τῶν μὴ φύσει ὄντων in place of Ross' τῶν φύσει ὄντων. Either reading, however, supports the point I am about to make, for both readings depend on Aristotle having in mind a class of natural objects. Whether nature is the primary material constituent of either natural or non-natural objects is secondary.

Section V - Aristotle's Great Assumption

Let us take a second look at Aristotle's remarks in *Physics* II.1. Notice that his analysis of *phusis* opens with a list of natural objects:

> Of existing things, some exist naturally and some exist on account of other causes. The natural ones are animals, the parts of animals, plants, and the simple bodies like earth, fire, air and water, for we say that these things and others such as them exist naturally.[49] (*Phys.* 192b9-11, my translation)

By choosing to begin his treatment of *phusis* with a list of natural things, Aristotle frames the ensuing discussion in a specific way; he accepts the existence of natural objects as a naked fact about the world. Moreover, this is done not as the conclusion of a reasoned philosophical debate, but rather as a matter of received common opinion. As W. Charlton observes in his commentary on *Physics* I & II, "The notion of nature is introduced by means of a distinction, *which appears in ordinary speech* (192b11-12), between natural objects and non-natural objects."[50] As we have already seen in section three, however, the way that *phusis* was spoken of in ordinary speech was, by the time of Aristotle's writing, already disorderly. The task Aristotle sets for himself is not to demonstrate that there are natural things but rather to explain the difference that is usually supposed to exist between the natural and the artificial. That these things—animals and their parts, plants, and the four elements—are natural is accepted by Aristotle at face value.

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[49] This list is repeated in another context at *De Caelo* I.3, 270a30-32. "But all natural bodies which change their properties we see to be subject to increase and diminution. This is the case, for instance, with the bodies of animals and their parts and with vegetable bodies, and similarly also with those of the elements." Given the parallels between this passage and the list given in *Phys.* II.1, it is reasonable to conclude that this list is a standard way of thinking for Aristotle.

[50] Charlton, 88, emphasis added.

Further evidence of this is seen throughout his subsequent remarks in *Physics* II.1. For instance, immediately after giving the list of natural things, he writes that the difference between natural and artificial objects is plainly seen (*phainetai*) (*Phys.* 192b12). In other words, that some things in the world are natural, and some artificial, is so obvious that Aristotle assumes any reasonable person will accept it. Plainly Aristotle himself does. In case his reader is unreasonable, however, Aristotle offers further argument. "That nature exists," he writes, "it would be absurd to try to prove; for it is obvious that there are many things of this kind [i.e. natural things]" (*Phys.* 193a4-5). We can see, therefore, that Aristotle's thinking about *phusis* is founded on an assumption, accepted without argument, that nature is an inherent part of the framework of the world. It would be absurd, he suggest, to think otherwise.

In this way, Aristotle builds his philosophical analysis of *phusis* upon a pre-existing, pre-theoretic understanding of *phusis*; he takes as his starting point the common thinking about *phusis* as expressed in ordinary speech. Thus, the pre-theoretic understanding of nature has its roots in the etymology of *phusis*, and is tied to **bheu*-'s sense of growing, flourishing, and swelling. It contains what Aristotle would have considered the *phusiologoi* to have studied: cosmology, the behaviour of animals, the whole of nature. It carries with it an opposition to *nomos* emphasized in the thinking of the tragedians and the Sophists. In short, the pre-theoretic understanding of nature that underlies Aristotle's philosophical analysis of *phusis* is best summarized in the phrase 'the natural world.' This is the world of living, growing things.

Of course, like most pre-theoretic concepts, it has its fuzzy boundaries. What we have seen of the etymology of *phusis* should make us unsurprised that the concept is not a tidy package with crisp edges. By the fourth century BCE, as we have seen, the concept of *phusis* was already a rich one, but along with this richness came no small portion of ambiguity. Aristotle's allegiance to this common understanding without acknowledging, at least explicitly, the ambiguities inherent in it. This is important, for, as we have also seen, use of the concept of *phusis* spans Aristotle's entire philosophical work, and so this assumption has significant implications for parts of his philosophy well beyond his central discussions of *phusis*. A large portion of this dissertation will be devoted to drawing out these implications, but there is a further element worth bearing in mind. Our concept of nature is deeply indebted to Aristotle's thinking, and it is not unreasonable that some of our own confusions about nature may turn out to be carried over from his.

Section VI - Three Tensions

This chapter opened by discussing three cases in which tensions can be observed in our modern thinking about nature: the shift in policy concerning response to fires in American national parks, the criticism and defence of homosexuality through the personae of Helen and Ganymede, and the question of the status of a half-eaten pear in a sand trap. These examples were not chosen at random, for each corresponds to a tension in Aristotle's concept of *phusis*. The problem about whether a half-eaten pear should be considered to be

a loose impediment or an artificial obstruction brings into focus how genuinely tenuous the distinction is between the artificial and the natural. The shift in forest fighting policy reflects a move away from thinking that nature is static towards viewing it as dynamic. Finally, the debate between Ganymede and Helen reflects a clash between thinking that nature is desirable and to be sought out and thinking that nature is disagreeable and should be avoided. These three tensions will be explored more fully in chapters three through five respectively, but let me say a few words about them here to clear the way for what will come.

In chapter three, we will focus on the divide between the natural and artificial realms, beginning first with an examination of how Aristotle distinguished between natural objects and artefacts in *Metaphysics* Z.7, and continuing with a discussion of the apparent violation of the criteria set out there and in *Physics* II.1 when he describes the city-state (*polis*) as a creation of *phusis*. From there, we will redirect our attention to the examples of natural objects given in *Physics* II.8–birds' nests and spiders' webs–which appear as if they should be said to be artificial given the criteria he identifies. Finally, we will end this chapter by addressing what Aristotle curiously calls natural arts, our discussion of which will both serve to highlight the pre-theoretic understanding of *phusis* and drive home just how deeply runs the tension surrounding the divide between the natural and the artificial.

Chapter four will explore the tension between conceiving of *phusis* as a static or a dynamic thing by attempting to sort out Aristotle's seemingly contrary remarks about old age and dying. For, while there are times that he describes

these processes as natural–e.g., *Phys.* V.6, 230a27-31, *Eth. Nic.* V.8, 1135a33-1135b2–this contrasts with his deeply held that nature acts for the sake of the good. Since, at least on some views, the decay associated with old age and dying is not for the sake of anything, Aristotle ought to say that old age and dying are contrary to nature, and he does so in places like *Cael.* II.6, 288b15-16. We will explicate the contradiction here in terms of static and dynamic views of nature, considering passages where he appears to have the former in mind–e.g., his remarks about the mouths of the Nile at *Meteor.* I.14, 351b29-34 and the contrast between civic courage and passion based on bravery in *Eth. Eud.* III.1–as well as the latter–the creation of the *polis* in *Pol.* I.2. We will then consider a potential resolution offered by Aristotle's suggestion that the two marks by which we define the natural are that which is present at birth or that which results from unimpeded growth (*Eth. Eud.* II.8, 1224b32-34). As we shall see, however, while this passage reveals that Aristotle was aware of the tension between the static and dynamic views of nature, he was reluctant and ultimately unable to embrace fully the resolution he proposes.

In chapter five we turn to a third tension that in many ways underlies the other two. Here we will consider the tension between conceiving of nature as embodying the highest good and conceiving of it as falling short of this. We will begin by considering how Aristotle's natural teleology rests upon the view that *phusis* embodies the good, especially through the principle that nature does nothing in vain. We will also take a close look at two arguments from the *Politics* that are predicated upon the connection between *phusis* and the good, his

defence of natural slavery in *Pol*. I.5-7 and his analysis of household management and wealth getting and condemnation of usury in *Pol.* 8-10. We then turn to the other side of the tension by examining passages where art (*technē*) is said to complete *phusis*. This chapter concludes by arguing that Aristotle's inability to resolve this tension between considering *phusis* to be the highest embodiment of the good and thinking that *technē* is, at least in part, superior to *phusis* prevents him from fully resolving either of the other two tensions.

Before getting to all of this, however, one important question needs to be addressed: when Aristotle makes statements about *phusis* acting in a broad manner, does he mean this to apply to a single overarching *phusis*, or is he using a sort of shorthand to refer to a group of individual *phuseis*? For example, let us take his frequently repeated principle that nature does nothing in vain. Does this refer to a single *phusis* that acts broadly or does he really mean that each individual thing's *phusis* never acts pointlessly? The common thinking, the chief proponents of which are James Lennox and Alan Gotthelf, is that Aristotle always means the latter. On their view, there is no room for an overarching *phusis* in Aristotle's philosophy. As we will speak of a kind of broad *phusis* in chapters three through five, we must first clear the way for this by addressing the arguments of Gotthelf and Lennox. This is the task of chapter two, so let us turn to this now.

Chapter 2

Man is Nature's agent and interpreter; he does and understands only as much as he has observed of the order of nature in fact or by inference; he does not know and cannot do more.
~Francis Bacon, *Novum Organum*

Section I - Introduction

In order to clear the way for the analysis of the three tensions present in Aristotle's understanding of *phusis*, one significant matter first needs to be settled. One of the premises that will underlie the arguments in the following three chapters is that Aristotle's understanding of nature includes a concept that may be best described as 'Big Nature'.[51] Although this idea runs against prevailing scholarly opinion, I will, in this chapter, defend reading Big Nature in Aristotle's thinking. The crux of the controversy is whether there is room in Aristotle's metaphysics for such an understanding of nature. Although some scholars, most notably David Sedley, have recently argued that there is, these attempts have largely been met with dismissal.[52] The more widely accepted, conventional view, championed by Alan Gotthelf and James Lennox, is that Aristotle's metaphysics

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[51] I am borrowing the term 'Big Nature' from an unpublished paper by Rachel Barney 'What is it that Does Nothing in Vain?' that was presented at the conference *Aristotle on the Personification of Nature* held at the University of Western Ontario on March 9, 1996.

[52] Those who read a concept of Big Nature in Aristotle's work include David Furley in "The Rainfall Example in Physics II.8" (see especially 119-120), John Cooper in "Aristotle on Natural Teleology" (see especially 217-221), and, of course, Sedley in "Is Aristotle's Teleology Anthropocentric?"

precludes him from adopting a concept of Big Nature.[53] Siding with Sedley, I will argue not only that a concept of Big Nature forms the foundation for his philosophical analysis of *phusis* but also that some of his comments about *phusis* cannot be understood without it. To be clear, this should not be interpreted as claiming that *every* Aristotelian use of '*phusis*' refers to Big Nature; such a position is clearly indefensible. Instead, I will only argue that *some* uses must be read in this manner.

In support of this, this chapter will be divided into two main sections. The first of these is devoted to analyzing the arguments Gotthelf and Lennox present against reading a concept of Big Nature in Aristotle. By recognizing that there are *three* ways in which Big Nature could be understood instead of the conventional two, I will propose that the brunt of their arguments can be sidestepped, and thus a sizeable portion of potential controversy may be defused. The third way of conceiving of Big Nature arises from the pre-theoretic understanding of nature identified previously. In the latter half of this chapter, I will show that the pre-theoretic understanding of nature, which roughly may be understood as 'the natural world,' is part of the way Aristotle thinks and writes. This will be accomplished by considering his use of several related phrases: 'in nature' (ἐν τῇ φύσει), 'the whole of nature' (ὅλη φύσις), 'nature considered as the sum of its

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[53] See especially Gotthelf's "Aristotle's Conception of Final Causality," and Lennox's "Material and Formal Natures in Aristotle's *De Partibus Animalium*." Others who have adopted the conventional view include Monte Ransome Johnson (*Aristotle on Teleology*), Andrea Falcon (*Aristotle and the Science of Nature*), and Mariska Leunissen (*Explanation and Teleology in Aristotle's Science of Nature*).

parts' (ἡ πᾶσα φύσις), and 'all nature' (πᾶσα ἡ φύσις). This will prepare us for investigating the three tensions developed in later chapters

Section II - Gotthelf and Lennox Against Big Nature

In 1976, Gotthelf published a paper on Aristotle's teleology in which he explored the meaning of Aristotle's claims that something comes to be *for the sake of* some reason.[54] As part of that discussion, he objected to prior interpretations of Aristotle's understanding of the mechanism of teleology. Particularly interesting to our purposes here is his response to the view he labelled as the "'immaterial agency' interpretation."[55] On this interpretation, Aristotle envisions natural teleology as operating similarly to human teleological activity, i.e. natural teleology acts analogously to a human artisan. This view, Gotthelf writes, "rests heavily on Aristotle's (in fact, quite infrequent) use of the metaphors of striving and desiring, and a somewhat casual reading of the comparisons of nature to an artisan in *Physics* II.8 and the biological works."[56] Belief that nature is an immaterial agent analogous to a human artisan, in

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[54] Allan Gotthelf, "Aristotle's Conception of Final Causality."

[55] Ibid., 227.

[56] Ibid.

Gotthelf's opinion, can only be supported by reading literally claims that Aristotle intended to be understood metaphorically.[57]

Not only does this view rest on a misreading, he claims, but it also conflicts with Aristotle's understanding of the relationship between nature and art. On the immaterial agency interpretation, natural teleology becomes one instance of the sort of activity practiced by human artisans. In this way, nature is reduced to a sub-category of art. But, as Gotthelf quite astutely observes, this turns on its head Aristotle's description of the relationship between nature and art,[58] for in *Physics* II.8, Aristotle clearly makes art posterior to nature: "generally art in some cases completes what nature cannot finish, and in others imitates nature" (*Phys.* 199a15-17). Reading a Big Nature that functions as an immaterial agent into Aristotle's philosophy would, therefore, necessarily conflict with his evaluation of the relationship between nature and art.

Lennox's treatment of the matter reinforces and expands upon Gotthelf's argument. He distinguishes between two uses of the concept of nature that he finds problematic: "Apparently Demiurgic Nature" and "Apparently Cosmic Nature."[59] Describing Apparently Demiurgic Nature as an "Aristotelian counterpart to Plato's Demiurge," he, much like Gotthelf, suggests that this concept is

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[57] The rate with which these metaphors occur in Aristotle's writing is not as infrequent as Gotthelf suggests. As Lennox observes, "There are seventy-plus cases in *PA* alone, where some specific outcome is attributed to a nature which distributes, treats, constructs, devises, etc., in order to achieve the outcome in question" (Lennox, "Material and Formal Natures in Aristotle's *De Partibus Animalium*," 184). Although Gotthelf restricts his comments to metaphors of "striving and desiring," we should also include in this list metaphors of distributing, treating, constructing, devising and so on, as they too call to mind a human agent at work. Seventy-plus occurrences in a book that numbers only 58 Bekker pages can hardly be said to be "quite infrequent."

[58] Ibid.

[59] James Lennox, "Material and Formal Natures in Aristotle's *De Partibus Animalium*"

mistakenly ascribed to Aristotle by overly emphasizing his metaphorical descriptions of nature acting like a craftsman.[60] Indeed, Lennox's Apparently Demiurgic Nature appears to be equivalent to what Gotthelf describes as the immaterial agency interpretation. With regards to Apparently Cosmic Nature, Lennox argues that the impetus for reading this concept into Aristotle stems from general statements our philosopher makes about nature's activities, e.g., his repeated refrain that nature does nothing in vain. Instead of fashioning the world like a demiurge, Apparently Cosmic Nature merely aims at the best possible end by "arranging particular natures in various ways."[61] Lennox argues that it is a mistake to read either concept into Aristotle's philosophy.

His strategy is to place the burden of proof on those who would locate these concepts in Aristotle's philosophy. As he writes:

> Aristotle's philosophical analysis of the concept 'nature' in the *Physics*, and reiterated in *PA* I.1, leaves no room for a Demiurgic or Cosmic Nature over and above the formal natures of specific natural substances.[62]

Rephrasing his position, Lennox further claims that proponents of both Apparently Demiurgic and Cosmic Nature are forced to "admit that there is nothing in Aristotle's *philosophical* reflections on the concept of nature (e.g. in *Ph.* II.1,2)" that corresponds to this sort of nature.[63] His argument is simple. If Aristotle indeed adopted either Demiurgic or Cosmic Nature, then we would expect his

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[60] Ibid., 184, emphasis in original.

[61] Ibid.

[62] Ibid.

[63] Ibid., 190.

philosophical analysis of *phusis* to reflect this. Lennox contends that it does not, and proposes that because his own account of 'formal nature' can explain Aristotle's claims without an appeal to either a Demiurgic or Cosmic Nature, his reading should be preferred.

In response, let us note that Big Nature need not take the form of a Demiurgic or Cosmic Nature; there is, at least, one further possible understanding of Big Nature that neither Gotthelf nor Lennox address. This is what I call Aristotle's pre-theoretic understanding of nature; it is the understanding of nature that comes before, and out of which he draws, his philosophical analysis of *phusis*. Precisely what the pre-theoretic concept entails is, of course, tricky to pin down with precision; being pre-theoretic it is, by necessity, not the subject of the sort of careful analysis that would make this clear. I will excavate the Aristotelian *corpus* to try to unearth this in the next sections, but for now some general comments can be made. The pre-theoretic understanding has its roots in the etymology of *phusis*; it is an extension of **bheu*-'s sense of growing, flourishing, and swelling. It is what Aristotle would have considered the pre-Socratics to have studied: cosmology, the behaviour of animals, the whole of nature. It carries with it an opposition to *nomos* as highlighted by the thinking of the tragedians and the Sophists. It is, in short, the natural world, the realm in which things grow.

Neither Gotthelf nor Lennox direct their arguments against this type of Big Nature. Gotthelf objects to reading a concept of Big Nature into Aristotle's work on the grounds that this would reduce nature to a subcategory of art or

craftsmanship, but Aristotle's depictions of the crafts (*technai*) require a deliberating rational agent. For example, when discussing deliberation (*bouleusis*) in *Nicomachean Ethics* III.3, he writes that "the things that are brought about by our own efforts, but not always in the same way, are the things about which we deliberate" (*Eth. Nic.* 1112b2-4) and we deliberate more "in the case of the arts [*technai*] than of the sciences [*epistemai*]" (*Eth. Nic.* 1112b7). The less developed an art the more deliberation is required, and for this reason, he suggests, we need to deliberate more in the art of navigation than in gymnastics (*Eth. Nic.* 112b5). The pre-theoretic understanding of Big Nature, does not describe nature as an intelligent agent; it refers only to the natural world. Thus, we may sidestep Gotthelf's concerns, for they do not address a non-rational Big Nature.

As for Lennox's argument, it suggests that there is no room for Big Nature–Demiurgic or Cosmic–in the metaphysics developed in Aristotle's central philosophical analyses of *phusis*. This may be true. But it does not preclude the possibility that a pre-theoretic understanding of nature may be at work in his thinking. Indeed, I suggest that this pre-theoretic understanding of nature lies at the foundation of his philosophical analysis. For his part, Lennox identifies two places where Aristotle philosophically discusses *phusis*–*Phys.* II.1, 2 and *Part. An.* I.1–and to this we may add another already familiar to us, *Metaphysics* Δ.4. As we have already observed in the previous chapter, Aristotle's definition of *phusis* in this chapter is built on a circularity; *phusis* is defined in reference to

natural (*phusei*) objects.[64] Similarly, Aristotle's comments in *Physics* II.1 began with a list of natural objects upon which was built his definition of *phusis* as an internal principle or cause of change and remaining the same. In the *Parts of Animals* I.1, the other location that Lennox identifies, we find parallels to Aristotle's approach in these other two chapters. For example, he writes that "if men and animals and their several parts are natural phenomena [*phusei*], then the natural philosopher must take into consideration flesh, bone, blood, and all the other homogeneous parts" (*Part. An.* 640b19-20). As he did in the *Physics*, Aristotle in the *Parts of Animals* assumes that certain things are natural, e.g., humans, animals and their parts.

As was discussed in the first chapter, these comments reveal a very deep intuitive assumption on his part, a foundational division of the world into natural and unnatural things. He appears to take for granted that some things exist naturally, e.g., animals and their parts, plants, and the four elements. Indeed in the opening of the *Parts of Animals*, after sorting out how natural science should proceed, the first topic he identifies for investigation is natural generation (*Part. An.* I.1, 640a13). Once again, an assumption is being made, i.e., that there is generation that is natural. All of this suggests that Aristotle's philosophical analysis of nature in *Physics* II.1, *Parts of Animals* I.1, and *Metaphysics* Δ.4 is built on a pre-existing, pre-theoretic understanding of the natural, and as we shall see, this is much looser than that captured by his analysis. Most importantly for us, traces of this pre-theoretic understanding are found right at the heart of his

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[64] Chapter 1, Section IV.

philosophical analysis of *phusis*, and this should be sufficient to address Lennox's worry. Moreover, this concept's presence where Aristotle develops his philosophical analysis of *phusis* betrays just how deeply this pre-theoretic understanding runs in his thinking about nature. What remains of this chapter is devoted to unpacking this pre-theoretic understanding.

Section III - In Nature (ἐν τῇ φύσει)

Having suggested that there is room for a pre-theoretic understanding of nature in Aristotle's thinking, the time has come to make clear what this concept is. As already noted, this is difficult to do, for because the concept is pre-theoretic no careful explication of it will be found in Aristotle's writings. If there was, of course, the concept would not remain pre-theoretic. Instead, we will have to come at this concept indirectly, by exploring the significance of a number of related phrases he uses: 'in nature' (ἐν τῇ φύσει), 'the whole of nature' (ὅλη φύσις), 'nature considered as the sum of its parts' (ἡ πᾶσα φύσις), 'and all nature' (πᾶσα ἡ φύσις). In each of these, Aristotle refers to *phusis* in the singular; the same phrases with *phusis* in the plural are not considered here. Furthermore, our discussion will focus on those instances when these phrases do not obviously refer to a small nature, i.e., the *phusis* of some specific object, like a human, a horse, a tree, etc. Instead we will focus on examples that seem to refer to Big Nature. By doing so, we will be able to flesh out further Aristotle's pre-theoretic

understanding of *phusis* and begin to see how he thinks about the natural world.[65]

Aristotle uses the phrase 'in nature' (ἐν τῇ φύσει) a total of twenty-five times.[66] In the majority of these–sixteen in all–he obviously is referring to the *phuseis* of individual things. For example, he writes that "no horse, bird, or fish is happy, nor anything the name of which does not imply some share of a divine element in its nature (ἐν τῇ φύσει)" (*Eth. Eud.* I.7, 1217a25-28); it is the *phusis* of each horse, bird, fish, and the like that does not share in the divine. Other examples include: animals that are defensive in their nature (*Hist. An.* IV.11, 538b15), the heat in the nature of an object (*Meteor.* IV.2, 379b34), things that are present in small quantities in our nature (*Problems* XXI.13, 928b19), and the nature of plants and animals (*Sens.* ch. 4, 442a7). At other times, ἐν τῇ φύσει is best translated simply as 'in the living body,' (*Part. An.* II.2, 647b12; II.3, 649b28), where the context reveals that Aristotle intended to pick out the bodies of individual animals. I begin with these examples, for while I will argue that Aristotle

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[65] Let me note one limitation of the adopted methodology, which searched for specific phrases using the online Thesaurus Linguae Graecae. Other phrases expressing a similar idea are thus omitted from my discussion. Nevertheless, the passages identified in this way alone should be sufficient to demonstrate the existence of a pre-theoretic understanding of nature in Aristotle's thinking, and adopting this methodology facilitates comparisons across a broad range of texts.

