

Δ Φ χ ς X Ψ

Stephan Millett

Δ Φ χ ς X Ψ

Aristotle's Powers and Responsibility for Nature

Λ Σ Ω Ε Φ Δ

Π Ψ Γ

μ λ ῆ ῥ Δ ρ π ψ ξ τ ι

Δ Φ χ ς φ X_χ Ψ_ω α ι

Δ Φ χ ς X Ψ

Peter Lang

Φ χ Ō ι τ

$\Delta \Phi \chi \varsigma X \Psi$

B e r n e r R e i h e *philosophischer Studien*
 $\Delta \Phi \chi \varsigma X \Psi$

This book addresses the theme of what “nature” is and humans’ obligations toward the natural world. It demonstrates that an approach based in metaphysics can help us to understand better what nature is and our obligations to the natural world. Beginning with ideas traced from Aristotle through some of the significant figures in European philosophy, the author shows that each living thing is a unique source of value. He then argues that this value puts humans under an obligation and that adopting an attitude of responsibility to living things is an essential part of what it means to be human.

Stephan Millett lives in Perth, Western Australia and works as an ethics specialist at Curtin University. He is a former newspaper editor, journalism educator and school teacher. He was awarded his PhD in Philosophy from Murdoch University in 1997.

$\mu \lambda \tilde{\eta} \tilde{v} \Delta \varrho \pi \psi \xi \tau \iota$

$\Delta \quad \Phi \quad \chi \quad \varsigma \quad \phi \quad X_{\chi} \quad \Psi_{\omega} \quad \dot{\alpha} \quad \iota$

$\Pi \quad \Psi \quad \Gamma$

$\Delta \Phi \chi \varsigma X \Psi$

Aristotle's Powers and Responsibility for Nature

Berner Reihe philosophischer Studien

Herausgegeben von

Prof. em. Dr. Andreas Graeser u.a., Universität Bern

Band 44

Diese Reihe versammelt Arbeiten, die im Umfeld des Instituts für Philosophie der Universität Bern entstanden und sich entsprechend der hier weiten Ausrichtung mit sehr unterschiedlichen Thematiken und Denkern verschiedener Observanz auseinandersetzen. Dabei orientieren sich die Autorinnen und Autoren an den Standards von Klarheit und Kohärenz und stellen ihre Beiträge in den Dienst der Sache.



PETER LANG

Bern · Berlin · Bruxelles · Frankfurt am Main · New York · Oxford · Wien

Stephan Millett

Aristotle's Powers and Responsibility for Nature



PETER LANG

Bern • Berlin • Bruxelles • Frankfurt am Main • New York • Oxford • Wien

Bibliographic information published by die Deutsche Nationalbibliothek

Die Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available on the Internet at <http://dnb.d-nb.de>.

British Library Cataloguing-in-Publication Data: A catalogue record for this book is available from The British Library, Great Britain

Library of Congress Cataloging-in-Publication Data

Millett, Stephan

Aristotle's powers and responsibility for nature / Stephan Millett.

p. cm. – (Berner Reihe philosophischer Studien, ISSN 1421-4903 ; Bd. 44)

Includes index.

ISBN 978-3-0343-0679-9

1. Aristotle. 2. Teleology. 3. Philosophy of nature. 4. Biology–Philosophy.

5. Metaphysics. 6. Environmental ethics. I. Title.

B491.T4M55 2011

113–dc23

2011033633

ISSN 1421-4903 (Print edition)

ISBN 978-3-0343-0679-9 **E-ISBN 978-3-0351-0289-5**

© Peter Lang AG, International Academic Publishers, Bern 2011

Hochfeldstrasse 32, CH-3012 Bern, Switzerland

info@peterlang.com, www.peterlang.com

All rights reserved.

All parts of this publication are protected by copyright.

Any utilisation outside the strict limits of the copyright law, without the permission of the publisher, is forbidden and liable to prosecution.

This applies in particular to reproductions, translations, microfilming, and storage and processing in electronic retrieval systems.

