Environmental Histories of Design

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Soft Control Material: Design and Environment, c. 1970

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Soft Control Material was developed in 1972 by Ecology Tool & Toy, a tech startup founded in 1970 by psychiatrist Warren M. Brodey and cybernetician Avery R. Johnson (both of whom were affiliated with MIT at the time). Soft Control Material was not a singular design object, but was, rather, a suite of interdependent technologies—high and low, digital and analog— comprising a sponge-like material made from foam and/or Freon filled bladders, special types of valves, and various articulated cladding surfaces. The Freon in the bladders would react to ambient temperature changes (from the sun or contact with an organic body) and expand or contract accordingly, causing the surface of the structure to change, or "breathe," or "respond" to various inputs. Though its inventors foresaw a number of applications for SCM (mainly various types of furniture), it was ultimately conceived as a self-organizing, biomimetic metastructure (both tool and toy) for effecting new types of human-environment communication; a "medium" that might, in Brodey's words, "provide instantaneous feedback and thereby allow infolding with time, memory, energy, [and] relation." These, in turn, would effect for the subject a virtuous topology of environmental discovery, new types of ecological and "inter-species" relationships, and, ultimately, a conscious evolution of humanity.

Though no physical traces of SCM remain, its articulation within a certain disciplinary and historical moment is exemplary of the way in which design was reconceived in relation to ecology and emerging theories of environment around 1970. Here, design activity moved away from the production of discreet objects, toward the techno-aesthetic manipulation and optimization of interfaces between the subject and its milieu.
The proposed paper will describe the conception of Soft Control Material and relate it to contemporary theoretical formulations of environmental ontology by Bruno Latour, Jane Bennett, Timothy Morton, and others.

Designing Life Cycles: Lifespans of 20th Century Consumer Technologies

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Next to the choice of materials and technical layouts, questions of durability, repairability, and lifespans determine a product‘s sustainability. While energy and to some degree, also resource efficiencies have risen during the last decades, such efforts have been more than counteracted by short life cycles as they characterize in particular the field of consumer and communication electronics (e.g. cell phones).

The paper puts product lifespans into the foreground of any environmental history of design. Lifespans must be analysed as a critical nodes where consumers‘ and producers‘ spheres intersect, with designers figuring as critical mediating agents. On one hand, engineering, design and marketing departments shape product lifespans when deciding on „hard facts“ such as material durability or means of maintenance and repair, as well as deciding on „soft facts“ such as fashion and appearance. On the other hand, consumers also shape lifespans through purchase and use behaviour or by creating niches for a product‘s „second life“.

Next to these theoretical considerations, the paper gives an overview on 20th century discussions on lifespans and its contested version of planned obsolescence, as they appeared inside public discourse and inside design discourse. Public discourse on (too) short lifespans accompanied the development of mass consumer society and it became widely known through Vance Packard‘s bestseller „The Waste Makers“ (1960). In the 1970s, Victor Papanek argued for an alternative design, and by the 1980s, lifespans and the question of planned obsolescence also entered political discourse in the context of an increasing awareness for scare resources.

Besides, some concrete examples of designing life cycles shall be discussed. Up to now, we only have vague examples on shortening lifespans through design that are iterated also in recent research such as Giles Slade‘s *Made to Break*. They include the light bulb, General Motor‘s yearly model change, nylons, the pocket transistor radio, and today‘s cell phones with their nearly yearly model turnover. But did the lifespans of e.g. the average car or vacuum cleaner change over the 20th century and in what ways? What was the role of producers, designers, and consumers in this process? The average washing machine of the 1970s, for instance, lasted for around 10 years, radios for about 6 to 15 years, and today’s figures suggest similar intervals. But it is hard to compare these figures to the early 20th century when technical artefacts were not „blackboxed“ yet, so that users could easily replace components such as heaters or vacuum tubes.

The paper argues that we need more detailed empirical studies on lifespans to be able to turn the standard reproach of planned obsolescence into fruitful ways for novel, more sustainable designs. Moreover, the look back into history suggests that not only designers and producers, but also users will have to actively take over “designing” functions to reach such alternative designs.

