AGAINST NATURAL TELEOLOGY AND ITS APPLICATION IN ETHICAL THEORY

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ABSTRACT

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Many ethical theories depend on the existence of natural teleology as a source of normativity. Natural Teleology, the purposive goal-directedness of non-conscious biological processes, is also embraced to some degree by a majority of philosophers of biology who agree that the teleological concepts of purpose, goal, defect, proper function and malfunction are legitimate, perhaps necessary, in biological explanations. In my dissertation I provide a substantive argument against the reduction of teleology to natural facts and argue that ethical theories that rely on it cannot be naturalistic. Several ethical theories could be my target, but I focus on the most overt example: neo-Aristotelian ethics. The project is in two sections, one in ethical theory and the other in philosophy of biology. In the first section of the dissertation, primarily using Philippa Foot and Judith Jarvis Thomson as models, I illustrate how Neo-Aristotelian theories rest on natural teleology. I offer a metaethical analysis of teleology, arguing that it does not belong to the good nor the right nor mere description, but rather the proper. I call this category of concept protonormativity. I claim that protonormativity, of which teleology is a paradigmatic example, does not yield normative facts and is not reducible to natural facts; it is a distinct conceptual category. In the second section I give a novel argument for why natural teleology cannot be reduced to natural facts. Teleological concepts such as “design” and “proper function” imply standards of correctness for phenotypic outcome. They entail norms for the way an item is to be in the end: functional or malfunctional, “good” or defective. However, since a phenotype is the result of a genotype in some set of environmental conditions, there can only be a proper phenotype if there exists a proper environment for the item to inhabit. Regarding artifacts, a designer is capable of setting a proper environment, but I argue science does not admit of proper environments for organisms in nature. The concept “proper environment” cannot be reduced to

any set of natural facts. Therefore metaethical naturalists must abandon proper phenotypes, natural teleology, and ethical theories that rely on it.

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INTRODUCTION

Appeals to "human nature" in philosophy, once unfashionable, are now more common than ever. Virtue ethicists, Thomists, deontologists, and contractarians, as well as feminists and consequentialists have sought to gain support for their own ethical positions by appealing to human nature. Generally, if one's ethics is in accordance with human nature this is seen as a *good* thing. For instance, the utilitarian Peter Singer has argued that understanding the way that human psychology has evolved and shaped human nature should inform both our strategies in trying to make humans happy, how much we can reasonably expect humans to sacrifice in the name of morality, and which of our moral intuitions are more trustworthy than others.[1] Historically, skepticism about human nature has often been blunt and implausible, such as the influential idea that the human mind begins as a blank slate.[2] But skepticism about human nature can take a different form altogether, not committing itself to a blank slate model at all. Indeed, one can affirm that humans have many innate instincts explained by evolutionary processes, yet deny that humans have a "nature" strictly speaking. In this dissertation I argue that naturalists should reject the idea of "human nature," and indeed should reject that *any* organism or its parts or operations has a nature, purpose, proper function, or the like. I think that a naturalistic and scientific worldview does not permit the existence of these phenomena because they imply the existence of norms that are themselves unsupported by naturalism. This amounts to an argument against the phenomenon known as *natural teleology*, the purported goal-directedness of non-mental (vegetative) biological processes. Aristotle's teleology was the basis for his understanding of biological organisms, and of course led to his ethics as well. In the dissertation I make a case against natural teleology and its accompanying norms, using that conclusion to

[1] See Singer's "Ethics and Sociobiology" (1982) and "Ethics and Intuitions" (2005)
[2] See Pinker's *The Blank Slate: The Modern Denial of Human Nature* (2002)

critique ethical theories that have relied on it. Because Aristotelian ethics is most explicit in its use of teleology it will be my main target, although I shall also point out how some other familiar ethical theories are in trouble if belief in natural teleology is unwarranted.

This work spans two areas in philosophy: ethical theory and philosophy of biology. In addition to providing an argument against natural teleology, I offer a metaethical diagnosis of the problem, arguing that teleology is not merely *descriptive* nor fully *normative*, but instead belongs to a family of concepts relating to "the proper" that I label *protonormative*. Teleological propositions resist conceptual reduction to merely descriptive terms, and do not conceptually entail propositions about normative concepts such as *goodness* or *rightness*, at least traditionally understood[3]. In order to use natural teleology to form a metaethically naturalistic theory, a neo-Aristotelian would have to explain not just how norms for teleological function give rise to practical reasons, but also explain how teleological norms are derived from natural facts. I focus on this latter step and argue that despite attempts to explain teleological functions in naturalistic terms, there exists an ineliminable reference to "proper environments," which I believe naturalists should reject. Without this naturalistic grounding, natural teleology itself cannot be fully "naturalized," and neo-Aristotelian ethics is forced to abandon its own claims to naturalism.

I begin by explaining the structure of neo-Aristotelian ethical theories. This tradition focuses on human *flourishing* by using natural teleology to link a substantive account of human well-being with an analysis of what makes a *good* human. This relies on the evaluation of humans as "good" or "bad" examples of our kind, a process that the neo-Aristotelian believes can be informed by a naturalistic examination of the proper functioning of certain physical and mental traits. The neo-Aristotelian strategy is to explain how the evaluation of humans is

[3] As I discuss in chapter two, there are protonormative senses of both "good" and "right," but these are not standardly thought of us normative in the traditional sense.

fundamentally the same sort of evaluation that we regularly make regarding functional versus malfunctional artifacts as well as plants and animals (and their parts). Since I agree that this mode of evaluation is legitimate in artifacts, I take it as my burden to show why it does not work when it comes to the biological world.

The second chapter turns to metaethical concerns, giving an analysis of the norms implied by teleology. I note that teleology can be expressed through a diverse range of evaluative and deontic vocabulary. For instance, while sometimes it is said that the *purpose* of the heart is to pump blood but it is not usual to hear that the heart *ought* to pump blood or that a *good* heart is one that pumps blood. I explain why all three propositions are implied by an understanding of the heart as teleological. I argue that propositions such as these, however, are not conceptually *normative*, traditionally understood, because they do not imply conclusions about any property of *goodness* nor about *right* action. Yet neither are these propositions conceptually reducible to mere descriptive propositions. I argue that they are best understood as expressing norms for *the proper*, a category of norms I label "protonormative." This is a novel categorization, and I try to explain what exactly I mean by "protonormativity" and why it is conceptually distinct from mere description and normativity. The upshot for neo-Aristotelian naturalists is that I believe they must address concerns both about making inferences from human nature to practical reason, but a more basic inferences from scientific naturalism to human nature.

In chapter three I begin to investigate the metaphysical status of natural teleology. I begin by surveying the literature on biological functions, which has been the area where teleology has been discussed by contemporary scholars. I focus mainly on a disagreement between causal-role theories of function, which do not treat functions as teleological in nature, and evolutionary theories of function that embrace teleology. After explaining the recent history of the debate, I

argue that a stalemate persists that requires a different strategy, which I provide in the next chapter.

Chapter four contains my argument against natural teleology. I recommend focusing on the norms for proper function versus malfunction and defect that teleology implies. I argue that such norms for the proper form and/or function of some item presuppose norms for a proper range of environments that the item is to inhabit. Artifacts obtain a range of proper environments in which the artifact is to function in virtue of the mental activity of a designer. Without mental activity I argue no natural process is capable of dictating environmental norms and thus biological items are not answerable to teleological norms. I consider several candidates for what might count as a "proper environment" acceptable to naturalists but reject each of them because they fail to overcome familiar objections to metaethical naturalism, notably Moore's open-question argument.

The conclusion sums up my findings, and considers some objections to the argument. I address a Kantian theory of teleology in which despite a lack of evidential support for natural teleology it is somehow a necessary presupposition to understand the concept of an organism. Less radically, some argue that natural teleology is necessary for the practice of biological science. I respond to both worries, showing how even if they are successful, they do not provide a metaethically naturalistic path for the use of natural teleology in moral theory.

CHAPTER I. ARISTOTELIAN NORMS OF NATURE

Neo-Aristotelian ethics is a naturalistic ethical tradition that strives to ground ethics in "norms of nature" that apply to all organisms, humans among them. The norms pertain to proper function versus malfunction and defect, which neo-Aristotelians are keen to point out are not overtly moralistic taken on their own and do not require a special semantic analysis[4]. These teleological norms give rise to two areas of focus: *flourishing*, and *good-of-a-kind evaluation*. This chapter surveys the theories of some influential neo-Aristotelian moral philosophers and highlights the common commitment they all have to teleological norms of nature. The commitment to natural teleology should not be surprising, as it figures so centrally in Aristotle's ethics. However, contemporary Aristotelians rarely discuss teleology explicitly, and so there is some work to be done to make the commitment clear.

Neo-Aristotelian ethics has enjoyed a resurgence in recent decades, championed by Philippa Foot and furthered by Rosalind Hursthouse (1999), Michael Thompson (1995), Douglas's Rassmusen and Den Uyl (1991, 1999), Julia Annas (2005), Richard Kraut (2007), and Judith Jarvis Thomson (2001). The details of each philosopher's approach vary, but they share the view that moral judgments are fundamentally of the same sort as the non-moral evaluative judgments we regularly make about the natural world. For many of the above philosophers, morality consists chiefly of good-of-a-kind evaluation as applied to the human animal, and human well-being, flourishing, is to be understood as analogous to the healthy condition of other organisms. As such, Neo-Aristotelian ethics is explicitly naturalistic, holding that the examination of nature can produce normative conclusions.

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[4] Since the mid 20th century, Neo-Aristotelians have been highly motivated to refute expressivists who thought that moral terms such as "good" required a special semantic analysis. See Anscombe (1958) and Foot (2001)

Obviously Aristotle himself laid the groundwork for neo-Aristotelian ethics, but the last 60 years of writing in this area has largely been inspired by two primary articles: Anscombe's "Modern Moral Philosophy," and Geach's "Good and Evil." Together they form the basis for an approach to neo-Aristotelianism that persists today. What Anscombe and Geach put forward is an Aristotelian account of ethics that eschews "modern" approaches influenced by Kant, Mill, and Sidgwick. Anscombe focuses her attack on the concept of "moral obligation" while Geach criticizes "moral goodness." Summarizing their central conclusions in these essays will help clarify the more complex work of contemporary Aristotelians.

Anscombe famously pushes three theses in "Modern Moral Philosophy:" 1) We should all stop doing moral philosophy until we have an "adequate" moral psychology 2) We should jettison the concepts of "*moral* obligation" and "*moral* duty" if psychologically possible, and 3) Differences between modern moralists from Kant, to Mill, and Sidgwick are of little importance because they all adhere to mistaken premises that Anscombe would correct.[5] Theses one and three are probably best interpreted as rhetorical flourishes, not to be taken too literally[6], but thesis two reflects a substantive philosophical position that has been adopted to one degree or another by virtue ethicists today.[7] I first discuss Anscombe's argument for an ethics without

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[5] (1958, 1)

[6] Anscombe herself ignored the recommendation of thesis one, for instance, as she persisted in doing moral philosophy.

[7] Any discussion of Anscombe's article must come with the caveat that she wrote the work for those presupposing a secular moral theory, and thus all her claims must be seen as conditional upon the premise of secularism, which she herself rejected! The only hint of this in the article itself comes after she suggests doing away with "moral duty" and "moral obligation," for she adds the explanation "…because they are survivals, or derivatives from survivals, from an earlier conception of ethics which no longer generally survives, and are only harmful without it." The earlier conception of ethics, it is fair to infer, is natural law, the doctrine to which she actually adhered. But we can shelve this detail, for the theses Anscombe offers were taken seriously by other secular virtue ethicists and can be accepted at face value for the sake of argument. For more, see (Driver, 2011)

"moral obligation" and the emphasis on "flourishing" that she recommends as a replacement. The discussion of of "flourishing" will transition into a discussion of "goodness," and so after Anscombe we will turn to Geach.

Flourishing

Anscombe argues that "Flourishing," rather than the contrivances of more modern philosophers, can provide a stable bed for morality while avoiding the tangles of the "is-ought" gap. She argues that while the logical jump from "is" to "ought" is famously rife with peril, there is no such peril when we infer from "is" to "needs," via the concept of "flourishing." She writes of an organism, "…to say that it needs that environment is not to say, e.g., that you want it to have that environment, but that it won't flourish unless it has it… in the case of a plant, let us say, the inference from "is" to "needs" is certainly not in the least dubious.[8] I believe her confidence in this inference is misplaced, and I will make that case in later chapters. But it is precisely this point that inspired a generation of virtue ethicists: the agenda of deriving some norms of nature by means of a reliance on "flourishing." The idea, as Anscombe sketches it, is that various natural facts about an organism's environment and behavior can be shown to affect its well-being, and that a robust understanding of well-being can serve as the bedrock of a theory of the virtues, and thus of morality. That organisms can flourish or not would seem uncontroversial, but the neo-Aristotelian concept of "flourishing" is not straightforwardly an empirical matter.

Though it can seem obvious when looking at the flowers in my garden that some plants are flourishing while others are not, as Foot notes, "A strength or a weakness in a living thing cannot

[8] (MMP p. 7)

be identified in the same way as, say, hardness or softness in a rock."[9] Indeed the concept is more opaque than it seems because the flourishing of an organism is not merely its being alive, but as Kraut says, a state of "*proper* development and healthy condition."[10] Moreover, this condition cannot be understood unless we know what is characteristic and proper of the kind of organism to which our specimen belongs.[11] For example, Foot and Hursthouse frequently discuss a free-riding wolf, "who eats but does not take part in the hunt." Such a wolf, they claim, is defective, and thus cannot said to be a good wolf or flourishing as a wolf.[12] So, "flourishing" depends on the nature of an organism: what is normal, natural, or proper for it given the kind of thing that it is. Flourishing itself is not an empirical matter, but one laden with norms about the teleology of an organism. It is this central premise of teleology that grounds neo-Aristotelian philosophy.

The importance of the connection between flourishing, good-of-a-kind evaluation, and teleology comes to light in what Hursthouse calls "Plato's requirement on the virtues," inspired from Plato's insistence that justice is both good in itself and for what it brings about.[13]:

(1) The virtues benefit their possessor (they enable her to flourish, to be, and live a life that is, *eudaimon*)

(2) The virtues make their possessor a good human being. (Humans need the virtues in order to live well, to flourish *as* human beings, to live a characteristically good, *eudaimon*, human life)

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[9] Foot (2001, 36)
[10] This is Kraut's definition in "What is Good and Why" (Kraut 2007, 7 n8). Emphasis added.
[11] Kraut writes, "to determine what is good for some living S we need to know what sort of thing S is – whether it is a human being, a horse, or a tree. [Kraut 2007,8 and 131 n1]
[12] Hursthouse, (2002, 196) and Foot (2001, 16) and Annas, 14
[13] *Republic* bk. 1

(3) The above two features of the virtues are interrelated[14]

Plato famously had difficulty demonstrating the truth of these theses[15], and his failure to demonstrate (1) and (2) in *Republic* can be explained by a lack of a persuasive story about (3). Aristotle, however, replaced Plato's mysterious and troublesome forms with an account of natural teleology. Instead of a person striving to meet an ethereal platonic standard of perfection, Aristotle describes how a person naturally is inclined towards their own good by means of an internal mechanism. This answers (3) by making (1) true in virtue of (2). That is, the Aristotelian turn was to define well-being as a function of the fulfillment of one's nature, also resulting in the evaluation of an individual qua kind-membership. This is the way neo-Aristotelians continue to link flourishing with morality.

Goodness

"Flourishing" depends, then, on good-of-a-kind analysis, and it was Geach who framed the debate over that sort of evaluation. In *Good and Evil* Geach writes, "'good' and 'bad' are always attributive, not predicative adjectives…There is no such thing as being just good or bad, there is only being a good or bad so-and-so."[16] This was a startling claim in Geach's day, and remains controversial today, defended tooth and nail by Thomson, Kraut, and some others against the conventional wisdom of contemporary ethical theory. I will briefly explain Geach's argument against the predicative "good," and then turn my attention to the teleological commitment that humans are apt for goodness attribution.

