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Making or Unmaking the Environment

The Role of Envisioning in the History of Sustainable Design

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Introduction

Design, history, and visions of sustainability

Over the last five decades, the urge to design, manufacture and consume in a sustainable fashion have become increasingly emphatic within design practice and mediation. This period has seen the articulation of a number of recipes for a kind of material culture with a low or manageable impact on social structures and the ecosystem. Designers are careful to present sustainability credentials when they pitch their work; corporations use sustainability as a communication genre to place their products on the market; aware consumers make their choices depending on what impact they imagine these choices will have on the ecosystem and the welfare of faraway communities. Visions have been presented as prospective success stories. They populate generations of handbooks of good practice. They affect policies, they shape behaviours and markets. Yet, with an attendant discourse mostly phrased in the future tense, the very making of sustainability, and the imprints it leaves as it unfolds in time are mostly left unexplored.

The meanings associated with key constructs like nature, environment, and human development change over time and across communities. They inspire forms of design thought to be sustainable, with other sources of agencies then contributing to shape the articulation of the vision, the translation into material, and its mediation. When the genealogical connection that links a fleeting expression of sustainable design and the worldview that informed it is eroded by further historical change, its products are left surviving, still justified by their very existence, by the thing power they are able to shift. These products include policies, spaces for inhabitation, behaviours, artefacts, and common perceptions. Out of custom or practice, policies and perceptions might favour a more or less labour-intensive form of manufacturing, recycled materials over

unprocessed ones, or slower life cycles instead of faster ones. It is an appropriate objective of the design history of sustainability to recover and interpret those genealogical lines that past visions of sustainability descended over time.

This dissertation aims to be a cultural history of sustainable design in which the 'sustainability project' is treated less as a teleologically incremental undertaking than a dynamic and constantly shapeshifting cultural trope. In other words, the focus is not on how the idea of sustainability progressed over time, but on how the several visions for sustainable design that existed and coexisted over time can be read as documents in their own right. Approaches to sustainable design that were proposed and implemented in the past can still function today as documents of the life from which they emerged, and maps of the topography of the context that shaped them. Therefore, the guiding principle in the following pages will involve to not discriminate between practices and approaches to sustainability and to assess which one is more credible, or even coherent. And neither will it to be measure the extent to which the expectations placed on design in the age of the environmental crisis were met.

In the following chapters I will instead examine a series of visions that made sustainable design and situate them in their specific time and place in order to read them as meta-documents of cultural change. The time frame the dissertation covers starts from the period when environmentalist awareness reached a critical mass in the early 1970s. Despite the massive, matter-of-factly unchartable mass of literature on the theory and practice of sustainability, as a subject of study in design history it still has not received much attention. Kjetil Fallan in a recent article wondered why sustainability still represents a 'glaringly white spot on the design historical map, still awaiting its scholarly historicization', despite being 'an essential parameter in all design practice, education, research and mediation'.[1] Design history is otherwise a discipline that has been very productive over the last four decades. The Design History Society, one of a few international academic organizations connecting scholars in the field, has been active in covering through its annual conferences a num-

[1] Kjetil Fallan, 'Our Common Future: Joining Forces for Histories of Sustainable Design', *Tecnoscienza* 5, 2: 16.

ber of themes that were still relatively unexplored from the perspective of design history. These included broad methodological and theoretical perspectives such as post-colonialism, actor-networks, as well as more specialist subjects such as the history of utopias, design for war and peace, and sport as driver of design change. In 2017, the society will fill this gap through a special issue of the *Journal of Design History* that explores the fertile ground between environmental history and design history, and a conference that invites new research specifically on the relationship between design, nature, environment, and sustainability.

There are two strands in the existing literature that can be read as first forays into this uncharted territory. The first one is formed by publications that promise to consider sustainability in the historical perspective, and yet end up looking at the past only selectively. Their authors typically choose a series of experiences or practitioners that might represent a model to follow, and go on to explain why they are still relevant for our day. This canon-making leads to renewed calls on the readers to heed the past warnings and make good for the future. In a way, the raw material of these publications is the image of the future as it was strived for in the past. But instead of dwelling on this quite intriguing material, the authors insist on comparing the present to that past image. The outcome is often embittered by this comparison between promise and real delivery. The second strand is formed by publications that are very relevant in terms of subject, but are written with a defined focus on art or architecture, and do not easily represent a starting ground from which design history can get traction. As Fallan notes, the 'two discourses—design and architecture—certainly have commonalities and points of convergence—but they are by no means interchangeable'.[2] The same can be said about fine arts.

The Handbook of Design for Sustainability, edited by Stuart Walker and Jacques Giard, provides two recent examples of the first category.[3] It includes a whole section on 'Theoretical and Historical Perspectives', with at least two texts that promise an historical perspective. One of the two is a chapter by Ja-

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[2] Fallan, 'Our Common Future', 6.

