

## Chapter 2

# Onto-epistemological transitions towards sustainability

When we see a "problem", whether pollution, carbon dioxide, or whatever, we then say, "We have got to solve that problem." But we are constantly producing that sort of problem – not just that particular problem, but that sort of problem – by the way we go on with our thought. If we can keep on thinking that the world is there solely for our convenience, then we are going to exploit it in some other way, and we are going to make another problem somewhere.

*David Bohm in On Dialogue*

This chapter examines how the sustainability challenge can be understood and approached as a question of transformations in human-nature relations. By conceptualising grassroots innovations as sites of transformation in the deeper onto-epistemological assumptions that guide environment-making, I explore how changes in worldviews can be known and studied. On this basis, a framework for understanding the co-production of ontologies and epistemologies is developed with a view to undertaking an empirical investigation of onto-epistemological transformation in grassroots innovations. Section 2.1 reviews the literature on grassroots innovations, outlines current research challenges in this emerging field and positions this study in relation to the need for understanding the role of narratives and visions in the development of particular sustainabilities within grassroots projects. Section 2.2 clarifies how the idea of onto-epistemological transitions is conceptualised in this thesis and explains my theoretical approach through a critical assessment and revision of the theoretical assumptions concerning social change in transitions theory. The key elements of the theoretical framework of this thesis are then elaborated in section 2.3 which sets out the specific ways in which onto-epistemological transformation is studied in this research.

## 2.1 Grassroots innovations for sustainable consumption

If the sustainability challenge involves cultivating new rules and visions of environment-making which go beyond the binary of society vs. nature, this suggests that sustainability research needs to engage with the social beliefs and cultural narratives that express this paradigm. And this means addressing people not just as individuals but in the communities and locales which structure their lives because, as Hale (2010) observes, "[i]ndividual action on the scale necessary will only emerge through collective decisions in the networks and communities with which people have strong personal affiliations, and which can give them both the motive and opportunity to act" (p. 263). Drawing on a diversity of approaches to studying grassroots environmental action, the emerging field of grassroots innovations inquires into the plurality of knowledges, identities, social contexts and structural relations that have potential to transform dominant unsustainable practices from the bottom up. Building on the wider literatures on sustainability transitions, sustainable consumption and community activism, Seyfang and Smith (2007) define grassroots innovations as:

"networks of activists and organisations generating novel bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved. In contrast to mainstream business greening, grassroots initiatives operate in civil society arenas and involve committed activists experimenting with social innovations as well as using greener technologies" (ibid., p. 585).

Viewing such networks of activists and organisations as innovative niches (cf. section 1.1.2), the focus of research on grassroots innovations is understanding the learning processes that take place within civil society sustainability experiments. In this way, community initiatives are theorised as 'green niches' that explore problem framings and practical solutions for sustainability.

Seeing the grassroots as sites of 'innovative diversity' where 'the rules are different', research on grassroots innovations is concerned with "the contexts, actors and processes under which niche lessons are able or unable to translate into mainstream situations (and transform sustainabilities)" (ibid., p. 598). The focus of analysis is "the social networks, learning processes, expectations and enrolment of actors and resources in emerging niche practices" (ibid., p. 590). Seyfang and Smith identify two main challenges for grassroots innovations: the first is related to intrinsic challenges around internal organisation and the other is related to diffusion challenges around external take up of niche innovations. They distinguish between 'strategic' and 'simple' niches, the former seeking reform and proliferation while the latter are not explicitly concerned with expansion. The objective of research in this area is to "gain a better understanding of the potential and needs of grassroots initiatives, as well as insights into the challenges they face and their possible

solutions" (ibid., p. 585). Thus, this research agenda proposes to build theoretical frameworks that focus on how contextualised knowledges and actions can bring about sustainability outcomes and it raises important questions related to the normative understandings and enactments of sustainability within the grassroots (and more widely in sustainability research).

### 2.1.1 Overview of the field and current research challenges

Initial research on grassroots innovations has been undertaken in projects investigating areas such as community energy, local food networks, complementary currencies and sustainable housing. Case studies on organic food networks (Seyfang, 2007), community housing (Seyfang *et al.*, 2010), energy transitions (Hielscher *et al.*, 2012; Smith, 2012; Seyfang and Haxeltine, 2012; Seyfang *et al.*, 2013), and complementary currencies (Seyfang and Longhurst, 2013a,b; Longhurst, 2013) have examined questions about how grassroots innovations develop and diffuse in practice. While Seyfang and Smith (2007) take the lenses of sustainable consumption and socio-technical transitions as their theoretical starting points, later research has seen the field embrace other theories, notably social practice theory (e.g. Hargreaves *et al.*, 2011, 2013b), new social movement theories (e.g. Seyfang and Haxeltine, 2012; Smith *et al.*, 2013), and the literature on social-ecological systems (e.g. Smith and Stirling, 2008 and Haxeltine and Seyfang, 2009). In addition to these articles, a number of studies have also explored the deeper theoretical foundations for grassroots innovations, including work on green niches (Smith and Raven, 2012), the multi-level perspective (MLP) and sustainability transitions (Smith *et al.*, 2010), power relationships and dynamics between green niches and commercial regimes (Hess, 2013), the significance of local contexts and the role of intermediaries in the development of grassroots innovations (Ornetzeder and Rohrer, 2013; Hargreaves *et al.*, 2013a), as well as comparative studies (Smith *et al.*, 2013).

From this body of work some of the insights in the original research agenda have been expanded. Seyfang's (2009) study of community housing, organic food networks and complementary currencies shows how grassroots innovations are important 'generators of ecological citizenship values and practices' and identifies three ways in which such values and practices spread: through scaling up (growth in scale), replication (multiplication), and translation (learning is taken up by mainstream). Smith's (2007) investigation of eco-housing and organic food initiatives further develops the ways in which sustainability translates from grassroots to mainstream. Seyfang and Haxeltine (2012) identify how awareness of social-psychological aspects of grassroots innovations (such as identity, belonging, purpose, and community) are critical to resolve tensions between internal organisation and external diffusion. Comparing the appropriate technology movement with current grassroots movements around technologies for social inclusion in Latin America, Smith *et al.* (2013) find this tension to involve three fundamental and enduring challenges for grassroots innovations; they have to navigate being: 1) locally-specific, yet widely-applicable; 2) appropriate to, yet transforming situations; and 3) project-based solutions,

yet seeking structural change. From this perspective three different but related forms of (contested) knowledge production can be identified within grassroots innovations: ethnographic (grassroots ingenuity), instrumental (empowering inclusion), and critical (structural critique).

Hargreaves *et al.* (2013a) explore the role of intermediaries in building institutions, sharing information, providing tools and resources, offering professional advice and engaging with policy makers. They find that intermediation is more about *opening up spaces for new kinds of activity* rather than developing "a single successful approach or a strategic vision for its growth and diffusion" (p. 879). A key challenge found across many of the studies on grassroots innovation is securing the necessary resources for activities (Hielscher *et al.*, 2012; Seyfang and Longhurst, 2013b). In a study of local food networks in England, Kirwan *et al.* (2013) find that there is a real danger that grassroots innovations end up spending a disproportionate amount of time and energy securing resources rather than focussing on their core needs. Hess (2013) finds that grassroots innovations in established industrial fields face substantial opposition and that their inability to match the resources and power of corporate structures diminish their influence. In their study of community growing projects, White and Stirling (2013) suggest that the development of grassroots innovations is best understood as taking place within the context of multiple provisioning systems with a diversity of stakeholders, motivations and identities (e.g. 'food' initiatives are just as much about 'education' and 'health' as they are about growing). This opens up for exploring how grassroots innovations identify and connect across 'niches', 'fields', 'regimes' or 'systems of provision'.

In a special issue on grassroots innovations in *Global Environmental Change*, Smith and Seyfang (2013) establish four main challenges for current research on grassroots innovations:

- whether and how grassroots innovators network with one another;
- the extent to which movements for grassroots innovation approaches exist and how they operate;
- whether and how innovations diffuse through processes of replication, scaling-up, and translation into institutions; and,
- whether or not these developments constitute alternative pathways for sustainability.

As initial studies in this emerging field show, "[g]rassroots innovations are no respecters of boundaries" (*ibid.*, p. 829) and, as such, grassroots activities, objectives, roles and domains often evade classification into neat categories. In this way, applying theoretical concepts and frameworks from literatures that do not pay sufficient attention to the contested and plural nature of core concepts like sustainability, social innovation, and the grassroots is not straightforward. In light of the foregoing concerns about how underlying onto-epistemological assumptions frame the human-nature relationships implied by

the notion of sustainability, a further challenge can be added to this list: what is the role of sustainability narratives and visions in the structuring, mobilisation and diffusion of particular forms of environment-making in grassroots innovations?

This question cuts across all of the four research challenges raised above in that it asks about how assumptions about sustainability affect grassroots innovations and whether they link particular projects and initiatives beyond the specific practices and strategies they engage. It builds on the understanding in this emerging field that innovation should not be understood in a narrow technological sense nor in a provisional sense of technical *and* social, but should rather be seen from within the practices, identities, institutions and ideas that enable sustainable forms of living. In this way, innovation is as much about the assumptions about, and visions of, sustainability that are enacted in particular practices as it is about socio-technical ‘solutions’. Grassroots innovations are different from typical market-based innovations as they originate in the social economy and are driven by concerns with particular social or ecological problems (Seyfang and Smith, 2007). As such, ‘innovation’ includes producing transformative agencies, narratives and networks which undermine dominant (unsustainable) practices (Smith and Raven, 2012). Because subjectivity, agency, and normativity are ultimately storied or scripted within a wider cultural meta-narrative, asking about the role of narratives in the development of grassroots innovations opens up for approaching innovation as conceptual just as much as social or technical. Challenging the relations, values, identities, visions, attitudes and lifestyles that are implied by the ‘lock-in’ of fixed behaviours, social contexts and cultural narratives could in this way present a potential for transforming the rules that guide environment-making.

### 2.1.2 Conceptualising grassroots (sustainability) innovations as transformations in ontology and epistemology

This thesis argues that, at a historical moment where there is a genuine prospect of short-term failure in key social, economic and biological systems which support human and non-human life (cf. Ehrlich and Ehrlich, 2013), the dominant user-resource perspective on sustainability is no longer sufficient to enable new ways of living. Alternative sustainability narratives and visions in grassroots innovations could provide clues to ways of being and thinking that embody new forms of human-nature relations and which make unsustainable ways of life (more) unacceptable, meaningless or even unimaginable. This study inquires into this aspect of grassroots innovations by examining the ‘rules that guide environment-making’ (cf. Moore, 2013), or, in other words, the onto-epistemological assumptions that underpin the ideas, visions, concepts and stories that organise and structure (un)sustainable ways of living (section 2.3 expands on this). The key to enacting new forms of life is thus not perceived to be about innovation per se but about *the relations that guide new forms of environment-making*. Rather than casting innovation simply as socio-technical intervention in human systems of consumption and production, this study sees innovation just as much as conceptual: sustainability innovations implicitly involve a (re)imagining of human-nature relationships.

While it might at first sight seem peculiar to engage with assumptions about being and knowing in a study about grassroots innovations and sustainability transitions, this should be understood from the perspective that the root of the sustainability challenge is metaphysical: the condition of *unsustainability* has arisen from dominant onto-epistemological beliefs which disregard the many ways in which the fates of the human and more-than-human worlds are intertwined. To be clear, a transformation in onto-epistemological assumptions implies a corresponding change in subjectivity and agency – it means the world is experienced as qualitatively different because "the very framework of people's reality structures" have altered (McIntosh, 2012b, p. 235). This has effects for a subject's way of being in the world and way of thinking about the world. So an onto-epistemological transition is conceptualised as making new ways of being, thinking and doing available for the subjects involved. Further, this is viewed as a radical form of innovation which gives expression to new relations between human and more-than-human worlds – here, innovation is not seen narrowly as modification of artifacts or agencies but pertaining more broadly to what sort of entities are granted agency. Viewing innovation as inextricably entangled in more-than-human nature positions sustainability scholarship as an inquiry into what kind of relationships are (re)produced and enacted within nature-as-matrix (the meaning of this term is further elaborated in section 2.2.3). This is the work that the term 'environment-making' (cf. Moore, 2013) is employed to do: it both describes particular forms of human-nature relationships (such as the user-resource relation) and opens up for examining the deeper 'rules' that structure those relationships (the onto-epistemological assumptions that give rise to specific modes of being and thinking).