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[14] Hursthouse, (2002, 167)
[15] For skepticism that Plato succeeds in making his case, see Sachs (1978) and Vlastos (1978)
[16] Geach, 33-34

Geach gives a semantic argument against the predicative use of "good." Unlike "X is a red ant," which can be broken down into "X is red" and "X is an ant," "X is a big ant" cannot be broken down into "X is big" and "X is an ant." Thus while "red" is a predicative adjective, "big" is attributive." Similarly, Geach points out, one cannot infer from "X is a good Y" that X is good *simplicater*. Consider that one can be a good murderer or robber without being *good*. Thomson says in support of Geach's point: "In that "good" is like "big" in being an attributive adjective, there is no such property as goodness just as there is no such property as bigness."[17] Obviously there is a logical leap here, for demonstrating legitimate attributive uses of "good" does not rule out legitimate "predicative" uses. Geach and Thomson insist that the predicative use of "good," is a philosopher's invention. This seems highly unlikely, for predicative uses of *good* are not only very common, but are deeply rooted in our historical normative discourse (consider the claim that "God is good").[18]

Whether or not Geach succeeds in discrediting the predicative "good," his argument puts a heavy burden on the attributive "good" to carry the weight of moral philosophy. The neo-Aristotelian promise is that humans (or perhaps persons) are apt for good-of-a-kind evaluation, and that this serves as the foundation of morality (either directly, or through the concept of "flourishing") If there are norms tied up with the kind HUMAN[19], where do they come from and how do we identify them? The Aristotelian answer is that teleology provides the norms for a human, that is, humans have a teleological nature as organisms and that this provides the norms for their kind membership. I will elaborate on the metaphysics of teleology in chapter 3. Next, I

[17] Thomson (2008, 11)
[18] For a persuasive argument against Geach and championing the predicative "good" see Pigden (1990)
[19] I will capitalize kinds, such that a human is a member of the kind HUMAN.

examine a neo-Aristotelian theory from Thomson that is a contemporary adoption of Geach and Anscombe's project.

Thomson is a neo-Aristotelian but not a virtue theorist.[20] She believes that good-of-a-kind evaluation can indeed issue in recognizable "oughts" without reference to what a virtuous person would do. Despite this departure from many other neo-Aristotelians, Thomson is an appropriate figure to include here because her theory of what she calls "goodness-fixing kinds" is the clearest expression of the neo-Aristotelian commitment to biological teleology.

In her book *Normativity*, Thomson takes a milder approach to Anscombe's point about moral obligation, but fully embraces Geach's argument regarding moral goodness. Thomson argues for an understanding of normativity that flows from analyzing two kinds of propositions that she calls "evaluatives" and "directives." Evaluatives take the form of good-of-a-kind analysis, while directives are deontic in character, issuing in "oughts" and "shoulds." As we will see, both sorts of propositions lend a certain primacy to goodness-fixing kinds. A goodness-fixing kind is a kind of which whose members can be said to be good or bad examples, functional or malfunctional, correct or defective. Thomson holds that the kinds TOASTER, SEEING-EYE DOG, BEEFSTEAK TOMATO, TIGER, and HUMAN are goodness-fixing kinds apt for good-of-a-kind evaluation while PEBBLE is not, as there can be nothing about a pebble that makes it a good or bad one qua PEBBLE.[21] Thomson notes that "what being a K is itself sets

[20] For her comments on virtue theory, see Thomson (2008, 231): "[My view] seems to me to be preferable to those theories about what a person ought to do that are nowadays called virtue theories. I stress "seems to me", however, since it is not altogether clear to me what those theories do demand of us. The received summary of what they require is this: what a person ought to do is what a virtuous person would do. But how demanding is that prescription? Is a person virtuous for simply not being vicious? Or is more required?"

[21] Though, we obviously could *want* a pebble for this or that, a wholly different consideration, Thomson (2008, 23). Also see Foot's reply to Hare in "Goodness and Choice." (1961)

the standards that a K has to meet if it to be good *qua* K" (Thomson, 21) and she posits the following theses:

> EVALUATIVE THESIS: There is such a property of being a good K if and only if K is a goodness-fixing kind. (Thomson, 21) [22]
>
> DIRECTIVE THESIS: For it to be the case that A ought to V is for it to be the case that there is a directive kind K such that: A is a K, and if a K doesn't V, then it is a defective K. (209)

As we see above, Thomson tries to show how directives, as she calls them, can play a role in Aristotelian ethics. But she is keen to insist that this "ought" is not uniquely moral, but the same sort of "ought" used to judge that "this toaster ought to toast bread." That is, if the toaster does not toast bread then it is a defective toaster.[23] This is an "ought" that connotes conditions for correctness, fittingness, or what is proper. Therefore we might see this as a compromise between Anscombe's rejection of deontic obligation and contemporary ethicists who regularly rely on it. Anscombe herself says that she could entertain a return to the "ordinary" instead of the "moral ought,"[24] and this is essentially what Thomson proposes, though she thinks it can also do the requisite work in a moral theory. I give a more detailed analysis on this sense of "ought" in the next chapter. Thomson's theses mark the grounds for potential disagreement in helpful way: show that any kind is *not* a goodness fixing kind and its members will become inapt for the kind of evaluation Thomson wants to engage in. In chapter 4 I make the case that organisms do not belong to goodness-fixing kinds.

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[22] Thomson (2008, 21)
[23] Thomson (2008, 208)
[24] See the last section of Anscombe (1958)

Teleology

In virtue of what is a kind goodness-fixing? I think the answer is clearly teleology. Foot (1961) broke ground on this topic in "goodness and choice," arguing that functional artifacts such as knives and pens are evaluated by the standards of their telos. As she says, "The function is involved in the meaning of the word."[25] A good knife, therefore, will be one that fulfills its function well. Foot calls items capable of such a functional evaluation "functional in the strong sense."[26] I give a more detailed analysis of functions in chapter three, but Foot's usage of "function" requires a brief explanation. The concept of "function" that neo-Aristotelians use is a normative one that contrasts the functional with the malfunctional or defective. The two most popular theories of function among philosophers of science are a *causal-role theory*[27], which defines the function of an item as the contribution it makes to a system that contains it, and an *evolutionary theory*[28], which defines the function of an item as the activity for which it was selected (either by artificial or natural selection). Foot, for one, is clear that she is not using either of these theories of function. Whatever a function is for Foot, it is non-historical,[29] ruling out the etiological theory, and it is normative, ruling out the causal role theory.[30]

Aristotelian functions are "normative" in the sense that they issue in evaluations of proper versus *improper* function (defect, malfunction, and disorder).[31] This is clear enough in Foot and Hursthouse, and made explicit by Thomson in the following passage:

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[25] Foot (2002, 133)
[26] Foot (2002, 134)
[27] See Cummins (1975) and Davies (2003)
[28] See Wright (1976), Millikan (1984), Neander (1991)
[29] Foot (2001, 32 n10)
[30] That causal-role functions are non-normative is accepted by all parties. I explain in detail why the causal role theory is non-normative in a later chapter.
[31] Though in the next chapter I will begin calling these sorts of norms "protonormative"

> Whatever explains why the pancreas has the function it does, it nevertheless does have the function of secreting digestive enzymes. So if A is your pancreas, then A is a member of a function kind, and therefore of a directive kind, such that if a member doesn't secrete digestive enzymes, then it is a defective member; and … *ought* to secrete digestive enzymes. (Thomson 2008, 210 – emphasis added)

Having this sort of function is one way a kind can be goodness-fixing. Thomson says a toaster is a function-kind and thus a goodness fixing kind in virtue of the fact that it is *manufactured* for making toast.[32] She notes that a seeing-eye dog does not have a function, *per se* but is belongs to a goodness-fixing kind in virtue of the fact that it is *trained* to lead the blind.[33] Her somewhat thinner explanation for tigers belonging to a goodness-fixing kind is that they are members of the *species* TIGER. I believe that these kinds are unified by all being presumed teleological.[34] Thomson remarks that it is in virtue of being manufactured that a toaster gets a function, but it seems to me that the telos of a toaster is acquired earlier in the process, through being *designed*. Though one does not "design" a seeing-eye dog, it is clear that the animal acquires a purpose from an agent; like a seashell that becomes used as a paperweight, an agent conferring purpose on an object can give it a telos. If organisms such as tigers and humans have teloi, it is usually not considered to be in virtue of an agent (creationism and intelligent-design aside), but in virtue of some other natural phenomenon, known as natural teleology.

Artifacts that have been designed by an agent with a mind can be understood teleologically because their purpose can be traced to a being that acted purposefully. There was effectively a baptism that occurred wherein some mind with intentional states conferred a final

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[32] Thomson (2008, 19)
[33] Thomson, (2008, 20)
[34] I say "presumed" because I disagree that tigers are teleological. Yet the assumption that they are is what leads Thomson to call them a goodness-fixing kind

cause upon the object. This is known as *external teleology* because the goal or purpose does not originate in the object itself but rather with an external agent. This is sometimes seen as a Platonic notion, as Plato's demiurge is the prototypical agent conferring purpose on that which he creates.[35] Unlike artifacts, living organisms on the Aristotelian view exhibit *internal teleology*, or their *own* goals and purposes.[36] Plainly, a conscious mind with intentional states is one such thing that is internally teleological, literally having mental states recognizable as goals and purposes.[37] A central question in the philosophy of biology is whether internal teleology can exist in something without a mind. This internal, non-mental goal-directedness is natural teleology.

Natural teleology is the purported goal directedness of non-conscious organisms and their parts and operations. In Aristotelian terms, it can be understood as a "nature," an internal directive principle.[38] It does not imply that everything is for a "cosmic purpose,"[39] but rather that individual living things themselves act for some purpose or end according to their nature. Natural teleology is prone to misunderstanding and distortion, and I think for that reason is rarely addressed by name in the neo-Aristotelian literature. Instead, neo-Aristotelians find other ways to describe the phenomenon. Foot (2001) discusses "Aristotelian categorical sentences,"

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[35] See Plato's *Timeaus* and *Republic*. Also discussed in Mclaughlin (2001, 16)
[36] The distinction between internal and external teleology can be found in Aristotle's *Physics* Bk. II ch. 3. It has been revived and clarified by Goudge (1961), Ayala (1970) and is nicely summarized in McGlaughlin (2001 16-19). Famously, Aristotle also believed that non-biological items such as stones were internally teleological, a view without merit and long since discredited.
[37] In fact, as McGlaughlin points out, the existence of external teleology presupposes something internally teleological like a conscious mind to do the baptizing – one cannot have an endless regress of externally teleological objects. McLaughlin (2001, 17)
[38] See Aristotle's *Physics* bk. II
[39] See Mayr (1992)

Hursthouse (1999) speaks of "characteristic traits," and Thomson (2001) highlights "goodness-fixing kinds," but they are all cognate concepts of natural teleology.

The teleology of organisms purportedly guides their development and sets standards for proper function versus malfunction, proper development versus malformation. Thus it is this property that would allow for good-of-a-kind evaluation of organisms using the attributive "good." Neo-Aristotelian naturalism holds both that this metaphysical commitment is consistent with naturalism and that these natural norms are relevant to moral theory because it allows for the evaluation of a human and his character. Douglass Rasmussen details these commitments:

> The neo-Aristotelian view of human flourishing that has been presented appeals to human nature in two basic ways: (1) it assumes that human nature is teleological, that is, that human beings have a *telos* or natural function; and (2) it assumes that this natural function has moral import. That human nature is teleological is at once the most important and the most controversial assumption of this view of human flourishing. It is the most important, because it is the idea that human flourishing is the end (*telos*) or function (*ergon*) of human life that allows this theory to avoid the "naturalistic fallacy." If human flourishing is the natural end for human life, and if we understand the human good in terms of that end, then it is simply not the case that all facts are valueless…Hence, it is not always a fallacy to go from a fact to a value, because some facts are inherently value-laden.[40]

Rasmussen's summary of the neo-Aristotelian project emphasizes not just the commitment to teleology, but a commitment to metaethical naturalism, the view that normative facts can be reduced to natural facts. In this case, Rasmussen is pointing to a particular version of ethical

[40] Rasmussen, (1999, 32)

naturalism in which natural teleology is treated as a natural phenomenon that can yield normative implications. How does the Neo-Aristotelian demonstrate these "norms of nature"?

In Foot's *Natural Goodness* she makes an argument for the existence of norms of nature that stem from the kind membership of an organism. She draws inspiration from an influential article by Michael Thompson (1995) called "The Representation of Life." I elaborate on Thompson's argument in greater detail in a later chapter, but his basic approach is as follows: Living things can be characteristically described with an unusual kind of sentence called an *Aristotelian Categorical*. Sentences such as these take the form "The S is F," or "S's are F," where S stands for some species (or "life form") and F stands for some predicated trait.[41] For instance "Deer flee quickly from predators," or "The Daffodil flowers in the springtime." The logical form of propositions such as these, Thompson notes, is unique because they cannot be appropriately interpreted with a universal or even an existential quantifier. Rather than being statistical generalizations, they seem to express what is "characteristic" or "proper" for an organism given its kind-membership.[42] Take an example from Anscombe (1958) that humans have 32 teeth.[43] This is an Aristotelian categorical sentence that strikes one as intuitively true, even though, obviously, very *few* humans have 32 teeth.

Naturalism

Neo-Aristotelians are avowed naturalists, but this commitment is surprisingly opaque due to disagreements about what naturalism is in the first place. Anscombe and Foot urged virtue theory to turn back to nature, to see moral evaluation as analogous to evaluation of other organisms.

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[41] Thompson (1995, 284)
[42] Thompson (1995, 247-296) and (2008)
[43] Anscombe writes "just as man has so many teeth, which is certainly not the average number of teeth men have, but is the number of teeth for the species… and this "man" with a complete set of teeth is a norm. (1958, 14)

However, McDowell's (1995) influential essay "Two Sorts of Naturalism" seems to push in another direction, encouraging the virtue theorist to look beyond our "first nature," which sets parameters for non-rational organisms, and focus instead on the "second nature" that human rationality enables[44]. McDowell took this to be a challenge to Footian naturalism, although it seems likely that Foot would embrace McDowell's stance.[45] The thrust of McDowell's point is that "empiricist naturalism is metaphysically shallow",[46] and indeed Foot and many other neo-Aristotelians are emphatic that their naturalism is not to be reduced to science[47]. This might strike many as odd, and lead one to question whether they have redefined "naturalism" in an idiosyncratic way. However, not all neo-Aristotelians disavow scientific naturalism. Annas, for instance writes "We are part of nature…when we examine our own rationality we are examining something of which we can and must give an account acceptable to the natural sciences."[48] She later adds, "There is nothing unscientific about an approach which stresses that what matters for the living of our lives, from an ethical point of view, is our rationality. We are not cutting ourselves off from the world that science studies, as the non-naturalists do."[49] Thomson also expresses confidence that at least the norms of our first nature are to be established by science,

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[44] McDowell (1995, 166)
[45] Hursthouse embraces McDowell's point and claims Foot would as well in Hursthouse (2012)
[46] McDowell, (1995, 168)
[47] For Foot's non-scientific bent, see Foot (2001, 32 n. 10)
[48] Annas, 28
[49] Annas, 28. Annas also says: "what is so helpful for ethics from this kind of biological naturalism is that we find that the normativity of our ethical discourse is not something which emerges mysteriously with humans and can only be projected back, in an anthropomorphic way, onto trees and their roots. Rather, we find normativity in the realm of living things, plants and animals, already. (p. 13)

writing, "I take it that it is for biologists to tell us what are the physical and mental norms for [humans]."[50]

McDowell's argument for second-nature sparked intramural debates among neo-Aristotelians over what sort of naturalism they should invoke, but I think McDowell's attempt to avoid the conflict between teleology and scientific naturalism fails. For even if the telos of our second-nature is non-scientific, the neo-Aristotelians believe that the teleological aspects of our first-nature do indeed follow scientific laws. They faithfully apply the attributive "good" to organisms and their parts and operations, with no invocation of any non-scientific naturalism. Mcdowell says, "Of course first nature matters. It matters, for one thing, because the innate endowment of human beings must put limits on the shapings of second nature that are possible for them."[51]

There are three steps to the neo-Aristotelian argument: first that artifacts can be uncontroversially evaluated as good or bad examples of a kind; second, that simple natural entities like roots and claws are equally apt for this sort of evaluation; and third, that the human organism is in the same evaluative position as the rest. McDowell is quibbling with this third step and whether our rationality elevates us above the rest of nature, but the reliance on natural teleology can be seen in the second step of the argument. Indeed, the reliance on natural teleology is so basic to neo-Aristotelianism that none of them particularly pause to question it.[52] In the next chapter I further investigate the status of natural teleology and whether it can be conceptually reduced to merely descriptive propositions.

