

**From:**

SACHA KAGAN

## **Art and Sustainability**

Connecting Patterns for a Culture of Complexity

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What is the cultural dimension of sustainability? This book offers a thought-provoking answer, with a theoretical synthesis on »cultures of sustainability«. Describing how modernity degenerated into a culture of unsustainability, to which the arts are contributing, Sacha Kagan engages us in a fundamental rethinking of our ways of knowing and seeing the world. We must learn not to be afraid of complexity, and to re-awaken a sensibility to patterns that connect. With an overview of ecological art over the past 40 years, and a discussion of art and social change, the book assesses the potential role of art in a much needed transformation process.

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# Contents

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## **Acknowledgements | 7**

## **Introduction | 9**

Sustainable Development and Sustainability | 9

The ‘cultural dimension’ of sustainability | 13

Overview of the following chapters | 16

Methodological considerations | 19

## **1. The Culture and Art of Unsustainability | 23**

Introduction | 23

Section 1: The culture of unsustainability | 24

Section 2: The art of unsustainability | 66

Conclusion | 91

## **2. Toward Culture(s) of Sustainability, Step One: Systems Thinking and the Limits of Holism | 93**

Introduction | 93

Section 1: Some basics of Systems Thinking | 96

Section 2: The Systems View of Life | 101

Section 3: The Systems View of Society | 115

Section 4: Ervin Laszlo’s “Systems View of the World”  
and the limits of Holism | 136

Section 5: Cybernetic apparatuses  
and the risk of a technological drift | 147

## **3. Toward Culture(s) of Sustainability, Step Two: From the ‘Big Picture’ to the Culture of Complexity | 153**

Introduction | 153

Section 1: Complexity: Edgar Morin’s ‘method’ | 154

Section 2: Transdisciplinarity | 200

Conclusion to chapters 2 and 3 | 212

## **4. Aesthetics of Sustainability | 217**

Introduction | 217

Section 1: From Aesthetics, environmental aesthetics  
and ecological aesthetics to aesthetics of sustainability | 219

Section 2: From Bateson’s sensibility to the pattern which connects,  
to a sensibility to patterns that connect | 225

Section 3: The sensibility to complexity | 235

Section 4: The transdisciplinary sensibility | 240

Section 5: The phenomenological and animistic sensibility  
to a more-than-human world | 246  
Conclusion | 267

## **5. Ecological Art | 269**

Introduction | 269  
Section 1: Land art, environmental art, ecological art | 271  
Section 2: Precursors and pioneers | 277  
Section 3: Exemplary directions in environmental/ecological art | 290  
Section 4: The “Reenchantment of Art” according to Suzi Gablik | 310  
Section 5: The Monongahela Conference  
on Post-Industrial Community Development | 323  
Section 6: The exhibition Ecovention | 333  
Conclusion | 343

## **6. Sustainability and Ecology as keywords: a decade of contemporary art | 345**

Introduction | 345  
Section 1: “Eco-centric topics” in contemporary art | 350  
Section 2: Exhibitions on art and sustainability | 364  
Section 3: Post-environmental art: The exhibition *Greenwashing* | 379  
Conclusion | 396

## **7. Fostering Change: Art and Social Conventions | 399**

Introduction | 399  
Section 1: Double entrepreneurship in conventions | 400  
Section 2: Polity Conventions: The political setting  
for double entrepreneurship in conventions | 429  
Conclusion | 460

## **Conclusion | 461**

## **Appendices | 475**

Appendix 1: The subconscious and the ‘eco-’ in autoecopoiesis:  
a speculative excursus | 475  
Appendix 2: Deutsche Zusammenfassung:  
Kunst und (Nicht-)Nachhaltigkeit | 481

## **Bibliography | 491**

# Introduction

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## SUSTAINABLE DEVELOPMENT AND SUSTAINABILITY

The expressions “sustainable development” and “sustainability”, which constitute the moving horizon of my research perspective, acquired a widespread popularity across the world within the past two decades, as a response to perceived threats to humanity’s continued existence.

The general understanding of “sustainable development” is most often described as a triptych of social justice, ecological integrity and economic well-being, and was popularized by the Brundtland report (1987). It aims at a development of human societies that would achieve “the reconciliation of social justice, ecological integrity and the well being of all living systems on the planet. The goal is to create an ecologically and socially just world within the means of nature without compromising future generations” (Moore 2005, p. 78).

