RADICAL ECOLOGY IN THE FACE OF THE ANTHROPOCENE EXTINCTION

A NEW AND URGENT PHILOSOPHY FOR COMPLEXITY IN THE SOCIAL SCIENCES

John A. Smith and Anna Wilson

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This book has two interlocking ambitions. The first is to steer what we purposefully call the idioms of critical philosophy towards a more ecologically informed paradigm. The second is to recognise that what has rightly come to be called the Anthropocene extinction is not and cannot be treated as simply a scientific fact but rather a sociopolitical and ecological dispute of immense complexity.

We start with an exploration of the consequences of a critical tradition which, under the name Enlightenment, has placed humanity at its centre and chance as its most general – and problematic – characteristic. We argue that this leads to a schizophrenic relationship between radical critique and science which can be avoided if we take the implications of biosemiotics seriously and develop a new, ecologically informed social science. We argue that in practice this means that for science to be practical in addressing the Anthropocene extinction, we have to recognise that it operates in a historically emergent, highly differentiated technopolitical ecology. Science, as it is currently commonly understood and used, is not ecological enough.

This book will interest social scientists interested in not only describing and critiquing but also understanding and responding to the complex problems facing humanity; scientists wanting to make sense of social phenomena; those educating the next generation of social scientists; and climate activists and policymakers.

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Introduction

Sociology is now in a condition of critical change. Having recently occupied the most human-centric ground imaginable, summed up in the notion of the social construction of reality, we now find ourselves confronted by that reality reasserting itself, instead, as a planetary-systems level dynamic threatening a new extinction, not simply of biodiversity, but of our own entire viability, especially in terms of the energy-saturated technosphere to which we are currently adapted and on which we depend. Differently put, sociology now finds itself entangled in a deep ecology which it began by denying: Durkheim's assertion that social phenomena are *sui generic* and a discrete class. The radical implication is that sociology can no longer be a single discipline but must engage the range of disciplines that the geosphere and the biosphere now demand. The old sociology is over, one of the first casualties of the Anthropocene extinction.

In this book, we set out to develop a radical ecological sociology that can better meet the increasingly urgent demands of the present. Our book is in two parts. "Part 1: A radical ecological philosophy" lays out the philosophical principles that our sociology demands. "Part 2: The Anthropocene extinction" demonstrates how a sociology informed by this philosophy might begin to articulate (so ultimately address) what we will describe as the predicament of the Anthropocene.

Introduction to Part 1: A radical ecological philosophy

The founding premise of Part 1 is that the Enlightenment philosophy of the formal subject and its legacy in the concepts of *sui generic* social phenomena and social construction are fundamentally non-ecological and refer to the non-living. In addition, the suspension of religious "dogma", however laudable, also promotes disorder and chance to quasi-causal status. In contrast, we propose an ontology based on the sciences of energised dynamics. We call this dynamic self-emergence, which necessarily then becomes auto-eco-organisation due to the precedence of achieved outcomes as the environmental condition of further dynamic interactions. This is captured in the terms "path dependency" and the "next-adjacent-possible". Such dynamics, whilst active and innovative, are energy- and law-guided, qualitative not arbitrary,

complex not chaotic. Otherwise, they could neither produce robust outcomes nor shape possibility. Crucially, they would not ground the emergence of living beings as opposed to formal subjects.

The advent of living beings also demands a further dimension, that of auto-exo-reference, in order to promote survival. Where auto-eco-organisation is our proposed ontology, auto-exo-reference is the basis of our proposed epistemology. It is an adaptive, next-adjacent-possible emergent path characterised by approximation and sufficiency. This in turn relates to the need to recognise approximation and fuzzy logic. The question is not true or false but true to certain degrees for certain intentionalities.

In order to ground this revision, we draw on a number of interdisciplinary scientific dimensions of physical and biological interactions as well as cognitive theories of approximation and fuzzy logic, which we hope to introduce in an accessible manner to the social science reader. The sources are novel, unfamiliar, complex and interactive. It would be inappropriate to attempt pre-emptive summaries. We will therefore confine ourselves to an outline of chapters that will serve to indicate our direction of travel.

