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Concepts and Challenges

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Foreword

Ulrich Beck, one of the most insightful and influential sociologists of his time, suggested original conceptual innovations that challenged sociologists, decision-makers, and the population generally. He was rightly criticized for several weaknesses and incoherencies of his analyses, such as his understatement of enduring social class divisions and of the power and vested interests in market dynamics. Nevertheless he captured many significant aspects of social constructions and their interaction with nature's constructions. Even the incoherent elements often refer to opposing tendencies that are difficult to reconcile. One conceptual contradiction in Beck's work is particularly helpful as a springboard for examining concepts and challenges in the interpenetration of society and nature.

In 1995 Beck (1995: 48–49) advanced a conception of the 'death reflex of normality' for communities near large-scale hazards (e.g. Seveso) that threaten to upend living conditions: 'as the hazards increase in extent, and the situation is subjectively perceived as hopeless, there is a growing tendency not merely to accept the hazard, but to deny it by every means at one's disposal …, there remains only the social construction of non-toxicity. It does not, admittedly, inhibit the *effect*, but only its designation …, staring into the abyss of dangers becomes integrated into normality'. Two decades later, anthropogenic hazards have become global and the scientific evidence of impending danger continues to mount and is widely disseminated. Environmentally degrading activities on one side of our

shared planet are starting to have harmful consequences on the other side and, because of their cumulative biophysical properties, are creating dangers for future generations. Fossil fuel combustion is particularly insidious because carbon emissions often have little effect on prosperous polluters but cause global warming that is threatening the distant, vulnerable poor who produce low emissions and future generations who haven't produced any. Such emissions are carried by wind and air currents and accumulate in the atmosphere to affect people distant in space and time from the principal polluters. Paradoxically Beck (2015) ignored his earlier concept of the death reflex of normality, and instead proposed conceptions of 'emancipatory catastrophism' and 'cosmopolitanism': the anticipation of global catastrophe prompts humans who are disproportionately causing pollution into taking the needs of others distant in space and time into consideration.

I would argue that the early Beck and the later Beck constructed two contrasting ideal-typical conceptions that capture opposing tendencies and possibilities. Either the anthropogenic unleashing of nature's autonomous hazardous dynamics results in dangers perceived to be too big and costly to solve; hence the hazards are denied or discounted on the presumption that future technology will enable humans to adapt to anything. Or they are perceived as too big and serious to ignore, hence the foreseen danger prompts humanity to free itself from the activities that threaten to unleash nature's harmful forces. The emancipatory ideal type is an aspiration found in policy discourse, such as the 2015 Paris Accord concerning climate change, and is approximated by material improvements in social practices principally in northern European societies. The path dependent normality ideal type, what I have referred to as sclerotic catastrophism (Murphy 2015, 2016) and what disaster sociologists (Turner and Pidgeon 1978; Vaughan 1996) have long documented as a 'failure of foresight' when confronted by inconvenient evidence thereby resulting in the 'incubation of man-made disasters', is approximated by high emissions per capita societies such as the United States, Canada, and Australia, which fail to implement environmental policies.

In the early stages of industrialization, whether in Eighteenth Century England or Twenty first Century China, pollution is mainly local and visible, which gives a material incentive to clean up the act, even if

somewhat belatedly. In later stages, a new type of pollution emerges largely invisible to the senses and causes slow-onset, distant harm. Ozone-layer depletion caused by CFCs and global warming because of fossil-fuel combustion require scientific measurement to know they exist, and media dissemination to spread this knowledge to the population. Invisibility to the senses facilitates denial and complacency. Remedies threaten to be costly and/or require life style sacrifices because fossil fuels have been the inanimate energy source of development and prosperity. Modifying social practices to achieve sustainability may in principle be reconcilable with economic growth, but in practice it is opposed by powerful vested interests, the population feels threatened by change, and the reconciliation is resisted. The benefits of emissions-free energy would accrue mainly to distant places or the future, whereas sacrifices by big and small polluters appear immediate and local. Skilled demagogues telling the population what it wishes to hear have an easy task, whereas impact scientists, environmental activists, and well-intentioned political leaders have a difficult undertaking. As Lockie and Wong (Chap. 15) argue, incorporating the future into contemporary decision-making is a significant challenge for sustainability, especially during periods of acceleration of path-dependent innovation. Oosterveer (Chap. 5) suggests a networks and flows perspective as most apt to incorporate time and place into social science analysis.

