

The impact of ecological thought on architectural theory.

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2019

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The impact of ecological thought on architectural theory

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Abstract

This thesis looks at the idea of ecology and its relationship to, and influence on, architectural thought. Ecological thinking emerged as a subset of biology in the second half of the nineteenth century and developed as a philosophical idea and a political outlook. As an idea that stands in the hinterland between science and society, it has not been particularly stable; sometimes it is fashionable, at others it has disappeared from consciousness. This thesis looks at the long history of ecology, paying particular attention to the periods when it was a popular idea and it had an impact on the imagination and outlook of architects. The first of these periods is in the decades from Darwin's publication of his theory of evolution through to the run-up to the First World War, prior to the emergence of the Modern Movement. The second period is brief, from the late '60s through to the early '70s, and is popularly referred to as the Age of Ecology. Finally, there is the period from 2000 to the present. The final section of the study looks at the impact of ecological thought on architectural ideas and buildings today, when there is a high level of concern about the environment. Through historical interpretation, the study identifies some of the core themes of ecological thought and looks at their relationship to the design of the built environment. It traces the recurring themes of naturalism, vitalism and materialism, which are emerging as significant influences on today's architecture. The thesis includes research interviews with some of the leading architectural thinkers and historians of our time in order to situate the discussion of ecology in the broader discourse on the purpose and nature of architecture and the future of the discipline and the profession.

Keywords

Ecology, environment, environmentalism, nature, naturalism, materialism, second nature, architectural history, environmental history, architectural theory, historiography, historical interpretation, mapping, conservation, biological, sustainability, Anthropocene, scarcity, ecological urbanism, Post-humanism, Romanticism, Vitalism, Darwinism, holism, organic, Systems Theory, cybernetics, chaos theory, complexity theory, spaceship earth, social ecology, literal greening, natural and biological analogies, new naturalism, expressionism, formalism, materialism, modernism, post-modernism, digital architecture, Ecosophy, Gaia, architecture's expanded field.

Declaration

This is to certify that I am solely responsible for the work which has been submitted in this thesis. Turnitin report submitted to the research department.

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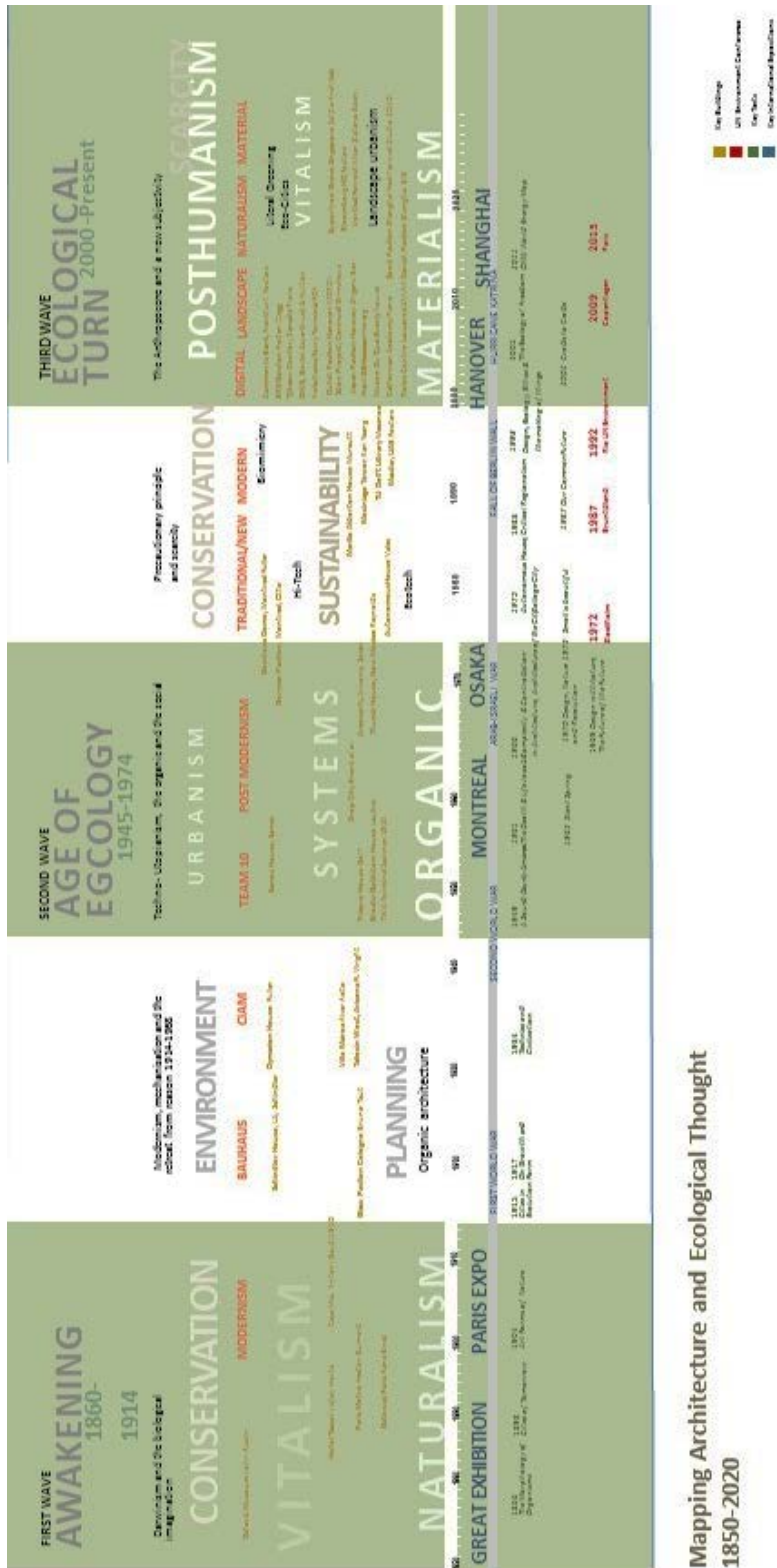


Figure 1 Mapping diagram of the waves of ecological thought produced by author 2019



Figure 2 Kings Cross Station, 2012, John McAslan+Partners, La Porte Monumentale Paris 1900, René Binet

1.0 Introduction to Ecology and Architecture

1.1 Personal statement

This research looks at the subject of ecology and its relationship to the architectural imagination (Muller, 2014). I made the decision to study ecology in the early years of the new millennium while writing and teaching about sustainability. I was fascinated by the fact that this simple word ‘ecology’, which I hadn’t heard used since enrolling at university in the early 1980s, was suddenly making a reappearance in the fashionable architectural publications. I was initially curious as to why it was being rehabilitated and I became increasingly intrigued by how it was being appropriated for our times.

I embarked on this study to try to find out why ecology was being adopted by those making architectural theory. I knew that it wasn’t the environmental imperative - the research on climate change or the impoverishment of bio-diversity - that was driving this process. I was aware that architectural theory had been peculiarly resistant to environmental thinking as sustainability, despite the fact that architectural practice was increasingly focused on the energy performance of buildings, environment and places rather than isolated building blocks.

In 2012, when I met Anthony Vidler and Kenneth Frampton in New York, they both alerted me to the fact that ecology had been very popular for a short period in the late 1960s. Later, Charles Jencks recalled how the schools of architecture at both UCL in London and Berkeley in California had changed their names in order to accommodate a new understanding of architecture as an ecological discipline. It became clear that ecology was an idea that had come in and out of favour depending on the culture of the times. Both the status and meaning of ecology has been quite different at different historical periods. As Haila and Levins remarked in the 1990s, “the principles derived from ecology are likely to be proved transitory” (Haila & Levins, 1992). Ecology’s impact on architectural ideas has tended to follow these shifts in culture.

I have been following the fortunes of ecology for over a decade and, to my surprise, its purchase on the architectural and the public imagination has increased. ‘Ecology’ has become a household word being used to describe any situation or system that involves a degree of complexity or unpredictability. Radio pundits often talk about the ecology of love or the ecology of the financial sector. More recently, I have heard colleagues use the expression an ‘empty signifier’ to describe a flexible, umbrella-like concept that can denote many different meanings. However, ecology is far from empty; like the concept nature it is very rich, in fact

loaded, with meaning. Such terms can provide an avenue to make sense of the mood of our times. As Rupert Darwall noted after completing a book on the history of global warming: “To explore global warming is to journey through the mind of Western contemporary man.” (Darwall, 2013, p. 7) . To explore ecology and its relationship to architectural thought provides an opportunity to look again at architecture after modernism.

As such, this thesis is an investigation into ecological thought and architectural thought. It is not a study of ecological design or an investigation of the practice of architects in relation to the ecological imperative. There is very little reference to the ecological crisis in this research. To some, given the urgency of the environmental project, it might seem indulgent to look at the history of ecological ideas and what they signify without reference to action or policy. However, there is a great deal of literature on these questions. What is more limited, though, is material looking in more detail at the ideas that constitute ecological thought and how they relate to architectural conventions and approaches to practice. As Baweja argues: “Architectural history has yet to produce a significant body of work in response to environmental discourses that are currently dominated by sustainability.” (Baweja, 2014) Since then, we have seen the launch of a few academic projects to address this issue, which are covered in Chapter 2 and 3.

1.2 Research Aims

The purpose of this research is to look more closely at the idea of ecology, to identify the complex array of meanings associated with the term, and to trace the ways in which these meanings have been adopted or elaborated in the architectural imagination, in architectural texts and buildings. (The term ‘imagination’ is used to capture all of the thinking, writing and design ideas, speculative or realised, that contribute to the discipline.)

This study set out to answer a number of questions. What do we mean by ecology? Is ecology a useful category or concept? Is that meaning consistent over time? How have architects responded to the idea of ecology? How have ecological ideas made an impact on architectural thought? What is the particular character of ecology’s impact on today’s architectural theory? How is ecology different today from previous movements and what does it tell us about contemporary architecture?

All of these questions are addressed and revisited throughout the thesis, but the core definitions and meanings are addressed in the front section. The middle section contains the

historical survey which deals with changing architectural and ecological ideas over time and the final section deals with the contemporary condition.

This thesis is an attempt to map out the influence of the idea of ecology on the architectural imagination. It looks at books, journals, magazines, events and buildings produced since 2000 and tries to identify the ways in which these cultural products have responded to the question of ecology. Attending academic architectural conferences from the end of the last century, I noticed an increase in the number of papers drawing on the work of philosophers that addressed environmental issues directly. Felix Guattari's writing on 'ecosophy' has emerging as influential, as has the work of Bruno Latour and, more recently, the work of architectural theorists such as Peg Rawes. The Architecture and Humanities Research Association (AHRA) conference in Stockholm in 2017 was entitled *Architecture and Feminisms: Ecologies, Economies, Technologies*, intimating that ecology might be considered a major design concern rather than a secondary issue for the architectural humanities.

The adoption of an 'ecological consciousness' within architectural theory marks a decisive moment in the evolution of architectural ideas. While didactic eco-architecture remains a minority activity and most architects would not describe their work as eco-architecture, the principles underpinning ecological thought have been very widely adopted. This is more than a pragmatic response to building regulations; it could be argued that for the first time since the Renaissance, architectural thought has ditched the basic values of humanism and opted for post-human principles. This idea is discussed in detail in Chapter 9 and 10. Of course, this shift in outlook is in the process of unfolding and it would be premature to suggest that everything has changed, but the adoption of the post-human outlook promoted by some architectural writers may have consequences for the design process, for the planning of the city, for attitudes to the formal and aesthetic qualities of buildings and for the idea of the professional role of the architect.

One of the significant challenges confronted in this thesis has been to describe how we think, talk and write about architecture, to capture the way in which *what* we build in turn influences the way we think about the world. A century ago, in *The Architecture of Humanism* (1914), Geoffrey Scott described the architectural imagination, in the wake of the demise of classicism, as driven by 'fallacies' (Scott, 1914). He likened fallacies to winds, forces that exist in the arts and society and tend to exert an influence on the thinking and creative output of the architect. These winds or sentiments blow more or less strongly at any given time and often they merge and act together. They influence the practice of architecture and they shape how architects explain their work to others and in turn they become the standard for

architectural criticism. Scott was attempting to grasp the relationship between the ideas in the world and the output of the architect and he notes that we leave in architecture “man's most unconscious record” (Scott, 1914). In other words, we can understand something about our history through the study of architecture, but we can't manipulate that record, architecture is witness to the tendencies of which we are rarely conscious.

Back in 1914, Scott wrote about four fallacies: the ‘romantic or poetic’, the ‘mechanical or scientific’, the ‘ethical or moral’ and the ‘evolutionary or biological’. A fallacy is a flawed argument, an argument that can be taken as true, but when scrutinised fails to satisfy. At the core of every fallacy there is a truth and Scott argues that the fallacies associated with his time encircle and enrich architecture. But they cannot be deemed to constitute or determine practice or the basis of criticism. Scott's text is a thought-provoking polemic; it makes clear and conscious the ideas that underpinned architectural thought and criticism in his time. He asked us to step back from the popular framework in which architecture is judged and think about questions that relate very directly to the discipline, which is essentially an artistic or aesthetic enterprise. Half a century later, Philip Johnson gave a lecture at Harvard in which he talked about the *Seven Crutches of Architecture* (1954). These crutches were ideas that architects used to validate design and critics used as the benchmarks of criticism. Among other things, he talked about the crutches of ‘utility’ and ‘history’ and ‘environmental control’ and argued that such design determinants drew us away from an appreciation of the core question of the discipline – the masterful play on form and light. Johnson argued that it is hard to operate without these crutches, but that we should be conscious of the way in which we rely on them.

In my appreciation of contemporary architecture and my teaching of the history of twentieth-century architecture, I have always been interested in fallacies. Today, we judge architecture in a very diverse range of ways. We can talk about the formal and aesthetic qualities of a building, but it's likely that our points will be rebutted by a critic concerned about the ethics of the sourcing of the materials or the political legacy of the client. Sometimes we are impressed by a building technology that has allowed us to generate a particular form, but we are just as likely to condemn the work for failing to create an authentic atmosphere or a legible symbolism. At times, a good building is deemed to be one that we built ourselves, using public money or self-build architects, and a bad one is deemed to be one built by a large international development company. Public appreciation of architecture is coloured by an eclectic mix of voices all shouting at once about many different issues. The discussion is often a long way removed from the questions that architecture legitimately sets out to solve. It is in

this context that I have attempted to look at ecology, how it sometimes appears and functions as both a fallacy and a crutch.

The other important aspect of this research is an attempt to come to terms with the value or social function of architecture. Architecture, like any other public activity, is the product of our shared resources, organised according to the thoughts and ambitions of a few professional experts: the architect, the contractor and the client. Even when the work is for a fabulously wealthy private client, this basic relationship between the public will and the public good is mediated through the public debate, the planning processes and other regulatory systems. As such, architecture is a social product. In the past 20 years, there has been a question mark hanging over architecture's transformative role.

In *Why Architecture Matters*, Paul Goldberger, the *New Yorker's* architectural critic, argues that architecture is about much more than the creation of shelter, it's a means through which we express who we are and articulate our ambitions for the future. To build is a commitment to the future, argues Goldberger. For philosopher Karsten Harries: "One task of architecture is to preserve at least a piece of utopia, and inevitably such a piece leaves and should leave a sting, awaken utopian longings, fill us with dreams of another an better world." (Goldberger, 2009, p. 39). Alain de Botton, in his popular book *The Architecture of Happiness* (Botton, 2006), argues that in building we have a chance to express what we want to be – to give life to our best image of ourselves and our society.

These inspiring descriptions of the contribution made by architecture to our cultural and social life make sense, but they can also sound a little empty in the current climate when other writers such as Douglas Murphy, in *Last Futures: Nature, Technology, and the End of Architecture*, suggests that the transformative aspect of the discipline is finished (Murphy, 2016). One of the few areas in which architects continue to express ambition about their buildings is in relation to environmental performance, and it is noted that the discussion on ecology has been adopted by those who are critical of the existing social relations as well as those who argue for a new pragmatism in which we take the world as we find it.

1.4 Why Study Ecology?

Ecology began life as a biological term used to describe the relationship between a living organism and its surroundings. In the twentieth century, it evolved as a biological science, a political outlook and an approach to knowledge. As an economic and political idea, it was initially concerned with resource depletion and population control, but evolved to address a range of questions relating to man-made environmental damage. In the realm of philosophy

and the history of ideas, ecology has been appropriated as a way of describing a systems approach to knowledge. As a 'hybrid' concept, ecology's ability to operate in the realms of science, economics and politics provides a certain flexibility in thinking that appeals to those critical of the compartmentalisation of knowledge. Today, the word 'ecology' is used to describe any set of relations that are complex – for example, *Ecology of Money* (2000) by Richard Douthwaite, *The Ecology of Love* (2004), a film starring Pharrell Williams, and 'The Ecology of Law' (*International Journal of the Sociology of Law*, Volume 31, Issue 1, March 2003 by Arjen van Witteloostuijn). Within architecture, the term 'the ecology of practice' has also become familiar (see AHRA conference agenda 2016 www.ahra-architecture.org/events).

Over time, ecology have been linked with a range of popular scientific and cultural ideas from Darwinism to Romanticism in the nineteenth century, the counterculture, technoutopianism, hippies and cybernetics of the 1960s and radical environmentalism, Buddhism and feminism in the twenty-first century. At each moment in time, the meaning of ecology is a variant of earlier ideas and as such the thesis deals with all discourses on ecology in a historically specific manner.

In the OED, 'ecology' is described as a branch of biology and as a political movement. As a biological discipline ecology is concerned with the network and relations between living organisms within a specific geographical area. From ecology, we derive an understanding of biodiversity and the web of relationships and dependencies between living things. Ecology develops tools to capture complex, transient and variable relations, such as weather analysis. It often attempts to make sense of systems that we can understand, but not cannot predict because they are subject to variable forces. The method of recording this process is fieldwork and mapping. The open-ended nature of the science of ecology makes it particularly attractive to those interested in theories of contingency, chaos and complexity, and those looking at ideas that link the natural world to the questions of life and being.

As Worster notes, because ecology is a social science addressing the interrelationship of living creatures, "it has never been far removed from the messy, shifting, hurly-burly world of human values" (Worster, 1992, p. XIV). The crossover between biological and social thought makes ecology particularly relevant in contemporary culture in which traditional disciplinary and philosophical divides between science and humanities and facts and values are being called into question. Since the industrial revolution, the aspiration to unite science and the arts has had a purchase on the imagination of key thinkers. The contemporary tendency to use biological metaphors and concepts to describe social patterns and human behaviour, which is often described as naturalism, provides fertile ground for ecological thinking. This strand of

thought is evident in both the historic and contemporary discourse on architecture and can be found in other creative disciplines in ‘neuroarthistory’ and ‘evolutionary aesthetics’ (Rampley, 2017).

Nature has historically been seen as a thing to be tamed or a thing to be emulated (Macnaghten, 1998). With ecology, we are encouraged to see life in terms of cycles of natality, growth, reproduction, death and entropy. Social life and social theory are understood as something that works against the natural cycles of our biology and establishes an individual and collective history that is linear or at least directional; this gives rise to ideas of advancement and progress (Arendt 1959). Political ecology represents an attempt to recalibrate our understanding of human activity and social life. It rejects the idea that nature should be tamed so that society sits more comfortably in the web of relations found in nature (Lovelock, 1988).

As a discipline, it seems to encourage us to approach understanding in a new way. Jamison argues that understanding of ‘green knowledge’ (2001) demands ‘fluid’ terms. Environmental thought relies on “dialectical, open-ended terms to characterise the ebbs and flows, nuances and subtleties and the ambiguities of environmental politics” (Jamison, 2001). The fact that ecology is a discipline that is concerned with relationships and systems means that it has often been closely aligned to systems theory (in the 1960s and 70s) and relational theory (since 2000). Systems theory was developed in the postwar period and is addressed later in this thesis as part of the review of the Age of Ecology (1968-1974). The role of systems theory in architecture has been explored by Reinhold Martin in *The Organisational Complex* (2003), a book about the development of postwar thinking to embrace new conditions in which ‘organisation’ replaced the early concerns of modernity. According to Martin, a new understanding of society emerged in which society and science were both understood as ‘networked, system-based, and feedback driven’ (2003 p8). Correspondence between Nobert Weiner, the father of cybernetics, and Giedion, a leading modernist historian and author of the postwar text *Mechanization Takes Command* (1948), suggests that there was a strong correlation between architectural thought and these new attempts to make sense of postwar consumer society.

1.5 The trouble with theory

This thesis is concerned with ecological thought as discussed by architects, architectural theorists and critics and those writing about the broader context of the built environment. The data gathering, its organisation, evaluation and narration, all contribute towards a better understanding of the impact that specific ideas can have on the way architecture develops as a

discipline and practice. The research is being undertaken in a context where many of the verities associated with life, art and knowledge are being called into question. It has been characterised as a 'post-human era'. The post-human thinker is concerned with the ethical issues generated by the move to include other subjects beyond the human species in our understanding of what is right and wrong. Post-humanism is understood as a critique of humanist conventions and ideas. The post-human outlook is closely aligned with the environmental sensibility and the relationship between these two trends will be explored in the text. What is significant is that the idea of architecture as we have known it until now is strongly tied to the humanist tradition.

Within this tradition, there is the natural world and the man-made world – they were connected and man was both part of nature and the author and participant in the world he had created – often against the laws of the natural world. This is important for architecture, because it has developed alongside the idea that humans should and could shape the world rather than simply being in it. According to Adrian Forty: “Environmentalism may have made ‘nature’ into a new measure of architectural quality, but there is far from universal agreement as to what that means to work buildings into the cycle of nature – a difference exemplified by the divergence of opinion as to what are the proper materials for a green architecture. The persuasiveness of environmentalism, and its many contradictions, will almost certainly ensure that nature continues to be an active – and disputed – category in architecture.” (Forty, 2000, p. 239)

If architecture is about shaping the world, making cities and buildings to give shape and form to society’s norms and conventions and providing a framework for human interaction, what happens when we change our approach to the ‘world’? Architects may claim that the structures and forms that they produce are derived from nature. Some argue that their work is derived from natural intelligence or natural design – in the same way that a shell takes the form that it does – so we build.

Architects may argue that as individuals they don’t ‘make’ buildings; that these new products are the consequence of a vast array of environmental factors and a vast array of individual actors and elements of technology. They may suggest that today’s buildings emerge as part of a process rather than being handed over as a product by a creative genius. Architects can minimize the nature of their activity – call it quiet or modest – make it minimal and suggest that it is barely anything at all. They may argue that as far as architecture exists, it touches the ground lightly, that it is barely distinguishable from the landscape itself. However, these

arguments fail to address the central question: can we determine the qualities of our environment?

This thesis sets out to understand an impulse which Hagan calls ‘ecologism’, and review the actual and anticipated consequences of ecologism on architectural thinking and practice. This ‘impact’ is not a direct or causal relationship in which we can plot precisely how environmentalism has changed theory or vice versa. Changes in environmental consciousness and architectural thought have developed in parallel. To use a naturalistic metaphor, it could be argued that a crisis in theory has cleared the space for the cultivation of ecological ideas.

1.6 What do ecologists believe?

“What do ecologists believe?”, asks Bramwell in *The Fading of the Greens* (Bramwell, 1994). She paints a picture of the ecologist as someone who wants to conserve finite resources and preserve natural diversity, who sees animals and humans as equal and tends to prefer rural life to city life. Ecologists see trade as wasteful and believe goods and people should be rooted to one place; for the ecologist, self-sufficiency and bio-regions are mechanisms to create a more efficient world. Ecologists think globally and worry about the destructive impact of modernisation on primitive people and the toxic impact of industrial production on the food chain. To the ecologist, Bramwell argues: “Civilisation is seen in a negative way, as an exterminatory, as destructive, as dominating.” (Bramwell, 1994, p. 26) This attitude to human progress places ecology outside what might be called the humanist tradition and into the realm of the ‘post-human’.

One feature of ecological politics is that it is anti-ideological. There is no single manifesto or panel of experts that define the attitudes of the ‘movement’. According to Garrard “Environmentalism is relatively young as a social, political and philosophical movement, but already a number of distinct eco-philosophies have emerged that seem as likely to compete with each other as to combine in any revolutionary synthesis.” (Garrard, 2004, p. 18) (Jamison, 2001). Today’s political ecology has evolved as part of the post-Cold War landscape as a critique of mainstream political parties and conventions. In the UK, it has been developed as a direct alternative to the two-party system, class politics and theories of class contradictions. Social ecologist Murray Bookchin (1921-2006) argues ecological questions are often posed in such a way that they transcend class and political boundaries (Bookchin, 2005) “Be they Ethiopian children or corporate barons, all people are held to be equally culpable in producing the current ecological problems. Ecological problems in effect are de-socialised,” (Bookchin, 2005).

The idea of an equilibrium and natural limits appears widely in environmental texts. James Lovelock, the originator of the Gaia hypothesis, argues that the planet as a whole is a self-regulating organism that will act to restore a certain balance when disrupted, while Felix Guattari writes about the ‘ecological disequilibrium’ that threatens the continuation of life on the planet (Guattari, 2005). Critics of this outlook within the environmental movement, such as Erik Swyngedouw and Alain Badiou reject the idea of the ‘rights of nature’ as a new form of the ‘opium of the people’. “It is an only slightly camouflaged religion: the millenarian terror, concern for everything save the properly political destiny of people, new instruments for the control of everyday life, the obsession with hygiene, the fear of death and of catastrophes ... it is a gigantic operation in the depoliticisation of subjects.” (Hammond, 2018, p. 12)

Hammond notes that as ecology has been integrated into mainstream politics, it has been difficult to sustain the idea that it is a radical anti-capitalist outlook. According to Badiou, it is “a process of depoliticisation has then been reinforced by the institutionalisation of climate governance arrangements” (Hammond, 2018). Swyngedouw argues that the depoliticisation of environmentalism has been ‘institutionally choreographed’ and that new ‘post-democratic institutional configurations’, such as the Kyoto Protocol or the Rio Summit contribute to a broader undermining of dissent and democratic life. (2010 p 227).

The fact that ecology is concerned with relationships and systems means that it is often closely aligned with systems theories. Systems theory was developed the Second World War from a new understanding of society and science in which were both understood to be ‘networked, system-based, and feedback driven’ (Martin, 2003, p. 8). Correspondence between Nobert Weiner, the father of cybernetics, and Siegfried Gideon, the leading modernist historian (1948) suggests that there was a strong correlation between architectural thought and these new attempts to make sense of the new consumer society. Systems theory remained popular among some architects in the 1970s and 1980s, given new life by scholars like Christopher Alexander and his colleagues at Berkeley, who linked design methodology to taxonomic studies of building types (Alexander, et al., 1977). After this period, the discussion about ecology tends to be subsumed by a bigger discussion led by international institutions and politicians about sustainability. It was only towards the end of the millennium that ecology and systems thinking started to reappear in the architectural literature, around concerns with ‘relations’ and situated knowledge.

Ecological consciousness today is described by Jamison as ‘internalised’ – that is, it is part of the everyday lifestyle or patterns of life adopted by the majority of the population. There has been a “shift from the protection of an external realm of non-human nature to the greening

of our own human societies. An ecological consciousness, we might say, is in the process of being internalised in our cultures and our personalities.” (Jamison, 2001) In this new cultural landscape, architectural academics such as Rawes (2013) and Susannah Hagan (Hagan, 2015) have adopted the systems approach to address social questions, stressing the importance of understanding the relations between subjects and objects rather focusing on things themselves. Ecology has become a shorthand for a range of epistemological sensitivities, providing a vocabulary through which a discussion of personal feelings and lifestyles can be explored alongside disciplinary concerns.

As ecological ideas have developed, some have argued that new technology provides the means through which mankind can minimise its negative impact on the natural environment. Others argue that nature is contingent and complex and the idea of a natural equilibrium idealises a process which can be brutal (including man's behavior). In the second half of the twentieth century, the ecologists divided into the techno-utopians versus the deep greens. The former embrace science as a tool for energy and waste management (and included new movements like Cradle-to-Cradle). The latter looked back with an Arcadian vision and argued that technological fixes prevent mankind from addressing the core issues, the rebalancing of the relationship between man and other living beings (Jamison, 2001).

1.7 How does ecology change over time?

In order to address the questions identified above, it was necessary to establish a framework for the analysis. I began the thesis by looking at questions thematically. Ecology raised questions for architecture about man and nature, about resources and scarcity and about knowledge. These themes have been relevant since Ernst Haeckel invented the discipline of ecology as a sub-set of biology. However, in recognition of the historically specific nature of all discussions on ecology, it seemed appropriate to organise the research material on a historical timeline.