Printed in Switzerland

CONTENTS

Introduction.....9

Part I: The Heritage of Aristotle

1 Aristotle’s Biological Teleology23

 Introduction.....23

 The Concept of Teleology in the Philosophy of Biology24

 Aristotle’s Teleology31

 Three Key Aristotelian Concepts.....34

 Aristotle’s Powers and Change42

 The Nature of *Phūsis*48

 Conclusion50

2 Persevering in Being: *Conatus* and *Dūnamis*.....51

 Introduction.....51

 Origins of Spinoza’s *Conatus*52

 Desire and Will: a Taxonomical Comparison.....74

 Conatus and ‘Change’ in Aristotle.....80

Physics B and an Internal Principle of Movement.....87

Part II: Moral Considerability

3 The Status of Organisms and Ecosystems.....95

 Introduction.....95

 Parts and Wholes98

 Ends-in-themselves108

 Intrinsic Value112

 Interest115

Intrinsic Value Theories in Environmental Philosophy.....	121
Third-order Autopoiesis and Ecosystems	127
Summary.....	137
4 Nature, Moral Considerability and Respect	139
Introduction.....	139
Taylor's Biocentric Ethic	140
Moral Considerability	144
Living Things as (Aristotelian) Teleological	
Centres of Activity.....	151
Addressing the Paradox of Individual 'Unity'	155
Inherent Worth and 'Good'	161
Moral Persons	166
Conflict and Resolution	168
Moral Significance and Merit	173
Conclusions.....	175
5 Selves, Conatus and Aristotle.....	177
Introduction.....	177
A Cosmological Approach.....	178
Individuation.....	184
Conatus	191
Interest	195
Individuals	198
An Aristotelian Umbrella.....	202

Part III: Value and Responsibility

6 Value, Complexity and Obligation.....	205
Introduction.....	205
Value Enters the World.....	206
Complexity is Relevant.....	209
Responsibility	223

Human-nature Dualism.....	230
Forms of Substantive Responsibility	234
7 Feeling, Responsibility and Virtue	241
From the Nature of Things to an Ethical Standpoint.....	241
Responsibility, Virtue, Feeling	248
Love of a Special Sort.....	251
Jonas' Ethic of Responsibility Revisited	253
8 Finally.....	271
References	281
Subject Index	295
Name Index	301

Introduction

Forms of life are dying out at an unprecedented rate. But what is life, what does it mean to be living and why does it matter? Does it matter if species die out? Does it matter if human domination of the planet creates an impoverished world that becomes less and less habitable? Does it matter that we behave ‘responsibly’? Even if we answer ‘yes’ to each of these—and we should—why should we approach these issues through metaphysics as this book does? The simple answer is that if we revise our understanding of the way the world is we have to revise our ethical relationship to it. And understanding our ethical relationship is a necessary pre-condition for acting responsibly.

This book sets out to re-assess how we understand the way the world is, what life itself is, what value there may be in living things and what this value means for those capable of recognising it. These are issues argued over in various forms over many years, starting with the ancient Greeks and, although there is very little acknowledgment of this, some key elements of ancient Greek thinking have persisted into some of the most influential modern theories of environmental ethics. Whitehead may have suggested that European philosophy was a footnote to Plato, but it turns out that some very important parts of contemporary environmental philosophy may be a footnote to Aristotle. Aristotle can, after all, be considered the first biologist. But this book turns primarily to his metaphysics, and not to his biological works or his *Ethics*.

From a re-examination of Aristotle focusing on his idea of the motive force immanent in living things, it becomes clear that it is individual living organisms that are the locus of value and that individual living things are the prime objects of moral consideration. This also puts decline of species into a clear value framework: it matters every time a species becomes extinct. It matters because a unique kind of value and a unique store of value—common to all

members of a species and instantiated in individuals—is gone, forever. But are all individual living things of equal value? Yes, and no. There may be some element of a thing’s value that it has in equal parts with all other living things, but the value of an individual is also related at least in part to its level of biological complexity—so that more complex beings have greater value than less complex beings. This, however, does not fully describe the value of any individual, because no individual can live in isolation from others, whether of the same species or not. Each individual must live in an environment that it co-creates with others—something that Jakob von Uexküll demonstrated with his concept of *Umwelt* and which was later interpreted by Thomas Sebeok and others in terms of biosemiosis. In the process of co-creating its environment, each individual necessarily values at least some other living thing—but this is not a conscious valuing—if only because without the one the other will suffer and possibly die.

An approach to ethics based on living individuals is a biocentric ethic. And it is not only possible, but also highly informative and useful, to have a biocentric ethic based on at least some of the Aristotelian way of viewing the world. The biocentric ethic in this book requires moral agents to take responsibility for all living things simply because they are living. This creates an ethic that applies equally to the human and the non-human world, so making superfluous the notion of a purely ‘environmental’ ethic. In this ethic of responsibility for nature the most significant object of moral concern is an individual living thing and its own unique nature. And the correct attitude toward individual living things is an attitude of responsibility—in all its complex forms. In some respects contemporary environmental ethics has moved on from discussions of biocentrism and related metaphysical questions, but this book sets out to show that it has done so a little too quickly and that there is still much fertile ground to cover. The coverage of Aristotle and Spinoza in the first two chapters can be quite technical at times, but is there to demonstrate incontrovertibly the value of revisiting Aristotle in respect of environmental metaphysics and ethics. Some readers may

feel inclined to skip these chapters, but should resist this—or at least come back to them—because concepts explained here recur throughout the book in a variety of forms.