The term ‘sustainability’ (used in 1981 by Lester Brown), has an older genealogy in the German-speaking world, as the term ‘Nachhaltigkeit’ was coined (first in 1713 by Hans Carl von Carlowitz) to characterize a management of forests that would not deplete resources on the long term, but allow the renewable natural resources to regenerate and thus ensure its exploitation over the long-term.<sup>1</sup> I will however not delve further into the specifically German discourses and debates around the term of ‘Nachhaltigkeit’, for two reasons: On the one hand, my research is focusing primarily on English-speaking literature, and thus on English-language discourses (with a number of insights from French-speaking literature). On the other hand, I consider the contemporary usages of the term ‘sustainability’ to be rooted mostly in its relatively recent history in English language, i.e. from the 1980’s onwards, as a heritage from the notions of “eco-development” as

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1 However, this genealogy of the term in German forestry has been reconstructed *a posteriori* by German researchers, when the English term “sustainability” imposed itself in recent years. There is no obvious direct link between the German old expression from forestry, and the contemporary usage of the English term as it emerged in the 1970’s.

discussed at the United Nations and other international organizations in the 1970's (for example, the Club of Rome's famous 1972 report *Limits to Growth* uses the adjective 'sustainable' to characterize the desired model of development) as well as from the history of ecology and environmentalist movements across the 20<sup>th</sup> century.<sup>2</sup>

The use of the term 'sustainability', rather than 'sustainable development', by many authors in this context, reflects "a concern, on the part of NGO and academic environmentalists, that development is seen as synonymous with growth, and therefore that sustainable development means ameliorating, but not challenging, continued economic growth" (Robinson 2004, p. 370). More generally, besides the discussion-point of economic growth, the use of the term 'sustainability' suggests a different priority in framing the future of humanity in terms of its balanced evolution, linking social and ecological issues, rather than framing it in terms of a linear development-course with the economy as its main focus. This is the sense in which I will favor the term 'sustainability' in the rest of this volume, and connect it to the constitution of a complex, 'systemic' perspective on reality.

The expressions 'sustainable development' and 'sustainability' established themselves across a pre-existing division of the environmentalist movement in two divergent discourses known as the 'preservationist' and the 'conservationist' discourses. Simons and Warfield (2007, p. 6) characterized this division as rooted in the divergence between "those who see nature as an art form [with an own spiritual dimension and who] prioritize the non-human" i.e. the preservationists, and "those who prize utility [of nature for mankind and] favour the human" i.e. the conservationists.

The preservationists, such as John Muir and later Aldo Leopold, inspired by the Romanticism of e.g. Henri David Thoreau, consider the whole living world as the community in which we live. A radical form of preservationist discourse is found in deep ecology (with e.g. Arne Naess), which attributes inherent rights to the natural environment. The conservationists, starting with Gifford Pinchot (who coined a 'resource conservation ethic' aiming at minimizing environmental damage so as to ensure continued benefits for human beings), inspired the contemporary mainstream environmental movement, as well as the more radical 'social ecology' movement of Murray Bookchin (which advocates for a participatory direct democracy rooted in anarchism and connects it to an ecological discourse).

Traditionally, preservationists aimed at "the preservation of natural areas in what was perceived to be a pristine (i.e. undeveloped) form" (Robinson 2004, p. 371) and called forward a spiritual awakening to the sacredness of nature, whereas the conservationists heralded the protection of natural areas as a pragmatic goal, i.e. "a form of enlightened self-interest" (ibid.).

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2 On the histories of the English and German terms sustainability and Nachhaltigkeit, see Grober 2002 and Tremmel 2003. See also Grabe 2010.

*Table 1: Biocentric vs. Culture-centric perspectives*

<b>Biocentric (from preservationist roots)</b>	<b>Culture-centric (from conservationist roots)</b>
Oriented to local, place-specific, closed system	Open System
Culture as nature: e.g. aboriginals as “noble savages”	Nature as culture, e.g. discursive
Stability (peaceful)	Instability (conflicted)
Finite human possibility	Infinite possibility
Independent of other systems	Interacts with and is changed by other systems
Pessimistic: problems result from immutable limits to growth	Optimistic: resourcefulness can solve problems
Culture as art, beauty	Culture as industry, utility
Absolute/fixed/normative (centralized, hierarchical, ranked)	Relative (equity, broad participation, decentralized)
Values secondary	Values primary
Empiricism	Humanism
Maintain/preserve	Expand/grow

Source: Simon and Warfield 2007, p. 10.