Part 1: Chapter outlines

Chapter 1: Reforming the enlightenment – chance as a second-order phenomenon and post-humanism

In this chapter, we examine what we call the groundlessness of the subject in Kant and Descartes. The former is self-asserting; the latter is beset by radical doubt of its own construction. Both deny an ecology of the subject partly in the name of certainty. At the same time, chance is allowed to permeate "appearances" such that there is no prospect of either animal or human cognition being in any way ecologically sufficient or approximately viable. This anti-ecology, we argue, is carried into sociology as the *sui generic* class of social phenomena and the centrality of the social construction of reality. Chance is again seen to permeate in the form of radical conventionality: could have been otherwise. We see chance or equi-probablity as a second-order, ecologically generated outcome.

Chapter 2: Auto-eco-organisation as ontology – the sciences of emergence

We mentioned auto-eco-organisation above. We want to stress the dynamics of the action of energetic forces upon "materials". This is active at the level of fundamental forces and the emergence of matter, through chemical evolution and the biosphere. It is arguable, but controversial, that matter is "informed" by energy, but it is clear that the processes are qualitative, deterministically complex, rather than chaotic. It is also clear that there are non-living precursors to the emergence of the living. The topography is the smear rather than the boundary. We draw on the thermodynamics of Prigogine and

the theoretical biology of Kauffmann to introduce these dimensions to the social science reader.

Chapter 3: Auto-exo-reference as epistemology – a biosemiotic approach

Auto-exo-reference follows. It differs from the more familiar "autopoiesis" or Matutrana and Varela's (1980) assertion that organisms "bring forth worlds" or decide what "counts" as environment, in that the *mutuality* of organismic structure and environmental "affordances" are stressed. What is clear is that we now have a persistent form of *semantic* causality that is equally active as *physical* causality, whether or not we consider the latter "informed". We draw on the discipline of biosemiotics to develop these questions and to introduce them to the social science reader. It must be stressed that auto-exo-reference is an *adapted* outcome of auto-eco-organisation and so demonstrates relations of mutuality and exhibits a degree of evolved viability. Nevertheless, part of this adaptation involves the dynamics of what counts as information and what is discounted as noise. This dynamic involves preconscious, conscious, cultural and environmental habituations. This introduces the crucial roles of approximation and fuzzy logic. Again, this is intended to introduce such multi-disciplinary conceptions for the social science reader.

Chapter 4: Materialist Darwinism and its discontents – debates in the modern synthesis, the ecology of physical and semantic causality; end-directedness and its consequences for an ecological social science

This is a complex and controversial set of subjects, not least because of the controversy "within" but also because of the traditional distrust of sociologists when evolution is mentioned. We will both introduce the *debate* which is by no means closed and contrast the notions of social construction with the evolution of post-natal plasticity. We draw on the work of a number of authors, including Hoffmeyer, Deacon, Jablonka and Lamb, to illustrate the range and implications of debate.

Chapter 5: The evolutionary ecology of the social – the adaptive unconscious, the mammalian emotions, the significance of approximation and end-directed dynamics

The concept of social construction, despite asymmetries of power and habituation, is associated with human, conscious purpose. But the social has an evolutionary history as a survival strategy long before our appropriation. This suggests that the adaptive unconscious and mammalian emotions may still influence its human manifestations. We examine this through access to inter-disciplinary work on the adaptive unconscious and the mammalian emotions and their relation to end-directed dynamics in both the biosphere and human society. Again we stress the importance of approximation, adaptation, the

multiple, fuzzy dimensions of "conscious" cognitions and the mutuality of end-directed dynamics and ecological affordances. We will draw on work on the evolution of emotions, the social theory of emotions and the emotive content of socio-structural dynamics using the work of Panksepp and Bevan, Plutchik, Tenhouten and Thompson.