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[50] Thomson (2008, 215)
[51] McDowell (1995, 171)
[52] The only consideration McDowell gives to skepticism over first nature is a dismissal: "For my present purposes, we can ignore a physicalism that refuses to count plant or animal flourishing as a subject for natural science" (175)

CHAPTER II. PROTONORMATIVITY

> But though perhaps no one could now be found who, like the institutional writers of former times, adopts the so-called Law of Nature as the foundation of ethics, and endeavours consistently to reason from it, the word [“natural”] and its cognates must still be counted among those which carry great weight in moral argumentation. That any mode of thinking, feeling, or acting, is "according to nature " is usually accepted as a strong argument for its goodness…and the word "unnatural " has not ceased to be one of the most vituperative epithets in the language.
>
> J.S. Mill, *On Nature*[53]

There is a temptation for the folk and philosophers alike to draw normative conclusions from assumptions about what is natural. Moore’s open question argument cautions against making this inference too quickly; If we can competently understand what it means to be natural yet question whether this state is good, we cannot conceptually reduce the normative “good” to the non-normative “according to nature.” This point alone does not preclude the metaphysical reduction of the good to the natural, but any argument in this direction after Moore must proceed cautiously and humbly. As described in the last chapter, Neo-Aristotelians have a sophisticated version of this argument, assuming that certain teleological facts about our nature as humans expose an evaluative framework whereby we can make judgments of attributive goodness versus defect. In this chapter, I investigate the metaethical commitments of this kind of naturalism. I argue that teleology itself is not able to bridge the conceptual gap between “is” and “ought” because it does not fit neatly into the traditional categories of *normativity* or *mere description* but

[53] Mill, *On Nature* p. 32

instead belongs to a family of concepts I will call *protonormativity*.[54] While normativity is typically construed as being roughly about *the good* and *the right*, protonormativity is about *the proper*. In this chapter, I explain the need for this conceptual category and use it to investigate the metaethical status of teleology. My finding is that if Aristotelian naturalism is to achieve its goal of using teleology to pull values from facts, this would require a two-step process: first bridging a gap from description to protonormativity, and then bridging a gap from protonormativity to normativity.

It is difficult at first to see what is distinctive about teleology because it can be expressed using an unusual diversity of evaluative, deontic, and descriptive vocabulary. Consider the following ten propositions:

1. A *good* toaster is one that toasts bread on both sides.
2. Toasters *ought* to toast bread on both sides.
3. A car with a leaky gas tank is *defective.*
4. Someone with blurry vision has *bad* eyesight.
5. Daffodils *should* flower in early spring.
6. The heart is *supposed to* pump blood.
7. Hearts are *for* pumping blood.
8. A heart with a leaky valve is *malfunctional*.

[54] My decision to coin the term "protonormativity" is the result of a compromise. Norms for "the proper" are norms, after all, and could simply be understood as one kind of normativity. Labeling them as normative has two disadvantages, though. First, this is a use of "normative" that is unfamiliar to many ethicists, requiring a revision of standard usage. Second, describing the two different kinds of normativity without having a different word for each would result in unhappy ambiguities and possible misinterpretations. Thus I have opted to give "the proper" its own category of protonormativity. Now I can easily discuss differences between protonormativity and normativity (the term that I reserve for "the good" and "the right"). Additionally, the prefix "proto" highlights the fact that protonormativity is used in some ethical theories such as neo-Aristotelianism as a source of full normativity.

9. Humans have 32 teeth.[55]

10. The Daffodil flowers in early spring.

Propositions 1 and 4 contain evaluative vocabulary, while 2 and 5 seem deontic. 6-8 appeal to more obvious teleological terms, while 9 and 10 are known as "generics" in the philosophy of language and appear, at least superficially, to be non-normative. I shall argue that contrary to appearances, all ten propositions are best understood as teleological, and furthermore as protonormative. A proposition is protonormative if it implies the existence of a standard by which some object or state of affairs is proper or improper. Despite the diversity of normative vocabulary, there is a unity to the above propositions: they all imply norms for the *normal, natural,* or *proper* form or function of some item. Judgments of this type are made often without any accompanying judgment about axiology or deontology. That is, one can easily judge that daffodils ought to flower in early spring without thinking it good (from the perspective of the universe) or even good *for me* that they do so, and without believing that anyone has a reason to ensure that they flower in in early spring, much less that the daffodils themselves have a reason to do so. While the "ought" of normative reasons is thought to imply "can," the protonormative "ought" does not imply "can": it makes perfect sense to say that the patient's heart ought to pump blood to my lungs, for example, even though it is diseased and cannot currently do so. Protonormative judgments about "the proper" sit in a gray area, more than merely descriptive, yet not quite "normative" in the traditional sense pertaining to axiology or deontology. I will return to defend the preceding claims in more detail. First let us look at why all ten propositions are best understood as teleological. This analysis will help explain why I take "teleology" to be a paradigmatically protonormative concept.

[55] Borrowed from Ansombe (1958)

I think all ten propositions above, not just 6-8, are teleological in nature.[56] Given the appearance of terms like "ought," "should," "good," and "bad," I owe an explanation for why they should be interpreted as teleological rather than in some other normative sense. I will move through the propositions, starting with those that appear to be deontic, to those that appear evaluative, and merely descriptive in turn, and show that each one can be translated without loss of meaning into an explicitly teleological proposition, one that reflects an expression of protonormativity.

Deontic Vocabulary in Protonormative Propositions

Deontic vocabulary such as "ought," "should," and "supposed to" is typically applied to agents in virtue of their practical reasons to act in various ways. Clearly that will not do for the deontic terms in the given propositions. Daffodils, roots, and hearts, after all, are not sensitive to reasons. Could it be that the normative words are meant to apply to agents in the vicinity? Are we to translate "Daffodils ought to bloom in early spring" as "someone ought to ensure that Daffodils bloom in early spring"? Surely not. Alternatively, we could read these as epistemic claims equivalent to "one would expect daffodils to bloom in early spring," but I think this is not the most natural reading, and certainly not a necessary one. A gardener, for instance, might woefully acknowledge that his (or indeed, maybe everyone's) daffodils will *not* bloom in early spring due to some pest or weather phenomenon yet nevertheless think that they "ought to" because of what the gardener believes to be normal for a daffodil. I think that the best interpretation of claims 3 and 4 is that they express norms for what a toaster or daffodil *properly*

[56] "Teleology" is not the only protonormative concept. There are many varieties of "the proper," sometimes captured by what is *normal, natural,* and especially *fitting*. "Fittingness" is an influential protonormative concept, playing a role in in fitting-attitude theories of value, and some theories of justice and desert. For an example of a fittingness account of justice, see Cupit (1996). For an overview of fitting attitude theories of value see Jacobson (2011) and Ronnow-Rasmussen (2011).

does. Despite an item not being sensitive to reasons, we commonly make judgments about what it *ought, should,* or is *supposed to* do such that failure to do what is proper renders the item malfunctional, defective, or otherwise "incorrect." This is clearly the usage Thomson intends in her theory, writing, "I don't mean that a toaster…is likely to do these things, though that may (or may not) be true. Rather mean rather that they are called on, or required to."[57] Recall Thomson's "directive thesis" which states "For it to be the case that A ought to V is for it to be the case that there is a directive kind K such that: A is a K, and if a K doesn't V, then it is a defective K.[58] Defect, as I have argued consistently throughout the past chapters, is a teleological concept, and thus I agree with Thomson that the "ought" contained in the propositions above implies a teleological, protonormative, type of norm.

This sense of ought is similar to what is sometimes called the "ought" of "fittingness." In fact, I think *the fitting* may be equivalent to what I am calling *the proper*, though I do not want to project my conceptual analysis on others. Nevertheless, it will be fruitful to look at how the concept of "fittingness" has been used in ethical theory, as it has sometimes been employed to describe teleological phenomena. Fitting-attitude theories of value are gaining in popularity, building off of work by Brentano and Ewing. A far earlier invocation of the "fittingness" concept can be found in Samuel Clarke, who takes the "fitness of all the things in the world to their proper and respective ends" as evidence of God's existence.[59] Clarke also uses "fitness" to describe just states of affairs, personal desert, and even hints of fitting-attitudes in the following passage. I quote it at length because of its prescience, 100 years before Paley and 150 years before Brentano:

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[57] Thomson, 207
[58] Thomson 209
[59] Clarke (1704, 58)

> That from these different relations of different things, there necessarily arises an agreement or disagreement of some things with others, or a fitness or unfitness of the application of different things or different relations to one to another; is likewise as plain as that there is any such thing as Proportion or Disproportion in Geometry and Arithmetic, or Uniformity or Difformity in comparing together the respective figures of bodies. Further, that there is a fitness or suitableness of certain circumstances to certain persons, and an unsuitableness of others; founded in the nature of things and the qualifications of persons, antecedent to all positive appointment whatsoever; also that from the different relations of different persons one to another, there necessarily arises a fitness or unfitness of certain manners of behavior of some persons towards others…Lastly, 'tis a thing evidently and infinitely more fit, that any one particular innocent and good being, should by the supreme ruler and disposer of all things, be placed and preserved in an easy and happy estate; than that, without any fault or demerit of its own, it should be made extremely, remedilessly, and endlessly miserable[60]

The use of "fittingness" to describe emotional responses gained traction in the writing of Brentano (1874), Broad (1925), Ewing (1939), Brandt (1946), and more recently by D'Arms and Jacobson (2000), Horgan and Timmons (2005), and Chappell (2012). The application of "fittingness" by these philosophers varied, but has most popularly been used to develop a fitting-attitude theory of value. I cannot attempt a fair summary of this body of literature here, so I shall focus on one influential analysis of the term by Ewing. His views are chiefly laid out in a 1939 exploratory article "A suggested non-Naturalistic Analysis of Good," (1939) and his book *The*

[60] Clarke (1704, 177-8)

Definition of Good published a decade later with a great deal more confidence in his own position[61].

Ewing was responding to G.E. Moore (1903), who blazed the path for ethical intuitionism by arguing in *Principia Ethica* that "Good" must be a non-natural and unanalyzable property, perceived by us through intuition. Ewing held that Moore was right about there being *some* fundamental non-natural and unanalyzable moral property, but that this basic property is not *goodness* but *fittingness*. He goes on to analyze "good" and "ought" in terms of what is fitting, which he takes to be normative but not essentially moral.[62] About "ought" Ewing writes,

> "Ought" really covers two different concepts, the concept of fittingness and the concept of moral obligation. If I ought to do something there must be a certain relation between the action and its environment such that the action is fitting, appropriate, suitable, and its omission unfitting, inappropriate, unsuitable. This in itself is, however, a different concept from the concept of a moral obligation, which we must fulfil or be guilty of sin… but it is not the case that we are always morally obliged to do what is most fitting.[63]

It looks very much like Clarke's "fitness" and Ewing's ought of fittingness is what I am calling the protonormative ought. It is a sense of "ought" that captures properness relations. Fitting-attitude theorists typically take "fittingness" to issue in reasons, thus itself serving a deontic function. I have my doubts that "fittingness" on its own issues directly in reasons. Perhaps it is true of some actions that if they are fitting in some precise respect, one has a reason to perform the action – I shall not take a position on that proposal. But "fittingness," all on it's own is not

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[61] In *Second Thoughts in Moral Philosophy* (1959) he retracts much of what he says about fittingness in his two earlier works. What I attribute to him would therefore best be described as "early Ewing."
[62] Ewing (1939, 3-4) and (1948, 130)
[63] Ewing, (194, 132)

directly reason-giving because it is not limited to agents in its application. Even if it is fitting for Daffodils to flower in early spring, a daffodil cannot have a reason to do so. Therefore, I can table the literature on fitting-attitudes and just make the simple point that whatever the relation of "fitting" is, it bears a close resemblance to what I mean by "proper." *Teleology*, I am suggesting, is just one species of the genus *proper*.

Evaluative Vocabulary In Protonormative Propositions

The evaluative vocabulary that appears in the earlier propositions exhibits good-of-a-kind evaluation. The propositions "A good toaster is one that toasts bread on both sides," and "Someone with blurry vision has bad eyesight" do not express that a toaster or one's vision is good *simplicater,* and certainly do not imply a *sui generis* property of goodness. Rather these propositions use the attributive "good," as Geach describes it, measuring a token item against standards laid down by its kind-membership.[64] I think that attributive uses of "good," are best understood as specifying norms for what is proper. A good X is merely one with proper form and/or function. A good set of snake fangs obviously need not be good *simplicater* nor good *for* me. To say that the snake fangs are good is just to judge them good examples of their kind, exemplifying proper form and/or function. The neo-Aristotelian tradition in ethics considers this sort of evaluation to be the central – sometimes the *only* – content of moral judgment. From Anscombe (1958) and Geach (1956), to Foot (2001), Hursthouse (1999), Kraut (2007), Thomson (2008) and others there has been a movement to banish the predicative "good," (good *simplicater*) from normative discourse in favor of the attributive "good." There is no property of

[64] See Geach, "Good and Evil," (1956)

goodness, they claim, only goodness-of-a-kind.[65] Whether or not they are correct about the legitimacy of the predicative "good," it is helpful to note that the attributive "good" they favor is best described as protonormative, given how I define the term. Indeed, Ancombe's famous essay "modern moral philosophy," a trailblazing article of the neo-Aristotelian movement, could be interpreted as holding that morality itself is about the protonormative concepts and has no need for the "modern" conceptions of "good" and "right" that I am calling normative.

Can we say that the "good" in "good heart" is the same concept as the "good" in "Good toaster?" Neo-Aristotelians treat them as having the same grammatical structure, and believe that the word "good" is being used in the same way (and argue further that the same sense applies to "good person"). I think this is entirely correct as a semantic point. It is a further question whether asserting facts about a good heart posits relies on a complicated ontology than asserting facts about a good toaster. I tackle that second question in chapter four. Here I will defend the semantic point against a contrary analysis by Von Wright in his influential *The Varieties of Goodness*.

Von Wright adopts somewhat idiosyncratic terms to mark the difference between artifactual and biological uses of the attributive good, calling them *instrumental* and *medical* goodness, respectively. Thus his instrumental goodness does not mean "good in virtue of an intrinsic or final good that it promotes," but rather is quite literally the goodness of instruments or artifacts. Medical goodness, accordingly, is the good of well-being, including the evaluations of a "good heart." Though he treats these as separate senses of "good," he notes a superficial similarity:

[65] Geach's 1956 article contains the best known version of the argument. The newest and perhaps most detailed version of this argument can be found in Thomson's book *Normativity*, (2008) which I discussed in the last chapter.

> "Organs resemble instruments or tools in that they have both morphological and functional characteristics. Faculties again have no morphological features proper to them; in this and other respects they resemble abilities and skills. The functional characteristics of organs, too, resemble abilities; they consist in things which the organs themselves *do*, such as pumping blood or breathing air, rather than – as is the case with tools – in their usability for various assigned purposes"[66]

So, why the distinct categories? It turns out that Von Wright believes that while medical goodness is a matter of good-of-a-kind, this is not necessarily so for instrumental goodness. Rather, he sees instrumental goodness as a measure of how well an item serves some purpose.[67] In his words, "not everything which is good for some purpose, also belongs to some kind which is essentially associated with this purpose. Therefore not every primary attribution of instrumental goodness for some purpose to a thing also serves as a basis for a secondary attribution of instrumental goodness of its kind to this thing." He therefore holds that good-of-a-kind evaluation of functional artifacts is secondary to the artifact serving some purpose, and considers it entirely possible that an artifact could be for a purpose yet not belong to a kind associated with this purpose. An example would be a knife that can be useful as a mirror even though knives have no necessary function as reflective objects. I think this is but a quibble, and should not impede a common analysis for artifacts and biological entities. Why not say that all good-of-a-kind analysis depends on an item having a purpose and it so happens that the only purposes found in organs are kind-associated purposes (purposes dictated by an item's kind membership)? This seems perfectly consistent, and unifies artificial and biological attributive goodness into a single teleo-evaluative category.

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[66] Von Wright (52)
[67] Von wright (20)

Descriptive Vocabulary In Protonormative Propositions

Despite appearances, the propositions "humans have 32 teeth," and "the daffodil flowers in early spring" are not merely descriptive, but express teleological norms. Generics, as they are called, are a hot topic in the philosophy of language, and I will not attempt an exhaustive analysis here.[68] However, there is no reason to think that all generics call for the same sort of analysis and we are concerned only with certain kinds of generic sentences. In the present context we are interested in generics that resist a statistical reading, and instead seem to reflect a reference to proper function. In his influential essay "The Representation of Life,[69]" Michael Thompson gives a detailed analysis of these sorts of generics, holding that all living things are accurately and essentially described by what he calls *Aristotelian categorical sentences*. These are sentences of the form "the S is (or has or does) F" where 'S' stands for the name of a species or life-form and 'F' stands for a predicate; thus we might say, "humans are two-legged" or "the Grizzly Bear hibernates in the winter."[70] He calls judgments of this type "natural historical judgments," and notes that they take the timeless voice of a nature documentary or a field guide.[71] Thompson wants us to see that "humans are two-legged" cannot adequately be captured by the familiar quantified sentences "*all* humans are two-legged" (which is obviously false), or even "*some* humans are two-legged." The person who claims that humans are two legged almost certainly means to be describing something about the human species, not merely that some (or even most) humans have two legs. Thompson holds that this makes Aristotelian categoricals a special kind of generic sentence that are not held hostage to statistical generalization.