[66] These passages were identified by using the Thesaurus Linguae Graecae to search for 'φυσει' and '_εν_' within one line of each other. Those that straightforwardly refer to small natures are: *Phys*. IV.1, 208b18; *Meteor*. IV.2, 379b34; IV.11, 389b14; *Sens*. ch. 4, 442a7; *Resp.* chapter 14, 477b2; *Hist*. *An.* I.1, 487a3; IV.11, 538b15; *Part. An*.II.2, 647b12; II.3, 649b28; *GA* V.6, 785b30; *Problems* XXI.13, 928b19; XXX.1, 954a12; *Metaph*. Γ.4, 1008b33; E.1, 1026a20 *Eth*. *Nic*. V.10, 1137b18; *Eth. Eud.* I.7, 1217a28. Those strike me as potentially referring to either a small or a broad nature are: *Phys.* II.8, 198b24, 199b30; VIII.7, 260b23; *Metaph*. I.8, 1058a25. Those that appear to refer to a broad nature are: *De. An.* III.5, 430a10, *Problems* I.55, 866a22; *Metaph*. A.2, 982b7; A.3, 984b16; A.4, 984b33.

occasionally uses ἐν τῇ φύσει to refer to a broad nature it is important to be clear that he does not *always* do so.

After setting aside the passages where ἐν τῇ φύσει clearly refers to small natures, nine examples of this phrase remain where Aristotle might mean to refer to a Big Nature. Some of these are ambiguous and could be read as referring to either the *phuseis* of individual objects or a broader *phusis*. Others, however, appear to be more definitive in their reference to a Big Nature. Let us work our way towards these by first considering a few of the ambiguous examples.

In *Physics* II.8, Aristotle's comparison of nature and art yields the following conclusion: "if, therefore, purpose is present in art, it is present also in nature" (*Phys.* 199b29-30). Near the end of the *Physics,* when discussing the possibility of continuous motion, Aristotle also lays down the following principle: "we always assume the presence in nature of the better, if it be possible" (*Phys.* VIII.7, 260b22-23).[67] Interpretation of both of these passages shares a common difficulty. Should we read Aristotle as referring to some general *phusis* where purpose is present and where the presence of the better should be assumed? Or, should we interpret Aristotle as describing the manner by which each individual *phusis* aims purposefully towards the good? The most conservative route here is to side with Lennox and assume that Aristotle is referring to individual *phuseis*. Nevertheless, the fact that Aristotle writes of *phusis* in the singular–in nature–and not the plural–in the natures of things–leaves the door open just enough to give one pause. He *might* mean that there is a teleological aim towards the good in

[67] The role of the good in Aristotelian natural teleology will be discussed further in Chapter five, Section II.

nature broadly construed. If it could be shown that other uses of ἐν τῇ φύσει refer to a broad *phusis* this would lend greater support for reading these passages as referring to an overarching *phusis* too.

To that end, let us consider what Aristotle has to say concerning the treatment of fevers in the *Problems*. There he recommends that the patient lie as still as possible, out of a draught, and wrapped so as to preserve the fire within because:

> "fire is extinguished if it is not allowed to draw in air; and the garments [in which the patient is wrapped] ought not to be removed until damp heat is present, for the fire if exposed to the air dries up the moisture– just as happens also in nature (ἐν τῇ φύσει)." (*Problems* I.55, 866a20-23)

Here Aristotle parallels what happens through the course of treatment with what happens in nature. Moreover, the *phusis* so described must be understood as a broad nature. If we restrict our reading to only individual natures then the comparison makes little sense: the *phusis* of a particular fire, i.e., the fever, dries up moisture just as the *phusis* of fire generally dries up moisture. Aristotle must have in mind two different kinds of fire: that which occurs as a result of the physician's art and what otherwise happens elsewhere, i.e., in nature. In this context, therefore, the most reasonable reading is one separating that which occurs in the realm of art from that which happens in the realm of nature, i.e., nature broadly construed.

Not much weight may be placed on this passage, for the authorship of *Problems* is strongly disputed; it is generally thought to have been written by

Aristotle's peripatetic followers.[68] My aim, however, is not to demonstrate merely that ἐν τῇ φύσει may be read as referring to a broad nature in an Aristotelian context, but rather that this is part of the thinking of Aristotle himself. For that reason, let us consider a further example of ἐν τῇ φύσει drawn from the *Metaphysics*, a work whose authenticity is beyond question. There, while discussing pre-Socratic cosmologies, Aristotle writes:

> "When one man said, then, that reason [*nous*] was present–as in animals, so in nature–as the cause of the world and of all its order, he seemed like a sober man in contrast with the random talk of his predecessors" (*Metaph.* A.3, 984b15-19).[69]

What is the *phusis* in which *nous* is present? The example Aristotle gives moves from what happens in individual *phuseis*, i.e., those of various animals, to what happens in nature generally. If he wanted to indicate that *nous* was present in each individual natural object, he presumably would have written 'as in animals, so in all other natural things,' for animals are, of course, individual natural things. Instead, just as *nous* is the cause and source of order in animals, so, too, it is said to play the same role in nature generally. Moreover, he seems to understand that this *phusis* as being associated with the whole world, for *nous*' presence in nature is said to be the cause of the world and its order. The most plausible reading of ἐν τῇ φύσει here is 'in the natural world.'

The same reasoning may be applied to three further passages. In the first, both the good and its contraries are said to be present in nature (*Metaph*. A.3, 984b33), in the second Aristotle describes the science that knows the *telos* and

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[68] Anagostopoulos, 16.

[69] Ross translates 'ἐν τῇ φύσει' as 'throughout nature' but I have have chosen 'in nature' in order to maintain consistency with the other passages discussed.

supreme good in the whole of nature [ἐν τῇ φύσει πάσῃ] (*Metaph*. A.2, 982b7), and in the third Aristotle writes "since in the class of things, as in nature as a whole [ἐν ἁπάσῃ τῇ φύσει], we find two factors involved. . .[matter and cause]. . .these distinct elements must likewise be found in the soul." (*De An.* III. 5, 430a10-13). The second and third of these passages will be discussed in greater detail when we examine his use of the phrase 'πᾶσα ἡ φύσις.' As for the first, Aristotle's focus there is on the cosmogonies of Parmenides and Hesiod. When he writes, "the contraries of the various forms of the good were also perceived to be present in nature," the *phusis* he has in mind must be a broad one, for the context is the creation of the whole universe. What happens 'in nature' is what happens in the universe.

These four passages reveal that Aristotle does have an idea of the natural world, and he uses the word *'phusis'* at times to refer to this broad nature. A closer look, however, reveals some inconsistency. In the *Problems*, the physician's art is contrasted with what happens in nature, whereas in the *Metaphysics* passages it appears as if everything in the universe, potentially including the physician's art, is understood as being 'in nature.' After all, in some respects the physician's art is part of the world. This is not too great a difficulty, for we may always fall back on the position that *Problems* was written by Aristotle's followers. Nevertheless, it is worth keeping this in the back of our minds as we turn to Aristotle's use of another set of phrases 'the whole of nature' (ὅλη φύσις), 'all nature' (πᾶσα ἡ φύσις), and 'nature as considered as

the sum of its parts' (ἡ πᾶσα φύσις). Aristotle makes reference to the natural world, but he may not do so in a perfectly crisp and tidy way.

Section IV - 'The Whole of Nature' (ὅλη φύσις) and 'All Nature' (πᾶσα ἡ φύσις)

The Aristotelian corpus includes eleven instances where the words ὅλη and φύσις are used together in the singular.[70] Of these uses, only two refer to the whole nature of a single thing. One of these is in the description of a mythical beast named the Bolinthos, which "in its general nature is similar to the ox, but surpasses it in size and strength" (*Marvels* ch. 1*,* 830a9).[71] The second such example occurs in Aristotle's discussion of the brain in *Parts of Animals* II.7 where he writes that "the purpose of [the brain's] presence in animals is no less than the preservation of the whole body (τῆς φύσεως ὅλης)" (*Part. An*. 652b7-8). Here the the referent of the phrase is clearly to the whole body of each individual animal possessing a brain. As with ἐν τῇ φύσει, the phrase does not always refer to a broad nature, but having acknowledged this, let us turn now to the far more interesting instances in which the phrase appears to do so.

Most of these passages follow a similar pattern, and these may be dealt with collectively. In the *Eudemian Ethics*, Aristotle discusses the view of friendship that birds of a feather flock together, in support of which he offers the following general observation: "the natural philosophers (οἱ φυσιολόγοι) even systematize

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[70] This list was also generated by Thesaurus Linguae Graecae searches for 'φύσις' in the nominative, genitive, dative, and accusative singular cases, and 'ὅλη' in the respective case within two lines of each other. The complete list of passages is as follows: *Cael.* I.5, 271b7; *De. An.* I.2, 404a5; *Part. An.* II.7, 652b7; *MA* ch. 3, 699a25; *Marvels* ch. 1, 830a8; *Metaph*. A.3, 984a31; A.6, 987b2; Γ.3, 1005a33; Λ.8, 1074b3; *Eth. Eud*. VII.1, 1235a10; *Pol*. II.8, 1267b28.

[71] Like *Problems*, *On Marvellous Things Heard* is not considered to be by Aristotle's own hand.

the whole of nature (τὴν ὅλην φύσιν) on the principle that like goes to like" (*Eth. Eud.* VII.1, 1235a9-10). Further examples of Aristotle's use of this phrase in the description of the views of the *phusiologoi* include: "those who have written about nature as a whole" (*Cael.* I.5, 271b7), and "they thought that they alone were inquiring about the whole of nature and of being" (*Metaph.* Γ.3, 1005a33). He also employs it when discussing specific philosophers, for example: "those who at the very beginning set themselves to this kind of inquiry [i.e., Parmenides]. . .say the one and nature as a whole is unchanging" (*Metaph*. A.3, 984a27-31), and "the mixture of seeds of all sorts he [Democritus] calls the elements of the whole of nature" (*De An*. I.2 404a4-5). In each of these instances, ἡ ὅλη φύσις is used to describe the object of study of the *phusiologoi*, i.e., the natural world. It is that into which they inquire, that about which they write, and that which they systematize. In this context, the whole of nature must be understood to be the entire universe.

One problem is that these instances of the phrase ἡ ὅλη φύσις generally occur within the context of expressing the views of some other thinker, sometimes a particular philosopher such as Parmenides or Democritus but more frequently the *phusiologoi* as a whole. Thus, it might be argued that these passages are examples only of Aristotle's adoption of the language of previous philosophers in the presentation of their ideas; he does not take it on as his own. On this argument, the Aristotelian corpus includes a broad nature, but it does so accidentally through the philosopher's recording of the views of his predecessors.

That Aristotle often presents these views solely so that they may be refuted only serves to strengthen the position that this idea was not his.

Two responses to this argument may be proposed. First the simple presence alone of this phrase in the *corpus* is significant. Even if it were solely used in the description of the views of other philosophers, this would nevertheless indicate Aristotle's familiarity with the concept. While this is insufficient evidence to show it was an idea he accepted, it demonstrates at the very least that the concept was a live possibility for him; it formed part of his contemporary intellectual backdrop. Moreover, Aristotle may be describing the views of others, but that *description* is his own. It would be one thing if he were quoting directly from the *phusiologoi* and thereby passively incorporating their terminology, but this is clearly not the case. Aristotle was apparently comfortable enough with the phrase ἡ ὅλη φύσις to use it himself without remark.[72]

Furthermore, we have one case where Aristotle employs the phrase when presenting an argument entirely his own. After describing a number of problems concerning the source of movement in the heavens, Aristotle concludes that "there is something so related to the whole of nature [τὴν ὅλην φύσιν], as the earth is to animals and things moved by them" (*MA* ch. 3, 699a25-26). Within the context of the discussion, i.e., the inquiry concerning whether the necessity of an independent unmoved mover which is the source of the motion of the heavens, the phrase τὴν ὅλην φύσιν must here refer to the whole universe, i.e., the fixed

[72] In addition to the passages already highlighted, he also uses the phrase twice more when mentioning other philosophers (*Metaph.* A.6, 987b2; *Pol.* II.8, 1267b28). In both cases he distinguishes between those who investigate nature and those who study ethics. These two instances will be discussed in significant detail shortly below, so I will say no more about them here.

stars and everything beneath them. In other words, when using the expression in the exposition of his own arguments it has the same meaning as when he uses it to describe the views of others. It is an Aristotelian idea, and his practice is to use ἡ ὅλη φύσις to refer to the whole world.

Closely related to the phrase ἡ ὅλη φύσις is a second, ἡ πᾶσα φύσις. Our treatment of this phrase is complicated by the fact that πᾶς adopts different senses depending on its location within a phrase. According to Smyth's grammar, when used in the attributive position, i.e., following a definite article that agrees with the modified noun, πᾶς, and its strengthened form ἅπας, "denotes the whole regarded as the sum of all its parts (the *sum total*, the *collective body*)."[73] When standing in the predicate position, e.g., πᾶσα ἡ φύσις, πᾶς means "all."[74] So, ἡ πᾶσα φύσις means something to the effect of 'the whole of nature considered as a total of its parts,' and πᾶσα ἡ φύσις means 'all nature.' Our aim here is instead to tease out Aristotle's understanding of the natural world as it is conceived of something that is beyond simply the sum of the individual natures of which it is comprised. To do so, we will consider the uses of the two phrases πᾶσα ἡ φύσις and ἡ πᾶσα φύσις in turn.[75]

When initially formulating the methodology of the science responsible for investigating first principles and causes, Aristotle writes: "the science which

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[73] Smyth, 1174b (italics in the original).

[74] Smyth, 1175.

[75] Passages were identified using the Thesaurus Linguae Gracae by searching for 'φύσις' in the nominative, genitive, dative, and accusative singular cases, and 'πᾶσα' in the respective case within two lines of each other. There are four instances where *phusis* is modified by a definite article and *pasa* stands in the predicate position: *De An.* III.5, 430a10; *Metaph.* A.2, 982b7; A.5, 986a1; α.3, 995a17. There are only two places where *pasa* modifies *phusis* in the attributive position: *De Gen. et Corr.* I.1, 315a7 and *Pol*. I.5, 1254a31.

knows to what end each thing must be done is the most authoritative of the sciences, and more authoritative than any ancillary science; and this end is the good in each class, and in general the supreme good in all nature [ἐν τῇ φύσει πάσῃ]" (*Metaph.* A.2, 982b5-8, trans. modified). When describing the Pythagoreans he writes, "numbers seem to be the first things in all nature [πάσης τῆς φύσεως]" (*Metaph*. A.5, 986a1, trans. modified), and when laying out his theory of the soul he writes, "[s]ince in every class of things, as in all nature [ἐν ἁπάσῃ τῇ φύσει], we find two factors involved, a matter. . .[and] a cause. . .these distinct elements must likewise be found within the soul" (*De An.* III.5, 430a10-13) (trans modified).[76] In each passage, Aristotle is referring to the natural world considered as a whole. He writes that there is a supreme good for all *phusis*, not one for every individual *phusis* (that would be ἐν φύσει πάσῃ). When number is said to be the first principle of *phusis* for the Pythagoreans and when he writes that in all *phusis* everything is the product of the union of some material with a cause, this *phusis* should be understood as referring to the entire world in the same way that references to ὅλη φύσις were understood in other accounts of pre-Socratic cosmologies. Thus, Aristotle's use of the phrase πᾶσα ἡ φύσις is very similar to his use of the phrase ἡ ὅλη φύσις; in both cases *phusis* is used to refer to the entire world.

In addition to these instances in which πᾶσα is used in the predicate position with φύσις, it is also found twice with φύσις in the attributive. Firstly,

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[76] He uses the phrase a fourth time when explaining why natural science will not have the precision of mathematics is that "presumably all nature has matter [ἅπασα γὰρ ἴσως ἡ φύσις ἔχει ὕλην]" (*Metaph*. α.3, 995a17). This passage should be read as meaning that every individual thing in nature is material, not that some broad *phusis* is entirely composed of matter.

Aristotle describes how Empedocles brings “the whole total of nature, except Strife, into one” (*De Gen. et Corr.* I.1, 315a7), and secondly he writes “Such a duality [between ruler and subject] exists in living creatures, originating from nature as a whole; even in things which have no life there is a ruling principle, as in a musical mode.” (*Pol*. I.5, 1254a31-33). The first passage is yet a further example of the same sort that we have already encountered of how ‘in nature,’ ‘the whole of nature,’ and ‘all nature’ can be used to refer to the whole world.

The second passage, on the other hand, is more interesting. For one thing, this is the first passage describing the natural world we have encountered where Aristotle has made *explicit* reference non-living things. Even more intriguing is the example given, a musical mode. Is this intended to be an example of a non-living thing or of a non-living natural thing? If Aristotle’s intention is the latter then non-living artificial things–for a musical mode, being the product of an art, is artificial–turn out to be part of the whole of nature in Aristotle’s mind, but this would conflict with the example in the *Problems* where what happens in nature was contrasted with what happens by the physician’s art. Are the arts part of the whole of nature? We might be able to dismiss this problem as an inconsistency between a possibly spurious work, *Problems*, and a central book in the Aristotelian *corpus*, *Politics*, were it not for other remarks made in central works that express the same sentiment as that found in the *Problems* passage.

The most prominent of these occurs in the *Parts of Animals* where Aristotle writes, “At this period [i.e., the time of Socrates] men gave up inquiring into nature

(τὰ περὶ φύσεως), and philosophers diverted their attention to political science (τὴν πολιτικήν) and to the virtues (ἀρετήν) which benefit mankind" (*Part. An.* I.1, 642a29-31). Here Aristotle distinguishes between the types of inquiry that preoccupied the pre-Socratics–physical investigations, especially the sorts of cosmologies encountered above–and the type of philosophy practiced by Socrates, which Aristotle identifies as political science and investigation into virtue. This is repeated with slightly different language in the *Metaphysics*: "Socrates, however, was busying himself about ethical matters and neglecting the world of nature as a whole (τῆς ὅλης φύσεως) but seeking the universal in these ethical matters, and fixed thought for the first time on definitions" (*Metaph.* A.6, 987b1-3), and echoed in the *Politics*: "Hippodamus. . .besides being an aspirant in the knowledge of nature (τὴν ὅλην φύσιν), was the first person not a statesman who made inquiries about the best form of government" (*Pol.* II.8, 1267b22-29).

In both the second and third passages, Aristotle significantly uses the expression ὅλη φύσις to refer to investigations that are set apart from enquiries into human activities, specifically ethics, linguistics, and politics. Given that all three passages appear to be articulating the same idea, we should read *phusis* in the first as expressing the same sense of nature as ὅλη φύσις in the other two. All three passages, therefore, distinguish between the natural world and human endeavours like political science and ethics. Broad nature, or the natural world, is thereby placed in opposition to humanity, and so it seems that the whole of nature does not necessarily include *everything* in the world. Instead, 'the whole of

nature,' 'all nature,' and 'in nature' may refer only to the world apart from human activity.

Section V - Conclusion

In this chapter, I have suggested that there is a pre-theoretic understanding of *phusis* at work in Aristotle's philosophy that is best described as 'the natural world.' This is a kind of Big Nature, but one that is not addressed by the arguments of either Gotthelf or Lennox. This idea arises in places right across the Aristotelian *corpus*, and it is exemplified by the phrases: 'in nature' (ἐν τῇ φύσει), 'the whole of nature' (ὅλη φύσις), 'nature considered as the sum of its parts' (ἡ πᾶσα φύσις), 'and all nature' (πᾶσα ἡ φύσις). By seeing how Aristotle uses these phrases, we have been able to sketch out a picture of the concept, even if it remains pre-theoretic and not explicitly surveyed by Aristotle himself. In the chapters that follow, we will try to fill in this picture more fully by considering other passage that appear to embody the pre-theoretic understanding of *phusis*.

For now, one question remains. Just what is included in the natural world? In many places, it appears that the natural world is used as a synonym for the entire universe, e.g., "reason [is] present–as in animals, so in nature–as the cause of the world and of all its order" (*Metaph.* A.3, 984b15-17). At other times, Aristotle distinguishes between the natural world and human activities like ethics and politics. The division between the human realm and the natural world is fuzzy, as we shall see in the next chapter as we explore this tension in further detail.

Chapter 3

We live in a time when we have put a man-made satellite environment around the planet. The planet is no longer nature. It's no longer the external world. It's now the content of an artwork. Nature has ceased to exist. . .But when you put a man-made environment around the planet, you have in a sense abolished nature. Nature from now on has to be programmed.
~Marshall McLuhan, *The Summer Way* (CBC Television, 1968)

Section I - Introduction

Thus far we have been introduced to some of the vagaries associated with our modern understanding of nature and have also begun to explore Aristotle's concept of *phusis*. In the first chapter we traced the development of this concept through the etymology of '*phusis*' and examined Aristotle's philosophical analysis of it. We also identified three potential tensions in his thinking about *phusis*. In chapter two, it was argued that the central texts where Aristotle works out his philosophical analysis of this concept embody a pre-theoretic understanding of *phusis* that allows for a broad *phusis* over and above the *phuseis* of individual things. We are now positioned to explore this pre-theoretic understanding and these tensions more fully. To that end, this chapter is devoted to the most prominent of these: the challenge of uniformly distinguishing between natural objects and artefacts. We have already encountered one light-hearted example of this–the conundrum posed by a half-eaten pear for one unlucky golfer–but, as we shall see, the problems presented by this tension carry more serious ramifications as well.

We will begin in Section II with a consideration of Aristotle's working out of the distinction between nature and artifice. Based on the care with which he

distinguishes between these two categories, we should expect to find a sharp delineation between the two throughout his corpus, but this turns out not always to be the case. In Section III, we will consider the implications of Aristotle's claim that the *polis* is "a creation of nature" (*Pol.* I.2, 1253a2), which David Keyt has described as "a blunder at the very root of Aristotle's political philosophy."[77] It seems that the *polis* meets the criteria laid out in Section II for being an artefact, so why is Aristotle so insistent on calling the *polis* natural? Can he consistently do so? In answering these questions, we will address a further nature-related claim that Keyt has alleged Aristotle is not entitled to make: that the *polis* is prior in nature to the individual (*Pol*. I.2, 1253a18-19, 1253a25-26). I will argue that Aristotle is indeed entitled to make this claim, but only on the pre-theoretic understanding of *phusis*. This will reinforce the conflict between his philosophical and pre-theoretic understandings.

In section V, we will see that not only is this pre-theoretic concept present in a peripheral work like the *Politics*–peripheral from the viewpoint of a natural philosopher–but that it lies right at the heart of Aristotle's natural philosophy in *Physics* II.8. There, shortly after carefully working out the distinction between nature and artifice in *Physics* II.1, Aristotle illustrates natural teleology with the examples of a swallow building its nest and a spider its web. In light of this I will argue first that Aristotle takes these objects–nests and webs–to be natural, and second that this violates the criteria of what it means to be natural developed in

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[77] Keyt, 118. I would like to thank David J. Riesbeck, whom I met during my time at the University of Texas at Austin, both for first bringing this paper to my attention and for the illuminating and insightful email correspondence that followed.

Physics II.1. As in the case of the naturalness of the *polis*, I will suggest that this betrays a pre-theoretic concept of *phusis* permeating Aristotle's thinking. This will be further developed by considering Aristotle's seemingly paradoxical comments about natural arts in Section V. Before getting to that point, however, let us begin by first addressing Aristotle's account of the distinction between nature and artifice.