Schnaiberg (1980) persuasively contrasted production science to impact science, and Beck (1992: 234) referred to this dynamic as science opposing science. Corporations pursuing profit have used production science to develop innovative methods of extracting carbon from safe storage underground in shale, tar sands, deep water, etc., to combust it, and thereby emit it into the atmosphere. Impact science then measures how the carbon accumulates there for a century causing global warming, and documents its effect on the environment needed by everyone. Commodities like fossil fuels are extremely profitable because their pollution costs to the environment and human health remain unpaid by the polluter. If those costs were included in the price instead of being externalized, then polluting commodities would become expensive and used less (Fairbrother 2016; Yearley Chap. 7). But Davidson (Chap. 3) argues that if the metabolic value of nature and worker were correctly internalised,

there would be no surplus value, hence merely reforming capitalism won't solve environmental problems. So what will?

The biosphere amounts to a commons (Pellizzoni Chap. 13) that present and future generations share and is a medium that carries a social relation between risk makers and risk takers, for example between prosperous high polluters and vulnerable low polluters. Humanity, far from being a homogeneous entity, is rife with differences of power and interests. This results in diverse groups with divergent impacts on the biosphere and differential victimisation, as environmental justice research documents (Roberts, Pellow, and Mohai Chap. 11). Therefore speaking of the human impact on the biosphere, as in narratives about the Anthropocene, is an oversimplification (Lidskog and Waterton Chap. 2). Discounting future harm and priority given to near-term economic benefits to the exclusion of long-term needs constitute a structure of monopolisation (Murphy 1988) embedded in culture, practices, and even the physical infrastructure of the economy. "Long term" can be specified as the length of a human lifetime, about one hundred years, which corresponds to the time frame when global warming and other environmental problems are predicted to become severe.

An increasing population of high consuming humans, some more than others, is monopolising the biophysical resources of the planet. This appropriation of the habitats and bodies of other species is problematic in its scale. It deprives other species of resources they need to survive, which leads to high rates of human-induced extinction (Wiens 2016). There is a serious contradiction inherent in monopolising nature's resources and waste sinks thereby closing them off to other forms of life in that it threatens to undermine the very services that nature's other species and its autonomous dynamics provide free of charge for humans, which have empowered human development.

Acceptance that we are now in the Anthropocene does not give warrant to conceptions of the mastery of nature by human reason, nor that human ingenuity is replacing nature, nor does it support reliance on the premise that technological innovation will always give humans the capacity to adapt in a timely fashion to anything nature throws at us in reaction to human activities, such as global warming. Scientific proponents of the concept Anthropocene see humanity as at most a force presently equal in

impact to nature's processes. Even if humanity were to become the driver of planetary change, it does not imply that the cliff ahead has been eliminated. And it is equally possible that human activities are tipping the planet into new dynamics of nature's driverless transformations beyond human control. The fact that human activities are causing global warming and climate change, biodiversity loss, ocean degradation, emergence of antibiotic resistant bacteria, etc., implies that human activities could result in nature's forces becoming more threatening by unleashing increasingly powerful and frequent hurricanes, flooding, droughts, wildfires, earthquakes, ocean level rise, infectious diseases and the like. That is the concern of many scientists, both social and natural, who argue that sustainability in the Anthropocene requires that humans modify their deleterious impacts on their biophysical environment. The interaction and interpenetration of social constructions and nature's constructions are becoming more intense, not less so. Nature is an actant whose dynamics have the potential to strike back against its manipulation by humans (Clark 2011), which Davidson (Chap. 3) analyses using the concept of socio-ecological metabolism. The impact of human activities on their biophysical environment threatens to let loose a reaction of nature's powerful forces that could undermine many human activities. Unless remedial action is taken, the Anthropocene could be short compared to the Holocene, paradoxically ushering in a subsequent biophysical epoch where nature's autonomous dynamics would be more dangerous and less propitious for sustaining human life and prosperity.

The interaction of socioeconomic constructions and nature's constructions results in uncertainty rather than predictability. Although many overall tendencies are scientifically known and predictable, the specifics and timing are not. Fossil fuel combustion and deforestation causing global warming have been well documented, but the location, timing, and severity of resulting hurricanes, floods, wildfires, drought, etc., remain uncertain. This leads to not only nature's future dynamics that we know we do not know (known unknowns such as the extent and rate of ocean-level rise) but also to other forces of nature that we can't even image (unknown unknowns). And some forces are scientifically known but denied, as when American President George W. Bush claimed that the risks of hurricanes for New Orleans were unexpected, even though they

had been scientifically well documented (Freudenburg et al. 2009). This could be called unknown knowns, that is, known but unacknowledged, and is quite prevalent. Human activities are now having a profound impact by unleashing new frequencies and intensities of previously experienced biophysical forces and letting loose new constructions of nature. Facile assumptions that society can always withstand nature's forces (robustness) or adapt or bounce back or forward (resilience; see Ylönen Chap. 4) runs the risk of encountering tipping points into dangerous unknowns.