[3] Stuart Walker and Jacques Giard, *The Handbook of Design for Sustainability*, Bloomsbury, London, 2013.

nis Birkeland, who writes about how 'the grassroots sustainability movement keeps springing back' despite 'the total increase in energy and material flows and increasing disparity of wealth' showing that things since the emergence of the movement in the 1950s have only got worse.[4] For Birkeland the conditions are infertile for sustainability to succeed, despite the tenacity of the environmentalists, because of the persistence of a hierarchical dualist paradigm in 'all dimensions and fractals of society'. This hierarchy 'refers to the qualities associated with the conceptions of the masculine, such as strong and authoritative [and] defined by opposition to their softer counterparts.'[5] On the basis of this fundamental dichotomy, Birkeland then develops her dualist reading of the history of the ideas in the second half of the 20th century, in which she locates the normative forces that disempowered and oppressed the voices that spoke for sustainability by defining them as 'soft' and therefore idealistic or unrealizable. Examples of 'hard' ways to respond to the environmental crisis that overshadowed grassroots, communitarians and other 'soft' approaches include the narrative of the techno-fix, and the refocusing of sustainability on economic issues. Thy also include the very idea of sustainable development, as in the Brundtland Report,[6] and the fallacious 'idea that nature and development should be balanced in a closed system'.[7] Birkeland proposes a way out of this impasse through a 'paradigm shift' and urges the reader to start thinking in terms of open systems to consider the boundary between nature and manmade as permeable. She maintains this 'Positive Development' would be a non-

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[4] Janis Birkeland, 'The Emergence of Design for Sustainability: And Onward and Upward…', in Walker and Giard, *The Handbook of Design for Sustainability,* 73-74.

[5] Birkeland, 'The Emergence of Design for Sustainability', 76.

[6] World Commission on Environment and Development, *Our Common Future*, Oxford University Press, Oxford, 1987. The document was the result of a three-year research by a commission headed by the Norwegian politician Gro Harlem Brundtland. The commission set out to 're-examine the critical issues of environment and development and to formulate innovative, concrete, and realistic action proposals to deal with them' (347) and defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (43).

[7] Birkeland, 'The Emergence of Design for Sustainability', 86.

zero-sum game resulting in an 'increase ecological carrying capacity and diversity'.[8]

In the same handbook, Dennis Doordan approaches the historical development of theories for sustainable design. Doordan finds the current definitions of sustainability, mostly influenced by the language of the Brundtland Report, lacking. He grants that the 'nature of sustainability [is] to escape easy definitions and definitive summations', but he emphasises that it should foremost involve accepting one's responsibilities.[9] He mentions a series of sources: Rachel Carson and the other pioneers of the 1960s made clear there are limits to the growth we can achieve before destroying the ecosystem; life-cycle analysis constantly gives us the data to confirm this; Walter Gropius and some others, Doordan adds, had an innate sensibility toward green design that did not need to be formulated as such. Doordan then concludes that a 'truly provocative theory of sustainable design will identify how design instigates, informs, and sustains the multidimensional efforts of a global community to advance the goal of wellbeing.'[10] Doordan suggests we focus on creating language that allow sustainability to actually take place. We should also nurture our 'spiritual dimension' and rely on it when making design to ask ourselves the right questions. From this point of view, he seems to agree with Birkeland and her soft/hard dualism, with the second term of the couplet having been in the course of modernization hegemonic. The suggestion to focus on the language is useful. As a matter of fact, translation is integral to the articulation of a vision, and as a consequence existing language is continuously invested with new meanings.

The other strand I mentioned at the beginning of this brief review includes to a handful of promising efforts that are however specifically focused on architecture or art only. In her introduction to the special issue of the *Design and Culture* journal on 'Sustainability's Prehistories' Panayiota Pyla makes important points by inviting all those concerned with design to constantly scrutinize the use of this 'magic word of consensus' and be aware of the agendas it

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[8] Birkeland, 'The Emergence of Design for Sustainability', 89.

[9] Dennis Doordan, 'Developing Theories for Sustainable Design', in Walker and Giard, *The Handbook of Design for Sustainability,* 58-59.

[10] Doordan, 'Developing Theories for Sustainable Design', 70.

might conceal. She argues that writing the history of sustainable design is an exercise that benefits the contemporary practice of design by offering keys to read the past experiences. But there is also more. According to Pyla, the history of sustainable design could also equip the larger field of historiography itself with a reconceptualized set of tools and methods, thanks to the opportunity it offers historians to re-read 'earlier conceptions of nature, ecology, environment, and sustainability.'[11] The rest of the special issue of *Design and Culture* that she edited, however, deals mostly with issues of sustainable architecture and conservation.

In *From Bauhaus to Eco-House*, Peder Anker builds a narrative that connects contemporary ecologically sustainable architecture to the Bauhaus.[12] In effect, Anker's aim is to show that eco-friendly architecture is a result of a century-long integration of science into design theory. This integration started with the exposure to biology and biocentrism that the exiled Bauhauslers were exposed while in London, through ecology and systems theory up to the inspiration drawn from space travel and the promise of interplanetary colonization. Anker's narrative from nature-inspired architecture to environmental engineering is compelling, though slightly deterministic. It provides a good example of a history of sustainable architecture that attempts to unravel the complexity of social networks of people, ideas, and places.

Similar things can be said about a book by James Nisbet that closely reads a series of land art and environmental installations conceived by US artists in the 1960s and 1970s.[13] Nisbet situates the artworks in their context, and declaredly attempts to use these artworks as primary sources, visual allegories that can express cultural change and even semantic drift of complex notions such as ecologies, environments and energy systems. The main inspiration for this interesting book is a 1976 essay by Raymond Williams on how 'the

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[11] Panayiota Pyla, 'Sustainability's Prehistories: Beyond Smooth Talk—Oxymorons, Ambivalences, and Other Current Realities of Sustainability', *Design & Culture* 4, 3, 2012: 276.

[12] Peder Anker, *From Bauhaus to Ecohouse: A History of Ecological Design*, Louisiana State University Press, Baton Rouge, LA, 2010.