Section II - Nature and Artifice

We have already seen in the opening chapter how Aristotle demarcates between the natural and the artificial in *Physics* II.1,[78] but let us briefly refresh our memories of the details of this. Aristotle there defines nature as "a principle [*archē*] or cause [*aitia*] of change and of remaining the same in that to which it belongs primarily, in virtue of itself and not accidentally" (*Phys*. 192b21-23). If something has a principle of this sort it has a nature (*Phys*. 192b33), and "the term 'according to nature' [*kata phusin*] is applied to all these things [i.e., things with a nature] and also to the attributes which belong to them in virtue of what they are, for instance the property of fire to be carried upwards–which is not a nature nor has a nature but is by nature [*phusei*] or according to nature [*kata phusin*]" (*Phys*. 192b35-193a2). As a consequence of this, natural objects are those with a *phusis*, i.e., an internal principle of change. In particular, Aristotle points to animals and their parts, plants, and the simple bodies as natural things

[78] See Chapter one, Section IV.

par excellence (*Phys*. 192b10-11). Other objects that lack such a principle, like beds and cloaks, are artificial (*Phys*. 192b16-19).

We are also familiar with the difficulties that arise when trying to flesh out precisely what it means to have a principle of this sort. As Sean Kelsey argued, the two most common understandings are flawed; one captures too many things as natural and the other too few. I have claimed that Kelsey's own suggestion, while intriguing, faces the challenge of not accounting for broken artefacts. Thus we are left without a clear account of precisely what Aristotle means when he defines *phusis* as an internal principle or cause of change and staying the same. This difficulty in parsing what it means to be an internal principle or cause indicates that not all is completely tidy with Aristotle's conceptualization of *phusis*, but let us not become too bogged down in attempting to explicate the finer details of this definition. There are deeper, and far more interesting, problems arising from his division of the world into natural and artificial realms. To explore them, let us adopt a basic and conservative understanding of what it means for *phusis* to be an internal principle. What we need to ensure is that the easy cases are covered. Plants and animals need to have such an internal principle while things like beds and cloaks do not, at least not in virtue of being beds and cloaks.

For help in developing this, let us turn to Aristotle's treatment in *Metaphysics* Z.7 of what he describes as the three types of coming to be: natural, artificial, and spontaneous.[79] Considering first those things that come to be

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[79] Given that our concern is to sort out the distinction between natural and artificial comings to be, the third group, i.e., the spontaneously generated, do not overly affect us. For the record, it includes things like: eels (*Hist. An.* VI.16), some fish, especially those in a pond near Knidos (*Hist. An.* VI.15, 569a11-27), and a number of different insects (*Hist. An.* V.1, 539a21-25).

naturally, the examples given in *Metaphysics* Z.7 include "a man or a plant or one of the things of this kind which we say are substances if anything is" (*Metaph*. 1032a18-20), so here he has in mind the same sorts of things as listed as natural in *Physics* II.1. Concerning their coming-to-be, he writes:

> And, in general, both that from which they are produced is nature, and the type according to which they are produced is nature (for that which is produced, e.g. a plant or an animal, has a nature), and so is that by which they are produced–the so-called 'formal' nature, which is specifically the same as the nature of the thing produced (though it is in another individual); for man begets man. (*Metaph*. 1032a22-25)

In order for something to count as a natural coming-to-be, it must be produced from nature, its type according to which it is produced must be a nature. Specifically, Aristotle makes clear that he has in mind here the formal nature of a thing. So, natural comings to be are those things in which the thing produced has the same form as the thing producing it. The two forms are not numerically the same, but it is like the case of one man giving his form to a male offspring. Both the father and the son have the same kind of form, i.e., that of man.

Artificial comings to be, however, differ from natural ones in that the originator and the end result do not share the same formal nature. Aristotle's example of this is health. In treating a patient, a physician must reason in reverse from the state he wants to produce, i.e., health, to steps he can take in order to achieve that end, e.g., warming the patient's body (*Metaph*. 1032b6-9). Aristotle labels health in this instance a "making" (*poiēsis*) that must come from art (*technē*) a capacity (*dunamis*) or intention (*dianoia*) (*Metaph.* 1032a27). In such cases, while the form of that which is produced is in the soul of the producer (*Metaph*. 1032b1) the form produced is not the same as the producer's. The

physician has the form of health in his soul–it is that which he is aiming to produce in his patient–but this is, of course, not the form of the physician himself.

This should be sufficient for generating our basic and conservative understanding of the difference between natural and artificial objects. Natural objects share the same form as that which created them. For example, an oak comes from another oak, and not a maple, while a deer comes from another deer, and not an elk. Conversely, artefacts do not share the same form with their producer. The form of the cloak is not the same as the form of the weaver, and the carpenter's form differs from the form of the bed. This does not solve the worries of Kelsey concerning precisely how *phusis* operates as a principle or cause, but it should give us a useful means by which to distinguish between the creation of natural and artificial objects.[80]

Section III - The Problem with the Polis

With our basic account of the difference between natural and artificial comings to be, let us consider Aristotle's controversial claim in the *Politics* where he describes the *polis* as "a creation of nature" (τῶν φύσει ἡ πόλις ἐστί, *Pol*. I.2, 1253a2). This seems like a strange thing to say for, as Keyt has argued in a seminal paper, it appears that Aristotle's understanding of the division between natural and artificial should lead him to place the *polis* in the latter category. That

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[80] It is worthwhile to reflect also upon Aristotle's description of coming to be in *Metaphysics* Λ.3. "Things come into being either by art or by nature or by chance or by spontaneity. Now art is a principle of movement in something other than the thing being moved, nature is a principle in the thing itself (for man begets man)" (*Metaph*. 1070a5-8). Again, it is not entirely clear how *phusis* is to act as an internal principle–as an efficient cause, a formal cause, or analogously to non-despotic authority–but once again the focus is on progenitor and offspring sharing the same form in natural comings to be (for man begets man).

he instead considers the *polis* to be a natural thing reveals, in Keyt's mind, that Aristotle blunders at the heart of his political philosophy. Although the belief that the *polis* is natural lies right at the heart of his argument in *Politics* I.2, it appears that Aristotle ought to say that the *polis* is an artefact, at least if he wants to be consistent with how he distinguishes between artefacts and natural objects. While agreeing with Keyt that there is indeed something suspicious at work in the opening chapters of the *Politics*, I will argue that characterizing this as a blunder is too crude.

Before considering Keyt's argument, let us get clear about precisely what is at stake here. On the one hand, if Keyt is correct then Aristotle indeed blunders at the heart of his political philosophy. He ought to say one thing, that the *polis* is artificial, but, inexplicably, says the opposite, that the *polis* is natural. On this reading, Aristotle simply made a mistake. On the other hand, if Keyt's argument is wrong and Aristotle may reasonably describe the *polis* as natural then there is a deeper issue. This would reveal a tension in his thinking about *phusis*, for his claim would be justified on some understanding of natural and unjustified on another. I will defend this second thesis by suggesting that Keyt's concern is prompted by the conflict between Aristotle's philosophical and pre-theoretic understandings of *phusis*. From the perspective of the philosophical understanding the *polis* is not natural–it does not proceed from an internal principle–but from the pre-theoretic perspective his description of the *polis* as natural may make sense as it is, in a way, part of the natural world.

The first step in demonstrating this is to examine Keyt's argument. In *Politics* I.2, Aristotle explicitly claims twice that "the *polis* is a creation of nature" (*Pol.* 1253a2, 1253a25) and implies this at least once more (*Pol.* 1252b31). As Keyt observes, however, these comments apparently run contrary to Aristotle's usual description of the distinction between nature and artifice.[81] There are numerous problems here, the first of which is that Aristotle describes statesmen and lawgivers as craftsmen (*dēmiourgoi*) (*Pol*. II.12, 1273b32-3, 1274b18-19; VII.4, 1325b40-1326a5). If statesmen and lawgivers are craftsmen responsible for shaping the state then it appears that the *polis* is a product of art and not a creation of nature. To frame this in the language of our basic account of the difference between natural and artificial comings to be, the form of the *polis* differs from the form of the statesman or lawgiver. Secondly, Aristotle is at least willing to entertain the possibility that politics is an art capable of the same sort of evolution and improvement as medicine and gymnastics (*Pol*. II.8, 1268b33-37), which would make the *polis* a product of this art. Thirdly, Aristotle's description of the manner in which all sciences and arts aim towards the good includes an example in which justice is identified as the good of political science (*Pol*. III.12, 1282b14-16). Based on this evidence, therefore, it appears that the *polis* is an artefact. It is the product of an art practiced by statesmen and lawgivers evolving over time and aiming at the good of justice.

In addition, Keyt identifies two further problematic but closely related Aristotelian views. The first of these is the claim that "man is by nature a political

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[81] Ibid., 119-120.

animal" (*Pol.* I.2, 1253a2-3). The second is Aristotle's suggestion that the *polis* is prior in nature to the individual (*Pol.* I.2, 1253a18-19, 1253a25-26). It is this second claim that is of special interest here, for I will attempt to be clear about why Aristotle is entitled to make the claim that the *polis* is natural by drawing out the problems with Keyt's arguments against his entitlement to make the claim that the *polis* is prior in nature to the individual.

Keyt argues that the *polis* does not meet the criteria for existing prior in nature to a human being. As Keyt observes, *A* is prior in nature to *B* for Aristotle if and only if the former can exist without the latter but not the latter without the former. For example, substance is prior in nature to accident (*Eth. Nic.* I.6), for a person may exist without being musical but there can be no property 'musical' without a person who embodies it. Keyt's remarks about this are telling, and as such are worth quoting in full:

> When Aristotle says that "a polis is prior in nature to a household and to each of us" (I.2. 1253a19), he presumably does not mean to deny that an individual or a family can exist apart from a polis. By his own account in I.2 the household exists before and hence independently of the polis.[82]

Keyt's illustration is that of Philoctetes who, after being driven from society on account of a necrotic snake bite emitting an overwhelming stench, was quite capable of surviving on his own.[83] Thus, individuals can exist independently of the *polis*. Moreover, if all humans were to be likewise driven into isolation, the *polis* would cease to exist. Since the individual may exist without the *polis* but

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[82] Ibid., 127.

[83] Ibid., 139.

there can be no *polis* without its individual constituent persons, Keyt argues, the individual should be considered to be prior in nature to the *polis*, not the other way around.

This argument rests on Keyt's assumption that Aristotle "presumably does not mean to deny that an individual or a family can exist apart from a polis," but it is not clear to me that this assumption is correct. On my reading, this is precisely what Aristotle intends to deny. The function of a human being is identified in *Nicomachean Ethics* as "an activity of soul in accordance with, or not without, rational principle" (*Eth. Nic.* I.7, 1098a7-8), and for this reason Aristotle argues we must cultivate the virtues. Thus, one cannot exist fully as a human being without an arena in which to practice these virtues. Given that the *polis* is necessary for virtuous activity, a person cannot exist fully as a human being in isolation. After all, one can hardly act magnanimously without someone to whom one can be generous, be friendly without friends, or be witty in conversation without one with whom to converse. Yet, all three are stock Aristotelian virtues. Mere existence. exemplified by Philoctetes' forced exile on Lemnos, is "common even to plants" but not "what is peculiar to humans" (*Eth. Nic*. I.7, 1098a1).[84] A human in isolation

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[84] The parallels between Aristotle's account of the natural growth of the *polis* in *Politics* I.2 and his discussion of the good in *Nicomachean Ethics* I.7 are strong. The *polis* is said to come into being once self-sufficiency is achieved or nearly achieved (*Pol.* I.2, 1252b28-29) and to exist for the sake of a good life (*Pol.* I.2, 1252b30). Furthermore, he describes self-sufficiency as "the end and the best" (*Pol.* I.2, 1253a1-2). In the *Nicomachean Ethics*, he writes that "the complete good is thought to be self-sufficient" (*Eth. Nic*. I.7, 1097b8). Furthermore, he is clear that self-sufficiency is not being treated as that "which is sufficient for a man by himself, for one who lives a solitary life" (*Eth. Nic.* I.7, 1097b9) but instead that one requires "parents, children, [a] wife. . .[and] friends and fellow citizens" (*Eth. Nic.* I.7, 1097b10). For this reason it is fair to use Aristotle's discussion from the *Nicomachean Ethics* to shed light on his argument in the *Politics*. Moreover, the function argument in *Nicomachean Ethics* I.7 is the conclusion of his earlier promise in book one, chapter two to determine if there is something humans choose for its own sake alone that on account of this can be said to be the chief good (*Eth. Nic.* I.7, 1094a18-22). This he describes as the object of the science of politics (*Eth. Nic*. I.7, 1094a27-28).

exists but not as a human, and so the *polis* can quite reasonably be said to be prior in nature to the individual. Keyt's argument emphasizes bare existence, whereas when Aristotle writes that the *polis* is prior in nature to humans, we should understand him to have *human* existence in mind.[85]

Thus we can understand Aristotle's claim that the *polis* is prior in nature as being motivated by the view that the *polis* is necessary for humans to achieve full development. This suggests that we might be able to make sense of his claim that the *polis* is natural in a similar way. The *polis* is natural not because it proceeds from an internal principle, i.e., not on Aristotle's philosophical understanding of *phusis*, but from the pre-theoretic understanding. As Miller has suggested, the claim that the *polis* exists by nature should be understood as meaning that "in order to promote the *natural* ends of its members, the polis attains self-sufficiency, providing them with everything they need in order to realize their *natural* ends."[86] Similarly, the claim that the *polis* is prior by nature to the individual is read by Miller as claiming that "human beings cannot realize their *natural* ends without the polis."[87] Miller does not make clear what he means by the term 'natural ends' in his article; the closest he comes is the following definition of 'natural existence': "a thing exists by nature if, and only if, it has as its function the promotion of an organism's natural ends and it results, in whole or in

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[85] Fred Miller Jr. advances a similar argument against Keyt based on three stages of moral development: (i) the capacity to acquire ethical and intellectual virtue, (ii) the acquisition of these virtues, and (iii) engaging in these virtues. He argues that the individual requires the institutions of the *polis*, e.g., an education system, to move from (i) to (ii) and similarly requires "the family, the constitution, and friendship relations" to go from (ii) to (iii). See Miller, "Nature and Politics," 52.

[86] Miller, "Nature and Politics," 53, *emphasis added*.

[87] Ibid., *emphasis added*.

part, from the organism's natural capacities and impulses."[88] Natural ends seem to be those that result from an organism's natural capacities or impulses, but what are natural capacities or impulses?

Things become a little clearer in Miller's later work where he introduces the concept of an 'extended nature' in the following way: "Aristotle also speaks of things as 'natural' in an extended sense if they arise as part of a natural teleological process. For example, birds make nests and spiders spin webs in order to promote the natural ends of sexual reproduction or self-preservation."[89] We will discuss Aristotle's views on nests and webs very shortly in the next section, so for now let us observe that Miller understands natural ends to be things like sexual reproduction and self-preservation. For Miller, these are natural because they arise as part of a natural teleological process, e.g., a bird's drive to reproduce. Overlooked, however, is the problem that other objects which similarly contribute towards the natural ends of humans would not be considered to be natural. A baby's cradle would certainly be said to be artificial by Aristotle, even though it contributes towards a natural teleological process in the same way as a bird's nest. Therefore, while we should agree with Miller that Aristotle's description of the *polis* as natural is based on an extended sense of *phusis*, we must disagree with the specifics of Miller's understanding of a natural process.

Instead, my suggestion of a pre-theoretic understanding of *phusis* supplies a tidier picture of why Aristotle considers the *polis* to be a creation of nature and

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[88] Ibid., 40-41.

[89] Miller, "Naturalism," 324.

prior to humans in nature. We have suggested that we should interpret these comments as expressing the view that the *polis* is necessary for human growth and development. Recall that *phusis* is derived from the Indo-European root **bheu-* that originally meant 'to grow, to flourish, or to swell.'[90] Recall also that *phusis* also originally referred to the vital energy of plants. It is this sense of *phusis* that is picked up in Aristotle's depiction of the *polis* as natural, for it reflects his view that the *polis* is necessary for the individual's growth or development. It is insofar as the *polis* contributes to the flourishing of a human being that Aristotle considers it to be natural. We can make sense of Aristotle's description of the *polis* as natural, therefore, by supposing that he is speaking in *Politics* I.2 not from his philosophical understanding of *phusis* but from his pre-theoretic understanding instead.

The challenge in this section has been to evaluate Keyt's suggestion that there is a blunder at the heart of Aristotle's political philosophy because of his description of the *polis* as a creation of nature. Aristotle's account of *phusis*, his philosophical understanding of nature, implies that the *polis* is unnatural; it does not proceed from an internal principle of change. We may consider that Aristotle simply errs in claiming that the *polis* is natural, but it seems unlikely that he would make such a basic mistake. Instead, I suggest that if we can make sense of this claim then we may come to a deeper appreciation of how he conceives of *phusis*. Towards this end, we considered Aristotle's related claim: the *polis* is prior in nature to the individual. If one speaks of the bare continuance of life, this claim is

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[90] See Chapter one, Section III.

false, for an individual may survive without the *polis*. On the other hand, I have argued that the *polis* is required for the flourishing of *human* life, and insofar as it is necessary for this it is prior in nature to the individual human. Aristotle's claim that the *polis* is natural should be read in a similar way. Here he is also speaking from the pre-theoretic understanding of nature, and on this understanding Aristotle is entitled to claim that the *polis* is natural. This allows us to make sense of Aristotle's claim without the charge that he has made the basic error suggested by Keyt, and thus this reading should be preferred. This further highlights the tension surrounding whether humans are or are not part of the natural world, but it rescues Aristotle from the challenge that his political philosophy rests upon a simple blunder.

Section IV: The Problem with Sparrows' Nests

In *Physics* II.8, Aristotle addresses a problem for his teleological account of nature. Why should we not believe that natural events happen by necessity instead of teleologically? This chapter has received a great deal of scholarly attention; it is here that Aristotle makes the apparent claim that rain falls for the sake of nourishing plants that has become one of the central planks in the Big Nature debate.[91] Despite the attention given to the chapter in general, a further curiosity has received much less attention than it is due.[92] After arguing that

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[91] Discussion of this debate can be found in the attached appendix.

[92] Miller is the noticeable exception.

phusis acts according to teleological principles, Aristotle continues by giving several examples:

> If both naturally and for the sake of an end the swallow creates its nest and the spider its web, and plants grow their leaves for the sake of their fruit and grow their roots not upwards but downwards for the sake of nourishment, it is clear that such a cause [i.e., teleology] exists in the things that come to be and are by nature.[93] (*Phys*. 199a26-30, my translation)

Aristotle explains plant growth by appeal to teleological principles. Leaves grow so as to provide shelter for the fruit, and roots grow downwards for the sake of procuring nourishment. Indeed, if roots did not grow for the sake of drawing nutrients from the soil, we might expect to see roots growing in every which direction. That they only grow downwards is offered as evidence by Aristotle that their growth is teleological and aims at this specific purpose. While these flora-related examples generate no controversy–beyond the obvious mistake Aristotle makes in explaining the purpose of leaves–the same cannot be said for the pair dealing with fauna. Leaves and roots are parts of plants, and so their growth can be described as the result of a principle internal to the plant as a whole. In the case of the nest and the web, however, neither are parts of their respective creators.[94] Both are caused by something external to themselves, just as cloaks and beds have external causes. To put this another way, if one were to plant the

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[93] εἰ φύσει τε ποιεῖ καὶ ἕνεκά του ἡ χελιδὼν τὴν νεοττιὰν καὶ ὁ ἀράχνης τὸ ἀράχνιον, καὶ τὰ φυτὰ τὰ φύλλα ἕνεκα τῶν καρπῶν καὶ τὰς ῥίζας οὐκ ἄνω ἀλλὰ κάτω τῆς τροφῆς, φανερὸν ὅτι ἔστιν ἡ αἰτία ἡ τοιαύτη ἐν τοῖς φύσει γιγνομένοις καὶ οὖσιν.

[94] It might just be possible to argue that since the material for the spider's web is excreted by its own body that the web is in some sense internal to the spider. For that reason, all future discussion here will focus on the sparrow, for the materials needed for creating its nest are external to it.

nest and it were to send up a shoot, it would not be a nest that came up but a tree (cf. *Phys* II.1, 193a13-16).[95] Based on his definition of *phusis* as an internal principle of change, it appears that Aristotle should instead describe the sparrow's nest and the spider's web as artificial and not natural.

Presumably, Aristotle considers a swallow to be prompted to build its nest due to some natural impulse–swallows after all build nests always or for the most part–but it is clear that the form of the nest differs from the form of the swallow. Therefore, the swallow building its nest is analogous to the case of the physician who has the form of health in his soul. Moreover, the nest is not created, nor does it grow, by a principle internal to it; its creation and growth stem from an impulse in the swallow.[96] There is, therefore, a problem here, for in describing the swallow's nest as something that comes to be and is by nature, Aristotle appears to have violated his principles of what makes something natural. A swallow's nest has more in common with an artefact than it does with other objects that Aristotle describes as natural.

One possible means of defusing this tension is to argue that Aristotle does not intend to describe the swallow's nest itself as natural but rather the *process* by which the nest is built. Just as the plant has an internal impulse that causes it to send its roots downwards, a sparrow might have an internal principle prompting it to build its nest. In this fashion, the swallow's building of the nest is

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[95] I would like to thank Daniel Bader for providing this delightful example in a commentary on a paper I presented at the annual meeting of the Canadian Philosophical Association in Fredericton, 2011.

[96] While the nest does possess an internal principle of downward motion insofar as it is an earthen object, we may remember that Aristotle allows that artefacts all possess this quality (*Phys.* II.1, 192b19-20).

natural because it is a change brought about by the swallow proceeding from some principle internal to it. This reading seems to be supported by the structure of the argument. Aristotle sets up these examples as a means of solving the problem of how nature acts: “That is why people wonder whether it is by intelligence or by some other faculty that these creatures work–spiders, ants, and the like” (*Phys.* II.8, 199a21-24). So, the argument goes, the emphasis should be placed on the faculty by which these creatures work. We should read this as ‘it is both naturally and for the sake of an end’ that the swallow builds; the nest comes to be and exists as a result of the swallow’s *phusis*. On this reading, Aristotle is only committed to the position that the swallow’s act of nest building is natural without the further claim that the nest itself is natural. Therefore no conflict would arise between his comments here and the principle that the natural is what has an internal principle of change.

Should we, however, read this passage in this way? The crux of the problem is whether we should understand Aristotle’s description of “the things that come to be and are by nature (τοῖς φύσει γιγνομένοις καὶ οὖσιν)” to mean that the *process* by which the examples are created is natural or rather that the *products* themselves natural. I will argue for the latter, and the first piece of evidence for this stems from the examples Aristotle gives. While I have suggested that the first two–a swallow’s nest and a spider’s web–are controversial for the reason that they should be considered to be artefacts by Aristotle’s definition of natural, the latter two examples–leaves for sheltering fruit and downward growing roots–are clearly natural things. After all, this is a matter

of a plant directing its own growth, i.e., the cause of the leaves' and the roots' growth is a principle that is internal to the plant. This at least suggests that Aristotle considers sparrows' nests and spiders' webs to be natural as well; they are mentioned in the same breath. It would be strange for Aristotle to give a set of examples where half were natural and half artificial, especially given that the context here is already one of naturalness.