Introduction to Part 2: The Anthropocene extinction

In the second half of the book, our intention is to make explicit the implications of our alternative concepts of auto-eco-organisation, path dependency, the next-adjacent-possible and the emergence of auto-exo-reference. We demonstrate how they play out in the contexts of analysis of case studies, policies and the political economy of intervention facing us in the dilemma or predicament of the Anthropocene extinction. Our contention is that this is not and cannot be a matter of just "the science" because of the complexity of contexts, political and cultural positions, and perhaps above all, in recognising the path-dependent *momentum* of the established, energy-saturated technosphere. Opposing this momentum is a colossal task that will require major changes to our traditionally oppositional discussion practices. Differently put, what counts as information and what can be discounted *safely* as noise as exemplified in our intellectual institutions must be constantly placed in question. In this sense, the notions of approximation and true-to-degree-for are central to the politics of enquiry.

Part 2: Chapter outlines

Chapter 6: Summary of Part 1 and methodology for Part 2

We understand social science readers may find the *detailed* inter-disciplinarity and references to the physical, biological, evolutionary and psychological sciences problematic. We have therefore provided a concise summary of Part 1 to aid those readers. We concede that Part 1 may be unfamiliar for social science. Indeed, it is intended as an introduction to interdisciplinary dimensions. The summary, then, is intended to ease this assimilation but is finally no substitute for the full text. We will not attempt to "summarise the summary". The theoretical and methodological implications for Part 2, however, is a new development.

    In particular, we contrast our notion of inter-disciplinarity with that essayed by so-called "Critical Realism" which for us remains firmly within the traditional confines of sociology. We also address Juarrero (2000; 2023) and her notions of constraint and dynamic kinetic stability. Both are versions of what ecologists call an environment. Put simply, we stress affordances rather than constraint and therefore organism/environment mutuality. Our example is the bird which does not simply "learn to fly", but rather, birds are only ontologically possible given the qualitative fluidity and composition of the atmosphere. The enterprise and intention "to fly" are, so to

speak, jointly realised. This and similar forms of dynamic emergence concern us throughout Part 2.

We also confront and disagree with the notion that the Anthropocene should be seen as the Capitalocene. We confront notions of momentum, reform and the limits of the next-adjacent-possible in this context. The outcome is a sense of complex "predicament" – a concept to which we return below – rather than "simple" revolution. The last thing it would be is "simple". We remain, despite our politics, dependent on the technosphere.

Finally, we topicalise the questions of scale: should we ally sociology to world-systems theory or to a more nuanced set of macro–micro perspectives. The question remains open and again informs the whole of Part 2.

Chapter 7: Three case studies

In this chapter, we present three case studies which are intended to describe the complex relations between policy intention and outcomes. These studies clearly pose some extremely difficult questions, but they are not intended as counsels of despair. They are intended, however, to show that an appreciation of the complexities of ecological dynamics will both surprise and be misunderstood if we employ simplistic, linear models of cause and effect, that do not confront the potential multiplicities of need, motive, intention and agency, and that do not recognise the reality of fuzzy logic. We select three contrasting contexts and foci: climate precarity in marginalised communities in South Africa's Cape Flats region; the consequences of proposals for an *Energy Transition Zone* in the Scottish city of Aberdeen; and the public discourse surrounding the UN's major climate change gathering in 2022, COP27. These are intended to highlight the undoubted influence of context; the path dependency that limits possible futures; and the dangers of choosing to identify some ideas, voices or experiences as "information" while dismissing others as "noise".

Chapter 8: The Anthropocene extinction – explicit evidence and implicit epistemology

In this chapter, we engage Thomas et al.'s (2020) important book *The Anthropocene*. They argue, and we agree with the call for a recognition, that the Anthropocene is not a problem to be solved, nor one to ignore, but a dilemma that defines our current relations with the planet, the biosphere, the technosphere and each other. They also call for a multi-disciplinary approach, and we agree that it should be noisy, even dissonant, if a realistic appreciation of auto-eco-organisational complexity is to be represented. This echoes our argument in Chapter 7 and further underlines that any "consilience" is bound to be fragmentary. We give particular attention to the urgent but controversial political and economic implications of proposed ways of living with or surviving our "dilemma". We contrast the different perspectives of the so-called Global North and Global South and further develop the

political economic implications of capitalism, environmental and ecological economics. A central theme in all of this and the rest of the book is the question of momenta, expressed in the dynamics of path dependency and the next-adjacent-possible, not the next-adjacent imaginary.