[13] James Nisbet, *Ecologies, Environments, and Energy Systems in Art of the 1960s and 1970s*, MIT Press, Cambridge, MA, 2014.

ideas of nature' change over time, which is particularly popular with environmental historians, and whose conclusion is useful to mention here as well. Williams examines the way 'nature' was constructed and represented in time, and how '[m]en come to project on to nature their own unacknowledged activities and consequences.' Nature was represented in different times and places as singular and abstracted; it was a 'selective breeder' in evolutionary thought in the 18th and 19th centuries; it is seen today as absolute wilderness, i.e. to represent all that was not touched, not spoiled by man. The latter category introduces the most remarkable part of Williams essay. When he reconstructs the narrative of human activity as an activity in which a pure nature is processed into products for use and byproduct in forms of waste and nature blight, he extends the parallelism to immaterial endeavours as well. Also the creation and maintenance of society, which consists in the entertaining of 'relations between men and men', is a product that brings its own byproduct. And this byproduct is the very cultural separation between manmade and natural. Society, in other words, is the very origin of the alienation from nature and the manmade-nature dualism.[14]

While Williams was writing his essay, some radical fringes of the counterculture were abandoning cities and communes in acts of 'voluntary primitivism' that involved rejecting not only the amenities and appliances of a standard middle class home, but even the concept itself of a human dwelling, preferring to live solitary existence in groups of a handful of individuals. The story is recounted and contextualized by Felicity Scott in her ample *Outlaw Territories*.[15] It seems to me the experience of these 'voluntary primitives' are the perfect corollary to Williams's essay.

Tony Fry, who wholesomely dismisses the project of design history, is in a class of his own. According to Fry, who over two decades dedicated several volumes to the definition of sustainability, design history has chosen a point of view from which it is structurally incapable to cast light on the making of sus-

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[14] Raymond Williams, 'Ideas of Nature', in Raymond Williams, *Problems in Materialism and Culture*, Verso, London, 1980, 84.

[15] Felicity D. Scott, *Outlaw Territories: Environments of Insecurity / Architectures of Counterinsurgency*, Zone Books, New York, 2016, 126-131.

tainability. In Fry's view, the design history discourse is an instrumental to the legitimization of the existing design practice, thus turning subservient to the status quo. Ultimately, Fry maintains, design history is characterized by a 'particularist concern' and consequently it is innately doomed to fail to connect its object of analysis to the broader context.[16]

For the angle I gave to this dissertation I am indebted to Fallan. After reviewing the existing sparse literature in the design history of sustainability, and encouraging scholars active in other adjacent disciplines such as environmental or technological history to take part to this exploration, Fallan eventually proposes a possible way forward in tackling this vast, open landscape. One point of approach to start mapping the territory and striate it 'could be to focus attention on how sustainability has been envisioned and visualized in the history of design since the 1960s, and how these visions have varied between different (sub)discourses and arenas and changed over time.' He goes on to propose a three-tiered structure to interpret visions, listing ideological, pragmatic and popular ones. The three categories respectively refer to mediation of sustainability in: design education and research; professional design discourse; and mass-media and popular culture.[17]

For this initial foray into the territory, I have chosen cases that represent all these three often overlapping categories. I will describe the cases in more detail later while giving an outline of the chapters forming the thesis. First, I would like to spend some words on the framework of analysis that I have chosen to understand sustainability and its visions for the intents and purposes of this dissertation.

A framework for sustainability: opportunity and risk

Writing in 1993, halfway between the time when the sustainability discourse reached a critical mass at the end of the end of the 1960s and our present day, the design historian Pauline Madge recognizes that the first and perhaps major hurdle anyone who sets out to examine the subject will meet is the shapeshif-

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[16] Tony Fry, *Design Futuring: Sustainability, Ethics and New Practice*, Berg, Oxford, 2009, 122.

[17] Fallan, 'Our Common Future', 24.

ting fluidity of the concept itself. Madge considers the 'great wave of environmentalism which emerged as a distinct social, political—and design—movement for the first time in the late 1960s and early 1970s' as the hatching ground for phenomena that might have a more social emphasis, such as the 'alternative design' and 'design for need' of the 1970s, or a more ecologically conservationist one like 'eco-design' and 'green design' in the 1980s.

Madge also acknowledges that 'sustainability' had risen in popularity to become 'the buzz word of the second wave of environmentalism,' which chronologically corresponds to the second half of the five-decade period at which I am looking. The term sustainability was popularized by the publication of the Brundtland report *Our Common Future* in 1987.[18] For its fortune, the term sustainability is indebted precisely to its semantic inclusivity. With its lexical stem conveying the meaning of surviving leisurely—and not used as an adjective in combination with the growth-oriented noun 'development'— it is a box that is able to include approaches on all points of a continuum of ways to understand risk and propose material solutions, from degrowth to sustainable development.

Historically, the interest for the issues that can be stacked under the rubric of sustainability reaches a critical mass during the 1960s. This happened in parallel with the emergence of dependency theory, world-systems theory, and cultural critiques that were directed specifically toward modernization and the features of modernization that were perceived to sustain or promote inequality and exploitation.