It would be strange indeed for Aristotle to do this, but not entirely unprecedented. Recall that messy business of Aristotle giving wooden beds and bronze statues as examples of natural objects (*Phys*. II.1, 193a12) and his parallel comments concerning bronze statues and utensils (*Metaph*. Δ.4, 1014b25-32).[97] Nevertheless, while Aristotle does occasionally mix examples of the artificial and the natural, it does not appear that he is doing that here. This too suggests that he considers the nests to be natural, but further conclusive evidence is needed. For that, let us compare Aristotle's remarks here to what he says elsewhere. Aristotle's description here refers to "the things that come to be and *are by nature* (τοῖς φύσει γιγνομένοις καὶ οὖσιν)." This is the same description he gives for the paradigmatic natural objects in *Physics* II.1, which begins "Of existing things, some *exist naturally* (τὰ μέν ἐστι φύσει)" (*Phys*. 192b9). Certainly he considers animals and their parts, plants, and the simple bodies to be natural things. Given that he describes the paradigmatic natural objects and swallows' nests in the same manner, we should read him as saying that the latter are natural just as the former.

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[97] See Chapter one, n. 46.

If we read Aristotle's remarks in *Physics* II.8 as describing a swallow's nest as natural, and I have argued that we should, then there is a deep problem. The principle of the nest's coming-to-be lies in the swallow, not the nest. The form of the nest is not a reproduction of the swallow's form–as it would be in the case of natural change–but is a production of a new form, just as when the physician produces health in his patient. His description of the nest as a natural object violates his explicit principles delineating the natural and the artificial. Moreover, this occurs not in some outlying work, where he might be forgiven for speaking more loosely about nature and the natural, but this is nestled right at the heart of his discussion of *phusis* in *Physics* II. Indeed, Aristotle repeats his *Physics* II.1 definition of nature in this chapter shortly below where he gives the example of the swallow's nest: "[f]or those things are natural which, by a continuous change originated from an internal principle, arrive at some end" (*Phys*. 199b16-17). It is clear that the understanding of *phusis* adopted throughout this chapter is one of an internal principle of change towards an end, but the example of the swallow's nest runs contrary to this. How might this apparent contradiction be explained?

The most plausible suggestion, to my knowledge, for resolving this problem has been made by Miller who argues that the example of the swallow's nest embodies what he calls an "extended sense" of nature.[98] As we have already seen, Miller proposes that in addition to speaking of something as natural if it meets Aristotle's explicit definition of nature, i.e., proceeding from an internal

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[98] Miller, "Naturalism," 324, and "Nature and Politics," 40-41.

principle, something may be said to be natural, for Aristotle, in an extended sense if it "arise[s] as part of a natural teleological process."[99] As we have already seen, however, Miller's suggestion is flawed because Aristotle would not consider some other objects that promote sexual reproduction or preservation to be natural. Simply contributing to these ends is not a sufficient reason for Aristotle to call something natural. As in the case of Miller's solution to the problems stemming from Aristotle's claims about the naturalness of the *polis*, I agree with Miller that Aristotle is speaking here with a second sense of *phusis* in mind. Once again, however, my suggestion of a pre-theoretic understanding of *phusis* provides a richer account of Aristotle's thinking. It appears that Aristotle, much as we do, considered a swallow's nest to be part of the whole of nature, i.e., something the *phusiologoi* might have studied, not Socrates. It is considered natural because it is tied to the swallow's growth and flourishing and is far removed from the human realm. It is part of the natural world. The nest is natural on the pre-theoretic understanding of *phusis* even if it does not meet the criteria established by Aristotle's philosophical understanding.

Section V - Natural Arts

This tension between the natural and the artificial comes to a head in the *Politics* where Aristotle describes the art of acquisition (*ktētikē*) and a subspecies of this art he calls wealth getting (*chrēmatistikē*). What is incredibly interesting is that here Aristotle categorizes the art of acquisition as natural. He writes that "the

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[99] Miller, "Naturalism," 324.

art of war is naturally an art of acquisition somehow (ἡ πολεμικὴ φύσει κτητική πως ἔσται)" (*Pol*. I.8, 1256b22-23, my translation). Jowett in the Barnes' edition of Aristotle's *Complete Works* tantalizingly translates this as, "from one point of view, the art of war is a natural art of acquisition," but Rackham in the Loeb edition translates it more conservatively with, "Hence even the art of war will by nature be in a manner an art of acquisition." More on this below. This same language turns up a little further on in the argument where Aristotle writes that "of the art of acquisition then there is one kind which by nature (κατὰ φύσιν) is a part of the management of a household" (*Pol*. I.8, 1256b26-27). Finally, the argument concludes with a further reference to the art of acquisition as being according to nature: "we see that there is a natural art of acquisition which is practised by managers of households and by statesmen (τοίνυν ἔστι τις κτητικὴ κατὰ φύσιν τοῖς οἰκονόμοις καὶ τοῖς πολιτικοῖς)" (*Pol*. I.8, 1256b37-39). The art of acquisition is, paradoxically, considered by Aristotle to be a natural art.

But, what does he mean when he says that the art of acquisition is natural? One possible reading treats his remarks as referring not to some broad *phusis* but to the distinct *phuseis* of the individual arts. On this interpretation, the art of war is, *by its own nature*, part of the art of acquisition, a reading which is suggested by Rackham's translation. The art of acquisition's *own nature* makes it part of the art of household management. The art of acquisition is, *by its own nature*, practiced by household managers and statesmen. One might argue that Aristotle here is not suggesting that the art of acquisition is part of the natural

world but rather that his argument is based on the nature of the art, just as a cloak or bed is said to be natural insofar as it is composed of earth (*Phys*. II.1, 192b19-21). Adopting this reading would eliminate any tension by treating Aristotle's description of acquisition as a natural art as the observation that an art may have a *phusis* of its own.

While this reading is possible, Aristotle's remarks in these passages make greater sense if we read them as referring to a broad nature. Immediately after investigating *ktētikē* in *Politics* I.8, he addresses *chrēmatistikē* in *Politics* I.9. There he contrasts these two arts in the following way: "one of them [i.e., acquisition] is natural, the other [i.e., wealth getting] is not natural but carried on rather by means of a certain acquired skill or art [ἔστι δ' ἡ μὲν φύσει ἡ δ' οὐ φύσει αὐτῶν, ἀλλὰ δι' ἐμπειρίας τινὸς καὶ τέχνης γίνεται μᾶλλον]" (*Pol.* 1257a4-5, Rackham's translation). The contrast between one art being natural (*phusei*) and the other coming to be by art (*technē*) makes clear that Aristotle considers the art of acquisition to be natural; he is not making the weaker claim that this art possesses a nature.

What makes this art natural? To understand this, we need to consider the examples he gives of practitioners of the art of acquisition earlier in chapter eight: shepherds, hunters, fishers, and farmers (*Pol*. 1256a30-1256b6). All of these trades deal with producing the things that are necessary for life. They are natural in a pre-theoretic way. Indeed, Aristotle clearly is thinking along these lines because he concludes here by saying that "property, in the sense of a bare livelihood, seems to be given by nature herself to all" (*Pol*. I.8, 1256b9-10). How

to interpret this passage and Aristotle's remarks that come after it, which suggest a hierarchy in nature in which plants serve the purposes of animals and animals the purposes of humans, is controversial,[100] but we need not get ourselves mired down in this. Instead, all we need to take from this passage is that the art of acquisition concerns acquiring the basic necessities of life. Insofar as these life necessities are necessary for the growth and flourishing of the individual, they are natural. Thus, the art of acquisition is natural when viewed from the standpoint of the pre-theoretic understanding of *phusis*.

Let us conclude this section with one final observation that really drives this interpretation home. After considering the natural art of acquisition and the artificial art of wealth getting, Aristotle identifies a third option, which he claims is *partly* natural! In *Politics* I.11 he writes:

> There is still a third sort of wealth-getting intermediate between this and the first or natural mode *which is partly natural, but is also concerned with exchange* (ἔχει γὰρ καὶ τῆς κατὰ φύσιν τι μέρος καὶ τῆς μεταβλητικῆς), viz. the industries that make their profit from the earth, and from things growing from the earth which, although they bear no fruit, are nevertheless profitable; for example, the cutting of timber and of mining. (*Pol*. 1258b26-32, *emphasis added*)

Mining and forestry are said to be partly natural. They are not involved in the production of the basic necessities of life in the way that shepherding and the like are, i.e., they 'bear no fruit,' but they still are closely tied to the earth. It is this association with the earth that Aristotle explicitly identifies as the reason why they are partly natural, and this makes clear that he has the pre-theoretic concept of nature in mind. After all, forestry and mining are both contrary to nature in that

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[100] This passage is discussed in detail in the appendix.

they violently change the subjects of their art from outside, one by felling trees whose *phusis* it is to grow upwards and the other by bringing to the surface that whose *phusis* it is to be at the centre of the earth. For that matter, even hunting and fishing, and to a lesser degree shepherding and farming, involve bringing about a change in another. All should be considered artificial from his philosophical understanding of *phusis*. Insofar as they contribute to the continued lives of human beings or insofar as they are tied to the natural world, however, they are, at least partly, natural in the pre-theoretic sense.

Section VII - Conclusion

In this chapter we have seen a tension develop between nature and artifice. In *Physics* II.1, Aristotle draws a sharp division between the two realms. What is natural proceeds from an internal principle of change and remaining the same, while what is artificial is created by something external to itself. This border begins to blur, however, when we begin to read elsewhere in the corpus, for some things are described as natural that seem like they should be said to be artificial on that definition, like a swallow's nest or the *polis*. Furthermore, Aristotle unites the two seemingly disparate realms in the *Politics* when describing natural, and partly natural, arts. All of this makes a mess of what was initially a very tidy division of the world.

We can make great headway in understanding this mess, however, if we accept that there are multiple understandings of *phusis* in Aristotle's work. The most prominent of this is his philosophical understanding, the standard, and well-

known, definition of *phusis* offered in *Physics* II.1. There exists, however, a second, pre-theoretic understanding that treats things as natural if they are either tied to the life force of a living thing or they come from the earth. If we read the problematic passages from this perspective, the problems dissolve. The *polis* is unnatural from the standpoint of an internal principle, but because it is necessary for a human to thrive and to live a complete human life, it is natural on the pre-theoretic understanding. The principle that guides the creation of the swallow's nest is external to it, but the nest is part of the so-called natural world. Similarly, shepherding and the like are natural because they provide for the basics of life, while mining and forestry pick up on the pre-theoretic idea that what is natural is tied to the earth.

Thus, in a way we can resolve the tension present in some of Aristotle's remarks about the natural and the artificial. Whether or not something will count as natural or artificial will depend, at least in part, upon what understanding of the natural is at work. Nevertheless, a deeper tension remains: are human beings part of the natural world? It appears that Aristotle considered humans to be natural in some respects, especially insofar as they are engaged in activities that are tied to fulfilling their own growth and development. It is for this reason, I suggested, that he considers the *polis* to be natural, and why those arts that promote the necessities of life are said to be natural as well. But where is the line to be drawn? Arts like mining and forestry, insofar as they are interactions with the natural world, are considered to be partly natural. The division between the

natural and the artificial that seems to be so sharp in *Physics* II.1 and *Metaphysics* Z.7 turns out to be rather fuzzy after all.

Chapter 4

It has taken me nearly twenty years of studied self-restraint, aided by the natural decay of my faculties, to make myself dull enough to be accepted as a serious person by the British public; and I am not sure that I am not still regarded as a suspicious character in some quarters.
~George Bernard Shaw

There is no such thing as a natural death
~Simone de Beauvoir, *A Very Easy Death*

Section I - How to Think About Old Age and Dying?

In the previous chapter we examined a tension present in Aristotle's conception of the relationship between humans and nature. In this chapter we will delve more deeply into the difficulties ingrained in Aristotle's conception of *phusis* by considering a further tension between what will be called the static and dynamic views of nature. Ultimately, I will argue that this tension may also be at least partly broken down if we accept, as we did in the previous chapter, that Aristotle's thinking contains more than one concept of *phusis*. I will suggest, however, that Aristotle appears to show awareness of this tension and attempts to resolve it himself. We shall get to this in due course, but to begin it will be helpful to have an example before us.

The fifth book of the *Physics* is devoted generally to an inquiry into motion and change, and in the sixth chapter Aristotle confronts the specific problem that a single motion appears to have two contraries: (i) the opposite change, e.g., as moving upwards is to moving downwards, and (ii) a state of remaining the same. This discussion leads to a further difficulty, as it seems that for some types of change, both changing and staying the same may be either natural or unnatural

(*Phys.* V.6, 230a20), as, for example, is the case with becoming white or becoming black (*Phys.* V.6, 230a22-23). It is within this context that Aristotle makes the following intriguing claim, "it is not true that becoming is natural and perishing unnatural (for growing old is natural) [τὸ γὰρ γηρᾶν κατὰ φύσιν]" (*Phys.* V.6, 230a27-28). Let us focus our attention on the example itself: growing old is here said to be natural. Furthermore, Aristotle considers not only the process of ageing to be natural, but some forms of death as well, for immediately after this he claims that "violent perishing is unnatural and as such contrary to natural perishing [φθορὰ ἂν εἴη φθορᾷ ἐναντία ἡ βίαιος ὡς παρὰ φύσιν οὖσα τῇ κατὰ φύσιν]" (*Phys.* V.6, 230a30-31).[101] Growing old is said to be natural, as is dying as a result of this, but some deaths, i.e., violent ones, are not.[102]

This is not a one-off remark, a kind of eidetic *hapax*; the same sentiment is repeated in the *Nicomachean Ethics* where Aristotle writes that "for many natural processes [πολλὰ γὰρ καὶ τῶν φύσει ὑπαρχόντων], even, we knowingly both perform and experience, none of which is either voluntary or involuntary, e.g., growing old or dying" (*Eth. Nic.* V.8, 1135a33-1135b2). In the course of arguing that voluntariness is necessary in order for there to be injustice, he observes that

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[101] We must guard ourselves here against reading the word 'violence' too strongly in this context. Here Aristotle, as is his usual practice, is referring to all of those things that are contrary to nature. While being run through with a hoplite's spear is one example of a violent death, it is not the only sort of violent death.

[102] One might suggest that when Aristotle describes growing old as natural he may not be presenting his own view, for at this point in the argument he is developing an *aporia* to be solved. This should not bother us too much for two reasons. Firstly, his claim that violent perishing is opposed to natural perishing falls after Aristotle begins to answer the *aporia*. (The beginning of his reply is indicated by the ἢ in line 29 [see Ross, *Physics*, 636].) Secondly, Aristotle gives the example of growing old so succinctly and in such a matter of fact manner that he seems to regard it as uncontroversial in this context.

some natural processes are neither voluntary or involuntary, illustrated with the examples of ageing and dying. As in the *Physics* passage, he appears to treat these two processes as clearly, and uncontroversially, natural. It is worth stressing the complete nonchalance with which Aristotle employs the examples of growing old and dying; they appear to be stock examples capable of being tossed into the discussion without debate.

Finally, we may observe that this thinking crops up in at least one other place. While discussing blood in the *History of Animals*, Aristotle writes that "blood in a healthy condition is naturally sweet to the taste, and red in colour; blood that deteriorates from *natural decay* or from disease is more or less black. Blood at its best, before it undergoes deterioration from either *natural decay* or disease, is neither very thick nor very thin" (*Hist. An.* III.19, 520b19-22, *emphasis added*). Here Aristotle allows for the general possibility of natural decay with respect to a specific part of the body, i.e., the blood. This sort of natural decay is contrasted with disease, which, in light of its interfering with the natural operation of the body, he appears to have considered violent and unnatural.

Taking these three passages together yields a tidy picture wherein Aristotle considers some forms of ageing, decay, and death to be natural. There are unnatural versions of these processes, to be sure, but *some* he considers to be natural. The problem with this tidy picture, as is so often the case, is that it portrays only a part of the story. Consider the following claim from *De Caelo*: "The incapacities of animals, age, decay and the like, are all unnatural" (*Cael*. II.6, 288b15-16). This appears to contradict the thinking we found in the passages

from the *Physics*, *Nicomachean Ethics*, and *History of Animals*. Moreover, this view, that old age and decay are unnatural, appears to be more broadly supported by Aristotle's writing about *phusis*. In *Physics* II.2, Aristotle writes that:

> The nature is the end or that for the sake of which. For if a thing undergoes a continuous change towards some end, that last stage is actually that for the sake of which. (This is why the poet was carried away into making an absurd statement when he said 'he has the end for the sake of which he was born.' For not every stage that is last claims to be an end, but only that which is best.) (*Phys*. 194a29-33)

As Gotthelf notes in connection with this passage, "for Aristotle a natural goal or end is always something good" and death is never good for an organism.[103] In other words, even though it occurs at the end of its life, the final goal of an organism's *phusis* is not death. Instead, only the final stage of development, i.e., the fully formed adult, is the end of an organism's *phusis*. From this more reflective and considered position, old age and death cannot be natural, but how are we to reconcile this with his competing statements in which the two serve as examples of natural processes?

One route that is not available to us is to suggest that the manuscripts have been corrupted, perhaps at the hands of a later editor, by changing a παρά to a κατά or vice versa. In the *De Caelo* passage, it is essential that old age and decay are thought to be unnatural, for before introducing the examples, Aristotle writes, "Retardation is always due to incapacity, and incapacity is unnatural" (*Cael.* II.6, 288b14-15). Thus, the examples of old age and decay are meant to function as specific examples of this more general principle. Conversely, old age and dying must be natural in order to make sense of the *Nicomachean*

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[103] *Gotthelf*, "Place of the Good," 115.

Ethics passage. If growing old and dying are not natural then there is no contrast between these natural examples and the ethical cases which Aristotle has been discussing, and so there would be no distinction for him to be drawing. Similarly, there would be no need to distinguish between unnatural decay and disease in the *History of Animals*. Finally, old age must be considered to be natural in the *Physics* passage or else this cannot serve as counter evidence to the belief that perishing is unnatural. Instead, if these contrary remarks about decay are to be reconciled, it will have to be in some other way.

I propose that the conflict reflects two different ways of thinking about *phusis*. The first of these, the view presented in the *Physics*, *Nicomachean Ethics*, and *History of Animals* passages, allows nature to be in a state of change. As long as the changes themselves are natural, e.g., the death is not violent or the blood is not blackened by disease, the result too is natural. Let us refer to this as the dynamic view of nature. As a way of getting our heads around the concept, this is the position adopted by the Yellowstone National Park rangers beginning in the early 1960s, with the understanding that the natural state of the park changes over time, occasionally through forest fires. On the other hand, the view presented in *De Caelo* treats nature as a specific, steady state. Insofar as disease removes animals from their ideal state, from the way that *phusis* intended them to be, disease is unnatural. Let us refer to this as the static view of nature. Similarly, this is the view of the Yellowstone rangers prior to the early 1960s that prompted the vigorous attack of all fires so as to preserve the natural state of the park, i.e., the way the park ‘originally’ was. I will argue that the

contradiction between Aristotle's descriptions of old age and decay as natural and as unnatural can best be understood as a tension between the dynamic and static views of nature.

The reach of this tension between the static and the dynamic views of nature is felt more extensively throughout the Aristotelian corpus. This chapter is devoted to an exploration of this, beginning with a pair of passages where the static view of nature is expressed: Aristotle's remarks about child soldiers and the mouths of the river Nile. We will then turn to the other side of the story by looking at how Aristotle allows for the possibility that nature can change by considering two further passages: his remarks about the continuity of coming-to-be and passing-away in *On Generation and Corruption* II.10 and his account of the natural growth of the *polis*. We will then consider the general principle advocated in the *Eudemian Ethics* that what is natural is either that which is within us when we are born or that which occurs when our growth is not limited in some way, a principle which appears to offer a possible dissolution of this tension. Although initially promising, we will see that this solution is ultimately insufficient, and I will argue that while Aristotle was aware of the tension in his thinking, in the end it remains without full resolution.

Section II - The Static View of Nature

In *Meteorology* I.14, Aristotle discusses a topic that, at least on the surface, appears to be quite unusual for him, the process by which the earth gradually changes. This is likely to strike us as odd, for we are used to the idea

that Aristotle is a steady state theorist who holds that the world remains the same over time. Nevertheless, he demonstrates an awareness in this chapter that the topologies of various locations do not remain static but will "change according as rivers come into existence and dry up" (*Meteor.* 351a20), even though the lengthiness of these processes combined with the shortness of human life means that we may remain unaware of this (*Meteor.* 351b9-11). This takes place according to an "order and cycle" (*Meteor.* 351a26) by which changes in the heat of the sun prompted by the alteration of its course (*Meteor.* 351a32) affect the sublunary realm. As a result, nations may come to inhabit place places that were once uninhabitable so slowly that those there now are unaware of the beginning of the process (*Meteor*. 351b22-26).

Of particular interest, however, is the example he gives to illustrate this. He writes about Egypt:

> Here it is obvious that the land is continually getting drier and that the whole country is a deposit of the river Nile. But because the neighbouring peoples settled in the land gradually as the marshes dried, the lapse of time has hidden the beginning of this process. Thus, all the mouths of the Nile, with the single exception of that at Canopus, are obviously artificial and not natural. (*Meteor*. 351b29-34)

Aristotle's description of the evolution of the mouth of the Nile begins with the surrounding land in a "marshy and watery state" (*Meteor.* 351b24). Gradually the Nile delta has become drier, which has allowed the Egyptians to settle the land. The result, Aristotle concludes, is that of all the mouths of the Nile, only Canopus has remained natural; all the others are artificial. This conclusion strikes me as strange. What makes all the mouths of the Nile, with the exception of the one at Canopus, artificial?

The challenge here is to determine from the scanty evidence why Aristotle holds that the mouth of Canopus is the sole natural outfall of the Nile. Only two clues are given. The first is that the land in the Nile delta is drying up; instead of describing the process in terms increasing silt deposits as we would, Aristotle envisions the process as one in which the water recedes to reveal the land underneath. Second, he claims that this has taken a long time, and so the beginning of this process was hidden, i.e., the Egyptian residents of the area are unaware that they now dwell on arable land that once was marsh. This is all the information we are given, so it is from these two claims that we need to derive the conclusion that Aristotle draws, i.e., that the mouth of the Nile at Canopus is the only natural mouth.

One possible way of doing this is to focus on the settling of the land. Perhaps Aristotle's thinking here is that all of the other mouths have been settled, i.e., touched by humans, and it is on account of this that they are said to be artificial. This suggestion will not stand, however, for Canopus was already a busy port by the birth of Aristotle.[104] Less likely, we might suppose Aristotle's thinking here instead is more specific. Instead of merely being touched by humans, perhaps he has in mind a specific alteration that humans have brought about, one that he does not directly mention. Maybe Aristotle has in mind some trivia about the artificiality of the mouths of the Nile that was common knowledge in

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[104] Canopus is thought to have been in existence at least as early as the reign of Ramses II, 1279-1213 BCE ("Canopus"). In their commentary on Herodutus, How and Wells note that it was reputed in antiquity to have been founded by Menelaus (How and Wells, 167), and cite as evidence Tacitus, who records that the Spartans named the city after a ship pilot who they buried there (Tacitus, *Annals*, II.60). Given its reputed history, Aristotle surely must have believed that Canopus had already existed for a significant length of time.

antiquity but lost to us now. One difficulty with this approach is that we would have to import something from beyond the text, yet Aristotle here seems to suggest that the conclusion follows from the information he has already given–his claim about Canopus is introduced by the phrase "it is clear, therefore (φαίνεται οὖν)" (*Meteor.* 351b33). Moreover, although Herodotus' account lists seven mouths, he only describes two of these, the Bolbitine and the Bucolic, as artificial excavations.[105] If it was common opinion that Canopus was the sole natural outlet of the Nile, we should expect Herodotus to show awareness of this.

