The Structural Links between Ecology, Evolution and Ethics. The Virtuous Epistemic Circle

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Chapter 1
Ecology, Evolution, Ethics: In Search of a Meta-paradigm – An Introduction

Donato Bergandi

Abstract – Evolutionary, ecological and ethical studies are, at the same time, specific scientific disciplines and, from an historical point of view, structurally linked domains of research. In a context of environmental crisis, the need is increasingly emerging for a connecting epistemological framework able to express a common or convergent tendency of thought and practice aimed at building, among other things, an environmental policy management respectful of the planet's biodiversity and its evolutionary potential.

Evolutionary biology, ecology and ethics: at first glance, three different objects of research, three different worldviews and three different scientific communities. In reality, there are both structural and historical links between these disciplines. First, some topics are obviously common across the board. Second, the emerging need for environmental policy management has gradually but radically changed the relationship between these disciplines. Over the last decades in particular, there has emerged a need for an interconnecting meta-paradigm that integrates more strictly evolutionary studies, biodiversity studies and the ethical frameworks that are most appropriate for allowing a lasting co-evolution between natural and social systems. Today such a need is more than a mere luxury, it is an epistemological and practical necessity.

In short, the authors of this volume address some of the foundational themes that interconnect evolutionary studies, ecology and ethics. Here they have chosen to analyze a topic using one of these specific disciplines as a kind of epistemological platform with specific links to topics from one or both of the remaining disciplines. **Michael Ruse**'s chapter, for instance, elucidates some of the structural links between Darwinism and ethics. Ruse analyzes the Evolutionism vs. Creationism debate, emphasizing the risks run by scientists when they ideologize the scientific content of their studies. In the case of the contributions of **Jean Gayon** and **Jean-Marc Drouin**, which respectively deal with the disciplines of evolutionary biology and ecology, some central connections have been developed between these two disciplines, while reserving the option to consider in detail their topic in order to discover

essential features or meanings. **Gayon** analyzes the multilayered meanings of "chance" in evolutionary studies and the methodological implications that accompany such disparate meanings. Froma similar analytical perspective, **Drouin**'s contribution focuses on the identification and critical evaluation of the different conceptions of time in ecology. Chance and time, factors of evolution in species and ecological systems, play a very important function in both disciplines, and these chapters help to capture their polysemous structure and development. **Bryan Norton**'s chapter, on adaptive environmental management, is set within an epistemological context where the Darwinian paradigm, ecological knowledge and ethical frameworks meet to give rise to practical, conservationist policies. In his contribution, **Patrick Blandin** pleads for the necessity of an eco-evolutionary ethics capable of fully encompassing humanity's responsibility in the future determination of the biosphere's evolutionary paths. Our value systems must recognize the predominant place that humanity has taken in the evolutionary history of the planet, and integrate the ethical ramifications of scientific advances in evolutionary and ecological studies. The chapter by **J. Baird Callicott** introduces us to a metaphorical ecological reversion with direct consequences for our moral conduct. If ecology showed that ecosystems are not organisms, recognizing organisms as a kind of ecosystem could be the basis for a new post-modern ecological ethics that lays the foundation for a better moral intégration of humans with the environment. The contributions of **Robin Attfield** and **Tom Regan** delve into some of the classical issues in environmental ethics, situating them within a broader ecological and evolutionary context. **Attfield**'s chapter tackles the confrontation between individualistic and ecologically holistic perspectives, their different approaches to the issue of intrinsic value, and their tangled relation to monism and pluralism. **Regan**'s contribution ponders the criteria that allow individual beings, human and non-human, to own moral rights, the role of the struggle for existence in the relationship between species, and the logical difficulties involved in attributing intrinsic value to collective entities (species, ecosystems). **Catherine Larrère**'s chapter discusses the opposition between two environmental and ethical worldviews with very different philosophical centers of gravity: nature and technology. These opposing perspectives have direct consequences not only for the perception of the problems at hand and for what entities are deemed morally significant, but also for the proposed solutions. To set out some foundational events in the history of evolutionary biology, ecology and environmental ethics is a first necessary step towards a clarification of their major epistemological orientations. On the basis of this

inevitably nonexhaustive history, it will be possible to better position the work of the different contributors, and to build a meta-paradigm, i.e. a connecting epistemological Framework resulting from one common or convergent tendency of thought and practice shared by different disciplines.

(…)

The current anthropocentric and globally dominant ethical worldview emerges from this history of relationships between man and nature, and we must recognize that this helped us to find our place in the world. The crucial question at issue is this: nowadays, is anthropocentrism, even in its weakest forms, the most suitable way to cope with the environmental crisis and the decline of biodiversity, which, practically speaking, are the direct results of this ethical worldview? To identify intrinsic value only in man, or to identify a ranking of intrinsic values in living beings, expresses the traditional religiously or philosophically-grounded hierarchicalist Great Chain of Being worldview. Is it possible to reform these positions in an environmentally-oriented sense that could radically change relationships between mankind and nature? Or, on the contrary, do we require an epistemological and ethical rupture with respect to the idea that humanity has of itself and of its place in the world?