Dependency theory was developed between 1950s and 1970s as to explain the situation of economic stagnation experienced by Latin American countries in the 20th century, in particular Brazil, Argentina and Chile. The theory uses the centre-periphery polarity to explain that world economy is systemically biased against underdeveloped countries, that are assigned a secondary role in the international division of labour. The countries on the periphery find themselves locked in the position of providers of raw materials, while the centre preserves the monopoly on added value through the monopoly on in-

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[18] Pauline Madge, 'Design, Ecology, Technology: A Historiographical Review', *Journal of Design History* 6, 3, 1993: 149.

dustrial manufacturing. In design history and theory, the main interpreter of dependency theory is Gui Bonsiepe, who was educated at the Ulm School of Design and spent most of his career in Brazil, after briefly working in Salvador Allende's Chile before the Pinochet coup in 1973. In contrast to other designers committed to empowerment through design like Victor Papanek, Bonsiepe believed that economic development and industrialization would take place with the weakening of the current dependency system.[19]

World-systems theory was chiefly developed by the sociologist Immanuel Wallerstein. It shares the same vision of the world polarized between a hegemonic centre and a large periphery, and it postulates that this model is a social construction, with a history and collective authorship. It develops on this consideration a more complex frame of historical analysis in which the role of the centre has been assumed by different countries throughout history, such the Netherlands, England, and the US. The theory specifically aims to correct the ingrained views that are the result of modernization theory, in particular: its focus on the nation state as the only unit of analysis; its assumption that there is a linear path of economic development that applies to every country; and its consequent disregard for the structural persistence of historical and transnational constraints to local development.[20]

Also: the self-evident fact of the unfolding environmental crisis provided a mirror experience effect. Well into the 20th century, the limits of modernization and rationalization became visible through the negative image left by their material byproduct. This darker aspect of modernization triggered doubts

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[19] Gui Bonsiepe, 'Precariousness and Ambiguity: Industrial Design in Dependent Countries', in Julian Bicknell and Liz McQuiston, *Design For Need: The Social Contribution of Design*, Oxford: Pergamon Press, 1977. The book is an anthology of papers presented to the 'Design for Need' symposium organized by Icsid (International Council of Societies of Industrial Design) and held at the Royal College of Art, London, in April 1976. See also James Fathers, 'Peripheral Vision: An Interview with Gui Bonsiepe Charting a Lifetime of Commitment to Design Empowerment', *Design Issues* 19, 4, 2003: 44-56.

[20] Immanuel Wallerstein, The Modern World-System, vol. I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century, Academic Press, New York, 1974. More recently: Immanuel Wallerstein, World-systems Analysis: An Introduction, Duke University Press, Durham, NC, 2005.

whether it could actually accomplish the radical pictures of human and technological progress that had been given for granted during the first half of the century. The German sociologist Ulrich Beck believed these very doubts embody the emergence of a conscience of modernization, a development which he termed 'reflexive modernization':

> The concept of risk is directly bound to the concept of reflexive modernization. *Risk* may be defined as a *systemic way of dealing with hazards and insecurities induced and introduced by modernization itself*. Risks, as opposed to older dangers, are consequences which relate to the threatening force of modernization and to its globalization of doubt. They are *politically reflexive*. [21]

These doubts were fed by the visible consequences of an industrial development that involved a set of risks and hazards unlike any that had been faced before. These risks and hazards easily cross distances of time and space, political and generational boundaries, making it impracticable to hold anyone accountable for them because of the way governance is structured within corporations. It is equally difficult to compensate those whose lives had been affected because they live on other parts of the planet, or they belong to a future generation.[22] Provided there is space in a society for individualism and freedom from constraints of expression and choice, according to Beck, then this reflexivity is a natural evolution. In fact, Beck explains further, it is a radicalization of modernization; it is the process through which the vectors of modernization redistribute risk across its network to the same extent to which they aim to redistribute other material and immaterial goods. This continuous process of negotiation of risk is what Beck calls 'risk society.' This conviction sets Beck apart from other critics of modernization such as Michel Foucault or Theodor Adorno, and furnishes his thought with a distinct aspect of operativeness. This form of self-scrutiny would make possible to adjust the trajectory of modernization and diffuse tensions.

Thus, the emergence of sustainability can be seen to embody either or both a mature phase of modernization developing a critical conscience, and a

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[21] Ulrich Beck, *Risk Society: Towards a New Modernity*, Sage, London, 1992 [1986], 21. Italics in the original.

[22] Beck, *Risk Society*, 40ff.

criticism of modernization because its model creates and reinforces relations of exploitation across linear trajectories, and neither has this model improved with time. In design, according to Madge, the unifying issue at the core of sustainable design is indeed the demand for change in lifestyles. As time passes, she maintains this radicalization has only become more evident.[23] However, I believe that focusing on the the extent to which the demands made under the banner of sustainable design are radical would not allow to include also the positions that are informed by the Brundtland Report, which has informed a vast range of projects and discussion, despite being liable to pass as 'soft' or 'domesticated' sustainability. I believe that considering the question how much risk as a society we for comparing the various approaches to sustainability.

On one side of this spectrum, there are approaches that treat the environmental problems like an existential threat to life on the planet, and the global inequality problem of as a result of unsustainable exploitation and economic imperialism. As a consequence, they advocate zero economic growth or even degrowth, i.e. a controlled return to previous levels in industrial output at least in the global North, and a change in the measurement of prosperity from quantitative indicators like volume of exchange and gross domestic product to qualitative ones, like levels of happiness and individual development. One of the first thinkers to articulate this radical programme was André Gorz, a precursor of political ecology, who as early as 1972 posed the question '[i]s the earth's balance, for which no-growth—or even de-growth—of material production is a necessary condition, compatible with the survival of the capitalist system?'[24]

Gorz was convinced of the necessity for degrowth by the work of the economist Nicholas Georgescu-Roegen, who in his treatise *The Entropy Law and the Economic Process* analysed economics through the lens of thermodynamics. Georgescu-Roegen believed the principles of thermodynamics and the laws of entropy were ultimately relevant to economic analysis too because humans do not create or destroy anything through production and consumption,

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[23] Pauline Madge, 'Ecological Design: A New Critique', *Design Issues* 13, 2: 1997: 53-54.