Over time, an additional distinction emerged between those who insisted on “questions related to values and fundamental changes in individual attitudes towards nature (the sustainability argument) [and those who, on] the other side take what they believe to be a more pragmatic and collective approach, oriented towards efficiency gains and improvements in technology (i.e. sustainable development)” (ibid.). The distinction has been labeled as “ecocentric” vs. “technocentric” (Pepper 1996 cited in Robinson 2004) or as “biocentric” vs. “culture-centric” (Simons and Warfield 2007). Robinson (2004) discusses further how the Brundtland Commission report constituted a “curious combination” of these two perspectives. But is the discussion of sustainability bound to be divided along such a binary line (with opposed sets of assumptions, as suggested by Simons and Warfield 2007 – cf. table 1)? Or can a complex understanding of sustainability be constructed, which would overcome the problematic assumptions of both approaches – namely, the traditional preservationist assumption of a fixed and pristine natural order, and the conservationist ‘optimism’ assuming an infinity of possibility

thanks to human creativity (i.e. denying – or promising to overcome – hard biophysical limits to growth)?

The arguments to be found in the present volume will tend to argue for the latter, i.e. that a complex understanding of sustainability is possible, and will elaborate a description of such an understanding as the emergence of an alternative worldview. Such a proposal is not an entirely new idea, and it echoes for example the ‘interdependency thesis’ of Michaelidou et al. (2002) according to which “neither environmental nor community sustainability are possible without the other” (Simons and Warfield 2007, p. 9). It also echoes, at a more fundamental level, a complex idea of nature, which incorporates both nature as inherent beauty and nature as human utility. Edgar Morin’s definition of nature already sets the stage for the whole discussion of sustainability and culture that will further unfold itself in the present volume: “Nature is not only *physis*, chaos and cosmos together. Nature is what binds, articulates, makes the anthropological communicate in depth with the biological and the physical” (Morin 1992, p. 382).

But why call it then an ‘alternative’ worldview? Robinson (2004) echoed the criticisms of sustainable development as “cosmetic environmentalism”, both evading the question of “limits to growth” with a faith vested entirely in an imminent technological revolution, and evading the hard political and social challenges of Western industrial societies (as argued e.g. by Naomi Klein 2000). Instead, he argues for an open usage of the term “sustainability”, not as a unitary concept, but as “a kind of discursive playing field in which [conflicting views] can be debated”, as “a political act, not a scientific concept” in the traditional restricted sense (i.e. supposedly value-neutral), and as “the emergent property of a conversation about what kind of world we collectively want to live in now and in the future” (Robinson 2004, p. 382). Within this playing field and this conversation, my focus, which will lie especially on the cultural dimension of sustainability, will also oppose these mainstream discourses on sustainability that perpetuate techno-optimism and evade political challenges. Laville and Leenhardt (1996, pp. 132-142) already argued that sustainable development requires a “spirit of utopia”, in order to reach beyond technocratic superficiality. Dieleman (2001, p. 14) defined “sustainable development” as “challenging existing definitions of reality in virtually all respects” and “working towards sustainable development” as “question[ing] current values and worldviews [...] seek[ing] creativity to develop new and yet unexplored products and practices [and] creat[ing] fear, anxiety, uncertainty and alienation” to be catalyzed and transformed into “empowerment”. These three authors also pointed most especially at the roles of culture and the arts in this context.

## THE ‘CULTURAL DIMENSION’ OF SUSTAINABILITY

Moacir Gadotti (the president of the deliberative council of the Instituto Paulo Freire, in Brazil) states: “To us, sustainability is the dream of living well; sustainability is a dynamic balance with others and the environment, it is the harmony among differences” (Gadotti 2009, pp. 13-14). As a shared dream, vision and worldview (as pointed out by Gadotti), as well as a conversation (as described by Robinson), sustainability reveals itself as a cultural phenomenon, if ‘culture’ is understood as value system and set of signifiers framing social identities and dispositions to act and to believe. Culture is a collective memory of a plurality of knowledge, know-hows and rules/conventions. Cultures, together with the individual minds, are also the ecosystems of ideas and mental images, i.e. of the ‘noological sphere’ of human imagination and creativity. The noological sphere is capable both of generativity and of regulation (through a relative capacity to resist to external disturbances).<sup>3</sup> Its mythical constructs are not only a superstructure as old-school Marxists used to claim, but a fundamental generative part of the fabric of human societies. As argued by Edgar Morin, an author on whom I will extensively draw in the present volume, “imagination is at the active and organizational heart of social and political reality” (Morin 1977, p. 341, following Castoriadis 1975).<sup>4</sup>