The beliefs, concepts and visions which guide a change in human relations with more-than-human nature are thus seen as key to understanding what kind of sustainabilities emerge from grassroots innovations. And, because nature and society are part of an imaginary which is both understood and represented narratively, the role of narratives in enabling new sustainability practices and ways of doing is central. Jerome Bruner observes that "one important way of characterizing a culture is by the narrative models it makes available for describing the course of a life" (2004, p. 694). Narratives, as habitual ways of speaking and conceptualising, "become recipes for structuring experience itself, for laying down routes into memory, for not only guiding the life narrative up to the present but directing it into the future" (ibid., 708), so that they eventually "create the realities they purport to describe" (Atkinson and Delamont, 2006, p. xxxiv). As cultural narratives in this way construe how people understand 'nature', as well as their relationship with social and ecological place and their sense of self, they directly affect what actions are perceived as sensible in order to achieve sustainability as well as what is accepted as valid forms of knowledge. Sustainability narratives tell a story of what the challenge of sustainability is about and what actions make sense to meet this challenge. At the same time, narratives express particular worldviews, identities, and normativities held within interpretive communities which sanction appropriate avenues of action (Squire, 2008).

As localities where 'the rules are different', grassroots innovations are a good starting point for an inquiry into alternative sustainability narratives. Investigating how grassroots

innovations constitute communities of interpretation, narrative-building and meaning-making, opens up for better understanding if and how they generate change through (de)stabilising particular narratives, concepts and meanings. By seeding change in sustainability narratives, grassroots innovations are potentially not just building alternative networks and infrastructures but transforming the ways of being and thinking which characterise unsustainable forms of living in the first place. While the existing literature on grassroots innovations provides a basis for theorising the formation and diffusion of particular radical social innovations, little is known about the practical and experiential aspects of qualitative changes in worldviews within grassroots projects. This thesis aims to address this gap by providing a coherent framework for thinking about sustainability as a quality of relationship between human and more-than-human worlds. The deeper question this thesis grapples with is *how sustainability narratives affect lifeworlds within grassroots innovations* and the ways in which sustainabilities are envisioned and enacted. Four supporting questions have been formulated to help answer this question:

1. *How do sustainability narratives inform what kinds of knowledge and action participants engage with in grassroots innovations?*
2. *How are transformations in individual and collective cultural narratives expressed in participants' worldviews and actions?*
3. *How do sustainability narratives affect the organisation and diffusion of grassroots innovations?*
4. *What is the role of stories in enabling emerging practices and tools for social change?*

The remainder of this chapter builds an understanding of the relation between narratives and worldviews, and creates a theoretical framework for answering these questions. It explores how concepts and insights from the literatures on Radical Human Ecology, complexity science, (counter-)narratives and eco-linguistics can aid a more detailed understanding of transitions in epistemology and ontology with a view to undertaking an empirical investigation of transformation in onto-epistemologies. The next section will substantiate the meaning of onto-epistemological transitions, expand the basic framework of this study and provide a basis for theorising social phenomena from the perspective of humanity-in-nature. Section 2.3 will then describe how onto-epistemological transitions can be studied as enactments of 'alternate realities' and introduce the key concepts and ideas that guide the empirical investigation of this thesis.

## 2.2 Onto-epistemological transitions

The envisioning and enactment of qualitatively different relationships to those of the user-resource perspective implies a deeper transformation in ontology and epistemology, or the perceived nature of being and knowing. A transformation in ontology (*what is* or what constitutes the phenomenal world) here indicates a change in someone's sense of being

and of being human. Correspondingly, a transformation in epistemology (*ways of knowing* or what counts as knowledge) denotes a change in what someone considers valid knowledge and how knowledge is derived. ‘Onto-epistemology’ therefore refers to the beliefs or assumptions that ‘shape individual and social consciousness’ and ‘people’s sense of being and what being human means’ (McIntosh, 2012a, p. 40). Acknowledging that “the deeper recesses of human agency are inevitably located in our onto-epistemological relationship to the world” (Williams *et al.*, 2012, p. 4), a change in onto-epistemology is in this way seen as opening new possibilities for people to experience and engage differently with the wider cosmos – a shift which is revealed and expressed in the personal and collective narratives that describe positionalities and context. This section outlines the importance of ontological and epistemological assumptions for the concept of sustainability, specifies the meaning of onto-epistemological transitions and clarifies how transformations in how the world is experienced and known are approached and theorised in this study. This explication also illustrates how social research can move away from modes of theorising which reproduce the assumptions of the user-resource view.

Concerned with questions of being, ontology shapes the experience of and participation in the world profoundly: my engagement with *something* depends on what kind of existence I consider this thing to have and whether I see it as real or unreal. Because it is impossible to know the whole of existence in a dynamic and evolving universe (Bohm and Hiley, 1993), I am left to make assumptions about the overall nature of existence and reality. Such assumptions about existence (e.g. men and women are fundamentally different, genetic makeup matters more than culture, race decides intelligence, trees have language, gods exist, animals are insentient) affect my interactions in the world. If I believe I exist within a hierarchy of being, I will tend to perceive humans – with their advanced language, thoughts and feelings – as separate and higher than other entities in the natural world. It is in this way that the ontological hierarchy of God-Humanity-Nature which characterises modernity (cf. Curry, 2006; Smith, 2011) supports a worldview which perceives nature as ‘resource’ or ‘raw materials’ and humanity as ‘users’ or ‘managers’ whose task it is to optimise the consumption of natural ‘assets’ in order to achieve sustainability – even if God is ‘crossed out’ in this hierarchy as Latour (1992) explains. On the other hand, if I perceive myself as ‘already inside’ a densely woven web of ecologies, as participant in myriad fields of life without a fixed position in a given existential order, I may see not forest ‘resources’ or ‘services’ provided by a neutral background environment, but other forms of life which are co-creators of the world I inhabit (cf. Capra, 1996). While these two contrasting assumptions or beliefs are typecast, they illustrate the difference between sustainability as a goal or an index (a quantified future target to reach) and sustainability as relation (a quality of relationship). Ontology in this way deeply affects personal and collective ways of being together.

A change in assumptions about existence entails a concurrent transformation in epistemology – the process of knowing or what is considered as sound knowledge. Knowing, in the context of the modern constitution, is typically understood as involving a knower

or observer (a 'self' or an 'I') which receives and interprets information from surrounding social phenomena or the wider external world (cf. Marsh and Stoker, 2002). In this conception, I subjectively *know* about this independently existing and objective world by way of representing it in my mind. I can then – with the right application of method – derive true or accurate knowledge about the known by deducing from these representations (abstract) universal laws which govern the universe. And because I can in turn encode this information in symbolic thought or notation, knowledge itself appears separate from the knower and from life: it can be stored as equations and maxims in books or as bits on a hard-drive (cf. Midgley, 2004). At the heart of this epistemological outlook is a fallacious assumption of a division between knower and known which has been overturned by insights across a range of fields, including cybernetics, complexity theory and quantum physics (in this study I draw in particular on the works of Gregory Bateson, Edgar Morin and David Bohm respectively). These understandings show that *knower* (e.g. organism) and *known* (e.g. environment) are inseparable and that *knowing* is not a process of representation of an external world but of 'bringing forth a world' according to the structure of a being's perceptual-biological constitution (Capra, 1996). This is of vital importance in understanding the sustainability challenge because the consequences are such that "[i]f we degrade [the environment], we degrade ourselves, and if we destroy it, we destroy ourselves" (Morin, 2007, p. 19). Epistemology thus has to do with the explanatory models, or ways of thinking, one engages with to explain worldly phenomena.

Taken together, people's ontologies (models of reality) and epistemologies (theories of knowledge) structure their worldview – how they experience and make sense of the world<sup>1</sup>. In this text, 'onto-epistemological change' is used to denote a shift in someone's worldview, i.e. in her assumptions about being and knowing which presents a qualitative different perspective on and relationship between subject and object<sup>2</sup>. If such a shift in the 'deeper recesses of agency' takes place, new avenues of action become possible. At the same time, a change in onto-epistemological commitments implies a transformation in the 'experience of reality' and the 'corresponding experience of relationship' between self and other (Williams *et al.*, 2012, p. 4) which creates a ground for new ways of being in and thinking about the world (section 2.3 continues to examine how this change can be conceptualised). Changes in ways of being and thinking are evidently part and parcel of the development of human societies and they have been studied from a variety of perspectives, e.g. as the transformation of social relations (Polanyi, 1957), rationalisation of society (Weber, 1946), paradigm shifts (Kuhn, 1970) and change in cultural mythology (Campbell, 1969). While historical transformations in ontology and epistemology are uncontroversial, it is perhaps less clear how to identify and theorise such changes in

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<sup>1</sup>The term 'worldview' has a long and windy history as a philosophical term which falls outside the scope of this thesis. In this text I take 'worldview' to mean 'sets of experience and assumptions about reality' (McIntosh, 2012a) which allow people to construct a 'global image of the world' (Vidal, 2008) and thus help them make sense of new experiences. Ontological and epistemological assumptions are therefore integral components of worldviews.

<sup>2</sup>The term is thus employed to indicate a change in personal *commitment* or *perspective* and not in a theological sense to signify one sort of substance turning into another form of substance.

the present. The rest of this section considers how this can be done in the context of the present study. I will clarify the particular approaches and concepts involved in studying a transformation of onto-epistemological assumptions further in section 2.3 but first I will substantiate the meaning of a *transition* in onto-epistemology and engage critically with the conceptualisation of social change in transition theory in order to develop a framework for studying onto-epistemological transitions. The next sections examine the ontological and epistemological assumptions in transition theory while section 2.2.3 shows why a ‘quasi-evolutionary’ approach to studying changes in ways of being and thinking is problematic. Section 2.2.4 then goes on to describe how this thesis conceives of broader, collective changes in worldviews and ways of being as a transition.

### 2.2.1 Transitions theory and social change

The Oxford English Dictionary defines transition (n.)<sup>3</sup> as "a passing or passage from one condition, action, or (rarely) place, to another; change" and transition (v.)<sup>4</sup> as "to make or undergo a transition (from one state, system, etc. to or into another); to change over or switch". Etymologically the word derives from the latin ‘transire’ meaning *going across or over*. As a word, transition therefore aptly describes what a change in worldview might mean: a passage to a different condition of being or thinking, implying the crossing over of certain thresholds as well as qualitative changes in underlying structures. In relation to the notion of sustainability transitions being characterised by fundamental changes or adjustments in social and technological relationships, onto-epistemological transition would then be concerned with qualitative changes in the organising assumptions and beliefs that structure those relationships.

However, the notion of transition in grassroots innovations carries with it theoretical assumptions from the wider field of transition theory which explains social change partly in terms of Universal Darwinism (i.e. the application of Darwinian theory beyond biology) and which retains some of the epistemological fallacies identified by recent ecological thinking as outlined above. Dutch transition theory originates in the ‘quasi-evolutionary’ theories of the Twente school which "aimed to make evolutionary variation–selection–retention mechanisms more sociological via crossovers with interpretivism/constructivism" (Geels, 2010, p. 504) and this evolutionary view of innovation carries with it – at least in outlook – the ontological separation between variation and selection processes implied in evolutionary biology, which does not self-evidently apply to sociocultural processes (Lane *et al.*, 2009). A (neo)Darwinian approach to explaining

<sup>3</sup>"transition, n.". OED Online. June 2014. Oxford University Press. <http://www.oed.com/view/Entry/204815> [accessed 10.07.14].