[24] André Gorz, quoted in Giorgos Kallis, Federico Demaria, and Giacomo D'Alisa, *Degrowth: A Vocabulary for a New Era*, Routledge, New York, 2015,

they merely shape matter and convert energy from one form to another.[25] The point of arrival of Georgescu-Roegen's analysis was that, all other factors held constant, population pressure and technological progress alone would be enough to bring about the end of mankind, because the carrying capacity of the Earth, the planet's capacity to sustain human population and consumption, is finite and therefore constantly decreasing. Georgescu-Roegen predicted economic growth would continue until collapse would be inevitable at some point in the future. The following year, the global think-tank Club of Rome commissioned a computer simulation to corroborated Georgescu-Roegen's hypothesis and establish with a degree of mathematical certainty when this collapsing point would arrive in the future. The results of the simulation were published in the book *Limits to Growth* that further popularized the image of planetary limits, and the notion of humanity overshooting these limits.[26] The computer model developed for the simulation, world3, used system dynamics theory and played out an interaction of several systems including population, industrial production, and non-renewable resources. The interaction projected most minerals and fossil fuels on which production and consumption modes were based in 1972 would become exhausted within the first quarter of the twenty-first century.

Also in 1972, *The Ecologist* magazine published a special issue called *A Blueprint for Survival,* which was also denounced the impact on the environment caused by the combination of human numbers and per capita consumption inherent to the current model of exponential growth: '*Indefinite* growth of whatever type cannot be sustained by *finite* resources. This is the nub of the environmental model.'[27] The editors of *The Ecologist* predicted disruption of ecosystems, failure of food supplies, exhaustion of resources, and eventually collapse of society. As a matter of fact, they explained, society was destined to be disrupted. This would either happen by accident if no action was underta-

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[25] Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process*, Harvard University Press, Cambridge, MA, 1971, 280.

[26] Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens III, *Limits to Growth*, Universe, New York, NY, 1972.

[27] The Editors of *The Ecologist, A Blueprint for Survival*, Penguin, Harmondsworth, 1972, 16-17.

ken, or by design in order to avoid a violent breakdown. In their report they listed the changes that were necessary. Specifically talking about the manufacturing, they maintained that

> the accent would [have to] be on quality rather than quantity, which means that skill and craftsmanship, which we have for so long systematically discouraged, would once more play a part in our lives … A society devoted to achievements of this sort would be an infinitely more agreeable place than is our present one, geared as it is to the mass production of shoddy utilitarian consumer goods in ever greater quantities.[28]

Barbara Ward and René Dubos used comparable language and arguments in their co-authored volume *Only One Earth*, the unofficial report commissioned by the Secretary-General of the 1972 United Nations Conference on the Human Environment in Stockholm in preparation of the symposium.[29]

For Gorz, the struggle against the exploiter of the natural environment is tantamount to a long-term struggle against exploitation of the fellow human. As such, engagement against environmental injustice can achieve radical goals and its momentum has to be preserved. A normalized form of ecology, warns Gorz, might gain traction in the public sphere and 'throw up obstacles to capitalist development and force a number of changes', but 'when, after exhausting every means of coercion and deceit, capitalism begins to work its way out of the ecological impasse, it will assimilate ecological necessities as technical constraints, and adapt the conditions of exploitations to them.'
Therefore, in an article originally published in 1974 on the 'two kinds of ecologies', he warns against the domestication of the ecological struggle in these terms:

> Ecology is like universal suffrage or the 40-hour week: at first, the ruling elite and the guardians to social order regard it as subversive, and proclaim that it will lead to the triumph of anarchy and irrationality. Then, when factual evidence and popular pressure can no longer be denied, the establishment suddenly gives way—what was unthinkable yesterday becomes taken for granted today, and fundamentally nothing changes. … It is

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[28] Editors of *The Ecologist, A Blueprint for Survival*, 66-67.

[29] Barbara Ward and René Dubois, *Only One World: The Care and Maintenance of a Small Planet*, Andre Deutsch, London, 1972.

> therefore time to end the pretense that ecology is, by itself, sufficient: *the ecological movement is not an end in itself, but a stage in the larger struggle.*[30]

Instead, Gorz advocates a clean break with the 'ideology of growth'. The material environment he imagines at the other side of this break is characterized by three processes: access to tools and goods is shared, and therefore exchange results in accumulation of social capital instead of profit-making; life cycles of objects are slowed down, with the objective of emphasizing the phase of use rather than the phase of manufacturing; craft, do-it-yourself, and repair are actively encouraged, with the result of increasing the participation of the user in the design process:

> Imagine a society based on these criteria: the production of practically indestructible materials, of apparel lasting for years, of simple machines which easy to repair and capable of functioning for a century or more … Imagine beyond this that the major industries, centrally planned, produced only that which was required to meet the basic needs of the population: four or five styles of durable shoes and clothing, three or four models of sturdy and adaptable vehicles … Each neighbourhood, each town would have public workshops equipped with a complete range of tools, machines, and raw materials, where the citizens *produce for themselves, outside the market economy*, the non-essentials according to their tastes and desires.[31]

On the other side of the sustainability spectrum there are approaches that still recognise the existence of problems of environmental degradation and economic imbalance. However, the response to these problems in their case is to emphasize the opportunity that is structurally inherent to any risk. Rather than the opportunity for political change, however, these approaches interpret risk as an opportunity for economic expansion. The pivotal issue is thus again growth. As Peter Bernstein demonstrated in his cultural history of risk management, the development of instruments aiming to convert uncertainty and ha-

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[30] André Gorz, *Ecology as Politics*, South End Press, New York, NY, 1979 (1975), 3; italics in the original.