There are environmental ethics that have urged humans to take responsibility for nature, but these have often assumed that ‘nature’—whatever it is—is there simply for the use and benefit of humans and have made simplistic assumptions as to what ‘nature’ is. In short, they have not explored the metaphysical bases for their environmental ethics and have thereby limited the possibilities. There have also been ethics concerned with the welfare of non-humans that have taken metaphysics into account when determining what should be morally considerable and what should not. Chief among them is Bernard Rollin’s pro-animal ethical theory which is based explicitly on an Aristotelian understanding of a living creature. The present work goes beyond Rollin in a number of ways.

This book explores in detail the question of what ‘nature’ is. This is a primarily metaphysical exploration, but one that also examines key aspects of modern biology—and establishes a clear relation between Aristotle’s conception of ‘nature’ and other conceptions relevant to contemporary environmental philosophy. Aristotle to date has not figured as prominently in the environmental literature as he perhaps should, although he has been given a significant status in work on animal rights, through the work of Rollin, and more particularly through the work of Stephen R. L. Clark, and has had something of a revival in various forms of environmental virtue theory. However, outside of Rollin and Clark, and narrow uses of Aristotelian virtues, when Aristotle has appeared in an environmental context, it has generally been to receive what is colloquially known as ‘bad press’. One of the aims of this book is to attempt an environmental rehabilitation of Aristotle—to show that an Aristotelian biological metaphysics can be coupled with an Aristotle-inspired moral philosophy to produce a biocentric environmental ethic. The initial focus, however, is not on ethics, but rather on biology and considerations of a biological metaphysics.

The book began life in a desire to examine claims that Humberto Maturana and Francisco Varela's concept of autopoiesis—a fringe player in the philosophy of biology, but one with an expanding sphere of influence—had dispensed with the need for any 'peculiar directing force' in explaining what it means to be a living thing. The term 'autopoiesis' was created in 1972 by Maturana and Varela and applied to single cells and multi-cellular organisms as part of an attempt to describe the necessary and sufficient conditions for the presence of life. One of the interesting claims made of autopoiesis is that its use can be extended beyond its origins in molecular biology and can be applied to such things as social systems and ecosystems. But, perhaps more important is the claim that the presence of autopoiesis is a defining characteristic of morally considerable entities: that an autopoietic unity is the paradigm case of moral considerability. This combination would make it useful not only for a biocentric ethic, but also for an ecocentric ethic. It turns out, however, that Maturana and Varela's theory is not fully coherent, that its claim to dispense with teleology in nature is deeply flawed and that use of autopoiesis should at the very least be restricted to the cellular level where it originated. It certainly should not be extended to cover social systems or ecosystems, but that is not to say that the ideas expressed in autopoiesis and the questions the concept tries to address are not important for environmental philosophy: they are. It is just that although ecosystems are an undoubtedly important element of environmental ethics they should not (and certainly not on the basis of any autopoietic character they might have) be considered individuals in their own right, as is claimed of them by some proponents of autopoiesis. It is better to see ecosystems as standing in a relationship of non-causal dependence to the biological individuals that comprise them—a relationship in which ecosystems have the character they do in large part because of the particular character of their component parts. The component parts of most interest here are living individuals, but working out just what makes something an individual is not an easy task. In examining the question of what an individual is—and how an individual maintains itself as an individual despite external

influences and internal changes—two key concepts emerge: Aristotle's concept of *dūnamis* and Spinoza's concept of *conatus*. There are several things of interest in these concepts. On closer examination, for example, it becomes clear that autopoiesis can be expressed in terms of *dūnamis* and that Spinoza's *conatus* both has a strong historical connection to *dūnamis* and also can be expressed in terms of it. Spinoza's concept of *conatus* (an internal impetus to maintain oneself in one's own being) is used extensively in deep ecology approaches to environmental ethics, notably Arne Naess's, and is a crucial component of Mathews' ecological metaphysics. For Stephen Clark there is a certain irony in this because Spinoza himself was adamantly anti-animal, holding not only that it was unnecessary to consider the interests and feelings of 'animals', but that it was actually wrong. A reassessment of *conatus* must, of necessity imply a reassessment of analyses that rely on the concept. So, although Naess's work is dealt with only in passing, if the interpretation of Spinoza's *conatus* outlined here holds then Naess also needs to be reconsidered. However, the connection made here between Aristotle and Spinoza is not entirely new: for example, Stephen Clark has referred to it in his work on animal rights. One of the results, however, of using it in the context of environmental metaphysics is that contemporary use of the concept of *conatus*, when examined closely, becomes, in fact, a concept much closer to Aristotle's *dūnamis* than to Spinoza's *conatus*. The close relationship between *dūnamis* and *conatus* by itself puts Aristotle firmly into the heart of environmental ethics, but the rehabilitation of Aristotle's reputation in environmental terms does not stop there. It turns out that other key contemporary theories in environmental ethics may also be read in Aristotelian terms and that the immanent purposiveness in all living things that Aristotle identified is a suitable foundation on which to build an ethic.