<sup>4</sup>"transition, v.". OED Online. June 2014. Oxford University Press. <http://www.oed.com/view/Entry/242997> [accessed 10.07.14].

social and cultural development seems insufficient theoretically<sup>5</sup> and therefore my conception of the term transition differs from transition theory in significant ways (see also section 2.2.4). To see how the onto-epistemological assumptions of transition theory affect its understanding of, and approach to, researching sustainability it is necessary to briefly outline the key premises of this theoretical framework.

In the Dutch variant of transition theory, a transition is a system-wide transformation of the rules – encompassing formal regulations, normative assumptions and cognitive heuristics (Scott, 1995) – which guide or structure ‘organisational fields’, denoting a community of interacting groups (Geels and Schot, 2007). Building on Nelson and Winter’s (1982) concept of the ‘technological regime’ as a domain where the cognitive routines of different actors are co-ordinated, Rip and Kemp (1998) widened this idea to include not just routines but the wider cognitive ‘rule-set’ or ‘grammar’ which is “embedded in a complex of engineering practices, production process technologies, product characteristics, skills and procedures, ways of handling relevant artefacts and persons, ways of defining problems; all of them embedded in institutions and infrastructures” (p. 338). Following Giddens (1984), transition theory views rules as existing primarily in practice: actors are at the same time rule-followers and rule-makers (Geels, 2011). Seeing rule structures as gradually rigidifying when moving from individual to community to wider organisational field, rules become constraining institutional habits and routines which are effectively reproduced in practice by narrowing the ‘search space’ for new ideas, practices and visions (ibid.). This is why transition theory sees innovation within socio-technical regimes as incremental and looks to niches, conceived as ‘protected spaces’ where rule structures are less rigid, for ‘path-breaking’ innovations (Smith and Raven, 2012).

The idea of *rules* being the element where transition ‘occurs’ potentially sits well with the notion of ontological and epistemological transformation: it incorporates foundational assumptions, beliefs and narratives as well as their internal relation or structure. But the explanatory model for the development of, and relationship between, different levels of rule structuration is a ‘quasi-evolutionary’ model, which explains socio-technical transitions in terms of variation-selection processes (Geels, 2005). The co-ordination of rule structures in socio-technical regimes (and in niches although rules are less stable and hence less constraining here) functions as retention or hereditary mechanism, which ‘replicate’ rules (Geels, 2010). As Hodgson (2002) explains:

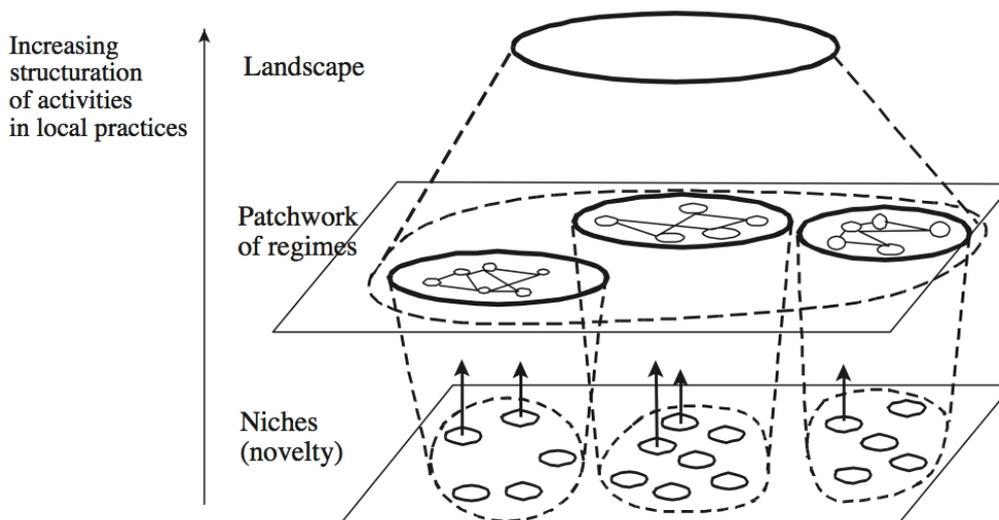
"Darwinian evolution is not tied to the specifics of genes or DNA: essentially it requires some mechanism of inheritance. On planet Earth, we find that DNA has the

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<sup>5</sup>Here, I follow Tim Ingold who explains that biological form is an emergent property of the whole evolutionary system rather than an expression of an inherent design specified in the genome. In this way, organisms are not products of a timeless variation-selection mechanism but producers (and products) of their evolution. Ingold observes: "In order to explain how change can occur in the absence of significant genetic modification, orthodox evolutionary theory has had to conceive of a ‘second track’, of culture history, superimposed upon the baseline of an evolved genotypic heritage. Once it is realised, however, that capacities are constituted within developmental systems, rather than carried with the genes as a biological endowment, we can begin to see how the dichotomies between biology and culture, and between evolution and history, can be dispensed with" (2000, p. 385).

capacity to replicate. But other 'replicators' may exist, on Earth and elsewhere. One possible and relevant example is the propensity of human beings to communicate, conform and imitate, making the replication or inheritance of customs, routines, habits and ideas a key feature of human socio-economic systems" (p. 270).

Socio-technical regimes are conceptualised as that level of structuration where certain rule-sets have become stable and dominant across the different communities involved (such as policy-makers, market actors, scientists, civil society), but importantly regimes are 'dynamically stable' experiencing constant pressure from lower and higher levels of structuration (Geels, 2005). The different levels of structuration were originally envisioned as sitting within a 'nested hierarchy' of niches, regimes and landscapes (see Figure 2.1), but later conceptualisations have rather referred to 'levels of structuration' which denote degrees of stability of practices rather than hierarchically understood entities (Geels, 2011). The various pressures coming from socio-technical niches and landscape, in combination with internal reform, together constitute the selection environment which determine the reproduction of rules within the regime (Geels and Schot, 2007).



**Figure 2.1: Niche-regimes-landscape as nested hierarchy. Source: Geels, 2005, p. 684.**

These selection pressures work at different levels of structuration (niche and regime) where 'adaptive agents' engage with different problematics in search of solutions (Geels, 2010). As mentioned above, because established rules are less of a constraint on the 'search space' in niches, this is also the level where radical innovations tend to occur. In relation to the regime, the niche provides evolutionary variation: they are 'protected spaces' or 'incubation rooms' for learning processes occurring in a multi-dimensional space comprising "technology, user preferences, regulation, symbolic meaning, infrastructure, and production systems" (Geels, 2005, p. 684). Thus, niches provide a space to build the relationships and networks that support new innovations. In general, variation is understood as "guided by expectations, visions and beliefs that provide cognitive

substance to search and innovation processes by intentional actors" (Geels, 2010, p. 504) and applies to both rule-following and rule-enactment (Dopfer *et al.*, 2004). Thus, as 'carrier' of rule-sets (routines, strategies, technologies, practices) a given 'level of socio-technical structuration' responds to selection pressures (collective interactions across different socio-technical domains) by incorporating new rules from among the variation produced at another level of structuration thereby producing *change* (see e.g. Dosi, 1997, for a review of the evolutionary view of economic change and Dopfer *et al.*, 2004, for an overview of replication and actualisation of rule structures in evolutionary economics). While transition theorists make reservations about the ontological foundation of niche, regime, and landscape concepts, seeing them primarily as "analytical and heuristic concepts to understand the complex dynamics of sociotechnical change" (Geels, 2002, p. 1259), I argue with Gibson-Graham (2008) that theorising is in itself ontologically performative and that seeing the niche-regime-landscape framework as the theoretical 'plot' for transitions (cf. Geels, 2011), involves ontological commitment, if not in principle then in praxis, to a view of social change as (neo)Darwinian. And the analytical concepts of the 'population thinking' implied by (quasi-)evolutionary approaches to socio-technical innovation (Hodgson, 2002), do not seem to explain innovation and social change processes effectively. The next section goes on to explain this in more detail.

### 2.2.2 Transition as cultural evolution

In *Complexity Perspectives in Innovation and Social Change*, Lane *et al.* (2009) examine different applications of the variation-selection framework of innovation and find that the explanatory power of Darwinian population thinking is limited regarding sociocultural innovation. The fundamental reason for this is that the ontological and spatio-temporal distinctions between variation and selection processes which obtain in biological evolution (variation occurring at the genetic level and selection occurring at the level of the organism) do not apply straightforwardly to sociocultural developments. The authors find that variation and selection processes are 'inextricably intermingled' in sociocultural innovations due to single actors' involvement in different organisational levels, a lack of correspondence between organisational level and temporal process, and the absence of co-ordination of selection criteria. This means that in practice "several of the most important [innovation processes] do not seem to be decomposable into variation and selection components" while "other kinds of processes, in particular organizational transformation achieved through structured negotiations, seem even more fundamental in achieving the kind of sociocultural innovation in which we are interested" (*ibid.*, p. 32). Rather than seeing innovation processes as involving the evolution of rule structures through distinct processes of variation and selection, Lane *et al.* see them as 'negotiations structured by rules structured by negotiations'<sup>6</sup>. Without needing to formulate a complete theory of

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<sup>6</sup>This is expressed in what the authors call the reciprocity principle: "the generation of new artifact types is mediated by the transformation of relationships among agents; and new artifact types mediate the transformation of relationships among agents" (p. 28). This locates an explanation of innovation processes in

innovation here, I agree with Lane *et al.* that it is not obvious how variation and selection apply to ideas or relationships (including ontological and epistemological assumptions) at larger organisational levels – not least because "it is still not clear that the inventions and strategems which are rewarded in the individual necessarily have survival value for the society; nor, vice versa, do the policies that representatives of society might prefer necessarily have survival value for individuals" (Bateson, 2002, p. 163). I return to this issue in the following section.

For now, I will simply point to the logical conclusion of Universal Darwinism when it comes to transitions in onto-epistemological assumptions. This is expressed by Beddoe *et al.* (2009) in their article 'Overcoming systemic roadblocks to sustainability: The evolutionary redesign of worldviews, institutions, and technologies'. The authors conclude that:

"Changes in our current interconnected worldviews, institutions, and technologies (our socio-ecological regime) are needed to achieve a lifestyle better adapted to current and future environmental realities. This transition, like all cultural transitions, will be evolutionary. *Cultural selection will, with feedback from other institutions and environmental factors, exert pressure favoring institutional variants that are better adapted to current circumstances, while at the same time exerting pressure away from those variants that are less adaptive.* Assuming that our society can overcome path dependence and can avoid becoming locked-in to maladaptive institutions, the process of cultural evolution will push our society toward the adoption of institutions that best suit the new circumstances" (ibid., p. 2488, my emphasis).

The authors assert that, at least to a certain extent, humanity "can design the future that we want by creating new cultural variants for evolution to act upon and by modifying the goals that drive cultural selection" (ibid., p. 2488). In this view, a transition in worldview is a process of design: by consciously constructing 'cultural variants' that increase adaptive capacities to crises, evolution will then select those that best fit new social-ecological circumstances. This seems, at best, an optimistic view of cultural evolution. A more nuanced view of cultural variation occurring through a process of 'normative contestation' in innovative niches is found in Elzen *et al.* (2011), who see sustainability transitions as a process of exerting normative pressure on regimes (through resource mobilization, framing processes, and political opportunity structures). Sustainability then enters the evolutionary framework as a normative goal which could influence the future orientation of a socio-technical regime. However, it is not clear that a theory which conceptualises sustainability transitions narrowly as a process of normative contestation (in this case environmental advocacy and campaigning) can capture transformations in ontology and epistemology which include changes in beliefs about what the world is like and how it is known – processes which pertain to the psyche and cognition (see section 2.3.1). And if

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'agent-artifact' space rather than in the adoption of new rules, a move which forms part of the authors' move towards 'organisation thinking'.