The thesis takes from environmental history a basic structure of development in which we can see moments in which ecology is an important cultural and political concern and other times when it becomes a second-order issue. The fortune of ecology is not necessarily determined by material changes in the environment. As Darwall points out, ecology hits a high point in popularity just before the 1970s oil crisis and yet, in retrospect, we assume that ecology and environmentalism became more popular *because* of the shortage of fuel.

The history of ecology in the twentieth century and its interplay with architectural ideas is the subject matter of this thesis and the structure of the text reflects this. As stated above,

this thesis does not attempt to address all modes of environmental thought. It traces the particular fortunes of ecology as a specific aspect of environmental consciousness. The various strands of environmentalism are defined in the next chapter.

Jamison divides the history of environmentalism into five phases, beginning with an awakening in the nineteenth century and ending with integration in the 1990s. This framework has been adopted for this thesis, but the research has not looked at the period in which environmental thought was incorporated into mainstream politics in the mode of sustainability (1974-1990).

In the organisation of the narrative of the history of ecology and architecture, there are three periods that stand out as important. There was the origin of the idea of ecology and an interest in this new strand of biology that ran from the 1860s to the First World War. The idea of ecological systems was explored into the 1930s in the UK in relation to planning, but is rejected from the mainstream discourse on the grounds that it was seen, like modern architecture, as a German idea. In Germany, this interest in ecology was pursued in the interwar period and explored by the Nazis, but German history is not the focus of this thesis and the experience of fascism has made an objective study of biological thought in this period difficult (Bramwell, 1989).

The second wave of enthusiasm for ecological thought is very brief and is often described as the Age of Ecology; it runs from about 1968-74 (Jamison, 2002). Although this is a brief moment, ecological ideas are explored alongside technological ideas from 1945. Although this doesn't take the form of an ecological movement, architects and planners refer to ecology from the 1950s onwards.

The third wave of ecology begins, as indicated above, around the new millennium and has continued to the present so that we now talk about ecology in relation to buildings and cities. These three waves of ecological and architectural activity give rise to a range of ideas, events and buildings. One of the clearest expressions of this combination of ideas and buildings is the production of pavilions for international expositions. As a show case for innovation the expo is an important means of capturing architectural and cultural ideas at a given moment. Whether pavilions represent an expression of national pride or global collaboration they are useful records of national sentiment and political fashions.

In these three periods when ecological thought appears to have an impact on the architectural imagination, there are three significant expos that appear in the mainstream histories of modern and contemporary architecture (Frampton, 1980). The first is the 1900 Expo in Paris, in which some of the buildings take direct aesthetic inspiration from the

drawings of Ernst Haeckel, the biologists that came up with the idea of ecology. During this period, in the shadow of Darwin and Spencer, ecologists developed a naturalistic, vitalist and holistic understanding of the world and human knowledge. This period gave rise to the conservation movement, with its campaigns to protect landscape and architecture from the brutality of industrialisation and urbanisation. It also gave birth to modern planning as a discipline concerned with the regional and strategic organisation of resources and activity, based on the assumption that even in a market economy it was possible for the state to take responsibility for providing the infrastructure and means for economic stability.

The 1967 Expo in Montreal took place during the highpoint of the radical ecology movement and played host to a number of different impulses. Buckminster Fuller's geodesic dome was an expression of the technological optimism of the moment, while Moshe Safdie's new housing was a reminder of important social issues and reflected a growing interest in vernacular architecture and organic form as an alternative source of architectural inspiration to modernism. Frei Otto's German Pavilion was the clearest articulation of an evolving interest in organic form-making.

Finally, at the start of the third period in which ecology has had an impact on architecture, Germany hosted its first expo in Hanover in 2000. This Hanover Expo is discussed in detail in Chapter 8.

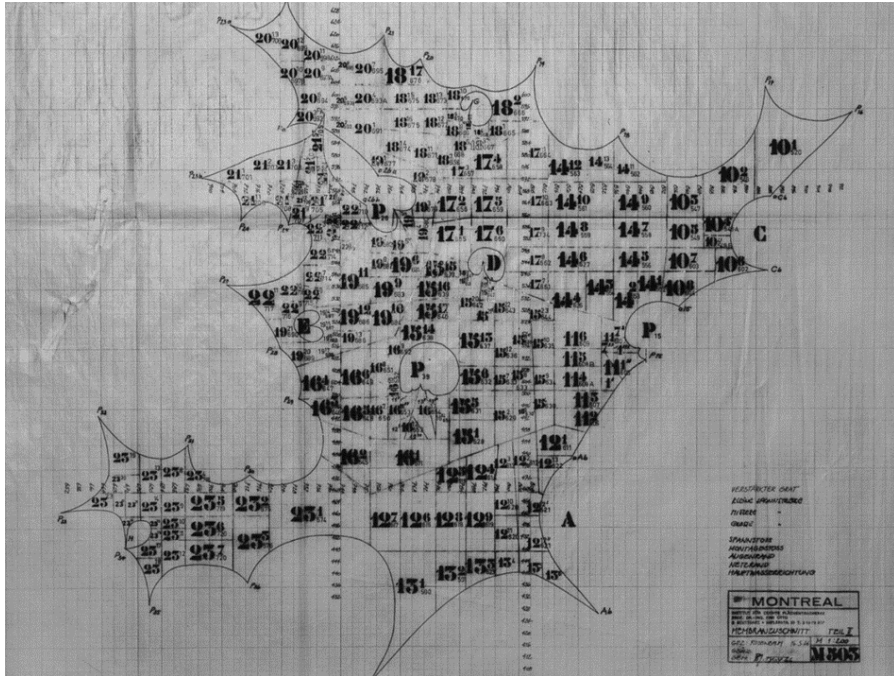
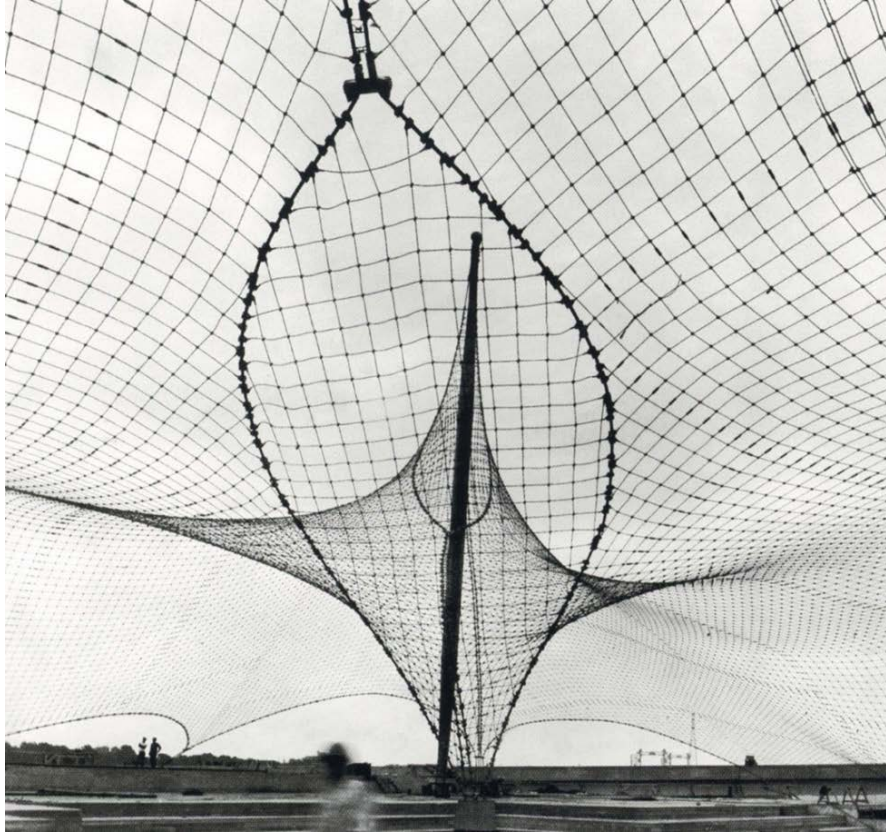


Figure 3 Frei Otto's drawings 1967 German Pavilion, Montreal

1.8 How does ecology affect architecture?

The impact of ecological thought on architecture is impossible to measure and difficult to categorise. A number of the authors in the SAGE handbook draw a clear connection between the problems of architectural theory in the wake of postmodernism and the question of environment. Ingersoll writes: “The search for a grand narrative of architectural sustainability seems to be unresolved, with attempts to historicise sustainability appearing to manage little more than to catalogue a confusing proliferation of movements and styles, resulting in a cul-de-sac of confusion and a rather pessimistic outlook.” (Crysler, 2012, p. 574) This thesis seeks to address this issue, not by constructing another catalogue of green buildings, but by mapping ecological and architectural ideas. Identifying key moments, individuals, texts and buildings that seem to relate to the themes associated with ecology and exploring the ideas thrown up by those activities should lead to an enrichment of architectural history and theory. This thesis is a practical exploration of that approach to the study of architecture and social life.

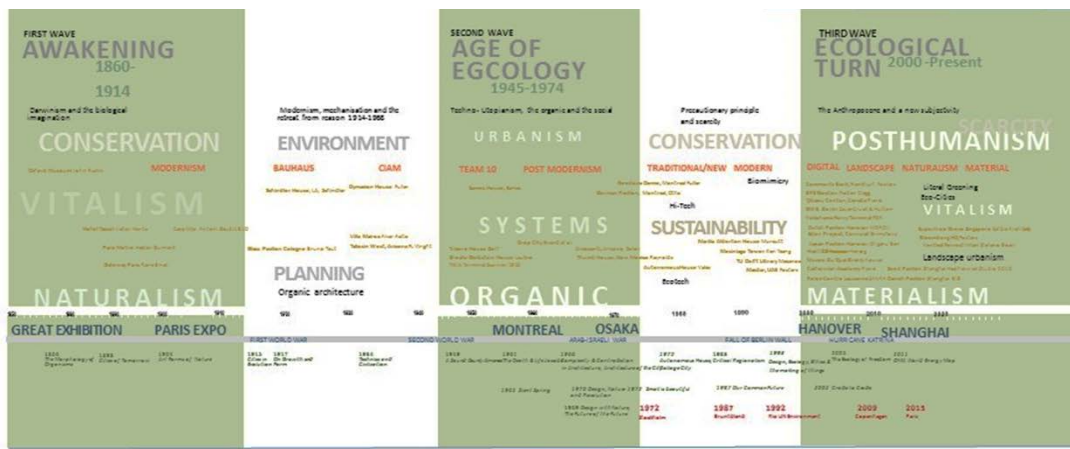
The table below is an attempt to identify some of the key subjects under investigation. It was produced as the outcome of the literature review and the study of the individuals most closely associated with ecology in the current history and theory of architecture.

The structure of this thesis is set out on the contents page. The front section of the thesis looks at approaches or methods and the literature on the subject. A list of terms has been introduced to define the different strands of environmental thought referred to in the text. The second section contains the historical survey looking at the origins of ecology, the popularity of ecology in the late 1960s and the reappearance of ecology in today’s discourse. The third section looks at the contemporary condition while the final section contains an appendix of interviews and the bibliography.

	Naturalism	Vitalism	Materialism	Holism
1860-1900	Scientific method from Darwin <i>D'Arcy Thompson</i>	Idea of life and science as an alternative to religion	Living things. Inanimate reimagined.	Look at the organism in context not the laboratory
1945-1973	Biological metaphors for structure and infrastructure. Team 10 and the critique of CIAM	<i>Bateson</i> Inter-disciplinarity	'As found' Primitive, Vernacular. <i>Merleau-Ponty</i>	Critical approach to Enlightenment <i>Frankfurt School</i>
2000	Designs imitating nature. Biomimicry, Landform New Naturalism and neuro-science	Digital design Schumacher, Lynn, Kipnis, Spuybroek, Massumi Weinstock	Animate materials The anti-icon movement Affect and Sensation. 6A SANAA	Attack on the critical. Deleuzian Rhizome thought Anti-dualism

	Scarcity	Technology	Social life
1860-1900	<i>Malthus</i> Early economics Science into housekeeping	<i>Ruskin</i> Romanticism. Technics and civilisation <i>Mumford</i>	<i>Spencer</i> Early social science. Planning Human behaviour Social Darwinism <i>Geddes, Mumford</i>
1945-1973	Oil crisis <i>EF Schumacher</i> Buddhist economics. Population Off-grid	<i>Buckminster Fuller</i> Techno-utopianism and Deep Greens and self-sufficiency. Information Age	Social – ecology as a critique of modernism. Preoccupation with social programme and participation <i>Foucault</i> power and suspicion of the state
2000	Scarcity versus austerity. A social construct – but one which can give rise to creativity. <i>Till</i>	Nature/ technology dualism abandoned. Eco-tech criticised as an apology for capitalism, <i>MVRDV</i> techno-dystopianism Feminism	<i>Deleuze</i> Social becomes the personal and the ethical Subjectivity is multiple. Feminism

Figure 4 Tables produced by author to show developments in ideas of ecology over time



Mapping Architecture and Ecological Thought 1850-2020

2.0 Methods

Architectural historians tend to talk about approaches and ideologies rather than methods. This chapter outlines the contemporary approaches that have informed this thesis and the ideological assumptions underpinning it. It begins with a description of the emerging ‘environmental histories of architecture’, sets out what we mean by architectural history and theory, explores the idea of ‘historical interpretation’, and looks at ‘critical theory’ before outlining the research sources. The purpose of this chapter is to throw some light on the questions confronting academics studying architecture in a culture that is highly sensitive to environmental concerns.

In mainstream publishing, most books on ecological architecture provide a brief historical overview followed by a catalogue of successful green buildings (Wines, 2000) (Brebba & Broadbent, 2008). Until recently, there has been little critical analysis of the intellectual traditions and ideas underpinning ecological design. This thesis addresses ecology as an idea rather than a style or product. It tries to do this in a historically specific manner; recognising that the ecological thought of the 1860s is quite different to that of the 1970s and today, but that there are certain core ideas that can be traced through time. Through historical interpretation, the thesis maps a framework for understanding the development or evolution of ecological thought alongside developments in architectural theory.

Groat and Wang recommend the historical–interpretive approach for authors attempting to trace the relationship between social-physical phenomena and their contexts (2002). An interpretive inquiry stresses the importance of the reassembly of research material to provide a narrative that is ‘holistic’ and ‘believable’. This type of historical research needs a subject area, the collection of data, the analysis of data, and an attempt to construct a narrative form to present that material. The thesis looks at architectural theory and practice from the postwar period to the present to create a credible narrative describing the evolution of ecological thinking within architectural theory (Groat, 2002). The subject area is the impact of ecological thought on architectural theory since 1968, the data used are texts and buildings produced from 1900 to the present, the analysis of the data is undertaken according to the conventions of ‘critical history’ while engaging with mapping approaches and forms of presentation adopted by structuralists and post-structuralists.

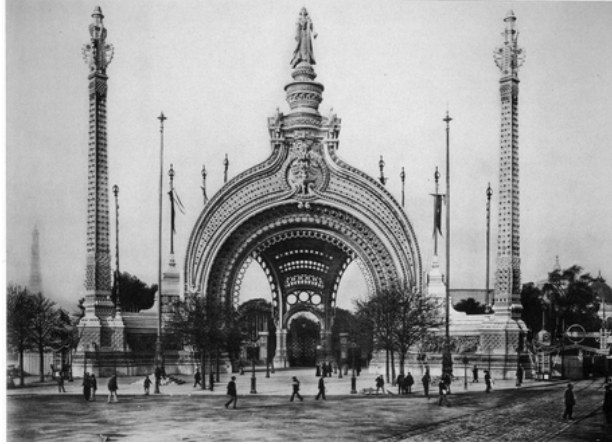


Figure 6 Paris 1900, Montreal 1967, Hanover 2000

2.1 Environmental histories of architecture

At present, there is a growing interest in ‘environmental histories of architecture’. Back in 2009, Daniel A Barber wrote that a “momentous historiographic transition is taking place, one that shifts emphasis away from an emergence of ‘modernity’ out of the potentials and pitfalls of industrialisation, and traces instead a history of the ‘environmentalisation’ of the architectural discourse as it confronts new pressures in the 20th century” (Barber, 2009).

This new area of research, which Barber calls environmental histories of architecture, looks at contemporary conditions through the lens of environmentalism and revisits historic buildings and urban development in terms of environmental control and destruction. Barber’s activities studying ‘proto-environmentalism’ provide an interesting insight into the way in which environmental thought is now being absorbed into the history curriculum alongside the more traditional territory of environmental services and materials.

Architecture’s environmental historians argue that we need to change our approach to historical knowledge and that environmental thought can guide that change. In the *Journal of Architecture* dedicated to the issue of ‘Architectural History in the Anthropocene’ (Volume 21, Number 8), Barber and colleague Esther da Costa Meyer argue that humans are not the sole agents of history and that the dualistic framework of human and non-human must be replaced. Da Costa Meyer refers to Latour’s suggestion that we learn to ‘share agency’ with other subjects (Meyer, 2016).

At the core of this environmental approach is the idea that a scholar should be focused on basic habitual relations rather than big ideas. Da Costa Meyer takes her lead from McKenzie Wark, author of *A Hacker Manifesto* (2004), whose position is that in the Anthropocene we stop constructing intellectual ‘superstructures’ and recognize that, in Wark’s words, ‘the primary object of thought is something very basic now: the means of production of social life as a whole’ (Meyer, 2016). This idea will be explored further in Chapter 8 which looks at the current discourse on architectural theory.

The ‘environmentalisation’ of architectural history is not entirely new; Banham’s *Architecture of the Well-Tempered Environment* (Banham, 1969) invites both architects and historians to rethink their attitude to the servicing of buildings. However, there is something distinct about contemporary methods in that it is more concerned with the possibility of revitalizing historical research than changing building production. The new environmental architectural historians such as Barber and Da Costa Meyer have a very particular outlook on architectural work that is strongly influenced by the fact that today we operate in a culture in

which environmental degradation is a primary concern. The idea that the object of research and thinking should be ‘very basic’ or ‘concerned the means of production of social life as a whole’ is not adopted in this thesis. The author works on the basis that it is possible to understand architecture within a broader social and ideological framework, to make sense of what we think and mean as well as what we produce on a day-to-day level.

2.2 Historical interpretation

Wallenstein argues architectural history is retroactive; we “rediscover moments because we find a reticence in the present”. He describes how we revisit old thinkers because of something that happens in the present. For Wallenstein, critical historians such as Tafuri, Cacciari and even Hays are trying to discover ‘what actually happened’ rather than exploring how events were interpreted. “Someone like Reinhold Martin would say that whatever happened is not really so interesting”, suggests Wallenstein, what is interesting is what happens if we “look at history in a certain way” (Wallenstein, 2014). For Wallenstein, this doesn’t mean denying historical scholarship, but rather recognising that the facts are there to be interpreted.

If you listen to Beethoven from the point of view of Schönberg he would sound different obviously. And as Adorno would say ... one needs to listen to Beethoven from the point of view of Schönberg or Goethe from the point of view of Beckett, we have no other option other than to look at it that way. I mean this is the way Goethe and Beethoven looked at history so in that sense we're doing the same thing (Wallenstein, 2014).

Wallenstein’s historically specific approach has been adopted, but historic interpretation does not preclude the possibility of objectivity or truth seeking. This thesis draws on the work of several architectural thinkers such as Tafuri that stand in that tradition. Interviews with Kenneth Frampton and Anthony Vidler, key members of the critical tradition, demonstrate the value of the earlier approach. In this thesis I am looking at the writings and comments of Frampton and Vidler because as critical historians their aspiration to place architectural products in their social and cultural context seems of great value. This approach to context goes well beyond the site analysis or the history of a place; it is not held in physical things. This idea of critical context refers to the broader influences on the discipline and it demands a certain immersion in the ideas and values of the time. How can we ever really make sense of Arcosanti, the life work of Soleri in the Arizona desert, without looking at his fantasy drawings, his writing and the output of the counter-culture of which was part?

Frampton and Vidler see their role as understanding architects’ intentions and buildings’ operation and qualities but they are also trying to understand the operation of forces

and influences that are implicit in the production of particular architectural responses allows them to step beyond the superficial reading of buildings. The critical historian attempts to identify the key pressures and tensions operating on the individual client and architect and the broader political and cultural pressures that gave rise to the specific design solution and a specific building or body of work. In this context we can often gain as much of an understanding of what was built and why it was built from drawings, reviews and historical reflections as by looking at the building itself.

The ability to grasp the character of the current period demands an open mind and today's critical theory needs to be "an immanent practice, moving with its time, always ready to invent new tools" (Wallenstein, 2014, p.402). This thesis borrows tools developed by post-structuralist thinkers, tools that are evolutionary and post-critical, recognizing that we live in a period in which it is difficult to navigate the intellectual landscape using old categories and conventions.

Architectural history provides a framework through which we can organise research chronologically, but historical analysis is not neutral. According to Wang, there are four basic approaches to interpretative history. The first is the quasi-scientific causal approach inspired by Popper, which allows for small-scale predictions, but rejects utopian narratives. The Hegelian approach associated with the historians of the Modern Movement is concerned with historical specificity and assumes that both man and his cultural products are an expression of a shared spirit of the time and that as time moved forward, so too does cultural expression. From the Hegelians we have developed the idea of movements and styles. The structuralists and post-structuralists argue that the Hegelians are teleological – or overly deterministic – in their interpretation (Groat, 2002, p. 146). They assume that meaning rests not so much in entities themselves as the relationship between them and they overlook historical specificity in favour of an evolutionary or cyclical view of history (Groat, 2002, pp. 148-146). Influenced by anthropologists such as Claude Lévi-Strauss (1908-2009), structuralists argue that systems of meaning have their own organic properties, that they constitute self-regulating systems and, as such, they are often timeless. Post-structuralists, such as Michel Foucault, tend to look at movements as web-like discourses that operate according to the dominant values for a period of time until they are replaced by another set of assumptions and relations.

Wang's analysis is useful, but it should not be understood as a menu of research methods; they need to be understood in a historical context. Leach's *What is Architectural History?* provides an overview in which the history of the history begins with Vasari in Renaissance Italy with the study of great men. This approach was adopted until the middle of

the eighteenth century when the construction of a national narrative became important and Hegel (1770-1831) suggested that creative work could be understood as an expression of the (national) spirit of the time (or *zeitgeist*) (Leach, 2010). In the early twentieth century, Wölfflin's 'styles' emerged as an important tool for historians and theorists (Wölfflin, 1915). Historians such as Gideon and Pevsner recorded the evolution of the modern movement using Wölfflin's styles and a 'diluted Hegelianism', a mix of disciplinary, social and cultural history (Ferne, 1996).

Since 1945, it became increasingly unacceptable to discuss architecture in isolation from context or situation. Social context has become a vital ingredient of architectural history at the same time as it became a concern of those designing buildings. For example the idea of 'British Modernism' was born alongside the welfare programme of the 1945 postwar Labour government (Dannatt, 1959) and as such postwar reconstruction provided British architecture with the sense of unity and purpose that made it a bona fide and coherent movement worthy of its capital letters. For Dannatt, 1945 "altered irrevocably the national meaning of architecture" (Dannatt, 1959).

In the middle of the twentieth century, architectural historians asserted their autonomy and created a small but productive field which was sustained by its relationship to the vocational training of architects. From the late 1960s, the Tafurian critique of operative history and the Frankfurt School's notions of 'ideology' and 'cultural production' had a major impact on historical approaches and gave rise to the distinct realm of 'architectural theory' (Leach, 2010). Cultural historians took objects of high culture as a record of ideas present in all forms of culture, while social historians assumed that artistic production and the creative imagination were heavily influenced by the outlook of the dominant class. By the latter half of the twentieth century, many historians became less concerned with objects and more interested in social structures of power. They drew on thinking from a range of disciplines, including politics, feminism, psychoanalysis, philosophy and social theory (Vidler, 2011).

The Tafurian approach demanded historical specificity and gave rise to historiography, the study of the writing of history. Today, it no longer seems necessary to make a distinction between the writing of history and the recording of how the history is written. In postmodern thought, there is an *a priori* assumption that the subjective experience of the author will give rise to a very particular version of history and that history can only really be understood as plural rather than singular. We have replaced 'history' with 'histories' and the idea of historical truth is treated with skepticism. Furedi, A sociologist, argues that this relativism and tolerance for different versions of the same event and different interpretations of cultural products has

undermined our capacity to think critically and rigorously about the cause and effect of human action. (Furedi, 1992).

This thesis deals with the ‘immediate past’ (Vidler, 2008) and, during this period, the line between history and theory has been blurred (Stoppani, 2017). Theory publications sometimes come in the form of polemics (Spencer, 2016) but more commonly they are readers and anthologies, pluralistic tomes in which conflicting ideas sit side by side with very little interpretation (Hays, 2000) (Nesbitt, 1996). Leach describes today’s architectural history as chaotic rather than canonical and Nesbitt describes a theoretical landscape made up of “a proliferation of theoretical paradigms and ideological frameworks” (Nesbitt, 1996). What Krufft sees as an intellectual vacuum is for Nesbitt evidence of an enlightened pluralism free from the repressive character of modernism and classicism. In the absence of a canon of any kind, there is a tendency to retreat into multiple opposing camps. These camps are often organized through academic institutions.

2.3 Architectural Theory

Krufft suggests a broader definition of theory, which comprises “any written system of architecture, comprehensive or partial, that is based on aesthetic categories. This definition still holds even if the aesthetic content is reduced to the functional.” (Krufft, 1994, p. 446) For Krufft, it’s not possible to read a building without the written evidence of the intentions of the architect; any ideas that are developed without the written material tell you more about the interpreter than the interpreted. This interpretation sits at the far end of the spectrum of architectural thought, which runs from the highly specific to the very open. For Peter Cook, architecture and architectural thought can be found in ‘everything’ (Cook, 2014). For Nesbitt, ‘theory’ distinguishes itself from criticism and history in one very particular way: it suggests an alternative to the status quo. It assumes the proponent of a theory is an active agent keen to bring about change. “It’s speculative, anticipatory and catalytic nature distinguishes theoretical activity from history and criticism ... Theory deals with architecture’s aspirations as much as its accomplishments.”

In this thesis, I have relied heavily on texts because I share Krufft’s understanding that the ‘cultural reading’ of buildings doesn’t necessarily tell us about the architects’ intentions or the social forces at play, it often tells us more about the author’s outlook and prejudices. I have tried to avoid projecting onto buildings ideas that I consider important. If I suggest a building is important or symbolic of a particular idea it is because the architect, historian or theorist has

made this argument or because the building or text appears in the key histories as part of the historical record.

A study of architectural theory needs to step outside the discipline and look at the common reference points that have informed the discourse. I began this thesis with a review of the work of Michel Foucault and his influence on the architectural imagination. That research has been largely abandoned and yet it would have been difficult to read contemporary theory books without understanding Foucault. I am also sympathetic to Nesbitt's sentiment that theory steps beyond the question of how to do something to the issue of how to do it better; it is aspirational.

Over the past 40 years, practice and the academy have become increasingly divided between those that believe the architect can create a critical open space within existing social relations and those that argue that the architect can only hope to give shape to contemporary forces rather than resist or transgress them. In 1969, Manfredo Tafuri (1935-1994) described architectural history and practice as a battle between those "attempting to dig down into the very bowels of reality in order to know and assimilate its values and shortcomings" against those "who want to push beyond reality, to construct *ex novo*, new realities, new values, new public symbols" (Tafuri, 1998, p. 12). In the first half of the last century, the avant-garde and postwar architects made buildings that attempted to address new values, through welfare reform and public social provision. When the political culture shifted in the 1980s, architecture's purpose was less clearly defined. Expressing the 'spirit of the times' meant celebrating liberalism and globalization, while architects on the critical side of the discipline argued for a 'resistance' to these trends and 'a return to sources' and 'autonomy' (Frampton and Eisenman).

Since the 1980s, the question of the social purpose of architecture and issues of formal and aesthetic autonomy have become increasingly complex. (By the new millennium, those arguing for autonomy had abandoning the social role of architecture in favour of a retreat into disciplinary and formal preoccupations.) One of the outcomes of a prolonged period of theoretical uncertainty since the 1980s has been the attempt to extend the boundaries of the discipline so that an 'expanded field' takes the place of a social programme (Vidler, 2011). There has also been a move to reject theory altogether and move towards pragmatism (Speaks, 2010) or at the very least to draw practice and theory closer together. This 'expanded field' which blurs the boundaries of the discipline to embrace landscape and big data, etc., has had a significant impact and finds practical expression in planning projects and policy initiatives as well as influencing the complexion of new, emerging practices. Uniting theory and practice

has proved difficult, but has led to a sub-discipline of a theory of practice. The language and vocabulary of practice comes mainly from the discipline of project management, audits, brief, client, construction design and management regulations, procurement and budgets, while academics have evolved an understanding based on linguistics, social theory, philosophy, psychology and law. What makes ecology such an attractive category today is that it has been adopted by both practice and the academy.