One of the most significant theories of environmental ethics that can be shown to be implicitly Aristotelian is in Paul Taylor's *Respect for Nature*. But, although Taylor's theory has been highly influential and is in most respects a cogent and well-developed approach, it suffers from having an underdeveloped concept of 'nature' and from

flaws in the principles used to decide competing claims for moral consideration. His theory is based on an implicit Aristotelian teleology, but it turns out not to be fully-consistent. Freya Mathews' theory of the 'ecological self' is another significant theory with an implied debt to Aristotle: the central concept here of 'self-realization' being expressed in terms of what she claims is a Spinozist concept of *conatus*. But Mathews' concept of *conatus* turns out to be in all essential respects the same as *dūnamis*. Mathews' theory is also more cosmological than ethical: it seeks to establish a new cosmology as a foundation for ethics. But, although it provides a wide class of morally-considerable entities it offers little in terms of practical ethical guidance. A final theory, this time acknowledging an explicit debt to Aristotle's biological ontology, is the theory of responsibility put forward by Hans Jonas. The theory, as Jonas presents it, is thoroughly anthropocentric—which presents its own problems, but there is a more serious flaw: Jonas appends to his anthropocentrism an assumption that only a totalitarian and coercive politics is adequate to ensure that the duty of responsibility to living things is met. Such a politics is, however, not necessary particularly if moral agents take up responsibility and cultivate it as a virtue, this virtue of responsibility becoming the heart of a new environmental ethic. This virtue ethic differs from one such as Kant's, for example, in that, following Emmanuel Lévinas, there is both an *a priori* obligation to ask what one might do to help an individual and a primary motive force for a moral agent to take responsibility for the welfare of an individual moral subject based in a *feeling* within the moral agent. The impetus behind moral agents taking responsibility for individual living things is a form of *love*—a love that is part of the very fabric of (biological) existence and one in which there is always already an obligation to help others.

Chapter 1 shows that Aristotle's biological teleology is important as a basis from which to understand moral considerability and places it at the heart of contemporary environmental metaphysics—and therefore at the heart of an ethic of responsibility for the environment. Discussion of biological teleology begins with Marjorie Grene for

whom teleological concepts enter necessarily into philosophers' reflection about the data of science and perform a regulative function in the laboratory. In understanding Aristotle's concept of *telos* we must, however, take care to clarify misconceptions, a task which takes up the next part of the chapter. This includes a detailed examination of causation and analysis of key terms in Aristotle, particularly *hou heneka* (that for the sake of which), *eidos* (form or species) and *to ti ēn einai* (the-what-it-is-to-be). From there we move to an examination of *dūnamis* (immanent potential) and *phūsis* (nature) as key elements of natural teleology before dealing with the concepts of 'change', understanding of which is necessary to understand immanent (or directive) teleology, and 'self-movement'. The chapter concludes with a clarification of the nature of 'nature' (*phūsis*) and the internal principle of motion (*dūnamis*). Clarifying the relationship between these is important for the discussion in the next chapter which shows how the concept of *conatus* associated with Spinoza—and used in environmental philosophy—derives from an interpretation of *dūnamis*.

Conatus is a concept that attempts to explain how a thing—whether a rock, a tree, a butterfly or a mammal—continues to be what it is despite changes. The *conatus* of living things, however, is different from the *conatus* of non-living things, such as rocks and understanding what is special about the ability of living things to persist in their being is important to our understanding of the 'interests' we should take into account when dealing with living things. Demonstrating the relationship between Spinoza's *conatus* and Aristotle's *dūnamis* lays the ground for an ethics of responsibility that encompasses all living individuals. Chapter 2 is in three parts. The first deals with those aspects of Spinoza's intellectual heritage that influenced him in the formation of his concept of *conatus*. This begins by establishing a connection between Cicero's use of *conatus* and the Greek expression *hormē*, before examining how *conatus*, *hormē* and related concepts in Aquinas, Descartes and Hobbes influenced Spinoza. The second part compares Spinoza's and Aristotle's taxonomies of volition and develops a connection between some of

Aristotle's concepts and Spinoza's concept of *conatus*. This is a weaker connection than that demonstrated in the third section, but coverage of it helps show the degree of Spinoza's indebtedness to Aristotle. The third part compares Spinoza's concept of *conatus* and Aristotle's concept of change—particularly that part centring on his concept of *dūnamis*. Possession of a special kind of *dūnamis* sets living things apart from other objects in the world and is the basis of their autonomy.