[31] Gorz, *Ecology as Politics*, 9; italics in the original. Gorz drew the ideas of tools that by exchange increase social capital instead of generating profit from another founding thinker of the degrowth movement, Ivan Illich. See Ivan Illich, *Tools for Conviviality*, Marion Boyars, London, 2001 [1973].

zard into profit-making is a key element 'of the energy that drives the economic system forward' and a central feature of modernization.[32] This is how a recent book on environmental management describes the 'natural tension between "green opportunities" and "green threats" to a business':

> Businesses face an ever-changing world of opportunities and threats. Environmental concerns are an integral part of this ever-changing world, and almost every business will have to deal with a growing list of such environmental concerns. Businesses need to understand where and how to respond to environmental challenges and problems, government regulations and interventions, and pressures from stakeholders. They also need to see where environmental issues open up new opportunities for markets and technologies.[33]

Obviously, the two sides of the spectrum do not interact well, and in fact the proponents of 'true' sustainability accuse corporations and governments to 'hijack sustainability' in order to continue pursuing their own agendas, sometimes to an unwittingly comical extent as in the examples reported by Adrian Parr in *Hijacking Sustainability.* Parr's study was one of the first ones to provide a close reading of how sustainability has been used as a communication genre by actors as diverse as political institutions, Hollywood celebrities, and even the US Armed Forces. It described sustainability as a 'buzzword on everyone's lips.' Even if it is not an ideology, for Parr sustainability 'is turning sustainability into a cultural hegemonic'. He sees in this hijacking and continuous repetition a convergence of popular culture and the sustainability movement that in fact 'provided the corporate world with new opportunities to resituate their products and services within the competitive global market'.[34]

Proponents of zero-growth sustainability dismiss the practice of 'greenwashing' as a corporate communication genre and insist on the paradox of governments or corporations presenting an sustainable programme while operating under the umbrella of growth economy. One of the earliest episodes in

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[32] Peter L. Bernstein, *Against the Gods: The Remarkable Story of Risk*, Wiley, New York, 1996, 3.

[33] Werner Antweiler, *Elements of Environmental Management*, University of Toronto Press, Toronto, 2014, 32.

[34] Adrian Parr, *Hijacking Sustainability*, MIT Press, Boston, MA, 2009, 15.

the history of this apparent hijacking of sustainability is the proclamation of the environment as a 'national mission for the seventies' by the administration of US President Nixon, who established the Environmental Protection Agency (EPA) and widely used the theme of the environment in its public communication:

> In the year 1980, will the President look back on a decade in which 70% of our people lived in metropolitan areas choked by traffic, suffocated by smog, poisoned by water, deafened by noise, and terrorized by crime? The great question of the 1970s is, shall we surrender to our surroundings, or shall we make our peace with nature and begin to make reparations for the damage we have done to our air, to our land, and to our water? Restoring nature to its natural state is a cause beyond party and beyond factions … It is a cause of particular concern to young Americans, because they more than we will reap the grim consequences of our failure to act on programs which are needed now if we are to prevent disaster later.[35]

Many were sceptical of Nixon's administration's real objectives, and dismissed this governmental environmentalism as a distraction strategy in a moment when the citizenship was highly divided on issues like the civil rights movement and the Viet Nam war. Reinhold Martin observes that Nixon's call heavily borrowed from mainstream environmentalism and its imagery of a universal human as temporary dweller of a planet that was to preserve for future generations. Its language had völkish undertones to it, with its emphasis on 'us,' 'common goal,' and 'our environment.' It indeed seemed 'to force this people together as a unified subject,' in a moment when the citizenship was sharply polarized. In fact, Martin argues, both 'architecture discourse' and Nixon were calling forth the same idealized 'human subject'.[36] Nixon was doing

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[35] Richard Nixon, 'Annual Message to the Congress on the State of the Union', *Nixon Foundation*, https://www.nixonfoundation.org/1970/01/state-of-the-union-1970 (accessed 15 January 2016). Nixon maintained that the same technology that created the problems would solve them, thus offering one of the first iterations of the idea of the techno-fix: 'The unexpected consequences of our technology have often worked to damage our environment; now we must turn that same technology to the work of its restoration and preservation.' Richard Nixon, 'A Statement from President Nixon', in The Editors of *Fortune* (ed.), *The Environment: A National Mission for the Seventies*, Harper & Row, New York, 1970.

[36] Reinhold Martin, 'Environment, c. 1973', *Grey Room* 14, 2004: 79.

so to 'integrate' this subject 'into a sociopolitical totality', and architecture discourse to claim its transcendence with respect to contemporary discourse.