Wallenstein describes the current field of architectural theory as one in which there is a battle between those that identify with architecture as a critical act and those that adopt a post-critical approach (Graafland, 2010). Somol and Whiting's position that "architecture ceases to worry about separating itself from the everyday in terms of autonomy and resistance, and becomes just as relaxed about reality as television" is a clear expression of the post-critical (Wallenstein, 2016, p. 398). Despite the fact that Somol and Whiting argue that 'relaxing' doesn't necessarily equate to a capitulation to market forces, the post-critical has been understood as just that: a pragmatic accommodation to the market. It's interesting that in trying to describe the function of their position, they use the term 'ecologies'. In *Notes Around the Doppler Effect* (Krista-Sykes, 2010), they describe their approach as one that "[r]espects or reorganizes multiple economies, ecologies, information systems and social groups".

Understanding the relationship between architecture and society tends to demand an *a priori* understanding of how society is working. Architects such as Rem Koolhaas at OMA have fulfilled this role as unofficial theorists for over a decade and Jencks has been constructing visions of the future since he published *Modern Movements in Architecture* in 1973. Architectural theorists tend to borrow from sociology and philosophy to describe contemporary conditions. As architecture is not an official part of the social sciences, architectural thinkers have a certain freedom to pick eclectically from a range of intellectual or ideological frameworks. Jencks describes some significant ideological battles between himself and British postwar modernists like the Smithsons, but he also indicates the very wide range of influences on his thinking over the course of his long career. This approach to scholarship suggests both a lack of disciplinary coherence and a certain freedom. In some circumstances, it leads to weak philosophy – but as Wallenstein remarks, if it's a source for design thinking, it serves a different purpose. This attempt to make sense of contemporary and historical conditions within a broader intellectual framework is the core of architectural theory today.

Architectural thinkers who describe contemporary conditions in a way that connects to architectural questions such as Hays, Martin or Carpo are described as theorists. Martin's description of the Organisational Complex is one example of how architectural thinkers and

writers construct frameworks for understanding social relations in a manner that relates very directly to architecture. Martin produces texts that are not part of the official archive of the architectural profession, but belong to a different archive populated by what he calls ‘agents’, ‘systems of knowledge’ and ‘space’. Martin’s thesis is that we can understand the development of social relations, power and knowledge in relation to technology and that the nature of this relationship shifts over time. So, with industrialization, we witnessed the development of sovereign power, which was reflected in the development of mechanical technology in the eighteenth and nineteenth century. With Modernism in the twentieth century, technology relied on thermodynamic science and this was complemented by disciplinary authority, but the present is technologically determined by cybernetics and the corresponding form of power is control society. These ideas about the relationship between science and society are tied together in the concept ‘organisational complex’ and this term can then be used as short hand for this set of social relations. Sometime these short-hand terms become so much part of the vocabulary of the discipline that they are not properly considered and understood.

Architectural theory can’t be proved or disproved like a scientific theory. It’s a term used to describe a broad spectrum of thinking that exists within a broader body of literature produced to help us make sense of our world and our lived experience. Buildings can’t tell us what they mean; so ‘architecture’ as a discipline involves both the production of buildings and the act of appreciation or interpretation. There is an interdependency between words and buildings in the creation of architecture; but it’s helpful to make a distinction between architecture – the act of designing buildings with a clear (or unclear) intention – and the discourse on architecture from which it draws ideas and is validated or condemned.

Both of these acts take place within a framework of thinking and commissioning that can only be understood with the help of other forms of inquiry be they cultural studies or philosophy, politics or economics. Even a simple judgement about the proportions of a room and whether they are good or bad – or whether proportions are important at all – takes place in both a professional and a societal context. The existence of specific disciplinary and social concerns at any given time, coupled with the creative will and outlook of the individual architect and the enthusiasm of the consumer is what allows us to identify architectural fashions and innovative deviations from specific trends.

To make things simple: when looking at buildings, they will be described as architecture; when we are referring to writing about architecture, they will be called texts. There are a variety of ways of writing about buildings; architectural text can be produced to help us understand architecture. Much of the time, architectural ‘ideas’ are written by architects

to capture the process of designing or to record practical solutions to design problems in ‘design thinking’. In his contribution to *Forty Ways to Think About Architecture* (Borden, 2014), Tony Fretton writes:

For architectural writers, words, concepts and arguments need to be precise to bear scrutiny on the page or in a lecture. For designers they need to be slack to allow conflicting practical and material factors to be fitted together with issues of power, ideology, ethics, cultural norms and the designer’s own architectural formation, and for the project to be presented to a client in understandable terms. Design thinking is associative and its arguments operate between reason and rhetoric. Ultimately it is just a means to an end, which is the production of buildings. (Borden, 2014, p. 243).

Historians and critics who analyse buildings from a distance use ‘disciplinary ideas’ rather than design thinking. These are unique to the act of making architecture, such as type, spatial composition or tectonics. Finally, there is analysis and reflection that comes from outside of architecture - from philosophy, sociology, psychology, computing, or linguistics. This third type of theory allow us to discuss, appreciate and understand architecture as a cultural product or in the context of social relations. This approach attaches meaning to architecture which goes beyond the disciplinary ideas of aesthetic, spatial and functional expression. Throughout this text we will refer to design-thinking, disciplinary thought and social/cultural thinking to describe these different aspects of theory.

2.4 Architecture as Evidence

Very early in this thesis, I was confronted with the dilemma faced by modern architectural writers that the historian Ernst Gombrich (1909-2001) referred to as “the chastening insight that no culture can be mapped out in its entirety, while no element of culture can be understood in isolation” (Ferne, 1996, p. 234). Architecture can be understood as a record of the general values of society and its most powerful people or clients. Simultaneously, it is a reflection of the creative will of those that design it. As a consequence, it can either be understood as a reflection of the dominant values or a self-conscious attempt to mark out some territory that transgresses those values and suggests a better way of being. Andrew Ballantyne argues that buildings indicate what society really values. They don’t reflect the ideas of society as a totality, but they suggest what decision-makers or the political elite feel is important. A building is suggestive of both the status and the outlook of the client, whether that is local government or a country. For Ballantyne, the Scottish Parliament by Enric Miralles, EMBT and RMJM illustrates his point (Ballantyne, 2006).

Buildings *are* evidence, but evidence of *what*? They are evidence of design fashions, trends within the commissioning process, expressions of procurement and reflections on the political will of those paying for them. If, as Ballantyne suggests, we see architecture as a public ‘gesture’, then in order to understand that gesture we need to understand the world in which it is made. Whether a building is popular or not is largely dependent on the extent to which social values are coherent and palpable or contested regardless of the style.

In this thesis, there is an assumption that buildings do, in some way, embody our contemporary cultural values and they can be seen to embody the specific cultural value – for example, our attitude towards the environment or the natural world. By looking at individual buildings, it is often hard to see the evidence of this assumption, unless the building is explicitly didactic. So, in work that is not explicitly ‘green’, we may be able to identify contemporary environmental values and in self-confessed green buildings we may imagine that we are looking at what has become known as ‘greenwash’. It’s only when the architect or client articulates specific values or when the building is written about by others in the form of scholarship, criticism or journalism that we are provided with evidence of whether the values embodied in or projected on to the project exist in a realm beyond the imagination of the researcher. So, if buildings are evidence, writing about building tells us what the building expresses (Ballantyne, 2006).

The author of a piece of architectural criticism can read into the work a certain value system and another critic can make another reading in the same way as we can read very different reviews of the same blockbuster film. As Forty (2000) says:

The history of architecture, as distinct from its present-day practice and criticism, is faced with the unique and special problem of seeing the work as it was seen by people in the past, and of attempting to recover their experience of it ... Whose experience do we succeed in recovering? ... Our problem, then, is to recover the past meaning of words so that we can interpret what those who uttered them intended to say. But this is no simple matter, for the history of language is not one of the straightforward replacement of one meaning by another. (Forty, 2000, p. 10)

2.5 Critical approaches and Arendt

According to Ballantyne, architecture can’t really be radical – it’s paid for by the authorities and as such expresses the consensus outlook among the powerbrokers and policy makers. As far as architecture innovates and break rules, it is transgressing the rules already broken by some section of the political elite (Arnold, 2006). Ballantyne’s position echoes the ideas of Tafuri, who argued that the transgressive energy of the Modern Movement had been

appropriated by the commercial classes to develop an aesthetic that made a system of exploitation look progressive. However, Tafuri also argued that the historian had a responsibility to be critical, not to promote empty utopianism (Ballantyne, 2005).

Wallenstein provides a simple and clear reading of the situation today when he divides the world of today's architectural thinkers into two, the critical and the post-critical (Graafland, 2010) (Speaks, 2010). According to Wallenstein, new theorists are "displacing the models of consciousness and negativity, as well as the obsessions with signs, language and discourse", in favour of a concern with "the body, affectivity and presence" (Wallenstein, 2016, p. 363). This new approach to theory, which is post-critical, operates "below the threshold of interpretation and reflection, and that requires that we remodel our theoretical tools, even the idea of theory as such". So, interpretation is increasingly becoming redundant in the face of an architectural imagination that places emphasis on life and experience.

This thesis can be located in the critical tradition. The approach taken in this thesis draws on the work of architectural historians Alan Colquhoun (1921-2012) and Kenneth Frampton who both have aspired to understand architecture within its own terms, according to its own norms and conventions as well as attempting to see it as part of broader social life. They are part of the critical tradition which has been attacked as irrelevant in recent years (Graafland, 2010). Frampton's prolific body of work combines conventional historical surveys with explorations of pertinent philosophical ideas and manifestos that attempt to collect together work to form an argument against what might crudely be called 'globalisation'. Sometimes Frampton writes about buildings (Frampton, 1991) and at other times he writes about ideas as they influence the making of buildings (Frampton, 2000).

Frampton adopts a materialist approach to social relation and architectural output, without negating the significance of ideas or the disciplinary concerns of the individual architects' ambitions. Colquhoun pioneered a critical approach to use of architectural and cultural language that avoided the introverted linguistic preoccupations of postmodernism. His essay *Changing Museum* (2009) moves from an analysis of the words 'museum' and 'gallery' and their distinct but overlapping meanings to provide an insight into the changing cultural values attached to museum objects and the buildings that contain them (Colquhoun & Frampton, 2009, p. 335).

The emergence of Critical Theory in architecture coincides with the development of postmodern architectural ideas: a critique of modernism with its singular and universal aspirations that argued for a return to history, an appreciation of the everyday and an understanding of the new symbolism or signs embedded in contemporary design.

This approach to the discipline was not explicitly uncritical but it implied that architecture might respond to changes in the organization of the city and economics rather than attempting to resist them. As a consequence the critical and the postmodern were understood as opposites. The critical was associated with the defense of modernism and the postmodern with the critique of modern and enlightenment values.

This critical approach aspires to be objective, to avoid becoming an advocate for a particular architectural style or movement and has a strong sense of historical specificity (Tafuri, 1998). A critical approach to history (exemplified by Frampton) is loosely based on the critical theory of the Frankfurt School (Marcuse, Horkheimer, Adorno and others), which was populated by Marxist scholars fleeing Nazi Germany for the USA. Critical Theory addressed the questions of mass society and consumption, identifying ideology as the most significant mechanism for social control in postwar America. In the period of postwar expansion, the critical theorists were concerned about the homogenization and sameness of modern culture and the problems thrown up by a culture of consumption.

The left and ecologists shared a belief that the architectural profession needed to look critically at its role in reaffirming the existing social order. Whether architects were ecologically engaged or not, most questioned the discipline itself, as part of the general critique of disciplines as “ideologically tied to and supportive of the established political power of the bourgeois liberal state” (Vidler, 2011). “Around 1968 ... things theoretically seemed to change. Architecture – rather than a subject discussed by architects and architectural theorists, became a subject of interest from the outside – from philosophy, epistemology, linguistics and, most importantly, politics.” (Vidler, 2011, p. 104) However, the impact of the theories of Foucault, Derrida, Barthes, Deleuze and Lacan was not to help architecture to be situated in a broader context but to “unpack the verities of the profession and disclose the ideological agendas behind apparently innocent practices” (Vidler, 2011, p. 105) It was not inevitable that a sociological or philosophical reading of architecture should undermine the coherence of disciplinary thinking, but it appears to have had that result.

From 1968 onwards, theory takes a certain distance from its subject. The moment marks a starting point in the critique of the profession and an attempt to reorganize the profession and professional education to either make it more scientific and connected to other built-environment disciplines, or to make it more socially minded. Critical theory attempted to situate ideas and practice in society. In architecture, theorists wanted to make sense of the discipline of architecture, not in relation to its own internal logic, but in relation to the wider world.

One of the most prominent exponents of this approach was Manfredo Tafuri (1935-1994). Tafuri argued that architecture could only be understood in the context of production, social relations and in relation to the workings of capital. This didn't mean that architecture expressed the will of capital in a crude and direct fashion, but that architects should understand that to a certain extent their impulses and aspirations were appropriated to support social stability. He also argued that architects should not use history and theory to legitimize their own approach to design, but that scholars should operate at a distance from practice, looking at the archive and the process of designing and making buildings in order to understand fully the forces at play (Tafuri & Co, 1976).

Another significant influence on those adopting a critical approach to history is Hannah Arendt (1906-1975) who is an important reference point in the writings of Frampton, Baird and a younger generation including Pier Vittorio Aureli and Reinhold Martin (Aureli, 2011) (Martin, 2013) (Frampton, 2002). Frampton says that he 'never recovered' from reading and meeting Arendt. George Baird took Arendt's expression 'the space of appearance' as the title for his book. (Baird, 1995) Arendt is best known for her writings on totalitarianism (Arendt, 1951), particularly her unsentimental reporting of the trial of a leading Nazi, Adolf Eichmann, in which she coined the phrase 'the banality of evil', and her love affair with Martin Heidegger. However, it is *The Human Condition*, first published in 1958, that had a significant impact on architectural thought. "It is the space of appearance in the widest sense of the word, namely, the space where I appear to others as others appear to me, where men exist not merely like other living or inanimate things but make their appearance explicitly", she wrote. What Arendt provides is a method for looking at 'life', or the totality of human existence, which deals with both humanity and the man-made world: "The reality and reliability of the human world rests primarily on the fact that we are surrounded by things more permanent than the activity by which they were produced, and potentially even more permanent than the lives of the authors." (Arendt, 1998, p. 95).

For Arendt, the built environment is not simply a form of cultural production; but arenas in which men living close to one another are confronted with the possibilities of action. Talking about the 'public realm', she says that unless "it is the scene of action and speech, of the web of human affairs and relationships and the stories engendered by the", it lacks a *raison d'être*. She adds that "without being talked about by men and without housing them, the world would not be a human artifice but a heap of unrelated things to which each isolated individual was at liberty to add one more object; without the human artifice to house them, human affairs would be floating, as futile and vain, as the wanderings of nomad tribes" (Arendt, 1998). In

Arendt's view, the world of things provides a framework and a set of habits and conventions through which we act out our everyday lives. Without this familiar framework, it would be hard for us to meet as equals in the public sphere, to have to reproduce our world everyday would be too great a task. Arendt's approach recognizes that how and what we build is not just a measure of what we value but a framework through which our consciousness and social relations are then developed. I have used this insight into the importance of both permanence and innovation in architecture throughout this thesis.

Table 2 Phases of environmentalism in <i>The Making of Green Knowledge</i>		
Period	Emphasis	Examples
Awakening Pre-1968	Public debate Issue identification	World Wildlife Fund <i>Silent Spring</i> 1962
Age of ecology 1969-74	Organization Program articulation	Friends of the Earth <i>Only One Earth</i> 1972
Politicisation 1975-79	Social movement Energy policy	No Nukes <i>Soft Energy Paths</i> 1977
Differentiation 1980-86	Think tanks Deep ecology	WRI, CSE, Earth First <i>State of the World</i> 1984
Internationalisation 1987-93	Sustainable development Global issues	UNCED <i>Our Common Future</i> 1987
Integration 1994 -	Incorporation Resistance	Agenda 21 <i>Natural Capitalism</i> 1999

Figure 7 Table reproduced from Jamison's *The Making of Green Knowledge* (2001 p 82)

2.6 Historical narratives

Architectural history can't produce a narrative that tells the whole story – we can only identify things that seem important in the evolution of thinking and building. In the history of the Modern Movement, key buildings, or a canon, are used to epitomize broader disciplinary trends. Today, the attempt to capture ecological thinking is often expressed in a catalogue of eco-buildings. But the project fails to really engage with the environmental imagination or those buildings that are not specifically flagged up as green or produced by an eco-architect.

This thesis explores ways to make sense of architectural ideas and their relationship to buildings and practice in the current conditions. It's based on the identification of key 'things' which might be objects, ideas or events. These things attract our attention because they seem to be a recurring reference point in the literature of the time or the literature about the time. Sometimes these ideas are manifest with an architect's work, but at other times they are highly speculative ideas laid out in magazines like *AD* and *AR* or discussed in conferences or

professional meetings. These discussions are very wide ranging and provide a backdrop or context within which the production of buildings takes place.

This thesis material is organised into a chronological survey. Certain key periods are identified as having been subject to a growth in interest in ecology. The increase in interest is evidenced in the volume of the primary literature on the subject, in public policy initiatives, and in the historical narratives that were written at the time and have been written subsequently. One outcome of the current uncertain intellectual environment is that very few authors attempt to embark on what might be called ‘big history’, the elucidation of overarching themes from which the assessment of individual works can be undertaken. Despite the fact that Rem Koolhaas chose ‘Fundamentals’ as the title for the 2014 Venice Biennale, very few critics or theorists are happy talking about or defining the fundamental character of the discipline today. Books that aspire to give an overview of a period, particularly the twentieth century, tend to rely on anthologies of original texts from the period or collections of opinions from a variety of different authors. There are plenty of books on green architecture, but very few have attempted to explore the implications of the evolving environmental ideas on the broader architectural discourse.

Architectural historians such as Jencks write and illustrate architectural history as if it were an evolutionary tree with many overlapping and interlocking branches. This approach does allow the reader to see a bigger picture and to appreciate the plurality of a given cultural climate. It allows the author to demonstrate (through the size of blobs or branches) when an idea is peripheral to mainstream thinking and when it is central. The limitation to this approach is that it promotes a view of history in which developments are understood as an accidental and evolutionary process. The danger is that we read architectural history as a series of fashions and fads dissociated from the cultural and social context. In this thesis I have used mapping tools and the tools used by evolutionary history to try and establish the relationship between sets of ideas and strands of thought and between buildings and ideas. This approach is not a substitute for looking at the dynamics at any moment in time or an alternative to a historical specific analysis.

The history of ecology is not a continuous narrative, it is a history of an idea that is disrupted by events. There are periods when the idea is popular and others when it falls out of popular usage altogether. In order to make sense of the distinct ideas thrown up over time I have organised the history of ecological thought into three waves. The first wave followed the birth of the discipline in the 1860s and lasted until 1914. The second wave began at the end of the Second World War, climaxed around 1968 and was over by the mid-1970s. We are

currently living through the third wave, which really started to develop at the start of the new millennium.

This approach has been arrived at by looking at Jencks's exploration of the representation of history from the 1970s. Jencks's method is particularly interesting because he uses visual techniques to draw the connections between different individuals and their mentors and to measure the impact of certain ideas and buildings. His sources are varied, but the basic idea of deep structures of ideas comes from Claude Lévi-Strauss and the idea of paradigms is derived from the work of Thomas Kuhn. The graphic and format can be traced back to the MOMA diagrams produced by Alfred Barr, the Museum's director in the 1930s.

Jencks describes the period in the 1970s when he was teaching at the Architectural Association. He describes key influences as Thomas Kuhn, Anthony Blunt and George Kubler. Kuhn looked sociologically at the development of science and developed the idea of paradigm shifts (Kuhn, 1963) something Jencks later adapted and called 'jumps in the universe'. Kubler had explored a similar idea in *The Shape of Time* (Kubler, 1962). These two approaches described how one professional interpretation or practice could dominate the imagination of most scientists or designers for a period of time until a leap in imagination broke with the convention and established a new understanding. As Jencks notes:

If you happen to be born at the right time and you're Leonardo da Vinci, you've got a stranglehold on the next 30 years. If you come on-stream with the right idea and you get what we call in economics, "lock in", then there's only room for one Archigram ... Foster and Rogers dominated British architecture for the next 50 years completely, and Hoover up all the big jobs. (Jencks interview 2015).

Jencks was enthralled by Kubler's method of classifying pots and everyday household items by recording their entrance and exit in history as a way of giving form to the intangible 'shape of time'. In the same way, Jencks looks at Anthony Blunt (art historian and spy) and his naturalistic tendency to treat art works in the same way as a biologist might treat a living species to develop a taxonomy. Blunt's *Some Uses and Misuses of the Terms Baroque and Rococo in Architecture* (Blunt, 1973) identified 12 taxons or characteristics of Baroque. From this, Jencks developed the idea of a taxonomy of architecture.

While this thesis is not based on a naturalistic view of history, the attempt to show how ideas and movements evolve and adapt over time is useful and given the disparate character of the architectural discourse the idea of organizing ideas and buildings according to certain evolving themes or sub-styles is also useful. So as far as there is a narrative in this thesis, the work (text or buildings) that relates in some way to themes of ecology has been organized in

time according to its relationship to core ideas and outlooks. Once these basic themes have been identified around the work, the relationship between different ideas and individuals has also been mapped.

The consequence of this mapping of texts and buildings is to identify three key periods in which ecology has had a significant impact on the architectural imagination. The first is very short-lived and is the period in which ecology was invented as a discipline. The second is the period dubbed The Age of Ecology by environmental historians – the period from 1945 to 1974 – which was at its most intense after 1968 when student radicalism was at its height. And the final wave of ecology is the past two decades. In the period since the new millennium, the ecological has emerged as a major concern in practice and, perhaps more significantly, in theory.

At a visual level, this schema of waves follows Jencks's idea of deep structures and pulsating blobs. It also follows Jamison's history of environmental thought and to some extent it mirrors feminist theory and the history of feminism. There was an early movement that coincided with industrialization, Darwinism and suffrage, then there was a radical movement that began in the late 1960s and was largely spent by the end of the 1970s and finally there was a new movement that emerged in the approach to the millennium in the wake of the fall of the USSR and the reorganization of politics around more individuated and personalized concerns (Hammond, 2018) (Jamison, 2001).

The main focus of the thesis is the second and third waves of ecological thought and the relationship between them. This particular core of the historical map relies heavily on ideas written in books and journals as much as completed buildings. The following section will look at the sources of information that have been used to populate this mapping or narrative exercise. As Wallenstein has noted, what is often significant in the analysis is not the establishment of an idea of an objective historical truth as much as an understanding as to why architects and critics chose to look at architecture from a particular perspective.

This thesis was undertaken on a part-time basis over a decade (with interruptions) and as such it treats the entire period since 2000 as the recent past. The initial attempt to understand the concepts associated with this one aspect of environmental thought was followed by a survey of many key anthologies of architectural theory in search of references to 'ecology'. A detailed analysis of the most significant anthologies to cover the period of study (1968-present) has allowed the author to identify the most influential texts and their content. This thesis is supplemented by case studies of texts and buildings identified from the literature and supported by interviews under with key protagonists identified through the literature. Analysis of key

ecological texts that are regularly cited in architectural texts has allowed the author to identify some important themes that constitute components of an environmental consciousness. These themes are used as part of the content analysis to include ideas/themes such as: natural stability, limits to natural resources, Malthusianism, Gaia, Biophilism, anti-modernism/industrialization, primitivism, appropriateness, psychological and social estrangement and mental instability, risk, pollution and natural networks.

What was surprising was that even in the second decade of the new millennium, there were very few references to either environmentalism or ecology in the main architectural theory anthologies (Hays, 2000) (Kruft, 1994) (Nesbitt, 1996). The first anthology to take environmental thought seriously was the SAGE anthology in 2013. Since then, we have witnessed the rapid development of the environmental history of architecture. Investigations into ecology and architecture consistently led historians back to the late 1960s and early 1970s when the idea of ecology was widely discussed within architecture. This discussion coincides with the development of critical history and historiography and also the emergence of the idea of a separate realm known as architectural theory (Vidler, 2011).

While many new historians are keen to argue that there is a strong sense of historical continuity between today's ecological thought and that of the 1960s and 1970s, it is undeniably the case that the ecological question fell off the agenda of theorists and teachers in the 1980s. Vidler was very conscious of the disruptions when he wrote a text in *AD* in 2010 called 'Whatever happened to ecology?' This question has provided an important focus for the thesis of the Age of Ecology in this thesis. One clear difference between the ecological discourse of 1960s and early 1970s and that of today relates to attitudes to the future. A comparison between McHale's *The Ecological Context* (1970) and a contemporary book such as *Ecological Urbanism* by Mostafavi is a useful reminder of the importance of context in determining the way in which an architectural discussion is framed. (McHale, 1970) (Mostafavi & Doherty, 2010).

2.7 Sources: Buildings

This thesis is focused mainly on texts. As far as the thesis looks at buildings, those chosen appear to embody a particular theme at any given time. The architectural ideas embodied in buildings are the reference points that appear in more than one location in the literature. Some buildings get written about more than others – not necessarily because they are better – but they are completed at important moments and embody in some way a shift in attitudes to design questions. One of the most famous buildings of the twentieth century, Falling Water by FLW,

is beautiful – but it is also a departure for American Modernism. In the second half of the twentieth century, the Pompidou Centre by Rogers and Piano has been widely discussed and written about including Baudrillard because it was seen as symbolic of a shift in the character of public life.

Architecture can be read and different authors can produce interpretations. As we know from the experience of the Modern Movement, highly successful buildings can become seen as eyesores within one generation. We are interested in the architects' intention and the way the building is received. Authors from outside the discipline are just as likely to express an opinion about what the building means and those within it.

This thesis does not attempt to address the question of building performance or to make a distinction between genuine eco-buildings and greenwash. All buildings that claim to be ecological and some that make no such claim, but have been evaluated by others as somehow addressing a new relationship between the man-made and the natural world, are worthy subject matter. The design of green buildings tends to be driven by environmental criteria and architectural criticism has tended to respond to this by abandoning the traditional criteria by which they might judge new projects associated with architectural criticism (Clark, 2015). The buildings included in these texts are often self-proclaimed environmental projects. What is perhaps more interesting is to follow the path taken by Hawkes in his books *The Environmental Imagination* (2008) and *The Environmental Tradition* (1996) and focus on those buildings that are not explicitly green, but that express one element of the package of ideas associated with environmentalism (Hawkes, 2008) (Hawkes, 1996).

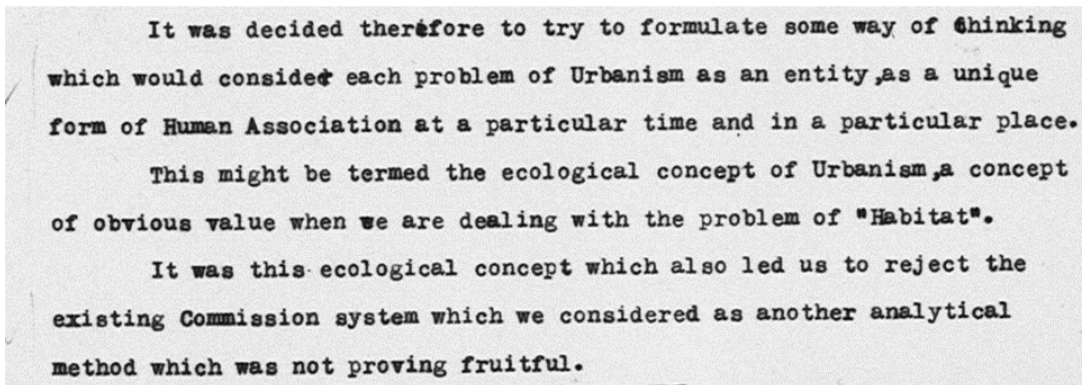
2.8 Sources: Texts

There is ambiguity in texts, a difference between intention and outcome, and post-rationalisation in design thinking. But works of architectural theory and history are in themselves legitimate sources to help us to understand the discipline as a whole. Historical interpretation demands that the author makes judgements as to the social weight of each text, critique and building. The subject matter for this thesis is books, articles, journals, interviews, records of events and conferences and buildings. The type of material used at any given point in time is dependent on several factors. Firstly, the architectural discourse at the time. Secondly, the discourse and culture in which the researcher is operating. Until recently, architectural academics wouldn't have looked to a publication such as the *Whole Earth Catalog* (WEC) as a source of information on the architecture of the 1960s. The publication was a 'how to'

magazine produced by 'hippies' who were living off-grid and writing about many things that had nothing to do with architecture.