The main issue in the first part of Chapter 3 is whether *individual* organisms are the only morally considerable entities and if they are, what this means for things such as ecosystems or communities. That individual organisms are morally considerable is intuitively satisfying, but to go beyond intuition we need to look at some of the claims made on behalf of ecosystems—such as the claim that ecosystems are what is known as autopoietic (self-creating) entities. But classifying ecosystems as autopoietic entities is shown to be flawed so discussion moves to the idea that ecosystem value supervenes on biological value. This supervenient relationship allows value to persist in ecosystems without imputing any ontological singularity to ecosystems or communities. A detailed coverage of both supervenience and ontological singularity is undertaken to clarify these difficult concepts before the discussion moves to causal 'powers' as these are implicit in Brennan's account of the features of a unified thing. From an Aristotelian perspective there is interaction and a relationship of reliance between the elements that make up an ecosystem, but the ecosystem or community itself has no *internal* principle of unity and is therefore not a source of value in the way an organism is. It is not an 'end-in-itself' with 'interests'. From ends-in-themselves the discussion moves to the idea of intrinsic value, another contested term in need of clarification, and then to the question of what an 'interest' is, what things have an interest and in what ways having interests is relevant to ethics. From there a discussion of intrinsic value theories in environmental philosophy leads to a discussion of so-called third-order autopoietic unities and the conclusion that there are no such

unities and that ecosystems have value only to the extent that it supervenes on the value in individual organisms.

Chapter 4 focuses primarily on the biocentric environmental ethic that Paul Taylor sets out in his book *Respect for Nature*, with particular emphasis on the idea that individual organisms are teleological centres of activity. Taylor argues that we should demonstrate respect for nature, but does not explain sufficiently what ‘nature’ is that we might treat it with respect, nor does he clearly articulate what a living individual is, so both of these are addressed here in some detail. The question of what is an individual is complicated by the paradox of unity, something that requires careful explanation before it is possible to situate value in living individuals as entities with a good of their own and to move to the question of how to distinguish in value terms between different morally-considerable entities.

Chapter 5 builds on the previous chapters to show that an Aristotelian biological ontology is broad enough to be applicable to life-based ethics in general, but it counsels caution that we should not accept this applicability too hastily because there are important questions of metaphysics that need to be addressed—particularly the question of whether a holistic metaphysic is appropriate to a full understanding of value in and responsibility for the natural world. The chapter examines, in particular, Freya Mathews’ use of *conatus* and demonstrates that an ethic based on the concept of *conatus* may be expressed, without significant loss, in terms of an Aristotelian teleological biology and not be tied necessarily to a metaphysical position such as holism or monism. The chapter begins with Mathews’ cosmological approach then examines how she deals with the question of individuation before arguing that her use of *conatus*, which is the principle of individuation in her cosmology of substance monism, is closer to the Aristotelian archetype *dūnamis* than it is to Spinoza’s concept of *conatus*. From this it is clear that an Aristotelian teleological biology is a sufficient basis, or at least a sufficient ontological basis, for an environmental ethic.

Chapter 6 looks at three aspects of Aristotelian biological teleology that need in particular to be expanded and clarified. The first is the idea that, with the emergence of entities with a good-of-their-own, interest and value enters the world. The second is a claim that the relative complexity of entities is important, with more complex organisms having a stronger *prima facie* claim on moral agents than do less complex organisms. The third aspect is the notion that the obligation under which moral agents are placed is one of *responsibility*, where responsibility is an obligation that requires moral agents to *act* to protect the good of moral subjects (or moral patients) and where all living things are moral subjects. The question of how value enters the world presupposes an understanding of what value is, but value is an elusive concept, so what it might be is discussed at some length. Complexity is shown to be relevant to understanding the relative value of things in the world, through the correlated concepts ecological niche and interconnectedness and the idea of biosemiosis that emerged from biologist Jakob von Uexküll's work on *Umwelt*—a phenomenological explanation of how an organism engages with the world external to it. The increased capacity or potential of complex organisms to interact with their environment and the greater number of other organisms it can interact with is seen to give it an 'ontological niche' value as well as a 'semiotic' and an ecological niche value. From value and complexity the chapter moves to an explication of responsibility relying on the work of Emmanuel Lévinas and Hans Jonas, both of whom react to Heidegger's human-nature dualism. There follows a discussion of Jonas' notion of substantive (or forward-looking) responsibility and its applicability beyond the human, to the natural world.