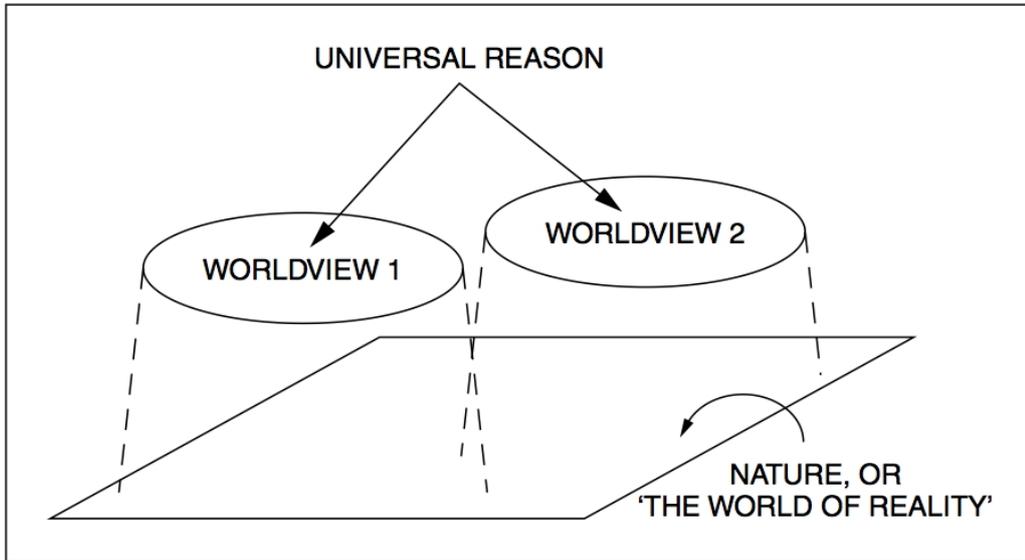
dominant socio-technical regimes are inherently unsustainable it is by no means obvious that selection mechanisms would (or could) favour *sustainable* cultural variants. As Elzen *et al.* (2011) remark: "[n]ormative pressure, even when it is increasing, cannot bring about substantial regime change on its own" (p. 265). Further, in a future characterised by crises and potential strife over vital life support systems evolutionary mechanisms may revert to favour brute force. The idea of cultural evolution as an explanatory model for transformations in worldviews seems much less tenable once we imagine the absence of a monopoly of violence implied by current socio-technical systems.

This section has provided an overview of the assumptions and implications of viewing transitions as occurring through variation and selection mechanisms in order to show how ontological and epistemological change would enter such a framework. It shows that, even as a mere heuristic, transition as a quasi-evolutionary social theory does not seem to provide a fitting 'plot' for changes in worldviews. While transition theorists simply aim to provide causal narratives by applying a process-based (explaining outcomes as event-chains), middle-range (a cross-over between evolutionary economics and constructivism) theory, they are at the same time performing specific ontological and epistemological assumptions through their representations (cf. Gibson-Graham, 2008). The basic assumptions inherent in this approach to transition create a framework which theorises by separating the world into specific domains: 'cultural sequences' are analysed as distinct from other socio-economic and institutional processes and 'environmental sequences' enter the framework mainly as a source of selective pressure forcing change in socio-technical systems (see Geels, 2011, for a complete formulation of this view). Taking "the realisation of 'societal functions' through the configuration and alignment of heterogeneous socio-technical elements and processes" (Smith *et al.*, 2010, p. 439) as their analytical starting point, transition theorists proceed to treat socio-technical systems as complex adaptive systems but these are still conceptualised as fundamentally separate (although co-evolving) with their environment (see e.g. Fischer-Kowalski and Rotmans, 2009). The ongoing pursuit in transition theory for 'an epistemological middle way' between "the search for laws and statistical correlations between variables" and "an emphasis on complexity, contingency, fluidity, untidiness and ambiguity" (Geels, 2011, p. 36), suggests a 'restricted' view of complexity (Morin, 2007) which remains within the paradigm of classical science. Theorising by way of decontextualising and (over-)simplifying complex phenomena confirms this view. Assuming that actors are collectively able to predict, anticipate and control future events or re-orderings of socio-technical 'configurations' by abstracting and modelling pathways according to which the social world is supposed to unfold (see e.g. Geels and Schot, 2007, and Rotmans and Loorbach, 2009), transition theorists effectively perform a knowledge mode which isolates objects from each other and their environment.

The next section proposes that it is helpful instead to view social change as occurring within one ontological plane – namely that of life itself – and puts forward an approach to studying onto-epistemological transitions that recognises the inseparability of the researcher or observer from the wider phenomena she is studying.

### 2.2.3 The double disengagement from social phenomena

These observations about the pitfalls of viewing a transition in ontology and epistemology as a process of cultural evolution occurring through a hypothesised mechanism of variation-selection, point to the need for coherence between epistemological assumptions and theoretical concepts: researching is in itself an enactment of ontological or epistemological assumptions as (academic) subjects (Gibson-Graham, 2008). Without this recognition any theory about changes in ontology and epistemology is likely to re-enact the ‘double disengagement’ of the observer from the world implied by the classical scientific knowledge mode (Ingold, 2000), effectively objectifying the ontologies and epistemologies studied. Here, the theorist firstly creates a division between humanity and nature and secondly divides humanity into cultures – see Figure 2.2. This perspective sees cultures as alternate worldviews imposed on the deeper objective reality of nature and proceeds to enact this division in academic discourse and studies. However, such a view is inconsistent with the epistemological and ontological implications of cybernetics (Bateson, 2002), general complexity (Morin, 2007), quantum physics (Bohm and Hiley, 1993) and theories of living systems (Capra, 1996). This section will set out the foundations for an epistemologically coherent approach to studying transitions in worldviews and ways of thinking.



**Figure 2.2: Worldviews from the vantage point of the ‘doubly disengaged’ observer.** Source: Ingold, 2000, p. 15.

Avoiding the double disengagement means engaging a mode of theorising which is consistent with the view of humanity-in-nature and knower-and-known as inseparable, and which allows us to think about evolution as a process which unfolds, not on separate planes, but continuously within *nature-as-matrix*. Nature-as-matrix can here be understood as the "relational matrices wherein organic forms are generated and held in place" (Ingold, 2011, p. 11) and where "living beings of all kinds [...] constitute each other's

conditions of existence, both for their own and for subsequent generations" (ibid., p. 8). This situates theorists, objects, natural laws, social phenomena, and all living beings on the same ontological plane: that of life itself. To understand what this means, it is useful to think of the unfolding of life as a 'holomovement' which – as an unbroken wholeness – carries within it all particular forms so that "the whole universe is in some way enfolded in everything and [...] each thing is enfolded in the whole" (Bohm and Hiley, 1993, p. 382). This *implicate order* is the ground of perception and thought and is contained 'hologrammatically' in any physical or mental appearance at any given moment (ibid.). This ontological understanding of quantum physics is the lifework of David Bohm whose work shows the possibility of integrating (ontological) dualities (e.g. thought-substance, life-matter, humanity-nature), not by combination but by showing, in the words of Tim Ingold (2011), that "any particular phenomenon on which we may choose to focus our attention enfolds within its constitution the totality of relations of which, in their unfolding, it is the momentary outcome" (p. 236). The implications of this understanding are wide-ranging and constitute a complete overturning of the view of reality which underpins the double disengagement of the observer from the world<sup>7</sup>. Rather than viewing theory as sets of concepts which correspond to or describe objectively existing realities, this 'holographic view' shows that theoretical concepts reflect realities which are inherently dependent on context and on the totality of wider relations. This is not a reduction of the inter-subjective field to solipsism but a corollary to the insight in cognitive science that "[i]nstead of representing an independent world, [minds] enact a world as a domain of distinctions that is inseparable from the structure embodied by the cognitive system" (Varela *et al.*, 1991, p. 140). Importantly,

"the view that our theories constitute appearances does not deny the independent reality of the universe as a whole. Rather it implies that even the appearances are part of this overall reality and make a contribution to it. What we emphasise is, however, that the content of the theory is not by itself reality, nor can it be in perfect correspondence with the whole of this reality, which is infinite and unknown, but which contains even the processes that make theoretical knowledge possible" (Bohm and Hiley, 1993, p. 326).

To the 'doubly disengaged' theorist this view is not immediately obvious, and potentially quite problematic, because symbolic thought and ordinary language tend to treat reality as if it consisted of 'objective facts' represented in 'subjective constructions' of the world. To understand the implications of the universe as an implicate order a 'holographic' epistemology is needed.

Such accounts of knowledge and thought have emerged from those fields of science which have developed descriptions of development in self-organising networks, notably

<sup>7</sup>It is not possible to do justice to the notion of the universe as an implicate order here – I am merely pointing to the consequences of this insight for understanding the human and natural domains as part of the same movement. See Bohm (1986; 1993; 2004a; 2004b) for the wider implications of this ontology.

cybernetics, complexity theory and dynamical systems theory. Gregory Bateson, a systems thinker and founding father of cybernetics, developed an 'ecology of mind' which advanced the understanding of knowing as a process taking place within the totality of 'organism plus environment' (better yet: organism-in-environment). In his famous example of the blind man who finds his way with the help of a stick, Bateson asks us to consider where this man's self begins: at the end or at the handle of the stick, or at some other place encircling his organism or brain? (2000, p. 318) Instead of thinking of the self as a unit existing within the separate or enclosed sphere of a head or body, in this case it is clearly more accurate to see it as extending outwards into the world via sensory pathways which include his organism and the stick:

"The total self-corrective unit which processes information, or, as I say, "thinks" and "acts" and "decides," is a *system* whose boundaries do not at all coincide with the boundaries either of the body or of what is popularly called the "self" or "consciousness"; and it is important to notice that there are *multiple* differences between the thinking system and the "self" as popularly conceived" (ibid., p. 319).

While Bateson did not complement his epistemology with a 'holographic' ontology<sup>8</sup>, he paved the way for understanding mind and world not as separate entities of knower and independent reality but as "stand[ing] in relation to each other through mutual specification or dependent coorigination" (Varela *et al.*, 1991, p. 150).

The implications of this insight for studying and understanding sustainability transitions are profound. In this light, it does not make sense to look at sustainability as a 'goal to reach' or an 'inherent characteristic' within a specified entity or system independent of context: sustainability is a quality pertaining to the relationships between human and non-human actors (people, animals, ecologies, social-ecological systems, climatic systems, etc.). From the epistemological perspective of living systems the idea of essential or innate attributes is incoherent:

"I will get nowhere by explaining prideful behaviour, for example, by referring to an individual's "pride". Nor can you explain aggression by referring to instinctive (or even learned) "aggressiveness". Such an explanation, which shifts attention from the interpersonal field to a factitious inner tendency, principle, instinct, or whatnot, is, I suggest, very great nonsense which only hides the real questions" (Bateson, 2002, p. 125).

By substituting 'prideful' with 'sustainable' in this quotation, it is possible to sense the epistemological difference between theorising as 'double disengagement' and the view of 'organism-in-environment' or 'humanity-in-nature'.

<sup>8</sup>Bateson never explicitly developed an ontology. He based his epistemology on a fundamental division between the living (what he calls 'creatura') and the non-living ('pleroma') worlds (2002) and effectively embraced the idea of cognition as the representation of an independent world in the mind. Capra (1996) provides an account of this in his Appendix comparing Bateson to the Santiago theory of cognition.

It is now possible to put forward a clearer formulation of what an onto-epistemological transition means and how it is possible to study such phenomena. The following section summarises the preceding observations on ontology and epistemology and shows how and why the sustainability challenge can be conceived as a question of deepening the relations within nature-as-matrix.