In the past decade, a number of academics have begun to look more closely at WEC and its editor, Stewart Brand (Felicity Scott, Simon Sadler and Lydia Kallipoliti). In 2016, MIT Press published a Whole Earth Field Guide for researchers (Gagilo, 2016). The 2017 SAH conference in Glasgow ran a series of sessions addressing this question of radical ecological design in the 1960s. Most of the work produced in this period was speculative, temporary and small-scale, so the record provided by publication such as WEC is significant. In studying the period, written explorations on how we might build and live take on a greater significance for the historian than completed buildings.

One of the starting points of the thesis was a review of important twentieth-century theoretical texts to identify where the issue of environment and ecology was discussed. This began with a word search in these texts. The occurrence was relatively rare – even in the period identified by many scholars as the Age of Ecology (1968-1974). One of the first surprising discoveries of a discussion of ecology was in the notes made by Alison and Peter Smithson for the famous 1956 CIAM meeting which gave rise to the formation of Team 10. The text is concerned with the critique of the limitations of pre-war modernism, and yet the idea of ecological urbanism appears. In this early use of the term, the Smithsons are using the term 'ecology' to describe a systems-based understanding of relationships involved in urban development.



It was decided therefore to try to formulate some way of thinking which would consider each problem of Urbanism as an entity, as a unique form of Human Association at a particular time and in a particular place.

This might be termed the ecological concept of Urbanism, a concept of obvious value when we are dealing with the problem of "Habitat".

It was this ecological concept which also led us to reject the existing Commission system which we considered as another analytical method which was not proving fruitful.

Figure 8 Extract from the Smithson's CIAM meeting from the Catalogue of Team 10 exhibition at Yale School of Architecture 2006.

Architectural critics are often inventing new words, terms and descriptive phrases to describe and judge architecture. In the same way that the language of architecture is constantly adapted

through building, so too is the vocabulary of the critic. The thesis began with a review of the key associated architectural texts that make reference to ecology. Sometimes these are texts with ecology in the title. On other occasions, they are key historical texts that are deemed important in the main historical narrative of the discipline that happen to talk about ecology. A review was undertaken of key architectural theory texts to identify where and when ecology was discussed in the postwar period. A second category of texts have been selected because they were referred to consistently in the first round of research. For example, one strand of contemporary ecological practice could be described as 'landscape urbanism'. Literature reviews of texts on ecology and theory identify landscape urbanism as an important and recurring theme. Google searches link landscape urbanism to a small handful of reference projects. Identifying key texts and, from them, important buildings allows for the establishment of something like an 'ecological canon', which is recorded in the drawings in the same way that historians of the early part of the twentieth century may have done in relations to Modernism. This approach provides a framework for understanding how architectural ideas are evolving.

Today's publishing houses are full of texts on ecological design – but the number of texts that deal with ecology and theory together is limited. Mostafavi's *Ecological Urbanism* marks the emergence of a new strand of theory that brings together ecological thinking with more conventional theoretical concerns about programme, form, place and symbolism (Krista Sykes, 2010). The key purpose of the thesis is to trace those emerging ideas that address both conventional theoretical questions and environmental questions (Mostafavi & Doherty, 2010)

In our current landscape, a handful of academic institutions and their publishing houses play a major role in shaping ideas: the ETH in Zurich; Polytechnic of Milan in Italy; TU Delft and TU Leuven in the Netherlands; the AA, Bartlett and London Met in the UK; and GSD Harvard, Yale, MIT, Princeton, Columbia and others in the USA. University publishing houses and college journals have become increasingly influential (Log, Footprint, GSD publications, MIT Press). The themes explored within Masters Units in schools provide better clues as how to catalogue contemporary thinking than national surveys. Patrik Schumacher of ZHA runs a unit at the AA which is more closely aligned with colleagues at SciArc and individuals at GSD than with other architects in London.

This thesis has drawn on many architectural or trade publications for evidence. Among British magazines, those published by EMAP *The Architects' Journal* and *The Architectural Review* - were among the quickest to engage in a discussion on environmental questions. In 2008, *The Architects' Journal* created the position of sustainability editor for Hattie Hartman,

its technical editor. Hartman was committed to promoting the environmental agenda within the industry and participates in a range of awards and events addressing the issue including the AJ Retrofit Awards, Open-City's Sustainability Soundings Board and the LafargeHolcim Awards for Sustainable Construction. In 2011, she published a book on Sustainable Design (Hartman, 2011) and has a forthcoming book called *Energy, People, Buildings*.

The Architectural Review under the editorship of Catherine Slessor (2011-2015) paid special attention to buildings by emerging architects and from practices operating outside of Europe. During her editorship, Slessor commissioned several 'critical' essays looking at the state of architectural theory and 'The Big Rethink' series by Peter Buchanan. Buchanan's nine essays focused on the impact of environmental imperatives on the discipline in and the profession. The title page of the series proclaimed: 'We are in the grip of widespread and systemic ecological and economic meltdown. This is a timely moment to reconsider all aspects of architecture, because it is so obviously required and architects now have the time and motivation to engage in such an exercise.' (Buchanan, 2012-2014)

In addition to *The Architectural Review* and *The Architects' Journal*, one other British magazine to adopt the environmental agenda was *Architectural Design*, now known as AD. The magazine, which was strongly associated with the *Whole Earth Catalog* in the 1960s, is published by Wiley and has evolved into a series of themed monographs edited in recent years by Maggie Toff. The publication's theme-based format allows it to explore ideas in some detail; in recent years, the issue of new digital technology and its impact on design thinking has been at the forefront of its output.

Changes in the way in which magazines record architecture have coincided with severe funding problems in architectural publishing. All print media suffered as a result of the expansion of free online content and changes in patterns of media consumption. In February 2014, *Building Design*, after 44 years in print, turned digital. In 2015, *The Architects' Journal* and *The Architectural Review* announced that they would follow suit (Dezeen, 2017). The good news is that this trend has been partly mitigated by the production of small-run magazines and themed books such as *San Rocco*, *Hunch*, *Log* and *Volume*. In 2011, Elias Redstone and the AA produced the 'Archazines' exhibition to celebrate the resurgence of alternative and independent architectural publishing (www.archazines.com). Redstone recorded 80 architecture magazines, fanzines and journals from over 20 countries produced by architects, artists, and students.

2.9 Sources: Interviews

Over the course of this research I have undertaken interviews with leading architectural writers and thinkers and asked them to reflect on the developments in architectural thought. Interviewees include Anthony Vidler, Kenneth Frampton, Sven-Olov Wallenstein and Charles Jencks. The interview with Jencks is the most extensive and focused. In the other interviews the discussion on ecology was not the primary focus of our meeting, but I have included the entire interview for context.

My primary concern with the Jencks interview was to get a clearer understanding of the attitude to ecology in the 1960s and 1970s and to address the question as to why ecology fell out of fashion so quickly in the early 1970s. The questions asked related to his motivations and the motivations of those around him in the world of theory and publishing. The insights provided by the interviews have contributed to the general understanding of the thesis and they have been used in the text on method and on theory. They serve as a reminder that the writing of the history of the immediate past is a difficult task and that two people's understanding of the same events can be very different.

The interview with Jencks sets out to deal directly with the changing nature of the discussion on ecology. What became clear through the interview was that it's very difficult to discuss the architectural history from the 1960s without reference to modernism and postmodernism, given that this binary understanding dominated the discourse. As one of the 'founders' of postmodernism and a leading critic of modernism, Jencks is important in this debate. Jencks is also particularly important because as an individual he provides some intellectual continuity between the postmodernists and those concerned with nature. Although Jencks is committed to 'Gaia' rather than ecology, his intellectual and design work has played an important role in switching attention from the historic or architectonic to the expressive, the natural and the digital.

Jencks approach to methods has also been informative. His pulsating bubble diagrams were initially derided as simplistic and deterministic, but over the past two decades, the idea of plotting the development of ideas in the same way that we might display GDP or public attitude surveys has become increasingly popular. The emergence of Big Data and the info-graphic as well as discourses on networks and institutional networks of power (Bourdieu, 1993) has given rise to the development of ideas diagrams of a similar character to those first drawn up by Jencks in the 1970s. There is an additional methodological issue here in that Jencks makes a direct link between his diagrams and biology. As such, he represents, within the discipline of

architectural theory, a singular expression of the tendency to conflate social and biological processes.

The interview with Sven-Olov Wallenstein was undertaken as part of the Venice Biennale in order to reflect on Modernism in Scotland. It was methodologically useful to explore the relationship between architecture and ideas, particularly the ideas of Foucault and then Gilles Deleuze (1925-1995) and Félix Guattari (1930-1992) areas in which Wallenstein has written. Given that Deleuze and Guattari are such important reference points in the architectural discourse on ecology, it seemed appropriate to talk to Wallenstein about their ideas and popularity. Wallenstein expressed concerns about the instrumental character of the debate about sustainability – but from the viewpoint of an academic rather than an architect. There are some interesting parallels in his sentiments and some of the sentiments expressed by architects.

The interviews with Kenneth Frampton and Anthony Vidler were undertaken early on in the research and were addressing additional issues beyond those in the PhD. They did not really address the question that emerged as the central issues of the thesis. They are more useful in relation to the question of method and the purpose of the discipline. However, since the interview with Vidler he has given a very useful lecture that addresses the question ‘Whatever happened to ecology?’ (Vidler, 2008).

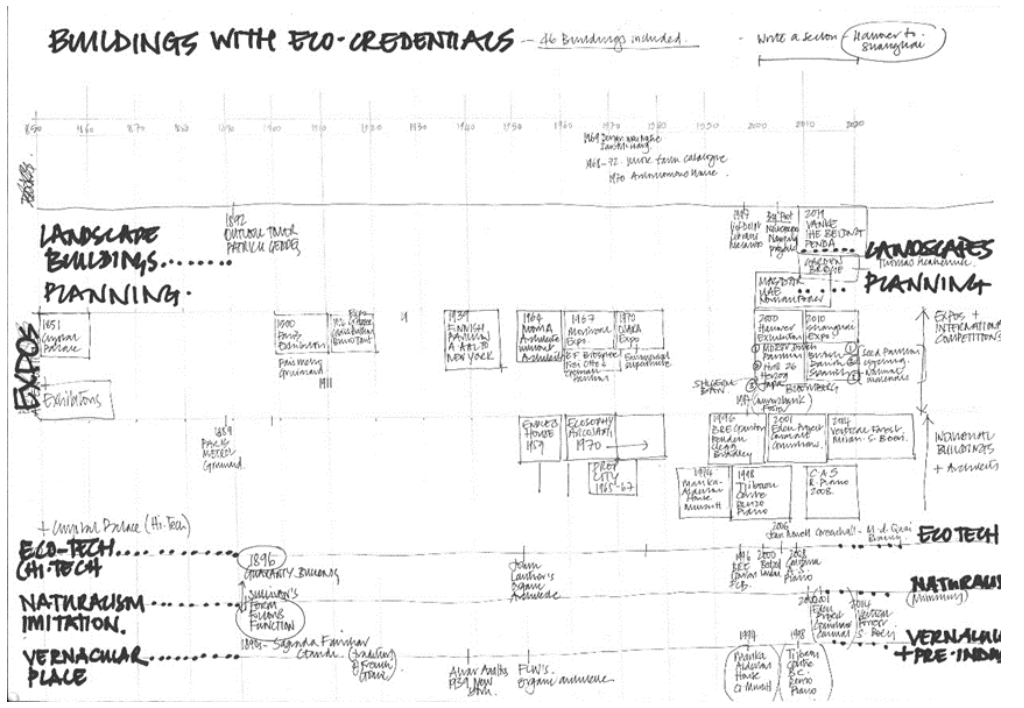
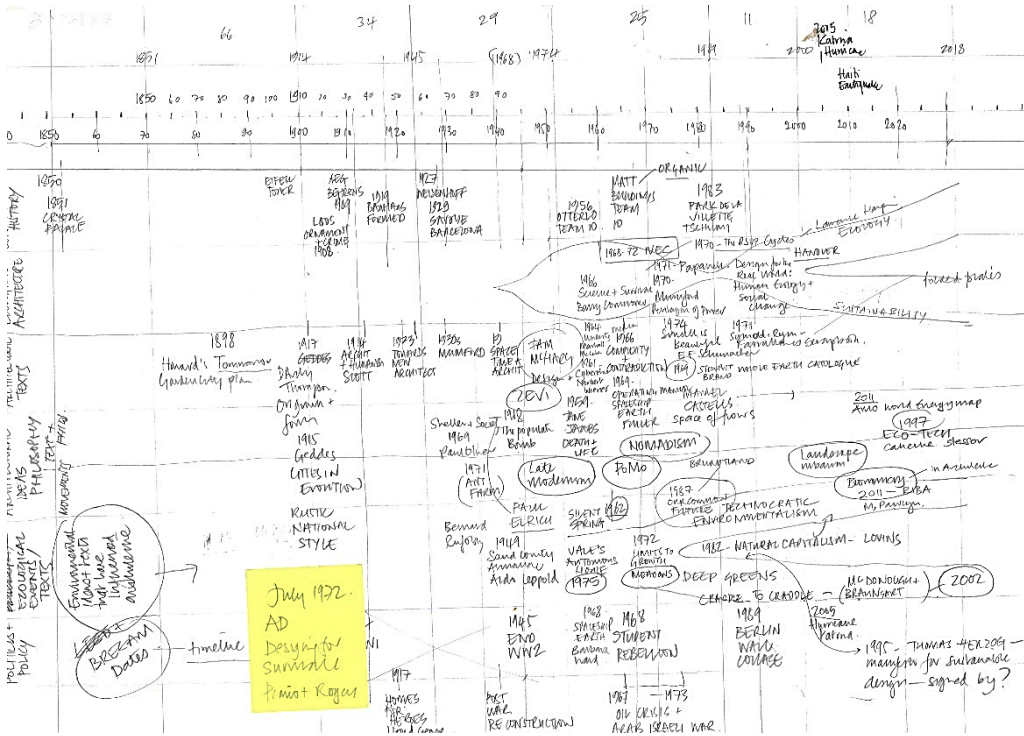
2.10 Other sources

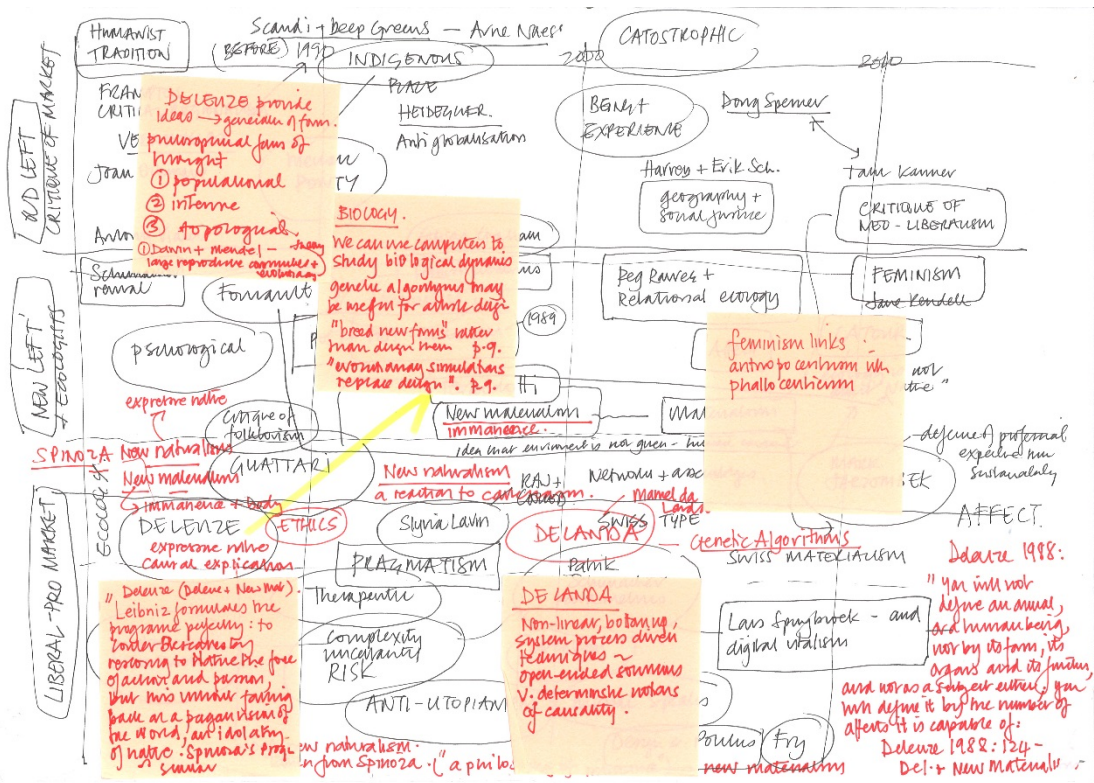
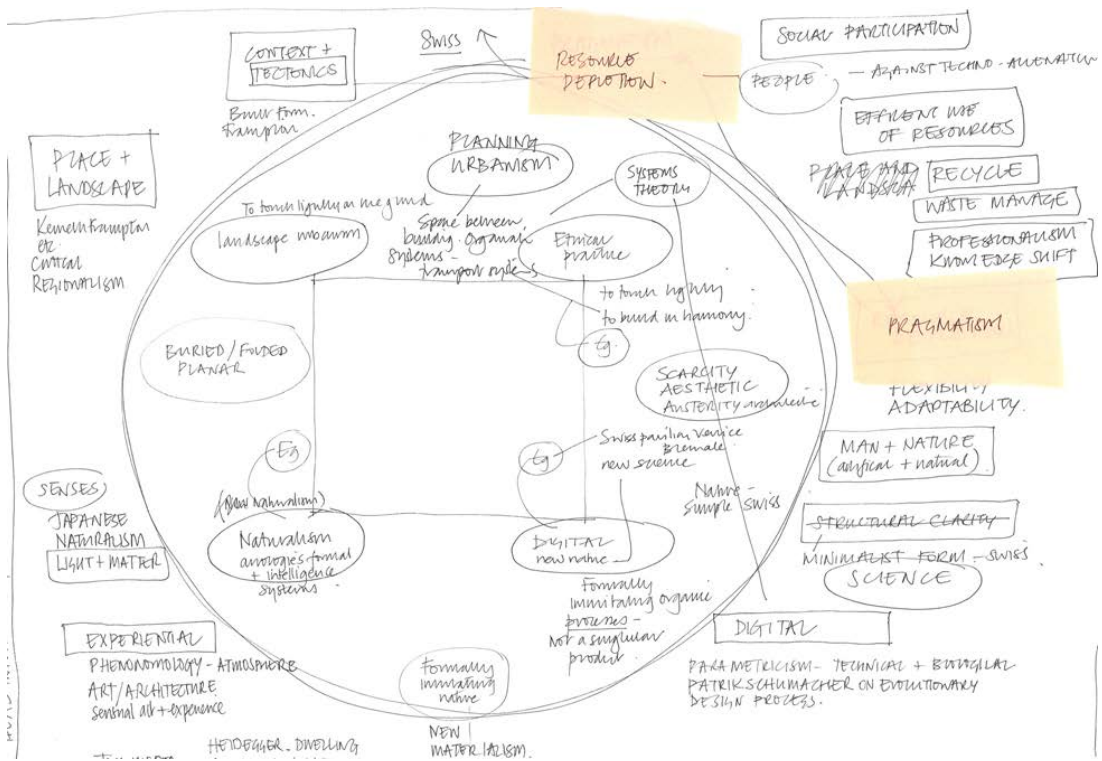
The Reyner Banham’s archives at the Getty Center in Los Angeles contains some interesting material on the issue of environmental thinking and the education of environmentalists. The archive contains a copy of the infamous statement-cum-letter from Jean Baudrillard to the Aspen Conference 1970. The French philosopher delivered a scathing critique of the environmental movement that goes some way to explain why the movement became marginal in the 1970s. The library research I have undertaken is largely conventional desktop research undertaken in the library at RGU. This library is well stocked, particularly with material from the 1960s and 1970s. I was lucky enough to find a copy of Soleri's Archology manuscript on my doorstep. In addition, I have benefited greatly from the growth of Amazon and the fact that, depressingly, many public and university libraries are now selling off books from the 1950s and 1960s that are rarely accessed by readers. Perhaps the most important or unique contribution this thesis can make to the broader discussion is to highlight the quality of some texts that are now largely forgotten.

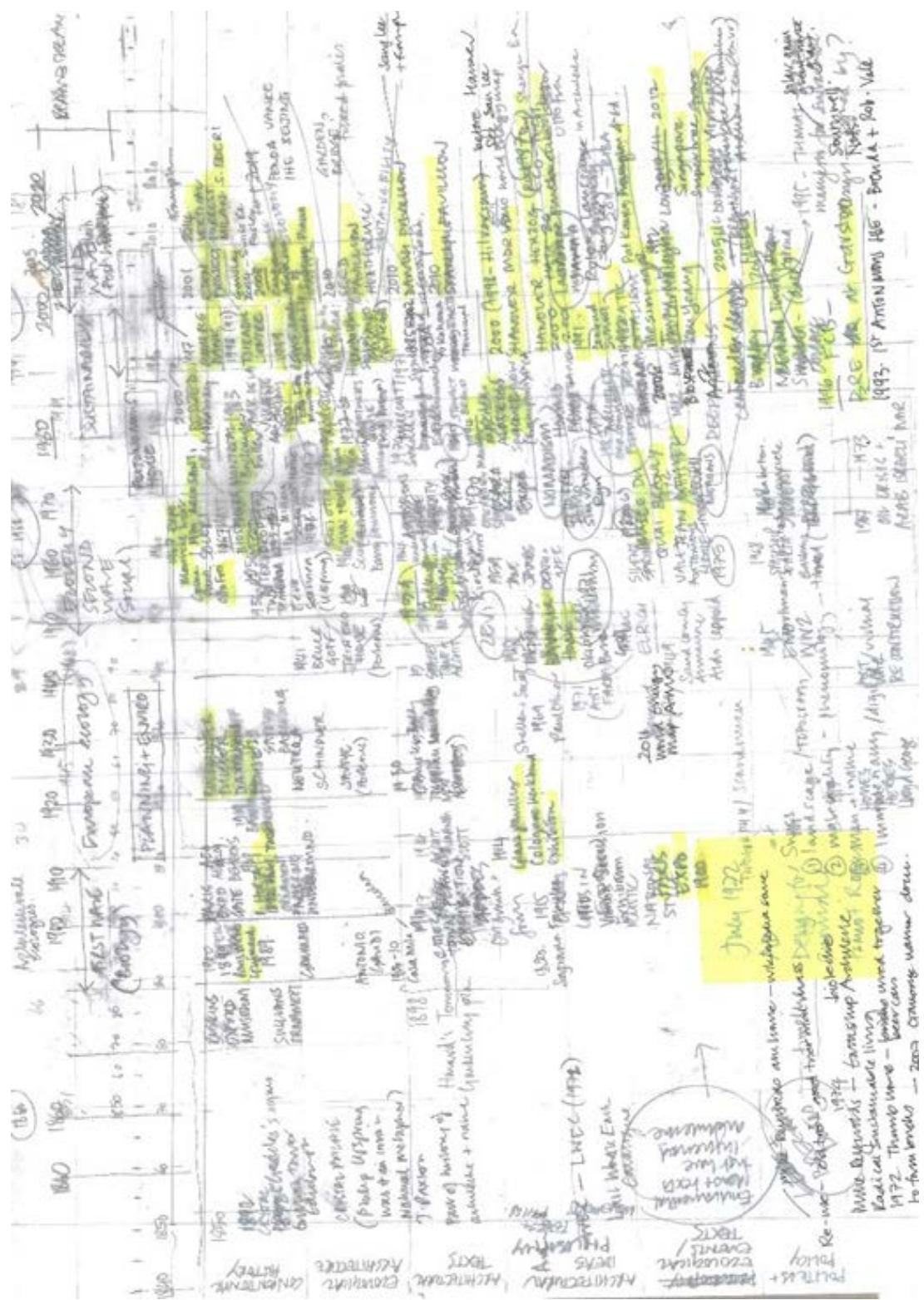
In addition to texts, conferences and conference papers provided useful material and provocations in the course of this research. Two AHRA (Architecture and Humanities Research Association) conferences were particularly informative. In 2015, *That Thing called Theory* AHRA conference was held in Leeds and in 2016 The Ecologies and Feminism conference in Stockholm. I also attended the SAH conference in Glasgow in 2018. The Stockholm conference provided a clear indication of the importance of the idea of ecology to contemporary architectural thought. It also made clear the connection between feminist thought and ecological thinking. A review of the agendas for forthcoming conferences also indicates the direction that the discourse on ecology is likely to take. Over the past 10 years, I have worked with a number of Masters Students in an attempt to understand the impact of environmentalism on practice. We have looked at the unintended consequences of BREEAM on the behavior of design-led Scottish practices and the pressures on journalists to reduce architectural judgment to an energy audit.

2.11 Time lines and diagrams

Sketches and diagrams produced by the author over the course of the research to aid in the mapping of ecological thought.







3.0 Terminology

'Green knowledge' says Jamison demands 'fluid' terms and environmental thought relies on "dialectical, open-ended terms to characterize the ebbs and flows, nuances and subtleties and the ambiguities of environmental politics" (Jamison, 2001). Raymond Williams described 'nature' as the most complex word in human language. For him, the idea of nature contained an "extraordinary amount of experience and human history, both complicated and transient" (Williams, 1980). Both nature and architecture are both difficult to define, each subject is dependent on shifts in the cultural values of a society at any given time, and both subject areas are riddled with ambiguities. In order to make sense of these difficult subjects and their relationship, this chapter describes and provides some definitions for the key ideas referred to in this study and how they have evolved historically.

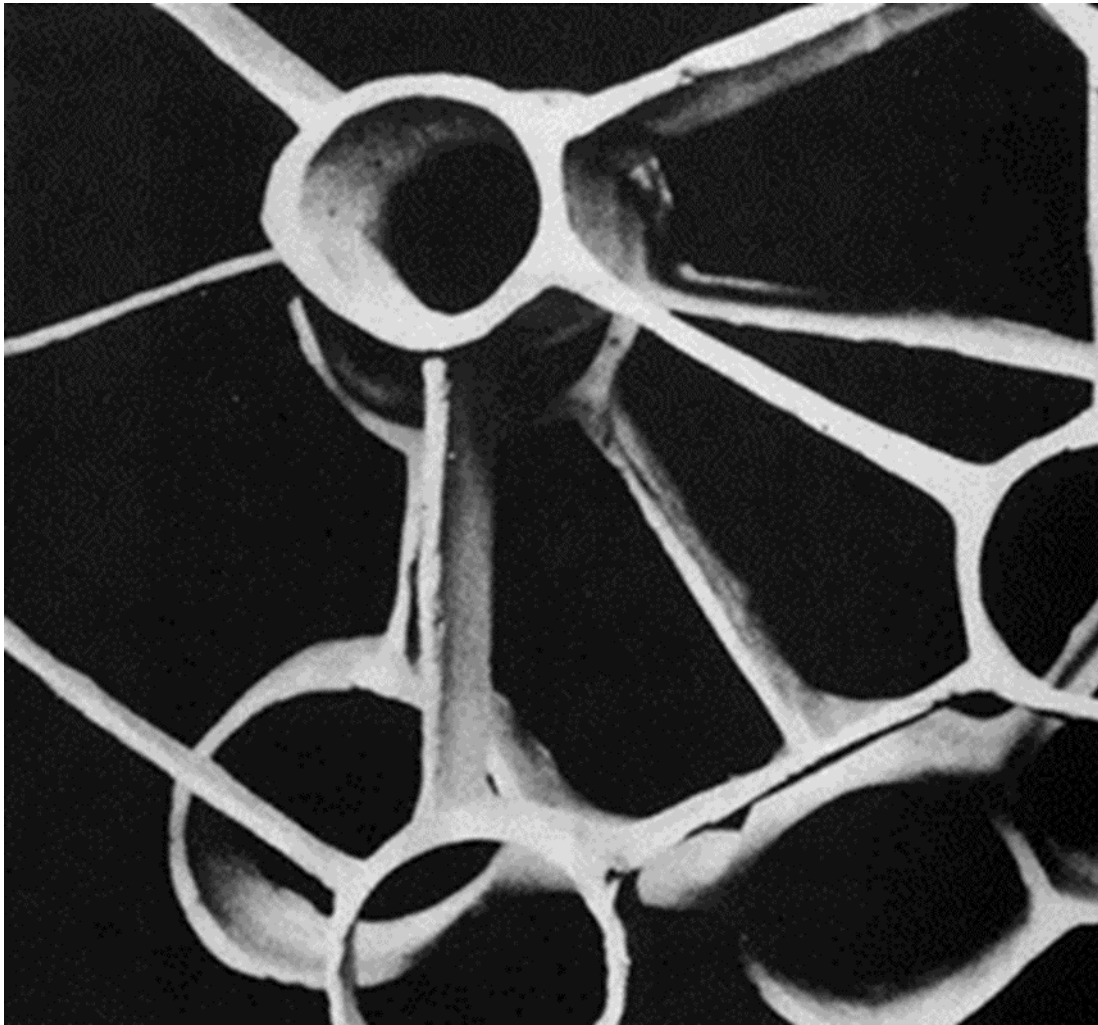


Figure 9 This is Tomorrow Exhibition, Whitechapel Gallery, 1956, James Stirling's contribution.