Chapter 7 focuses on recognition of responsibility and what happens when this responsibility is recognised by a moral agent. It begins by describing how it is possible to move from a claim about the nature of things in the world to an ethical standpoint with regard to those things—making use of ideas from Holmes Rolston III, Emmanuel Lévinas, Martin Heidegger and Hans Jonas. The section following this deals with responsibility, virtue and feeling and the idea

that moral agents are ‘called’ to behave well toward that which has value in and of itself. The ‘call’ is recognised—for Lévinas—in the ‘epiphany of the face’ an analogous understanding of which occurs when we encounter and engage with non-human living things. In this analogous understanding we engage semiotically with the natural world and in the first instance ‘feel’ a claim by a living thing and then respond to that feeling. The appropriate response is to take substantive (forward-looking) responsibility for a living thing and thereby cultivate responsibility as a virtue—a virtue that begins as a *feeling* in the moral agent and which, having arisen, is put into practice through the use of rational judgment. The feeling that *triggers* virtue is ‘love’, but love of a special sort. And it is this ‘love’ that allows a moral agent to recognize that he or she ought to take substantive responsibility for any living individual. The sort of love referred to here is much the same as an aspect of love described by Spinoza, for whom ‘love is a joy,’ ‘accompanied by the idea of an external cause’. From ‘love’ as a trigger for responsibility, the chapter moves to a discussion of Hans Jonas’ ‘imperative’ of responsibility, his human chauvinism and his totalitarian politics before concluding that neither human chauvinism nor a totalitarian politics is entailed in an ethic of responsibility. However, living things do demand something of us and if we deny the demand and do not act on it in a way that promotes the flourishing of individual living things we deny something essential about ourselves. Not to act, not to value through our actions that which has value in itself is the opposite of virtue.

PART I

THE HERITAGE OF ARISTOTLE

1. Aristotle's Biological Teleology

Introduction

There is no doubt that we recognise some things as morally important and that there are many reasons for this. But what is it that makes something morally important? There is a wide sense in which we can address this question and a narrow sense. In the widest sense we would look at human psychology, social connectedness, personal context and a host of other issues. And, we would focus on the thinking of moral agents. The focus of this book, however, is not to answer this question in its widest sense, but to address it in a narrower sense, a sense that looks to what might be inherent in an object that makes it morally considerable and which, in effect, announces a need to those around it. The story, if it can be called such, begins with Aristotle's notion of internal teleology and shows that this internal or, more correctly, immanent teleology is an undeniably important basis from which to understand moral considerability in the natural world. Once we understand this immanent teleology we can come to understand that it sits at the heart of contemporary environmental metaphysics—and ultimately at the heart of an ethic of responsibility for the environment.

Why begin with Aristotle? There are several reasons for this, some of which will become apparent in the coming chapters, but first among the reasons is that the teleology referred to is immanent (indwelling) in some living, concrete, identifiable individual and not in some grand process. This is satisfying at a common sense level and, as we shall see in the following chapters, firmly locates *value* in each living individual, so that there is something identifiable and tangible to which we, as moral agents, have an obligation. This also means that decisions that affect the natural world should be made with reference

to the value of individual living things—one by one. But more of that later. Beginning with Aristotle’s biology teleology is not merely to recognise a historical debt—as rich as this debt may be—to the first systematic biologist. More importantly, it provides the basis for a rich understanding of what it means for there to be purpose in nature. This is not a grand purpose, within a grand design, but undirected purposiveness within a living organism. Beginning with an account based in biological teleology allows us to understand that purposiveness in nature is a purposiveness that is not directed, but is directive; a purposiveness that inheres in living individuals of all sorts. Teleology, however, is often not well understood, so the early part of this chapter takes some time to explain it, with a special focus on the role teleology plays within modern biology.

The Concept of Teleology in the Philosophy of Biology

Dictionary definitions of teleology refer to ‘the doctrine or study of ends or final causes’, especially as it relates to evidence of design or purpose in nature¹ or, in shorthand, as the ‘doctrine of final causes’²—an argument, derived from St. Thomas Aquinas’ interpretation of Aristotle, for the universe being designed by an unmoved mover (God). But, like most dictionary definitions it is too great a simplification. Etymologically, teleology is the explanation (*logos*) of something in terms of the end (*telos*) it serves. *Logos* here is used in the sense of talk or discourse, although there are many other senses in which it has been and is used. *Telos*, as the explanation of something

- 1 W. Little, H.W. Fowler, J. Coulson, The Shorter Oxford English Dictionary on Historical Principles, Rev. & Ed. C. Onions, 3rd ed. Oxford: Clarendon, 1985, p.2255.
- 2 C. Onions ed., The Oxford Dictionary of English Etymology, Oxford: Clarendon, 1991, p. 908.