Ecology and Counterculture in Italy: The Design Experience of Global Tools (1973-1975)

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In the early 1970s Italy, such as other European countries, was characterized by a great success of initiatives based on the need for a political and ideological interpretation of environmental issues and for their integration in a radical reform of social and economical processes. Protagonists of this period were a series of élites grouped around single intellectuals (such as the journalist Dario Paccino, author of the book *L'Imbroglio ecologico*, 1972; Virginio Bettini, translator of the Italian edition of *Il cerchio da chiudere* by Barry Commoner and Paul Ehrlich, 1972; and the university professor Giorgio Nebbia), magazines (such as the scientific review "Ecologia" founded in 1971; "Se" supplement of the design magazine "Abitare"; "Sapere" directed, from 1974, by Giulio Maccacaro; "Rosso Vivo" founded in 1974), and public organizations (the association Italia Nostra was founded in 1955 and had great influence on the public debate in the 1970s, the same period of the institution of the first Ministry of Ecology). Furthermore in 1972, the Club of Rome (founded in 1968 by Italian industrial Aurelio Peccei and the Scottish scientist Alexander King) published *The Limits to Growth* report, a study based on MIT computer models that simulated the relations between the earth's resources and the human population, which is today considered a milestone in the history of environmentalism.

On the other side, the growth of a common ecological awareness was facilitated by the communication network developed by the national counterculture, strongly influenced by the US environmental movement. This is mostly documented by the impact of magazines such as "Pianeta Fresco", founded by Fernanda Pivano in 1967, "Mondo Beat" (1966), "Provo - Onda Verde" (1966), "Stampa Alternativa", etc. Since then, topics of sustainability, preservation, pollution, appeared also in the most influential Italian architectural and design magazines ("Casabella", "Domus", "Rassegna", "IN", "Progettare Inpiù"), occupied, in the same years, by the projects and theories of the Italian Radicals. In particular "Casabella" (founded in 1928), under the directorship of Alessandro Mendini (issue no. 349, 1970 – issue no. 412, 1976), became the "radical media" promoting ideas and proposals of the movement.

Starting from the cultural background of the national history of the environmental movement and focusing on the spread of alternative forms of activism and ecological communication, the paper analyses a specific educational programme developed between 1973 and 1975 by the members of the Radical Architecture (including Ettore Sottsass Jr. and Andrea Branzi, among others), structured through a diffuse system of laboratories and fully documented in the pages of "Casabella". Although rarely studied by Italian design historiography, probably because it represents a sort of "Indian summer" of the Radicals that coincided with a crucial schism in the architectural and design Italian context manifested during the XV Triennale di Milano (1973), the experience of Global

Tools represents an emblematic experimental activity based on the concepts of sustainability, multi- disciplinarity, co-design and political and social engagement. The "teaching of crafts" was a pre- ecologist answer to the global crisis of the period expressed through the attention towards manual technics, materials and relative behavioural characteristics. The ecological connotation of "the school of non-architecture", the political and social implications (i.e. the protest against the capitalist system, the new vision of the user integrated in its environment), the attention towards the value of manual, minimal, plain techniques, the media and level of communication used, presented many links with the American counterculture debate that found an important output in Stewart Brand's *The Whole Earth Catalogue* launched in 1968 to promote technologies, materials and knowledge for spreading alternative forms of living.

The paper investigates the visionary dimension of this design programme through a comparison with contemporary forms of environmental counterculture and their impact on material culture (in particular the US one), studying the communication processes hidden behind the initiative and stressing the implications of such a model in training future designers. It is possible to reconstruct Global Tools' activities through an analysis of "Casabella" and other professional archives. This involves an investigation of the role played by Italian design magazines in building an ecological awareness in the country; the visionary connotation of this debate, manifested through the creation of utopian and dystopian visions of the human environment (visionary especially if compared to the contemporary development of a scientific method to look at the global future in terms of sustainability, documented for example in the short essay by Tomás Maldonado, *La speranza progettuale*, 1972); the heritage of this model within the Italian design educational system, in particular in the Florentine Design School.