The inclusion of a cultural dimension in the discourses on sustainability has developed gradually in the past decade, at different levels of discourse. In 1996, the exhibition “Villette-Amazone” was organized in Paris at the “Grande Halle de la Villette” (the largest science center in Paris) by the ‘Comité 21’, French committee for environment and sustainable development. It combined ecological urbanism, architecture, technologies and artistic projects (by artists such as ‘the Harrisons’ about whom I will talk longer in chapter 5, and other artists).<sup>5</sup> It also was accompanied by a publication, a “manifesto for the environment in the 21<sup>st</sup> century” written by Bettina Laville (environmental adviser of the French President François Mitterand) and Jacques Leenhardt (philosopher and sociologist). In it, the authors aim to “engage a reflection on the role of culture in the transformations of our relationships with the environment” whereby to “rethink man and his knowledges in the very midst of nature and no longer outside of it” (Laville

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- 3 The meaning of “generativity” will be introduced in the first section of chapter 3.
  - 4 Exact page numbers in quotes from Morin 1977, refer to the 1981 pocket book reprint.
  - 5 The other artists included in that exhibition (whose work I will however not discuss in the present volume) included Frans Krajcberg, Chen Zen, Gilles Clément, Jean-Michel Alberola, Bernard Pagès, Giuseppe Penone, Jaume Plensa, Erik Samakh, Dominique Bailly and Josef Koudelka, among others. The selection of artistic projects in that exhibition focused especially on the activity of landscaping.

and Leenhardt 1996, p. 15). They call forward the need for a “new epistemology” (ibid., p. 12), pointing out that “precaution and contingency [...] consciously break away from violence, *hybris* [...] This here is a matter of culture”(ibid., p. 13). They further discuss how some artists in the 20<sup>th</sup> century “constructed, maybe without exactly realizing it, the conditions of possibility of a new outlook on nature” (ibid., p. 58) and the emergence of an ecological art (which I will discuss in chapter 5). They denounce the “divorce between the worlds of science and of culture” (ibid., p. 89) and “the civilization of *ex-situ*” (ibid., p. 90) to which they opposed the duty of “environmental sciences” to “replace man in the earthly ecosystem” (ibid., p. 93). Arguing that “ecologists have unfortunately renounced imagination” (ibid., p. 100), they call forward a “moral of transformation” (ibid., p. 102), a “new humanism” founded on the “end of anthropocentrism” (ibid., p. 97) and a “mobilization of the imaginary” (ibid., p. 116) with the participation of artists. Laville and Leenhardt, in their manifesto, suggested that “sustainable development is maybe the new challenge of the 21<sup>st</sup> century, the sesame [i.e. the key to success] of a cultural revolution [...] on no account the trivial fruit of a technocratic consensus” (ibid., pp. 134-135). Unfortunately, not much happened in France in the decade that followed *Villette-Amazone*, in terms of integration of culture, art and sustainability, but significant developments emerged elsewhere around the world.

The UNESCO Summit on Culture and Sustainable Development in 1998, under the title “The Power of Culture”, proclaimed in general terms the interdependence of culture and sustainable (mainly economic) development.<sup>6</sup> In Australia, Jon Hawkes’ four-pillar model of sustainability (Hawkes 2001) included cultural vitality as a major dimension of sustainability, pointing at the inherent value of cultural diversity and of a vibrant cultural life of human communities. In parallel, in Germany, a number of cultural actors and of personalities involved in the field of sustainability, called for a greater attention to the role of the arts and culture in the search for sustainability. They organized in January 2002 at the Art Academy of Berlin, a conference of the German Society for Political Culture (Institut für Kulturpolitik der Kulturpolitische Gesellschaft) where they supported the “Tutzinger Manifest”, a call for the integration of culture in Agenda 21 processes, which had been launched in April 2001 at the conference “Aesthetics of Sustainability” held at the Protestant Academy Tutzung. The “Agenda 21” action program launched at the 1992 Earth Summit of the United Nations in Rio de Janeiro, and the local agendas 21 that followed at the level of local policies, aimed to work concretely towards sustainable development, but did not directly include, especially in its first decade of existence, a cultural dimension (neither in a wide understanding of culture, nor

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6 A further elaboration for cultural policies based on UNESCO’s 1998 summit, was developed by Colin Mercer (2002).