in terms of the ends it serves, has a long history that really began with first Plato's³ and then Aristotle's notions of final causes, but the term *telos* itself is first recorded as being used by Homer (*Odyssey* 17.496) where it is translated as 'coming to pass, performance, consummation'.⁴ Plato's phrase *haptoitu tou telous* in the *Symposium* (211b) is translated by Liddell and Scott as 'the full realization, the highest point, (the) ideal' of beauty, which carries with it the sense of 'to attain the end'. However, in Walter Hamilton's 1951 Penguin translation this phrase appears as that which is 'absolute, existing alone within itself, unique, eternal'. The *telos* is that which is absolutely, existing alone within itself. In the *Gorgias* (499e), *telos* appears in the phrase *telos einai hapasōn tōn praxeōn to agathon*—'good is the object of all action'. The object here has the same sense as 'goal' or 'endpoint'. The notion of *good* being the object of all action is particularly important for Plato's pupil, Aristotle. For Aristotle, the good (*to agathon*) of or for an entity is identified with its *telos*—that is, what an entity aims at, whether consciously or not, must necessarily be a good for the entity.

It should be noted that Aristotle was primarily concerned with the *telos* of *individual living things*, as part of his general investigation of the phenomenon of change. His interest in explaining change in (especially) living things has given him a prominent place in the history of biology and his thinking is still a central component of contemporary discussions of teleology in biology. There has in modern times been some significant discussion of Aristotle's teleological biology. For example, in *The Idea of Nature* Collingwood⁵ argued that there was a need to reinstate Aristotle's recognition of goals in nature. However, despite Collingwood's assertion that to some degree this reinstatement had already occurred there is ample evidence that Aristotle's sense of goals within nature

3 e.g. Phaedo 97c6-d3, e1-4; 986a6-b3; 99a7.

4 Henry George Liddell and Robert Scott, *A Greek-English Lexicon*, 9th ed. Revised Henry Stuart Jones and Roderick McKenzie, Oxford: Clarendon, 1990.

5 Robin George Collingwood, *The Idea of Nature*, Oxford: Clarendon, 1945.

has not been revived on any large scale, except within the philosophy of biology where Aristotle's biological ontology is frequently discussed. The Deep Ecology and New Age movements, in some at least of their various forms, may well be modern examples of belief in internal goals in nature, but none invokes the spirit of Aristotle. In fact, outside of work in environmental virtue ethics, Aristotle gets some bad press as he is regarded as holding that nature was merely a resource to be used for human benefit.⁶

Outside of the philosophy of biology teleological views of nature have tended to follow the Renaissance model in which any sense of purposiveness in organic nature is thought to be imposed from outside or to be reliant on consciousness. Within the philosophy of biology, however, teleology has been considered very differently, and treated extensively. To get an idea of what teleology is within biology, there is no better place to start than Marjorie Grene's discussion.

Teleological language, Grene says, 'persists in biology' but the language used is '*not*...the language of conscious purpose; as both Aristotle and Collingwood knew, the 'ends' of nature are not plans. Organic phenomena are directive, not directed.'⁷ That is, there is something *inside* or *internal* to organisms that directs them to some *telos* or endpoint. They are not directed by some external force. In discussing the role of teleology in biology Grene is specifically *not* talking about teleology as i) conscious purpose, i.e. purposive behaviour or ii) the 'vast cosmological teleology which seems to some people inherent in the conception of evolution.'⁸ She lists three

6 Derek Wall ed., *Green History: a reader in environmental literature, philosophy and politics* London: Routledge, 1994. p. 54. Wall says this is a position held by e.g. J. Donald Hughes, *Ecology in Ancient Civilizations*, Albuquerque: University of New Mexico Press, 1975.

7 Marjorie Grene, *The Understanding of Nature*, Dordrecht: D. Reidel, 1974, p.174.

8 Ibid. With respect to this, Wardy argues that: 'On my scheme, Aristotle retains his unique position in the history of natural philosophy by advocating teleology free of both design and cosmic subordination. (Robert Wardy, *Aristotelian rainfall or the lore of averages*', *Phronesis* Vol. 38, 1. p. 29)

general types of phenomena which seem to demand teleological language when we speak of them and six main ways to understand teleology. These three types of phenomena are: part-whole relations or structures found in morphology; means-end relations or structures found in physiology; and directed processes of the sort most obviously exemplified in individual development.⁹ Reference to teleology can be characterized as 1) reflective, 2) regulative, 3) descriptive, 4) operational, 5) explanatory or 6) ontological. The first five of these relate to teleological *explanation* generally. The sixth pertains particularly to Aristotle's sense of teleology, however it is worthwhile briefly discussing each of these senses of teleology to get a complete sense of what teleology is in biology.