#### 2.2.4 Transition as a transformation within social life

Seeing sustainability as a challenge to the way human-nature relationships are conceived and enacted brings the issue of normativity into play not as a matter simply of different notional perspectives on nature but also as one of actual relationship. Circumventing the double disengagement of the theorist from reality situates both scholarship on transition and phenomena in transition within the same realm, that of social life. Here, *social life* refers to Bohm's notion of an implicate order in which mind and world cannot be adequately understood as separate domains but rather, and again with a formulation by Ingold, as "the unfolding of a continuous and ever-evolving field of relations within which beings of all kinds are generated and held in place" (2011, p. 237). Because social life is a *field of relations* which is enfolded within any particular phenomena (and vice versa), any proper understanding of it cannot ignore relational coherence and wider context. While this understanding of transition diverges from Dutch transition theory by seeing (non)human actors and social phenomena as inextricably intertwined and enmeshed – rather than as separate but linked through causal narratives – it agrees that a good starting point for understanding change is the rules that govern relations within any particular field of relations. Seeing humans and their environments (be they forests, farmlands or factories) as interpenetrating concepts, what compels change in such relations is the introduction of new rules of environment-making (cf. Moore, 2013) – from the broader logics that govern power and production to the specific regulations, assumptions and heuristics that structure particular organisational fields. Importantly, this perspective acknowledges and emphasises the interdependence of species and environment, what Morin (2007) calls 'self-eco-organization': "a self-generating and self-producing process, that is to say, the idea of a recursive loop which obliges us to break our classical ideas of product → producer, and of cause → effect" (p. 14). In this way, "species and environments are at once making and unmaking each other, always and at every turn" (Moore, 2013, na.)<sup>9</sup>. The implications of these observations for how transitions in worldviews and ways of being can be studied will be explored in the following section. For now, it is possible to explicate how (sustainability) transitions in ontology and epistemology can be theorised without having to conceptualise culture as evolutionary in the sense of a selection process taking place among cultural variants.

A transition in ontology is not so much a change between different cultural 'lenses'

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<sup>9</sup>For Moore humanity and extra-human natures are dialectically joined through his concept of the *oikeios* through which "bundles of relations between human and extra-human agents" are "formed, stabilized, and periodically disrupted" (2013, na.).

through which the objective world is represented or constructed as it is a transformation in the very constitution of the phenomenal world. Here it might be useful to return to the Canadian lumberjack who sees ‘money’ when he sees a tree (Jensen, 2004). If he learns to experience the tree not purely as a resource but as a living being with its own unique history and existence, then the nature of that tree is qualitatively altered for him. This change in his belief about the nature of the tree has profound consequences for his experience and engagement with the tree: this signifies a change in the ontological status he assigns to the tree and, consequently, a transformation in his relation with it. The tree is no longer just a source of income but an entity with its own form of agency. Thus, the lumberjack’s immediate and experienced sense of reality is changed, the world itself is different – not through substituting one assumption with another but by *learning to alter his experience of the world*. We can say that a transition has taken place not so much in the lumberjack’s worldview but in his lifeworld: "the world as we organically experience it in its enigmatic multiplicity and open-endedness, prior to conceptually freezing it into a static space of ‘facts’" (Abram, 1997, p. 40). Clearly, this change is complex and gradual but it signifies an experiential difference and not simply an ethical or attitudinal one. The lifeworld, as a ‘continuous creation’, ‘an intertwining of past, present, and future’ (Dorfman, 2009, p. 298) is rooted in an intuitive understanding of the world beyond conceptual thinking. It is "the living source behind rigid structures" (ibid., p. 300) which is always in motion but ‘sediments’ in the concepts we employ to describe it<sup>10</sup>.

In indigenous (cf. Williams *et al.*, 2012) and eco-philosophical (cf. Abram, 1988) understandings of the lifeworld it is an "organic, all-encompassing, gestalt, *thing* in which knowledge arises" (Mehl-Madrona and Mainguy, 2012, 207). It is in this sense I use the term here. It is similar, as Tim Ingold (2000) points out, to what anthropologists call ‘cosmology’ but to view people’s everyday experience of the world in such terms is to "already [take] a step out of the world of nature within which the lives of all other creatures are confined" (p. 14) through the implicit ontology that specific cultural understandings of the world take place against a wider background of an objective reality (cf. section 2.2.3 above). The personal lifeworld is embedded in the inter-subjective field of social life, it is an *inside view* of the wider field of relations which is simultaneously enacted or brought into being by virtue of an individual’s perceptual-biological structure. However, mind is not confined to individuals and is immanent in the entire system of organism-in-environment. Thus, worldviews are not ‘inside our heads’ and the use of the word ‘worldview’ in the context of this study refers not to a *view* of something (the representation of some object or relation) but to how a particular *world* is enacted. Section 3.1.1 in Chapter 3 expands on how I employ the notion of the lifeworld in the empirical study.

Concurrently, a transition in epistemology refers to a change in the understanding of

<sup>10</sup>Dorfman (2009) draws on Merleau-Ponty’s concept of *radical reflection* to situate the concept of the lifeworld as a historical co-production of ideality and sees the task of phenomenology as "contribut[ing] to the reactivation and (re)foundation of sense" (p. 300).

what counts as knowledge, including what it means to know something and what constitutes a knower. Inquiring into transformations in ways of knowing entails first of all that problems of knowledge should be seen in connection with the wider questions pertaining to human life. Here, I agree with Midgley (2004) when she points out: "[t]hinking out how to live is a more basic and urgent use of the human intellect than the discovery of any fact whatsoever, and the considerations it reveals ought to guide us in the search for knowledge, as they ought in every other project we pursue" (p. 161). Secondly, the inquiry needs to acknowledge the specificity and contextual nature of knowledge within the ongoing stream of social life: a practical understanding of the lifeworld with its "multiple ways of knowing environments, of living in places and of imagining the future" (Hulme, 2010b, p. 560) cannot be adequately understood through context independent modes of knowing (Morin, 2007) – at least not without exercising 'epistemological violence' to the people and places that are (re)presented in terms of abstracted concepts (Radcliffe *et al.*, 2010). Following Bohm, Ingold (2011) describes this dilemma in terms of the contrast between the implicate order of social life (which is by nature relational, context-dependent and processual) and the explicate order of symbolic thought (which operates in terms of separate categories, events and identities). Any theorising that does not want to reduce lived phenomena to fragmented parts, needs to be a theorising *with*, not a theorising *of*, social life (*ibid.*).

In this way, we can now say that a transition in ontology and epistemology is a qualitative transformation in how the world is experienced and known within interpretive communities. As part of sustainability transitions, such transformations involve abandoning the rules and visions of environment-making implied by the user-resource perspective and enacting human-nature relations which acknowledge 'social' and 'natural' phenomena as inextricably intertwined. This entails a shift from seeing the world as consisting of separate entities which are ordered along a hierarchy of being to understanding the relationships that generate those entities in the first place. As Fritjof Capra (1996) observes:

"The origin of our dilemma lies in our tendency to create the abstractions of separate objects, including a separate self, and then to believe that they belong to an objective, independently existing reality. To overcome our Cartesian anxiety, we need to think systematically, shifting our conceptual focus from objects to relationships. Only then can we realize that identity, individuality, and autonomy do not imply separateness and independence" (p. 295).

This shift is explicitly 'onto-epistemological' (*cf.* Williams *et al.*, 2012) as it implies a transformation from within social life, one that recognises and sustains the interconnected 'self-eco-organisation' of human societies.

It is now possible to explicate what the onto-epistemological dimension of the sustainability challenge entails. As a shift away from those ontological and epistemological assumptions which produce a relation between humans and more-than-human entities that can be described as *users of resources*, an 'onto-epistemological transition' denotes the emergence and stabilisation of alternative beliefs or assumptions about reality that gives

rise to experiencing the world as fundamentally interconnected and which sees human and more-than-human agencies as inextricably entwined. This is more than a shift in attitude or moral stance towards the natural world: it is a transformation in the experience of reality. There are clearly various alternative onto-epistemological commitments which recognise the interconnectedness of human and more-than-human worlds. In addition to the literatures I draw on above pre-modern or indigenous perspectives should not go unmentioned (cf. McIntosh, 2012a). The point here is not to advance a claim for any one onto-epistemology but to acknowledge the need to move beyond positivist and reductionist beliefs "predicated on logic or reason usually applied in ways that reduces the basis of reality down to materialistic formulations" (ibid., p. 32). Neither is it helpful to think of onto-epistemological transitions as a process with a fixed end point where one set of beliefs have simply replaced another. In light of the hegemony of the user-resource perspective (cf. Smith, 2011) this is first and foremost a 'decolonisation of consciousness' (cf. Williams *et al.*, 2012, p. 4) which *deepens* experience and cannot be said to 'end'.

This section has substantiated the meaning of onto-epistemological transition and formulated a mode of theorising which is capable of examining onto-epistemological change without exerting 'epistemological violence' in order to be able to conceptualise changes in worldviews in grassroots innovations. The next section now goes on to examine how onto-epistemological transitions can be studied as a process of envisioning and enacting alternative forms of environment-making.

### 2.3 The rules and visions that guide environment-making

If the sustainability challenge involves a change in view from objects to relationships, this requires concepts which aid the perceptual change from the user-resource relationship to humanity-in-nature<sup>11</sup>. This is what the notion of environment-making aims to do by moving away from viewing societies and nature as separate towards understanding these abstractions within the larger (holo)movement or field of relations which constitutes social life (cf. Moore, 2013). Drawing on the insight from transitions theory that it is a change in *rule structures* – beliefs, routines, and regulations performed in practices – which constitute societal transitions, this study proceeds to examine 'the rules and visions of environment-making' in grassroots innovations, in particular the onto-epistemological assumptions that structure alternative worldviews and sustainabilities. However, these rules and visions are not replicated via a mechanism of selection and variation, they are more akin to dynamic patterns of meaning enacted in different practices and activities (cf. section 2.3.3). As described above, a transformation in onto-epistemology occurs as these patterns change – the experience and perception of the world alter.

<sup>11</sup>However, to even begin something as circumstantial as *changing view* (and thereby the meanings pertaining to particular ideas, narratives and terminologies) something more than a new vocabulary is needed: a recognition that creating a new way of speaking about things is not simply a matter of mapping out an alternative phraseology and an acceptance of the limits of whatever the current position is. There are inevitably aspects of the *other* way of seeing which are obscure (one could say there is a paradox inherent to attempting to reach *beyond* what is *here*).

This provides a starting point for examining how transitions in onto-epistemology come about and how we can know about them. First of all, certain onto-epistemologies can be considered *alternative* insofar as they diverge from the dominant conceptions and practices of sustainability as a user-resource relation. Second, as a transformation in how phenomena are experienced and known, a change in onto-epistemology involves a shift in the *concepts, language and practices* that make sense of the world. And third, a *transition* in onto-epistemology implies that certain meanings (and enactments) of alternative sustainabilities stabilise within a broader social context where new concepts and practices take root and proliferate. Chapter 3 proceeds to discuss how this thesis examines such changes in meaning drawing on ethnographic, phenomenological and narrative methods while the following sections expand on the above understanding and set out the theoretical ground on which onto-epistemological transitions can be conceptualised. Section 2.3.1 introduces the idea of enacting alternative (sustainable) realities by engaging with symbols of transformation and connecting with wider social contexts, while the following section bridges this idea with sustainability transitions by expanding the conceptual vocabulary of transition theory. Sections 2.3.3 and 2.3.4 proceed to examine the role of metaphors and language in structuring social reality and deepening meanings and relationships within nature-as-matrix. Finally, section 2.3.5 describes how social realities are co-created narratively and section 2.3.6 brings these insights home to grassroots innovations and the attending empirical study of onto-epistemological transition.