Manufacturing the Raw: Examining the Conceptualisation of Nature and Natural Resources within Design Pageantries

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The study of International Exhibitions and World's Fairs offers invaluable historical and analytical insight into how nature and natural resources were displayed and conceptualised during the nineteenth and twentieth centuries. However, despite their ubiquity at these pageantries, raw material displays have been largely overlooked by academic scrutiny and are largely absent from interpretative models within design studies and environmental histories. Design history, for example, tend to favour the analysis of manufactured and luxury goods, fine arts, architectural feats, and industrial marvels when investigating how exhibitions provided an image of progress of, for and to the West since mid-nineteenth century.

Aiming to fill this scholarly gap and addressing the workshop's preoccupations with the emergence of environmental histories of design, my paper departs from the examination of specific case studies on raw materials displayed in

International Exhibitions to interrogate how discourses around design and nature have been constituted; how the future of Western industrialisation and geographical expansion had been predicated upon nature's alleged inexhaustibility, and how the deployment of specific raw materials in the construction of national identities and their associated designed products contributed to, or assuaged, unsustainable economic and material growth.

Extrapolating from these case studies, my paper contributes to a broader understanding of how nature and raw materials have been devoid of agency within design discourse. Finally, it speculates on recent political developments in Latin American thought and politics that wish to restore rights to nature and proposes that the incorporation of these views into design disciplines may contribute to a more robust environmental thinking and practice.

Slow Design in Sportswear: Patagonia Case Study

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For the purposes of this sustainability and design paper workshop, I will look at its articulation in the apparel industry, specifically through the case study of American Sportswear brand, Patagonia. The company emerged during the cultural ferment of the 1960s, heavily influenced by care and concern for the environment. These company values continue to operate within Patagonia, balancing its position as a global sportswear brand today. This example outlines some of the key tensions within the clothing industry as highlighted through design and sustainability discourse. For example, by prioritizing sustainability, Patagonia engages with principles of slow time, going against the grain of the apparel manufacturing industry as well as scholarly conceptions of fashion. In tracing this connection, I'd like to come to some conclusions concerning the place of environmental thinking in design and its impact on fashion studies in the sportswear sector.

Unpacking this relationship puts slow within a historical trajectory, a movement and set of practices where ideologies are inherited from the the American environmental movement since 1960s and design thinkers such as Victor Papanek and Buckminster Fuller. Slow & fashion can therefore be positioned within design history and environmentalist ideologies. Therefore, My interest in this workshop lies in the clear relationship between fashion practices and design studies/history. Some of these overlaps are disciplinary- the study of fashion and dress as well as design objects and history have emerged from older more established fields such as Art history. Similarly, the education of fashion designers as a subset of design practice still predominantly takes place within art schools. As a result, most of the literature addressing ecological concerns that is applicable to the fashion system, emerges from this broader design context.

The term 'Slow fashion' has gained increased attention within the fashion industry. For example, recent articles in the *New York Times,* the *Guardian* and the proliferation of self-styled, "slow fashion' practitioners attest to influence of

this idea. Coined by Kate Fletcher in a 2007 article in *The Ecologist,* slow fashion takes its cue from the global slow food movement and its tenants of "good, clean and fair". Within fashion, the adoption of these values occurs at a variety of levels and takes on variant practices. For example,the efforts of independent workshops producing a-seasonal capsule collections and the shifting of company business models dovetail with the green movement's promotion of sustainability. This most recent 'environmental turn' within garment production, focuses on the environmental impact of manufacturing, care and disposal of clothing and the conditions of industry workers. As a result, consumers now demand greater transparency in clothing manufacture (the American company Everlane is built on this model) and businesses increasingly incorporate organic materials into their product lines. For example, H&M is now the largest consumer of organic cotton in the industry. Despite this attention, slow and its applications to fashion has yet to be meaningfully teased out. This omission may exist for a variety of reasons, including the relatively new emergence of the field of fashion studies itself and the highly politicized nature of the environmental movement which often dismissed or demonized fashion. Therefore, that incorporates and builds upon the existing body of literature both within fashion studies and design studies can contribute much to ongoing discussion.