If we are to make sense of this passage, it seems that we must do so based solely on the two premises explicitly offered: (i) the Nile delta is drying up, and (ii) its current inhabitants are unaware of the beginning of this process. If we have ruled out the possibility that the artificiality stems from human habitation then all that is left to us is the suggestion that the artificiality is somehow a result of the fact that the land has dried up. But why would this be unnatural? The only sense I can make of this is to suggest that Aristotle believes the mouths of the Nile to be artificial because they are the results of this process of drying up. (Surely the conclusion that the Canopic mouth of the Nile is natural and all others artificial cannot be based on the observation that the current inhabitants are unaware of the process.) Even though this seems to be the same sort of ordered process he has been discussing and on account of this he should call all the mouths of the Nile natural, it appears that Aristotle's thinking is that change is unnatural. Although aware that this process of change must be constant so that

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[105] Herodotus, *Histories*, 2.17.

"neither the Tanais nor the Nile has always been flowing" (353a16), he seems to cling to the idea that what is natural is a static maintenance of the way things were, the way nature originally set them up.

This is a strong, and potentially controversial, claim, but it is supported by other instances where Aristotle similarly treats what is natural as a static state. In addition to his remarks about the unnaturalness of decay, this static view of nature also underlies his remarks about child soldiers. In *Eudemian Ethics* III.1, Aristotle deals with bravery and fear. There he distinguishes five types of courage: civic, military, that based on inexperience, that based on hope, and that based on irrational feelings like love. Of these, he says, "the bravery of passion is above all natural (passion is invincible, and therefore children are excellent fighters); civic courage is the effect of law" (*Eth. Eud.* 1229a27-30). The imagery here is rich, so let us take the time to unpack this carefully.

First, let us observe that Aristotle suggests the best kind of bravery is the kind that is based on passion; he describes it as invincible. Moreover, of the five kinds of bravery he identifies, this is the one that is said to be the most natural (μάλιστα φυσική). Not only is passion-based bravery described as superior to the other forms and the kind that is the most natural, but it is also connected here to children. Children make excellent fighters because they possess this kind of natural bravery. The implication, we are invited to supply by comparison, is that adults are somehow corrupted and feel this sort of bravery less than when they were children. In this fashion Peter Pan would turn out to be Aristotle's ideal soldier, for by never growing old he will never lose this passion.

That this is the correct comparison to draw is driven home by Aristotle's concluding remark: "civic courage is the effect of law [*nomos*]" (*Eth. Eud.* 1229a30). The contrast between passion-driven bravery and civic courage parallels the contrast between *phusis* and *nomos*. As *nomos* requires inculcation, adults, not children, will feel its effects. Here, what is natural is said to be the way humans first are, i.e., when they are young. As they age, their natural bravery comes to be replaced by bravery driven by *nomos*. This change is a falling away from what is natural–passion-based bravery is said to be the most natural–and also, incidentally, a falling away from what is best.[106]

To summarize, there is a certain strain of thought running through Aristotle's work that treats the natural as an initial, and static, state.[107] Movement away from that state over time, whether it be in the drying of the mouth of the Nile or human ageing, is treated as unnatural. As we have already seen in the introduction to this chapter, however, it is not the only approach taken by Aristotle. We will now turn towards the other approach, the view that nature is dynamic.

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[106] Interestingly, in privileging the natural bravery of the young over the mature bravery acquired by *nomos*, Aristotle here seems to contradict what he says elsewhere about natural virtue (φυσικὴ ἀρετὴ) and moral virtue (ἐθικὴ ἀρετή). In *Nicomachean Ethics* VI.13, to be good in the strictest sense is said to require moral virtue (*Eth. Nic.* 1144b30-31), and having a natural disposition towards moral qualities like bravery and self-control is hurtful without intelligence (νοῦς) (*Ethi. Nic.* 1144b7-10). Moreover, natural virtues are inferior to ethical virtue insofar as natural virtues may be present individually–one may be naturally brave while lacking self-control–whereas possession of practical wisdom, which is necessary for ethical virtue, bestows all virtues (*Eth. Nic.* 1144b33-1145a2).

[107] This is a little strange because Aristotle, of course, did not consider the world to be created. Properly speaking there is thus no initial state of the world which has devolved into the world as it now is. Nevertheless, there would have been a temporal beginning of the Nile, and Aristotle could point to the state of its seven mouths at that point as their natural state.

Section III - The Dynamic View of Nature

The process of sublunary change described in *Meteorology* I.14 is also described more generally in *On Generation and Corruption* II.10. Here, coming-to-be is said to occur as the sun approaches the earth, while passing-away results from the sun's retreat (*De Gen. et Corr.* 336b17-18), and both processes are described as natural (*De Gen. et Corr.* 336b19). These two processes alternate, and, as in Anaximander's cosmology, the time allotted to each is balanced without one dominating over the other. His explanation for why this is the case is telling:

> Coming-to-be and passing-away will, as we have said, always be continuous, and will never fail owing to the cause we stated. And this continuity has a sufficient reason. For in all things, as we affirm, nature always strives after the better. (*De Gen. et Corr.* 336b25-27)

Nature strives after the better, and the best state is one of perfect being. Since individual substances in the sublunary realm cannot exist forever, nature settles for the next best thing: a process of continual coming-to-be.

Although some commentators have taken Aristotle to be referring here to the *phuseis* of individual substances striving after their own immortality,[108] there is strong evidence that he has a broader view of nature in mind in this passage. First, his comments are situated within a context of how the sun's movements are the cause of generation and decay in the sublunary realm (*De Gen. et Corr.* 336b17-18), so when Aristotle here claims that "nature strives after the

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[108] See, for example C.J.F. Williams' commentary where he suggests that Aristotle's doctrine here is repeated at *De Anima* 415a25-415b27 (Williams, p. 193). The *De Anima* passage to which Williams refers analyzes the individual's quest for immortality through reproduction of its own kind. In other words, Williams understands the coming to be and passing away that is "continuous and will never fail" (*De Gen. et Corr.* 336b25-26) to refer to the process of individual reproduction.

better" (*De Gen. et Corr.* 336b27), we should read this passage as referring to the pre-theoretic understanding of phusis. The word '*phusis*' is here being used to refer to the natural world. Furthermore, it is the "perfection of the universe (συνεπλήρωσε τὸ ὅλον)" at which this process of both generation and decay aims (*De Gen. et Corr.* 336b32). While it may always be better for an individual organism for it to continue living, from the perspective of the perfection of the universe this need not be so. Indeed, the death and decay of its individual constituents is integral to the best functioning of the universe as a whole, and so from the perspective of the entire universe, the perspective from which Aristotle writes in this passage, decay and death is for the better and natural.

It is worth comparing his remarks here to an earlier passage in *On Generation and Corruption* which addresses the same topic. In book one, chapter three, Aristotle writes that:

> At present we are to state the cause classed under the head of the matter, to which it is due that passing-away and coming-to-be never fail to occur in nature [δι' ἣν ἀεὶ φθορὰ καὶ γένεσις οὐχ ὑπολείπει τὴν φύσιν]. (*De Gen. et Corr.* 318a8-10)

Here again passing-away is explicitly listed in addition to coming-to-be, and both are said to occur in nature. The *phusis* described does not appear to be that of various individual substances, but instead he is referring to nature conceived in the pre-theoretic sense. That this is Aristotle's intention is further signalled by his reference to the universe in the next paragraph, i.e., "If, then, some one of the things which are is constantly disappearing, why has not the universe (τὸ πᾶν) been used up long ago and vanished away[?]" (*De Gen. et Corr.* 318a17-18). In both this passage and the previous one, Aristotle speaks of passing away as

being natural, which it is from the viewpoint of the pre-theoretic understanding of *phusis*. Because it is not for the good of an individual organism, decay is contrary to a particular organism's *phusis*, yet not to *phusis* more broadly speaking.

In these passages, therefore, *phusis* conceived as the natural world is described as being in a constant state of flux, enjoying alternating periods of coming-to-be and passing-away. It is normal, and natural, for nature to change. Growing old and dying, on this view, are not considered to be a falling away from an ideal natural state–as they are on the static view of nature–but instead they are treated as part of a natural process. This exemplifies the dynamic view of nature because what is natural is thought to be able to change.

Another example of this way of thinking about nature is found in *Politics* I.2 where Aristotle identifies three distinct stages of the growth of the *polis*: (i) the union of male and female (*Pol.* 1252a27) and of ruler and subject (*Pol.* 1252a30) to create the household, (ii) the village that forms when several families come together (*Pol.* 1252b16-17), and (iii) the self-sufficient *polis* that stems from the unification of several villages (*Pol.* 1252b28-29). It is crucial to note, at least for our purposes here, the care which Aristotle takes to show that *each step* along the way is a natural one. Firstly, he argues that the union of man and woman is natural because humans naturally desire to achieve immortality through procreation (*Pol.* 1252a29-30) and that the relationship between master and slave is natural on the grounds that each is naturally suited to their role (*Pol.* 1252a31-1252b1). Additionally the entire family unit is said to be "established by nature" (*Pol.* 1252b13) for it aims at fulfilling the natural, everyday needs of its

members. Secondly, the village is described in its "most natural form," which is one in which the households are all extended families (*Pol.* 1252b17-18). Finally, the *polis*, as we are well aware, is described numerous times as a creation of nature (*Pol*. 1253a2, 1253a25). Each of the three stages of growth–the household, the village, and the *polis*–is said to be natural.

Even more telling is the manner in which Aristotle phrases the conclusion of his argument. "If the earlier forms of society are natural, so is the state, for it is the end of them, and the nature of a thing is its end" (*Pol*. 1252b30-32). The underlying thought expressed here is that what is natural changes over time in a progression driven by its nature–nature is dynamic and evolves over time. The earlier forms of the state, i.e., the family and the village, were natural, but these necessarily changed as time moved on, just as the earth was said to change gradually in *Meteorology* I.14. Even though they are progressing to a natural end, each stage along the way is said to be natural too. In this way, *phusis* is being viewed dynamically; nature can change over time.

Before we leave behind this example of the *polis*, let us acknowledge one point of disanalogy between the growth of the *polis* and Aristotle's claims that ageing, decay, and death are natural. Although it has been suggested that both express a dynamic view of nature, in the former, *phusis* drives development towards the state that defines what that thing is, i.e., "what each thing is when it is fully developed, we call its nature, whether we are speaking of a man, a horse, or a family" (*Pol.* I.2, 1252b32-1253a1). *Phusis* is a cause of change, but this process of change leads to it expressing itself fully as itself. In regards to ageing,

decay, and death, however, this natural process is of a different sort. No longer is the thing moving towards what it truly is, but rather those properties that make it what it is are gradually being stripped away from it. So, while Aristotle's remarks concerning both the formation of the *polis* and ageing, etc. reflect the view that nature and the natural change over time, they do not do so in precisely the same way. The static view of nature treats the natural as a specific state, although whether this is the original state or one that occurs later in development depends on the specific case. We may go back to nature or forward to nature, but in both cases there is a specific natural state at which we aim.

Section IV - A Resolution?

Thus far I have argued that Aristotle's thinking about *phusis* contains two competing strands of thought: one that treats nature as a static state and another that considers it to be in dynamic flux. This leads him, at times, to say contradictory things, particularly that the decay associated with old age both is and is not natural. Is Aristotle unaware of these contradictions? Given his meticulous thoughtfulness, that seems unlikely, but if he is aware of the tension how does he reconcile these two competing views? In this section, we will consider one way in which Aristotle might be thought to have done so.

In *Eudemian Ethics* II.8 Aristotle tackles a puzzle about continent and incontinent individuals. The former "forcibly drags himself away against the resistance of appetites" (*Eth. Eud.* 1224a34) while the latter "forcibly drags himself contrary to his reason" (*Eth. Eud.* 1224a36). The indication that each is

acting forcibly is that each feels pain when acting.[109] The continent person we are told feels pain because he acts against the "resistance of desire" (*Eth. Eud.* 1224a35), while we are left to assume, in parallel, that the incontinent person's pain stems from acting against the resistance of his reason. Aristotle then moves to block the claim that the continent individual acts by force–a possibility which would pose grave consequences for morality–on the grounds that "persuasion is opposed to force and necessity" (*Eth. Eud.* 1224b2), and the continent individual is persuaded by her reason in her actions. If the continent person is acting against force and necessity, he must be acting naturally, but he who is acting according to appetite is not acting in this way–his appetite does not persuade him in the way that reason does. So, Aristotle concludes that the incontinent person "alone seem to act from force and involuntarily" (*Eth. Eud.* 1224b4).

It is at this point that Aristotle encounters a thorny problem, his answer to which will be particularly telling for our project here. Aristotle has already stipulated that living things act by force if they are moved contrary to their internal tendency (*Eth. Eud.* 1224a20-22), but an individual's appetite, as Aristotle worries, is internal. Thus it seems that both the continent and the incontinent are led by internal tendencies–reason in the case of the former and appetite in the case of the latter–and so "neither acts on compulsion nor by force, but, as far at least as the above goes, voluntarily" (*Eth. Eud.* 1224b10-11). Thus, both the incontinent and the continent will act according to nature, but they will act in

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[109] Compare Aristotle's remarks here to what he says about pleasure and pain elsewhere: "pain is the lack of that which is according to nature and pleasure is replenishment" (*Eth. Nic.* 1173b8-9) "pleasure is a restoration of each to its own nature from that which runs counter to it" (*MM* 1205b6-7), and "whatsoever is in conformity with nature is pleasant" (*Hist. An.* 589a7-8).

opposite ways–as old age is said to be both according to and against nature. Aristotle's response to this problem about continence and incontinence, therefore, has the potential to be very helpful in clearing up the tension stemming from his descriptions of old age.

Given the importance of Aristotle's solution, it is worth quoting it at length. He writes:

> Of the parts of the soul this may be said [that they act by compulsion]; but the soul as a whole, whether in the continent or the incontinent, acts voluntarily, and neither acts on compulsion, but one of the elements in them does, since by nature we have both. For reason is in them by nature, because if growth is permitted and not maimed it will be there; and appetite, because it accompanies and is present in us from birth. But these are practically the two marks by which we define the natural–it is either that which is found in us as soon as we are born, or that which comes to us if growth is allowed to proceed regularly, e.g., grey hair, old age, and so on. So that each acts contrary to nature, and yet, broadly speaking, according to nature, but not the same nature. (*Eth. Eud.* 1224b26-36)

In order to resolve the tension, Aristotle observes that both the continent and the incontinent act according to nature in one way but contrary to nature in another. If the matter is considered on the level of the parts of the individual's soul, the action is violent. In the case of the incontinent person, reason is externally overwhelmed by the appetite, and in the case of the continent person appetite is trumped by reason. If we consider things from the perspective of the whole individual, however, the action is natural, for both appetite and reason are internal to the individual.

What is particularly interesting for our purposes here is how he describes the naturalness of the appetite and the reason. The appetite is natural, he says, because it is part of us right from birth. On the other hand, reason is natural not

because we are born with it but because it will develop as long as our growth is not violently constrained. This, Aristotle claims, is a general principle: "it [i.e., nature] is either that which is found in us as soon as we are born, or that which comes to us if growth is allowed to proceed regularly" (*Eth. Eud.* 1224b32-34). Based on this principle, therefore, what is natural may be identified on one of two grounds: it may either be present initially or the result of unimpeded growth.[110] Or, to put this another way, nature may be considered to be either static (present at birth) or dynamic (as the result of growth).

Let us apply this principle to his problematic remarks about growing old and dying to determine if this helps to resolve the contradiction apparently present in them. This seems particularly prudent given that the example he uses here for the results of growth without interference, grey hair and *old age* (*Eth. Eud.* 1224b34)! Perhaps, therefore, there is no tension after all. Based on one of the two criteria some forms of ageing, decay, and death are indeed natural, i.e., those that result from the normal development of human beings. On the other hand, it is also reasonable to consider the way that human beings were at birth to be natural. Aristotle appears to be endorsing both the dynamic and the static

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[110] It is worth comparing here Aristotle's approach to describing the naturalness of the *polis* in *Politics* I.2. There he writes that both "he who thus considers things in their first growth and origin, whether a state or anything else, will obtain the clearest view of them" (*Pol.* 1252a24-25) and "for what each thing is when fully developed we call its nature, whether we are speaking of a man, a horse, or a family" (*Pol.* 1252b32-33). In the first case, we can see the *polis* most clearly, i.e., we are best able to understand its nature, by going back to its beginning, by considering how it was initially. At the same time, the *polis*' nature–or, more specifically, the nature of the family, for the *polis* is conceived here as the natural extension of the family–is seen in the result of an evolution. Aristotle's approach in describing the *polis* as a creation of nature is, therefore, informed by the principle that nature is found either at the beginning or a the end of a process of growth.

views of nature. It seems, therefore, that we may have resolved the tension between Aristotle's claims about ageing, decay, and death.

This apparent resolution, however, is only partial. It does permit a partial reconciliation between the claims that growing old is natural in the *Physics*, that old age and death are natural in the *Nicomachean Ethics*, that there is a kind of decay that is natural in the *History of Animals*, and claims, like those in the *De Caelo*, that these things are unnatural. There are two criteria by which the natural may by identified, and growing old meets only one of them. From the perspective of the other, growing old is unnatural. The problem is that either of these criteria should be sufficient to establish something as natural. While, growing old is not natural if we look to the organization of the organism at birth, it is natural on the other criterion. This should be sufficient to establish it as natural, but in *De Caelo*, and elsewhere, Aristotle calls it unnatural.

Similarly, his claim in the *Meteorology* appears to be not only that the mouth of the delta at Canopus is natural because its original state is maintained but also that all the other mouths are unnatural merely in virtue of the fact that they have changed. Both of these passages, that from the *De Caelo* and from the *Meteorology*, claim more than is justified by the general principle from the *Eudemian Ethics*. In the *De Caelo*, Aristotle denies that the result of a process that he elsewhere considers to be natural growth is natural. In the *Meteorology*, Aristotle first describes the change of rivers in terms of natural growth. It is said that these changes "follow some order and cycle" (*Meteor*. I.14, 351a26), and of

course orderliness is the hallmark of nature.[111] Moreover, he describes how "the interior of the earth has its periods of maturity, like the bodies of plants and animals" (*Meteor.* I.14, 351a28-29), where the only difference is that each plant or animal grows and decays as a whole while the earth grows and decays in its various parts, at times growing here while decaying over there, and such (*Meteor*. I.14, 351a30-31). If Aristotle were really following the principle from the *Eudemian Ethics*, he should not describe age and decay in humans and the various mouths of the Nile as unnatural, but he should merely describe them as not meeting one of the two criteria for naturalness. According to this principle these things should be considered natural, just not from the standpoint of the static view of nature.

I propose, therefore, that while the principle from the *Eudemian Ethics* exhibits that Aristotle was aware of the tension between the static and the dynamic views of nature, his remarks in *De Caelo* and *Meteorology* suggest that he did not come to grips with it completely. He recognizes that there is a problem and proposes a potential solution, but seems not to commit fully to it. That Aristotle maintains some reticence about the proposed solution is illustrated very tidily by the conclusion of his argument in the *Eudemian Ethics*: "it is *tolerably clear* from the above [i.e., from the argument that there are two marks by which the natural is defined] how these puzzles are to be met" (*Eth. Eud.* II.8, 1224b39-1225a1, *emphasis added*). It appears that Aristotle feels that he has

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[111] The connection between order and *phusis* is well entrenched in Aristotle's thinking, cf. "that which holds by nature and is natural can never be anything disorderly, for nature is everywhere the cause of order" (*Phys.* VIII.1, 252a10-12), "it is that which happens as a regular thing that is according to nature" (*GA* I.19, 727b29-30) and, of course, his repeated claim that the natural is what happens always or for the most part (*Phys.* II.8, 198b35, 199b26; *MM* I.33, 1194b37-1195a1; II.8, 1206b38-39; etc.)

broadly sketched out a response, although he has not worked out the fine details of this. It remains a nagging problem, with an only partially adopted solution.

Section V - Conclusion

In the end, what have we learned in this chapter? In the last, we saw that there is a tension in how Aristotle conceives of the relationship between humanity and nature. Here it has been argued that there is a further tension in how he conceives of nature itself. This tension derives from two apparent ways of thinking of nature. One view treats it as a static state whereas the other considers it to be a dynamic process of growth. Thus, we can explain seemingly contrary remarks about nature and the natural by observing that Aristotle is not always talking about the same nature, the same kind of natural, or, at the very least, he is not always thinking about nature in the same way. His understanding of nature is made more intricate by this, and our job of reconstructing what he thought is likewise more complicated as a result. Old age may be either natural or contrary to nature depending on which understanding is adopted.

Yet, let us reflect a little further upon Aristotle's apparent hesitance to accept fully his solution that nature is defined by two criteria: one backward looking towards a thing's coming to be, and one forward looking towards a thing's completed growth. Although our discussion of these intriguing passages has centred around the different views they present of nature, i.e., static vs dynamic, there is also a strong current of value judgements that underlies many of them. The discussion of whether or not decay and death is natural is, of course,

premised in no small part by questions of whether or not death is a good or a bad thing. We have focussed, in this chapter, on whether or not change may be natural, but arguments against the naturalness of decay really are built on the observation that decay is a *harmful* change for the organism that undergoes it. In other words, there is a further criterion on which a thing may be deemed natural or unnatural: whether it is beneficial or harmful. In the next chapter we will pick up on this further problem and ask to what degree is nature considered by Aristotle to be good.

Chapter 5

Nature, Mr. Allnutt, is what we are put into this world to rise above.
~Katherine Hepburn to Humphrey Bogart in *The African Queen*

Section I - Introduction

Thus far I have advanced three chief arguments. First, I have proposed that in addition to Aristotle's well-worked out philosophical understanding of *phusis* his thinking also exhibits a pre-theoretic understanding. Second, I have suggested that these two understandings at times conflict with each other, and on account of this there are certain tensions in what he says about *phusis*, especially in regards to the division between the natural and the artificial. For example, although he describes both the *polis* and swallows' nests as natural, neither proceeds from an internal principle of change and rest. This tension can be dissolved, at least to some degree, by recognizing that Aristotle's thinking contains at least two understandings of *phusis*. Third, I argued that contained within the pre-theoretic understanding of *phusis* lies a tension between a dynamic and a static view of nature. While Aristotle appears to have been aware of this tension, he does not seem to have been wholly comfortable with the implications of his proposed solution to it and remained reluctant to accept it fully.