in the more restricted sense of specific cultural-artistic activities).<sup>7</sup> The German “Tutzing Manifest” denounced the dominance of technical, social and political economy discourses in the Agenda 21, and the absence of a discussion of the cultural background and significance of a search for sustainable development. It also denounced the absence of interest for questions of sustainability in cultural policy and among a majority of the art worlds. And it advocated (in the context of the Johannesburg World Summit on Sustainable Development of 2002) for the integration of culture in strategies for sustainability, and for the building of networks in order to overcome this gap. (One of the lead organizers of the two conferences and “Tutzing Manifest”, Hildegard Kurt, will come back under my focus in chapter 5.) The Manifest explicitly stated: “If sustainability is to be attractive and fascinating, if it is to appeal to the senses and convey a meaning, then beauty becomes an elementary component of a future that has a future, a way of life to which all people are entitled. For the Agenda 21 to be successful it is critical to integrate participants with the ability to bring ideas, visions and existential experiences alive in socially recognisable symbols, rituals and practices.”<sup>8</sup>

In the meanwhile, a coalition of local governments across the world have launched the “Agenda 21 for Culture”, approved by the 4<sup>th</sup> Forum of Local Authorities for Social Inclusion, in Barcelona in May 2004.<sup>9</sup> This policy document lists principles relating culture and the themes of human rights (which should include cultural rights), of diversity (i.e. the role of cultural diversity for human development), of local sustainable development (pointing at interculturality, at the importance of a “cultural ecosystem” and at the prospects for economic wealth), of social inclusion (cultural activities as part of citizenship) and of the economic role of cultural industries in the knowledge economy. Lately, concerns for ecology, sustainability and sustainable development also gained attention in the field of cultural policy and among prominent arts organizations, as indicated for example by the organization of a conference in December 2009 (“CultureFutures”, alongside the COP15 UN Climate conference in Copenhagen) devoted to the roles of arts and culture for the “transition to an ecological age by 2050”.<sup>10</sup> Among the co-organizers of that conference were organizations such as the International Federation of Arts Councils and Cultural Agencies (IFACCA), the network of the European Union National Institutes for Culture (EUNIC), the Asia-Europe Foundation (ASEF), The Danish Cultural Institute, The British Council, the Goethe Institut, The Royal Society for the Arts (in the UK), the

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7 For an introduction to the Agenda21, cf. Keating 1993.

8 The Tutzing Manifest, in English translation, is available online at: <http://www.kupoge.de/ifk/tutzing-manifest/pdf/tuma-gb.pdf>

9 The Agenda 21 for Culture and accompanying documents and reports can be found online at <http://agenda21culture.net>

10 See the conference online documentation at: <http://www.culturefutures.org/>

Association of Performing Arts Presenters (in the USA) and the European Cultural Foundation.<sup>11</sup> These organizations have not only gathered in that one-off event, but also started engaging, in recent years, in different reflections and programs aiming to integrate their work within the context of sustainability (and particularly of climate change).

At the level of academic research on sustainability, the inclusion of culture and the arts also emerged throughout the past decade. For example, in a 1999 publication about education for sustainability, Stoltenberg and Michelsen pointed at the cultural dimension of sustainable development (next to its ecological, social and economic dimensions) as including the “handling of time”, traditional knowledge, a “holistic perception of nature”, lifestyles and ethics (cited in Altner 2006, p. 74). At the Erasmus Universiteit Rotterdam, Hans Dieleman launched in 2000 a research program on “art & sustainability” aiming to “explore the various roles artists can play in change processes towards sustainability” and linking the “systems characteristics of sustainable development” with the “beyond rationality” characteristics of art (Dieleman 2001).

I will argue in this volume that the cultural dimension of sustainability involves not only the inclusion of the value of culture and of the arts in the discussion of local sustainable development and of sustainable communities, with an understanding of the contribution of culture (as in ‘cultural expressions’ of a community, cultural activities and the arts) to economic, social and cultural capital (as argued e.g. by Duxbury, Gillette and Pepper 2007), but also involves an understanding of ‘culture(s) of sustainability’, i.e. set(s) of norms and values, social conventions and institutions, informing the transition to more sustainable practices. At a more abstract level, the question of culture(s) of sustainability also touches upon transformations in world-views and paradigmatic bases for the knowledge of the world around oneself, i.e. epistemological issues. Under this perspective, my concern will be to understand how the arts are related to such a question of culture(s) of sustainability. My focus, in the present volume, will be lying at the level of ideas, discourses and practices of different social actors including especially artists and intellectuals, rather than at the level of the institutional orientations of (cultural) policies as reflected in the Agenda 21 for Culture.