Drawing Natures: US Freeway Controversies, Representational Techniques, and the Rise of Environmental Design

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From the postwar years through the 1970s, the design and planning of urban American freeways were highly contentious processes, involving negotiations among governments, citizens, and experts. In the midst of freeway controversies, a handful of urban designers used innovative methods to reimagine freeways as living infrastructures: hybrid natural/technological complexes of interacting and unpredictable components. This paper examines two such visions: a 1962 study by architectural theorist Christopher Alexander and engineer Marvin Manheim, and a successful 1964 freeway relocation proposal for citizens of Princeton, NJ by landscape architect and urban planner Ian McHarg. These projects highlight early moments in the development of environmental design, and their different drawing techniques point to broader 1960s shifts regarding how designers cultivated relationships with living others through the design process.

Both projects mixed technological rationalism with environmental attentiveness in order to envision the living dimensions of freeway environments, engaging complex dynamics that were unpredictable and often beyond the designer's control. Both used layered, plan-based site analyses to recommend freeway locations. However, each project visually represented their analyses with markedly different techniques. Alexander and Manheim's approach used hand-drawn plan-based sketches, elaborating on prior modernist drawing practices that positioned the designer as a creative mediator of immanent natural forces. McHarg's modification of Alexander and Manheim's approach masked the use of hand drawing and expanded the role of visual analysis, positioning the designer

as an objective observer decoding a natural world outside human experience. The representational gap between these two projects thus illustrates how 1960s environmental design gradually abandoned prior modernist methods that engaged the agency of nature as something close at hand and intimate to the act of making. More and more, the proponents of this nascent discipline instead enacted nature as something distant: viewed from above, mediated through measurement, and untouchable.

This paper complements techno-social accounts of American postwar modernism, contributes to a growing literature on modernism and ecological thought, and historically contextualizes contemporary notions of the ecological city. More broadly, by considering drawing as a series of actions through which designers actively negotiate the natures of built environments, this account cultivates a new understanding of the environmental dimensions of design process. As such, it explores just what is at stake in how designers enact relationships with living others within the design studio.

Much Ado About Some Smoke Particles: Diverging Design Paths to "Clean" Diesel Exhaust Emissions in the USA and in Europe, 1970s–1980s

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In 2000, the French manufacturer Peugeot introduced its new "clean" diesel sedan equipped with a particulate filter. Car magazines swiftly denounced German automakers for not clearing their diesels of cancer-causing particles. The accused manufacturers remarked that a particulate trap was but one of many ways to design a "clean" vehicle and that they had decided to modify the engine design. This reasoning is surprising–especially as German car manufacturers had been ardent promoters of particulate filters, when diesels had first been accused of emitting cancer-causing particles during the 1970s and 1980s. Yet, the filters suddenly disappeared from both the design of diesel cars and the public discourse in Europe and in the USA, only reappearing in the early 2000s.

My paper analyses these changing perspectives on the design of "clean" diesel cars, addressing several key questions: How did the perceptions of diesel cars shift from non-polluting to hazardous and vice versa between the 1970s and 1980s? How are the perceptions linked to the marketing of car design and environmental policies such as exhaust emission standards? What kind of different designs that could clean-up diesel cars were discussed among manufacturers, politicians, environmentalists, and the media? In particular: Why did the particulate filter appear as perfect solution, before becoming a technology non grata? Did the design of the gasoline-powered car equipped with a catalytic converter influence this process? Answering these questions, my paper will contribute to our general understanding in what way diverging design paths to "clean" diesel technology shaped social and cultural perception of diesel cars in both reviewed countries up to the very present.