We hope that the contributions in this volume will provide some elements of a response to the complex weave of evolutionary, ecological and moral questions that are posed with respect to the possible future pathways of development of humanity's relationship with the rest of nature.

Chapter 2
Evolution Versus Creation: A Sibling Rivalry?

Michael Ruse

Abstract – In this paper, I argue that evolutionary thinking started as a secular response to the Christianity of the eighteenth century. While I agree that Charles Darwin's theory of evolution was in essence scientific, I argue that Darwin's supporters often wanted to continue to treat evolutionary thinking as a secular response to religious claims. This continues to the present, and I suggest that evolutionists should be aware of this fact and temper their thinking and behavior accordingly.

Chapter 3
Evolution and Chance

Jean Gayon

Abstract – Chance comes into play at many levels in the explanation of the evolutionary process. This paper examines the various senses this concept takes at different levels, including mutation, genetic drift, genetic revolutions, ecosystems and macroevolution. Three main concepts of chance are identified: luck, randomness and contingency relative to a given theoretical system.

Chapter 4
Some Conceptions of Time in Ecology

Jean-Marc Drouin

Abstract – Whether one is dealing with variations in the size of populations,changes in landscapes, or modifications in the composition of species, all thèse phenomena are characterized by their temporal structures. Although, like geology, ecology is a historical science, it is also a science of processes like physiology. It is in the combination of these two aspects, and by using both of these paradigms, that the present paper looks for the conceptions of time specific to ecology. Thus, overall representations of ecological phenomena have brought several conceptions of time into play, which can be distinguished in terms of the timescale, its rhythm and its structure. Schematically, descriptions of ecological processes have been founded successively on the idea of a cycle, then on the idea of organic growth, before coming around to unpredictability and chaos. At a more detailed level, this succession of paradigms goes hand in hand with the continued use of concepts that were characteristic of a previous paradigm. The success of some classical concepts can thus be measured by their ability to be inscribed into a new theoretical framework.

Chapter 5
Facts, Values, and Analogies: A Darwinian Approach to Environmental Choice

Bryan G. Norton

Abstract – Most writing on environmental ethics concerns the dichotomy between humans and non-humans, and much of the work in the field has been motivated by the effort to escape "anthropocentrism" with respect to environmental values. Resulting debates about whether to extend "moral considerability" to various elements of non-human nature have been, to say the least, inconclusive. In this paper, a new approach to re-conceptualizing our responsibilities toward nature is proposed, an approach that begins with a re-examination of spatio-temporal scaling in the conceptualization of environmental problems and human responses to them.

Chapter 6
Towards EcoEvoEthics

Patrick Blandin

Abstract – Ecology long considered the natural world as an "equilibrium world". This view culminated in the 1950s with the ecosystem paradigm, which was strengthened by the idea that the reciprocal selection of interacting species should produce ecological stability. At the end of the 1940s, Aldo Leopold's Land Ethic valued the stability of natural communities, and the balance of nature became a key issue for conservationists. Nowadays, there is a shift towards a co-change paradigm: interacting biological and non-biological entities are co-changing through a transactional web that forms the biosphere. Consequently, as ecology meets evolution, the conservation target must shift from the stability of ecological systems to their adaptability. Simultaneously, there is a need for an eco-evolutionary ethics which assumes that we and our co-evolving aliens are living in a changing world. Difficult issues should therefore be addressed, such as the uniqueness and intrinsic value of living entities versus the substitutability of functionally redundant species, and the evolutionary value of diversity. Finally, beyond the biocentrism versus anthropocentrism debate, this EcoEvoEthics should affirm that a thing is right when it tends to enhance the biosphere's capacity to evolve.

Chapter 7
Ecology and Moral Ontology

J. Baird Callicott

Abstract – The "superorganism" was the first paradigm in ecology, set out by Drude in Europe and Clements in North America. It was succeeded by the "ecosystem" paradigm, set out by Tansley, developed by Lindeman and consolidated by Odum, who, at the mid-point of the twentieth century, returned it to its superorganismic roots. The analogy of ecosystems to organisms could not withstand subséquent scientific scrutiny: ecosystems are too ill-bounded, porous, dynamic and artificial to be sufficiently like organisms to qualify as superorganisms. The reverse analogy – organisms to ecosystems – is more perfect. Humans and other organisms may be fruitfully conceived as superecosystems. One's very cells host mutualistic mitochondrial organelles; one's gut hosts a huge biodiversity of bacteria, as do the surface areas of one's body. In addition to the resident biota, abiotic materials (air, water, various nutrients) flow through oneself. This superecosystemic conception of oneself implies a relational – as opposed to a monadic – moral ontology. One's relationships – to other humans, to various kinds of animals, to one's various social and biotic communities, to the biosphere – generate a set of nuanced duties and obligations. One discharges such duties and obligations in a spirit of affection and pride, not in a spirit of begrudging self-sacrifice.