## OVERVIEW OF THE FOLLOWING CHAPTERS

I will now give a brief overview of the progression of the chapters in the present volume. However, this should not be mistaken for an ‘executive

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11 One of the co-organizers of the “Culture|Futures” conference was the small NGO Cultura21 Nordic, which is a chapter of the Cultura21 international network that I founded and coordinate since 2007, building upon the German NGO Cultura21 which emerged in 2005 and was officially founded in 2006 by Davide Brocchi.

summary'. The main developments and arguments that I will unfold, have to be found in the chapters themselves, and will not be presented in a placated premature version in the following few paragraphs.

The literacy of sustainability, which at a general level can be considered as a common culture (but as a 'uniplural' rather than simply unified culture, as I will argue later), departs from a currently dominant culture based on modes of knowing inherited from modernity. This argument will be developed in the first chapter of this volume, on 'the culture of unsustainability'.

Based on disjunctive thinking, simplification by reductionism and atomization of knowledge and experience, the culture of unsustainability developed an advanced form of cultivated autism in the relationships of modern societies and modern individuals with their environments. This development will be described in the first section of chapter 1, retracing the historical roots as well as the different dimensions and the significance of a culture of unsustainability in the organization of modern to late-modern societies.

The second section of chapter 1 will explore how the social organization and the values of modern and postmodern art have been contributing to the wider culture of unsustainability. This critical overview will focus primarily on the so-called 'high', 'autonomous', 'fine' arts, rather than on popular cultural expressions. I choose to focus especially on 'high art' because of its peculiar contrast between the ambitious claims and hopes often elaborated within art worlds with regards to art's transformative potential, and the challenges and limits set against such ambitions by art's embeddedness in a wider culture of unsustainability. This limitation of my focus to the high arts will also allow me to further explore an alternative development within the scope of the present volume (in chapter 5 on ecological art). More generally, the critical analysis of the culture and the art of unsustainability, as conducted in chapter 1, will serve as a baseline against which the further chapters will unfold the exploration of a culture/cultures of sustainability (chapters 2 and 3) and will more specifically analyze its significance in terms of aesthetic and artistic experience (chapter 4).

As already stated after Robinson (2004), sustainability cannot be summed up in a master plan or a single concept. It requires a reform of thought toward complexity which can help put the pieces together, but without superimposing on reality a new simplifying template replacing the disjunctive literacy of modernity. The exploration of such a difficult undertaking, will require two chapters:

- Chapter 2 will introduce 'systems thinking' as a first step toward a culture of sustainability, introducing a non-linear understanding of life and society and laying the foundations for an 'ecological literacy'; but the limits and pitfalls of systems thinking will also be assessed (most especially with regard to the risk of simplification by holism);

- Chapter 3 will move further into theories of complexity and into the framework of transdisciplinarity, as correction to the simplification of systemic holism and as the basis for a literacy of complexity.

The culture of complexity thus articulated, will be further detailed in its aesthetic dimension in chapter 4 on ‘aesthetics of sustainability’. The core insight of this chapter, which constitutes the cornerstone of the present volume, will be based on Gregory Bateson’s understanding of aesthetics as the “sensibility to the pattern which connects” as well as on theories of complexity and phenomenological considerations of a sensibility to the “more-than-human”.

This sensibility has been most especially at the core of the development of numerous ecological-artistic practices in the past 40 years, which are introduced in chapter 5. This chapter offers an overview of the field of so-called “eco-art”, within the art world of contemporary visual art, as an exemplary and illustrative account of a possible development of ‘aesthetics of sustainability’ in the arts (but by no means an exhaustive mapping of all modern and contemporary artistic and cultural practices which may contribute at different degrees and levels, to a culture of sustainability).

Sustainability and ecology have in the meanwhile turned into a focus of attention for a diversity of artists and other cultural actors (e.g. curators, art critics) involved in the art world of contemporary visual art, most especially in the decade 2000-2010. I will conduct a short overview of some of these developments in chapter 6, assessing how far these artistic discourses and interests may be relevant to the culture and aesthetics of sustainability as I discuss them in this volume, and how far they may contribute relevant insights and sensibilities in this context. Here again, my analysis in no way claims to be exhaustive, but merely to offer an exploratory overview.