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[68] See Carlson and Pelletier (1995), Geurts (1985), and Leslie (2008) for an overview of the literature.
[69] Thompson (1995)
[70] Thompson, (285)
[71] Thompson, (280-281)

> Although 'the mayfly' breeds shortly before dying, *most* mayflies die long before breeding… a natural-historical judgment may be true though individuals falling under both the subject and predicate concepts are as rare as one likes, statistically speaking.[72]

Thompson also references the clever example from G.E.M. Anscombe that humans have 32 teeth, which seems intuitively true even though, as it turns out, *hardly any* humans actually have 32 teeth.[73] Thompson's mayflies and Anscombe's teeth illustrate that these kinds of judgments may initially sound merely descriptive, but they conceal non-statistical teleological judgments. Or at the very least, I think their truth conditions depend on the existence of teleological norms; for it to be true that humans have 32 teeth it must be true that humans normally (non-statistical) or properly have 32 teeth.

Thompson is of two minds when it comes to whether Aristotelian categoricals are "normative" in some sense. As we will see, his ambivalence is driven in large part by the conceptual ambiguity that "protonormativity" might clarify. On the one hand, Thompson rejects a normative understanding of categorical sentences that would boil them down to what an 'S' *ought* to be like, complaining that this leaves too much room for vagueness. He writes:

> There is, after all, a way of hearing the word "ought" which might have us assent, in certain moods, to something like " it holds of every cockroach that it ought to be killed". This "ought" evidently pertains to "human ends and projects" and is thus out of the question. What we want is a so-to-speak intrinsic or non-relative oughtness – we want, for example "it ought, *as far as its merely being a horse goes*, to be four-legged," or "It is supposed, by its mere horse-nature, to be four legged"…[74]

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[72] Thompson, (284-285)
[73] see Anscombe, (1958)
[74] Thompson, 290

Thus here is a connection between the attributive "good," and a certain non-moral use of "ought." I think what Thompson seeks is precisely what a concept of protonormativity provides: an "ought" of the proper that does not (necessarily) imply an "ought" of normative reason-giving force.

He goes on to solidify the connection between his categorical sentences and the attribute "good." He argues that we can evaluate a particular living thing by comparing the Aristotelian categorical that tells us what a given species is like with a statement about a particular member of that species.[75] For example, deer flee predators by running away, and if this deer is a fast runner, it is a good deer (insofar as this trait goes). If poison ivy gives mammals a rash, and this specimen of poison ivy does not cause a rash, this specimen is defective.[76]

Thompson mentions but does not linger on the fact that Aristotelian categoricals and the evaluative scheme that accompanies them imply the existence of biological teleology. [77] This much should be clear from my description of his project above. Thompson is advocating an Aristotelian picture of biology in which organisms have an internal drive, a nature, that acts as a standard of correct development. Since this invokes norms for what is "proper" without any necessary connection to normative reasons, this lends further support for my analysis of teleology as a paradigmatically protonormative concept.

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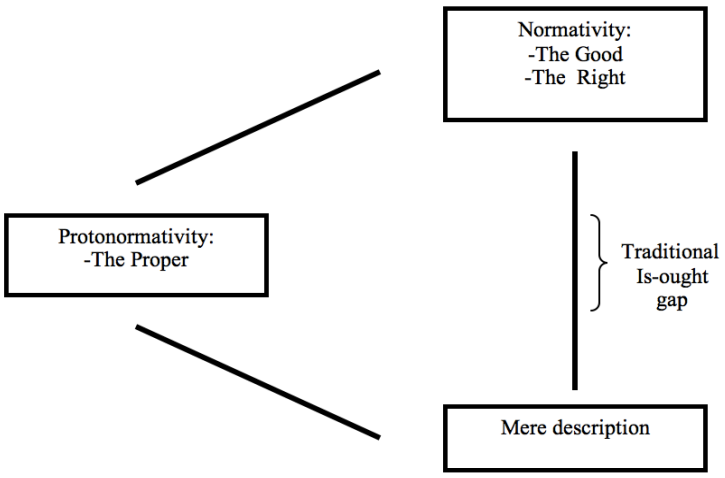
[75] Thomson, 291

[76] It is a point of disagreement between Thompson and Philippa Foot (2002) whether *any* Aristotelian categorical can yield evaluations of goodness and defect or whether evaluative power is only possessed by categoricals that are central to the "way of life" of an organism. Foot holds the latter view, arguing that only traits that affect the life of an organism are apt for evaluation in this way. For instance if humans are two-legged, and Simon has only one leg, is Simon a defective human? Foot would say "no" because the number of legs a human has is but peripheral to human experience. If a human lacked *sympathy*, however, this is something that Foot might argue renders one defective. See Foot (2001, 33). JJ. Thomson agrees with Foot in *Normativity* (2008, 215)

[77] Thompson, (1995, 292)

The Is-Ought Triangle

In the last chapter I described the neo-Aristotelian reliance on the attributive "good" and natural teleology, arguing that the approach hopes to demonstrate continuity between the descriptive and the normative. As Douglass Rasmussen says, "If human flourishing is the natural end for human life, and if we understand the human good in terms of that end, then it is simply not the case that all facts are valueless…Hence, it is not always a fallacy to go from a fact to a value, because some facts are inherently value-laden."[78] If my interpretation of the metaethics of teleology is accurate, Rasmussen is mistaken; The picture is more complicated than previously acknowledged. I think If neo-Aristotelians are to succeed in using natural norms to bridge the gap between facts and values, this must be done in a two-step process. Instead of explaining away one gap, there are *two* gaps to worry about. I call the resulting picture the is-ought triangle.



The is-ought triangle is the result of accepting the distinctiveness of protonormativity. Judging that "daffodils ought to flower in the springtime" does not require that I think it good that they do so, nor that anyone has a reason to make it so, nor be in favor of it happening, nor want to pursue springtime flowering, nor any of the other purported dimensions of normative judgment. I could

[78] Rasmussen, 32

just as well think daffodils ugly, resent the allergies they give me, and want to destroy every last one of them. Nor am I claiming, as Moore might say, that daffodils ought to exist for their own sake[79]. The judgment is far blander than that: I merely think that it is proper or correct for daffodils to flower in the spring, no matter their normative valence or my attitude towards them. We can make sense of the claim that the lion protonormatively "ought" to devour the baby giraffe even if doing so is bad for the giraffe, awful for anyone watching, and in this case even bad for the lion (tragically, this giraffe is diseased). Given all these stipulations we can still think that there is a protonormative sense in which the lion ought to eat the giraffe because it would be normal, natural, or proper for it to do so. The "ought" in this case is obviously not a normative "ought" since the lion is not an agent.[80]

Let us be agnostic about the status of the traditional "is-ought" gap between mere description and normativity. Maybe there can be metaphysical reduction of the normative to the descriptive, but after Moore we should have confidence that there will not be conceptual reduction.[81] If ethical naturalism has merit, the path from natural facts to values will not be as simple as neo-Aristotelians have made it seem. What I suggest in offering the is-ought triangle is that the challenge of reduction exists not only between normativity and description, but between all three concepts. Hard as it is to pull "ought" from "is," it will be equally hard to pull "proper" from "is" and "ought" from "proper" without introducing other significant normative (or protonormative) background assumptions. In the remainder of this section I discuss the nature of

[79] See the preface of Moore (1903)
[80] Protonormative "oughts" can obviously apply to agents as well, however, though not *qua* agent. Just like lions, humans and their parts and operations will be subject to a great many protonormative claims having to do with hearts pumping blood and other vegetative processes, etc.
[81] though see Jackson (2000) for a dissent.

the two new gaps of conceptual irreducibility in the triangle, leaving open the question of metaphysical reduction.

The Proper-Ought Gap

Doubting the inference from "proper" to "ought" is certainly not new, but typically such discussions have treated the proper as a matter of description. I am thinking foremost of traditional objections to virtue ethics where the complaint is that facts about human nature do not on their own seem to generate reasons for humans to act in accordance with their nature.[82] Some aspects of my nature may benefit me or others while other aspects of my nature might be quite detrimental. It is the substance of these other normative facts, not the facts about my nature, that are reason-giving. Like Ferdinand the bull, who possessed a fearsome physique yet preferred to smell flowers rather than fight matadors[83], I may want to suppress some feature of my own nature in order to pursue what makes me happy. What is proper, all on its own without extra normative assumptions, does not seem to directly lead to conclusions about the good or the right.

The typical neo-Aristotelian response is to insist that well-being is necessarily connected to kind-membership.[84] This thesis can of course be found in Aristotle, and has been advanced by Geach, Foot, Kraut, Rasmussen and others. Yet something akin to Moore's open question argument arises, for I can sensibly admit that action or disposition X is in my nature based on my kind-membership, yet wonder whether I should aim to exemplify my own kind, or some other

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[82] See Gowans, "Virtue and Nature" (2008), Copp and Sobel, "Morality and Virtue: An Assessment of Some Recent Work in Virtue Ethics" (2004) and Harman, "Human Flourishing, Ethics, and Value" (1983) for just three examples.

[83] See *The Story of Ferdinand* (1936) by Munroe Leaf. Thanks to Christian Coons for the example.

[84] Kraut says, "if S if flourishing, there is always some kind to which S belongs, and S is flourishing as a member of that kind. So "George is flourishing" is an elliptical or incomplete expression…The thesis that I will be defending is that what is good for human begins is to flourish as human beings" Kraut, (131 n1)

kind of thing. Why *should* Ferdinand want to be the best bull he can be? Why not just do what gives him pleasure? Neo-Aristotelians have replies to this challenge, discussed in the last chapter, but none of them succeed in drawing a conceptual link between kind-membership and well-being. Perhaps more can be said for non-conceptual metaphysical identity between one's welfare and the fulfillment of one's nature. It is not my goal to deny this possibility here, only to put forward the most plausible way to understand the conceptual relationship between teleology and normativity.[85]

The Is-Proper Gap

There is a sense in which worries about the gap between "proper" and "ought" are made unnecessary if "proper" itself is vulnerable to the open-question argument. While the inference from proper function or human nature to some reason-giving force has been the target of great scrutiny, inferences from mere description to protonormativity have gone largely unexamined. Where they have received attention it has been to the extent that one worried about fully normative conclusions that teleology might generate. In what follows I sketch out some concerns about reducing the proper to mere description, following the core insight of Moore's open-question argument. While my focus in this section is on conceptual reduction, in chapter four I provide reasons to think that this open-question-argument style of objection is also a problem for metaphysical reduction of the teleological to the descriptive.

Some protonormative propositions *can* be conceptually reduced to descriptive propositions. Specifically, propositions about the teleology of artifacts are reducible to mere description, while propositions that invoke natural teleology in organisms are not reducible. In this section, I begin to explain why this is so, however the argument will take longer to make, and stretches across

[85] Although See Gowans, Sobel, and Harman for three persuasive arguments against the likelihood of that project succeeding.

chapters three and four. By the end of chapter four, I make a case not just against conceptual reduction but against metaphysical reduction of the teleological to the descriptive. All I have space for in the current chapter is give a broad-brush explanation for how the argument will proceed.

The teleology of artifacts and of organisms differs in many ways. As I explained in chapter one, artifacts are typically thought to be *externally* teleological, their purpose originating from an external source (an agent). When it is claimed that organisms are teleological, either the claim is that they are *internally* teleological, such that they are the bearers of their own source of purpose, or they are "intelligently designed," likely by God. I think that this difference between organism and artifact teleology points to different levels of *authoritativeness*. My contention is that broadly speaking, the norms of biological purposes are seen as more authoritative than the norms of artifact purposes. Since I separate protonormative purposes from normative reasons, I do *not* mean that there is more of a reason to use an organ such as a kidney for its natural purpose than there is reason to use a knife for its purpose (although I think this is *also* a common thought). Rather, what I mean by "authority" in this case marks the difference between a sense of "proper" that is grounded all the way down, and a sense that remains constructed and more contingent. I hope the following analogies can help clarify this subtle point.

Consider a creationist view that understands organisms to be artifacts designed by God. Comparing the norms for form and function of a heart that God designed with the equivalent norms for a chair that I myself designed, the creationist might think that the norms had a different sort of standing in proportion to the authority of their source. Both chair-norms and heart-norms are protonormative because they generate standards of correct form and function that dictate what is proper for the chair and the heart, respectively. Yet protonormative standards

set by me and set by God would have a noticeably different weight. The way a creationist might describe the difference is that "proper according to Smith" is contingent upon the intentions and imagination of an unimportant and fallible agent (Smith), whereas norms that are "proper according to God" have an infallible infinite agent as their source, and are equivalent to "proper full-stop." Both the chair and heart have a telos, but the telos with a human source seems less authoritative than the one with a divine source.

I suspect that this once-standard theistic understanding of biological teleology is the source of the strong valance that often attaches to the term "natural" and its cognates. This is Mill's point the passage that begins chapter two: what is "natural," or "normal" (understood in a non-statistical way) is so often taken to be a deeply entrenched instance of "proper." Not just proper "according to Smith" but proper "full stop." To the degree that one sees "the natural" as equally contingent and fallible as a human designer (and this dethroning can sometimes accompany an understanding of evolutionary biology) it may lose this valance for some. Yet from Aristotle himself to contemporary secular philosophers of biology there is a tendency for many to think that even if my nose has the function of holding up my glasses in some trivial sense, it "really" has the "proper" or "primary" function of breathing and smelling that is grounded in its selective history.[86] That this distinction remains and has traction on our intuitions (which I admit it does), the two levels of protonormativity can be identified even in the secular arena.[87]

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[86] For instance see Millikan (1984) chapter one.

[87] At the risk of muddying the waters, and keeping in mind that I take "normativity" and "protonormativity" to be different concepts, it may help to notice a similar though not identical to the distinction between hypothetical and categorical imperatives for Kant. Both sorts of imperatives issue in "oughts," but only categorical imperatives are binding because their source (universal rationality) is more authoritative than that of hypothetical imperatives, the source of which lies with contingent urges.

For another helpful analogy, look at the distinction between type-one and type-two normativity made by David Copp (1995). He distinguishes between two types of normativity in the following way. "Paradigmatic type-one normative propositions are true only if the standards to which they appeal have a *de facto* standing, whereas paradigmatic type-two propositions are true only if the relevant standards have an appropriate normative standing or justification."[88] To avoid using the word "normativity" in the definition itself, we could rephrase to say that whereas type-one normativity only applies in reference to a standard that itself may be arbitrary, type-two normative propositions relate to standards which are objectively authoritative. Etiquette is an example of type-one normativity as it consists of a set of norms, all of which rest on some convention rather than an independent and objective justification. Morality, Copp rightly insists, is type-two normative: moral truths lay claim to an authority independent of whim or mere convention.[89] Type-one normative propositions can be fully understood in descriptive terms, and imply no normative properties. Let us borrow from Copp and extend these categories for protonormativity as well (taking us admittedly far afield from Copp's own application). Allow that type-two protonormative propositions express norms for what is proper "full stop." Assertions about what is *natural* and *unnatural* usually fall into this category for they are often intended to be somehow self-justifying when dictating what is proper. Type-one protonormative propositions express norms for what is proper according to some source that is not necessarily authoritative.

Note that just as Copp is primarily interested in type-two normativity, we should be interested in type-two rather than type-one protonormativity. This is because like norms of etiquette, the telos of an artifact is not very mysterious; it stems from a sort of arbitrary fallible

[88] Copp (1995, 22)
[89] Copp (1995, 22)

source. However, morality and natural teleology share a kind of objective force (with the accompanying metaphysical "queerness" that worries some) that raises them above the status of etiquette.[90] Artificial teleology emerges when an agent designs an artifact or otherwise foists purpose upon some previously purpose-less object. In so doing the agent has created a type-one protonormative relation between the object's performance and the agent's intentions. There is some weak sense in which there are now norms for the object, but they are only grounded in the intentions of some agent, who herself has no ultimate authoritative standing. The intentions of an agent are highly contingent and not themselves justificatory. Natural teleology, on the other hand, claims to be grounded in nature itself, not the intentions of any agent. No matter our intentions or purposes, the norms of natural teleology supposedly exist as brute facts. The telos of an artifact may shift depending on the whims of its designer and/or user, but the telos of a kidney, for instance, remains constant no matter what any agent feels or wants. This sentiment can be found both ethical theories such as Foot's "natural goodness,"[91] but also in non-ethical theories of function [find a few examples]. Kant thought that hypothetical imperatives mimicked the standing of categorical imperatives, yet lacked the force to be truly binding. Similarly, type-one propositions mimic the standing of type-two propositions yet their source is transparently non-authoritative.

The two-level distinction has bearing on the question of conceptual reduction. It is an empirical matter what the purpose of some design element of an artifact is, and hence what would count as a malfunction or defect. If only we could consult the designer, or perhaps gain

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[90] There are dissenters, obviously, early Foot being one of them in her "Morality as a system of hypothetical imperatives." But I take it to be a standard if not universal view that morality carries more weight, and has more authority over us, than etiquette.