Nature's dynamics have repeatedly undermined the hubris of claims of mastering nature's forces for small scale phenomena. It is unreasonable to presume that such undermining could not occur on the global scale. Because nature's forces let loose by human practices are so powerful and global, even wealthy humans are threatened. At the least, the backlash by nature's forces puts human innovation on a costly treadmill to keep up with nature's constructions compared to the Holocene where nature's services could be counted on and freely harvested. At the worse, depending on technological solutionism could prove to be disastrous magical thinking because of nature's reaction to its manipulation. Promoting technological innovation is one thing, relying on it exclusively to circumvent modifying polluting practices is very different. If polluters believed their own rhetoric that technological innovations will solve pollution problems, they would be willing to accept technological solutions as preconditions for production, for example combustion of coal and oil only if there were no carbon emissions into the atmosphere. But such technological solutionism remains merely a talking point as carbon pollution intensifies.

Discourse is propagated by embodied humans both sustained and endangered by a material world of primal nature's dynamics. BP's discourse to American regulators that its blowout protector is failsafe was refuted by deep water pressures in the Gulf of Mexico where it failed to ensure safety (Freudenburg and Gramling 2011). There is so much greenwashing and clinging to the status quo that it is important to consider a possible death reflex of normality. Policy discourse is vacuous if it is not implemented into effective action. Rau (Chap. 9) argues in favour of practice-oriented sustainability thinking and assessment which would prompt more inclusive sustainability initiatives. Huddart-Kennedy and

Hauslik (Chap. 8) propose, in contrast to individualistic voluntarist approaches, a social practices framework which takes into account everyday structural arrangements based on internalized social norms as well as corporate and political structures. Ecological modernisation discourse concerning anthropogenic climate change will be valid if and only if practices change to make carbon emissions less than withdrawals from the atmosphere, otherwise global warming will continue to worsen (Murphy 2015, 2016). The important issue is whether socially constructed discourse leads to practices in harmony with nature's constructions or whether there is a mismatch (Adam 1995). Thus social science requires a material grounding and collaboration with impact natural science (Clark 2011). Since anthropogenic environmental problems have resulted from social practices and have social consequences, impact natural science similarly requires a grounding in social science. As Lidskog and Sundqvist (Chap. 8) argue, different kinds of expertise are needed.

Governance is key to determining environmental impacts, hence in a global world Mol (Chap. 6) argues that what he calls the environmental state must be outward looking and cosmopolitan. Fischer (Chap. 12) examines the theory and practices of the progressive/liberal and radical participatory versions of environmental democracy. Empirically, social democracy is not only a real-world leader in minimizing economic inequalities and inequalities of opportunity, but also a leader in environmental performance (see Murphy 2015). It deploys governments, trade unions, etc., to redistribute wealth and opportunity more equitably and typically is more inclusive of consideration of future generations and poor countries because of environmental considerations. Individualism and neoliberalism on the contrary foster monopolisation of opportunities and benefits by the prosperous of the present generation to the exclusion of others, including future generations, by pushing aside government and regulations. Van Koppen and Bush (Chap. 14) argue that sociopolitical fit is more difficult to achieve and needs our first attention compared to biophysical fit. But in the context of actual or threatened catastrophes, more progress may be made on both by giving them concurrent and equal attention.

Like Beck, I too would like emancipatory catastrophism to occur, but it is important to recognize it as aspirational. To transform aspirations

into reality and not degenerate into well-intentioned but naïve wishful thinking, it is necessary to understand the real imperfect world of power and privilege. This entails investigating sclerotic catastrophism, economic interests, short-termism (Adam 1995), and nationalism, which fail to take the welfare of future generations and distant populations into account. The backsliding of the Trump Administration in the United States concerning the urgent problem of anthropogenic climate change, and more generally its rejection of both natural scientific and social scientific expertise, is an example of the reflex of clinging to path-dependent normality. This failure of foresight in the context of scientific evidence of human-made dangers like global warming threatens to construct the incubation of catastrophe in the Anthropocene.

The renowned editors and authors of this timely and important book elaborate on themes such as these by focussing on specific concepts to increase understanding of the problematic relations between social constructions and nature's biophysical constructions and the interpenetration of the two. The editors Boström and Davidson (Chap. 1) insightfully saw the need for a critical analysis of concepts in environmental sociology, their integration with concepts used more broadly in the environmental sciences, and an interdisciplinary perspective. To its credit, environmental sociology has over the years continually studied social action by humans not only as embodied, but also in its material context of being sustained yet threatened by nature's dynamic, autonomous processes, which facilitates such integration and interdisciplinarity. This valuable book is environmental sociology's latest major contribution to the analysis of challenging socio-ecological relations.