For instance, I will analyze how diesel cars were suddenly considered a health threat due to their particulate emissions in the USA by the late-1970s. While

initially discussing several technological solutions to clean-up diesels, the debate soon narrowed down to particulate filters. This discussion reached Germany in the mid-1980s and the design of diesel cars with particulate filters was compared to gasoline-powered cars equipped with catalytic converters. The German and US public considered both designs to be eco-friendly. At that time, Mercedes-Benz even introduced a diesel-powered S-class sedan equipped with a particulate filter but had to withdraw the most prestigious diesel from the market because of numerous design flaws. This was not only a costly and painful experience for Mercedes-Benz but also reacted upon other automakers. Diesel manufacturers hence modified their strategies and tried to reduce emissions by modifying the engine design. In addition, they equipped diesel cars with catalytic converters. This change in design, however, rather improved the image than actually reduced the output of fumes. Yet, diesels were once again perceived as "non-polluting" in Germany but not in the USA. My article will focus in particular on these complex and intertwined processes that had a tremendous impact on the design of diesel cars.

I will draw on a wide range of sources such as material from automakers, governments as well as engineers and media reports. Particularly, I will focus on the design of diesel cars produced by German and US automakers such as Mercedes-Benz, Volkswagen, and General Motors in the 1970s and 1980s. They not only dominated the diesel market in both countries but also implemented different market strategies that were modified several times. My paper thereby sheds light on the question how diverging design paths to "clean" diesel cars emerged and how they were linked to specific historical contexts.

Disclosing the Relationship Between Design, Repair/Reuse and Recycling.

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"It is very alarming when objects cease to conform to the properties expected of them" (Thompson 1979).

Recently, environmentally sound design, conceptualized and executed in for example Design-for-Environment or DfE (Lenox et al. 2000), Cradle-to-Cradle design (Braungart 2007) and Design for disassembly or DfD (Williams and McDonnell 2012) have been introduced as means of addressing environmental impacts in and of system and product design. While these tenets are not to be conflated, they all include processes of manufacturing, consumption, repair/reuse and recycling. Focusing on the two latter, this paper explores the intricate and sometimes contradictory relationship between design, repair/reuse and recycling in relation to digital technologies. While environmentally sound design of digital technologies is advocated, both as a means to facilitate repair/reuse and recycling, it also gives rise to different ways of thinking about current consumption patterns, obsolescence and subsequent measurements of discarding. As a means of comparison, this paper looks at planned obsolescence, as developed and used during the 1950's and 60's. Focusing specifically on the ways in which this planned obsolescence related to

recycling/reuse (see for comparison Strasser 1999; Lucas 2002), the ambition of this paper is to provide for different ways of thinking about current consumption patterns, obsolescence and subsequent measurements of discarding.

The Environmental Crisis in Design Culture: Opportunity and Awakening (1968-1973)

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This paper reviews and contrasts different positions within design culture at a moment when environmental awareness reached a critical mass over the years 1968-1973. To this aim, the paper outlines the different meanings associated to the notion of environmental crisis in design theory and design mediation, and the possible interventions put forward.

"It is easier to produce an object than to make it disappear," writes Tomás Maldonado in the eighth chapter of *Design, Nature, and Revolution: Toward a Critical Ecology,* originally published in Italian in 1970. The Argentinian artist, industrial designer, and head of the Ulm school of design was writing in the same years the North American countercultural ecologist movement had reached its enthusiastic zenith. In comparison, his tone was remarkably bleaker and resolutely rationalist. The critical ecology Maldonado sketches is a reflection on the political content of the relations between different groups thriving or declining within a system, and the feasibility of design as environmental programming. The book, translated from the original Italian and published in the US in 1972, was a meticulously footnoted snapshot of the state of the debate in all the branches of the social sciences design theory feeds upon. In the central chapters of the book, taking the lead from a discussion on the progressive consumption of the planet surface, and the risk this poises in the long term for the very survival of the human race, Maldonado surveys the different types of populations and meta-populations thriving since the industrial revolution. They include humans, vehicles, products, and different kinds of waste. Even after manipulation, treatment and reduction, one realizes discarded objects can be merely forced to renounce their materiality, in order to leave the population of the material pollutants for the one of the chemical pollutants.