Martin refers in particular to architects like Peter Eisenman, who attempted through the retreat into an extremely formalist visual language to remove his work from the flux of the current events and find there sanctuary. Martin shows that these attempts, as much as Nixon's environmental policy and his policy to end the convertibility of the US dollar to gold in 1971 are comparable expressions of the same historical process. Environmental risk, as any kind of risk in Beck's theory, is not directly observable. It must be enounced within and through the grid of a signifying system, like statistics or chemistry. But this very sign system, Martin adds, can be 'refunctioned economically … for example, in the case of both oil consumption and exploration.'[37] The historical trend that Martin identifies is a separation between sign and meaning, and the multiplication of opportunity this ungluing brings forth. It is the opening of new land for development. The deduction is that in Beckian terms every risk is treated as capable to return profit in capitalism. In effect, Martin elucidates, '[a]s Michael Hardt and Antonio Negri have pointed out, at precisely that moment when the assessed risk of impending ecological crisis points to an outer limit to the exploitation of the physical environment, the self-perpetuating "ecology of capital" also turns inward, toward the reflexive circulation and exchange of signs themselves … when there is nothing left to consume, capital consumes itself'.[38]

Victor Papanek's position was somewhere in the middle of the risk-growth gradient of proportionality. He saw the deterioration of the ecosystem as an existential threat, and economic imbalances as unsustainable, but his accusation is explicitly directed to designers. They are the main category responsible for the situation, and therefore they logically have to be the ones who will fix it. In *Design for the Real World* he acknowledged the pervasive ubiquity of the effects of design on human and natural environments and ascribed the responsibility for the current state of things to the whole design profession, and

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[37] Martin, 'Environment, c. 1973', 80.

[38] Martin, 'Environment, c. 1973', 95-96. The passage Martin refers to is in Antonio Negri and Michael Hardt, *Empire*, Harvard University Press, Cambridge, MA, 2000, 269-272.

condemned designers for their contribution to global exploitation, pollution, and repetitive consumption:

> Today, industrial design has put murder on a mass-production basis. By designing criminally unsafe automobiles that kill or maim nearly one million people around the world each year, by creating whole new species of permanent garbage to clutter up the landscape, and by choosing materials and processes that pollute the air we breath, designers have become a dangerous breed.[39]

The power of this rhetoric has been described as 'overwhelming.' Its crude persuasiveness is allegedly capable of driving students away from a career in design, and pressure those 'who stay to fight … to shore up their practice with robust empirical research'[40] in order to preemptively shield their work from criticism. Victor Margolin notes that Papanek's points were informed by 'an earlier diatribe on a similar theme by journalist Vance Packard, *The Waste Makers*'.[41] Other popular diatribes that might have contributed vivid images and data to Papanek were *Silent Spring* by Rachel Carson on the effects of industrial micropollutants on the biosphere;[42] and *Unsafe at Any Speed* by Ralph Nader on reluctance of car manufacturers to modify automobile design in order to improve drivers' safety.[43] Recently, however, it has been convincingly argued that in fact the original sources of inspiration to Papanek's activism and to the imagery of his *Design for the Real World* are to be found in the discussion on participatory design and the emergence of a pan-Scandinavian student design

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[39] Victor Papanek, *Design for the Real World: Human Ecology and Social Change,* Thames & Hudson, London, 1985 (1972), p. ix.

[40] Cameron Tonkinwise, '(Review) Environments, Natures and Social Theory: Towards a Critical Hybridity by Damian White, Alan Rudy & Brian Gareau', *Journal of Design History* 29, 3, 2016: 312.

[41] Victor Margolin, 'Design for a Sustainable World', *Design Issues* 14, 2, 1998: 83n. More on *The Waste Makers* in Chapter 1.

[42] Rachel Carson, *Silent Spring*, Houghton Mifflin Harcourt, Boston, MA, 1962.

[43] Ralph Nader, *Unsafe at Any Speed: The Designed-In Dangers of the American Automobile*, Grossman Publishers, New York, 1965.

movement in the 1960s. He was exposed to both while touring the Nordic region as a visiting lecturer at the end of the 1960s.[44]

Thanks to Papanek's skills as writer and charisma as educator, these notions in the 1970s had became increasingly attractive and capable to enrol energies and disciples. With its attention for categories of users until then overlooked, such as the disabled or the population of the developing countries, and its celebration of low technology, Papanek's book, as Victor Margolin put it, 'struck a sympathetic chord with many practicing designers and students who were looking for some alternative to designing more products for the consumer culture.'[45]

Outline of the dissertation

The dissertation opens with a study of the visual culture of the environmental crisis during the 1960s, with the development of a visual and cultural trope of a flood that threatens to go out of control. This material multitude takes the form of spills overflowing from the domain of the manmade to the natural environment and vice versa: industrial catastrophes, environmental disasters. The flood of matter also takes the form of a flood of consumer items entering the domestic sphere, and surviving in their afterlives as their negative image, the pile of garbage that invades and erases nature. The primary sources for the chapter are two snapshots from the visual culture of the environmental crisis are provided as examples. The first one is the history of the cover designs of one of the most popular anti-consumerist diatribes of the 1960s, *the Waste Makers* by Vance Packard. The other one is the development of the 'Keep America Beautiful' campaign over the course of the same decade. Both visual stories exemplify the gradual change that environmentalist discourse experienced, from being focused on littering and visual pollution to deeper issues of ecology and environ-

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[44] See Ida Kamilla Lie, '"Make Us More Useful to Society!": The Scandinavian Design Students' Organization (SDO) and Socially Responsible Design, 1967–1973,' *Design and Culture* 8, 3, 2016: 327-361; and Alison J. Clarke, '"Actions Speak Louder": Victor Papanek and the Legacy of Design Activism', *Design and Culture* 5, 2, 2013: 151-168.