3.1 Nature and the natural

“Nature is indeed very difficult to pin down. It is the physical world around and inside us, like trees, rivers, mountain ranges, HIV viruses, microbes, elephants, oil, cocoa, diamonds, clouds, neutrons, the heart, shit etc.? Does it encompass things like roses in a botanical garden, freshly squeezed orange juice, Adventure Island in Disneyland, a Richard Rogers skyscraper, sewage flows, genetically modified tomatoes, and a hamburger?”, asks Erik Swyngedouw, a geographer (Swyngedouw, 2010, p. 299)

The philosopher Timothy Morton in *Ecology without Nature* suggests that we look at ecology without reference to nature because there are such a wide variety of ways in which the word nature can be understood (Morton, 2007). Nature is a list of things that are deemed to constitute nature (for example, trees) and it is also a force, a law or a norm (such as natural laws). Nature can also be seen as a fantasy, a balanced world and the opposite of our dystopian future (Morton, 2013). Thinkers such as Žižek and Latour both deride the concept of ‘nature’. If you try to fix on a singular meaning for nature you lose any proper sense of its meaning (Žižek, 2008)

The words ‘nature’ and ‘natural’ often make an appearance in architectural theory without the authors paying much attention to what we mean by them. Today we can talk about natural form, natural materials and natural landscapes and yet we struggle to reach a consensus on what can and cannot be included under these categories (Forty, 2000). Sylvia Lavin, in her essay *The Raw and the Cooked* (Lavin, 2014), encourages us to reflect on the essentially artificial or ‘cooked’ nature of the discipline of architecture and the strangeness of the architect's enthusiasm for the ‘raw’ natural or unworked material.

Swyngedouw draws our attention to the fact that the word ‘nature’ was first expressed by the Romantics as part of the celebration of ‘wildness’ in the context of revolutionary change and transformation in the wake of the French Revolution (Swyngedouw, 2010). However, it is important to recognise that as often as nature is represented as ‘wild’ it is seen as fixed and stable. Changes that take place in a stable and balanced nature are deemed to be caused by external forces such as human acts. This tension in our understanding of nature is reproduced throughout the discourse on political ecology.

One of the most important developments in the evolution of thought about nature came from the philosopher Immanuel Kant (1724 –1804). According to Berlin, before Kant the popular attitude towards nature was on the whole benevolent or respectful. “Nature was regarded as a harmonious system, or at least a symmetrical, well-composed system, such that man suffered when he got out of gear with it”, he notes (Berlin, 1965, p. 75). Kant's attitude was different; he saw nature as “at worst an enemy, at best simply neutral stuff which one

moulds". In Kantian thought, man is understood as a natural object; his body is in nature as are his emotions, he is most human when he dominates nature. Schiller takes these ideas from Kant and develops this idea of inner freedom of mankind into the idea of the tragic hero (Berlin, 1965). The pre- and post-Enlightenment attitudes to nature are a central theme in the discourse on ecology.

Kant placed the human will or subjectivity at the heart of his analysis of nature. According to Kant, the difference between man and nature is that other things operate under the law of causality, but man is free to act according to his own will. This allows men to choose between good and evil and right and wrong. This led Kant to the conclusion that morality is a human construct - to which we are free to subject ourselves; mankind has autonomy. This idea of human autonomy and its relationship to the power of nature is an important theme in the discourse. Some contemporary environmental thinkers suggest that the aspiration for autonomy has placed us in an unsustainable relationship with nature (Buchanan, 2011).

Kant's understanding of human knowledge, as described in *The Critique of Pure Reason* (1781), is also important in the ecological discourse. Kant argues that we use the mind to make sense of the world, a process in which we can never fully know the thing in itself, but we can make sense of the phenomena. Our minds understand the world in ways that match the order and structure of the universe by organising our perception and experiences into rational categories and rational systems (Dallmyr, 2011).

Kant is often the subject of ecologists' polemic. His argument that human understanding is organised according to categories that already exist in the mind prior to experience is challenged by modern ecological thinkers.

Adrian Forty's historical overview of the changing attitudes to nature in architectural thought suggests that there have been a number of significant shifts in thinking about art and nature since the Enlightenment (Forty, 2000). His schema begins not with Kant but with Johann Wolfgang von Goethe (1749-1832) and his understanding of art (and architecture) as 'second nature'. For Goethe, nature was a source of beauty, imitation and the origin of architecture. The study of anatomy and plant morphology guided the artist to an approach that transcends the mechanistic qualities of the natural sciences. Goethe rejected the narrow rationalist understanding of architecture and believed it was driven by the human instinct for expression. He argued that architecture was animated by the vital forces of mankind (Forty, 2000). Early proponents of modernism tended to reject nature as a source of formal or material expression, despite exceptions such as Frank Lloyd Wright. Forty constructs a narrative in which nature

disappeared from the architectural discourse with the onset of modernism and only reappeared in the late 1960s as a legitimate source of inspiration for architects.

In the contemporary discourse, it is deemed impossible to fix upon a single meaning for nature and equally difficult to draw a boundary to determine what might be described as the natural world as distinct from the artificial. As Williams argued back in 1980, in the history of the countryside it's very hard to draw a line between what is the product of natural process and what is the work of man. It's equally difficult to look at the patterns of human activity and everyday life and not see within them parallels with the life cycles of plants and other living organisms (Williams, 1980).

In the past decade, the idea that the boundary between nature and artifice, or even rural and urban, is irrelevant has become an important element of ecological thought. According to the German architectural journal *Cloud-Cuckoo-Land*, it is no longer possible or necessary to make a distinction between nature and culture: "While modernism ... had separated nature and culture, cultural theories since the beginning of the twenty-first century have considered nature not an antipode, but rather a component of culture." (Weidinger, 2016) Andreas Quednau argues that the entire environment - culture and nature - needs to be understood as a 'systemic whole' operating on the basis of the metabolic exchange of materials and creating a 'second nature' (Weidinger, 2016). The idea of second nature emerged in the 1960s and will be discussed in the chapter on the Age of Ecology.

Although it is difficult to make a single definition of nature, for the purpose of this thesis a distinction will be made between the man-made world and the world in which mankind has not consciously intervened. The term nature will be used rarely – but the idea of naturalism appears quite regularly. In the current period, we talk about a new naturalism and historically, in the first period of early ecological thought, we discuss the use of natural and biological metaphors and naturalism. Naturalism is the philosophical idea that only natural laws and forces operate in the world and is sometime equated with materialism. The term naturalism is used more broadly in contemporary architectural discourse to describe architects that either imitate natural forms in their work or evoke a sense of the natural world in their use of materials or the way they engage with the landscape. For example, we might describe Tado Ando's work as naturalistic (Jodidio,P, 2009).

3. 2 Environment and environmentalism

As an idea, the 'environment' emerges in the early nineteenth century at the historical moment when the new urban forms and new social relations generated by the expansion of industrial

capitalism give rise to a corresponding desire to understand mankind as a social animal rather than a singular entity (Benevolo, 1971). The first record of the term 'environment' in English appears in the translation of a Romantic essay by Goethe (1827). Thomas Carlyle, while searching for an equivalent of the German word *umgebung*, invented the word environment from the French 'environs' meaning 'surroundings' (Jessop, 2012). The cultural theorist Leo Spitzer suggests that 'environment' is used because it is a less personal and more deterministic way of assessing fixed factors that make up the character of the places in which we live (Spitzer, 1942) (Jessop, 2012). While the term environment begins life as a tool for exploring romantic sensibilities, it is quickly developed by the sociologist and Social Darwinist Herbert Spencer (Pearce, 2010), who replaces the plurality of external conditions with a singular environment and invents the concepts of 'force of circumstances' and 'organism-environment interaction' (Pearce, 2010).

Today, environment is used to describe both the given or natural world and the man-made world (for example, the 'built environment'). It is concerned with the complex set of relations in which any entity finds itself. The 'environmental imagination' describes thought concerned with context and in particular its natural context. The term 'environmental consciousness' refers to a growing awareness or sensitivity to the questions of the environment. This sensitivity comes under a variety of different guises and names and covers a wide range of discussions from bio-regionalism to biophilism and biomimicry (Corner 1999, Wilson 1993, Pawlyn 2001). The terms green politics, green ideas and green buildings are used in the same way as environment as an umbrella term to denote a broad interest in the environment and as such these terms can be used interchangeably with environmentalism.

While environment describes context, environmentalism suggests a moral judgment about the negative impact of man on his natural context. Today 'environmentalism' is used to describe a political outlook or consciousness. It covers a wide variety of political positions, but denotes an outlook in which the question of the conservation and management of the natural world is a primary concern.

3.3 Sustainability

The idea of sustainability is a comparatively new idea they was generated from a political dialogue that operated on an international level. Back in the 1970s, Willy Brandt talked about a three-fold crisis – a crisis of environment, energy and development. It was an idea that was fully articulated in Brundtland's report of the World Commission on Environment and Development, *Our Common Future* (Brandt, 1987). The Brundtland Report, as it is often

known, first established the idea of sustainability as a new branch of politics aimed at addressing the problems of development at a global level. The idea of sustainability was that it should be possible to address economic, social and environmental issues in an integrated manner. As the concept was used among international bodies, it started to provide a framework for domestic political discussions and for campaign groups concerned about pollution and underdevelopment. However, the term is often associated with policy makers and government initiatives and technical approaches to environmental questions. The terms has been particularly well used in the UK planning system and discourse, an arena in which has been adopted to mean long-term planning. In other words, planning which will be beneficial over time rather than satisfying short-term criteria in relation to economics or welfare provision. Where sustainability has been used to describe buildings, it suggests a similar approach, assuming the measurement of energy performance and human comfort, but it also addressing broader questions of transport links and the carbon footprint of materials employed.

From the late 1990s, in certain academic and political circles, the term sustainability started to be treated with a degree of skepticism; architects started talking about ‘corporate green-wash’ and ‘green-bling’. Martin Pawley, writing in the *Architects Journal* in 2000, described the terms ‘sustainable development’ and ‘sustainability’ as ‘highly contentious’ (Pawley, 2000) “Their scope extends beyond the built environment and is now firmly embedded in the socio-political arena. This ascendancy has been rapid while various definitions fail to satisfy critics ... The first is an oxymoron, the second ill-defined and impossible to achieve”, wrote Pawley. One might have assumed that following the publication of the Brundtland Report (Brundtland Commission, 1987), the question of sustainability would have featured significantly in theory texts. But until the late 1990s, modernity, context, place, form, history, society and disciplinary autonomy dominated this realm of theory (Dovey, 2008). It is only in the past decade and a half that ‘sustainability’ and ‘the ecological’ have started to appear as a legitimate subject matter within the discourse on theory (Greig Crysler, 2012).

In 2010, Professor Mark Jarzombek from MIT suggested that “an architectural discourse about Sustainability – from a cultural and theoretical point of view – is tottering on irrelevancy” (Jarzombek, 2010, p. 1). Over a period of 10 years, sustainability had become a popular expression, a catchword for the environmental concerns of architects and a buzzword among policy makers and clients, but it had also started to attract critics. “The reason we want Nature ... to exist is so that there is a fixed point on which to leverage design and policy, but that Archimedean point – and the utopian project of modernity on which it is founded – does

not exist and to hold on to the illusion is absurd. Just as religion is the opium of the masses, Sustainability is now the opium of architects and technocrats.” (Jarzombek, 2010, p. 1)

Jarzombek was joined by a growing chorus of theorists concerned that sustainability had adopted the modernist/rationalist/functionalist approach to environmental problems. One of the dominant arguments coming from the critics of sustainability was that the problems of the environment could not simply be addressed by the efficient use of technology and materials (Rawes, 2013). In 2000, Susannah Hagan proclaimed that “the sustainability lexicon is exhausted, overused and abused. The phrase ‘sustainable development’ has haunted urban planning, urban design, urban geography and, above all and most meaninglessly, political discourse for the last two decades,” (Hagan, 2000, p. 12).

There are many architectural writers that continue to use the term sustainability; the Harvard text, *Ecological Urbanism*, contains many references to the term. However, it's important to recognize that the ‘s’ word is now associated with top-down, technocratic approaches to environmental questions and as such is seen as problematic among a growing number of architectural opinion formers. Sustainability has not been adopted by many of today’s architectural theorists because it is understood to be compromised by its close association with the idea of growth and progress (Dobson, 1991). Within the architectural profession, there was a sense among radical theorists that some parts of the profession are using the sustainability agenda for commercial gain. Jarzombek's critique of the multidisciplinary engineering firm, Arup, is a clear expression of this sentiment (Jarzombek, 2010)

The introduction to the SAGE Theory anthology confirms the general cynicism among theorists. “The academic consensus in architecture moves rapidly to embrace the idea of sustainability as the ultimate technical fix, a specialised knowledge base that will enhance the profession’s claims to expertise, or a messianic agenda that will unify architecture around a universal common cause, the importance of reasserting social and historical differences is increasingly important.” (Crysler, et al., 2012, p. 6).

3.4 Ecosophy

Ecosophy is the term used by Félix Guattari in the 1980s to describe a convergence of ecology and philosophy, but the individual that is most clearly associated with the notion is Arne Naess, the father of the deep green movement.

For me reality has always been something slippery to handle. I seem to grasp it firmly but like an eel, or even a small lively trout in shallow water, firmness of grasp doesn't guarantee against escape. (Naess & Rothenberg, 2003) (Drengson, 2005, p. xvii).

In 1969, Naess resigned as professor of semantics and the philosophy of science in order to focus his attention on the development of Ecosophy T, his own particular brand of eco-philosophy which was named after the Tverastein, a local mountain. It was given a letter to indicate the personal character of his outlook and on the assumption that there would be many 'ecosophies' developed by others. This demonstrates Naess approach to knowledge and understanding. He can be understood within the postmodern critique of both science and reason and the construction of meta-narratives and universal truths.

While many of Naess's contemporaries looked to French philosophers to provide a framework for the critique of science and reason, Naess has studied the work of Spinoza in order to develop an understanding of pre-enlightenment ideas. For Naess, the appeal of Spinoza was that he looked at the world as a single unity or substance. In the introduction to *The Selected Works of Arne Naess* (2005), the editor Alan Drengson draws attention to Naess's enthusiasm for Spinoza as opposed to Cartesian thought. "Contrary to the dominant, Western way of viewing reality, there is extrinsically connected discrete objects or 'things in themselves' in the sense of Kant's *Ding an sich*. With Naess's 'gestalt ontology' there is no dualistic 'I' standing outside of reality looking in. Living beings, individuals in the sense of Spinoza's modes, are spatiotemporal manifestations of 'one substance', nature or beauty." (Drengson 2005). In 1969 Soleri coined the term 'arcology' to describe the convergence of architecture and ecology, which he suggested could be seen as a philosophy.

3.5 Gaia

Gaia theory (or the Gaia hypothesis) was developed by James Lovelock, who was a chemist and developed by Lyn Margulis, a microbiologist, in the 1970s. The basic theory is that organic beings interact with the inorganic world in self-regulating and complex systems, and that these systems help to maintain planetary life. Gaia theorists are interested in the biosphere, evolution, climate change and the oceans. The usefulness of the thesis is a matter of contention among scientists.

Jencks became interested in Gaia in the 1980s and the outcome of this interest was the book *The Jumping Universe*, which at the time of publication in 1995 coincided with a broader interest in complexity theory within maths and physics. The book was the outcome of a conference organised at the AA by Jeffrey Kipnis and Jencks. "I'm a great follower of Gaia and I suppose in a nutshell I moved to cosmology in 1980 ... I've moved to Gaia rather than ecology because I don't believe that man is the measure of all things, nor woman either, and

the human species doesn't have a birth right and a legal ownership of the planet, even a moral right.” (Jencks, 2015)

Kipnis holds a master's degree in physics, but is widely recognised for his contribution to architecture thought, which began with a collaboration with Peter Eisenman and Jacques Derrida. He works in partnership with architects such as Reiser and Umemoto, authors of *The Atlas of Novel Tectonics*, an important reference book in the contemporary discussion on the new materialism.

The appeal of Gaia theory is that it is insulated from the policy orientation and practical questions addressed by sustainability and instead looks at nature as a philosophical question. Gaia theory gives nature a certain sense of moral agency: “Gaia will bump us off if we're not going to be better to her. It won't be by any means the end of life, no way! I mean it will just be another hiccup in the chequered history of the earth.” (Jencks, 2015)

3.6 The Anthropocene

The backdrop to the contemporary discussion on ecology is the idea of the Anthropocene. When *San Rocco*, the influential European publication, published an issue on ecology in winter 2014 (Issue No. 10), the authors used the term ‘geostory’ rather than ‘history’ and made frequent references to the Anthropocene. Gugger and Macaes Costa argued that the world of architecture was grieving over the loss of an anthropocentric world view. In their view, we needed to adjust to the fact that we were now living in “an uncanny era in which human history has collided with geological time, giving rise to strange phenomena that are impossible to categorise in terms of opposition of human versus natural (global warming, mass extinction, pollution)” (Gugger & Macaes Costa , 2014).

Central to this thinking is the idea that we are living through a new paradigm or a new period in history in which our ambition should not be ‘mastery’ of nature but ‘co-existence’ (Latour, 2008). According to Hagan, the way we understand nature today takes two distinct forms: we either adopt a modernist version of the world in which nature is seen as a source of raw materials and an instrument of knowledge, or we adopt the environmental model in which “nature is viewed as a complex system on which we are, and will always be, dependent” (Hagan, 2000). This paradigm shift, which takes place at a material and philosophical level, is described using a term that is borrowed from geology's timescale - Anthropocene. Rather than working with historical conventions. The Anthropocene begins at the moment when man's impact on the earth was so significant that it altered the eco-system. The starting point of the

period is often associated with the start of the Industrial Revolution, although others identify 1945 and the atomic tests as the origin (Morton, 2013), while the end point is the present.

The idea of the Anthropocene has only appeared in the literature on the environment in the past few years. It was used by Soviet scientists in the 1960s, and in the English language it first appears around 1984 and then falls out of usage until 1999 when it was suddenly popularised. The word itself is credited to biologist Eugene Stoermer, who borrowed the term from geology and started using it informally in the 1980s. It was first used in print in 2000 by chemists Crutzen and Stoermer as a relatively informal term, the review of its official status ongoing. What is important about the Anthropocene is that it marks a shift in our approach to history and geography (Standish, 2015).

Environmentalists and architectural scholars are not alone in their enthusiasm for the idea of the Anthropocene; other disciplines such as history, sociology, philosophy geography have adopted the framework. In geography, the idea that 'history' (his-story) should no longer be restricted to describing the evolution of human activity but should cover the story of the earth and even the universe, is gaining strength (Mazlish, 1999).

Mazlish argues that the very nature and meaning of history, with the idea of 'agency' at its core, is being transformed by the interdisciplinary explorations of history and geography. One of the consequences of this understanding is that human activity as redefined as fundamentally damaging (Standish, 2015). According to White, if we accept this category to describe our age, we must also change our understanding of history. History is no longer a record of the lives of (great) men but should be organised according to notions that describe the relationship between man and nature (Standish, 2015).

The idea of the Anthropocene places the idea of ecology at the heart of our understanding of contemporary life, and at the same time it redefines the term ecology. Latour is keen to stress that ecology is not nature, in fact it is nothing to do with nature. Ecology describes the world as a network of interconnected systems (Latour, 2008). Humanity is embedded within these systems and human social relations should be understood in the context of relations between all living things. This logic is extended further to ask us to rethink our understanding of the 'object' or 'things' and the relationship between them.

A common reference point for scholars on this subject remains Gregory Bateson (1904-1980). "Bateson wrote that humans do not live and act against a natural background. Rather they are part of it" (Bateson, 1972) (Rawes, 2013, p. 283). Bateson developed the idea of 'feedback loops', the understanding that all actions in the natural world have consequences. This attitude aligns with ideas developed in science and social theory in the last decade of the

twentieth century, such as chaos theory, as explored by Jencks and in theories of risk first set out by Ulrich Beck in *Risk Society* (1992) and explored in more detail in relation to the city and urbanisation.



Figure 10 Agnes Dean, 1982, an Artist Harvested Two Acres of Wheat and Kongjian Yu, Turenscape, Rice Campus, Shenyang 2011. Both images appear in Ecological Urbanism by Mohsen Mostafavi.

4.0 Literature Review

The literature used in this research is wide ranging but can be broadly understood in three ways: as environmental, architectural or concerned with both environmental and architectural together. The environmental literature is particularly concerned with the idea of ecology. The first two sections of this chapter deal with the environmental literature, section three deals with architectural ideas and the final two sections review texts that address the crossover between ecology and architecture.

4.1 Environmental History

The books and articles on the environment used in this research are largely the product of the relatively young discipline of environmental history, which has been developing since the 1970s. This history in turn draws on the philosophy and sociology of the environment, also emerging areas of scholarly activity. Two books have been particularly useful in describing the evolution of environmentalism and the development of environmental policy: *What is Environmental History* by J.D. Hughes (2006) and *The Age of Global Warming: A History* by Rupert Darwall (2013). Both texts pay particular attention to the development of environmental ideas and policy in the USA, while Anna Bramwell's greatly undervalued *A History of Ecology in the Twentieth Century* (1989) addresses the same questions from the UK and European perspective.

Donald Hughes notes that until the 1970s the history of the environmentalism tended to be written by enthusiasts, but the creation of the *Environment and History Journal* in 1995 in the UK marked the professionalization of the subject. The discipline is young, but we are witnessing the emergence of an attempt to understand environmental thought and its genealogy. Authors writing about the history of ecology often begin their narrative in the early 1960s with the publication of Rachel Carson's *Silent Spring* (1962), when American anxiety about industrial pollution led to the popularity of environmental thought and ecology became a commonly used term (Hughes, 2006). The establishment of Earth Day on 22 April 1970 marks the official recognition of the Earth as a complete organism, capable of being irreparably damaged by human action. The development of the environmental movement and green activism is usually associated with the student radicalism in both Europe and the US of 1968 – the moment that is associated with the birth of a so-called 'counter culture'.

Other histories of environmentalism place the origin of the outlook in antiquity; in the past decade we have seen the rise in the popularity of histories of the Earth with their origin in the 'Big Bang'. In *The Greening of Architecture: A Critical History* (Tabb, 2013) an introductory chapter on 'early design strategies' looks at the Ancient Greeks and Romans and how they built in relation to climate (Tabb and Deviren, 2013, p1). In these texts, the understanding of geographical context is often interpreted as early environmentalism. For example, Mencius and Xenophon recorded human changes to landscape and Hippocrates wrote texts on *Air, Water, Places* (Hughes 2006). These environmental histories look at the early development of human settlements and tend to frame this history in terms of a pre- and post-industrial narrative in which a harmonious coexistence between man and nature is followed by human domination of nature. The new histories of the earth tend to stress both the destructive power man and the insignificance of man in the long history of the earth. This discourse will be discussed in more detail in chapter 8 on contemporary ecological thought.

The texts that locate the origins of environmentalism in antiquity fail to appreciate the distinct character of outlook. This study follows Bramwell's assertion (1989) that there is a strong link between 'environmental consciousness' and industrialization and as such the origin of ecology should be located around the time that the concept of ecology was first coined. Hughes identifies George Perkins Marsh, the US ambassador to Italy who published *Man and Nature* (1864), a study on deforestation, as a key player in the development of ecological thought. To talk about an environmental outlook prior to this point ignores the essential character of the idea and subsequent movements – that they are a reaction to the significant transformation of the natural world by industry.

In this literature, it is possible to see the evolution of environmental thinking not as a continuous process but as a series of fits and starts in which environmental consciousness comes to the fore in response to broader social and political debates. An interest in the environment within the political class takes a variety of forms. Sometimes it suggests a reaction to a social question – such as the debates around the limitations of the American Dream in the 1960s – and in others, it marks a direct response to an environmental crisis.

For Bramwell, environmental consciousness begins in the second half of the nineteenth century in the wake of Romanticism, the scientific work of Darwin, the emergence of the social sciences and the work of Ernst Haeckel (Bramwell, 1989). Hughes locates the birth of ecological science in the USA by the development of conservationism and land management. Hughes explains that until the end of the nineteenth century, the open character of the USA's western frontier was seen as an environmental safety net, a mechanism through which

egalitarian principles were kept alive thanks to the availability of unlimited natural resources (Hughes, 2006). However, towards the end of the nineteenth century there was a shift in consciousness to recognize the limited nature of resources. Marsh developed 'natural economics' arguing that deforestation was affecting the material, fuel and economic wealth of society. The idea of resource depletion influenced conservationist John Muir, founder of the Sierra Club in 1892, and the Progressive Conservation Movement, which began lobbying and gaining support from the White House particularly from Theodore Roosevelt (1901-9) and Franklin D. Roosevelt (1933-45). Darwall notes that one of the consequences of the First World War for the US was to initiate concerns about energy depletion. The regulation of the coal industry in 1917 is evidence of this concern.

Between 1890 and 1930, the gradual closing down of the USA's western frontier coincided with a shift in attitudes towards concerns about resource depletion. By the time of the 1929 crash, commentators argued that the West could not be understood as a source of inexhaustible natural resources (Hughes, 2006). In the early twentieth century, the question of the social distribution of resources and democracy was addressed directly through the question of national interest and war, but by the 1930s a series of heat waves (1936), dust bowls and crop failures placed environmental damage on the political agenda. Aldo Leopold's exquisitely written *A Sand County Almanac* (1949) reflects the growing public interest into the impact of man's activity on natural eco-systems. However, the environmental discourse in the US remains tied to the question of economic management and, in Darwall's opinion, in the immediate postwar period environmentalism was 'Americanised' with the formation of the Paley Commission. The Paley Commission's *Resources for Freedom* (1952) argued that using resources in the present day allowed the economy to grow; to recycle might create problems for the future and, as a consequence, Paley was labelled an 'ameliorist' (Darwall, 2013, p. 41).

4.2 Environmental theory

We often think of environmentalism as a response to developments in climate science or new knowledge about pollution, but we can also read the development of environmental thought in relation to broader cultural trends. As Rupert Darwall says: "To explore global warming is to journey through the mind of Western contemporary man." (Darwall, 2013, p. 7). So what does that journey look like? For a schematic framework for that journey, this research relies on the work of Andrew Jamison's *The Making of the New Environmental Consciousness* (1990) and *The Making of Green Knowledge* (2001). An earlier text by Donald Worster's *Nature's Economy: A History of Ecological Ideas* (1977) and Fred Dallmayr's *Return to Nature: An*

Ecological Counter-history (2011) also provide a mechanism for thinking about the history of environmental thought.

Jamison organises environmentalism into stages: from the ‘awakening’, to an ‘age of ecology’ through to ‘politicisation’, ‘differentiation’ and ‘internationalisation’ and finally the recent and ongoing conditions of ‘integration’. In the period from 1974-1994, he describes how green ideas are appropriated by politicians at a national and international level and how the green movement starts to divide. From Jamison’s approach, it was possible to identify three key periods in which ecology had an influence on architectural thought. This study is mainly concerned with two periods, the first described by Jamison as the ‘Age of Ecology’ in which some of the key ideas of ecology are defined and the second the current period in which ecology is an important element in architectural discourse. This immediate past, the period from the new millennium to the present, is described by Jamison as a period of ‘integration’, because he argues environmental thinking has been integrated into mainstream politics and has in the process become a divided movement. There has been a process of ‘intellectualization’ or ‘culturisation’ in which environmental thought has changed the way we think about and frame our understanding of the world (Jamison, 2001). In *Eco-criticism* (2004), Greg Garrard outlines key positions as cornucopianism, deep ecology, eco-feminism, social ecology, eco-Marxism and Heideggerian eco-philosophy. A more simplistic binary is the formulation of old and new environmentalism.