In this chapter we will continue our exploration of the pre-theoretic understanding of *phusis* and thereby unearth a third tension, one which underlies, and is all caught up in, the other two. As we will see, this tension centres around the value or merit to be ascribed to nature. As a striking illustration of this tension, recall the twelfth century Latin poem we encountered in the first chapter wherein

two classical Greek mythological paragons of beauty, Helen of Troy and Ganymede the cupbearer to Zeus, defend heterosexual and homosexual love respectively:

> *Helen*: Oh how lovely is love between different sexes,
> When a man favors a woman in a mutual embrace!
> He and she are drawn together by natural attraction:
> Birds, wild animals, boars all enjoy this union.
>
> *Ganymede*: But humans should not be like birds or pigs:
> Humans have reason.
> Peasants, who may as well be called pigs—
> These are the only men who should resort to women.[112]

As we have already seen, Helen's position is predicated upon observations of animals engaged in heterosexual unions and supported by the inference that this behaviour is born of natural attraction. The force of her argument is thus derived from the further presupposition that whatever is natural is to be desired and emulated. Ganymede, on the other hand, retorts that humans, by possessing reason, are capable of rising above what is merely natural. To borrow a line from Oscar Wilde, the "poorest workman could make you a more comfortable seat than the whole of Nature can."[113] Nature, on this view, is something to be overcome, while Helen treats nature as an ideal. But who has the right of it? Aristotle appears to take both approaches, for while he often presupposes that the way of nature is the best possible, he also permits that art may improve upon nature.

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[112] Boswell, 385.

[113] Wilde, 4.

The details of this will be addressed below. For now, however, let us observe the significance of this discussion, as it underlies and informs the two tensions considered in the previous chapters. First, discussions about whether or not humanity is part of nature are all caught up in the question of whether or not humans should act according to nature. Second, whether one considers nature to be static or dynamic depends, in great part, upon the value that is placed on the relevant states. When Aristotle claims that the decay associated with old age is unnatural, he does so because he privileges the mature adult state. Likewise, claims that old age and death are natural recognize the value that these processes play in the greater natural world. Whether the natural should be considered to be superior will therefore have implications for the tensions identified in the previous two chapters.

In addressing this third tension, we will begin by considering some of the numerous examples in which Aristotle explicitly claims that nature's way is the best, or at least the best possible, especially the principle that nature does nothing in vain. We will then examine two arguments that rest upon the belief that the natural is best: his rejection of certain ways of gaining wealth, especially usury, in *Politics* I.8-10, and his defence of natural slavery in *Politics* I.5-7. In the first half of this chapter, Aristotle appears to side with Helen, but in the latter sections his sympathies towards Ganymede will begin to emerge. For, Aristotle allows that nature is not always capable of bringing about everything that it may wish to do and claims that art is sometimes necessary for the completion of nature. The stakes here are high, for if we grant this there will be significant

problems for Aristotle's arguments in *Politics* I.5-10. In light of this, I will propose not only that this tension runs very deep in his thinking but also that its lack of a resolution means that no settlement may be reached for the other two either.

Section II - Nature and The Good

Let us begin our discussion with an example from Aristotle's biology. Having finished his treatment of the sanguineous terrestrial animals, Aristotle turns his attention in *Parts of Animals* IV.12 to birds where, among other things, he explains how the *phuseis* of some birds use the earthy material available to them to create spurs or talons for the bird's defence (*Part. An.* 694a11-13)). This earthy material is leftover after the primary structures of the bird have been completed, and like leftover scrap building supplies, it might still be fashioned towards some use. Aristotle observes, however, that not all avian *phuseis* employ this material in the same fashion; instead of creating spurs or talons, some use it to elongate the legs, while others use it to fill in the spaces between the bird's toes (*Part. An.* 694a28-694b2). With regards to the webbed feet of these animals, Aristotle offers the following analysis:

> "The forms, then, of these are necessary results of the causes that have been mentioned. Yet at the same time they are intended for the animal's advantage. For they are in harmony with the mode of life of these birds, who, living on the water, where their wings are useless, require that their feet shall be such as to serve in swimming." (*Part. An.* 694b5-9).

Aristotle's explanation for why aquatic birds have webbed feet focusses on the benefit that these provide to their owners. Given a duck's aquatic habitat, webbed feet are clearly much more in harmony with its lifestyle than would be talons or

claws, so the duck's *phusis* uses the available earthy material to create webbing between the toes, which is useful, instead of converting it into talons or spurs, which would not be. Similarly, the *phuseis* of other birds will use any leftover earthy material available to fashion talons, spurs, or longer legs depending upon what would be most advantageous to them. In general, Aristotle holds that the *phusis* of an animal bestows upon it only those parts that would be of use and thereby does what is best for that animal.

This importance of the good to Aristotelian teleology has been well explored by scholars. In his book on teleology, Andrew Woodfield observes that for Aristotle "final causes are causes in the sense of the end or the good of the rest; for 'that for the sake of which' means what is best and the end of the things that lead up to it."[114] John Cooper, in two separate works, argues that "Aristotle believed that many (not, of course, all) natural events and facts need to be explained by reference to natural goals [and] [h]e understands by a goal (*hou heneka*) whether natural or not, something good,"[115] for example, front teeth fall out "on account of the end, the good they do the creature whose teeth they are."[116] Most recently, Mariska Leunissen has explicated this in terms of what she calls secondary teleology, i.e., a process by which "a formal nature of an animal *us*[*es*] materials for something good, where those materials 'happen to be

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[114] Woodfield, 206.

[115] Cooper, "Natural Teleology," 197.

[116] Cooper, Hypothetical Necessity, 163; cf. Chales Kahn, "The Place of the Prime Mover in Aristotle's Teleology."

available' in the animal, usually as the result of material necessity."[117] Developing this approach more finely, Allan Gotthelf has maintained that while "for Aristotle a natural goal or end is always something good. . .the fundamental account of what it is for something to be an end for Aristotle must–or indeed should–refer to the goodness of that end."[118] In particular, he astutely argues that the goodness aimed at by Aristotelian teleology, at least within the biological works, refers to the continued life of the particular organism, not some external standard of the good.[119]

Delving more deeply into the role of the good in Aristotle's teleology, let us consider one of the most interesting, and probably one of the most familiar, refrains in the Aristotelian corpus, the claim that "nature does nothing in vain."[120] The phrase is used sixteen times throughout the corpus, most frequently in the biological works (nine times), but also in *Politics* (twice) *De Caelo* (twice), *De Anima* (twice), and in the fragments once.[121] To these we may add the related

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[117] Leunissen, 19 (emphasis in original).

[118] Gotthelf, "Place of the Good," 115.

[119] Ibid., 117.

[120] This single English translation covers four related Greek phrases: ἡ φύσις ποιεῖ οὐδὲν μάτην, ἡ φύσις ποιεῖ οὐθὲν μάτην, ἡ φύσις ποιεῖ μηδὲν μάτην, ἡ φύσις ποιεῖ μηθὲν μάτην. Recent translations generally adopt "nature does nothing pointlessly," but I prefer the metre of the old translation and will use it instead. Nothing hangs on this besides style, and the reader is invited to substitute the new, preferred translation if he or she pleases.

[121] The complete list is as follows: *GA* II.5, 741b4; II.6, 744a36; *IA* ch. 2, 704b15; ch.r 8, 708a9; ch. 18, 711a18; *Part. An.* II.13, 658a8; III.1, 661b24; IV.13, 695b19; *Resp.* ch. 10, 476a12; *Pol.* I.2, 1253a9; I.8, 1256b21; *De An.* III.9, 432b21; III.12, 434a31; *Cael.* I.4, 271a33, II.13, 291b13; fragment category 6, treatise 33, fragment 230, line 6. This list does not include instances where Aristotle makes use of this principle in explanations without explicitly mentioning it, e.g., *GA* V.2, 781b22-28.

phrase “nature never makes anything superfluous,”[122] which is found three times in combination with the claim that nature does nothing in vain (*Part. An.* III.1, 661b24; IV.13, 695b19; *GA* II.6, 744a37) and three times alone (*Part. An.* IV.11, 691b4; IV.12, 694a15; *GA* II.4, 739b19).[123] All told, therefore, the phrase ‘nature does nothing in vain’ and the related claim that nature does nothing superfluously appear nearly twenty times in arguments taken from works that occupy a wide spectrum of the corpus. Our next step here will be to understand its meaning.

On the simplest characterization, this phrase is used in hypothetical counterfactual arguments to explain either a trait’s presence or absence in a given animal, or class of animals, or thing.[124] For example, Aristotle’s explanations of why fish lack both limbs (*Part. An.* IV.13, 695b17-20) and eyelids

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[122] Similarly, this phrase translates three Greek phrases: ἡ φύσις ποιεῖ οὐδὲν περίεργον, ἡ φύσις ποιεῖ οὐθὲν περίεργον, ἡ φύσις ποιεῖ μηδὲν περίεργον. The possible ἡ φύσις ποιεῖ μηθὲν περίεργον does not seem to appear in Aristotle.

[123] In addition, there are further phrases that communicate the same idea, e.g., “everything that nature makes is for the sake of something” (*Part. An.* I.1, 641b12-3). While these analogous phrases will not be directly considered, they could be used to demonstrate the same conclusion as will be drawn below.

[124] In his analysis of the phrase ‘nature does nothing in vain,’ James Lennox distinguishes between what he calls the negative assertion, i.e., that nature does nothing in vain, and the positive assertion, i.e., that nature does nothing in vain *and* it does what is best given the possibilities (Lennox, Nothing in Vain, p. 220, n. 4). He argues that the negative assertion is used in explanations for why a particular feature is absent in an animal while the positive assertion is used to explain why a particular trait is present. While this seems true in some cases, it does not appear to hold in all. For example, Aristotle uses the negative assertion when describing why the eyelid is created at a certain time in development, and while one could read this as an explanation of why a trait is absent before a certain point it is just as reasonable to read it as explaining why a trait appears at that point (*GA* II.6, 744a35-744b5; cf. *Part. An.* II.13, 658a8-9 where the negative assertion is used to show why fish have no eyelids). Also, the negative assertion is used in a mixed way to explain both why a trait is absent and another is present, e.g., why the female lacks the ability to reproduce alone when the sexes are separate and why males are able to perfect the work of generation in such instances (*GA* II.5, 741b2-6). That the negative assertion is meant also to explain this trait in males in addition to the absence of the ability in females is signified by the διόπερ at 741b5. Besides, in *Politics* he uses the negative assertion to explain why humans have speech (*Pol.* I.2, 1253a9). Granted, Lennox probably intended his comments to be restricted to the biological works, but it must be noted that across the corpus the negative assertion is not restricted to explaining a lack of a trait.

(*Part. An.* II.13, 658a6-10) are both built on this principle. Possessing either would be redundant; limbs are not needed for swimming, and fish do not require eyelids because, Aristotle suggests, water contains fewer objects that bump into eyes that air. Similarly, he argues that if animals possessed both lungs and gills, which both serve the same function, one of these would be redundant, and so all animals possess one or the other but not both (*Resp.* ch. 10, 476a7-16). Likewise there are no animals possessing both saw-teeth and tusks, as both are used for defence (*Part. An.* III.1, 661b23-26).[125]

Moreover, Aristotle makes this a common principle of scientific explanation in general. As he writes:

> We must postulate the principles we are accustomed constantly to use for our scientific investigation of nature, that is we must take for granted principles of this universal character which appear in all nature's work. Of these one is that nature creates nothing without a purpose. . . (*IA* ch. 2, 704b12-15).

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[125] The four examples given here are all taken from the biological works. Pamela Huby in "What did Aristotle Mean by 'Nature Does Nothing in Vain?'" argues that the uses of the phrase can be broken into three main groups–biological, political, and physical–and argues further that the use within each group differs. It might be suggested, therefore, that I have oversimplified matters by lumping all three uses together and providing examples only of the biological.
In response, I suggest that Huby's division unnecessarily complicates matters. It rests on the argument that the physical uses express a "transcendental" argument where nature is elevated to a status "hardly to be distinguished from god" because nature "goes beyond doing nothing in vain" by doing "'the best of what is possible'" (Huby, 162-163). Because of this, she concludes that the physical arguments are "different in kind from those used in biology" (Ibid., 162). This interpretation rests on the reading Aristotle has in mind a nature over and above the natures of individual things, a reading that may not be justified, as argued in chapter two. Moreover, it presupposes that Aristotle has in mind a transcendental nature in the physical works but not in the biological ones, but this is a presupposition only. Since nature is also said to act for the good in the biological works, e.g., *IA* chapter two, 704b12-15, and chapter eight, 708a9-10, we could suggest that nature there too is making "a positive choice of what is best" (Ibid., 163) just as nature does in the physical works. Besides, the arguments in the *Politics* and the physical works look similar to the biological, e.g., the principle is used to explain why humans have speech (*Pol.* I.2, 1253a9-15), why stars are likely to be round (*De Caelo* II.11, 291b11-15) and why animals have sensation (*De An.* III.12, 434a30-434b2). Compare these examples with his explanation for why humans bend their arms forward and legs backwards (*IA* ch. 12, 711a14-19). Because of this, I once again propose that we adopt the simpler characterization based on the shared features of the uses of the phrase 'nature does nothing in vain.'

Nature does nothing in vain or makes nothing that is superfluous because it is *better* that this be the case. In other words, nature operates for the good. No animal has both lungs and gills, for example, not only because it would be redundant but because it would, it seems, harm the animal. In Aristotle's accounts of growth, there is only so much matter to go around, and if an animal's *phusis* were to use some of this precious matter to fashion both lungs and gills, some other important part might potentially be left out. Indeed, Aristotle is clear that when nature does nothing in vain it does so for the sake of the good. The passage above continues: "nature creates nothing without a purpose, *but always the best possible in each kind of living creature by reference to its essential constitution*" (*IA* ch. 2, 704b15-17, *emphasis added*).[126] In other words, nature's creative power is tied to the assumption that what is created is good. As Aristotle is "accustomed constantly to use this [principle] for [his] scientific investigation of nature," the impact of the association between *phusis* and the good has broad import for his philosophy as a whole.

Consider a handful of examples. In the *Physics*, we get the general claims that "we always assume the presence in nature of the better, if it be possible" (*Phys*. VIII.7, 260b22-23)[127] and that "which holds by nature and is natural can never be anything disorderly; for nature is everywhere the cause of

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[126] This is one of three positive assertions identified by Lennox; cf. *IA* ch. 8, 708a9; ch. 12, 711a18.

[127] This is the second half of what Lennox labels the positive assertion, i.e., 'nature does nothing in vain and does what is best given the possibilities.' It is interesting that the first half–the assertion that nature does nothing in vain–does not appear, either alone or with the further claim that nature does what is good, in the *Physics*, the work most devoted to investigating nature.

order" (*Phys*. VIII.1, 252a10-12). In the biological works, in addition to those instances already identified where nature doing nothing in vain is tied to it doing what is best, we read that "nature flies from the infinite; for the infinite is imperfect, and nature always seeks an end" (*GA* I.1, 715b14-16) and that "of what is possible nature invariably brings about the best" (*Part An.* IV.10, 687a16-17). In the *Nicomachean Ethics* we read "everything that depends on the action of nature is by nature as good as it can be" (*Eth. Nic*. I.9, 1099b21). And in the *Parts of Animals* we read that "in the works of nature the good and that for the sake of which is still more dominant than in works of art" (*Part. An.* I.1, 639b19-20). The connection between *phusis* and the good is seen right across the Aristotelian *corpus*.

One further important example from the *Metaphysics* deserves a more detailed treatment. In Λ.10, Aristotle makes the following vexatious remark:

> "We must consider also in which of two ways the nature of the universe (ἡ τοῦ ὅλου φύσις) contains the good or the highest good, whether as something separate and by itself, or as the order of the parts. Probably in both ways, as an army does. For the good is found both in the order and in the leader, and more in the latter; for he does not depend on the order but it depends on him. And all things are ordered together somehow, but not all alike–both fishes and fowls and plants; and the world is not such that one thing has nothing to do with another, but they are connected. For all are ordered together to one end. (*Meta.* 1075a9-18)

This particularly thorny passage has invited a sizeable amount of controversy as it appears to make reference to a broad nature teleologically ordered towards some higher good; Sedley, for example, makes extensive use of it in support of his view that Aristotle's teleology is anthropocentric.[128] Those who deny a broad

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[128] Sedley, 192-5.

nature in Aristotle's thinking standardly respond that his remarks here refer to the individual *phuseis* of everything in the universe attempting to emulate a single *telos*, i.e., that of the Prime Mover. So, Leunissen suggests that if this approach is taken, as she argues it should be, then she does "not see what explanatory work would be left to do for a cosmic nature."[129] On this reading, there is no need to assume a broad nature over and above the *phuseis* of individual substances.

My own preference is to read this passage as referring to a broad nature, but I will not press the case for this here. It would be distracting to my current concerns to wade into this particular morass. Nevertheless, even if we take Aristotle to be referring here to a collection of individual *phuseis* and not a single *phusis* of the whole, each of these *phuseis* is oriented towards the good, and in this way the universe contains the good (*agathon*), indeed, the highest good (*ariston*). The good is the goal of Aristotelian teleology.

Let us have one final example. Aristotle is so concerned with showing that nature is good that he even considers a response to a similar objection as that raised against the Forms in Plato's *Parmenides*.[130] In the *Parmenides*, the titular character presents the following problem to Socrates: for the theory of Forms to be complete there seemingly must not only be Forms of the Just, the Beautiful, and the Good, and the like but also of cruder things such as hair, mud and dirt (*Parmenides* 130b-d). Socrates is at a loss as to how to deal with these

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[129] Leunissen, 47. She also cites Johnson (2005, 276 n.44) and Scharle (2008, 167) on this point; cf. Wardy, 23-4.

[130] The authorship of *Magna Moralia* is disputed. While I will speak as if Aristotle is the author, it is highly possible that the work is by one of his later followers. Thus, very little actual weight will be placed on this passage.

dishonourable (*atimotaton*) and base (*phaulotaton*) things (*Parmenides* 130c), but he is clearly worried that allowing for Forms of these sorts of things will sully the nobler Forms. Similarly, in the *Magna Moralia*, Aristotle observes that there may be a "base nature (φύσις φαύλη)"–the kind possessed by "worms, and beetles, and of ignoble creatures (τῶν ἀτίμων ζῴων) generally"–yet he aims to forestall the move from this to the claim that nature *simpliciter* is bad (*MM* II.7, 1205a29-31). Borrowing his examples, there may be base branches of knowledge without knowledge itself being base (*MM* II.7, 1205a32-34). This suggests that Aristotle was so intent on tying nature to the good that he felt it necessary to account for what he considered to be ignoble *phuseis*.

To summarize, the good plays an integral role in Aristotle's understanding of nature, and of natural teleology in particular. In the biological works, an animal's *phusis* is said to act in order to bring about whatever is best for that animal. When Aristotle describes how nature does nothing in vain, he understands, at least implicitly, that whatever would be done in vain would be harmful and this is why an animal's *phusis* does not do this. In addition, we have seen how the idea that nature is tied to the good arises in numerous places across the Aristotelian corpus, and also observed his description that the universe contains the highest good through all things within it being ordered towards one goal. Finally, he may even have been concerned to forestall a worry prompted by the observation that ignoble creatures too have *phuseis* by arguing that there may be bad *phuseis* without *phusis* itself being bad. This should serve to demonstrate the degree to which the concept of nature is tied to the concept of

the good in Aristotle's thinking. In the next section we will consider two arguments from the *Politics* that take this as their central premiss.

Section III - Gaining Wealth and Natural Slavery

In *Politics* I.9, Aristotle analyzes what he calls the art of wealth-getting (*chrēmatistikē*). This art is contrasted with the art discussed in I.8–called the art of household management (*oikonomikē*)–that Aristotle describes paradoxically as a natural art (*Pol.* I.8, 1256b23 and 1256b37).[131] *Oikonomikē* itself is said to cover a number of further arts: husbandry and the provision of food (*Pol*. I.6, 1256a17), shepherding (*Pol.* I.6, 1256a30-35), hunting (*Pol.* I.6, 1256a35-38), and farming (*Pol.* I.6, 1256a38-40). Each of these subservient arts deals with acquiring the necessities of life, and overall Aristotle categorizes *oikonomikē* as the the art that "must either find ready to hand, or itself provide, such things necessary to life, and useful for the community of the family or state, as can be stored" (*Pol*. I.6, 1256b29-30). To this Aristotle adds the caveat that this art, like all others, is limited because "the instruments of any art are never unlimited" (*Pol.* I.6, 1256b34-35); the wealth, which is the instrument of this art, that may be achieved through *oikonomikē* has a boundary.[132] *Oikonomikē*, therefore is a natural art dealing with the procurement and storage of the necessities of life.

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[131] See Chapter three, Section V for more concerning these two passages as well as Aristotle's treatment of natural arts in general.

[132] Presumably Aristotle considers this art to be limited because the foodstuffs with which it deals are not eternal. Unlike precious metals, as we shall soon see, one's stores of food have a shelf life.

In contrast to *oikonomikē* Aristotle places the art of *chrēmatistikē*. This art is made possible because objects have two uses: their intended use and an ability to function as an object of exchange. A shoe, for example is worn to protect the feet, but it may also be used as an object of barter (*Pol*. I.7, 1257a10); I could, for example, trade you my pair of shoes for a rooster. This ability of an object to be used for barter reaches its apex in the invention of a monetary system (*Pol.* I.7, 1257b1), where coins are used to stand for other objects. In direct contrast to *oikonomikē*, Aristotle claims that this monetary based art of *chrēmatistikē* is unlimited (*Pol.* I.7, 1257b34-35), and he condemns it as unnatural (*Pol.* I.7, 1257b11). After all, one cannot eat money, and "he who is rich in coin may often be in want of necessary food" (*Pol*. I.7, 1257b13-14). Money is unnatural because it has no value of its own, i.e., its use is for the sake of exchange and not for its own sake, and it is not useful as a means to any of the necessities of life (*Pol.* I.7, 1257b12-13).[133]

Thus far the story is straightforward, but it becomes complicated by consideration of a rather curious remark. Not all forms of barter are said to be unnatural. As Aristotle writes:

> In the first community, indeed, which is the family, this art [retail trade] is obviously of no use, but it begins to be useful when the society increases. For the members of the family originally had all things in common; later, when the family divided into parts, the parts shared in many things, and different parts in different things, which they had to give in exchange for what they wanted, a kind of barter which is still

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[133] Of course, Aristotle famously goes on in chapter ten to criticize usury as the most unnatural form of wealth getting, for the purpose of money is to be used in exchange (*Pol.* I.10, 1258b4). Whereas other forms of accumulating wealth at least fulfill this purpose of money, usury uses money simply to breed more money (*Pol*. I.10, 1258b6). In this way, usury fails even to use money for its natural purpose, and is even more unnatural than the use of money in the first place.

> practised among barbarous nations who exchange with one another the necessaries of life and nothing more; giving and receiving wine, for example, in exchange for corn, and the like. This sort of barter is not part of the wealth-getting art and is not contrary to nature, but is needed for the satisfaction of men's natural wants. (*Pol.* I.8, 1257a21-30)

It is the last part of this quotation that is so curious; Aristotle describes the kind of barter practiced by barbarians as natural, whose trade is limited solely to the exchange of life's necessities. But this is strange, for while the objects of the exchange are the sorts of things that are necessities of life, e.g., corn and wine, using wine and corn as objects of exchange are still using them for purposes other than their natural ones. The purpose of wine is to be drunk, not to stand as a measure of the value of corn. Aristotle should instead describe this sort of exchange as unnatural, for it uses its objects for purposes other than their own. Perhaps he might be entitled to describe this as the most natural of exchanges–just as usury was said to be the most unnatural–for it comes closest to using its objects for their intended purpose. The final aim of my exchange of wine for corn is to preserve my life, and that is, after all, the purpose of wine and corn in their own right. Nevertheless, during the exchange itself, the wine is necessarily being used as a means of valuing corn, and insofar as that occurs it is being used for a purpose other than its own.