[91] See Foot (2001, 26) "Features of plants and animals have what one might call an 'autonomous,' 'intrinsic,' or 'as I shall say 'natural' goodness and defect that may have nothing to do with the needs or wants of the members of any other species of living thing."

insight into a multi-generational design process, we could ascertain that some artifact X has some proper function Y. There is no Moorean open question about the teleology of artifacts. Is the toaster *supposed to* toast bread? We can investigate, read the manual, and discover that yes it is. If we know that the designer intended for the tank to hold gasoline, and that this tank is leaking, we can see that there is something *wrong* with this tank. It is *defective*. It is a *bad* (attributive) gas tank. None of these are open questions. If God exists, and God's design was knowable I believe the same would be true of organisms. If God intended for my ears to hear, that is what my ears *ought* to do. Hearing would be a condition of *good* ears. Note that this discussion is about the is-proper gap, not the is-ought gap. Whether I have *reasons* to use my ears to hear is still an open question that depends on other factors not settled by God's design. Closing the is-proper gap does not thereby close the is-ought gap.

Several objections might be raised to my two-level analysis of protonormativity. The notion of protonormative "authority," might seem vague. There might also be concerns that I am giving too little credit to artifact teleology (type-one protonormativity) or too much credit to natural teleology (type-two protonormativity). I will address these concerns in order.

Is protonormative "authority" too vague a concept to do any work? It is a hard concept to describe in part because the word "authority" sounds legalistic and deontic, neither of which I intend to apply in this context. But *the proper* itself is a subtle category, so much so that a concept like "teleology" can be mistaken by some for a normative concept and by others for a descriptive concept. Therefore it should be no surprise that a descriptor of the force of "properness" should itself be subtle. Though protonormative authority may have no bearing on our practical reasons (at least there is not reason to insist that it does), there is nevertheless a sense in which states of affairs can be more or less proper.

On a related note, even though type-one protonormativity may lack ultimate authority, it is not therefore totally arbitrary. To answer concerns that I am not giving artificial teleology enough credit, let it be clear that I think that only certain processes are capable of setting an artifact's telos. The proper function of a knife is to cut. It gained this function through a combination of the history of people selecting knives for their cutting ability and the designer intending this specific object to be a knife. I will go into more detail about what this process entails in the next chapter. I think that an agent has the ability to confer a new purpose or function onto an object, but some kind of mental activity is essential. For any given artifact there is a concrete answer to what its purpose is. Such purposes are easy to come by in a sense – any old agent can generate one – but they are not random; artifact purposes require mental activity.

Alternatively, do I give too much credit to the authority of natural teleology? In reply, I need only refer the reader to any number of neo-Aristotelian defenders, all of whom assume from the start that it has such authority. Neo-Aristotelians typically realize that they need an argument for why our human telos should have normative authority over our reasons, but typically it is assumed without a second thought that our natural telos is the authoritative standard of our proper function, prior to any "secondary" function we may confer on ourselves.

In many ways my conclusion in this chapter is very modest. I note that there is a unity to the propositions that I listed at the beginning; They all can be translated into teleological language without loss of meaning, and all express norms for a *proper* relation that I describe as protonormativity. I am not promoting an error theory about protonormativity, nor am I denying the possibility for a synthetic identity with some normative or descriptive properties. I have only claimed that it is conceptually distinct from the latter two categories, and therefore substantive questions can be asked about the connection between all three. I have charged some neo-

Aristotelians of being too quick to glide from description, to protonormativity, to normativity and suggested that they need a more detailed account of the metaphysics involved. I think this thesis stands on its own, and can be accepted independently of the stronger thesis I push in later chapters against the possibility of fully naturalizing the protonormative concept of teleology.

CHAPTER III. BEYOND THE FUNCTION DEBATE

In the last chapter I argued that some propositions imply the existence of norms that fall in between mere description and full-blown normativity. I labeled this new category "protonormativity," characterizing it as pertaining to *the proper*, leaving traditional ethical notions like *the good* and *the right* for "normativity." I made the case that protonormativity is a distinct conceptual category and that its status *vis a vis* metaethical realism should be treated with all the caution that we treat normativity. In other words, instead of merely worrying about one is-ought gap, the introduction of a third metaethical category should introduce worries over three gaps. I made a case against the conceptual reduction of the normative to the protonormative and the (type-two) protonormative to the descriptive. I left open whether or not metaphysical reduction is possible. In this chapter and the next I begin to build a case against the reduction of natural teleology to mere description. Thus rather than an argument against the possibility of any protonormative reduction, I only seek to block the reduction of this particular protonormative concept.

Much of the literature on teleology focuses on the nature of biological functions; however, I think this literature makes little headway into the question of whether natural teleology exists. In this chapter I will survey some of the important debates regarding biological functions, explain why much of it is of limited relevance to my project. Toward the end I will set clear parameters for a substantive debate over the metaphysical, indeed metaethical, status of natural teleology and its corresponding protonormativity. The naturalist critique of natural teleology, I believe, is best made by denying the existence of "proper environments" for organisms to inhabit, something to which natural teleology is absolutely committed. With this

strategy in hand, will offer a fuller argument against the possibility of proper environments in the next chapter.

The last few decades have seen growing interest in how to understand biological functions. From Hempel and Nagel in the 1960's, Wright and Cummins in the 1970's, to Millikan, Neander, and others in more recent years, a thorough body of literature has emerged. As Buller (1999) describes in the introduction to his edited volume on the subject, a "near-consensus" has emerged about how to understand biological functions. This dominant view is that biological functions are explained by their selective evolutionary history, and that explanation is teleological, that is, functional explanations have to do with what a trait is *for,* or what its *purpose* is. Following the taxonomy of Walsh and Ariew (1996) I shall refer to this view as a theory of evolutionary functions (E-functions). Bucking this popular view is Cummins (1975), Amundson and Lauder (1994), and Davies (2003) among others. They advocate for a theory of causal-role functions (C-functions) that identifies the function of a trait with some causal role it plays in contributing to a system that contains it. C-functions, unlike E-functions, are not teleological. C-function theorists disagree that functional explanation implies "purpose" and deny that functions have anything to do with why a trait evolved.

This chapter will detail the differences between these two main theories of function and identify what has thought to be at stake in the debate between them. Though the debate is in many respects well-trodden, the emphasis has not usually been on the issue that matters most for my project: the metaphysics of natural teleology. Some philosophers in the area are doing conceptual analysis on the concept of a "function," while others building a technical theory of functions to play some role their philosophy of mind or language. I do not share either of these goals. Therefore while I will review the major developments in functional theories over the last

few decades, my goal in the chapter is to break free from the dialogue and offer my own framework for how to conceptualize the puzzle of biological teleology. What matters for the realism of natural teleology, and incidentally what should be salient for ethicists, is its protonormative status. That is, teleological functions allow for the possibility of malfunction, defect, and error in non-conscious nature. Natural teleology implies that biological traits can be evaluated according to these norms of *proper* versus *improper* performance. This is the central feature that concerns me, and vindicating or undermining this possibility should be what a debate over natural teleology focuses on. This framing will give structure for a substantive debate over whether or not natural teleology exists in the next chapter.

The Initial Puzzle

As with many great philosophical problems, there is a disagreement over who carries the burden of proof regarding the existence of natural teleology. Proponents for teleological realism argue that attributing teleology to the natural world is both intuitive and indispensible to the practice biological science.[92] From this perspective the burden would be on any debunker to demonstrate that teleology is objectionably non-naturalistic or otherwise useless to a scientific understanding of the world. The debunkers, meanwhile, argue that only in biology do teleological attributions of purposes and goals linger, remaining preposterous in physics and chemistry, and that the biologists' attachment to them reveals an Paley-esque tendency to anthropomorphize the natural world. From this perspective, the burden should be on teleologists to demonstrate that their explanations tolerably naturalistic. I favor the latter position. I consider teleology to be *prima facie* puzzling and in need of a robust naturalistic defense to be allowed into a scientific view of the world. Intuitive though it may be that vegetative processes exhibit

[92] This can perspective can be found in Dennett (1995), Ruse (2005) and especially Kant (1790). I return to this argument in the conclusion.

goals and purposes, I think such intuitions should be subordinate to a more sober assessment of what naturalism can support.

Lewins provides a helpful parable to illustrate the *prima facie* oddity of natural teleology in *Organisms and Artifacts* (2005) that considers talk of "cloud chasing" by meteorologists. He notes that animism once dominated meteorology, geology, and botany. Naturalists in these disciplines would appeal to spirits to explain the properties and movement of clouds, rocks, and plants, yet today such overtly supernatural appeals are now rejected. While geology and botany jettisoned anthropomorphic language in their science, meteorologists oddly persisted in talk of "clouds chasing each other across the skies." Lewins builds the analogy, noting that such talk had great predictive success, a feature which philosophers of science might find puzzling. As Lewins muses, "Could it be that clouds alone really did harbour some kind of intentional or pseudointentional states that explained the survival of the animist paradigm in meteorology?" [93]

The would-be debunkers of natural teleology hold that talk of goals and purposes of vegetative processes is akin to talk of cloud chasing. The vocabulary can be useful and so it is psychologically and sociologically understandable why the fishy metaphysics would have persisted. We could harmlessly retain the framework as a heuristic if scientists find the metaphor inspiring, but we should not retain the metaphysics, nor the norms that are implied, if it is not supported by science. Protonormativity is not treated as a mere heuristic; it is taken seriously by ethicists and therefore should either be defended in its own right or cast aside as a relic.

E-Functions

Wright (1976) sparked the contemporary scholarship on historical accounts of function, though much of the work in this area owes its precision to Ruth Millikan (1984). Over several

[93] Lewins (2005, 5)

books and articles she has described her etiological theory of functions, which she calls "proper functions."[94] I will favor the broader term E-function, returning to her own use of the word "proper," later in the chapter. To explain the historical nature of functions, Millikan introduces the concept of a "reproductively established family," in which items within a family are "copied" and therefore stand in a certain historical relation to each other. (1984, 19) *First-order* reproductively established families are those in which one member is a *direct* reproduction or copy of another, whereas to belong to a *higher-order* reproductively established family is to be an *indirect* copy of an ancestral member. (1984, 22-24) One organism is a copy[95], so to speak, of a parent organism, thus contributing to a first-order family. My femur, however, was not replicated from another femur, but rather copied via another process by something else with a femur (my parents, as it happens). Thus we can speak of organs and heritable traits as having "ancestors" of a sort: the temporally prior members of their higher-order reproductively established family. Note that one copy need not be an exact facsimile of another to belong in the same family. Words spoken with an accent can be qualitatively differently yet be the same word. Humans intuitively all belong in the same reproductively established family despite their obvious differences.

Millikan's next step is to hold that the E-function of an item X is to do the activity Y that its ancestors did that causally explains why X's ancestors were copied. Reproductively established families compete with other families, in a sense, and the most reproductively successful items are "selected for," and survive to replicate.[96] Let us take an example to

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[94] See Millikan (1984), (1989), (2002) and (1999)
[95] Millikan admits that "reproduction" and "copy" do not correspond completely to ordinary use. Obviously a child is not a "copy" of its parent, but she hopes that the technical term is clear enough. I do not find it problematic myself. Millikan (1984, 19)
[96] Millikan (1984, 20)

illustrate the definition. My heart pumps blood and it nudges my lungs about in my chest as it moves. Millikan's theory asks us to look at which effect was responsible for the heart being replicated, and we can easily see that the pumping played a central role in the survival (and future reproduction) of an ancestral animal, while the moving about of lung tissue presumably did not. The pumping of ancestral hearts *explains* why my heart is here, thus pumping is an E-function of the heart while moving lung tissue about is not. Note here that her theory does not strictly limit the number of functions that an item has. An item will have as many functions as its ancestors had reproductively advantageous effects, but this will be a finite number, and will be connected to a fact about the adaptations of a living thing. The roots of a tree extract nutrients from the soil, but they also keep it from being blown away and from being knocked over when climbed by an animal. As long as each of these facts about tree roots were an important factor in its reproductive success, they are E-functions of a tree root. Note also that for an item to have an E-function, it need not even be able to perform the action in question. The E-function of my heart is set by how its ancestors behaved, not by how it currently behaves. Thus a heart that does not pump well, or even at all, still has the E-function, or in Millikan's own language, the *proper* function of pumping blood. This attribution of a proper function X to an incapacitated item incapable of performing X will become a sticking point in the debate between E-function and C-function theorists.

Millikan's historical theory gives us intuitively correct answers to many questions of biological function. The function of the lungs is to oxygenate the blood. The function of tree roots is to extract nutrients from the soil and prevent it from being blown away, but not to be a shelter for an ant colony. The function of a claw will vary depending on what kind of animal it belongs to: some animals use their claws to scratch, others to dig, and the proper functions will

diverge accordingly. However the E-function theory that Millikan outlines is famously vulnerable to at least two objections. First, by focusing on the history of a trait the theory may lose grip on the intuitively forward-looking nature of functions as related to the fitness of an organism. After all, intuitively the function of X would seem to be to perform some future beneficial effect, and E-functions focus instead on effects that have already transpired. Secondly, Millikan calls her theory one of "proper" functions, and this (what I call protonormative) valence may fall short of being fully supported from a scientific perspective. These challenges are pursued by Cummins, Davies, and others who subscribe to C-function theories.

C-Functions

Cummins rejects the idea that the function of an item has to do with the item's evolutionary history. He defines functional analysis in the following way: "to ascribe a function to something is to ascribe a capacity to it which is singled out by its role in an analysis of some capacity of a containing system."[97] In other words, to understand something's C-function, you must identify what role that item plays (or is capable of playing) in a containing system. This first requires singling out and analyzing a system in which the item is a contributing player. An item can have as many C-functions, none more privileged than another, as it has systems to which it contributes (in fact, more, since an item may have more than one contribution to a system). A femur, for instance, may have one function relative to the circulatory system, another function in relation to the muscular system, and yet another function relative to the animal as a whole (insofar as it performs a vital role in hunting or otherwise procuring food). In principle

[97] Cummins (1975, 765)

there is no limit to the number of functions an item can have. This has led to the complaint that C-functions are too promiscuous, leading to many more functions than is plausible.[98]

Cummins himself does not seem concerned about promiscuity. C-functions are forward-looking, causal, and relative to a system capacity. This relativity is essential, and he denies the possibility of prioritizing some effects as privileged or proper. "Selected effects" theories, as he calls them[99], hold that some effects of an item or trait (a femur or a tree branch) are given more weight than other effects in determining the function of the item. There are two ways, says Cummins, to attempt to select out which effects matter and which do not.[100] One way would be to tie the function of an item to the function of the containing system. Thus if a leg has a function, the femur's function is whatever effect properly contributes to the function of the leg. But how do we tell the leg's function? Following this model, by finding the function of whatever the leg contributes to, perhaps the individual as a whole. But do individual people have functions? The result of this line of thinking is an endless regress unless the analysis at some point settles on something with no function (in which case, unfortunately, all its parts are accordingly stripped of their function).[101] The other way of trying to justify a selected-effects model is to find a natural stopping point at which explanation is sufficient: a goal towards which biological systems and their parts aim. One might be attracted to this option if she takes the fitness of an individual to be an end point for function ascriptions.[102] But without looking at another theory such as E-functions there is no empirical way to support the claim that the function of a trait is always to contribute to fitness. One can observe various effects of a trait,

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[98] See McGlaughlin (2001) chapter 6
[99] Cummins (1975, 752)
[100] (Cummins 757)
[101] Cummins (1984, 757)
[102] This is the approach taken by Bigelow and Pargetter (1987) with their propensity theory of functions

one can attribute functions to them relativistically as Cummins does, but there is no basis for privileging some effects over others to name a "proper function" with this limited set of tools. Far from being concerned with this, Cummins sees this as a feature of his theory, avoiding what he sees as metaphysically problematic teleological implications.

This lack of teleology, however, leads to another objection to C-functions in that they do not provide a basis for a trait to be defective or malfunctional. This is typically taken to be a weakness of his theory, since such ascriptions of malfunction seem to many to be an important feature for a functional theory to capture, nevertheless this implication is also something that Cummins flaunts rather than flouts.[103] Given his definition of a function, some trait will either contribute to the containing system or it will not. This gives us a distinction between "functional" and "non-functional," but in the case of a trait that was previously functional and then becomes incapacitated, since Cummins theory is purely causal in nature, it would be impossible for a trait to be "malfunctional." Malfunction ascriptions would imply that some norms of performance attached to the trait despite the incapacitation. Cummins himself sees this as the logical consequence of rejecting teleology in functional explanations. This point is obviously of central importance for my project. Malfunction and defect are norms for "the proper" as I understand the concept, and it is precisely this aspect that opens the door to application in ethical theory. To delve deeper into the dispute over malfunction and defect I look next to Neander's theory of E-functions, for it provides a more direct argument for their teleological character.