The new environmentalists argue that environmental problems can best be resolved through human design and action. The old environmentalists argue that such approaches to ‘technical fixes’ are themselves symptomatic of a failure to address important social questions about control and power. The Marxist intellectual David Harvey is an erudite exponent of the second position (Harvey, 2003). He describes a ‘right royal battle’ in the scientific community and the environmental movement. Harvey argues that the fantasy of total control of nature can be found in the sophisticated environmental management strategies put forward by new environmentalists (Harvey 2003). Many of today’s architectural theorists share Harvey’s skepticism over “the role to be played by science and technology, as opposed to transformations in social relations, in finding solutions to environmental dilemmas and ecological degradations” (Harvey 2003).

Nordhaus and Shellenberger, the authors of *Break Through: From the Death of Environmentalism to the Politics of Possibility* (2007) are new environmentalists; they are optimistic about the possibility of mankind developing the means to address the problem of global warming. However, this approach is often criticized for failing to address the social

limitations of the market system and is often characterized as ‘technocratic’ or ‘anthropomorphic managerialism’ or Promethean (Garrard, 2004). For new environmentalists, the active management of natural resources within the existing economic framework is possible. In opposition, the old environmentalists work on the assumption that human activity must be constrained in order to guarantee the natural balance of the earth's eco-system. The old environmentalism camp is populated by deep ecologists like Arne Naess and Gary Snyder, who are inspired by Eastern religions and argue that both human and non-human life is of value independent of the usefulness to humans. “Deep ecology is concerned with encouraging an egalitarian attitude on the part of humans not only towards all members of the ecosphere, but even towards all identifiable entities and forms in the ecosphere.” (Garrard, 2012, p. 24) They tend to argue for a smaller human population rather than technical innovation and they are responsible for the development of environmental ethics and a new materialism that values the inanimate as well as the animate.

4.3 Architectural theory

In order to make sense of ecological thought and its impact on architectural thinking, it is necessary to map the basic developments in architectural theory. Architectural theory takes many forms: it is the record of how to design and build (‘How To’ literature); it is a set of ideas and conventions associated with the particular practice of the discipline (spatial and contextual questions); and finally, it is a set of ideas that situate architecture within a broader cultural, social or philosophical context (Crysler et. al., 2012). The question of the content and boundaries of architectural theory was the subject of an AHRA conference in 2014 and is a central issue in the SAGE handbook on theory (Crysler et. al., 2012), the most recent comprehensive attempt to provide an overview of the field.

This research began with a study of the prominent anthologies produced on architectural theory. The anthologies identified are: *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995* by Kate Nesbitt (1996) and *Constructing a New Agenda: Architectural Theory 1993-2009*, edited by A. Krista Sykes (2010). Both books were produced at Princeton, one 14 years after the other and both the approach of the editor and the content included shifts significantly over that decade and a half. The other two anthologies - *Architecture Theory Since 1968* by K. Michael Hays (1998) and *The SAGE Handbook of Architectural Theory*, co-edited by S. Cairns and Hilde Heynen (2012) - also

make an interesting comparison. The later SAGE publication is not organized with chronology in mind; the editor is attempting to identify themes in the work.

The study also draws heavily on the work of Anthony Vidler, particularly the series of articles that he published in the *Architectural Review* from 2011 -2014 looking at the 'Trouble with Theory'. One of the fundamental assumptions of Vidler's text is that architecture now operates in an expanded field. Vidler imported the idea of an 'expanded field' from sculpture at a moment when the status of the architect in the construction process appeared to be diminishing. For Vidler, the work of practices such as SITE that embrace landscape and environment provide an opportunity for the profession to reassert itself. His attitude is echoed by many of the authors contributing to Harvard's anthology *Ecological Urbanism* (2011) who see the expansion of architecture to address urban and even regional questions as a positive development.

The idea of the 'expanded field' coincides with a period of architectural theory in which there is no single dominant outlook, but a large range of prefixes, such as 'post' and 'neo', and more recently a series of 'turns'. In the current context, there is talk of 'post-humanism', 'neo-naturalism' and 'new' materialism, along with the 'digital turn' and the 'ontological turn'. These new understandings will be described in Chapter 8. The starting point for this current period is often located in the year of 1968, a year which is identified as a turning point in cultural life. It's worth dwelling on the changes in 1968 because it relates to the age of ecology as well as the birth of today's architectural theory.

The character of the current discourse on architecture theory, which is eclectic and thematic, has its origin in the development of postmodernism and critical theory in the 1960s. Radical activity around the Vietnam War and developments in political theory meant architecture was increasingly understood as an instrument of state power. By the 1970s, Hegelianism had been usurped by theory that linked built form directly to political power and looked closely at politics, economics, and institutional power and design, such as Michel Foucault (Porphyrios & Papadakis, 1981). In the 1980s, Foucault's 'space-as-power thesis' was one of the most significant strands of thinking in the critical camp. At the same time, Walter Benjamin's (1892-1940) attempt to understand the relationship between mechanised production and creativity and his descriptive analysis of the city and the place of the individual subject within the city became important (Porphyrios & Papadakis, 1981).

By the late 1960s, the counter-culture sentiment expressed in political life was having an impact on architecture and the discourse evolved through the work of groups and publications like Archigram. 'Even AD was transformed into a hip broadsheet ... started in

1969 when Peter Murray joined Robin Middleton as art editor and began the wild rise to be the architectural equivalent of the *Whole Earth Catalog*.’ (Vidler, 2011). Frampton recalls that in the mid-1960s, architectural thinkers were ‘increasingly bereft of a realistic theoretical basis on which to work’ (Frampton, 1988). According to Mallgrave, the radicalism of 1968 didn’t provoke a crisis in architecture, but simply revealed it; the ‘social and political events of 1968 made manifest the outlines of an architectural crisis of confidence’ (Mallgrave & Contandriopoulos, 2008, p. 17).

Architectural theorists were not able to explain the cause or source of this crisis. Some ignored it and continued to write as if the Modern Movement was still the undisputed framework for practice and theory, but the death of both Gropius and Mies van der Rohe in 1969 provoked some recognition that Modernism might vanish with its masters. The divide that opened up in architectural thinking was as much a generational one as an ideological one (Mallgrave & Contandriopoulos, 2008) (Jencks, 2015).

Theorists began to look for validation from either the humanities or the sciences. By the early 1970s, modernism was programmatically and formally compromised and, in place of an overarching ‘theory’, distinct camps were formed (Vidler, 2011)(Jencks 2015). Since then these camps or strands of thought have become attached to individuals, institutions and publications, and as such they never entirely disappear, but they were either central to the discourse or marginal.

While Late Modernist architecture continued to be produced into the 1960s and 1970s and postmodernist architecture only really appeared in the mid- to late-1970s with projects such as Charles Moore’s Piazza d’Italia in New Orleans, the unravelling of the Modernist consensus was underway. As Mallgrave notes, the journals were not announcing the end of Modernism, but there was a ‘generational divide’ that emerged in 1968. ‘It was a divide that would oppose the ideological platform of high modernism, not with a unifying counter-strategy but rather with a fragmentation of theory.’ (Mallgrave & Contandriopoulos, 2008, p. 17). From the mid-1960s onwards, there was a continuous struggle to establish any consensus around architectural ideas. ‘The architect proceeds as in any battle, as a provocateur. He saps the edges of taste, undermines the conventional boundaries, assaults the thresholds of respectability and shocks the psychic stability of the past by introducing the new, the strange, the erotic and exotic.’ (Jencks, 1973, p. 63) The key tension in the early period was between those that saw architecture as an art and those that saw it as a science. In the long run, the supporters of science appeared to win the battle. However, as the decade progressed, the tension between those that prioritized formal concerns over social became significant. This is the period in which we

witness the development of ideas from outside of the discipline exerting an ever-stronger influence over the discourse. As assistant executive editor at the *AR*, Peter 'Reyner' Banham (1922-1988) launched a series of banner articles under the heading of 'Stocktaking 1960' between January and June 1960. Banham claimed the new decade marked a 'great divide', suggesting there had been a fundamental change in taste. 'The Modern Movement's private mythology of Form and Function has come apart.' Torn between 'tradition' and 'technology' or 'science' and 'history', 'the profession needed to re-define its limits in the midst of "these competing bids for intellectual domination"' (Vidler, 2011). Banham himself seemed torn. In *Stocktaking* (1960) Banham argues for a new technological understanding of the discipline based on cybernetics and computer science, but a few years later he argued that concerns that drive design should address social questions (Banham, 1960).

Forty identifies two key influences on architectural thought following 1968. In his essay on nature he argues nature was reintroduced into the discourse (following its rejection by the Modern Movement) through the philosophy of the Frankfurt School on the one hand and the green movement epitomized by Rachel Carson on the other. The green movement was not only concerned about pollution, but gives shape to an anxiety about technology (Forty, 2000). Forty identifies *The Dialectics of the Enlightenment* (1947) by Adorno and Horkheimer as significant in that it is concerned primarily with man's exploitation of nature rather than man's exploitation of each other (Horkheimer, 1997). 'Seen in these terms, the critique of capitalism shifted from the social relations of production to the relations between human beings and nature.' (Forty, 2000, p. 239).

At the end of the 1960s, the critiques of modernisation and the Modern Movement started to gain a purchase on the mainstream imagination (Vidler, 2011). An important shift underpinning the development of critical thought was a lack of enthusiasm for the idea of progress. Sigfried Giedion (1888-1968) reported in the introduction to *Mechanization Takes Command* (1948): 'Now after the Second World War, it may well be that there are no people left, however remote, who have not lost their faith in progress. Men have become frightened by progress, changed from a hope into a menace. Faith in progress lies on the scrap heap, along with many other devaluated symbols.' (Giedion, 1948, p. 715).

For Tafuri, the late 1960s is marked by a 'Neo-Romanticism', an optimistic attempt to explore the possibilities of a new technology detached from the question of social progress. Tafuri was critical of Archigram and the Japanese Metabolists, for proposing a vision of a new world which bore no relation to reality (Tafuri & Co, 1976). According to Tafuri, the 1960s

and the 'critical turn' was an expression of the problems provoked by the discrediting of CIAM's basic principles:

At the start of the 1960s came a widespread dissatisfaction with the traditional instruments for the control and shaping of the environment ... architects reacted against the new limits imposed by administrative bodies in charge of the various sectoral plans ... To broaden the scope and capacity of architecture so as to deal with the problem of the total environment seemed to call for going well beyond the principles inherited from CIAM. (Tafuri & Co, 1976, p. 363).

The aspiration to address the question of the 'total environment' is evident in the literature explored in Chapter 5 and 6 which look at the Age of Ecology and its demise. The failure to address these questions in any significant way seemed to strengthen anxiety about progress. By the 1980s there was a return to historicism or the use of history as a source of authority within architecture and in other disciplines (Furedi, 1992). For architects, the return to historical precedent seemed to provide a much richer source of inspiration than the mechanistic and quasi-scientific formulas of later Modernist thinking. This 'pomo' or postmodern approach sustained architectural ideas for a quarter of a century; a professional debate between the modern and the postmodern prevailed until the new millennium. However, today we can talk about a new context for architectural theory, in which the discussion is no longer focused on historicism and anti-historicism but draws on the ideas that operate in mainstream society and that might broadly be categorized as 'post-human' and perhaps 'post-theory' (Grief, 2015) (Morton, 2013).

The Hegelian approach to architectural history; in particular the idea of an avant-garde as the front line of innovation and historical development, was a plausible framework for thinking about movements and changing ideas as long as there was a broader cultural attachment to the idea of progress. However, once the idea of an inevitable 'progress' in society was rejected by critical historians the old framework of diluted Hegelianism inappropriate (Bronner, 2011). In place of an analysis of pioneers and movements, there was a shift to see cultural history as a series of accidental driven by events and imperatives rather than social movements. In place of the Hegelian force of history comes historiography. The development of historiography and evolutionary history was inspired, according to Jencks, by a recognition of the failure of progress and a sensitivity to the failure of institutions to embrace changes in knowledge (Jencks, 2015).

The vast majority of those writing the history of modern architectural ideas agree that 1968 was something of a watershed. This point is often seen as important as it marks the start of Postmodernism in architecture and a new approach to theory which operates at a critical

distance from the profession. After the 1960s architectural theory becomes increasing thematic and eclectic. Nesbitt identifies several key themes that have dominated theory over the last 30 years. These include meaning and representation, place, urbanism/contextualism, politics and ethics and the body. She argues that architectural theory should take its lead from social theory and address questions of space and power and gender. She describes a global discourse in which the 'institutions of theory' can be found in New York, Venice and London (Nesbitt, 1996, p. 22). She has been criticized for failing to look outside of her own milieu in Princeton (SAGE, 2012), but in reality the East Coast schools of the US and the cluster of schools around the AA in London have exercised and continue to exercise a disproportionate level of influence over theoretical discussions, not least through its publishing houses such as MIT.

The most recent theory anthology – the SAGE handbook – was published in the UK and edited by an international team led by Greig Crysler, Arcus Professor of Gender, Sexuality and the Built Environment at the College of Environmental Design, University of California Berkeley, Stephen Cairns (NUS) and Hilde Heynen (KU Leuven). It breaks with the popular anthology format of reprinting essays from other publications and contains instead commissioned essays covering a wide range of material from “a complex, pluralistic map of the field” (Crysler, 2012, p. 6). The study is described by its authors as ‘relational’, by which they mean that it draws on wider discourses and attempts to ‘situate’ all of the work discussed. The editors see their approach as an alternative to postmodernism, as providing architectural interpretation within its social and ideological context. They credit Hays with providing the opening within which they were able to redirect attention away from the postmodern idea of 'architecture as a system of representation intertwined with the texts, institutions and agents' (Crysler, 2012, p. 6).

The SAGE book of architectural theory engages directly with sustainability and ecology, probing the content of the ideas and making sense of how they sit in relationship to each other. In the primary structure of the book, questions of nature, ecology and sustainability appear low down on the content list, but the editors choose to make the issue of sustainability the first 'itinerary' in the book. A number of the authors in the SAGE handbook draw a clear connection between the problems of architectural theory in the wake of postmodernism and the question of environment. Ingersoll writes: “The search for a grand narrative of architectural sustainability seems to be unresolved, with attempts to historicise sustainability appearing to manage little more than to catalogue a confusing proliferation of movements and styles, resulting in a cul-de-sac of confusion and a rather pessimistic outlook.” (Crysler, 2012, p. 574). It is the unresolved question of the grand narrative that this research attempts to address.

4.4 Early literature on architecture and ecology

The literature on architecture and ecology developed from the late 1960s, but there is some work produced the first half of the twentieth century that might be considered part of a ‘back story’. Despite the emergence of modernism and the enthusiasm for the industrial, mechanical and the scientific aesthetic there remained a small strand of architectural production and thought concerned with the natural and the organic. The work of Geddes and Mumford, both of who were interested in planning, biology and context provided an alternative to modern planning principles. The work of Ian McHarg (1920-2001), particularly *Design with Nature* (1969), promoted the idea of ecological planning and included the basic idea that was to be developed in GIS (geographical information systems). Bruno Zevi’s book on organic architecture is the most significant text from this period, but there are a number of other less well-known texts and other documents that have attracted the interest of scholars, such as the Eames film *Powers of Ten* (1977) and a book by Tomás Maldonado, *Design Nature and Revolution: Towards a Critical Ecology* (1972) (Maldonado, 1972).



Figure 11 Taliesin West (1937) by Frank Lloyd Wright

In his book *Towards an Organic Architecture* (1950), Zevi explores the work of Frank Lloyd Wright and other American architects and describes their approach to design based on an assessment of users’ needs as ‘organic’. He counter poses the organic approach, which is designed from the inside out, to the external imposition of platonic form associated with modernism (and classicism) in Europe. The work identified as ‘organic’ by Zevi looks

‘modern’ – that is, it is built of steel and glass and has very little decoration; it’s naturalistic or organic quality is derived from the relationship of the building to the land and the character of the design process rather than its aesthetic. Organic architecture is not literally alive, but it has a vitality derived from the relationship to the user and their needs that is said to be missing in conventional modern buildings (Zevi, 1950). The work of Alvar Aalto, provided a Scandinavian expression of such ideas which acted as a counterpoint to the more mechanistic or rationalistic strands of European modernism. Aalto’s engagement with local building traditions and materials provided a framework for architects looking to develop a particular language for their work which situated buildings in its environmental context. This impulse was later identified and analyzed by Kenneth Frampton and dubbed critical regionalism.

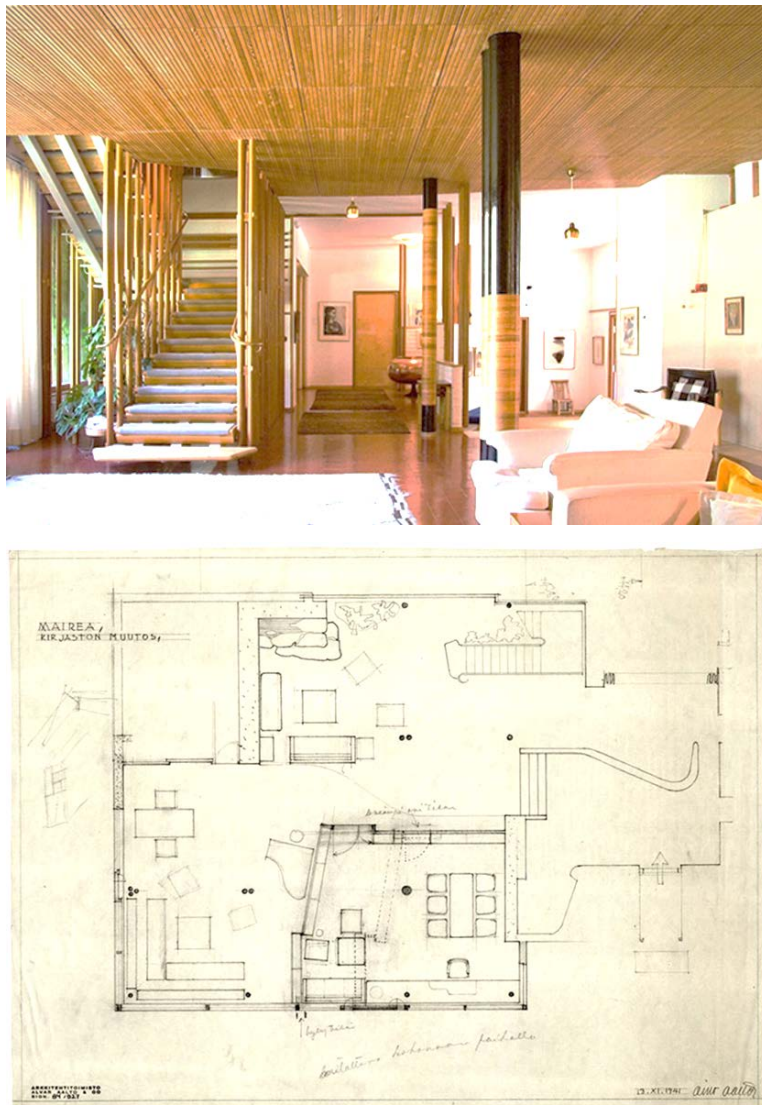


Figure 12 1930 Aalto, Villa Mairea

From 1945-1974, the word ecology appears in several texts that shape the attitude of British, European and American architectural discourse. These texts, which are dealt with in some detail in Chapter 5 include: 1956 CIAM Draft Framework, written by Alison and Peter Smithson for the Congress meeting in Dubrovnik in 1956, McHale's *The Ecological Context* (1970), two books by Banham - *Los Angeles: The Architecture of Four Ecologies* (1971) and *The Architecture of the Well-tempered Environment* (1969) - and Buckminster Fuller's *An Operating Manual for Spaceship Earth* (1969). *The Ecological Context* (McHale, 1970) explores scientific ideas about ecology and the future of the planet based on an approach to mapping human behaviour and resources developed by McHale's mentor Buckminster Fuller. Vidler describes the publication of *Los Angeles: The Architecture of The Four Ecologies* (Banham, 1971) as marking the end of an era.

After the mid-1970s, there are those that write about green architecture and environmentalism, but the question is rarely tied to the big questions of the discipline and society in the way that it was in the postwar period. The word ecology appears to fall out of favour. The majority of the literature on environment and architecture looks of how to build low-energy homes in remote locations. With the exception of committed environmentalists such as the Vales in the UK (Vale, 1975) and Sim Van der Ryn in the USA (Ryn & Wendell, 1978), who published *Ecological Design* (Cowan, et al., 1995), the attention of architects appeared to shift to other concerns for more than a decade. When the issue of the environment returned it tended to be described as 'sustainable architecture' and the question of building performance seemed more important than the broader questions of naturalism and society.

In the past decade, there has been a renewed interest in this period from 1945-1974; several academics have begun to look more closely at *Whole Earth Catalog* and its editor Brand as a source of environmental thought (Felicity Scott, Simon Sadler and Lydia Kallipoliti). Felicity Scott's *Architecture or Techno-utopia: Politics after Modernism* (2007) surveys "projects, conceptual work, exhibitions, publications, pedagogical initiatives, and agitprop performances that had as their premise the belief that architecture could be ethically and politically relevant" (Scott, 2007). In 2016, MIT Press published a *Whole Earth Field Guide* for researchers (Gagilo & Maniaque-benton, 2016). Most of the work produced in this period was speculative and temporary and small scale so the record provided by publication such as WEC is significant, so written explorations on how we might build and live take on a greater significance for the historian.

The US-based Society of Architectural Historians conference in Glasgow in 2017 ran a session addressing this question of radical ecological design in the 1960s. As described

elsewhere, the emergence of a contemporary environmental history of architecture means that the archives relating to this period are likely to gain greater attention in the coming period.



Figure 13 Dunster, *Bedzed*, 2000

4.5 Contemporary texts on architecture and ecology

As discussed in Chapter 3, the Dutch magazine *Volume* (Volume NIA , 2008) *Beyond Zero*) published an entire issue dedicated to discussing sustainability in a critical way and undertaking a mapping exercise to set out the evolution of the various different strand of environmental thought. Early popular ‘green’ texts included *Green Architecture: Design for a Sustainable Future* (1991), Papanek's *The Green Imperative* (1995) and Brian Edwards's *Green Architecture* (2001). Throughout the 1990s, Jencks produced several books which addressed the issue of environmental thought, most notably *The Architecture of the Jumping Universe* (1995).

As early as 1971, Jencks was making projections about the future of architecture in *Architecture and Beyond 2000*. In the book, he identified six traditions in architecture: ‘the intuitive’, which included the biomorphic; the unselfconscious or the vernacular; ‘the activist’, which included the futurists and the utopian; ‘the logical’, which included engineering; ‘the self-conscious’, which referred to the academic; ‘the historicist’; and finally ‘the idealist’, which included the rational, the purist, the cybernetic and the semiological. The fact that he included the biomorphic in the early 1970s is a mark of his interest in naturalism and the environmental agenda (Jencks, 1971). In *The Language of Post-Modern Architecture* (1978),

he referred to the work of Soleri and his 'ecological dreams', but focused on Soleri's form-making and architectural language rather than the environmental performance of the building. In the 1990s, Jencks attempted to introduce ideas about complexity to the profession. *The Architecture of the Jumping Universe* (1995) was largely ignored at the time of publication but when in July 2000 Jencks was asked by the *Architectural Review* to reflect on the state of the discipline, he noted that "green architectures, in the plural, are coming from everywhere". One of Jencks's blob diagrams commissioned to illustrate the article includes a strand called 'ecological architecture', which is distinct from its neighbouring strand called 'complexity'. Within the ecological strand, Jencks includes a wide range of people and buildings:

Renzo Piano's Tijbaou Cultural Center; SITE, the landscape architects; Bill Dunster and Bedzed; Morphosis; the Eden Project; Ken Yeang; Ted Cullinan's grid shells; Rogers's Cardiff parliament; Jean Nouvel's Branly Cartier; the Utrecht wonderwall; François Gites Ruraux; Montpellier and Blanc. Beside ecology, Jencks placed the strand 'critical modernism'. What is interesting to Jencks is the fact that many varieties of architectural thought have embraced the ecological. He notes: "One would have thought the ecological imperative might have been monopolized by the Activist tradition, but it has been taken up by all of them in different ways." (Jencks, 2000)

From the 1990s, a number of well-researched books started to indicate the possibility of a way of talking about environment and ecology that related to mainstream architectural concerns rather than serving a radical but isolated aspect of practice. *The Environmental Tradition: Studies in the Architecture of Environment* (1996) by Dean Hawkes marked the start of a new approach in which environmental thought was no longer reduced to a question of measuring building performance, but addressed design intention and aesthetics. This was followed by *Taking Shape: A New Contract between Architecture and Nature* by Susannah Hagan (2001) and John Farmer's *Green Shift: Changing Attitudes in Architecture to the Natural World* (1999). Hagan has produced two books, *Taking Shape* in 2001 and *Ecological Urbanism: The Nature of the City* in 2015, and has played an important role in framing the debate about ecology and the future of the profession in the UK. Like many of her contemporaries, she is keen to create a closer relationship between theory and practice and as such she argues that theory is both implicit and explicit. Theory is implicit because design work is grounded in traditions, norms and conventions and it is explicit because practitioners are generally 'reflective' - they and others look back on work done and make judgments about it. In *Ecological Urbanism*, she argues that we are witnessing the emergence of a new meta-narrative – 'ecologism'.

During the 1990s, a strand of thinking which Garrard calls 'Heideggerian ecophilosophy' was also influential. Sharr argues in the Thinkers for Architects series that Heideggerian ideas inform the designs of architects such as Peter Zumthor, Steven Holl, Hans Scharoun and Colin St. John Wilson (Sharr, 2007). Martin Heidegger (1889-1976) provided a powerful critique of industrial modernity and as such has influenced those developing postmodern thinking within the discipline of architecture (Garrard, 2004). Heidegger's concern is the relationship between material existence and being, not just how we exist but how we appear to others; he argues that humans need not force their meanings and instrumental values onto things. Poetry and archaic language disclose the essential nature of things. Ecology is not something that is explicitly discussed by these architects. However, this work is often associated with a renewed interest in materialism and British architects such as Tom Emmeron, who teaches at the ETH in Zurich, have been instrumental in introducing naturalistic themes into the Swiss discourse.

The idea of a vital world was explored in the work of Merleau-Ponty (1908-1961). He followed Heidegger's approach and attempted to overcome the anthropocentrism of his mentor by arguing that language belongs to the animate landscape as much as to ourselves. Merleau-Ponty encouraged the sensuous pleasure associated with the encounters with the flesh of the world, as opposed to the self-denial which he argues was often 'wrongly' associated with environmentalism. His work was influential on several leading postwar architects and still exerts an influence today, particularly in relation to the place of feeling and sensuous experience in the appreciation of architecture. (Merleau-Ponty for Architects, Jonathan Hale, 2016).

To understand the relationship between ecology and architectural thinking today, the study has focused on books that address the question of architectural ideas and ecology directly. *Ecological Urbanism* by Mohsen Mostafavi, published by the Graduate School of Design at Harvard (Mostafavi, 2010), *Relational Ecologies* by Rawes and published by Routledge (2013) and *Ecology*, San Rocco Issue no 10 Winter 2014 have been particularly important. *Ecological Urbanism* (2010), was published first and contains a wide range of opinions. The editor, Mohsen Mostafavi (1954), an Iranian-American architect and Dean at the Graduate School of Design at Harvard was previously the chairman of the Architectural Association and Dean at Cornell. *Relational Ecologies*, published and written by a British academic and feminist, provides an important framework for the discussion of ecology in the UK. San Rocco is produced in Milan and Venice by a group of relatively young European architects and supported by the US-based Graham Foundation for the Advanced Studies of the Applied Arts.

The editorial board includes the Belgian Kersten Geers, Andrea Zanderigo, Matteo Ghidoni (editor) and Pier Paolo Tamburelli. Geers (1975) studied in Ghent and Madrid before working in Rotterdam and teaching at TU Delft and The Berlage Institute. A number of the contributors to San Rocco are connected to The Berlage Institute, which has proved to be the intellectual source of much of the thinking in Dutch design in the past three decades whether from Herman Hertzberger, Winy Mass of MVRDV or Elia Zenghelis co-founder of OMA (http://www.theberlage.nl/persons/elia_zenghelis).