What I think is happening here is an intrusion on two fronts of Aristotle's pre-theoretic understanding of *phusis* into his philosophical analysis. The first of these is relatively obvious; he takes the exchange of the necessities of life to be natural because they are tied to the needs of humans for sustenance. This, I think, sways Aristotle's opinion towards calling this sort of exchange natural, for it

is natural on this understanding even if it is unnatural on the more developed criterion that a thing must be used for its purpose. The second of these, however, is a little more subtle. I suggest further that Aristotle's judgement is being clouded by an image of a 'noble savage,' even if the term itself is anachronistic here. The picture he appears to have in mind is something like the following: barbarians are simple folk, and as such they are obviously closer to nature. Greeks, and Macedonians for that matter, are far superior and more developed, and subsequently are much further removed from nature. It follows, therefore, that what the barbarians do must be natural. This explains why Aristotle limits his comments to 'barbarous nations,' for surely there were still some Greeks who bartered from time to time, farmers who had surplus to exchange with neighbours for instance. Aristotle could have described the features of this sort of trade generally, but instead he attaches it to barbarians. That he does so is telling.

In line with this image of the noble savage, let us also take note of an undercurrent in Aristotle's thinking here. What is natural is, in these chapters of the *Politics*, clearly tied to what is good. It is hard not to read these chapters as an attack by Aristotle on those who pursue wealth for its own sake; they are doing something wrong. If only these people could be more like the barbarians who practice natural trade; this is how people ought to be. Wealth-getting pursues what Jowett translates as "riches of the spurious kind (ὁ τοιοῦτος πλοῦτος)" (*Pol.* I.8, 1257b30) whereas household management provides "the elements of true riches (ἀληθινὸς πλοῦτος)" which are "needed for a good life" (*Pol.* I.7, 1256b30-31). Usury, the most unnatural of all the practices here

discussed, is described as “the most hated sort, and with the greatest reason” for it “makes a gain out of money itself, and not from the *natural object* of it” (*Pol*. I. 10, 1258b2-4, *emphasis added*). The implication is that what is natural is good, and the more unnatural a thing becomes the worse it gets.

Leaving this argument aside for the time being, let us consider a second that also rests upon the premiss that what is natural is good. For this we do not have to travel far from the previous text, for just before investigating the acquisition of property in *Politics* I.8-10, Aristotle debates whether slavery exists naturally or by convention in I.4-6. The argument here is familiar not only to Aristotelian scholars but also to many beyond this field; it is surely one of Aristotle’s most notorious. Our focus, however, will not be to evaluate the strength of the argument itself but rather to bring out the thinking about nature that it instantiates.

In chapter four, Aristotle: defines a slave as the possession of his master (*Pol*. 1254a16). A slave is one kind of living instrument analogous to the look-out man in a ship who is an instrument to the ship’s pilot (*Pol*. 1253b29-31), specifically an instrument of action that produces something else (*Pol*. 1254a4-5). Chapter five continues by arguing that (some) slaves occupy this position naturally, drawing on an analogy between this and the relationship between soul and body (*Pol*. 1254a34ff). Just as it is “*natural* and expedient” that the soul rules over the body (*Pol*. 1254b6-9, *emphasis added*), any time there is a similar difference “the lower sort are *by nature* slaves, and it is *better* for them as for all inferiors that they should be under the rule of a master” (*Pol.* 1254b19-21,

emphasis added). In chapter six he distinguishes between those who are naturally slaves and those who become slaves in some other fashion, such as by being captured in war (*Pol*. 1255a7). Because some become slaves in this way, there were those who had argued prior to Aristotle that slavery is contrary to nature. In response, Aristotle, as he not infrequently chooses to do, seeks a middle path and concludes "that there is some foundation for this difference of opinion, and that all are not either slaves by nature or freemen by nature, and also that there is in some cases a marked distinction between the two classes, rendering it expedient and right for the one to be slaves and the others to be masters" (*Pol.* 1255b5-8). In other words, some individuals who end up in slavery do not deserve their fate; others, however, Aristotle considers to be slaves by nature, and those who possess a slavish nature, in his thinking, are better off as slaves (*Pol*. 1254b19-21, 1255a1-2).

Once again, the concept of nature is thoroughly embedded in Aristotle's argument. The entire inquiry is framed by the question of whether or not there exists someone "intended by nature to be a slave" (*Pol*. I.5, 1254a18), and the soul is said to be "by nature the ruler" over the body (*Pol*. I.5, 1254a35). We are told to "look for the intentions of nature in things which retain their nature" (*Pol*. I. 5, 1254a36), while it is said that "in bad or corrupted natures the body will often appear to rule over the soul because they are in an evil and unnatural condition" (*Pol*. I.5, 1254b1-2). The rule of soul over the body is said to be "natural and expedient" (*Pol*. I.5, 1254b8), while "the male is by nature superior,

and the female inferior" (*Pol*. I.5, 1254b13). The concept of nature does all of the heavy lifting in Aristotle's argument here.

This is seen even more starkly by formalizing Aristotle's argument in *Politics* I.5:

> 1. Living creatures consist of a body and a soul (*Pol*. 1254a33-34).
> 2. One of these naturally must rule over the other (*Pol*. 1254a35).
> 3. To determine which rules, we must "look for the intentions of nature in things which retain their nature" and are not corrupted (*Pol*. 1254a35-37).
> 4. When we look at those who retain their natures we observe that the soul rules the body with a despotic rule (*Pol*. 1254b2-5).
> 5. The mind rules over the appetite with a constitutional and royal rule (*Pol*. 1254b5-6)
> 6. The two rulings from 4 and 5 are natural (*Pol*. 1254b6-9).
> 7. The opposites of this ruling is hurtful (*Pol*. 1254b9).
> 8. Humans are superior to animals (*Pol*. 1254b16) and thus animals, or at least tame animals, are better off when they are ruled by humans because this allows the animals to be preserved (*Pol*. 1254b10-13).
> 9. Males are naturally superior, females naturally inferior, and so men naturally rule (*Pol*. 1254b12-15).
> 10. Whenever there is a difference such as that between souls and bodies or humans and animals, the lower sort are naturally slaves (*Pol*. 1254b15-19)
> 11. Therefore, it is better for these lower sorts to be slaves (*Pol*. 1254b20).

There are two reasons given for why some are better off as slaves. In premise 8 Aristotle argues that tame animals are better off when ruled by humans because this allows them to be preserved. Aristotle thought that animals, even tame animals, are driven by their impulses, which presumably gets them into trouble from time to time. For instance, an animal might choose to eat what tastes best rather than what is better for it or stray into a dangerous but pleasing location. Human reason, however, can steer animals towards what is best for them by carefully regulating their diet and restricting their movement. Given that there is a

similar difference between masters and slaves (premise 10), it is better for the slaves to be slaves (conclusion 11) because this allows the slaves to gain the benefit of their master's wisdom. This is one reason given for why slaves are better of as slaves, but it is not the only one.

The second, and more dominant, strand of argument here rests on the premise that the strong naturally rule over the weak (premises 1-7 and 9-11). Premises 1 through 6 are meant to establish that the strong naturally rule over the weak, premise 9 is a further example of this, while premise 10 maintains that this holds true in the case of slavery. The key premise here is the seventh, which moves from the claim that the strong ruling over the weak is natural to what Aristotle appears to take to be a corollary, that the opposite is harmful.

Consider what this means. The crucial step in this argument rests on the tacit premise that anything which is natural is beneficial and that which is unnatural is harmful. This is the only way to move from the descriptive claims of premises 1-6, 9 and 10 to the normative conclusion that it is better for those who possess a slavish nature to be slaves. While the argument partly rests on the observation that animals benefit from the rule of humans, this is only a secondary part of the argument here. The real focus of the argument rests on the assumption that what is natural is good, and Aristotle asserts this without any supporting argument. We may assume, therefore, that he did not think any such argument was needed. The association between the natural and the good was so strong in his mind that there was no need to argue for this.

This leaves us with two arguments in the *Politics* that rest upon the connection between the natural and the good. Aristotle's criticism of certain forms of achieving wealth is predicated on the belief that they are unnatural, and because they are unnatural he holds them to be wrong. His argument in support of some kinds of slavery is likewise dependent upon the belief that what is natural is beneficial and what is unnatural is harmful. Both of these arguments depend upon the association between the natural and the good. If what is natural is not guaranteed to be good, the arguments lose their force. There would be no justification for condemning those who practice usury simply on the grounds that the practice is unnatural, and similarly Aristotle could not support slavery simply because it was natural. Both of these arguments rest on the belief that what is natural is good, and Aristotle accepts this premise in each case without any additional argument or support. Apparently this belief was so deeply held, or he felt that it was so obvious, that there was no need to offer any defence of it.

Section IV - Nature as Less Than Ideal

Thus far I have glossed over an important detail. I have treated Aristotle's remarks as making the claim that *phusis* acts for the good, but this is not always said to be so without qualification. Let us return to the passage from the opening of the *Progression of Animals* where he suggests that it is a general principle that nature does nothing in vain. There he writes:

> Of these one [general principle] is that nature creates nothing without a purpose, but always the best possible in each kind of living creature by reference to its essential constitution. Accordingly if one way is better than another that is the way of nature. (*IA* ch. 2, 704b15-17)

Aristotle is making two related but significantly different claims here. In the first sentence he argues that each organism's *phusis* acts to create the best *possible* outcome for that particular organism. It would be better for humans to be able to fly, at least in some respects, but it is not possible for us to do so.[134] Thus, the fact that humans are incapable of unassisted flight is not a mark against the truth of the principle, for although nature acts for the best it is constrained by what is possible. In the second sentence, however, Aristotle makes a much stronger claim, i.e., that whatever way is better that is what nature will do. In other words, nature acts for the best, full stop. These two claims appear to conflict, for if the way of nature is always to be the way that is better then nature cannot be constrained in any way.

Thus far we have considered Aristotle's remarks as if he had the second formulation in mind, i.e., as if he believed that nature always did what is best without qualification. In this section we will examine the other side of this tension, the view that nature is not the best possible but rather that it is, or may be, deficient in some way. The most innocuous instance of this, as we have already seen, is Aristotle's suggestion that nature does the best possible, e.g., "nature's workmanship is never purposeless. . .but everything for the best possible in the circumstances" (*IA* ch. 12, 711a16-19). The implication here is that there may be a better option, but the circumstances restrict what nature is able to accomplish at the time. There is, however, in Aristotle's thinking a strand of more serious

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[134] Human beings lack wings, which are necessary for flight (*Part. An.* IV.12, 693b30ff), and a tail, which is necessary for steering during flight (*IA* ch. 10, 710a3-4).

criticism of the shortcomings of nature, as, for example, when he writes in the *Politics* that "the deficiencies of nature are what art and education seek to fill up" (*Pol.* VII.17, 1336b41-1337a1). Here we see the thinking that not only is nature inadequate in some way but that its counterpart, human art and reason, are able to improve upon the areas where nature falls short.

The best-known instance of this is a passage in *Physics* II.8 where Aristotle compares the operations of art and nature to conclude that if the one acts teleologically then the other does as well. As part of this argument, Aristotle writes that "generally art in some cases completes what nature cannot bring to a finish, and in others imitates nature" (*Phys.* 199a15-17). There are numerous examples of art imitating nature in the Aristotelian corpus; one of the stock examples is that of the doctor who artificially warms the patient because this is what would occur if the disease resolved itself naturally (*Meta*. ζ.7, 1032b5-9). What is really interesting here is Aristotle's claim in the first half of this sentence, that art in some cases completes what nature cannot finish itself. The implication of this is twofold: first that nature is not perfect; second, and more audaciously, that humans can actually improve upon what nature does.

For a really sharp example of this, we may turn to Aristotle's 'lost' defence of philosophy, the *Protrepticus*–lost no longer thanks to the reconstructive work of Hutchinson and Johnson.[135] While discussing natural teleology there, Aristotle elaborates further upon the view sketched in *Physics* II.8 by writing:

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[135] I will accept the reconstruction of Hutchinson and Johnson presented in "Authenticating Aristotle's Protrepticus."

> Skill exists to help nature and to complete what nature leaves undone. For some things nature seems capable of completing by itself without requiring any help, but others it completes with difficulty or cannot do at all. . .some seeds obviously germinate without protection, whatever kind of land they fall into, others need the skill of farming as well. (*Protrepticus*)[136]

Once again nature is described as being incapable of bringing something about, in this case the germination of certain plants. While most plants are capable of reproduction on their own, a few are more finicky and require the careful tending of a human farmer. While nature would prefer to ensure that all plants were able to germinate on their own, this does not seem to be possible given the circumstances. So, humans step in and complete what nature is incapable of finishing on its own, and nature is thus subservient to art in this case.[137]

The clearest example of nature needing artificial assistance is one of which Aristotle could not have been aware. Corn is thoroughly dependent upon human beings for its initial and continued existence. With regard to its initial existence, Margaret Visser observes, "Nothing like this man-sized plant with its huge cobs and succulent kernels exists in uncultivated nature,"[138] and Michael Pollan poetically describes it as "a human artefact."[139] This description is hardly

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[136] Hutchinson and Johnson, 259. In defence of the authenticity of this passage, we may observe that it is part of a much larger block of text. Concerning this block of text, Hutchinson and Johnson argue that it "shows no signs whatever of being anything other than a continuous unbroken quotation, unmodified as far as we can tell, of a long passage, the largest continuous fragment we currently possess of the *Protrepticus*" (Hutchinson and Johnson, 262). Additionally, given the parallels between this passage and that from *Physics* II.8, it seems entirely reasonable to conclude that the passage is by Aristotle's own hand.

[137] Of course, nature is not entirely subservient to art. After all, there is a reason why art imitates nature, as we read in *Physics* II.8. What is important here is that nature is not always superior, even though it certainly is in some instances.

[138] Visser, 29. The information that follows concerning the history of corn is taken from Visser, 29-30; cf. Pollan, 26-28.

[139] Pollan, 27.

an exaggeration. The ancestors to modern corn are thought to have to have been teosinte grasses with separate kernels, and through domestication early Central Americans were able to transform this grass with separate seeds into a plant like corn with kernels clustered around a cob. This process must have occurred before 3600 BCE, for this is where we find evidence of the earliest cobs, albeit cobs that are no longer than half an inch long. It is not until approximately 2900 BCE that corn had been bred with kernels of the size familiar to us. Without the human breeding of teosinte grasses and the further refinement of the first tiny cob-bearing plants, there would be no corn as we know it today.

With regard to its continued existence, corn is also entirely reliant upon human intervention, for the cob's husk is tightly wrapped around the kernels inside. While this offers the benefit of superior protection to the kernels, the job done by the husk is a little too good, for it is so tight that it prevents the kernels from from sprouting. Moreover, the density of the kernels on the cob means that even if the seedlings were able to escape the husk, they would quickly crowd themselves out. As Margaret Visser notes, "In fact, if man ceased to take a hand by unwrapping the cob, plucking the seed, and planting it out, *Zea maïs* would become extinct."[140] To put this as Aristotle would, if he were aware of the situation, when it comes to corn, human art is capable of bringing to completion what nature intends but cannot complete on its own.

This presents a second way of viewing nature, one in which it is considered to be less than ideal. This runs the gamut from the negative view that

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[140] Visser, 28.

nature is deficient to the significantly more positive view that nature does the best it can given the constraints placed upon it. The common thread the unites all of these possibilities is the view that nature can be improved upon through human skill and reason. In this way art completes what nature is unable to finish on its own.

Section V - Implications

We have now seen two competing strands of thinking in Aristotle's thinking about nature and the good. On the one hand, nature is said to exhibit the good, i.e., the way of nature is the best. On the other hand, there are times when Aristotle is willing to admit the shortcomings of nature, especially by acknowledging that art completes what nature is unable to finish. It appears, on the surface, as if there is a little bit of both Helen and Ganymede in his thinking, but how well does this appearance stand up to careful inspection? It might be objected that my labelling these sections as 'nature and the good' and 'nature as less than ideal' is question begging and creates the illusion of a sharp problem that is actually much less serious. Instead, one might argue that whatever tension exists in Aristotle's thinking is more moderate, where nature is generally seen to be good, but even when it falls short of the highest good it still aims at the best possible. There is much less contrast between the claim that nature does what is good and nature does what is good in the circumstances.

This can be illustrated by returning once again to the *Progression of Animals* passage that has played such an important role so far:

> Of these one is that nature creates nothing without a purpose, but always the best possible in each kind of living creature by reference to its essential constitution. Accordingly if one way is better than another that is the way of nature. (*IA* ch. 2, 704b15-17)

As we have already seen, the second sentence expresses the idea that what is natural is always better, and the first sentence places limits on this in some situations. If there really were a deep tension, the argument runs, Aristotle should not be expected to make these two claims back to back. Perhaps we are being too caught up in linguistic technicalities, and instead we should read these both sentences as expressing parallel ideas. Nature is superior, but, as should be expected, there are a few exceptions.

The crux of the problem, however, lies in the two arguments from the *Politics* concerning wealth getting and slavery. Both of these rest on the premiss that the way of nature is the best *simpliciter*, not the view that the natural is generally pretty good. In order for Aristotle to conclude that those with a slavish nature are better off as slaves, he requires the premise that nature always aims at the good, that what is natural is always the best. If we allow that nature can be improved upon then Aristotle would have to provide a further argument for why it is in this case that human artifice cannot improve upon nature. He would be open to the simple suggestion that slavery is an example where nature intends to bring something about but cannot, and it is up to human art to fill in the gaps. Similarly, his condemnation of usury on the grounds that it is unnatural would fall prey to the same line of reasoning. Perhaps earning money from money is a clever improvement upon the natural order of things. After all, it allows for significant

increases in the levels of wealth just as the refinement of teosinte grasses have transformed it into a plant capable of bearing a cornucopia of kernels.

On one level it does not matter overly much if these arguments against slavery and usury fall. After all, there are significantly better arguments to be made against each of them, so why should we be concerned? On another level, however, the point I want to stress is what this reveals about Aristotle's thinking about nature. When making these arguments in the *Politics*, we have to assume that Aristotle took them very seriously. They are presented with all the weight and *gravitas* that we would expect of any other serious argument. For these arguments to succeed, he must be thinking that nature aims at the good. Not the mostly good. Not what is good given some constraints. But the good itself. That he backs off from this in other places reveals that his understanding of nature contains a deep tension. At times it is considered that the natural way is the best way, but at other times that way can be improved upon. Aristotle's thinking on this is divided.

Seeing this tension allows us to understand better the two other tensions we have previously addressed. Aristotle's indecision about whether nature is superior or capable of being improved upon underlies his worries about the possibility of nature to change. If nature can change and still be natural, then nature cannot be the best. This would require the possibility that nature could change from the best into the best, but this is obviously a logical impossibility. More specifically, Aristotle's concern about about old age and death is also driven by his indecision about the status of nature's goodness. If nature is considered to

be the best then the natural state for an organism must be at the prime of its life, the time when it is at its peak. Ageing, in so far as it is a falling away from this optimal state, could not be considered to be natural on this view. If, however, one is not committed to the view that the natural must fully embody the good then one is free to allow that what is natural can change, and on this view ageing can be considered to be natural. We can understand Aristotle's inability to accept the solution to the tension surrounding nature's capacity for change as an extension of his inability to sort out the degree to which nature exhibits the good.

Furthermore, the tension over whether or not humans are part of the natural world has also informed his inability to decide whether or not what is natural is best. Questions concerning the relationship between humans and the natural world, or at any rate the interesting questions about this, all focus on what it is that humans ought to do. Aristotle's concerns about acquiring wealth are driven by concerns about what is natural. Likewise, he is willing to defend a form of slavery on the grounds that it is natural. Here the thinking is that human beings ought to do what is natural; we ought to conform to the natural world. Of course, we can take another tack and argue that humans are separate from nature and ought to supersede it. If we do this, slavery and usury would need to be evaluated on grounds other than their naturalness or artificiality. But Aristotle either did not recognize this or feel that such an argument was necessary

Section VI - Final Conclusions

In *Physics* II.1, Aristotle defines *phusis* as "an *archē* or *aitia* of change and of remaining the same in that to which it belongs primarily, in virtue of itself and not accidentally" (*Phys*. 192b21-23, trans. modified). This is his philosophical understanding of nature, and it is very well known to all Aristotelian scholars. Less appreciated, however, is that this philosophical understanding rests upon a pre-existing, pre-theoretic understanding of the natural world. Aristotle's pre-theoretic understanding was shaped by: (i) the etymology of the word *phusis*, (ii) the word's use in Homer and the Hippocratics, (iii) and the prior philosophical uses of the word, especially among the *phusiologoi* and the Sophists. The concept possessed a rich heritage prior to Aristotle, but this means that it was already convoluted by the time he inherited it.

Because of this, there appear to be three tensions in what he says about *phusis*. Most noticeably, he is unclear about the degree to which humans belong to the natural world. This is highlighted by his treatment of natural arts, especially his classification of some arts as partly natural. I have suggested that he is torn between conceiving of nature as a specific, static state or allowing that nature can change. On the former understanding, ageing and decay are unnatural, but on the latter, they turn out to be natural. Aristotle appears to resolve this tension to some degree by claiming that there are two criteria for defining the natural–what exists initially or what results from uninhibited growth–but this still does not explain why death is unnatural. Further underlying this claims seems to be the belief that what is natural is good, and death is bad for the organism. This same

thinking is used to undergird arguments in support of slavery and against usury, but at other times Aristotle suggests that human artifice can improve upon nature. If that is true, however, then the bare fact that slavery is natural is not sufficient on its own to guarantee that slavery is justified, and neither could usury be condemned simply because it was unnatural. The murkiness of the concept of *phusis* seeps through many of the places where Aristotle uses it.

If there is any error on his part it is that he does not demonstrate greater awareness of this. While he does acknowledge that *phusis* is spoken of in many ways and appears even to recognize the pre-theoretic understanding in *Metaphysics* Δ.4 where the first meaning of *phusis* he mentions is "the genesis of growing things" (*Metaph*. 1014b16), he is not careful in other discussions to make clear which meaning of *phusis* he is using. The most charitable reading would suggest that Aristotle was always clear in his own mind about which meaning of *phusis* was in play in different passages but that he did not make this clear to his readers. One task of an Aristotelian commentator, therefore, would be to recover which meaning he had in mind in different places throughout the *corpus*. This charitable reading can be pushed only so far, however, because there are times when Aristotle himself seems to have conflated the different understandings of *phusis*. The most noticeable of these is in *Physics* II.8 where he ought to speak from the philosophical understanding but his remarks about swallows' nests can only be made sense of from the pre-theoretic. At least, there appears to be no way to make swallows' nests turn out to be natural in the sense of having an

internal principle of change and staying the same, but they are natural from the standpoint of belonging to the natural world.