Chapter 9: Global governance and its discontents "in practice" – radically incompatible perspectives: political, economic, cultural and scientific conflicts

In this chapter, we discuss the role, structure, findings and actions of the IPCC as a body intended to promote some kind of global governance and agreement on targets to mitigate our common dilemma. We further discuss radical opposition to measures to control CO_2 emissions, for example in the writing of Godefridi (2019) who sees control of CO_2 emissions as necessarily a control of humanity and as a road to what he calls environmental totalitarianism. In contrasting these and other opposing positions, we try to chart a course of the realistically possible and as assessment of what we have to face, despite disagreement. Part of what we must recognise is that our ecologism is not anti-human as Godefridi argues but is necessarily post-humanist to an important degree so far as we recognise the interaction of many interlocking forces in auto-eco-organisation and auto-exo-reference on a variety of scales, locations and affordances both human and non-human.

Chapter 10: In place of a conclusion – imperatives and ambiguities

The first task of this section is to detail the relation between the ecological philosophy outlined in Part 1 with the Anthropocene "predicament" analysed in Part 2. We began Part 1 with two interlocking ambitions. The first was to steer what we purposefully call the *idioms* of critical philosophy towards a more ecologically informed paradigm. The second was to recognise that what is rightly called *The Anthropocene Extinction* is not, and cannot be treated as simply a scientific fact but is rather a socio-political and ecological dilemma of immense complexity. We therefore try to promote the importance of both fuzzy logic and PAC (probably approximately correct) reasoning as both adapted to our path dependency and the ambiguities of the next-adjacent-possible. This, again, is neither a counsel of despair nor the familiar conventional pluralism of postmodern writers but an attempt to be more realistic. Part of the realism is the mutuality of environments and organisms, understood both as species-members and as organised collectives.

We use this methodic, multi-dimensional mutuality to again contrast "capitalistic" and Marxist perspectives, both redefined in the context of our Anthropocene predicament. We suggest a crucial shift from *quantitative* emphases in both to a *qualitative* promotion of more appropriate forms of energy use and technology. Central to this analysis is the market as an emergent, information-bearing phenomenon that refuses to be suppressed. We discuss Hayek, Keynes and a reformed version of Modern Monetary

Theory in this context. Interventions in what the market might make qualitatively possible are discussed. This is our attempt to defuse the politics of growth versus degrowth and the controls implied which clearly limit human freedoms. We do not say that human autonomy, or the free market, are sacrosanct. They are as entangled as every other social construction. But we do argue that authoritarian forms carry equally problematic entanglements with the abuse of power.

We also suggest that a world-systems perspective shifts the notions of responsibility or the politics of "blame" to an ecological concept of multi-agency in which humans are, biologically, psychologically and culturally, important but highly differentiated players in auto-eco-organised emergence. Then, lastly, we contrast our "report on knowledge" with Lyotard's famous statement of the postmodern condition to underline the momentous changes in both ontology and epistemology that have been impressed upon us by the Anthropocene predicament.

Finally, we discuss the relations between the logics of correct versus incorrect with those of PAC theory and fuzzy logic. This is an important epistemic matter but also a political challenge. Our institutions and traditions of debate are based on this notion of proposition and opposition. The relevant example here is the IPCC and Global Warming Policy Foundation (GWPF) who, as a matter of *accepted* practice, do not engage with each other. Fuzzy logic and PAC theory dare to suggest that being correct is approximate or being true is so to a certain degree makes oppositional institutions inappropriate. This is an enormous geopolitical challenge.

Part 1

A radical ecological philosophy

1 Reforming the philosophy of the Enlightenment

Chance as a second-order phenomenon and post-humanism

Questioning Enlightenment: A preliminary

> But our ability even to frame our understanding of the world in terms of something larger than our own small patch of ground, our own culture, family, or religion clearly does. And in that, we are all, inescapably, the heirs of the architects of the Enlightenment "science of man." For this, then, if for no other reason, the Enlightenment still matters.
>
> (Pagden, 2013, p. 351)

This passage closes Pagden's account of the Enlightenment. We are, it seems, positively embedded in that foundation. We are also entangled in its violence, negativity and moral equivocations and political radicalism that Pagden's long, detailed historical and analytical account frankly exposes and more enthusiastic accounts (e.g., Pinker, 2018) tend to gloss.