### 2.3.1 Constellating an alternate reality

Growing from a diversity of disciplines concerned with the 'study of relationships between man and environment', Radical Human Ecology is an approach to "the study and practice of community" which explicitly "views people as co-participants with the rest of the earth community" and takes as its starting point "our experience of reality and the corresponding experience of the relationship between ourselves and our larger Life World" (Williams *et al.*, 2012, p. 4). *Radical Human Ecology – Intercultural and indigenous approaches* sets out a range of research theories, epistemologies and practices that engage with the 'onto-epistemological challenge' of global scale ecological crisis (*ibid.*). Employing a range of approaches spanning (auto)ethnography, action research, phenomenology, participatory and collaborative methods, grounded theory and native science, this volume engages with different aspects of the 'metaphysical underpinnings of material reality' in order to understand the processes involved in onto-epistemological change. Describing the work of the Koru International Network (KIN) which aims to strengthen "human cultural diversity in support of bio-diversity through the revitalization of indigenous worldviews or literacies within all peoples" (p. 398), Lewis Williams (2012) writes that a major task is coming into awareness of our own histories and positions within both local and global society:

"the focus becomes not so much what we know but how we know what we know. This includes not only being aware of our own psycho-spiritual histories, the stories of where we come from, but understanding the meaning of privilege, (and I would argue psycho-spiritual trauma) from our various subject positions, including the cultural-power locations from which we speak and the ways in which we accordingly position others" (ibid., p. 415).

This is the kind of 'inside' view which ensures that onto-epistemological transformation does not get reduced to a set of abstract 'mechanisms' or 'pathways' but becomes anchored in worldviews and cultural identities as they are experienced and enacted within the stream of social life.

Such an approach to a recent and ongoing transition is found in the work of Alastair McIntosh who describes the transformation in social and political realities that initiated and accompanied national land reforms in Scotland. In *Soil and Soul* (2001), McIntosh explains how the grassroots work and campaigning that led to the community buyout of the Isle of Eigg in 1997 was successful in part due to the deliberate expansion of 'consensual reality' as the ordinary frame of reference for the events that took place. Seeing consensual reality as a conditioned view which focuses awareness and attention to a few narrow aspects of reality (which in the context of the neoliberal economy are primarily consumerist), the key to onto-epistemological change is subversion and enlargement of the usual frames of reference by the introduction of new relations and meanings. Drawing on research into human consciousness, sociology, liberation theology and ecology, McIntosh provides a compelling account of the interventions that the Isle of Eigg activists undertook to transform 'the fabric of social reality' by way of "alter[ing] the co-ordinates by which reality was mapped and reset them" (ibid., p. 166). Such transformation entails a repositioning of the involved human actors within their wider social relations:

"The principles at play involved changing what sociologists Peter Berger and Thomas Luckmann call 'the social construction of reality'. It's a matter of developing 'plausibility structures' that give an alternative to what has previously constituted social power. It's a question of understanding symbolic actions towards this not as hollow gestures, but, in Jungian terms, as 'symbols of transformation'. At the deepest level of the psyche this transformation has got to be cosmological. It has got to position the human person more meaningfully than before in relation to the universe" (ibid., p. 166).

Such repositioning required "drawing presumed authority structures into question and helping to build an exciting and sustainable alternative" (ibid., p. 140) allowing people to envision and enact a qualitatively different reality.

McIntosh describes the process as one of 'constellating an alternate reality'<sup>12</sup>. Interestingly, he does so in language which is remarkably similar to the transition concepts of

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<sup>12</sup>'Constellate' meaning "to group meaningfully together" by deepening consciousness and conscience (McIntosh, 2001, p. 124).

‘niche’, ‘regime’ and ‘landscape’ (ibid., p. 140): a first step is to assess the *set* in which an intervention takes place (the ‘arrayed forces’), a second step is to gauge the *setting* (the ‘ground upon which those forces are positioned’) and, lastly, to consider the *stars* or the global perspective (‘the constellations taking shape in the really big picture’). Key to a change in view are *visions* which connect with broader contexts in order to “lift the debate beyond negativity and to accept confrontation but not get stuck there” and “to make a connection in many people’s minds, so that even far away from Eigg headlines would be made and passion for change aroused” (ibid., p. 140). Opening up for broader levels of meaning to infuse the setting, an outward vision can connect the different levels in which an action is taking place:

"Figure out the constellations taking shape in the really big picture. Get the setting not just into local perspective, but also out into the global scheme of things. Let the small picture blur, reorganise and re-emerge in relation to the big picture. Let yourself hear the old myths and also the new ones coming forward. Discern, then navigate. Never be so vain as to expect to reach the stars, but do set your course by them" (ibid., p. 140-1).

By providing a language which puts relations at the centre and allows connecting ‘by metaphor’ to greater contexts of meaning, McIntosh provides a ‘plot from within’ which engages with phenomenal reality as experienced by the people involved rather than a doubly disengaged outside view. It takes little imagination to see how the set gets populated with characters cast in different *roles*, and who engage with different *props* and *storylines* to enact a wider narrative of transition. The next section bridges these observations with the transitions literature and shows how this vocabulary provides a basis for conceptualising the enactment of alternative worldviews.

### 2.3.2 New vocabularies and ‘plots’ for onto-epistemological transitions

A critical feature of McIntosh’s approach to understanding social transformation is that it embodies a radically different way of theorising than one which aspires to an objective view of socio-technical transitions and which sees change as occurring through a mechanism of variation and selection unfolding according to certain pathways. As Smith *et al.* (2010) observe, the ‘allure’ of transitions theory is that “[i]ts terminology of niche, regime and landscape provides a language for organising a diverse array of considerations into narrative accounts of transitions” (p. 442). However, it does so by risking to “become counter-productively simplistic in its abstraction” (ibid.). By assuming an epistemological position which takes a ‘restricted’ view of complexity and casts changes in worldviews as a (quasi-)evolutionary process of selection among cultural variants (cf. Section 2.2.2), the attraction of the niche-regime-landscape framework is nominal for students of onto-epistemological change as this is inevitably concerned with an experiential ‘inside’ view of how worlds are brought into being within lived realities. The (neo)Darwinian evolutionary perspective of transitions is ultimately limited to the vantage point of the disengaged observer because its abstract and decontextualised conceptual language affords

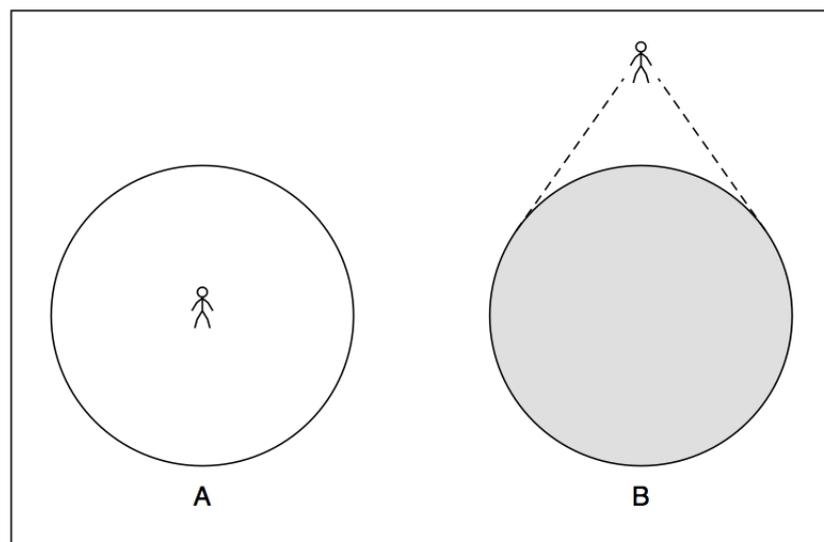
little explanatory effectiveness in understanding the qualitative nature of transformations in onto-epistemology. The danger is that lacking the depth and richness necessary for describing the inherent experience and meaning of onto-epistemological transformation the language of transition risks misrepresenting the fundamental processes. As Alastair McIntosh observes, all too easily "histories become reconfigured in the mind as image defines reality rather than the other way around" (2001, p. 175). By directly engaging with the metaphysical nature of constellating an alternate reality, McIntosh opens up a vocabulary which expands the metaphorical qualities of the multi-level perspective to include concepts that convey the performative nature of worldviews.

By shifting the imagery of niche-regime-landscape towards one of set-setting-stars a whole new set of metaphors become relevant which have the potential to circumvent the polarising dynamic of niche-regime through introducing a vocabulary which allows a more nuanced conceptualisation of change processes. It now becomes possible to talk of *players* and their *roles*, of *props*, *stage-setting*, and *storylines*. Such dramatisation of social change is likely to bear directly on the people involved. It introduces relationships as a central feature of the plot. And perhaps most importantly, it parachutes the researcher of onto-epistemological change directly into the heart of the drama: as narrator it is impossible to remain doubly disengaged as the observer now has to reflect on and clarify her own position among a variety of characters (writer, co-author, researcher, participant, etc.). This, I suggest, is a direct way of honouring Williams' (2012) call for awareness of how our own histories and subject positions shape "how we know what we know" (p. 415). It allows for incorporating multiple modes of knowing by acknowledging the performative nature of ontologies while it permits the researcher to engage in a field of relations as participant *and* acknowledge her own onto-epistemology as narrator. This approach helps enable the study of both the multiplicity of realities involved in a certain plot as well as the different ways these realities are drawn into a singular representation as certain viewpoints win out and become an authoritative narrative. It can provide an overarching plot for a transition while it remains ambiguous and flexible enough to abide the idiosyncratic nature of particular transitions by establishing a vocabulary which privileges contextual relationships over abstract conceptual placeholders.

This can be seen as a way of bridging the evolutionary ontology of transitions theory with narrative or relational ontologies by deliberately broadening core theoretical concepts and allowing insights from different approaches to sustainability research to cross-pollinate. However, this is not to say that one can simply choose from different aspects among various ontologies: if one is not clear about foundational assumptions, findings can easily become contradictory or inconsistent (Geels, 2010). Garud and Gehman (2012) argue that sustainability research is explicitly *not* a boundary object (cf. Star and Griesemer, 1989) but entails genuine semantic, syntactic and pragmatic differences between approaches. In their overview of three different meta-theoretical approaches to sustainability research and policy-making, Garud and Gehman (2012) show how ontologies vary across research paradigms. As a student of sustainability, the challenge is to use the distinctive advantages of each of these lines of thinking to clarify one's own position. As

should be clear from the discussion of onto-epistemological transformation, my approach is grounded in a narrative ontology which engage with how meaning is created through narratives ‘in action’ as well as the deeper cultural symbols and assumptions that shape identities and action. Radical Human Ecology thus provides a good starting point for studying onto-epistemologies (and their implication for sustainability). Seeing the immediate lived context as the cornerstone for a sense of belonging which is "grounded in the soil and has grown together with all the natural-spiritual elements emanating from it" where "we can be deeply connected with all our relations, past and present, human and non-human" (Kockel, 2012, p. 59-60), presents the possibility of theorising non-human nature(s) as more than just ‘coded and symbolised’ in particular subjective constructions of reality (cf. Swyngedouw, 2007). Holding ‘all our relations’ lived contexts express and embody the rules and visions that guide environment-making: we learn something about ourselves, our modes of knowledge and our relations with more-than-human nature by engaging with the way social contexts simultaneously inscribe and erase aspects of the wider field relations of which it is part (cf. Ingold, 2011).

Viewing the ‘environment’ not as object but as a place of belonging or a field of habitation makes it possible to conceive of human action not as an imposition *on* nature but as originating *within* and occurring *through* nature. Further, it places the researcher as participant and co-creator in her world, rather than as a detached observer or analyst. This is illustrated by Ingold’s (2000) contrasting of a Heideggerian ‘dwelling perspective’ of the environment as *lifeworld* with the dualistic view of the environment as *globe* – see Figure 2.3. The next section expands on the approach to sustainability research taken in this study through a discussion of how the guiding rules and visions of environment-making can be recognised through the imagery and metaphors that express particular qualities of human-nature relationships.