Nevertheless, even if Aristotle does slip in how he thinks about nature, he should not be faulted too heavily for this. After all, he was working with an idea which, by his time, had already become convoluted; these tensions were already ingrained into the concept. Furthermore they remain entrenched in the concept even today. We are torn when it comes to such things as considering forest fires to be part of nature or an interference with it, whether we should be emulating or overcoming nature, and whether or not we should treat a half-eaten pear as natural. Aristotle's thinking reflects this confusion, but we cannot judge him harshly for this. If there is any reason to fault him it is only because he is generally such a careful and meticulous thinker, so that the tensions stand out in comparison. That nature features so prevalently in Aristotle's thought but remained puzzling even to him speaks volumes towards its inherent obscurity.

Appendix[141]

In the previous five chapters, I have argued that running throughout Aristotle's work is a concept of a certain kind of Big Nature, one that is best described as 'the natural world.' After presenting the arguments raised by Gotthelf and Lennox against other forms of Big Nature–Demiurgic and Cosmic–I left them unchallenged. In the following pages I want to call these arguments into question. To that end, I will first review both Sedley's argument in defence of locating a Cosmic Big Nature in Aristotle's thinking as well as the chief criticisms raised against this in the nearly two decades since his article was published. With the lessons learned from the shortcomings, real or perceived, of Sedley's argument, I will develop a fresh, firmer case in defence of the view that there is room in Aristotle's metaphysics for a Cosmic Big Nature.

In 1991, Sedley published a now infamous paper defending the position that Aristotle's broad natural teleology was anthropocentric.[142] The response has been an almost universal rejection of his argument.[143] At the heart of his paper is an argument built upon David Furley's previous demonstration of why Aristotle's well-known description of rainfall in *Physics* II.8 should be read as if the

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[141] The groundwork for the argument presented here was carried out in the winter of 2007 while I was a visiting student at the University of Texas at Austin. While there, I had the privilege of working with Jim Hankinson, whose guidance and suggestions were invaluable, and I remain deeply in his debt.

[142] David Sedley, "Is Aristotle's teleology anthropocentric?"

[143] Wardy and Judson, whom we will consider below, are good examples of Sedley's critics. More recently, however, Mohan Matthen argues that "Sedley's hypothesis is controversial, to say the least" but tempers this somewhat with the suggestion that, "in light of [Sedley's] work it now seems uncontroversial that Aristotle's teleology of the living world is not fragmented and species-bound in the way it was only recently thought to be." (Matthen, "Teleology in Living Things," 345)

philosopher considered rain to fall for a purpose.[144] Because of the weight placed upon this passage, it is worth quoting Aristotle at length here:

> We do not ascribe to chance or mere coincidence the frequency of rain in winter, but frequent rain in summer we do; nor heat in summer but only if we have it in winter. If then, it is agreed that things are either the result of coincidence or for the sake of something, and these cannot be the result of coincidence or spontaneity, it follows that they must be for the sake of something; and that such things are all due to nature even the champions of the theory which is before us would agree. Therefore action for an end is present in things which come to be and are by nature. (*Phys.* 198b33-199a8)

Aristotle divides events into two categories: those that happen haphazardly or by chance, and those that occur regularly and for a purpose. All regular occurrences are purposeful, so winter rain, which happens regularly, must thus be for some purpose. What is left for the interpreter to determine is what Aristotle takes this purpose to be. Knowing that Aristotle's cosmology attributes a proper place in the world to each of the four elements–concentric circles of earth, water, air, and fire–one might be tempted to assume that he considers rain to fall for the sake of water returning to its proper place. This assumption, however, fails to explicate why Aristotle considers only *winter* rain to have a purpose, while summer rain does not. After all, rain returns water to its proper place during the summer as well. Nor, does this proposal alone explain his comments about summer heat.

To offer a more satisfactory interpretation of Aristotle's reasoning, Sedley cleverly proposes that one approach the problem not as a Western scholar but from the mindset of an Attic farmer. He writes, "In Attica, winter rain was the only important rain for farmers. . .[and] it is the heat of the summer sun that serves to

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[144] David Furley, "The rainfall example in *Physics* ii.8."

ripen the olives of Attica."[145] Viewed from this perspective, Aristotle's emphasis on *seasonal* rainfall and heat becomes more intelligible. Rain falls regularly in winter for the sake of the growth of cereal crops, while the regular summer heat provides for the ripening of olives.

This reading of Aristotle's comments on rainfall presupposes a place for Big Nature in Aristotle's ontology. If Lennox is right and there is no Big Nature over and above the *phuseis* of individual substances then rain would have to fall solely for some purpose internal to itself. Sedley's proposed reading entails that the *phusis* directing rainfall must be over and above the *phusis* of the rain, for the rain falls for a purpose external to itself. One cannot appeal to the formal *phusis* of the rain to explain why it falls regularly in winter and not summer, so it appears as if we should attribute a concept of Big Nature to Aristotle.[146]

Sedley's reading of this passage is not without controversy. In particular, both Robert Wardy and Lindsay Judson have taken issue with Sedley on this point.[147] Wardy critiques Sedley for being too hasty to dismiss what Wardy calls the 'elemental teleology' reading, i.e. the interpretation that rain falls for the sake

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[145] Sedley, 186.

[146] Most recently Mariska Leunissen has suggested that the rainfall passage should be read as an example of art completing nature. Human beings "impart the art of agriculture on the water, which due to material necessity is regularly available in the winter for the irrigation of seeds" (Leunissen, 38). In other words, without human beings rainfall would not be for the sake of crop growth; instead, humans have adjusted their planting schedules to correspond to when rain falls. Rain falls for a purpose, but that purpose is dictated not by nature but by the human farmers. For her complete argument, see 31 and 36-39.
What Leunissen's proposed reading overlooks is that plants would grow in winter even without the intervention of humans. Attic farmers plant in the winter presumably because their art imitates nature (*Physics* II.8, 199a15-17). While her explanation accounts for the apparently anthropocentricity of the teleology of rainfall, it does not account for the broad, interactive teleology that Sedley reads in this passage.

[147] Robert Wardy, "Aristotelian Rainfall or the Lore of Averages" and Lindsay Judson, "Aristotelian Teleology."

of its return to its proper place in the universe. He proposes that while the circumstances surrounding rainfall in August may be accidental, once these circumstances arise the resulting rainfall is not. On this reading, rain always falls for water to return to its proper place. If the conditions are right, let us say droplets of water have risen high in the air and heavy storm-clouds have formed, then there will be rain for the sake of this return. It is unusual, however, for these clouds to form in summer. Thus, if Wardy is correct, Aristotle's intention in this passage is not to claim that *rain* in August is unnatural but that the *circumstances* leading to the formation of heavy storm-clouds at that time is. There is then no worry about an overarching *phusis* directing the rainfall, and on account of this Wardy believes his reading should be preferred.

Judson in turn has criticized Sedley's reading of the *Physics* II.8 passage on the general grounds that it requires us to import "some view generally thought un-Aristotelian—the view that the world is governed by divine providence, or the view that it is the work of a cosmic Nature."[148] Additionally, Judson has also suggested that Sedley's reading allows for too much to be captured within the scope of natural teleology. In support of this, he provides two examples: a hypothetical case where regular avalanches block a certain valley that subsequently permits a warring tribe to regroup in safety, and students regularly using hayfever as an excuse for poor performance on their exams. Sedley's Aristotle, Judson argues, would be forced to accept the unappetizing consequences that "avalanches happen for the sake of providing safety for the

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[148] Judson, 346.

tribe" and "the hayfever occurs for the sake of providing an excuse."[149] Judson sees only one way out for Sedley's Aristotle to avoid these results, by *ad hoc* "restricting the sorts of regularities and/or beneficial consequences to which the argument is meant to apply."[150]

There is, however, another defence available. Considering first the hayfever example; it seems unreasonable to foist this upon Aristotle as being a regular occurrence. Surely not all students use hayfever as an excuse for poor performance. A number generally do quite well and presumably need no such excuse, while others who do poorly routinely offer other excuses such as a lack of sleep or a cruel professor out to get them. The second example faces the same critique. It is implausible to believe that a warring tribe would regroup in a blocked valley sufficiently frequently to prompt Aristotle to describe this as occurring always or for the most part. Undoubtedly some avalanches would occur when the tribe was on the offensive, who then would be prevented from pressing their attack rather than allowed a recuperative respite. This example fails upon closer scrutiny because avalanches and regroupings are separate, unrelated events. Aristotle's assumption is that regularity can only be explained if two events are linked and without that link the regularity would not exist. Judson's counter arguments fail because they do not describe events that could happen with sufficient regularity. We are uneasy associating a causal connection between the events because of our awareness that they do not, our could not, occur regularly.

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[149] Ibid.

[150] Ibid.

If these events truly did occur regularly, they would not function as counter examples; we would, instead, be seeking the connection. By dismissing Judson's second criticism, all that remains is his first, i.e., that Sedley's reading imports a view "generally thought un-Aristotelian."

The dispute over the rainfall passage in *Physics* II.8 reduces to this. David Sedley, following Furley, suggests this passage is evidence that Aristotle thought the *telos* of rainfall was external to the rain itself. Robert Wardy and Lindsay Judson, however, resist this reading for the worry that it imports an un-Aristotelian idea of Big Nature. Instead, they argue that one can, and therefore should, read Aristotle's remarks in a manner more in keeping with the traditional view of his philosophy. The result is a stalemate, where one side claims Aristotle allows for Big Nature and cites this passage as evidence while the other denies that Aristotle's philosophy allows for this concept and proposes alternate readings instead.

One potential route forward seems to be to comb through the Aristotelian *corpus* in a search for further evidence of Big Nature. The greater the number of apparent references to the concept, the greater the evidence that this idea is Aristotelian after all. If the rainfall example in *Physics* II.8 turns out to be unique, however, the prudent response would be to disregard it as anomalous. Thus, the search for such passages is a road well-travelled in Aristotelian scholarship. That a number of candidates have been identified will prove to be both a blessing and a curse, for while it is useful to have these passages in hand, they too have

drawn as much controversy as the rainfall example. For our purposes here, it will be sufficient to consider only two of these examples.

In *Parts of Animals* IV.13 Aristotle makes the following observation concerning the placement of the mouths of dolphins:

> . . .in others, as the dolphin and the Selachia, it [the mouth] is placed on the under surface; so that these fishes turn on the back in order to take their food. The purpose of nature in this was apparently not merely to provide a means of salvation for other animals, by allowing them opportunity of escape during the time lost in the act of turning—for all the fishes with this kind of mouth prey on living animals—but also to prevent these fishes from giving way too much to their gluttonous ravening after food. (*Part. An.* 696b23-31)

Aristotle here describes two ends for the sake of which a dolphin's mouth is placed on the underside of its body: to allow their prey time to escape and to prevent them from overeating. While the second appeals to the dolphin's own good, the good of the first is enjoyed strictly by the dolphin's prey. As in the *Physics* II.8 rainfall example, Aristotle here allows for the possibility that the end of a thing's *phusis* may be external to itself. This in turn suggests that Aristotle's understanding of the working of nature is not limited to the material and formal natures of individual substances, as Lennox suggests. If the *phusis* responsible for the placement of the dolphin's mouth is that of the dolphin itself, it would not be concerned with the good of the prey. Yet while it appears as if Aristotle has in mind here a *phusis* over and above that of the dolphin and its prey, opponents of reading Big Nature in Aristotle observe that this form of explanation appears

nowhere else in Aristotle's biological works, and thus they argue that this passage should be dismissed as anomalous.[151]

Equally prominent for its apparent reference to Big Nature is a passage from *Politics* I.8 where, in the context of investigating the means by which wealth can be gained, Aristotle describes the relationship between humans and other living organisms in the following way:

> we may infer that, after the birth of animals, plants exist for their sake, and that the other animals exist for the sake of man, the tame for use and food, the wild, if not all, at least the greater part of them, for food, and for the provision of clothing and various instruments. Now if nature makes nothing incomplete, and nothing in vain, the inference must be that she has made all animals for the sake of man. (*Pol.* 1256b15-22.)

What is the *phusis* that makes nothing incomplete or in vain? The most intuitive approach is to read Aristotle's remarks here as referring to a Big Nature over and above the *phuseis* of animals and plants which it arranges for the ultimate purpose of serving humanity. The parallels between this passage and that dealing with dolphins' mouths are obvious, so while the form of explanation used by Aristotle to explain the placement of dolphin's mouths may be unique when considered against the biological works, it turns out not to be when considered against the corpus as a whole.

As with the dolphin passage, the proper interpretation of Aristotle's remarks here is a matter of some controversy. While Sedley shares my Big Nature reading, or I share his, others move to challenge the import of Aristotle's statements. Wardy, for example, denies "that this text has any theoretical import

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[151] See, for example, Lennox, 199 and Judson, 363.

for [Aristotle's] natural philosophy"[152] while Judson argues that Aristotle writes here from the viewpoint of a household manager and thus "[n]othing follows, however, about the status of these things from the standpoint of biology—or of Aristotelian first philosophy."[153] In other words, neither believes that Aristotle's argument in this passage should be taken seriously.

Underlying this dismissal by Wardy and Judson is the sentiment that the ideas expressed in these passages are somehow un-Aristotelian and thus they must be explained away. Treating Aristotle's apparent references to Big Nature in this way is common. Depending on the specific passage and commentator, it may be claimed that Aristotle is not writing from the standpoint of a philosopher, or that he is simply paying homage to 'common' ways of thinking, or that his remarks should be understood only metaphorically. At least one commentator has found the idea of Big Nature to be so thoroughly against his view of Aristotle that he treats reference to it as a later interpolation![154]

In general, we should be wary of adopting this kind of methodology for it leads down a rather dangerous road. Any judgement concerning the 'Aristotelianness' of a particular passage ultimately reflects the biases of the interpreter. Those that yield already desired results are considered to be philosophically serious, while those that appear to express a disfavoured view are dismissed as not reflecting Aristotle's true beliefs. Let us instead adopt the

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[152] Wardy, 22.

[153] Judson, 357.

[154] Roger French, for example, asserts that the passage describing the placement of dolphins' mouths must simply be a later interpolation (French, 51).

approach that, except in cases in which he clearly acknowledges that the view under discussion is not his own, we must treat all of what Aristotle writes to reflect his own thinking. To do otherwise effectively imposes our own views onto the text.

As for the argument of the uniqueness or anomalousness of any one apparent reference to Big Nature, this becomes weaker the greater their number. We have already examined three of the most familiar: the rainfall example in *Physics* II.8, the position the mouths of dolphins in *Parts of Animals* IV.13, and Aristotle's description of natural hierarchy in *Politics* I.8. To that list may be added at least one more, his comparison between the good of the universe and the good of an army in *Metaphysics* Λ.10.[155] Note that these references span the *corpus*; physics, biology, politics and metaphysics are all represented. While the evidence from these passages is not definitive, and certainly not without controversy, this suggests that the concept of Big Nature runs deeply throughout Aristotle's philosophy.

It is clear that the passages generally offered as evidence for a concept of Big Nature in Aristotle have proven to be more controversial than conclusive. Most of this disagreement stems, it seems, from taking a head-on approach to the matter; those who have argued on behalf of Big Nature try for too much too fast with the result that the idea strikes many as being too un-Aristotelian. We may be able to avoid a great deal of difficulty, therefore, through the adoption of a less ambitious method, by sidling up to the problem instead. Rather than asking if Aristotle endorses a concept of Big Nature, let us inquire if there is evidence for

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[155] For discussion of this passage, see Sedley 192-195 and Wardy 23ff.

an endorsement of the concept of a big nature, i.e. a *phusis* over and above the *phuseis* of individual substances that stops short of being the *phusis* of the whole world. If it can be shown that Aristotle allows for big natures then the move to Big Nature would be a much smaller leap.

There is one location particularly well-suited to demonstrate this, Aristotle's description of the historical growth of the *polis* in *Politics* I.2. Admittedly, Sedley himself discusses this chapter, but his remarks focus on the hierarchical structure of "conjugal pairings, households, and whole *poleis*"[156] and the teleological nature embodied by these structures; our approach will be different. Throughout his description of the historical growth of the *polis*, Aristotle describes the union of male and female (*Pol*. 1252a26), the family (*Pol*. 1252b13), and the *polis* (*Pol*. 1252b31) as natural (*phusei*). While Sedley takes these three to be natural entities, he does not investigate the implications of this. Instead, he focusses on exploring how Aristotle's discussion in this chapter serves as an example of how *phusis* may be organized around some good (our own) just as the *polis* is. This may have been an oversight on Sedley's part, for a closer reading of this passage holds the key to demonstrating that Aristotle accepted there to be big natures.

First, let us acknowledge two objections Wardy raises against Sedley's use of this passage. The first is that "Aristotle's *leitmotif* is that the πόλις is φύσει, not that it is a φύσις in its own right."[157] In order to count as evidence that Aristotle has a concept of a big nature, this passage would need to describe the

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[156] Sedley, 193.

[157] Wardy, 25.

polis as a *phusis*, but Wardy argues that Aristotle only labels it natural (*phusei*). Secondly, he argues that treating the *polis* as a substance with its own nature leads to unattractive results. If a *polis* is a substance then human beings could not be substances, for no Aristotelian substance may be made up of other substances. People, it would turn out, are "no more substances than are arms or legs," as Wardy so nicely puts it.[158] If we are to read this chapter as evidence for a big nature in Aristotle's philosophy, these two challenges must be satisfied.

Aristotle's account of the development of the state reads as if he were describing the growth of an organism. This development begins with the union of male and female, runs through extended families and villages, and culminates in the *polis*. The *polis* is the mature form; he describes it as the end of these previous stages (*Pol*. 1252b32). But of what exactly is the *polis* the mature form? Based on his claims that the *polis* is prior to the individual at *Pol*. 1253a19 and *Pol*. 1253a26, one might be tempted to think that the *polis* is the *telos* of a human being, but this reading overlooks a key component of his description of the *polis*' growth. He is clear at the beginning of his account that the origin of the *polis* is not an individual human, but the union of male and female (*Pol*. 1252a25-27). Similarly, at the end of his account he is careful to describe the *polis* as the end of the earlier forms of society, i.e. a male-female union, family, village and the like, and not as the end of an individual (*Pol*. 1252b30-32). His claims that the *polis* is prior to the individual do not arise until after his account of the creation of the *polis* has been completed.

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[158] Ibid.

Aristotle's general account here is a description of the *polis*, from its infancy as the union between a man and a woman to its maturity as a self-sufficient *polis*. This will prove to be important, as we shall soon see, but more interesting for the time being are the examples he gives at the end of this account. He writes, "what each thing is when fully developed, we call its nature [*phusis*], whether we are speaking of a man, a horse, or a *family* [*oikias*]" (*Pol*. 1252a32-34, *emphasis added*). Three examples are given of things he considers to have a *phusis*: a man, a horse, and a family. There can be no doubt, therefore, that Aristotle considers a family to be the sort of thing that possesses a *phusis*; he mentions it in the same breath, and gives it the same status, as a human and a horse. But a family is not the same thing as a horse or a human, for it is a collective over and above the individual natures of which it is composed. A family is a big nature.

Wardy objected to Sedley's description of the *polis* as having a *phusis* on two grounds: (i) the passage treated the *polis* as *phusei* and not as being a *phusis* in its own right, and (ii) treating the *polis* as a substance with its own nature leads to the result that humans are no longer substances. What force do these objections have against the claim that the family has a *phusis*? While it is true that Aristotle's account of the growth of the *polis* describes male-female unions, the family and the *polis* as natural only, not as having a *phusis*, he also explicitly includes the family among the examples of things with *phuseis*. This is enough to show that objection (i) does not apply to the family. Additionally, if the family's *phusis* finds its expression in the *polis*–as the *polis* is the fully developed

form of the family–presumably this means that Aristotle held that the *polis* too had a nature. This just might be enough to head off objection (i) for the *polis* as well, but we need not press this. Our present aim is only to present evidence of a big nature, and it makes no difference if that takes the form of the family or the *polis*. Since Aristotle says unambiguously that the former has a *phusis*, just as humans and horses, this is sufficient.

Wardy's second objection cannot be dismissed as easily. Even if the focus has shifted from the *polis* to the family, treating the family as a substance with a *phusis* of its own still results in the problem that humans turn out not to be substances on the grounds that no substance is composed of other substances. There are at least two ways of dealing with this. Firstly, we must acknowledge that this sort of problem runs broadly throughout Aristotle's thinking. As we have seen, he includes both animals and the simple bodies (earth, water, air and fire) among his list of natural bodies at the beginning of *Physics* II.1. As Sarah Waterlow observes, this list corresponds to the list of things said to be commonly held as substances in the *Metaphysics* (*Metaph.* Z.2, 1028b8-13). Although Aristotle ultimately rejects the parts of animals and the simple bodies as substances in subsequent chapters of the *Metaphysics*, Waterlow points out that "the equation in *Physics* II.1, 193a9-10 of 'being a substance' with 'having a nature (= the inner principle of change)' entails a substantial status for the simple bodies."[159] In *Physics* II.1, Aristotle appears committed to the view that both simple bodies and animals are substances despite the conflict with his

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[159] Waterlow, 53.

metaphysics. It matters little why he says this—books I and II of the *Physics*, at least, are thought to be earlier works, and if we consider Aristotle to be a 'working philosopher' we may hypothesize that he was as yet unaware of the difficulty inherent to his view as presented there—all that matters is that in one of his core books he is comfortable treating both wholes and their parts as substances. Even if he is mistaken or not entitled to do it, this seems to have once been an Aristotelian idea. Thus, the apparent difficulties with the claim that both families and humans are substances should not rule out reading *Politics* I.2 as demonstrating that Aristotle considered a family to have a *phusis*.

Secondly, we need not necessarily think that there is a conflict here. *Politics* I.2 tells the story of the development of the *polis*, but this begins with the first union of human beings. Again, his account ends at *Pol*. 1252b30-32 with the claim that the *polis* is the *telos* of the "earlier forms of society," not the human being. Only later does Aristotle describe a *polis* as prior in nature to a human (*Pol*. 1253a19). This suggests that Aristotle was aiming his discussion on two levels. On the one hand, a human being properly speaking is a substance in its own right with its own *phusis*. But on the other, we can also think of a human being as a political animal, and *qua* political animal a human being's identity depends upon the state. In this second sense, an individual is analogous to a simple body, while the latter becomes incorporated into an claw or hoof that is part of an animal's body, the former becomes incorporated into a family that becomes part of the *polis*. Wardy's objection can be overcome if we recognize that human beings can be spoken of in many ways. *Qua* human beings they are

substances in their own right, but *qua* political animals they are 'no more substances than are arms or legs.'

If we have been successful in showing that Aristotle's philosophy includes a concept of big natures, then is there anything standing in the way of making the leap to Big Nature? It appears not. If the *polis*, or at least the family, possesses a *phusis* then there seems to be no conceptual problem with extending this to the whole world. This alone is not proof that Aristotle did acknowledge a *phusis* for the whole world, rather this argument is meant to clear the way for reading the passages identified by Sedley and others as evidence for this kind of Big Nature, e.g., the rainfall passage in *Physics* II.8, Aristotle's remarks about the placement of dolphins' mouths in *Parts of Animals* IV.13, his suggestion that lower forms of life exist for the sake of the higher in *Politics* I.8, and his comparison between the organization of the universe and an army in *Metaphysics* Λ.10. Reading a concept of Big Nature in Aristotle has traditionally been resisted on the grounds that his philosophy leaves no room for a *phusis* over and above the *phuseis* of individual substances. If we are correct, however, his philosophy not only leaves room for such a *phusis* but actively accepts at least one, the *phusis* of the family. Big Nature turns out not to be so un-Aristotelian after all.

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