Citing conservative objections Pagden is able, at the same time, to comment on the possibility that

> The Enlightenment, by insisting that what should be of concern to all of us was some greater cosmopolitan world, had made the thought of community almost untenable. It had been a false move, and we—in the western world at least—have been suffering for it ever since.
>
> (ibid., p. 336)

The Enlightenment is, on the one hand, portrayed, *correctly*, as a progressive critical movement. Its achievements are manifold, putting unto doubt religious dogma, founding critical engagement in philosophy and the sciences, developing scientific method and, less directly, contributing to political and social developments such as democracy, human rights and the accountability of political leadership. Of particular relevance here, the Enlightenment makes the discipline of sociology possible but, in our view, compromised.

But we can see from the critical traditions of our discipline that such an intervention called by itself and its supporters *Enlightenment* may be progressive but is neither simply innocent nor neutral. Its political history is certainly not bloodless. It may be better understood, we suggest, as a new

paradigm in both epistemological and political senses that shapes, informs *and limits* the actual, that is the *political* history of inquiry throughout many societies. It becomes a politico-critical *idiom* central to the "greater", cosmopolitan West. We are less interested in so-called conservative notions of community, certainly not in sympathy with associated political, nationalistic or religious radicalisms. We are keenly interested in the philosophical and political demands made by the Anthropocene on the very notion of *a* viable community and even more problematic the competing, or at least ecological, co-influence of *many* communities. That will mean a re-engagement with our own idiomatic legacy of "Enlightenment". This implies that our heritage, our community, may be disciplined but not closed. It also implies that ecological pressures, in every sense, will shape our philosophical reasoning. More impatient pragmatists can turn to Part 2 immediately. For the moment, we want to say that we *must* be conscious that in speaking *about* the world we are not speaking *for* the world. Even impatient pragmatists, *especially* impatient pragmatists, are advised to note this. *Praxis* does not consist of speaking for oneself to oneself.

In particular, a justifiable disbelief in a Creator leads not only to a costless or innocent freedom from religious dogma but to a new position with three major salient characteristics:

1. An emphasis on chance as the agent of change.
2. A parallel emphasis on human *conscious* cognition as the one foundation we can "count on". This is evident in Descartes and Kant and provides the general ground for phenomenology and the contemporary concept of social construction. At the same time, this means we are subject to environmental change and the conventionalities of culture. Conversely, the *evolution* of cognition and the role of the pre- or unconscious, together with emotion, predisposition and inhibition, are scarcely engaged as either grounds or attractors. This is sufficient to place any ecological consideration of relations between socio-biology and cultural expression off limits. As Durkheim insists, social phenomena are a discrete class that "arise in *different* milieu". Heard in its fundamental key, this amounts to an abandonment of any ontology that precedes the human subject or its social expression.

   As Heidegger puts it: "The modern form of ontology is transcendental philosophy which becomes epistemology" (1973, p. 88).
3. More subtly, the relation between *physical* cause and all the aspects of the *semantic*, such as perception, intentionality, meaning and morality, is severed as the Creator and His Will, so to speak, become redundant. We are being ironic of course. But any relation between physical causality and what we shall call *semantic* causality is also "let go". By semantic causality, we mean a spectrum of cause and effect that extends far beyond the action of objects upon other objects. The spectrum may be understood, variously, as consisting of forces at one end to signs,

dispositions, perceptions, cultures, economic activity and the living at the other. This preliminary will take much analysis below. Suffice it to say that material cause becomes paramount and "real" whilst semantic, especially cultural-semantic causation – social construction – assumes "real" *but* conventional or contingent status. It always *could be otherwise*. This is *not* the case, for example, in biosemiotics which shares our view of a deep relation between the physical and semantic and a distrust of the exclusive emphasis on human consciousness – or what Sebeok (1977) called glottocentrism: mistaking the (human) part for the (biosemiotic) whole.