[103] Cummins (2002)

Teleology and Malfunctioning

Neander's view is nearly identical to Millikan's, holding that "the function of a trait is the effect for which that trait was selected."[104] However, where Millikan often ducks the label of "teleology," Neander embraces it directly. Teleological explanation, she allows, has a *prima facie* problem of seemingly having to explain something by its effects rather than its causes, thus perhaps invoking backwards causation, therefore she gives an analysis that tries to describe E-functions as essentially teleological without falling into fishy metaphysics.[105] Uncontroversially, conscious agents with intentional states act teleologically; we literally have goals and purposes *in mind* that we pursue. So, one strategy is to give an analogous argument for natural (non-conscious) teleology in terms relevantly similar to mental teleology:

> There is an ambiguity in talk of purposes. A purpose is both a future desired effect, and a certain more of less resolute attitude to bringing about that future desired effect…the explanatory power of purposive explanations does not derive from their explicit reference to the future [state of affairs] but so much as their implicit reference thereby to past intentional attitudes to those future effects…so these teleological explanations are just a species of ordinary causal explanation after all.[106]

The argument by analogy:

> Notice the neat fit between [the etiological theory] and the general pattern of teleological explanations outlined [above]…the forward reference to a trait's function, to what the trait is *supposed to do*, serves as an implicit reference to past selection of that type of trait

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[104] Neander (1991)
[105] Neander (1991, 456)
[106] Neander (1991, 456)

> for that type of effect. We have here, in common with other teleological explanations, an explanans that explicitly refers to something that post-dates the explanandum.[107]

There is a neat fit, admittedly, and it explains away concerns that teleological explanations might involve "backward causation," but Neander's explanatory story will not be sufficient to ground teleology. Davies offers this critique, examined in the next section.

Davies' Critique

Davies allies with Cummins in preferring C-functions over E-functions, and offers several arguments aimed at discrediting the metaphysics of E-functions and their teleology. I share this goal, but while I am sympathetic to his arguments, I think they are not conclusive. In the next chapter I apply my own critique that, I believe, succeeds where Davies' argument falls short.

His first argument picks up on the claim by E-function theorists that traits are properly identified and organized according to their function. That is, what all hearts have in common is precisely that they have the E-function of pumping blood; Traits are functional kinds sharing the essence of a particular function. As Neander says, "No purely morphological or dispositional characterization will do the job because the category must embrace pathological diversity and differences across species as well. A badly diseased heart need not look like a normal heart, nor be capable of doing what a normal heart does. But it is still a heart in virtue of the fact that it has the proper function of circulating blood."[108] This thesis is touted by E-function theorists for it gives common purpose to each token belonging to a type of trait whether or not that token is operating successfully. The purported result is that an incapacitated malfunctional heart retains

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[107] Neander (1991, 461)
[108] Neander (1991, 467)

its E-function and thus its kind-membership. Davies offers an argument that this latter claim is false; he holds instead that an incapacitated token trait cannot be malfunctional for in losing its relevant capacity, it also loses its kind membership. Thus while C-functions cannot account for incapacitated malfunctions, Davies argues, neither can E-functions.[109]

On its face, this seems like a hollow critique. E-functions are historical, based on the selected effects of ancestral traits, therefore a current trait that lacks the relevant selected capacity ought to be able to retain its E-function since it obviously retains its history. However, Davies argues that the only traits that can have E-functions are those that are self-perpetuating.[110] There must be a causal link between the effects of historical token traits and the activities of current traits, Davies insists, because without this link we can explain the presence of some trait (a kidney, say) in an organism by appealing to *any* trait possessed by ancestors of that organism. Ancestral hearts would explain the presence of current kidneys just as well as ancestral kidneys.[111] This is a sticky claim, and not entirely obvious. Nevertheless, if one insists that only the self-perpetuating traits will be eligible for E-functions, if a trait loses that property (he imagines that we could lighten a dark-colored moth with a solvent), it must be disqualified from the relevant functional category. Thus malfunctions are impossible because as Davies says, "incapacitated instances no longer qualify as members of the relevant selected function category." (Davies, 203) However, the way out for an E-function theorist, as Neander explains, is to hold that selection operates on types rather than tokens. She notes "your opposable thumb has a proper function in virtue of the fact that this type of trait has a proper function."[112] Thus as

[109] Davies (2003, 200)
[110] Davies (2003, 200)
[111] Davies (2003, 202)
[112] Neander (1991, 460)

long as the type of trait is self-perpetuating, tokens of the trait can fail to be self-perpetuating and yet be selected for, thus remaining members of the functional category.

The insistence the selection acts on types rather than tokens allows the E-function theorist to escape Davies trap. But this defense stirs other difficulties. It raises a question as to order of explanation: is it a heart because it has function X or vice versa? If one explains the kind-membership of an item in terms of its function one cannot then explain the function of that item in terms of its kind-membership. If selection acts on types of traits, then those types are explanatorily prior to selection. Given the commitment of the etiological theory that proper functions are derived from natural selection, it cannot be that trait types are also defined according to those proper functions. The three claims form an inconsistent triad.

(1) Trait types exist prior to selection (because selection acts on types, not tokens)

(2) Selection is explanatorily prior to proper functions (according to etiological theory)

(3) Trait T belongs to a type in virtue of its proper function

If selection is what produces proper functions, and proper functions are what organize trait types, those trait types cannot possibly exist prior to selection acting on them. Something is amiss. One strategy to escape the contradiction would be to give up (1). It strikes me as a controversial assumption to begin with; why must we think that selection acts on types rather than tokens? But jettisoning this thesis is damaging for E-functions because without this premise it is hard to attribute functions to incapacitated traits. Alternatively Amundson and Lauder take issue with thesis (3) for they argue that trait types can be identified morphologically and/or historically and do not rely on functional kinds.[113]

[113] Amundson and Lauder (1994)

Davies has another argument against the naturalism of E-functions that is more in the spirit of how I think natural teleology needs to be critiqued. He describes the selected effects theorist (he picks on Millikan) as adopting two conflicting claims: 1) that "possession of a selected function involves nothing more than the possession of a selectively successful history," and 2) "traits with selected functions can, if sufficiently incapacitated, malfunction."[114] The first claim is the central commitment of E-functions that they are explained in terms of an item's evolutionary past. The second claim is the prize that sets theories of proper function apart from causal-role functions: the ability to establish norms of performance for an item even if that item is incapacitated. Thus we might say that though this heart is damaged and *cannot* pump blood, hearts are nevertheless *for* pumping blood, and *ought* to pump blood if working *properly*. The attribution of malfunctions (and equally defects) is taken by Millikan and company to be an advantage of their theory over Cummins' causal-role functions. However, Davies tries to make the case that the kind of historically grounded explanation of E-functions are unable to support the protonormative (which he calls "normative") attribution of malfunction. The crux of Davies' complaint is that proper functions that persist despite incapacitation must be abstract, non-physical, and therefore non-causal properties (Davies, 142). He takes it that scientific naturalism cannot support such properties. No purely causal history of an object, he holds, will be able to explain how an object could gain the property of "having the function of X" despite the inability to perform X. As he says, "There are no mechanisms in the processes that comprise natural selection endowed with the power to produce such norms" (Davies, 141). Thus Davies doubles down on Cummins' belief that traits can be functional or non-functional but never malfunctional. Empirical science can discover what a trait does and does not do, but not what a trait cannot-yet-

[114] Davies (2003, 140)

should do. I am sympathetic to Davies' critique but this argument strikes me as too quick. In the next chapter I present a longer argument for the non-naturalism of natural teleology that I think more fully explains the conflict between naturalism and teleology.

I believe that applying norms for proper performance is not just objectionable for incapacitated biological traits, it is objectionable for any biological non-artifact whether incapacitated or not. Thus I propose a way of getting at the heart of the metaphysical debate that will be relevant to philosophers of biology, but also to ethicists who had their heart set on vindicating "natural norms". Norms for malfunction and defect, indeed for natural teleology broadly construed, imply norms for the phenotypic outcome of organisms and their parts and operations. That is, anyone committed to natural teleology, including proper-function theorists, is committed to believing that phenotypes are subject to norms of "proper" and "improper." Given that a phenotype is but a genotype in an environment, the commitment extends to finding some way to insert protonormativity into genotypes, environments, or some organic unity of the two. In the next chapter I illustrate exactly why naturalism will not support any such moves. If my argument there is sound, naturalists must reject natural teleology and proper functions. If that is the case, ethicists must choose between teleological commitments and ethical naturalism and cannot adhere to a theory such as neo-Aristotelian virtue ethics that purports to adopt both.

A New Approach

What strikes me as odd about so much of the function debate is that it centers around post-hoc legitimizing of the habits and metaphysical intuitions of both practicing scientists and ordinary speakers. As Davies is keen to point out, this seems entirely backwards. Why not determine what a reasonable metaphysics can support and then adjust our beliefs and practices accordingly? This may be revisionist but not to a disturbing degree, especially if the revision is a

minor one. As far as the battle between conceptual analysis and a modest metaphysics I think both sides get to eat half their cake: I think E-function theorists by and large have the right conceptual analysis but C-function theorists have the right metaphysics. Most function ascriptions in biology, I believe, are teleological. If we are rejecting biological teleology due to its fishy metaphysics, rather than revise the concept of function, I think we might as well just give up on it. I have no quarrel with its metaphorical use, akin to metaphors of "cloud chasing," but we ought to come to grips with our propensity to anthropomorphize or "artifize" (there must be a word for this: whatever we might call the tendency to equate organisms with artifacts) biological entities.

Instead of debating the metaphysics of biological causation or the process of natural selection, I propose a more accessible controversy that might settle the matter equally well: the existence of proper/normal/natural environments for organisms. How could this be a sufficient proxy for the debate over natural teleology? The answer is that natural teleology, and the related cognate concepts of natural design, proper function, etc. all imply the existence of some standards of correctness for organism phenotypes. Malfunctions, dysfunctions, and defects could be simply described as incorrect or improper phenotypic results. A defective heart is one that is supposed to (or ought to, or should) pump blood and has failed to meet that standard. A phenotype, of course, is the result of a genotype in some environment. In order to apply the notion of "proper" to any phenotype, somehow "proper" must also appear in the antecedent part of the equation, either in the form of a proper genotype, environment, or some combination thereof. If we are not able to signify one environment as more proper/normal/natural than the other, it seems that we cannot label one phenotype as more proper/normal/natural than the other. If proper environments are illegitimate, natural teleology is impossible. Natural teleology is an

internal goal-directedness, but such activity can only take place under certain conditions; lungs might be said to be *for* oxygenating the blood but they do a lousy job of this underwater. If lungs are to *properly* oxygenate the blood, then the ocean floor is an inappropriate environment for lungs to operate. Thus by *modus tollens,* if environments cannot be proper or improper and the ocean floor cannot be ruled out as such, it is false that lungs properly oxygenate the blood.

CHAPTER IV. TELEOLOGY AND PROBLEM WITH PROPER ENVIRONMENTS

In the last chapter I argued that the literature on biological functions had not conclusively addressed the metaphysics of natural teleology. Since natural teleology is used as a source of normativity by a number of ethical theories, the question of whether teleology is metaphysically real is crucial. More specifically, I am interested in the question of whether organisms and their parts and operations are answerable to teleological norms of proper form and function, malfunction and defect. To address this issue directly I propose a new angle of discussion, a new line of attack against teleology. In the end I am not just interested in the metaphysics but the metaethics of teleology: the question of whether invoking biological teleology is something available to the metaethical naturalist. The central claim I make in this chapter, indeed the thesis that the dissertation rests upon, is that teleological norms rely on environmental norms, and there are no objective and naturalistic norms for "proper environment" that we can apply to biological entities. The argument I will employ has equal force against scientifically grounded theories of proper function and less scientific neo-Aristotelian theories of function. Therefore the argument in this chapter has direct application to the functional literature in philosophy of science as well as ethical neo-Aristotelian literature about "norms of nature." Here is an abridged version of the argument, meant to convey the rough trajectory of my reasoning:

1) Norms for proper form and function of some item entail norms for the proper environment of that item
2) While artifacts obtain environmental norms from a designer, organisms have no environmental norms
3) SO, organisms have no norms for proper form and function

And here is an expanded version of the argument that provides more detail:

1) Norms for proper form and/or function of some item can be described as norms for the outcome of the item.
2) The outcome of some item is determined by the interaction of initial material interacting with some environment.
3) A norm for proper outcome presupposes a norm for either initial material or environment.
4) Norms for proper initial material also presuppose norms for proper environment.[115]
5) Norms for proper environment are either set internally or externally
6) Norms for the proper environment of designed artifacts are set externally from the mental activity of a designer.
7) Biological entities are not designed artifacts, and did not come from the mental activity of a designer.[116]
8) Norms for proper environment of organisms (or their parts) are not set internally because DNA does not contain information about proper environments.
9) Naturalism does not support a mind-independent external standard for the proper environment of biological entities.[117]
10) Norms for proper environment of organisms (or their parts) are not set internally or externally. [from 8, 9]
11) So, there can be no norm for proper environment for biological entities [from 5, 10]
12) So, since there are no norms for proper environment for biological entities, there can be no norms for their proper outcome [from 2-4,11]

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[115] This premise is non-obvious, and I will provide an argument for it.
[116] This is an undefended secular assumption. Without it, the argument is no less interesting for it would conclude that organisms have a proper function if and only if designed by God.
[117] This is easily the most controversial, and most important claim in the entire dissertation

13) So, biological entities cannot have norms for proper form or function [from 1,12]

Elements of the argument will look familiar to some, for an attack on "proper" or "normal" environments have played an important role in past arguments against Aristotelian essentialism, notably from Kitcher (1993) and Sober (1980). One aim of the argument above is to show that the argument against the legitimacy of proper environments is more forceful and wide-ranging than previously recognized.

Outcomes, Initial Material, and Proper Environments

The term "outcome" is meant to be parallel to the biological notion of a phenotype. In past iterations of this argument instead of writing about "outcomes" and "initial material" I applied the terms "phenotype" and "genotype" to both organisms and artifacts. I still have a fondness for the simplicity of using those terms, and I think the metaphor is apt. But it relies on a controversial understanding of what a genotype is, and although I make a case for it by the end of the argument, it would be question-begging to insist on the terminology to frame the debate.[118] Although using the terms "genotype" and "phenotype" would be convenient, it is not essential because the point I am making regarding environments can be made independently in organisms and artifacts respectively: it is true of both of them that if you want a norm for their outcome, you must have a norm for environmental conditions. I will illustrate the point regarding organisms first, and artifacts second.

The genotype of an organism is its genetic profile, the code of life found in its DNA. The phenotype of an organism is the expression of the genotype once it is placed in some

[118] The analogy only works if you grant that DNA is not a "program." I cannot allow a biological genotype to include programmatic "guidance information" because then the equivalent genotype of artifacts would also include this information, which exists in the mind of a designer. The analogy only works if a genotype is non-informational material. I happen to believe this is true of DNA, but stipulating this terminology in the argument would be question-begging.

environment. This has been emphasized before in critiques of Aristotelian essentialism, especially in what Sober calls the *natural state model*: an essentialist theory that is compatible with genetic variation and allows for evaluation of goodness and defect:

> According to the Natural State Model, there is one path of foetal development which counts as the realization of the organism's natural state, while other developmental results are consequences of unnatural interferences. Put slightly differently, for any given genotype, there is a single phenotype…or restricted range of phenotypes which count as natural.[119]

The result of this model is a range of "characteristic" traits of a species. Just like organisms, artifacts have some initial material, when you put the material in an environment there is a way it will turn out, and just like organisms, put in two disparate environments, an artifact can turn out dramatically different. Thus I offer a thin but versatile analogy to a "genotype" as "initial material" that is affected in various ways by an environment.