Teleological concepts enter into the philosopher's *reflection* about the data of science and in at least two senses also have a *regulative* function within the biological laboratory. The first is a fairly simple sense in which certain concepts may regulate a scientist's *choice* of data and the other is a more complex, *Kantian*, sense. Kant's regulative principle is a 'principle of reason which serves as a *rule*, postulating what we ought to do in the regress [toward empirical knowledge] but *not anticipating* what is present *in the object as it is in itself, prior to all regress*.'¹⁰ That is, the principle of reason does not give us direct access to objects in the world, but does help us achieve a greater level of understanding of what objects in the world might be. Citing 1934 work by A.F. Baker,¹¹ Grene points out, with respect to the first sense of the regulative role of concepts, that a scientist studying, say, the development of a fungus, must already know

9 Grene, M. 'Time and Teleology', *The Knower and the Known*. London: Faber and Faber, 1966, p. 228-9

10 Immanuel Kant, *Critique of Pure Reason*, Trans. Norman Kemp Smith, London: Macmillan, 1992, A509, B537.

11 In her 1976 work 'Aristotle and Modern Biology' (in Grene and Mendelsohn (1976) eds., *Topics in the Philosophy of Biology*, Dordrecht: Reidel), Grene cites Baker's work in more detail as: A.F. Baker, *Purpose and Natural Selection: a Defence of Teleology*, *Scientific Journal of the Royal College of Science* 4, 1934, pp. 106-19.

something about the orderly development of the organism if the right ‘facts’ are to be selected for analysis. Both the interrelation of parts with reference to the whole, and the orderly development of the organism under investigation, must have been assumed before the ‘right’ facts could be selected for further investigation and analysis. For Grene, however, every question asked also contains a concept of ‘that for the sake of which’ the development is occurring, that is, a concept of its natural *telos*. For her, such considerations place teleological thinking in the position of at least a *regulative* principle (in the Kantian sense) at the beginning of biological research. A Kantian regulative principle cannot say anything about an object as it is in itself, it ‘cannot tell us *what an object is*, but only *how the empirical regress is to be carried out* so as to arrive at the complete concept of the object...’¹² This regress is a ‘task’ (Kant A508, B536) i.e. an attempt to reach a ‘maximum’ of the series of conditions in a sensible world. The maximum is not given and the regress, or task of trying to reach a maximum (which might be seen as trying to reach perfect understanding), continues indefinitely (Kant is at pains to point out that this is an indefinite as opposed to an infinite regress). From this point of view, says Grene, *telos* is a reflective concept that acts as a signpost to the study of nature. Teleological concepts, therefore, are not merely meta-scientific, but are at the least regulative of the biologists’ choice of data and the problems she chooses to examine and in this fashion enter into the scientists’ reflection about the data of science. Grene is clear, however, that teleology should not be treated as *only* a regulative idea. She wants to know if there can be ‘real processes with natural endpoints, real *telē* in nature.’ In other words, she is concerned with the question of whether there are objective and not merely hypothetical explanations of the working of nature. This is an important matter on which there have been many attacks, and it is part of the intention of this chapter to demonstrate that there can be, in fact, objective (Aristotelian) *telē* in nature.

12 Kant, Critique of Pure Reason A510, B538.

Greene argues that there are *descriptive* and *operational* functions for teleological concepts in biology: descriptive because a biologist cannot proceed to describe what it is that she is analysing without referring to structures, uses, or achievements; and *operational* because teleological concepts operate within the procedures of biology in that they determine the way phenomena are described and the way experiments and subsequent analyses are conducted. Biologists describe phenomena in terms of existing structures and types. For example, Oppenheimer argues that in embryology the experimenter can succeed only if questions are put which the ‘embryo can comprehend’.¹³ Answers to the experimenter’s questions come at the ‘supracellular level’ from ‘the embryo alive’. In this way teleological concepts ‘control not only the way the phenomena are described but the way experimentations with them and therefore the subsequent scientific analysis of them itself proceeds. We have teleological discourse, then, firmly within the *procedures* of biological science.’¹⁴

In addition to the reflective, regulative, descriptive and operational aspects of teleology in science, the application of information theory to biology suggests *explanation* also can be teleological. The transmission of the DNA code, for example can be considered as either a problem in information theory generating a finalistic explanation or as a causal explanation which would ‘involve knowing how it can happen that these three groups of nucleotides attract this amino acid, what are the effective forces of attraction among the atomic groupings’.¹⁵ Greene suggests that the explanation itself is teleological, and on two levels: the level of the message and the level of the particulars comprising the message. The message, as it is understood, cannot be reduced to its component particulars whereas the component particulars are explained by their role in the message. Greene makes her point as follows:

13 The idea of asking a question that the embryo can comprehend is revisited in Chapter 6 in the context of the Umwelt.

14 Greene, *Understanding*, p. 177.

15 Cited in Greene, *Time and Teleology*, p. 238.