The question remains, of the relevance of such artistic practices and experiences for wider social transformations toward sustainability. I will finally address this question in chapter 7, considering art as a field of experimentation where a ‘double entrepreneurship in conventions’ may allow transformations across social fields. The question of art and social change will also raise political issues related both to the relative window of opportunity for such social change, and to the very question of the political dimension of social sustainability. This later question will also be addressed in chapter 7, with a focus kept on its declination in the worlds of the arts.

Given the width of the area covered in this book, not all possibly relevant approaches can be introduced, and many specific topics will be only shortly evoked. I will focus on the discourses and arguments that are most especially relevant to a discussion of culture, art and sustainability under the perspective of complexity.

## METHODOLOGICAL CONSIDERATIONS

My work in the current volume consists in a theoretical exploration, without a properly empirical element, but with especially two chapters (5 and 6) delving into a historical overview of a specific movement in art and a discussion of some contemporary developments in the field of contemporary visual arts which are especially relevant to my analysis.

The choice not to include an empirical study in this work, but to focus my analysis at the theoretical level, stems from the methodological and epistemological challenge of my research theme: The search for sustainability calls forward a movement away from the usual confines of disciplinary, or even inter-disciplinary work, and towards transdisciplinarity.<sup>12</sup> This movement, which I aimed to retrace as part of the description of a culture of sustainability, was also the movement in which I had to engage myself in the making of the current research, and thus I was engaged in a recursive process by which my very theoretical work had to move towards complexity and transdisciplinarity. This imposed that I engage into grounds on which I am not familiar, such as the natural sciences as opposed to the social sciences from which I come. To the reflexive researcher, such a wide horizon as transdisciplinarity finishes to shatter the illusion of a full knowledge of all relevant discourses, which is usually maintained in small (inter-)disciplinary communities of ‘peers’.

The preceding couple of self-descriptive sentences are not innocently laid bare to the reader. They reflect an epistemological attention to complexity:

So-called ‘Human Sciences’ and ‘Natural Sciences’ (or ‘soft’ and ‘hard’ sciences) need to base themselves on each other. In the epistemology of Edgar Morin (whose “method” I will discuss in the first section of chapter 3, not just as a mere methodology but as the basis for no less than a paradigm shift in scientific work), the nature of reality loses a stable primary ontological basis (in a linear view), and establishes itself through the complex circular relation between the level of the social construction of reality (i.e. the social sciences) and the level of natural facts, i.e. the physical and biological substrata for the existence of any human (socially constructed) reality. Thereby, Morin’s epistemology aims at a “complex knowledge carrying its own reflexivity” (Morin 1977, p. 19).

This reflexivity also concerns the individual researcher’s subjectivity: “The subject who disappears from his discourse in fact takes over the Control Tower. By pretending to give way to the Copernician Sun, he reconstitutes a Ptolemaic system whose center is his spirit” (Morin 1992, p. 19). Consequently, the researcher’s subjectivity should be acknowledged and

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12 The meaning and significance of transdisciplinarity is not introduced here, but it will be in the second section of chapter 3, as part of my exploration of a culture of sustainability.

made visible, without turning the discourse into an apology for subjectivism. The researcher's culture too, i.e. the social and historical conditions, influence the conceptual work, and therefore a sociology of knowledge is always required as part of the reflexive process.<sup>13</sup> But Morin also warns against a purely social-constructivist discourse which would be equally naive in denying the physical base of any human, 'socially constructed' reality.<sup>14</sup> He calls forward a cyclic, rotational method: "This rotation leads us to physicalize our notions, then to socialize them, then to rephysicalize them, then to resocialize them, and so on *ad infinitum* [so that such a method be ] not a vicious circle, but a productive praxis" (ibid., p. 288).

My epistemological position, after Morin's, should therefore not be mistaken for a post-modernist radical constructivism, which it is not. As argued in more details by Smith and Jenks (2006), theories of complexity, in their attachments to emergence, evolution and to the recognition of the reality of 'attractors,' reject an absolutist notion of contingency: In short, not everything in reality is socially constructed, and social constructions and conventions are not floating in an ocean of chaos (in the common speech understanding of the term 'chaos') but are embedded/entangled with attractors, i.e. intervening variables at physical, chemical, biological and ecological levels of reality.

The recognition of subjectivity and the researcher's reflexivity allow science's social praxis to emerge: "All knowledge is a physical praxis which is at the same time an anthropo-social praxis" (Morin 1977, p. 383). There exist only normative knowledge and normative science. Physics is also a human science and, as will be further articulated in chapters 2 and 3, the social sciences are also becoming (for a large part) an emergence rooted in physics. And science, rather than being a disinterested activity, is a historical emergence of the Western civilization.