Chapter 8
Animal Rights and Environmental Ethics

Tom Regan

Abstract – The position I favor (the "rights view") prioritizes the moral rights of individuals when it comes to our moral thinking. Some defining features of these rights are explained; reasons for recognizing them in the case of humans are advanced; and arguments for extending them to other-than-human animals are sketched. Several objections are considered, including those that dispute the rights view's alleged inability to explain (1) the amorality of predator-prey relations and (2) our obligations to preserve rare and endangered species.

Chapter 9
Reconciling Individualist and Deeper Environmentalist Theories? An Exploration

Robin Attfield

Abstract – This chapter discusses whether an individualist environmental ethic can be combined and reconciled with an ecocentric or holistic ethic. Versions of individualism include anthropocentrism, sentientism and the variety of biocentrism that I favour. In particular, I consider the value-pluralism advocated by Alan Carter, which seeks, with the aid of multi-dimensional diagrams, to honour a large range of currently held (and supposedly incommensurable) values, including both individualist and ecocentric ones. Carter's description of his own theory accidentally involves contradictions, but even if these are circumvented, there turn out to be problems with endorsing his kind of pluralism, including the absence of reasons or criteria for prioritising values. Arguably, the value of ecosystems depends on that of present and future individuals, and diverse values such as flourishing, achievement, freedom and health can, at least in particular contexts, be prioritised in terms of their value. With the help of arguments adduced by Elinor Mason, I show that, while single-value monistic theories are unsatisfactory, more sophisticated monistic theories for which the values honoured are commensurable are préférable to pluralistic theories such as Carter's for which they are not.

Chapter 10
Two Philosophies of the Environmental Crisis

Catherine Larrère

Abstract – One of the most important – and most disturbing – characteristics of philosophical reflection on environmental questions is that there are, in reality, two separate issues involved. One refers to a philosophy of nature and the other to a philosophy of technology. This has led to two forms of well-established and clearly argued reflection, each with its own debates. These two currents have developed independently of each other, and continue to do so, as if the other did not exist. But this duality is no longer tenable. Due to the generalization of the environmental crisis and the emergence of new

technologies, it has become impossible to treat nature and technology separately. This paper is thus an attempt at a synthesis of these two fields of environmental ethics.

Chapter 11
Epilogue: The Epistemic and Practical Circle in an Evolutionary, Ecologically Sustainable Society

Donato Bergandi

Abstract – In a context of human demographic, technological and economic pressure on natural systems, we face some demanding challenges. We must decide 1) whether to "preserve" nature for its own sake or to "conserve" nature because nature is essentially a reservoir of goods that are functional to humanity's wellbeing; 2) to choose ways of life that respect the biodiversity and evolutionary potential of the planet; and, to allow all this to come to fruition, 3) to clearly define the role of scientific expertise in a democratic society, recognizing the importance of biospheric equilibrium. In fact, in socio-scientific controversies, which are characterized by complex linkages between some life and environmental sciences objects and economic, political and ethical issues, a posture of transparent, impartial commitment is appearing, more and more, as a deontological necessity.

The earth is fast becoming an unfit home for its noblest inhabitant, and another era of equal human crime and human improvidence . . . would reduce it to such a condition of impoverished productiveness, of shattered surface, of climatic excess, as to threaten the depravation, barbarism, and perhaps even extinction of the species.

George Perkins Marsh – 1864

Can human activity really be significant enough to drive the Earth into a new geological epoch? . . . The ultimate drivers of the Anthropocene, . . . if they continue unabated through this century, may well threaten the viability of

contemporary civilization and perhaps even the future existence of Homo sapiens.

Will Steffen, Jacques Grinevald, Paul Crutzen, and John McNeill – 2011

There is a grave danger facing mankind. The danger is not from acid rain, global warming, smog, or the logging of rain forests, as environmentalists would have us believe. The danger to mankind is from environmentalism.

Michael S. Berliner – Ayn Rand Institute 2012

(…)

As humans, to survive and develop our potentialities, we have no solution other than to metabolize environmental energies, but we can, and likely must, minimize our impact on the biosphere's evolutionary and ecological processes. By doing so, by respecting non-human nature for its own sake, grounded on the very fact of its existence as an evolutionary entity, we will, most likely, witness a paradoxical side effect: that we too will continue to form a part of this biosphere for a long time to come.