It will be evident from this presentation that we want to argue that this legacy is *to a degree* mistaken; true *to a degree*. This is our first mention of fuzzy logic and the importance of approximation which will form a crucial dimension of our analyses. It does *not* mean we are tacit supporters of Creationism disguised as intelligent design, even though some of the arguments for so-called "design" – intent, fate or inevitability, *especially* lawlike emergence, rather than chance – must be taken seriously.

More generally, the points above may be summed up as the consequences of replacing faith and a Theocentric worldview with a critical *but* humanistic one. That is a little too simplistic because *humanism* presents us with a history of divided perspectives. On the one hand, philosophical criticism tends towards the arbitrary: the "could have been otherwise" that *critically* undermines any and all certainty in perception or cultural solidarity. On the other, there is a commitment to observation, evidence and experimentation: scientific method. Here the "could have been otherwise" is far more nuanced and provisional: some perceptions, theories and beliefs are better-founded, evidence-based, more justifiable and more qualitatively certain than others.

An ostensibly more critically oriented tradition exemplified in philosophy and the social sciences has tended to assume that this scientifically justified hierarchy of certainties is not as justified as it might seem: it is another social construction that "could have been otherwise". Ironically, this is to imply that the arbitrary in human affairs is absolute. For this reason, we shall look to the sciences of cognition, especially biosemiotics, to probably approximately correct (PAC) cognitive theory and to the application of fuzzy logic to forge an *ecological* alternative.

Put more radically, the *spectrum* of Enlightenment thinking from critical genealogy to the most applied of sciences lacks both an adequate ontology and ecology. The former because the critical stance is absolute and no qualitative hierarchy is admissible; the latter because its success depends entirely on specialism and the tightly focused enquiry that makes a degree of practical certainty feasible. If we are to face the challenges of the Anthropocene extinction, we cannot operate with an anti-ecology based on absolutist critical dogma nor on anti-ecology based on the demands of operational specialism. The latter, nevertheless, is potentially more viable and so a degree of trust

must be both earned and granted to some "scientific" positions to ground the ecological imperatives we seek to interrogate.

As disbelievers in the Abrahamic faiths, we nevertheless have to insist that the concept of God, the Creator, if less rational and clearly mythic, is actually more plausible than an insistence upon chance that "could have been otherwise". Without some sense of origin, purpose and destiny, no lawlike universe is conceivable: it could have been otherwise. However weak the laws, however impossible the predictions, the universe and our part of it have an order, fuzzy or not, that permits adaptation – not of the chance material encounter, nor the genetic mutation, nor the critically sovereign individual that Kant proposes – but of the path-dependent auto-eco-organisation of the physical environment and the biological species to which it affords life. This is the ecological imperative: not the individual, nor the specifics of solidarity, but *adaptation* as the origin of difference. This relation, at every point, however primitive, is multiple, mutual and qualitative. It does not consist of chance distinctions whose differences are so trivial they can be safely ignored for all ontological purposes.

Descartes and Kant

Common sense, usually the inferior of philosophy and science, operates on the basis of approximations which it sometimes takes to be absolutely true, but a lot of the time as provisionally true and open to "correction" – which in turn remains open *to a degree*. In lay terms, this is what fuzzy logic and probably approximately correct (PAC) theory propose. It *is* rational in the sense of reasonable and also practical for sustaining the living – not just humans. More of that is below. For the moment, we want to contrast this moderately ecological notion of cognition with Descartes and Kant.

> I resolved to pretend that nothing which had ever entered my mind was any more true than the illusions of my dreams.
> (Descartes, 1968/1975, 4th Meditation, p. 53)

It is interesting that Descartes' Enlightenment begins with pretence and is indeed *perpetrated* "by some evil demon … who has used all his artifice to deceive me" (ibid., 1st Meditation, p. 100). Note that the perpetrator is also imaginary. It is through this mythic construct that Descartes is able to *radicalise* doubt rather than make it commonsensically *provisional* and on that basis to ground the certitude: *Cogito ergo sum*. That is quite a price to pay for securing a modest certitude from the domain of the provisional. Of course, he went on to derive considerable profit in the fields of mathematics and geometry. But he did lose both approximation and, most significantly, any semblance of authentic relation between cognition and its environment. His commitment, then, is to abstraction rather than ecology and so far as we are his descendants, that remains part of our politico-idiomatic usage.