**Figure 2.3: The environment viewed as (A) lifeworld and (B) globe. Source: Ingold, 2000, p. 209.**

### 2.3.3 Mythopoesis and meaning

A key insight in McIntosh's account of the campaigning and activism that led to the community buyout of the Isle of Eigg, is that a transformation in the fabric of social reality needs to connect with the mythological nature of the lifeworld. He writes that "[w]e would do well [...] to distinguish between that which is 'imaginary' and therefore unreal, and that which is 'imaginal', and therefore beyond the normal bounds of consciousness – but not necessarily any less 'real' because of it" (McIntosh, 2001, p. 72). By engaging with the mythopoetic framework of reality<sup>13</sup> it is possible to access the deeper structures that shape the worldviews which substantiate our relationships. This acknowledges that any account of reality is necessarily storied and it pays attention to the imagery, metaphors and myths that express what lived reality is like. McIntosh observes: "where you come from, who you are and what your destiny proves to be are all linked within that story, which is nothing less than the story of the world's creation, of the human and animal forebears, and of the world's destiny" (ibid., p. 45). In this sense, how we story our experiences is a direct expression of how we attribute meaning to our participation in life and reciprocally affects the meaning we ascribe to new events within the lifeworld.

This corresponds with research in cognitive science that underpins the view of knowing as a process of *bringing forth a world* in accordance with one's own psychological and physiological constitution. As a central part of this structure, the imagination plays an important role in giving meaning to experience, as George Lakoff's work is showing:

"Meaningful conceptual structures arise from two sources: (1) from the structured nature of bodily and social experience and (2) from our innate capacity to imaginatively project from certain well-structured aspects of bodily and interactional experience to abstract conceptual structures. Rational thought is the application of very general cognitive processes – focusing, scanning, superimposition, figure-ground reversal, etc. – to such structures" (Lakoff quoted in Varela *et al.*, 1991, p. 178).

The 'projection of abstract concepts' is a key function of the imagination, which, according to Lakoff, occurs through 'frames' or 'schemas' which include the semantic roles and relations involved in a given context<sup>14</sup>. Frames are in this way 'habits' of the imagination which give structure to thought by way of reference to other frames: "All thinking and talking involves "framing." And since frames come in systems, a single word typically activates not only its defining frame, but also much of the system its defining frame is in" (Lakoff, 2010, pp. 71-2). Crucially, this process is not just 'mental' as these habits of the imagination become enacted and physical: "frames can become reified – made real – in institutions, industries, and cultural practices. Once reified, they don't disappear until the

<sup>13</sup>Combining 'myth' and 'poesis' (to make), 'mythopoesis' literally means 'the making of myth' indicating the storied nature of how we experience reality.

<sup>14</sup>Lakoff gives the following example of semantic roles and relations: "A hospital frame, for example, includes the roles: Doctor, Nurse, Patient, Visitor, Receptionist, Operating Room, Recovery Room, Scalpel, etc. Among the relations are specifications of what happens in a hospital, e.g., Doctors operate on Patients in Operating Rooms with Scalpels" (2010, p. 71).

institutions, industries, and cultural practices disappear" (Lakoff, 2010, p. 77).

The significance of this insight for understanding transitions in onto-epistemology is unambiguous: the images and symbols which express (sustainable) relationships are more than just 'mental representations' which form part of 'cultural sequences', they play a critical role in shaping how those relations are interpreted and enacted. Viewed within the mythopoetic framework of reality metaphors are central as they both reveal and shape the nature of lived experience. They do so through analogy (Hofstadter, 2007), or framing, as Lakoff puts it above, and thus deepen meaning by expanding the frames of reference. McGilchrist (2009) observes that this is a process in which metaphors endow meaning by broadening context:

"Any one thing can be understood only in terms of another thing, and ultimately that must come down to a something that is experienced, outside the system of signs (i.e. by the body). The very words which form the building blocks of explicit thought are themselves all originally metaphors, grounded in the human body and its experience. Metaphors *embody* thought and places it in a living *context*" (p. 118, original emphasis).

In this way, metaphors guide how and what we imagine the world to be like through connecting with auxiliary contexts through analogy and framing. They connect with the larger 'world-pictures' that constitute our worldview and which "are so general and so vast that they affect the whole shape of our thinking" (Midgley, 2004, p. 309). These nexus of metaphors affect what *kind* of world is brought forth in perception and thought. In turn, acculturated meanings direct how individual concepts and metaphors are understood, and meaning is therefore a primary concern in onto-epistemological transition.

Meaning can be seen as the dynamic that 'holds together' the various sensations, thoughts and impressions that arise within the lifeworld, as it gives *form* to perception (Bohm, 2004b) by means of (self)reference to previously cognised phenomena (Hofstadter, 2007). In this way, meaning shapes the lifeworld in a deep way: it organises what is deemed relevant and what is not by giving both a cognitive 'pattern' and 'restraint' to lived reality (Bateson, 2000). It is through the distinct meanings infused into the 'organic experience' of our lifeworlds that we come to understand our particular place within the world at large, our relations to other living beings and the specificities and applications of things. Meaning structures people's sense of purpose or veracity, and, as particular meanings become acculturated as 'true' or 'real', they play an important role in shaping new perceptions and behaviours (Kajtar, forthcoming)<sup>15</sup>. Conversely, meaning is revealed narratively in the values we hold, the stories we tell about ourselves and others; they are embedded in the language we use and, with a nod to Wittgenstein, in the wider 'form of

<sup>15</sup>Peter Kajtar (forthcoming) observes that meaning and thought are part of a dynamic where "meanings give form to thought, and thoughts shape meanings" (na.). In this mutually informing process thought and meaning are abstracted from the deeper holomovement which gives rise to them and because meaning and thought are necessarily limited they are relevant only within limited contexts.

life' in which we are immersed<sup>16</sup>. And because particular meanings are constituted by context, understanding onto-epistemological transitions calls for a mode of inquiry which focuses on relationships, admits the reality of divergent ontologies within social relations and sees mind or agency as inherent to all the elements which constitute social life.

An example of a study which examines the social world from such a perspective is found in Annemarie Mol's (2002) *The body multiple*, which shows how the meaning of atherosclerosis changes when it is viewed through the various practices in which it is treated by doctors, patients and medical staff. In this way focusing on practices rather than objects shows that any one object is in fact multiple: reality itself multiplies when viewed through the diversity of particular enactments of atherosclerosis. But "far from necessarily falling into fragments, multiple objects tend to hang together somehow. Attending to the multiplicity of reality opens up the possibility of studying this remarkable achievement" (ibid., p. 5). This move from universality to the 'manyfoldedness' of objects allows examining the myriad nature of reality as well as the processes that draw this multiplicity together into a singular thing – e.g. as a certain disease with a specific treatment – through various modes of coordination. Mol's deeper point is that ontologies are not given but brought into being, sustained or discontinued in day-to-day practices. Taking this insight as a starting point, it is possible to study environment-making as the enactment of particular ontologies revealed through linguistic and social practices. The following section continues to examine how the relations implied by particular onto-epistemologies can be discerned in relation to the language and imagery of wider cultural narratives.

### 2.3.4 Metaphoric resonance and cultural myth

In his in-depth study of the role of metaphors in shaping cultural values and social relations, *Metaphors for Environmental Sustainability*, Brendon Larson (2011) describes the matrix of framing metaphors as a *metaphoric web*. It can be thought of as a large cluster or assemblage of interconnected metaphors which mutually generate and embody specific worldviews by connecting different cultural realms. Larson denominates the conceptual and contextual connotations that metaphors draw on to impart meaning as *metaphoric resonance*. This is what prompts analogy or activates other cognitive frames. Through a detailed examination of the prevalence and use of metaphors in different scientific research areas<sup>17</sup>, Larson identifies how certain cultural assumptions have come to influence scientific practice through their metaphoric resonance. Describing the gradual adoption of certain metaphors as supposedly value-free renditions of the world, he shows how pre-existent metaphysical and cultural suppositions come to be accepted as 'facts' in scientific and social discourse. This process of 'naturalising' metaphors obscures their inherent values and makes it increasingly difficult to critique or even be conscious of them as they

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<sup>16</sup>Marie McGinn describes Wittgenstein's understanding of meaning (and language) as rooted in, and deriving significance from, *forms of life* understood as "historical groups of individuals who are bound together into a community by a shared set of complex, language-involving practices" (1997, p. 51).

<sup>17</sup>Larson studies four such 'feedback metaphors' in biology: progress, competition, barcoding and melt-down.

become part of, and begin to shape, the metaphoric webs that compose worldviews. In this sense, "what we envision as possibility, what should be, becomes what is" (ibid., p. 91) as metaphors are enacted in scientific or social practices.

However, this is not to say that metaphors 'determine' social realities, they "simply highlight [aspects] of relations between ourselves and others and between ourselves and the world" (ibid., 86). Thus, metaphors focus attention on certain aspects of the wider holomovement of life and privilege certain ways of understanding over others with real social and political consequences. In his study of how the metaphor of 'competition' has in large part come to be seen as inherent to social and natural order within Western cultures, Larson describes the emergence of this metaphor and its gradual adoption in common language and persuasion as a reinforcing process between a search for explanation and rationalisation:

"it was our perception of competition in the cultural world that contributed to a large extent to our search for it in the natural world. Having found it there, it became the way things are. Once the metaphor was naturalized in this way, people could more easily defend it in the cultural realm: not only is competition found in societies, but we should actively promote it because it is the way the world works – it is natural" (ibid., p. 75-6).

Through such feedback, metaphors can come to reinforce prevalent ways of thinking and seeing. But they also have the potential to alter received notions when they shift pre-existent frames or ways of thinking – different metaphors embody alternate ways of seeing problems (cf. Lakoff, 2010). Because metaphors have the ability to "act to renew our relation with the natural world" and thereby "bring us closer to the world rather than separating us from it" (Larson, 2011, p. 226) an increased awareness of the latent meanings and values of metaphors brings the prospect of envisioning and expressing qualitatively different relationships within the lifeworld.

The challenge for research on onto-epistemological transitions is to recognise the role of language in structuring social reality and to avoid "reducing the abundance of life around us into reductive and ultimately false systems that are given more importance than our holistic experience" (ibid., p. 228). Because metaphors place thought and language in living context the choice and proclivity of theoretical metaphors are not neutral or innocent; they carry metaphorical resonance which place them within larger metaphorical webs that embody particular worldviews. The biologist and mathematician Brian Goodwin has observed about metaphors that they consolidate certain attitudes or ways of seeing which are in turn substantiated by the larger cultural myths of which they are part:

"They give meaning to scientific theories, and they encourage particular attitudes to the processes described: in the case of Darwinism, to the nature of the evolutionary process as one predominantly driven by competition, survival and selfishness. This makes sense to us in terms of our experience of our own culture and its values. Both culture and nature then become rooted in similar ways of seeing the world, which are

shaped at a deeper level than metaphor by cultural myths, from which the metaphors arise" (Goodwin, 1997, p. xii).

The ability of metaphoric webs to connect different social realms, value systems and 'world-pictures' make them critical in understanding the larger cultural myths which form the mythopoetic basis of experiential reality. Larson's work shows that it is infeasible and ill-conceived to try to avoid myth altogether by stripping language of metaphor. As Mary Midgley (2004) reminds us: "We have a choice of what myths, what visions we will use to help us understand the physical world. We do not have a choice of understanding it without using any myths or visions at all" (p. 235). It is possible to achieve greater reflexive understanding of our own point of view by embracing the polysemy of metaphors. By acknowledging the myths that shape and define our relationships, we open up for the possibility to transform our ways of thinking by consciously shifting the meanings that underpin our thought and language. On the other hand, "[i]f we ignore them, we travel blindly inside myths and visions which are largely provided by other people" (ibid., p. 235).

It is now possible to see more clearly the significance of viewing sustainability as a quality which pertains to certain kinds of relationships or modes of environment-making. It brings into play the foundational assumptions, images and symbols, modes of knowing and cultural myths that together affect our experience of and relation to the environment. Shifting focus from objects to relations emphasises the ways in which we come to understand 'nature' over particular strategies or targets that enact a specific definition or meaning of sustainability. The next section goes on to show how a transformation of the relationships that characterise interactions as (un)sustainable, involves engaging with the ways in which deeper cultural narratives shape particular worldviews.