These three texts mark the edges of an intellectual territory or institutional network which includes Ivy League schools on the American East Coast, the AA and UCL and other schools in London, The Berlage/ TU Delft, University of Leuven/Ghent and academics in Brussels, Milan and Venice. There are a number of institutions and individuals within this network that have expressed a specific interest in the issue of ecology. Some of these individuals are long-standing environmentalists, others are theorists. As discussed previously, neither ecology nor environmentalism can be understood as a singular ideological outlook.

Scott Cohen and Erika Naginski's *The Return of Nature: Sustaining Architecture in the Face of Sustainability* (2014) has contributed to the quality of the discourse by including texts, such as Sylvia Lavin's *The Raw and the Cooked*, which look more critically at the assumptions underpinning some of the work. Mostafavi's *Ecological Urbanism* (2010) suggested the emergence of a new strand of theory which brings together ecological thinking with more conventional theoretical concerns about programme, form, place, symbolism (Krista Sykes, 2010). The key purpose of the study is to trace those notions that address both traditional theoretical questions and environmental questions and to ask if these ideas will change our understanding of the core features of the discipline and the architect. Where these ideas find more explicit expression is at present in the renewed interest in the work of Deleuze, Guattari, Latour and Bateson (Mostafavi, 2010).

That Harvard's Graduate School of Design chooses to publish an entire tome on the question of ecology suggests a shift in culture. GSD has a reputation for dealing with prosaic architectural questions rather than the practical questions of U-values, comfort and performance. Michael Speaks, in his essay on 'Design Intelligence', argues that a 'pragmatic turn' is an understandable reaction to the remoteness of postmodern theory and an expression of the desire to 'do' and to be 'active' rather than think. As a pragmatist, Speaks is concerned with the contingent nature of social life and ecological risks are a significant part of this contingency. Speaks argues that we are witnessing 'the emergence of new forms of natural and urban life that evolve over time into self-organized artificial ecologies teaming with life'

(Krista-Sykes, 2010, p. 213). Simon Guy supports Speaks's argument that this shift towards ecology in architectural thought is the result of the practical imperative to act - "it's not language that has a hole in its ozone layer" (Crysler, 2012) . However, it is also possible to understand this development as the outcome of a broader shift in the architectural imagination. This research attempts to trace that shift in thinking by looking at the themes of the natural, the vital and the material in contemporary theory and practice. These themes are clearly articulated in the texts identified which will be analyzed in Chapter 8.

In addition to texts, this research has relied heavily on recent events and initiatives in order to identify important emerging themes in the discourse on theory and ecology. The discourse on eco-feminism remains on the periphery of discussions in practice and even in academia, but in some areas the subject is attracting new scholars. Ecology and feminism was the subject of the Architecture and Humanities Research Association conference in Stockholm in 2016. Garrard (Garrard, 2012) notes that the anthropocentric idea of man dominating nature is echoed in the 'androcentric' dualism between man and woman in feminist thought. Androcentric refers to a sense of superiority in men and was explored by Karen Warren in her writings on the logic of domination in *The Power and the Promise of Ecological Feminism in Environmental Ethics* (1990). The assumption that women are somehow 'closer to nature' as a result of childbirth and menstruation was a highly contested idea among feminists, many who had campaigned against the idea that women are 'naturally' disposed to certain roles, but it has been explored by authors such as Plumwood in *Feminism and the Mastery of Nature* (1992) and it has a certain purchase on the imagination of today's eco-feminists (AHRA Conference 2016). Plumwood argues that the separation of mind and body in rationalist thought has led to a situation in which we see animals as machines and apply reason in a mechanistic fashion to avoid a connection with our emotional selves.

Another clear expression of a renewed interest in ecology is the Mellon sponsored Architecture and/or the Environment project, launched by the Canadian Centre for Architecture in 2017 (CCA, 2017). The ambition is to write an environmental history of architecture as part of collaborative and multidisciplinary project. It will build upon the CCA exhibitions *1973: Sorry, Out of Gas* in 2007 and *It's All Happening So Fast: A Counter-History of the Modern Canadian Environment* in 2016. According to the project's organisers: "The CCA has come to understand the environment as not merely reducible to nature, but first and foremost as a battleground for social, political, and economic issues." A multidisciplinary research project will be undertaken by a selected team consisting of Daniel Barber (University of Pennsylvania), Aleksandr Bierig (Harvard University), Nerea Calvillo (University of

Warwick), Jiat-Hwee Chang (National University of Singapore), Isabelle Doucet (University of Manchester), Hannah Le Roux (University of the Witwatersrand, Johannesburg), Kiel Moe (Harvard University), and Paulo Tavares (Universidade de Brasília) is looking at a range of subjects which include: buildings for multi-species encounters; the trade of fossil fuels at the London Coal Exchange; ragweed as an urban pollutant; courses on environmental control systems in architecture schools; and air conditioning in Singapore, Doha, and Guangzhou.

A similar kind of open source history initiative has been developed by Lydia Kallipoliti, published online as *History of Ecological Design* (Kallipoliti, n.d.). According to Kallipoliti's scheme, the world of ecological design falls into three themes: naturalism, synthetic naturalism and dark naturalism. She argues that while these themes can be seen in a range of work produced in the last century, there is a broad historical progression from naturalism which has its roots in the nineteenth century to synthetic naturalism which emerges in the wake of the Second World War and runs almost to the new millennium, and then finally dark naturalism. These new ways of reading architectural history are already having an impact on education. The authors of the Architecture and/or the Environment project argue that a new architectural environmental history might allow a more critical engagement in response to fears that "the pragmatic, techno-utopian, or even environmentalist stances that have monopolized the subject do not equip us to face the challenges ahead" (CCA, 2017).

5.0 Early Ecological thought



Paris 1900 Gateway, Binet

5.1 Introduction

This chapter looks at the historic origins of the term ecology. It will describe the main themes incorporated into early ecological thought and at their impact on the broader cultural discourse. At the end of the nineteenth century, the idea of ecology and a broader interest in

the development of the biological sciences had a significant influence on many aspects of cultural production. The biological or evolutionary imagination also had an impact on the emerging discipline of architectural history and art history (Rampley, 2017). There was a brief moment when this enthusiasm was translated into architectural practice and thought, but it was short-lived. By 1914, the emerging Modern Movement and the machine aesthetic proved to have a much greater impact on architectural imagination than ecology's naturalism and vitalism. A distinct strand of naturalism that had begun with Louis Sullivan in the USA and John Ruskin in the UK remained on the agenda and even influenced Bauhaus architects in the first part of the twentieth century (Anker, 2010). However, the only direct and explicit expression of ecological thought in architecture was Art Nouveau, a movements that lasted less than 20 years (Colquhoun, 2002). By the beginning of the twentieth century, ecology was part of the outlook of the emerging discipline of planners who were starting to speculate on the nature of urban development if it was planned at a regional scale. Ebenezer Howard's plans for the Garden City (Howard, 1898) demonstrated the enthusiasm for the inclusion of the natural world in city plans, but the interest in biological systems was a more central theme in the work of Geddes.

5.2 Early ecological thought

Before there was an ecological political protest movement in the 1960s there were a variety of intellectual ideas and public campaigns that provided a framework for the environmental imagination. Some of these had a direct impact on architecture and architectural thinking. The period from the end of the nineteenth century until the 1930s is often described as the first stage of environmental thought, as proto-environmentalism or as 'the awakening' (Jamison, 2001). In this period of awakening there are a variety of different sentiments expressed around the question of the environment. Those most closely associated with the modern environmental movement are campaigns associated with conservation of landscape and buildings and discourses about the limits on natural resources and materials. At the level of ideas, Bramwell argues that ecology has its roots in both rational scientific movements and the romantic anti-science/anti-industrial movements. In the late nineteenth century, scientific developments sat alongside a moral and philosophical attempt to revisit popular understanding of the relationship between man and the natural world (Bramwell, 1989). In this period of awakening, ecology evolved from a biological science to a science and a political or ideological programme. The character of that programme is not written in stone – but many of the ideas associated with ecology were derived from the philosophical writings of Ernst Haeckel, who

dedicated much of his later life devoted to writing about the relationship between science and society. Within Haeckel's work, it is possible to identify a number of themes: naturalism, the turn to nature as a source of truth rather than human constructs and abstractions; vitalism, the idea of a life force; and finally holism, the belief in the unity of things and the idea that knowledge can only really capture the reality of the world if it finds mechanism to avoid separating and classifying elements of nature and life from the whole. In this chapter we will look at these ideas of naturalism, vitalism and holism in relation to Haeckel and other's work. Prior to this analysis, we will look at Haeckel's work and its explicit influence on the Paris Expo of 1900.

5.3 Darwinism

According to Freud, Charles Darwin (1809-1882) compelled man to understand that materially and mentally they were animals. Darwin also implied that morality could be understood as a human construct that had developed over time and so a new moral purpose and way of living could be imagined and organised by man and could be understood as part of evolutionary progress.

“The effect of Darwin's theory of evolution on man's self-image has been momentous. Sigmund Freud, in his essay ‘A difficulty in Psycho-Analysis’ (1917), compares it to the Copernican Revolution which dealt an irreparable blow to human narcissism by removing the earth from the centre of the universe.” (Carey, 1995).

Meanwhile, Romantics promoted the idea that the rational led to the denial of the imaginative realm. Romantics were a manifestation of the Enlightenment, revolutionary and anti-bourgeois spirit but, according to Bennett: “In both art and thought, imagination is elevated over reason, or, at the very least given equal status. Emotion is celebrated over logic and intuition over science. There is a new emphasis on subjectivity. Romanticism is also widely associated with both the cult of nature and profound spirituality.” (Bennett, 1999, p. 124).

Mumford described Darwin as an ecologist. “When he wanted to perform an experiment on a baby, he didn't take the baby into the laboratory, he put the baby in the girl's arms, and then performed the experiment. Darwin knew the natural environment of a baby to be a woman's arms, not on a laboratory table.” (Bramwell, 1989). In Britain at the end of the nineteenth century, this new knowledge from the biological sciences began to be seen as tool to understand human life. Herbert Spencer, one of the founders of modern sociology, started to study developments in ideas and human knowledge as ‘evolutionary’ rather than fixed. This

tendency is described as the 'evolutionary imagination', the 'bio-political' or simply Darwinism. *The Origin of the Species* (Darwin, 1859) had a considerable impact on the imagination of both scientist and social thinkers, and novelists such as George Eliot in *Middlemarch* (1872) capture the evolving influence of the new science on the popular imagination.

5.4 Romanticism

Romanticism represents “the greatest single shift in the consciousness of the West” (Berlin, 2000). Romanticism refers to a strand of European art and thought that runs from the middle of the eighteenth century (Bennett, 1999) British romanticism emerges in the context of industrialisation, while Germany provides a pre-industrial and pre-national setting. Romantic thought in Britain is concerned with the impact of industrialisation and scientific progress; in opposition to the idea that a man might be defined by his specialised role within the production process, the romantic is interested in heroism, human judgment and the whole man. Shelley was exercised by the restriction on the inner life of the individual.

The idea of a Romantic Movement didn't emerge until the second half of the nineteenth century. When in 1820 Thomas Love Peacock suggestion that, in the new scientific age, poetry had become redundant inspired Shelley to write ‘A Defence of Poetry’ and to argue that the poem was an image of life expressed as an eternal truth. "Our calculations have outrun conception ... The cultivation of those sciences which have enlarged the limits of the empire, has ... proportionately circumscribed those of the internal world: and man, having enslaved the elements, remains himself a slave", wrote Shelley (Bennett, 1999, p. 293).

For Wordsworth, factory work and the industrial division of labour were undermining humans’ capacity to exercise judgment; the poet spoke to the whole man, not his specialised functional role within the production process. In the late nineteenth century, scientific developments sat alongside a moral and philosophical attempt to revisit popular understanding of the relationship between man and the natural world. The Romantics promoted the idea that to be rational assumes, in some way, the denial of the imaginative realm. Political Ecology shared this assumption and gave form to a reaction to urban life, in a similar way to the Romantics.

Romanticism can be understood as both a reaction against Enlightenment rationality and a product of the Enlightenment’s revolutionary, antibourgeois spirit. “In art, it is associated with the rejection of artistic and literary conventions, in particular neo-classicism. In both art and thought, imagination is elevated over reason, or, at the very least given equal status. Emotion is celebrated over logic and intuition over science. There is a new emphasis on

subjectivity. Romanticism is also widely associated with both the cult of nature and profound spirituality.” (Bennett, 1999, p. 124).

Isaiah Berlin locates the origin of Romanticism in the eighteenth century, led by individuals such as Johann Gottfried von Herder (1744–1803) whose doctrines include the notions of 'belonging' and the 'incompatible and reconcilable nature of ideas' (Berlin, 2000, p. 58). Herder argued that a work of art is the voice of one man addressing himself to other men. All artefacts are in some way an expression of the attitude of the maker. Herder wrote: “If a folk song speaks to you it is because the people that made it are German like yourself, and they spoke to you who belong with them in the same society; and because they were Germans they used particular nuances, they used particular successions of sounds, they used particular words which, being in some way connected, and swimming on the great tide of words and symbols and experience upon which all Germans swim, have something peculiar to say to certain persons which they cannot say to certain other persons.” (Berlin, 2000, p. 59).

According to Berlin, this doctrine of art as communication was responsible for the development of the notion of 'natural roots' and the idea of 'being at home' alongside others that share your language and are from the same place (Berlin, 2000, p. 60). Herder's doctrines led some to conclude that a work of art has to be analysed in terms of the particular group that it is produced for, the motive of the author, the impact that it has and the bond it creates between the creator and the recipients. This aspect of romanticism finds expression in elements of ecological thought, particularly the enthusiasm for localism and the interest in vernacular culture which will be discussed in subsequent chapters.

Following on from Herder's ideas are those of Martin Heidegger (1889-1976) who has had a significant influence on architectural thought since the 1980s (Sharr, 2007). Heidegger is categorised as a phenomenologist rather than a Romantic but his work stands in the tradition established by Herder and Schiller and connects with the critiques of industrial society put forward by Ruskin and Morris.

Heidegger's theses that in the process of industrialisation and mechanisation we have lost some basic appreciation of the 'thing-ness' of objects is, in Bramwell's opinion, linked to the discussion about ecology (Bramwell, 1989). Heidegger is describing man's alienated nature and his life world which parallels the sense of alienation or separation between man and his product identified by Marx and Engels. In Heidegger's discourse, objects become things without meaning in the same way humans lose a real appreciation of the truth and meaning to be found in nature (Bramwell, 1989). Heidegger's 1951 text, *Building Dwelling Thinking* (Heidegger, 1971), which was translated into English in 1971, has been an important

reference point for critical regionalism (Frampton, 2000) and those interested in atmosphere and materiality (Zumthor, 2006).

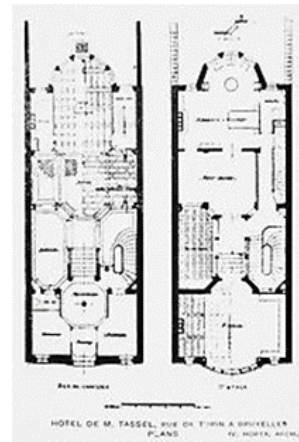
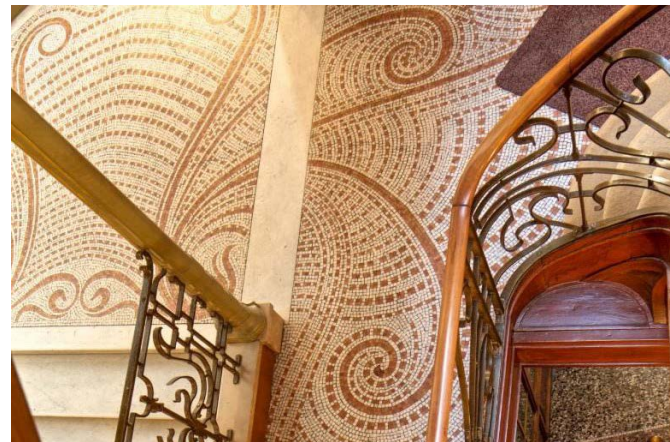
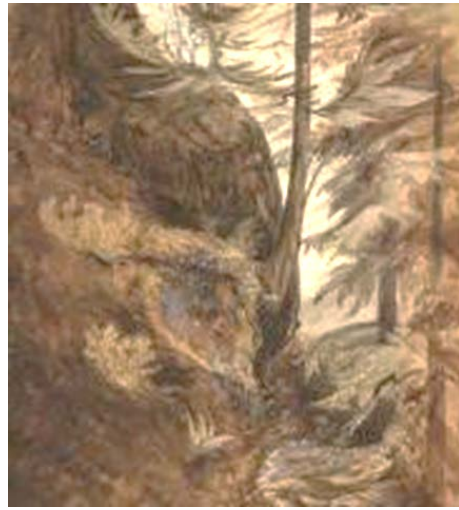
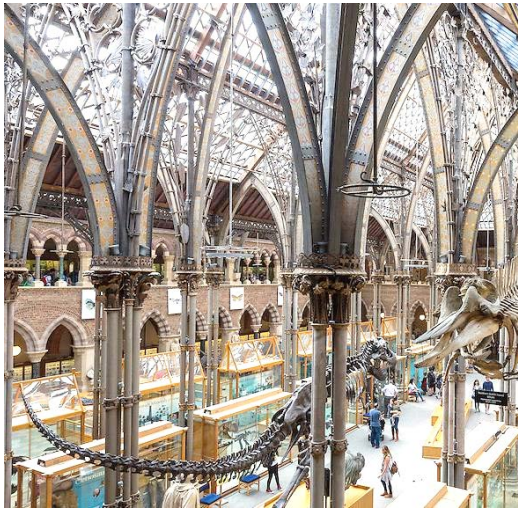


Figure 14 1850 Oxford University Museum of Natural History by Thomas Newenham Deane and Benjamin Woodward, Chamonix by John Ruskin, Hotel Tassel, Horta,

5.5 Conservation

In Europe, conservation history emerged as a discipline; there was a growing interest in land use, resource conservation and ‘the wilderness’. The most significant intellectual development came from France. The Annales School, which was formed by Febvre, Le Roy Ladurie, Bloch, Duby and Goff, wanted to introduce the environment into the emerging discipline of sociology (Hughes, 2006, p. 33). Lucien Febvre (1878-1956) argued that environment had an important relationship to human affairs, but tried to avoid the deterministic assumption that environment could explain human behaviour. Although Febvre addresses the issue of deforestation, his concern was focused on the spiritual or existential issues related to the natural environment; he substitutes the idea of ‘man’ for ‘human society’. “The civilized man directs his exploitation of the earth with a mastery which has ceased to astonish him, but which, when we reflect upon it for a moment, is singularly disturbing,” he wrote in *A Geographical Introduction to History*, 1925 (Hughes, 2006, p. 33).

In Britain, it was Ruskin, who has been described as “one of the fathers of our environmental tradition” (Bate, 1991) who was responsible for “the political ideas of British Ecologism” (Bramwell, 1989, p. 96). In his early work, he explored the relationship between art and the natural world, the idea of beauty, and questions of economics and capitalism. His impact on architectural discourse was mainly through *The Seven Lamps* (1849) and *The Stones of Venice* (1853) in which he celebrated ‘material and structural honesty’. In parallel, he shaped anti-industrial sentiments that occupied the romantic side of the ecological imagination (Edwards, 2001). According to Forty, the two most sophisticated developments of the idea of architecture as ‘second nature’ are to be found in the writings of Semper and Ruskin. Semper understood architecture not as natural or organic, but as the product of human activity. The development of architecture could be understood in parallel with or as an analogy of natural development. Ruskin saw nature as God’s work and the source of beauty. However, he was not interested in art as imitation. Architecture engaged with human emotion and was an expression of human will and meaning. His exploration of architecture focuses on the interaction between human will and the materials provided by nature. For Ruskin, the distinction between the bird’s nest and a man-made structure rests on the unchanging and perfected character of the nest and the fact that architecture is the opposite. “Architecture for Ruskin is a ‘Second Nature’ because it is the outcome of the uniquely human faculty for mental and manual work; while this endows the best works of architecture with a life comparable to that of works of nature, they never

attain the perfection of organic nature, against which architecture must always ultimately be judged.” (Forty, 2000, p. 234)

Ruskin’s writing was anti-urban or Arcadian, and he founded the Guild of St George, which promoted the establishment of small farms, villages and rural industries. According to Spuybroek, Ruskin would have delighted in the new digital technology because it allows us to return to a craft in which each individual product is unique (Spuybroek, 2016). Like Ruskin, Geddes supported the idea of a return to rural settlement patterns or Back to Earth decentralisation. Geddes studied under TH Huxley – he was interested in the statistical classification of human and animal populations. He believed that human society was living within fixed physical limits. He supported the ideas of George Perkins Masters’s theory that the decline of past great civilisations could be linked to the environmental damage caused by deforestation. From Comte, he adopted the idea of the benevolent and apolitical planner.

In 1914, Geddes visited India and drew the conclusion that colonialism was a good thing because the empire could be trusted to look after the land. In *Rural and Urban Thought: A contribution to the theory of progress and decay*, Geddes complained that the “biological and evolutionary sciences had not been given a chance to improve the world”. Geddes developed the idea of an evolutionary history founded on the idea of bio-technical phases in the development of society (Geddes, 1929).

Early twentieth century British environmentalism was influenced by ‘a narrative of national decay’ (Darwall, 2013). German ideas (even those associated with fascism) were highly influential on individuals associated with Britain's early environmentalism, such as DH Lawrence, Hilaire Belloc, GK Chesterton, TS Eliot and Julian Huxley; a hostility to the industrial class, liberal industrial capital and to the urban bourgeois culture led writers like Belloc and Chesterton to argue for a return to small peasant settlements. The British Soil Association operated from immediately after the Second World War until the early 1960s and it produced a journal called *Mother Earth*, edited by a former officer of the British Union of Fascists.

5.6 Concerns about resource depletion

During this period, American campaigners were concerned with conservation and in the UK public intellectuals like John Ruskin developed a critique of industrialization and development and an argument for the protection of both buildings and landscapes. Alongside Ruskin, the development of Romanticism led to the idea that nature might provide an antidote to culture and human activity. In the USA, conservationists such as Perkins Marsh argued for

conservation on the grounds that it would provide social stability and economic prosperity. America's romantic imagination was fired by the work of Henry David Thoreau (1817-62), whose life in isolation in a small shed at Walden Pond, Massachusetts became a source for inspiration for environmentalist and artists. Thoreau is often described as the father of 'deep ecology', the origin or the idea that man should develop a relationship with nature that is reflective and participatory rather than utilitarian. For Thoreau, nature had a therapeutic quality; a close relationship with nature can dispel the tendency toward melancholia, which it is assumed emerged as a modern condition as a result of man's alienation from the natural world.

The Second Law of Thermodynamics (1842) changed our understanding of energy. The possibility of 'loss', in particular the dissipation of energy, or entropy, coincided with a growing interest in mechanical disciplines that look at energy product, use and its dissipation. This scientific understanding had an impact on economics and the idea of resource management. The exploration of biological systems and holistic approaches to behaviour and habitats influenced a strand of economics that focused on physical resources rather than wealth creation. Energy economics started to review how you might account for energy, inspired by science and Fordist discussions of efficiency within production. According to Martinez-Alier, nineteenth-century scientists such as the chemist Frederick Soddy (1877-1956) sowed the seeds of a discipline that would really flourish in the 1980s. The idea of 'Natural Capital', first popularised by EF Schumacher in *Small is Beautiful* in 1973, is now widely discussed (Schumacher, 1993). A new conception of the earth as an organism, or a complete self-correcting system, was developed by the likes of Ernst Fisher in the USA and AJ Hebertson in the UK alongside 'organic geography'.

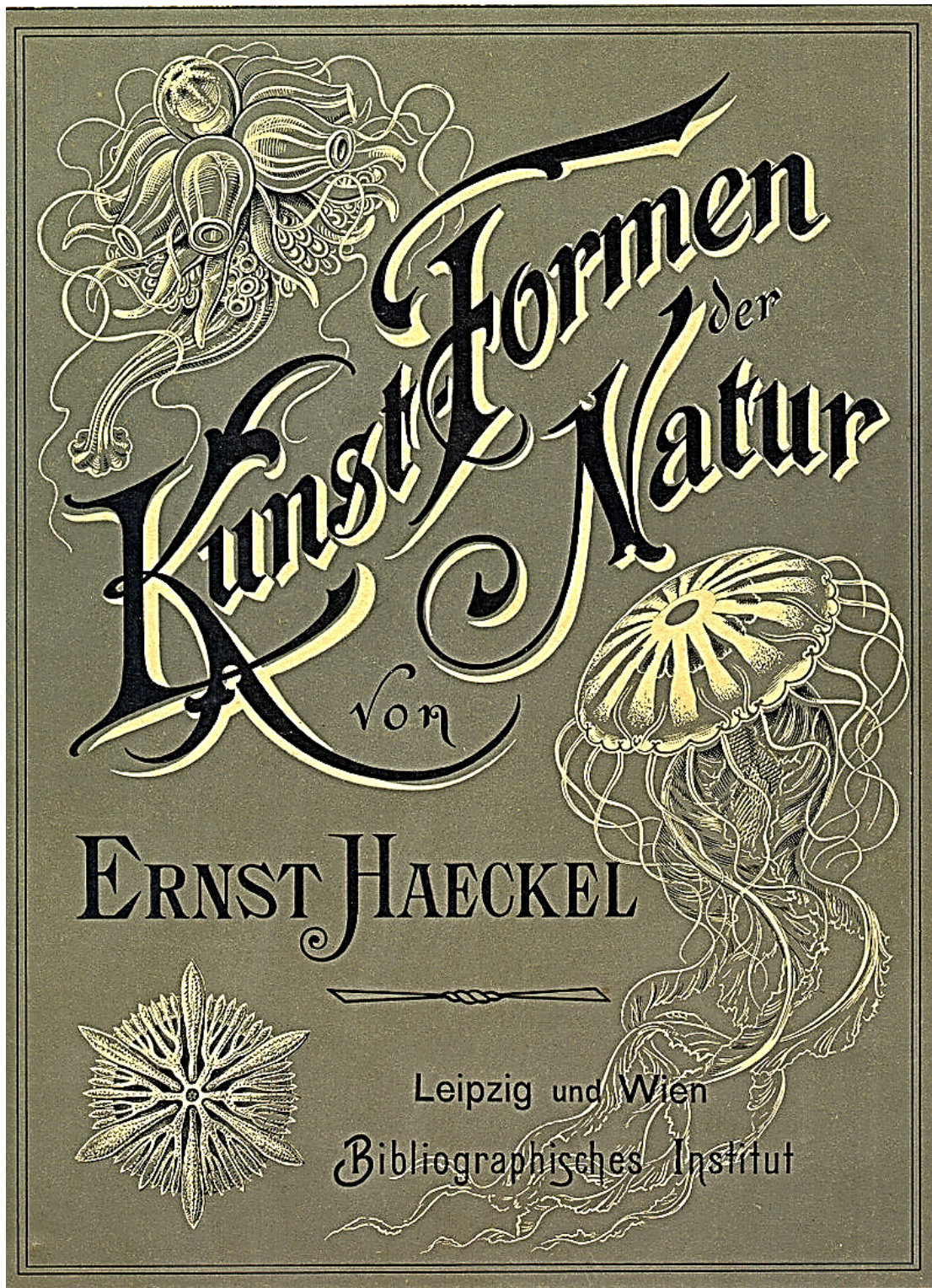


Figure 15 Illustrations from *Kunstformen der Natur* (Artforms of Nature) 1904 Leipzig and Wien

5.7 Haeckel's ecology

The credit for the term 'ecology' belongs to Ernst Haeckel (1834-1919). While Haeckel gave a name and a scientific form to ecological thought in the 1860s, the concept developed as a political and a scientific idea in the twentieth century (Bramwell, 1989; Merchant, 2005). Haeckel's work can be characterised as a mixture of biologism, philosophy and aesthetics. He was best known in Britain for his artwork and for his pamphlets on Darwin's theories of evolution.