To see the importance of proper environments for artifacts, look at the following passage from J.J. Thomson describing the functional norms of a toaster:

> A toaster is marked as defective when it fails to toast bread only if it fails to toast bread in suitable circumstances - that is, circumstances such that toasters are manufactured to toast bread in them... it is only when it is in those circumstances that toasters ought to toast bread. I won't try to spell out what exactly all those suitable circumstances are; I leave them to intuition.[120]

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[119] Sober (1980): 374
[120] Thomson, 208-9

In fact, I believe the suitable circumstances *can* be spelled out for artifacts but not for organisms, though that argument will follow shortly.[121] At present, note that any notion of defect or malfunction versus proper function seems to require the presupposition of some proper/normal/natural environment, what Thomson is calling "suitable circumstances." References to environmental norms of this type are present in much of the literature on biological function. Millikan rightly gives "normal conditions" a central role in her theory of proper functions, for example, while Bigelow and Pargetter explain the role this way:

> …This account of functions must be relativized to an environment. A creature may have a high degree of fitness in a specific climate – but a low degree of fitness in another climate. Likewise, a character may confer propensities which are survival-enhancing in the creature's usual habitat, but which would be lethal elsewhere. When we speak of the function of a character, therefore, we mean that the character generates propensities that are survival-enhancing in the creature's natural habitat. [122]

It is clear that if one is judging function versus malfunction for some item, this evaluation can only be done in a range of normal/natural/proper environments; when placed in a bizarre environment an item my behave erratically, but this is not taken to be a defect in the item itself. Thus it seems that proper outcomes, whether or organisms or artifacts, entail proper environments. But could we not assume proper initial conditions instead of proper

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[121] Allow this somewhat dense explanation that I take to be the mainstream view among proper-function theorists: The proper (sometimes "normal") environment is the historical environment that was in place during moments when successful toasting was selected by agents and therefore the environmental conditions that designers literally "have in mind" when designing new toasters. It is established by mental acts on the part of designers over time choosing to reproduce a toaster and intending some range of environments (the range that allowed the desirable toasting effects) in which the toaster is to perform. While the function of a unique item can be individually set by a designer, if an item is to belong to a functional kind such as TOASTER it is answerable to the historical standard.

[122] Bigelow and Pargetter, 192

environments? It seems like an ability to attach "proper" to either one would enable proper outcomes. In fact, I believe that assuming proper intial material (or "genotype" in organism) also presupposes a proper environment because initial material is the outcome of some antecedent process which was itself a combination of initial material in some environment. DNA, for example, forms an organism's genotype, but is itself the product of some replication process, which happened in an environment. I shall elaborate on this point shortly.

Mental Sources of Environmental Norms

In artifacts, proper environmental norms come from the mental activity of a designer, external to the artifact itself. This harkens back to the discussion of external teleology in previous chapters. Where can we find the source for a proper environment in organisms? It must apparently either be internal to the organisms itself, or external to it. I will eventually rule out both possibilities. That organisms contain their own guiding set of norms for form and function is the Aristotelian notion of a *formal cause*. Contemporary versions of Aristotle's formal cause live on today in philosophical and scientific theories of "natural design," sometimes with specific reference to the DNA molecule as an organism's "blueprint," or "program." I believe that an artifact's design is able to specify environmental norms, so if DNA contained a design, and was able to generate equivalent norms for proper environment, we would indeed have an example of an internal Aristotelian formal cause. Therefore I now turn to prominent theorists in philosophy and science that believe that organisms have a natural design, blueprint, nor program.

It is increasingly popular among philosophers and biologists to frame questions of biological adaptation in terms of *natural design*. The benefits of the design approach are apparent. Thinking of organisms as akin to artifacts ignites the imagination of scientists, and places one in a position to discover the processes that led to the wondrous complexity of traits.

Thinking of organisms as the product of design of course is not new. Aristotle believed that organisms had a *formal cause* that acted as the "plan" that an organism was to follow to fulfill its nature. Centuries later, the assumption of scientists had been that God the creator had designed all life - an argument most famously detailed in William Paley's *Natural Theology* (1803). But until fairly recently, committed naturalists would have opposed the design argument, conceding to Paley that design conceptually implied a designer, all the while rejecting a designer. Breaking with this assumption, some new natural design enthusiasts including Dennett (1995), Ruse (2003), Mayr (1989), and Kitcher (1993) have attributed design to biological organisms while denying the necessity of a designer. Dennett writes,

> The key to understanding Darwin's contribution is *granting* the premise of the argument from design…watches and other designed objects don't happen; they have to be the product of what modern industry calls "R and D" - research and development…what Darwin saw was that in principle the same work could be done by a different sort of [natural] process.[123]

An alternative position, the one I favor, is captured by Davies, who says "Darwin did not show us how to understand the world in terms of design despite the absence of a designer; he showed us instead that we ought to stop thinking of the world in terms of design."[124] This is more than a mere terminological dispute. A world with natural design would be a metaphysically different place than a world without. Most notably, the concept of *design* is interconnected with the concept of *defect,* or an incorrect deviation from a design. Obviously something is able to be "not according to plan" *only if* there is a plan in the first place. I aim to settle this dispute by showing

[123] (Dennett 1995, 68)
[124] (Davies 2003, 14)

that a design requires a designer, not by definition, but because designs necessarily must contain information about proper environments – something only a designer can provide.

Internal Sources of Environmental Norms

Mayr argued over many books and articles that Aristotelian teleology was dead, but that something akin to it, called "teleonomy", was an important part of biological explanations. He described it thusly: "A teleonomic process or behavior is one which owes its goal-directedness to the operation of a program…it depends on the existence of some endpoint, goal, or terminus which is foreseen in the program that regulates the behavior."[125] A program is defined as "coded or prearranged information that controls a process (or behavior) leading it toward a given end."[126] Mayr intends the above definitions to cover purposive behavior in both natural and artificial entities. He is explicit that his notion of a genetic program is consistent with Aristotle's notion of a formal cause [needs explanation now], or *eidos*. He writes that it is "legitimate to employ modern terms like *genetic program* for *eidos*," continuing, "just as the blueprint used by the builder determines the form of a house, so does the *eidos* … give the form to the developing organism, and this *eidos* reflects the terminal *telos* of the full-grown individual.[127]

Mayr's theory of teleonomic programs fits with other theories of natural design from the likes of Dennett and Kitcher.[128] Both see one of Darwin's crowning achievements to be the demonstration that a design does not require a designer The story is a familiar one: DNA is an *information* molecule, guiding the development of an organism. If Mayr's theory of biological teleonomy is correct, it appears we have the internal purposive mechanism that Aristotle wanted

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[125] Mayr (1988): 45
[126] Mayr (1988): 49
[127] Mayr (1988): 56
[128] As opposed to Ruse and Dawkins who hedge on the metaphysics of design and just believe it to be an ineliminable metaphor. I address this point in my conclusion.

all along. The genetic program lays out the proper "form" of the organism, and we can compare actual results against what the program has called for. Deviations from the program, from the standard of correctness, are errors or defects. We can play as foremen touring a construction site, blueprint in hand, pointing to the windows that *ought* to be six inches lower and the roof that *should* have been pitched three degrees steeper. All of this is possible if Mayr, Dennett and Kitcher are correct that organisms operate on the basis of goal-directed genetic programs or designs.

Though Mayr calls DNA the "blueprint of life," Dawkins and Dennett point out the *blueprint* analogy should really be replaced a *recipe* analogy. What is helpful about their objection is that in making their case against genetic blueprints they actually reinforce their commitment to formal causation generally. When it comes to our genome, say Dawkins and Dennett, a blueprint is the wrong metaphor because a blueprint suggests a one to one mapping of genes to traits as well as a "reversibility" of design; just as one can construct an accurate product by examining a blueprint, one can construct an accurate blueprint by examining a product.[129] Yet one cannot examine a cake and necessarily reproduce its recipe – it may be opaque. The same is true, of course, for organisms and their DNA. Furthermore, as Dawkins points out, a recipe is not just a description of a finished cake, but rather "a set of instructions, which, if obeyed in the right order, will result in a cake."[130] This too seems like a fairer description of DNA than a blueprint, which is typically just a representation of the final product. But a recipe is still a formal cause, just one with more specificity. One can follow it incorrectly and end up with a defective product. A recipe may be much closer to a fair description of DNA than a blueprint but both will be on the wrong side of my critique as they are both types of designs.

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[129] Dawkins (2003): 89, 105 and Dennett (1995): 116
[130] Dawkins (1996): 419

A design represents the completed structure of the object-to-be. In the case of designed artifacts it is appropriate to say that there is a way the artifact is *supposed to* turn out and this is true only in virtue of some mental activity on the part of a designer or designers.[131] Sometimes when we design artifacts we make a pictorial representation - a blueprint. A blueprint is physical, whereas a design could exist just in the mind of the designer. A recipe is also a physical instantiation of a design, but instead of being a representation of the finished object, it is a set of instructions for how to make the object. Importantly both blueprints and recipes are sets of instructions that make assumptions not only about the materials used but the *environment* in which the materials are used (and in the case of a recipe, the *proper order* of construction as well). Baking a cake at sea level is different than baking a cake at high altitude. If that seems trivial, consider trying to bake a cake at the bottom of a swimming pool instead of in a kitchen. Though it may not say so explicitly, a set of environmental constraints (starting with earth gravity, perhaps, and becoming more specific) are dictated by any recipe, blueprint, or the like.

One might worry that in many cases the proper environment for an artifact simply is not specified, neither mentioned in any plan or blueprint, nor conceived of by a designer. I take this concern seriously, but it can be addressed. My response is that when omitted from plans and blueprints, even ignored by designers, a range of proper environments is necessarily implicit in artifact design. As I will explain, when an artifact is designed, just by having some phenotypic outcome in mind the designer establishes the norms for environment.

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[131] While the function of a unique item can be individually set by a designer, if an item is to belong to a functional kind such as TOASTER it is answerable to some historical standard toaster-functions. This historical standard, in turn, is established by mental acts on the part of designers over time choosing to reproduce a toaster and intending some range of environments (the range that allowed the desirable toasting effects) in which the toaster is to perform.

Cake recipes sometimes recommend different temperatures or cooking times based on altitude because of the effect this environmental detail can have on the finished product. Yet these recipes do not bother specifying that baking is to be done on dry land rather than underwater, or with earth gravity rather than Martian gravity. Such details are taken for granted, though their importance to the resulting cake is obvious. Are we to conclude that there is something wrong with the recipe if our underwater cake is mushy and disintegrates? Is it the result of a bad recipe or design flaw? Of course not, and for the very reason that all these relevant environmental constraints must have been part of the design *even if not specified in the recipe*. Take another, more dramatic example: If the great pyramids of Giza had a blueprint at all, it would not have bothered to specify that gravitational pull was to come from beneath the pyramids rather than from the side. Of course, Egyptians had no deep knowledge of gravity, let alone that it *could* possibly come from a different direction. As good evidence that the designer did not even entertain the possibility, note that no adhesive was used between the giant blocks: the structural integrity *depended* on gravity coming from beneath. Now imagine some science fiction scenario in which a huge source of gravitational pull is placed beside the pyramids, causing the blocks to fly helplessly sideways, thereby destroying the structure. I pose the question again: would anyone call this development the result of a design flaw? On the contrary, we would all want to say that rather than a design flaw, this is result of an *unintended environment*. If this is true, and supposing that the pyramid designers did not even *consider* this eventuality, we are forced to conclude that the pyramid design carried implicit information about the intended environment in which the pyramids were meant to sit. Only by attributing this implicit environmental data do we avoid blaming the design for artifacts caught in bizarre environments. Where recipes and blueprints fail to include enough environmental specificity we

know that because the designer had some phenotype or range of phenotypes in mind, and only certain environments will be consistent with those phenotypes, those environments count as being implicitly represented by the design itself.

DNA may be like a recipe in significant ways, but we have seen that recipes are incomplete manifestations of design. They lack critical environmental information that would be required in order to have a standard for correct phenotypic outcome. Two organisms with the same genotype, when placed in two radically different environments, may result in two radically different phenotypes. Mayr claimed above that DNA reflected the telos of the mature individual, but since DNA itself contains no environmental data, this cannot be true. Unless DNA bears some information about natural/normal/proper environmental conditions, it cannot truly dictate any standards of correctness for phenotype form and function. Am I being unfair to DNA, uncharitably denying it the capability of carrying the very same implicit environmental information that I postulated in artificial design? Is not DNA a replication molecule, can be judged objectively according to the accuracy of replication? This is a tempting thought, but it is ultimately question-begging. To see why, examine the following speculative story in Dawkins' *The Selfish Gene* about the origins of life:

> At some point a particularly remarkable molecule was formed by accident. We will call it the *Replicator*. It may not necessarily have been the biggest or the most complex molecule around, but it had the extraordinary property of being able to create copies of itself… So [eventually] we arrive at a large population of identical replicas. But now we must mention an important property of any copying process; it is not perfect. Mistakes will happen… We do not know how accurately the original replicator molecules made their copies. Their modern descendants, the DNA molecules, are astonishingly faithful

> compared with the most high-fidelity human copying process, but even they occasionally make mistakes, and it is ultimately these mistakes that make evolution possible. (Dawkins 2006, 15)

This seems like a reasonable account of the DNA molecule's ancestry but a skeptic might wonder how the word "mistake" enters the story. A mistake or error occurs when a task is done incorrectly, or when some standard fails to be met. A thing can only err in reference to an end. In Dawkins' story the end is replication, which we know because the molecules in question are called *replicators*. But if Dawkins were around observing these early molecules, what would he notice? He would notice that these fancy molecules sometimes replicate perfect copies, sometimes replicate imperfect copies, and sometimes do not replicate at all. From this observation, it seems the honest description for them would be *sometimes-replicators*. And if sometimes-replicators do not replicate a perfect copy they haven't made a mistake at all – in fact, it is to be expected! One only arrives at an telos for DNA molecules if one assumed it from the start. There is no reason we need to call mutations "errors" as long as we all agree that a mutation is the result of a dissimilar genetic replication. DNA bears some similarity to blueprints, recipes, and models, however these are but physical manifestations of design - not designs in themselves. Artificial designs are able to contain information not included in their physical counterparts precisely because their origin is mental. There is a fact of the matter about what a designer *intended* or *had in mind*, such that we may credit the design with containing some information omitted in the recipe. The same cannot be said for DNA. Any attempt made to find this implicit environmental specificity would have to look outside the DNA molecule, to, say, natural selection. In doing so one would abandon the position of internal design in favor of an external source.

External Sources of Environmental Norms

If one pivots from an internal to an external standard of correctness for phenotypic outcomes we find more symmetry between artifacts and organisms. What the natural design theorist needs is an explanation for how a non-mental process is able to dictate the proper/normal/natural environment for an organism. This task is critical because only with the addition of this environmental specificity in the equation can we arrive at a standard for correct or incorrect phenotypic outcome. To make my case against these candidates for a "proper environment," I will rely on some well-established arguments made by Sober and Kitcher regarding Aristotelian essentialism. Sober, for example, cautions:

> When one looks to genetic theory for a conception of the relation between genotype and phenotype, one finds no such distinction between natural state and states which are the results of interference. One finds, instead the *norm of reaction*, which graphs the different phenotypic results that a genotype can have in different environments...[according to the] norm of reaction: all environments are on a par, and all phenotypes are on a par. (Sober 1980, 374)

To use Sober's example, the height of a corn plant depends in part on the temperature of the climate in which it grows. One temperature and the corn will grow low – another temperature and it grows high. Both are "natural" phenotypes for the corn plant; nothing in the corn's genotype specifies which environment should be privileged. Ironically, The lessons of these anti-essentialist arguments shall deal the final blow to Kitcher's own theory of natural design.

Thus far I have argued that teleological terms such as "defect," "design," and notions of proper form and function, insofar as they entail norms for phenotypic outcome, depend on norms for a proper/normal/natural environment. If one cannot specify environmental norms in a

naturalistic and objective way, there can be no objective or agent-neutral way to apply teleological terms. Proper function theorists would be forced to relativize their theory to some standard set by an agent and give up the claim that proper functions exist in organisms themselves. Neo-Aristotelian virtue ethicists woule be forced to either invoke a creator/designer as natural law does, or give up their claim to naturalism. These are the stakes. Is there hope of discovering proper environments for organisms? Several possible answers to this challenge are on offer. As we consider them, the point to keep in mind is that a theory of natural environment above all must not seem arbitrary: for an environment to count as the "right" or "natural" one it has to be the case that the organism really "ought" to develop there. This is not *normative* in the traditional sense, as no one I know suggests that we would have a reason to put organisms in their natural environment or that it is "good" that they be there – only that there is a sense of natural propriety about this "correct" path of development.

Where would such environmental norms come? Not from DNA, which is itself only a genotype and carries no environmental information; we must look for an external source of norms. Only three candidates for what could count as a proper, or "natural" environment leap out, and I will argue that none of them are up to the task. I shall consider A) the environment of statistical frequency B) the environment of greatest fitness and C) the environment of evolutionary adaptedness. Each of these have some intuitive pull, yet none will be able to support a norm for proper environment for the Aristotelian naturalist.

The environments of statistical frequency and of greatest fitness are the most obviously problematic, so I will address them first. The environment of statistical frequency is the one in which token organisms are most commonly found. Though "normal" is sometimes *colloquially* taken to mean "statistically common" in some circumstances, it clearly will not suffice here. One

could poison or otherwise interfere with a population of organisms, effectively altering their environment of statistical frequency, but no one would be inclined to see this as normal, natural or proper. If increased pollution somehow led to mass blindness or sterility in humans, would anyone conclude that this was the normal environment? On the contrary, the likely reaction would be that humans had *deviated* from their natural state because of this highly *unnatural* environment. Kitcher agrees, writing about environments that, "statistical considerations will not work. For we select environments as normal in virtue of the fact that they permit genotypes to issue in the traits we value."[132] Millikan offers the example of Amos the mouse, left on earth after all other mice have been tossed into space (we know not why); the current environment of statistical frequency for mice now being outer space, we are forced to absurdly conclude that poor Amos ought (normally/naturally/properly) to explode.[133] So much for the environment of statistical frequency.