### 2.3.5 Co-creating reality through stories

This chapter has shown how the rules and visions that guide environment-making – the beliefs, routines and regulations which shape interactions within nature-as-matrix – can be seen as an expression of the deeper cultural meanings, metaphors, and myths that structure ways of conceiving and enacting 'sustainability' and, more broadly, 'nature'. They give meaning to the various pieces of information, scientific facts and future scenarios of the sustainability challenge by narrating them in terms of lived experience and established frames or 'habits' of the imagination. Cognitive science and communication studies show how new information is assimilated according to one's existing worldview rather than a process of ratiocination (cf. section 2.3.3). This suggests that enabling new forms of environment-making needs to move beyond the 'deficit model' which envisions humans as rational actors who respond to scientific facts by rational adaptation (cf. Hulme, 2009). Rather than people reasoning their way to a specific conclusion faced with a certain set of facts, "the facts must make sense in terms of their system of frames, or they will be ignored" (Lakoff, 2010, p. 73). This is the cogency of the mythopoetic approach: it acknowledges that perception and experience becomes intelligible in *story*, that it is here

facts are made to 'fit' lived reality and imbued with personal meanings.

To investigate this process, studies into onto-epistemological transition can draw on research on narrative and story, which has a long and varied history cutting across disciplines including psychology, anthropology, sociology, literary studies and cultural theory. Despite the 'narrative turn' in the social sciences over the last couple of decades which has brought with it a stronger focus on narratives, performances and qualitative methods (Atkinson and Delamont, 2006), there is no unified approach to studying narratives. For the purposes of inquiring into onto-epistemology it is important to avoid the objectifying view of the double disengagement – stories should not be seen as vehicles for cultural selection but as bringing forth a world with particular kinds of actors and relationships. This can be done by complementing Jerome Bruner's (2004) constructivist approach which holds that life narratives 'become recipes for structuring experience' and for 'directing us into the future' (p. 708) with Tim Ingold's (2011) anthropological approach to stories as 'wayfaring': occurring within a world of movement and becoming, storying is in itself knowing and to tell a story is to bring what is known to life<sup>18</sup>. In this way, narratives both constitute and represent reality, they structure relations within the lifeworld at individual and collective levels.

Narratives operate within interpretive communities of speakers and listeners (Squire, 2008) and are broadly defined as "connect[ing] events into a sequence that is consequential for later action and for the meanings that the speaker wants listeners to take away from the story" (Riessman, 2008, p. 3). Thus, narratives designate meaning and guide collective interactions. Expanding on Bruner's (2004) understanding that a culture can be characterised by the narrative models it offers for describing life choices and events, narrative inquiry can be seen as a way to find out about the rules and visions that direct social developments within interpretive communities. Cultural narratives tie together different realities – or enactments of ontologies – by establishing common frames of reference and suggesting particular ways of doing:

"Narratives are produced and performed in accordance with socially shared conventions, they are embedded in social encounters, they are part and parcel of everyday work; they are amongst the ways in which social organizations and institutions are constituted; they are productive of individual and collective identities; they are constituent features of rituals and ceremonies; they express authority and expertise; they display rhetorical and other aesthetic skills" (Atkinson and Delamont, 2006, p. xxi).

This makes narratives apt for investigating onto-epistemological change: they both constitute and represent identities and relationships within nature-as-matrix. These observations on meaning, metaphors and cultural narratives are considered further in relation to grassroots innovations and sustainability transitions in the next section which summarises what

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<sup>18</sup>Ingold (2011) holds that because any thing "enfolds within its constitution the history of relations that have brought it there" things "do not exist, they occur" and upon encountering a thing we come to know it through its story (p. 160). Thus, "[t]o know someone or something is to know their story" and to tell it is to partake in its becoming (ibid., p. 160-1).

a narrative approach to onto-epistemological transitions entails.

### 2.3.6 Re-narrating sustainabilities in grassroots innovations

As sites of ‘alternate constellations of reality’ grassroots narratives of the sustainability challenge can be considered to express alternative rules and visions of environment-making which hold the potential to enable qualitatively different relationships between human communities and more-than-human nature both in narrators’ ‘global’ image of the world and in ‘local’ action. By organising events, characters, and plots as well as contextualising perspectives, relationships, and actions, narratives position narrators in relation to the wider universe and give meaning to the complex phenomena of the lifeworld. Communications theorist Walter Fisher (1987) explained how stories are "meant to give order to human experience and to induce others to dwell in them in order to establish ways of living in common, in intellectual and spiritual communities in which there is confirmation of the story that constitutes one’s life" (ibid., p. 63). This view considers narratives as expressive of onto-epistemologies by virtue of their inherent meanings and relations rather than simply positioning subjects in relation to an objective reality which is inaccessible to perception and knowable only through abstract reason (Roberts, 2010). And it sees narratives as ontological as much as analytical: the stories we tell are constitutive as well as representative of the realities we inhabit and co-create.

Recognising narration as a process of meaning- and identity-making in which the narrator ‘positions’ herself interactively within a wider field of relationships, Bamberg (2004) describes participation in ‘locally situated narrating practices’ as potentially emancipatory: by situating subjectivities differently to given positions in a cultural meta-narrative, the narrator creates a possibility for a transformation in onto-epistemology. When her role shifts within the narrative, so does her worldview and relationships. Such positioning within a narrative is thus crucial in the construction of identity and a narrator "maneuvers simultaneously in between being complicit and countering established narratives that give guidance to one’s actions but at the same time constrain and delineate one’s agency" (ibid, p. 363). Viewing narratives as ‘landscapes for the perception of different possibilities’, re-narrating one’s own life-story can be seen as a process of opening up for new realities to emerge (ibid.). Cultural master- or meta-narratives can then be conceptualised as persisting features of such landscapes which shape the story but are nonetheless malleable. This stands in direct relation to McIntosh’s imagery of navigating according to the ‘big picture’ constellations and introducing change by connecting with wider contexts.

A narrative approach to studying onto-epistemological transformation in grassroots innovations as described in this chapter affords a theoretical understanding and conceptual vocabulary which can describe the main actors, social forces, relations, strategies, knowledges and plots that affect how people come to view themselves in relation to place and more-than-human nature. Sustainability narratives tell a story of what the challenge of sustainability is about and what actions make sense to meet this challenge – they express particular beliefs and ways of doing held within interpretive communities and

which can sanction apposite avenues of action (Squire, 2008). Investigating how grassroots innovations constitute such communities of interpretation, narrative-building and meaning-making, opens up for better understanding how they generate change through (de)stabilising particular sustainability concepts and meanings. By seeding change in sustainability narratives, interpretive communities are potentially not only building alternative networks and infrastructures but transforming the worldviews which shape unsustainable modes of environment-making. And recognising the multiplicity of realities as rendered in personal and collective narratives, allows for studying how different enactments of sustainability are drawn together and coordinated in different contexts.

Such an approach to studying onto-epistemological change in grassroots innovations addresses the identified need for a better understanding of the role of sustainability narratives and visions in the formation and diffusion of grassroots innovations. It bridges current theoretical approaches to sustainability transitions with relational and situated research paradigms which expand and deepen the conceptual vocabulary available for studying how sustainability visions, normativities, identities and knowledges shape grassroots innovations. As such it is also a contribution to the wider debates on sustainability transitions, counter-narratives and cultural change. And further, acknowledging that onto-epistemological transition is a process of bringing forth alternate realities which have not yet stabilised more widely, this approach is also itself an expression of the experimentation with meanings, concepts and language that is necessary for transforming ways of being and thinking. The following chapter goes on to describe the methodology developed for this study and how the ideas and concepts discussed here inform the empirical research. But first the next section will outline the main arguments and findings of this chapter and bring them to bear on the key research questions of this thesis.

## 2.4 Chapter summary

This chapter has described how transformations in onto-epistemology can be seen as qualitative changes in how the world is experienced and known, and explored how onto-epistemological assumptions form part of ‘the rules and visions’ that guide environment-making (cf. Geels and Schot, 2007; Moore, 2013). As such, onto-epistemologies are key to understanding how particular sustainabilities are enacted and their significance can be studied through the assumptions, metaphors and narratives that interpretive communities employ to describe their lifeworlds (cf. Bruner, 2004; Dorfman, 2009). Explaining how theorising cultural change as a (neo)Darwinian evolutionary process reproduces a division between humans and nature (cf. Ingold, 2000; Morin, 2007), this chapter went on to describe how onto-epistemological transitions can be conceptualised as transformations in social life which situate the researcher, her observations and social phenomena within the same ontological plane (cf. Bohm, 1986). Drawing on ‘holographic’ understandings of ontology and epistemology, an approach was formulated that focuses on relational qualities rather than separate objects and which acknowledges researched phenomena as a momentary outcome of a wider totality or field of relations (cf. Bohm and Hiley, 1993;

Bateson, 2000; Ingold, 2011).

Seeing onto-epistemological transformation as a process of constellating and enacting alternate realities (cf. McIntosh, 2001), a transition in onto-epistemology involves a shift in the meanings that shape the lifeworld (cf. Bohm, 2004b). Drawing on insights from Radical Human Ecology, the technical vocabulary of transitions theory was broadened to include elements of narrative and storytelling in order to describe such shifts in meaning from the perspective of narrators in grassroots innovations. It was argued that this 'inside' view of transitions is better placed to describe the processes of change in worldviews and onto-epistemological assumptions. Investigating the role of metaphors and myths in assigning meaning and focussing attention within the lifeworld, it was then argued that acknowledging the cultural meta-narratives that shape and define our relationships presents a possibility for transformations in onto-epistemology (cf. Larson, 2011; Midgley, 2004; Bamberg, 2004). Finally, the role of narratives in co-creating social realities and shared conventions, identities and institutions was outlined (cf. Fisher, 1987), and a rationale for a narrative approach to studying onto-epistemological transitions in grassroots innovations was put forward.

The considerations in this chapter has furthered a theoretical understanding of the research questions that guide the empirical investigation in several ways:

*1. How do sustainability narratives inform what kinds of knowledge and action participants engage with in grassroots innovations?*

Seeing narration as a social activity which positions actors within the landscape of a wider meta-narrative, sustainability narratives situate narrators spatio-temporally and give meaning to new experiences and perceptions in relation to 'nature'. If sustainability narratives in this way construe how people understand their sense of self and relationship with place, they are likely to affect directly what is accepted as valid knowledge and what actions are perceived as sensible in order to achieve sustainability. The question of what kinds of action become available when a life-narrative undergoes transformation can be addressed by examining the onto-epistemological assumptions inherent to a (new) sustainability narrative.

*2. How are transformations in individual and collective cultural narratives expressed in participants' worldviews and actions?*

As narratives are both indicative and productive of particular worldviews, they are also a gauge to transformations in personal beliefs and actions. Such changes can be perceived in the patterns of language, the concepts and metaphors which describe narrators' beliefs and actions. But, considering the mythopoetic nature of reality, some of these changes are likely to be unconscious or only experienced gradually as new modes of being and thinking. There is conceivably also a potential for conflict between different the 'rules and visions' inherent to different narratives, which suggests that onto-epistemological transformation is a complex and possibly difficult experience.

*3. How do sustainability narratives affect the organisation and diffusion of grassroots innovations?*

Alternative sustainability narratives in grassroots innovations tell a story of the nature and scale of the sustainability challenge and what actions make sense in light of this perspective. Therefore, such narratives position participants individually and collectively in relation to dominant narratives about sustainability and presumably play an important role in attracting or deterring participation in specific activities. This raises questions about how onto-epistemological assumptions affect grassroots innovations both in terms of participants' experience of their involvement and the wider impact of a project.

*4. What is the role of stories in enabling emerging practices and tools for social change?*

Because stories have the potential to either constrain or make new modes of action available, they are key to the activities that take place within interpretive communities; they can weave new visions, practices and technologies into people's lifeworlds. What *kinds* of stories circulate within grassroots innovations is therefore a guide to the forms of environment-making that emerge and they are likely to have a central role in directing activities and establishing relationships as particular practices or projects develop.

In line with this theoretical exposition of onto-epistemological transitions, the next chapter proceeds to construct a suitable methodology for researching changes in worldviews and onto-epistemological assumptions.