Maldonado's reflection points to a paradox at the very heart of environmentalist design discourse, at the time of his writing and perhaps still valid today. How can design practice solve problems facilitated by uncritical design practice? Can more design be the solution? Maldonado is critical of Buckminster Fuller's flamboyant but amateurish ecology programme. Whereas Buckminster Fuller urged designers to turn to industrial engineering, and hijack it to push forward a countercultural programme, Maldonado points the finger at policy-making. *Design, Nature, and Revolution* is an antidote to the hieratic holism of Buckminster Fuller's *I Seem to Be a Verb* (1970)—and perhaps also to the moralistic programme Victor Papanek put forward in *Design for the Real World* (1971). In their stead, Maldonado, just two years after being forced to disband the Ulm Institute along with the rest of its faculty and studentship, urges the

reader to look toward governance and politics. His programme is either more audacious or modest. Design won't solve problems in a society where the political decision-making process is flawed. Political change must be brought about first. The readers are implicitly invited to draw their conclusions, depending on their inclinations vis-à-vis revolutionary politics.

With this call to action in mind, the final part of the paper looks at the reception of the notion of environmental crisis within the ICSID (International Council of Societies of Industrial Design), an organization in whose governance Maldonado and several former Ulm faculty and students were involved in the 1960s and 70s. The organization over the years consistently lobbied for recognition of the design profession. At the end of the 1960s it established a working group on "environmental emergencies" as opposed to human and industrial issues. These emergencies amounted to natural disasters alone. Design was presented as a way to provide solutions in case of earthquakes, floods, and similar catastrophic events. There was no reference to the role of humans in the triggering of natural disasters. The ICSID archival papers also show how keen the organization was to underline the possibilities offered by design in these events. For instance, much social capital was employed to ensure some representative could attend the 1972 Stockholm UN conference on the Human Environment. Yet, the archive also shows that the first event explicitly dedicated to sustainability is a 1982 meeting in Taiwan on "Design factors in energy conservation."

The paper will conclude by arguing for the importance of further historicization of the interplay between historical trends in design culture, and the evolution of the environmental context. Such a two-fold perspective provides researchers with materials relevant to understand the way design has been mediated and practiced in the age of sustainability, and represents a basis for assessing the effective impact of theories, practices, and policies on the planet's ecosystems.

'Designing Problems out of Products' – *The Green Designer* Creates Pragmatic Solutions

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Whether it's the shaping of a chair, the structure of a website or the weight of the miniature glass bottles sold on board aircrafts: A designer is solving problems. An exhibition on green design will (in most cases) display objects that, in one way or another, approach different problems, such as how to increase the object's durability or how to incorporate technical innovations to save more power.

The 1986 exhibition *The Green Designer* was initiated and organized by the Design Council (UK) and curated by Paul Burall, Design Council's Publicity Officer, and the now leading environmentalist John Elkington. It featured objects like refillable shampoo bottles and fuel-efficient jet engines. In the mid 80's the general public was (through warnings and intimidations in popular culture) well informed on the potential forthcoming doom of the planet. The exhibition

focused on solutions rather than problems, on encouragement rather than blaming. In The Green Designer Elkington introduced the term "the green consumer" as a vision for an ideal consumer, and thus encouraged the visitors to buy "green" products themselves. The exhibition inspired Elkington to further develop the concept, and the year after he published the popular book The Green Consumer Guide. But although the exhibition represent a story of success, it was still criticised for presenting easy, one-off solutions to complex problems, which would not serve the environment—but rather lead to increased consumption. Thus can Elkington's own description of the exhibition: "Designing problems out of products", be understood to have almost an ironic dual meaning.

On the subject of green design, environmental historians can use exhibitions as a case to discuss different questions, such as how notions of the humans-object-nature-relationship have been conceptualised all through the environmental movement; how exhibitions on green design have influenced the actions of its audience towards a more sustainable consumerism; and finally to scrutinize pragmatic solutions for the everyday life, like when the plastic miniature bottles was introduced on board aircrafts. The plastic bottles weighs five times less than glass, and the jet engine could thus be a little bit more fuel-efficient.