What about the environment of greatest fitness? All that it takes to see that this will not meet the normal/natural/proper description is to realize that for any given organism, its environment of greatest fitness is almost certainly in the lab of some mad scientist who keeps it alive cryogenically, cloning copies from its DNA *ad infinitum*. This would ensure long life and optimal reproduction, but this is as absurd a candidate for a natural environment as the polluted world was. It seems about as *unnatural* as an environment can be, implying that the proper functions of our internal organs, for example, are to be frozen inert lumps.

A far more reasonable environment to consider as normal/natural/proper is the environment of evolutionary adaptedness. Indeed it is this environment that most people would cite in their attribution of something like a "natural habitat." Cacti belong in the desert and whales in the

[132] Kitcher (1999) 67
[133] Millikan (1989) 300

ocean rather than vice versa because these are the conditions to which their species have adapted, or so the story goes. Notice that this solution captures much of the appeal of the two solutions rejected above. The environment of evolutionary adaptedness, for example, is going to be one in which an organism likely has a high degree of fitness and it rules out bizarre "mad scientist" thought experiments.

In *Adapting Minds*, Buller picks up the fight where Sober leaves off. Against the notion of the environment of evolutionary adaptedness (EEA) counting as "normal" Buller protests:

> The EEA of a genotype is simply the environment in which that genotype had *higher fitness than available alternative genotypes* in the population. In a different environment, the genotype may have had an even greater fitness advantage over those alternatives. So why not identify the "natural environment" of a genotype with the environment in which the genotype has its highest fitness? (Buller 2006, 435)

His point illustrates the sense of arbitrariness that pervades any attempt to pick out a particular environment as a proper one. The contingent accidents of evolutionary history seem no more promising for generating any kind of normative standards than pure statistical frequency does. The environment of evolutionary adaptedness has both intuitive appeal and widespread popularity on its side, but neither of these are sufficient to ground a normative standard. Compare attempting the same feat in artifact design. No amount of intuition or popular agreement could make it the case that an artifact is supposed to be a certain way if it is contrary to the function that it has been selected and designed for. We might decide that we have reason to use it in a manner contrary to its design, but this is to make a claim about our practical reasoning and does not alter any fact about the underlying teleological norm.

Notice that this is Moore's open-question argument all over again. What is essentially an argument against conceptual reduction can be applied here to a more metaphysical question. I claim that it is an open question whether any environment, even the environment of evolutionary adaptedness, is "proper." Since this identification of proper environment serves a necessary role in assigning proper functions, the problem of conceptual reduction runs quite deep. Note, however, that all this does is block a certain kind of scientific naturalism. Recall from Chapter one that neo-Aristotelians have an uncomfortable relationship with scientific naturalism in the first place. They do not see their theory as scientific, but this is in virtue of their emphasis on rationality; they seem to realize that natural teleology itself has a naturalism problem. Other non-naturalistic options are available to the neo-Aristotelian. If it is ineliminable for the understanding of life, for example, as Thompson (and Kant) believe, this is an option, but then this begins to look like non-naturalist intuitionism: Teleology exists as a real phenomenon but cannot be discovered empirically

Against Proper Outcomes for Organisms

Artifacts have phenotypic norms in virtue of being the creation of an agent with mental states and being intended by that agent to perform a certain function. Organisms do not because, as I argued above, only mental activity is able to specify "proper" environments and only something with a proper environment can be held to norms of proper form or function. Thus the central commitment of Aristotelian naturalism, that evaluating humans is the same sort of practice (and therefore just as legitimate as) evaluating functional artifacts, is false. The evaluations are metaethically very different because teleological norms in artifacts can be reduced to mere description while such norms for the "the proper" in organisms are irreducible. I think this result should not be surprising. Indeed, the surprising result would have been if neo-

Aristotelians had managed to pull “ought” from “is,” even the mildly protonormative “ought” of teleological goodness-fixing kinds.

The conclusions of neo-Aristotelian ethicists could be retained if they posited some agent that was responsible for designing organisms, perhaps God. This, of course, very quickly begins to look like Catholic natural law, or perhaps instead some version of intelligent design. I fully allow that organisms and their parts would be goodness-fixing kinds if a deity had been responsible for their creation, and that this assumption would enable the evaluation of goodness versus defect and the attribution of purpose. This turn might have been welcomed by Anscombe, but clearly not by the secular neo-Aristotelians such as Thomson.

My conclusion contradicts some popularly held views in the philosophy of biology: that there can be design without a designer and that proper functions or teleological explanations can be reduced to efficient causes. My thesis also asks us to revise some of our intuitions about biology. If there is no design, and therefore no standards of correctness for organisms or their traits, all phenotype outcomes are normatively on a par.[134] Strictly speaking there could be no such thing as *defective* hearing or eyesight, no *malformed* limbs or *abnormal* psychologies because there would not exist an objectively correct, normal, or natural "way for these traits to be" in the first place. As counterintuitive as the denial of natural norms may seem, I want to emphasize that we can of course *make sense* of these attributions of normativity. We can capture many intuitions about "goodness and defect" in nature through a combination of understanding what is statistically common and what kinds of traits lead to human happiness. Without the concept of design, there is no "correct" standard for human eyesight given by nature - yet we can

[134] This is to say, they are normatively on a par in this one respect. Any normativity would have to come from another source, some other standard. This could be hedonism, an objective list theory, etc. None of these are ruled out. I only mean to say here that there is nothing about eyesight *per se* that brings with it a set of norms.

still detect which eyes see with greater clarity and distance, and by and large we all desire accurate eyesight because it helps us get around.

Therefore we *can* have a standard of "good" eyesight but it would either be statistical (and therefore helpful to neither the ethicist nor the philosopher of biology) or it would be set subjectively according to my eyesight-related preferences. The relevant standard of eyesight, given my interests, is that of clarity and accuracy, but this is a standard that I have set - not one that I have objectively discovered in nature. Were I to face a great reward for being blind, I might well prefer to be blind instead of sighted, and my standard would change. There simply is no fact of the matter about what eyes are "supposed" to do, and therefore no way for them to be defective according to any standard *but* one we set ourselves. There does not exist an objective standard laid down in anything like natural design. A combination of these alternative standards can grant us near-extensional equivalance with typical attributions of design and defect, but I admit that some intuitive attributions of natural design and defect will not find their corollary with either statistical frequency or human welfare.

Against Natural Teleology

To some, the conclusion will seem abrupt. If what most people mean when they claim that “the heart ought to pump blood,” and “daffodils flower in early spring,” is that they have the propensity to do this in the environment in which they (hearts or daffodils) evolved, what can be so wrong with labeling this the “proper,” or “normal” environment? Is there really such an important difference between the claim that the heart ought to pump blood, and the claim that the heart will pump blood when placed in conditions X? Once we relativize to some environment, I am perfectly happy with function-talk, so what is the gravity of my point? I believe the argument laid out here is both trivial and profound in the best possible ways. My thesis is trivial in that I do

not think it does any violence to the science of evolutionary biology: scientists can go about using teleological language if they find it useful, so long as they acknowledge the need to index to some presupposed proper environment. My thesis is profound in that it shakes up the metaphysics of biology in a way that makes certain stances unavailable to the naturalist. Aristotle thought that organisms contained their own immanent goal-directed nature, and this must be false if we require an external source to set a standard of proper environment. There can be no *aiming* of a goal-directed mechanism if there is no target it is *trying* to hit.

CHAPTER V: CONCLUSION

Perhaps the most provocative conclusion of the dissertation is that there is no such thing as good eyesight or bad hearing *per se*. Or equivalently, that it is strictly speaking false (without further qualification) that humans have ten fingers and ten toes. Both sorts of claims rely on teleological norms that entail good-of-a-kind evaluation, the application of the attributive "good," which I argue can only be legitimately applied to artifacts. This is because norms for goodness and defect rely on norms for proper environments, and I believe environmental norms are only plausibly established by mental activity. We could have good hearing and eyesight only if we were artifacts designed by God; an assumption I reject on independent grounds.[135] What I have found is that some people find the denial that "humans have ten fingers" or the possibility of "good hearing" to be so implausible as to be a *reductio* of my entire argument.[136] Others find the claims almost trivially true once fully explained. Optimistically, I can embrace some of this divergence and have my cake while eating it. For while I think my argument is disruptive to the metaphysics of teleological norms, I believe it need not disrupt natural science or common discourse.

Is it normatively significant if one has good eyesight or bad hearing? There are two ways that it is taken to matter: Good hearing and eyesight might be good *for* me and/or having good traits such as these might make me a good example of a human. That is, when the Martians come to collect good human specimens for their zoo, they should want humans with good hearing and eyesight. The first point is a matter of well-being. The second point is a matter of good-of-a-kind evaluation. Taken on its own, the claim that good hearing and eyesight are good for my well-

[135] Though, if one had good reason to believe we *were* artifacts designed by God, these norms could be embraced once more.
[136] Thanks to Julia Staffel for sharing this view with me at a conference.

being requires two extra assumptions. Not only do we need to assume that eyesight and hearing will be of utility to me (we can obviously concoct scenarios in which they are not), but we will have to pick a dog in the fight between subjectivist and objective list theories of well being, and describe exactly how the utility of hearing and eyesight increases my well-being. As such, all the work is being done by these other two assumptions, and not by the claim that I have good hearing and eyesight *per se*. Turning to good-of-a-kind evaluation, even if it were shown that good hearing and eyesight made me a good human, the further question remains: does it matter if I am a good human? It matters if there are Martians coming to collect me for their zoo, but that strikes me as a scenario in which it is quite bad for me to be a good human. Neo-Aristotelians aim to demonstrate that being a good human is good *for* me. That my flourishing *as a human* requires that I be a good instance of the kind HUMAN.

Rather than hearing and eyesight, a Neo-Aristotelian is more likely to focus on the qualities of justice, wisdom, courage, and moderation, the virtues that are Plato's focus in *Republic,*[137] and adopted by the Catholic church as the cardinal virtues. The Neo-Aristotelian strategy is link the attributive evaluation to well-being via a theory of natural teleology. If it in my nature to be a certain way, if my biological processes are directed towards certain ends, these ends might be said to be constitutive of my flourishing *qua* human. But if I am right that these norms are non-naturalistic because of an ineliminable indexing to a proper environment, neo-Aristotelians are faced with the dilemma of giving up their naturalism or their teleological norms.

It is worth noting a less abstract implication for my approach. Historically, various traits and dispositions have been treated as morally important, for example sexual orientation. By

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[137] *Republic* bk. IV

relying on scriptural evidence regarding the purpose of our sexual drive, Catholicism treats homosexual desire as disordered, and homosexual acts as sinful. Even without the gloss of sin, there is a long history of homosexual desire being treated as defective, dysfunctional, or disordered. Until 1973 it was listed as a mental disorder in the American Psychiatric Association Diagnostic and Statistical Manual. Once abandoned by the APA, homosexuality remained classified as a disorder by the pentagon until 2006.[138] As I commented earlier, even after some quality or trait is considered a defect, extra assumptions are needed to demonstrate its normative significance. Nevertheless, we should heed Mill's quotation from an earlier chapter, that charges of being "unnatural" remains a "vituperative epithet," in the mouths and minds of many. To claim that a gay person is "disordered" with the caveat "not that there's anything wrong with that" (to quote a memorable "Seinfeld" episode) is an unsatisfying defense of homosexuality. My critique allows for a more robust defense: organisms and their parts and operations are not apt for terms like "disordered" in the first place. As such, whatever the philosophical merits of the argument given over the preceding chapters, it may also have some bearing on practical concerns. I take this as a virtue of my approach, though I admit that I am forced to do some bullet-biting in that my denial that homosexuality as a defect comes with the denial that *anything* can count as a defect in a human.

My argument has proceeded as follows. Neo-Aristotelian ethical theory focuses on human flourishing, which neo-Aristotelians essentially connect to the evaluation of token humans as good or bad examples of the kind HUMAN. Despite their claims to naturalism, I argue that naturalists must reject this neo-Aristotelian tradition because organisms and their parts and operations are not apt for good-of-a-kind evaluation in the first place. This sort of evaluation,

[138] Psychiatric News, July 21, 2006, Volume 41 Number 14 page 9

using the attributive, rather than predicative "good," entails the existence of teleological norms for the proper form and/or function of some item. I describe norms of the *proper* as *protonormative,* conceptually distinct from normative concepts of *right* and *good* (understood as a predicate). I argued that these teleological norms presuppose norms for proper environmental conditions. This being the case, while naturalism can support that environmental norms of artifacts come from the mental activity of an agent, naturalism cannot support any equivalent grounding of proper environments for organisms; all efforts to find environmental norms for organisms will fail the open-question argument. Without proper environmental norms there can be no biological teleology and thus no good-of-a-kind evaluation for organisms or their parts and operations.

In making my case, I rely on at least two consequential but undefended assumptions. I assume that mental activity fits in a naturalistic description of the world, and that organisms have not been designed by God (or anyone else). The latter assumption is not very problematic because my whole project could easily be cast as a conditional: natural teleology is only possible if we are artifacts designed by God. This amended conclusion is friendly to natural law, which supposes that our telos is set by God's will (which counts as design per my definition in chapter four), and also friendly to intelligent-design enthusiasts. However, my argument can only accommodate versions of those positions that avoid claiming that God's design is empirically discoverable. The other undefended assumption, regarding the status of mental activity, is less easily dispensed with. Mental activity, after all, exists and must be accommodated in any plausible ontology. Further, mental activity is itself teleological. Can my account of "naturalism," which relies on the tools of the natural sciences, detect mental activity? I hope so, but there is not ample room to defend this at present. Thankfully there is space to quell concerns

that my argument is contradictory, denying teleology but affirming mental activity, itself teleological. If artificial teleology exists in virtue of mental activity, does this not vindicate natural teleology? My answer may come as unsatisfying, but it avoids contradiction; For I never once doubted the existence of internal mental teleology. This is what must be engaged (in an act of design) by an agent to produce external teleology. Still, one may wonder, where did mental teleology come from if not from some non-mental teleology? This is what I do not know, but nor do I consider it my burden. The origins and nature of mental activity *everyone's* problem, after all. The story I favor is that mental activity is an emergent property, and that neurons themselves are not teleological. There is plenty of room for disagreement, but the emergence view I favor is highly plausible and can stand in for now even without a robust philosophy or mind behind it.

Finally, I need to address the view that natural teleology, despite being empirically undetectable, is nonetheless ineliminable in any complete description of the natural world. I will offer a few reasons to doubt this view, but a full rebuttal is not necessary, for this position does not appreciably help any of my targets. The idea that natural teleology is ineliminable was given expression in Kant's (1790) *Critique of Judgment*. Let me say a few words about Kant's own view, and then comment on some neo-Kantian claims from Michael Ruse and Michael Thompson. Kant thought that despite the best understanding of the natural world being a mechanistic one that rules out teleology, we *must* conceptualize organisms as essentially teleological to make sense of them. This tension is known as the "antimony."[139] Following Kant, Ruse (2003) has claimed that teleology is a necessary assumption for biologists to make in order to make scientific progress. Thompson (1995) goes further, arguing that we must see organisms as teleological in order to distinguish life from non-life. I myself very much doubt that any of

[139] Guyer (2000, 219)

this is true. Many theorists of proper function such as Millikan and Neander seem to think that teleology is fully compatible with mechanistic laws. Though I disagree with them about this, the point here is that they both see modern biology, teleology included, as fully explainable in mechanistic terms. Suppose every time a biologist spoke of proper functions, what he really meant was "item X performing the activity that X's ancestors performed which gave them a reproductive advantage in environmental range A-D." This is fully comprehensible in scientifically naturalistic terms. Once we index it to some environmental range, we can fully understand the function ascription, as well as any further evaluations of defect or malfunction. But it critically relies on that assumption about environment, which was inserted by the scientist rather than "discovered" as proper. It is a small point in many ways – and for that reason it does not seem to disrupt scientific practice. But the metaphysical and metaethical difference is enormous. "Norms of nature" require that presupposition of proper environment, and while we can set it ourselves, this rules out metaethical naturalism, and starts to look like something else, perhaps constructivism. Thus the Kantian argument seems unlikely to me because it is to easy to translate teleological propositions into descriptive language if we are willing to stipulate certain conditions like proper environments. This generates conditional norms, or hypothetical norms that can be useful in science, perhaps even useful in ethics. But in stipulating the "properness" of environments, one has stopped trying to defend metaethical naturalism and has moved on to some other sort of metaethical position.

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