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Acknowledgement

The seed of this idea—scrutinizing core existing concepts in the environmental sciences—developed from a growing conviction that we all need to reach a better transdisciplinary interchange on the terms, concepts and discourses that shape our thoughts and communication (or lack of thought and communication) on environment-society relations. This "we" refers not just to the authors of this book but, in principle, everyone within and outside academia. However, the concern among "we as authors" started as a worry that environmental sociologists a little too often continue to do research in a somewhat habitual way—formulating our standard questions, applying our favorite theories and methods, providing our standard critique—without sufficiently reflecting on, firstly, how our own discipline progresses in terms of theorizing, and secondly, how the concepts we use and ideas we formulate actually speak to the broader field and practice in environmental science and policy. And not the least, we reflected, this might also be the situation among several other disciplines within the environmental sciences. Indeed, in this broader field, scholars, policy-makers and practitioners often share the same concepts and express the same words—but do they actually mean the same things? Or what if they mean the same things, but fail to take notice of each other simply because they apply different concepts? While the incommensurability between disciplines in the sciences is not new, our concern was that problems like these are ever more problematic in

the face of the world's escalating environmental problems. More conceptual reflexivity and better communication—particularly between the natural and social sciences—are fundamentally needed.

Concerns like these resulted in the organizing of an international workshop, a collaboration between the environmental sociology section at Örebro University and the Research Committee on Environment and Society (RC24) of the International Sociological Association. Hence, a workshop on Core Concepts in Environmental Sociology took place at Örebro University, Sweden, in September 2015. It attracted around 25 environmental sociologists from 10 countries and 4 continents for a three-day long, engaging and intensive workshop. Several outcomes emerged from the workshop. In addition to individual papers, some of which were eventually published as peer-reviewed articles, it resulted in two major publications. The first one was a special issue on Conceptual Innovation in Environmental Sociology, published in the journal *Environmental Sociology* (Vol 2, No 4), edited by Rolf Lidskog and Claire Waterton. The second one is this volume.

We wish to send a big thank you to all participants who attended this workshop for their contributions to a friendly and constructive interchange. We hope all this will trigger a new, important conceptual discussion not only within environmental sociology but much broader in environmental science, and outside academia. The book hopefully manages to explain in further detail why we find this is so important.

We would like to send a thank you to all members of the environmental sociology section at Örebro University, who assisted by providing constructive comments on the book in different stages of the working process as well as on drafts of both the intro and concluding chapters. Particularly thanks to the following persons: Monika Berg, Karin Gustafsson, Erik Hysing, Rolf Lidskog, Erik Löfmarck, Sebastian Svenberg, Daniel Sjödin, and Ylva Uggla. A big thank you also to Henrike Rau who provided very constructive comment of a late draft of the intro chapter. As well, we appreciate the tremendous work of the staff at Palgrave Macmillan, who did a fantastic job of editing our work, and helping us get this volume to print.

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Abbreviations

ANT	Actor-Network Theory
CBD	Convention on Biological Diversity
CFC	ChloroFluoroCarbon
CDM	Clean Development Mechanism
CEO	Chief Executive Officer
COP	Conference of the Parties
CSDII	*Compendium of Sustainable Development Indicator Initiatives*
CSI	Citizen Science Initiatives
CSR	Corporate Social Responsibility
EF	Ecological Footprint
EIA	Environmental Impact Assessments
EPA	Environmental Protection Agency
EROI	Energy Return on Investment
ETS	Emissions Trading Scheme
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIN	Global Integrated Network
GVC	Global Value Chain
HANPP	Human Appropriation of Net Primary Production
HDI	Human Development Index
HPI	Happy Planet Index
ICT	Information and Communication Technology

IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IPR	Intellectual Property Rights
ISPO	Indonesian Sustainable Palm Oil
JI	Joint Implementation
LCA	Life Cycle Analysis
LULU	Locally Unwanted Land Use
MFA	Material Flow Analysis
MEA	Millenium Ecosystem Assessmentt
MuSIASEM	Multi-scale Integrated Analysis of Societal and Ecosystem Metabolism
NEA	National Ecosystem Assessment
NIMBY	Not In My Backyard
NGO	Non-governmental Organization
OECD	Organisation for Economic Co-operation and Development
PROSA	Practice-oriented sustainability assessments
RSPO	Roundtable on Sustainable Palm Oil
SA	Sustainability Assessment
SDG	Sustainable Development Goal
SDI	Sustainable Development Indicators
SES	Social-Ecological System
SLCA	Social Life Cycle Analysis
SRA	Society for Risk Analysis
STS	Science and Technology Studies
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WCED	World Commission on Environment and Development
WTO	World Trade Organization
WWF	World Wide Fund for Nature

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