### **On complexity**

The notion of complexity, which will be properly defined and articulated in chapter 3 with the account of Edgar Morin's theoretical work, plays a key role in the understanding of the search-field of sustainability and in the sort of *Second Enlightenment* that is required in order to achieve such an understanding. To prevent misunderstandings, a few cautionary remarks are warranted from the start: Complexity is not 'complication'.

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13 If the present volume may partly fail with regard to Morin's epistemological requirements, it would be by a lack of space devoted to myself, in my written text, rather than by an excess of subjectivity. The kind of self-reflexivity, at a personal level, practiced by Morin in his texts, is something which I am only now barely starting to practice.

14 Cf. Morin 1977, pp. 273-275.

The complicated can be relatively easily reduced to some relatively basic principles (like e.g. the ‘complications’ of a Swiss watch). But complexity disarms the explanations based on single empirical bases, single and linear logics: Complexity requires multiple logics that are neither separated from each other into neat boxes, nor integrating neatly with each other, but enter into ambivalent relations and tensions. In the universe, in Nature, in our reality, as will be argued in chapter 3 after Morin, *everything is complex*. “The simple is but an arbitrary moment of abstraction torn from complexity, an effective instrument of manipulation flattening complexity” (ibid., p. 386).

The science of complexity as Morin sees it, shall be en-cyclo-pedic, not in the sense of an encyclopedic accumulation of knowledge areas, nor in the sense of a pretense to engulf the whole of knowledge (and be ‘exhaustive’), but in the sense of “agkuklios paidea, training which puts knowledge in cycle [...] that is to say of learning to articulate the disjointed points of view of knowledge into an active cycle” (ibid., p. 14). Morin’s encyclopedic challenge is concerned with the organization and articulation of knowledge, not with its accumulation.

Furthermore, an understanding of complexity means that *everything shall be ecologized* and that *everything shall be seen in meta-perspective* and with loops. It further means that the Western logical tradition of the disjunctive, i.e. the excluded third, shall be modified in order to also consider the included third and the existence of several levels of reality (and more generally of emergence), as Nicolescu (2002) argued. These notions will all be further introduced in the upcoming chapters. A proper definition and understanding of complexity cannot be laid out in details here and now; it can only be evoked, with the aid of further complex “macro-concepts” that themselves require considerable developments; this understanding will thus emerge in due time: first partly in chapter 2, and then more fully throughout chapter 3.

The rotational approach suggested by Morin, which opposes both radical social constructivism and naturalism, may indirectly remind my German colleagues of the ‘Positivismusstreit’ (positivism dispute) which famously opposed Theodor Adorno and Karl Popper in 1961, concerning methodology in the social sciences, and which further opposed especially Jürgen Habermas (for the Frankfurt School) and Hans Albert (for the school of critical rationalism) in the following decade. I will not discuss the details of this dispute (which is replete with arcane terminological clashes), but shortly mention one point: In the course of the exchange, Adorno expressed why the complexity of social reality calls forward a dialectical treatment, insofar as

“the cognitive ideal of the consistent, preferably simple, mathematically elegant explanation falls down where reality itself, society, is neither consistent, nor simple, nor neutrally left to the discretion of categorial formulation. [...]. Society is full of contradictions and yet determinable; rational and irrational in one, a system and yet fragmented; blind nature and yet mediated by consciousness. The sociological mode of procedure must bow to this. Otherwise, out of puristic zeal to avoid contradiction, it will fall into the most fatal contradiction of all, namely, that existing between its own structure and that of its object. [...] The conception of the contradictory nature of societal reality does not, however, sabotage knowledge of it and expose it to the merely fortuitous. Such knowledge is guaranteed by the possibility of grasping the contradiction as necessary and thus extending rationality to it” (Adorno 1976).

Whereas the Frankfurt school further developed and promoted dialectics as what they considered to be the proper methodological approach to the complexity of society, Morin elaborates a “dia-logic” which claims relevance, transversally, to the natural sciences as well as the social sciences, i.e. to the complexity of the physical and biological as well as the social world (Morin’s dialogic will be introduced in chapter 3).

These epistemological and methodological questions are only very lightly touched at this point. Following Nietzsche’s claim that “the methods come at the end” (in his *Anti-christ*), it is only much later, in the conclusion of chapter 3, that will emerge a methodical framework for a culture of sustainability.