[45] Margolin, 'Design for a Sustainable World', 83. More on the figure of Papanek within the context of development design in Chapter 3.

mental degradation. The visual stories are constructed for the human gaze, and as a result they construct the image of a nature that has to function as beautiful spectacle for the human eye. The trope of the rising flood functions as a device that triggers a sense of emergency and crisis, and collective mobilization as a response.

The second chapter studies the evolution of the concept of environment in design discourse, and its expansion from a notion borrowed to the field of cybernetics along with the concept of feedback, to a more general and inclusive term that by way of synecdoche comes to stand for first for the human environment and then the whole ecosystem. To pin down this re-articulation of the concept, I will examine a series of texts by Tomás Maldonado, a design theorist who intensely used the notion of environment in the period 1966-1975. Maldonado was associated with the Ulm School of Design for most of the existence of this institution, and was one of the main proponents of the discipline of 'environmental design', also through his activity as lecturer in the US and Italy. In the early 1970s, when the Nixon's administration announced its environmental policy, Maldonado was one of the most sceptical commenters. He dismissed the attempt to hijack the environmentalist cause as a 'fashion,' which risked to domesticate and disempower a real issue he termed the 'scandal of nature.' For Maldonado the 'scandal of nature' was intimately connected with the 'scandal of society,' that is the exploitation of the working class in a capitalist economy. The exploitation of the ecosystem was a systemic fact. He recognized the social system is one of several subsystems forming a planetary system. In a 1970 treatise, Maldonado argued that solving the problem of exploitation was however something that design could not do on its own, and believed the political process had to be reformed first. By the mid 1970s, Maldonado was using the same theoretical framework of analysis of the environmental crisis, but after observing that environmentalism was no fleeting fashion, had changed his stance and urged designers to act autonomously. The existential treat was real, Maldonado argued, and action was urgently required because the social system was the only one able to existentially disrupt the whole by making life on the planet impossible.

The third chapter focuses on how the notion of appropriateness came to be embraced in the context of the emergence of development design and intermediate technology in the context of development cooperation during the 1970s. The chapter focuses on two organizations and charts their progress from a linear modus operandi, to a plurality of possible iterations of the notion of design and technology, guided by the notion of appropriateness. The organizations are the International Council of Societies of Industrial Design (Icsid) and the Intermediate Technology Development Group (ITDG). Icsid started engaging with the area of sustainability at the very beginning of the decade, albeit initially its activities were only focused on the finding solutions in case of humanitarian emergencies. Progressively during the course of the 1970s the organization incorporated Papanek's vision and started collaborating with the United Nations Industrial Development Organization (UNIDO). The partnership climaxed in 1979 with a conference held in Ahmedabad, India, and a declaration that was positively influenced by Papanek's ideas. The ITDG, originally founded by E. F. Schumacher in 1965, started running development cooperation projects in the global South at the beginning of the 1970s, originally designing solutions for the developing countries from its UK offices.

The term 'planned obsolescence' was coined and re-coined twice in the course of the 20th century, both times with the positive connotations of a constructive proposal, first during the economic depression of the 1930s and then during the years of the economic expansion after the Second World War. The second time around it was quickly seized upon by critics of consumerism, and it is still today pronounced to instigate indignation in the audience, indignation at cynical practises in common use among corporations that aim to lure customers in, and make them into repetitive consumers. The common perception is that the idea of artificially predetermining product lifespan is an integral feature of market economies and capitalist modes of manufacturing. The fourth chapter questions this narrative by focusing on the debate on durability that took place between 1973 and 1979 in East Germany, a plan economy, and the theoretical and practical responses that the debate generated. One project by Karl Clauss Dietel, the designer who started the debate, is the design of a motorcycle that he used to explain his idea of the 'open principle.' The project is

based on the same relation of proportionality between design openness and longevity one can see in contemporary and later projects conceived in the context of market economies.

Since the discourse on sustainability gained critical momentum in the early 1970s, throwaway culture has become synonymous with unsustainable lifestyles. The sixth chapter studies the rise of repair cultures over the last two decades and the worldview that they assume or explicitly declare. It identifies a genealogical connection with the 1960s countercultural trope of appropriating technological methods for one's own purposes, and presents an overview over a series of experiences in the recent history of repair activism, from grassroots groups of amateurs to institutional projects curated by design museums. The chapter contrasts to the countercultural line of descent, the contemporary meanings associated to repair activism, which tend to reveal a vision in which the present is 'broken' and the past is fetishized as a legendary golden age. The chapter then concludes with a theoretical framework in which Agamben's treatment of the apparatus is used to explain the deeper implications of brokenness.

Finally, the sixth chapter addresses the question of the construction of the wild and the natural as inherently sustainable. The primary source of the chapter is formed by a series of objects made by humans and non-humans such as animals or plants. The artefacts were collected in the Amazon forest and developed through a participative methodology. The chapter uses an analytical framework developed by Claude Lévi-Strauss in his book on *The Savage Mind* (1962). In the book, Lévi-Strauss refers to two types tool-making behaviour, which he terms 'savage mind' and 'engineer mind'. The terms are often misunderstood as consecutive stages in a linear history of technological advance, with the engineer mind being the more refined and sophisticated way to utilize knowledge in order to solve material problems. In fact, the two modalities are not stages but aspects that coexist, and a close reading of the objects to which the chapter is dedicated reveals that these two aspects not only can occur in non-human things as well.

Fig 1. Techno-fix? A Pace College student in a gas mask ‘smells’ a magnolia blossom in City Hall Park on Earth Day, April 22, 1970, in New York. (AP Photo)