Haeckel studied in Würzburg and Berlin and spent much of his academic career in Jena (home to the German Romantic Movement led by Schelling). He studied medicine and science and developed enthusiasm for comparative anatomy and crystallography. In 1872, he embarked on the *HMS Challenger* expedition to Heligoland, from which he developed an understanding of how to study and categorise simple marine animals according to their structural skeleton, growth and movement. From an interest in landscape painting he developed a method to illustrate his scientific findings in exquisite detail.

His published work includes more than 100 detailed, multi-colour illustrations of animals and sea creatures in *Kunstformen der Natur*, *The Riddle of the Universe* and *Freedom in Science and Teaching* with TH Huxley (1825-95), written to support the teaching of evolutionary theory (Haeckel, 1879) (2000) (1992). His books were translated into English by the Rationalist Press Association and sold for two shillings (Bramwell, 1989) and, at the time, were as popular as the works of Darwin and Marx. Haeckel coined the term ecology in 1866 in *Generelle Morphologie*, a book on his method of research; influenced by Darwin, he had developed a thesis that biological entities operate within systems (Haeckel, 1866). The science of ecology was developed further by Edward Suess (1831-1914), who conceived of the idea of natural equilibrium and then the term 'biosphere' in 1875 to describe the arena of life on the surface of the earth. Ecology became a fashionable focus of discussion again in the 1920s when VI Vernadsky published *La Biosphère*, an ecological exploration of life on earth, and then again in 1935 when Sir Arthur Tansley introduced the term 'ecosystem' (Bramwell, 1989).

In the early part of the twentieth century, Haeckel joined with others to form the Monist League and linked his biological research to political, social and spiritual questions. An interest in Buddhism, which gave equal status to all species, had encouraged him to develop a critique of Western, and particularly Cartesian, thought. He believed that to adopt the standard dichotomies of rational thought, such as 'mind versus matter' or 'reason versus emotion', was unhelpful in understanding complex systems and relationships. He argued that cell theory had

taught us that all matter was sensate and we should look at things holistically. Monism emerged as a framework to understand the world in terms of one single reality without the need to resort to religion; Lukács described it as ‘religious atheism’ (Lukács, 1980). Among the Monist League’s supporters were high-profile individuals including DH Lawrence, TH Huxley, Francis Galton, Herbert Spencer and Geddes. They were described as both left-leaning and eugenicists (Bramwell, 1989).

Haeckel and his colleagues were supportive of the assertion of man’s will, as long as it was in accordance with natural laws. However, Haeckel was particularly concerned about the loss of soil fertility and the loss of other energy sources. Haeckel was accused of being a socialist, but insisted that you could not attach any political idea to ecology. If anything, it was an aristocratic idea, one that looked to the benefit of intuition rather than relying heavily on the democratic impulse and reason (Lukács, 1980).

Haeckel argued that the building block of the natural and human world was the ‘cell-soul’: “Every scientific man who has long observed the life-activity of these single-celled Protista is positively convinced that they also possess a soul; that this ‘cell-soul’ also consists of a sum of sensations, perceptions, and volitions; the feeling, thinking and willing of our human soul differ from these only in degree.” (Proctor, 2006)

Haeckel described the cell-soul as the vital principle and the regulator of vital functions. In the Challenger Report, Haeckel concludes his study with the description of the cell-soul of microorganism: “The common central vital principle, commonly called the ‘soul’, which is considered to be the regulator of all vital functions, appears in the Radiolaria as in other Protista in its simplest form, as the cell-soul. By the continual activity of this central ‘psyche’ all vital functions are maintained in unbroken action, and in uniform correlation.” (Proctor, 2006, p. 148)



Figure 16 Illustrations from *Kunstformen der Natur* (Artforms of Nature) 1904 Leipzig and Wien, Plate 27 Ctenophorae

5.8 1900 Paris Exhibition

Early manifestations of ecology in architecture are limited. The Art Nouveau movement was clearly influenced by the natural world, but it was a short-lived movement that lasted barely 20 years before being overwhelmed by the Modern Movement. Art Nouveau was strongest initially in Belgium, France and then the rest of Europe. The movement grew out of a desire to replace classical conventions with something new and was inspired by the earlier Gothic revival and the Arts and Crafts movement, alongside artwork from Japan, the Middle Ages and Rocco (Colquhoun, 2002). Art Nouveau architects were interested in structural rationalism and the evolving analysis of the structures and forms of natural organisms provided a useful starting point for the establishment of new conventions. In architecture, an interest in naturalism tended to coincide with scientific positivism (Colquhoun, 2002) particularly in France, where naturalism was inspired by the positivism of Auguste Comte (1798-1857). In Germany, naturalism was associated with symbolism, an idea taken from Kant and Fichte in which the appearance of things is less important than the essential character of the thing that can be found somewhere beneath the surface (Colquhoun, 2002).

“The Industrial Revolution had radically altered both the individual and collective conditions of artistic production. In the face of this situation, Art Nouveau artists and architects reacted in a way that would become typical of later avant-gardes: they leapt over recent history to remote and idealised past in order to find an art that could be historically justified and yet be absolutely new.” (Colquhoun, 2002, p. 13) One of the most significant architectural writers in this period was the French architect Viollet Le Duc. He studied materials and their properties as generators of form. From the Romantic Movement, he borrowed the idea of the ‘organic’ as a quality of architecture, particularly domestic architecture.

The Art Nouveau movement engaged in an aesthetic portrayal of nature organised according to the evolutionary or scientific framework.

The link between Haeckel and the Art Nouveau movement is most clearly expressed at the 1900 Paris World Fair, which attracted 51 million visitors and launched a number of significant cultural innovative products, such as the escalator and the talking film. The exhibition was built on the site adjoining the Eiffel Tower, which had been completed for a similar expo a decade earlier (1889).

The Art Nouveaux approach to design and decoration was explored in the work of René Binet (1806-1911), in particular on the Porte Monumentale that formed the entrance, the

Pavilion Blue at the foot of the Eiffel Tower by architect René Dulong and interior designer Gustave Serrurier-Bovy and in the Grand and Petite Palais (Chandler, 1987).

Haeckel's work directly informed both the form and the decoration of Binet's interventions, in particular the Porte Mounmentale or main gateway to the show. In this gateway, you see reference to the skeletal structure of simple organisms in which the structure and skin are one and the same thing and are highly ordered, organised by the historical process of evolution. According to Breidbach, the work is not only inspired by biology – it captures a sense of the movement of living beings by expressing ‘gradually unfolding forms’ often through repetition. The Salle des Fetes had an interior that was decorated with a pattern that resembles amoeba.

The Porte Monumentale had a dinosaur's vertebrae for its structure, the cells of the beehive within its dome and its pinnacles looked as if they were made of coral. We know from his correspondence that Binet was directly inspired by Haeckel, taking ideas for decoration and form from the physical forms of radiolarian illustrated by Haeckel. Binet wrote: “Since the shell is produced by the cell, and to some extent distinct from its body, it is a natural work of construction rather than an animal in its own right. It is, therefore, a kind of natural architecture, and the cellular inhabitant, with its ‘feeling of distance’, can be thought of as a prototype of the architect.” He was also influenced by Haeckel's Monism and the idea that there might be a unity in beauty, truth and goodness (Proctor, 2006).

Binet recorded his work in Paris and his thoughts on naturalism in *The Esquisses Decoratives* (1902). One of the illustrations included in the book, a ‘Comparative Museum of Architecture’, alludes to the various attempts at the end of the nineteenth century to create an evolutionary architectural history (Banister Fletcher's *History of Architecture on the Comparative Method* of 1896, for example, attempted to describe ‘the gradual evolution of the various styles’ (Proctor, 2006).

Binet argued in the 1902 book that if the architect used nature as a source for art, the work would be more objective. Naturalism was seen by Binet as a means of removing the architect's particular personality from the work. This would allow the architect to avoid the danger of falling out of fashion, which is ironic given that it did fall out of fashion very rapidly in the face of the machine aesthetic (Proctor, 2006). This idea that naturalistic architecture provides an alternative to the more ego-driven design imperative of abstract form-making associated with classicism and modernism reappears in later discourses on ecological design particularly after 2000.

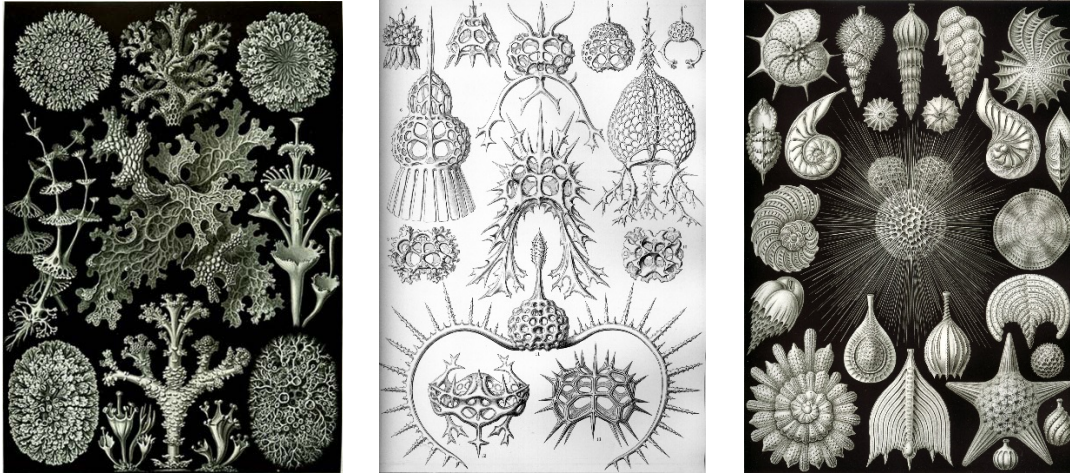


Figure 17 Illustrations from *Kunstformen der Natur (Artforms of Nature)* Plates 2 Thalamphora, Plate 22 *Spyroidea*, Plate 83 Lichens *Cladonia*

5.9 Themes in early ecological thought

5.9.1 Naturalism

As biological science developed the capacity to understand the cell form and to look more closely at the components of living organisms, the idea of natural structures as a pattern for design became stronger. At a lecture in 1894, Louis Sullivan said: “While man once invented a process called composition, Nature has forever brought forth organisms.” (Sullivan, 1894) He went on to argue that true art which springs directly from nature must contain “the life of a life”.

Haeckel’s work provided an important link between ecology and the aesthetic discussions led by individuals such as Sullivan and Ruskin. Haeckel became increasingly interested in the idea that nature reveals itself through the order of its forms. For Haeckel, to know something was not a result of conceptualising it, but of seeing it (Breidbach, 1998). Haeckel argued that the image of nature is the true character of the thing; it is the process of finding the pattern or order in nature that allows us to understand it. This philosophical approach made sense to Haeckel as both biologist and aesthete. “A beautiful plastic image conveys a natural truth even in the simple case of an illustration that reproduces a systematically pattern”, he wrote (Breidbach, 1998).

Art Nouveau architects and artists took nature as a source for their aesthetics, using the latest developments in evolutionary and scientific thought as the backdrop to their understanding of nature. Binet’s buildings at the 1900 Paris World Fair are one of the clearest expressions of this relationship between ecology and architecture. Meanwhile in the USA,

similar sentiments were expressed by architects who were deemed by Pevsner to be among the pioneers of the Modern Movement. Louis Sullivan, in particular, gave shape to an interest in the organic and the vital in American architecture. His architectural work is renowned for having replaced classical decorative features with simpler and flatter naturalistic friezes (Colquhoun, 2002), but it's his written and spoken words that articulate a form of naturalism and vitalism. In his AIA lecture, 'Emotional Architecture as Compared to Intellectual: a study in objective and subjective' (Sullivan, 1894), Sullivan spoke passionately about the importance of nature as a source for ideas for the architect. He complained that man had failed to create 'complete' architecture because they had been unable to address questions through both reason and emotion – but had opted for either one or the other.

It has, alas, for centuries been taught that the intellect and the emotions were two separate and antagonistic things... How depressing it is to realize that it might have been taught that they are two beautifully congenial and harmonious phases of that single and integral essence that we call the soul. That no nature in which the development of either is wanting can be called a completely rounded nature.

Operating between art and science, Haeckel built on the eighteenth-century visual tradition, while at the same time using biology to classify the organisms according to how they functioned or worked. He produced numerous taxonomies of living beings and wrote: "Nature has created an inexhaustible wealth of wondrous forms whose beauty and diversity way exceeds anything that has been created by man." (Breidbach, 1998) This aspect of Haeckel's work was developed by D'Arcy Wentworth Thompson (1860-1948), a Scottish biologist who pioneered the idea of mathematical biology and was professor of Natural History at Dundee for 32 years. Thompson's book, *On Growth and Form* (1917), which looks at the idea of morphogenesis, the study of the way in which structure and form of plants and animals develop, had a significant influence on postwar architectural thinkers such as the Independent Group in the 1950s (Thompson, 2000).

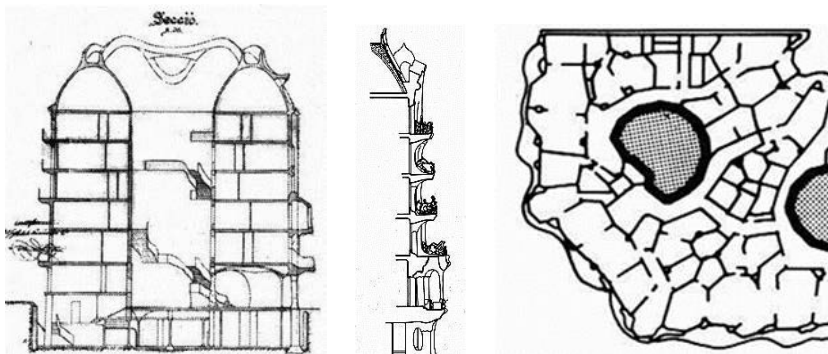


Figure 18 1910 Gaudi, Casa Mila

5.9.2 Vitalism

As Haeckel's career progressed, he became increasingly convinced that man could use his scientific research to bring about social reform. Monists believe that human moral instincts are passed down from our animal ancestors and that the tendency to cooperate is a natural instinct. They saw man and nature as driven by a 'life force' or vitality; and the more developed the being, the more focused their sense of purpose was likely to be. This idea that living things contain an inner life force was known as 'vitalism' and it provided an explanation for human progress in the absence of the will of God. Vitalism (*Lebensphilosophie* in German) is rarely used in contemporary political discourse, but it was a particularly influential mode of thought at the turn of the twentieth century. Vitalism was not so much a movement, more a sentiment that became part of the assumptions of many discussions at the end of the nineteenth century and it was one of the essential features of the ecological imagination.

Vitalism is based on the understanding that there is a difference between living beings and inorganic matter and that what distinguishes these two things is a 'life force', or the spirit. This idea relies heavily on scientific understanding, but also attempts to fill the spiritual void created through the development of science. György Lukács (1885-1971), argued in *The Destruction of Reason* (Lukács, 1980) that vitalism influenced all schools of thought in late nineteenth-century Europe. He described an outlook popular among the intelligentsia that wanted to develop a new moral purpose in the absence of religion and in the face of an organised working class. In the wake of the collapse of Germany's democratic movement and the failure of the 1848 Revolution, the intelligentsia could no longer unequivocally embrace the idea of progress and so turned to an evolutionary mode of thinking (Lukács 1980). Influenced by Auguste Comte (1798-1857) and positivism - the idea that facts and experience, rather than metaphysical speculation - are the key to truth had a particular appeal to the intelligentsia. Vitalism placed 'life' at the heart of philosophy, reaffirming a sense of certainty previously lost to science. "Life cannot be brought before the judgment seat of reason", wrote one leading exponent (Lukács, 1980, p. 426).

One of the leading exponents of vitalism, Wilhelm Dilthey (1833-1911), a historian, psychologist, sociologist, philosopher and a critic of rationalist science, argued that life itself was its own proof. For Dilthey, the world does not exist independent of human consciousness and knowledge is determined by consciousness. Dilthey proposed a 'new objectivity' based on intuition rather than the scientific method.

Intuition was not a supplement to conceptual thinking, argued Dilthey, but its antithesis; it was the occasional flash of insight that allows us really know the world. While reason constructs models and symbols by which we understand the world, intuition provides genuine understanding and is more akin to the spiritual life. Dilthey didn't influence the architectural discourse directly, but one of his followers, Georg Simmel (1858-1918), became an important reference point for twentieth-century architectural and urban theory. Simmel was a vitalist and a sociologist who followed Haeckel in his defence of Darwinism; he argues that what we deem to be universal laws are in fact no different from the prejudices of the medieval period (Lukács, 1980).

In *Metropolis and Mental Life* Simmel says that the modern city creates a certain type of person, a blasé type, a person that reflects the contradictions of urban life such as extreme individuality and social totality and the confrontation of objects and people (Simmel, 1903). For Simmel, getting to grips with 'objectivity reality' was not a realistic ambition. Instead, 'living' could provide some insight, it could chart a third way between being and consciousness. Simmel's approach created the space for a subjective spirituality, without a definite object or religious framework. Robert Musil's *The Man Without Qualities* describes the vitalist imagination in detail: "The self never grasps its impressions and utterances singly, but always in context ... and so everything that has a name leans on everything else in regular rows, a link in a large incalculable unity, one relying on another and all penetrated by a common tension." (Musil, 1995).

Mumford clearly identified with the strong sense of vitalism expressed by Haeckel and other early ecologists – not doubt this outlook was developed through a dialogue with Geddes (1854-1932), who Mumford greatly admired. (Mumford named his only son, who was killed in Italy in Second World War, Geddes.) These ideas had a significant impact on ecological thought developed in the period after 1968 and on the cradle-to-cradle movement today. In the USA, Sullivan's speech captures the vitalist spirit very eloquently:

It cannot for a moment be doubted that an art work to be alive, to awaken us to its life, to inspire us sooner or later with its purpose, must indeed be animate with a soul, must have been breathed upon by the spirit and must breathe in turn that spirit. It must stand for the actual, vital first-hand experiences of the one who made it, and must represent his deep-down impression not only of physical nature but more especially and necessarily his understanding of the out-working of that Great Spirit which makes nature so intelligible to us that it ceases to be a phantasm and becomes a sweet, a superb, a convincing Reality. (Sullivan, 1894)

5.9.3 Holism

Throughout Haeckel's work, a connection is made between beauty and the unity and order of nature, "that all natural phenomena without exception, from the motions of the heavenly bodies and the fall of a rolling stone to the growth of plants and the consciousness of men, obey one and the same great law of causation; that all may be ultimately referred to the mechanics of atoms—the mechanical or mechanistic, homogeneous or monistic view of the universe", wrote Haeckel (Proctor, 2006). Haeckel saw biology as a unique discipline that could form the foundation of a scientific religion (Breibach, 1998). The relationship between man, nature and knowledge dominated the scientific imagination. Haeckel wanted to address the questions presented to contemporary ecologists. Does man act on the world as a dominating player or can he exist within the world? In terms of human understanding, are we looking at the world from outside of the egg or from inside? In terms of an individual's character, is it made by nature or the world that he constructs for himself? Is there some innate spiritual satisfaction to be derived from nature? Is it a substitute for God?

Implicit within these statements is the emerging idea that knowledge based purely on the Cartesian logic of 'cause and effect' and 'observer and observed' are not sufficiently sophisticated to capture the complexity of natural systems. At this early stage, you can see a certain paradox within environmental thinking: ecology is a discipline that is embedded in the development of science is also driven by a sense that something has been lost in the development of a scientific understanding. According to Proctor, Haeckel devised his Monism "in opposition to Cartesian Dualism", adding: "To the absolute division between the physical world and the spirit, he opposed, on the one hand, the reduction of the soul, the mind, and consciousness to purely physical and chemical facts, and on the other, the attribution of soul, or psyche, to the physical world." (Proctor, 2006)

Geddes's work is still admired today often for its interdisciplinary and eclectic character. Anthony Vidler admits to being a 'Patrick Geddes fan', telling me: "I believe that his relationship to entomology, his relationship to Thomas Huxley's teachings, his relationship to geography through his connections with French and Belgian geographers and others made him a model of thinking about urban issues." (Vidler, 2012) The holism and complexity of Geddes's work has a resonance in the contemporary urban discourse. It should be noted that Geddes was not a democrat. In 1914, he visited India and drew the conclusion that colonialism was a good thing because the empire could be trusted to look after the land. In 'Rural and Urban

Thought: a contribution to the theory of progress and decay' Geddes, writing with Victor Branford, complained that the "biological and evolutionary sciences had not been given a chance to improve the world" (Geddes, 1929). Geddes developed the idea of an evolutionary history founded on the idea of bio-technical phases in the development of society which was pursued by Mumford as the idea of the bio-technic.

Bio-technic thinking assumed that biology could inform the development of technology and technology might become more concerned with questions of life. This critique of the conventions of the rationalist mode of thought can be found as a strong constituent element throughout much of ecological discourse. When Anne Chisholm interviewed Mumford in the 1970s, he made a similar argument and you will hear the same argument made today. "We learn only by samples. By separating primary from secondary qualities, by making mathematical description the test of truth, by utilising only a part of the human self to explore only part of the environment, the new science successfully turned the most significant attribute of life into purely secondary phenomena, ticketed for replacement by the machine. Thus living organisms in their most typical functions and purposes became superfluous." (Chisholm, 1972) Mumford argued that since the seventeenth century, man had been breaking nature down into smaller units in order to understand it, and as a result had lost a sense of the complex nature of things and developed a certain contempt for the natural world.

5.10 Planning and the legacy of early ecological thought

In the twentieth century, naturalist and vitalist thought had a limited life span. Nevertheless, the ideas prevailed among those developing the new discipline of planning and was particularly evident in the work of Patrick Geddes (1854-1932) (Welter, 2002). Naturalism described above exerted a considerable influence on the emerging discipline of planning. Geddes, like Haeckel, began life as a natural scientist and then progressed to the position of a scholar of the relationship between man and nature until finally he became a planner. Geddes supported the idea of a return to rural settlement patterns or Back to Earth decentralisation proposed by Ruskin. He studied under TH Huxley and he was interested in the statistical classification of human and animal populations. He believed that human society was living within fixed physical limits. He also supported the ideas of George Perkins Masters, the American conservationist, who had developed a theory that the decline of past great civilisations could be linked to the environmental damage caused by deforestation. From Comte, Geddes adopted the idea of the benevolent and apolitical planner. As Bramwell points out, the irony is that those

that who most fervently believed that man should stop meddling in the natural balance of things proposed a greater level of intervention in order to ensure that some sense of natural balance is maintained. “He believed that a viable sociology could only be created on the basis of biological knowledge.” (Bramwell, 1989).

Scholarship in this area of biological and ecological thought in art and architecture is relatively underdeveloped because ecological thought in the period between the wars is associated with fascism and has consequently tended to be ignored (Bramwell, 1989; Rampley, 2017). Some scholars have begun to explore biological metaphors in twentieth century European architecture. Sonja Hnilica made the connection between cell diagrams and Abercrombie’s Egg map of London. The map, which was produced by Patrick Abercrombie and John Henry Forshaw at the London County Council (LCC) in 1943 as part of the London City Plan, was titled ‘social and functional analysis.’ (Hnilica, 2018) (Anon., 2018).

The image of London as a collection of cells was produced by graphic designer Arthur Ling, who wanted to demonstrate that idea that London consists of numerous distinct communities that are both self-sufficient and part of a larger organism. The imagery is very close to images of cells produced by the modern electron microscope, which had been invented in the 1930s. The organic quality of the images suggest movement, growth and the ambiguity of the edges of individual cells in the same way that an image of living cells works. Abercrombie’s cells each had their own green belt to ensure that inhabitants were never too far removed from the natural world. The fact that Abercrombie founded the Campaign to Protect Rural England (CPRE) in 1926 suggests that he was concerned about the loss of landscape and a connection with the natural world in the process of urbanisation.

The London plan image became known as the ‘Egg Diagram’ and has since been dubbed the ‘potato plan’ by a Dutch publication (NAI, 2018). The strong relationship between the disciplines of biology and planning is evident in Mumford’s work. Lewis Mumford (1895-1990), a regional planner under Roosevelt and a significant urban and architectural critic in the 1930s, coined the term ‘bio-technics’ as part of his critique of urbanisation. Bio-technics was an attempt to find an accommodation between technology and the natural world. Mumford talked of a different kind of technology that wasn’t based on waste and consumption, but on equilibriums – where you put back into the system what you have taken out.

In *The Pentagon of Power* (Mumford, 1970), Mumford wrote: “[A] growing appreciation of all that distinguishes the world of organism from the world of machines gave rise, in the nineteenth century, to a fresh vision of the entire cosmic process. This vision is profoundly different from one offered by those who left out of their world picture the essential

qualitative attribute of life: its expectancy, its inner impetus, its insurgency, its creativity, its ability under exceptional circumstances to transcend either physical or organic limitations. The name given to this new vision of life was bestowed belatedly, only when it began to be systematically pursued: it is ecology.” (Chisholm, 1972).

The idea of the organic in architecture was pursued in US architecture throughout the 1930s and 1940s and became an important element of American, or at least Californian, modernism in the postwar period. In the world of architectural ideas, it finds its clearest expression in the work of Bruno Zevi (1918-2000). *Towards an Organic Architecture*, which is both ‘modern’ and simultaneously a critique of Le Corbusier’s *Vers Une Architecture* (1923). However, it can also be argued, as Porteous does, that Le Corbusier’s preoccupation with light and space and exposure to the greenery follows in this tradition (Porteous, 2002). Porteous suggests that the tendency to see modern masters such as Richard Neutra, Walter Gropius, Le Corbusier and Wright as entirely uninterested in building material performance, and hence efficiency, is misplaced.

New scholarship on the relationship between the Bauhaus and naturalism or biology suggests that there was a strong strand of naturalistic thought in the work of many of its contributors. László Moholy-Nagy, who moved to the UK in the mid-1930s and then to the USA, was one of the clearest advocates of the idea of ‘nature as a constructional model’, for a new kind of functionality. Some claim that the introduction of the biological into Bauhaus thinking occurred in the 1930s when many of the staff were in North London, such as Walter Gropius, Marcel Breur and Moholy-Nagy.

Peder Anker in *From Bauhaus to Eco-House* (2010) describes how the above and members of MARS (Modern Architecture Research) Group became advocates of environmental sensitivity: “There must be no antagonism between architecture and its natural setting”, they pointed out in an exhibition manifesto of 1938. At the time, environmentalist Clough Williams-Ellis argued that modernism could save Britain from ecological destruction. Williams-Ellis and Patrick Abercrombie (the most influential planner in the immediate postwar period) led a crusade against the ‘unregulated development of the English landscape’. Modern architecture was understood as an advancement in public health, as well as an alternative to environmental destruction (Anker, 2010).

Moholy-Nagy left the UK in 1937 for Chicago, where he established a new Bauhaus and wrote *Vision in Motion* (1947), which was an attempt to “add to the politico-social a biological bill of rights for people to live in harmony with nature” (Anker, 2010). However, before he left he made two films. The first, *In the Cradle of the Deep* (1937) looks at the growth

of lobsters from baby to old age. In the film, Nagy states that the “prehistoric animal shell is constructed in such a wonderful way that we could immediately adapt it to a fine bakelite or other moulded plastic form” (Anker, 2010). The other film, *The New Architecture of the London Zoo* (1936) was about the work of Berthold Lubetkin and explored different biological experiences of space in the human and animal world.

Peder Anker describes the gathering of Bauhaus immigrants and British environmentalists as the first attempt to establish an environmental architecture (*Bauhaus to Eco-House*, Anker). While he identifies some interesting relationships, there is little evidence in Sibyl Moholy-Nagy’s biography of her husband that he was exercised by the question. In fact Sibyl’s own work is more closely aligned to the question of ecology. Sibyl Moholy-Nagy (1903 – 1971) was a German architectural historian and author who moved to the USA in the late 1930s with her husband, going on to write his memoir, *Experiment in Totality* in 1950. She produced also number of important books exploring ideas that relate directly to ecological thought, including *Native Genius in Anonymous Architecture* (1957) and *Matrix of Man: An Illustrated History of Urban Environment* (1968). Both books address the same concerns as Rudofsky’s work on the vernacular which will be discussed in the section on the return to the primitive later in this chapter.

László Moholy-Nagy was interested in biology as a source for the designer and he was also interested in the idea of a ‘totality’ in the same way that Haeckel was interested in ‘unity’ as a theory of everything that could provide the intellectual certainty required to fill the spiritual hole created by the development of reason and the death of religion. In her husband’s biography, Sibyl writes: “He accepted the sharing of his life as a biological law because it was bios- the interaction of vital impulses that stimulated man to work for his emotional fulfillment.” (Moholy Nagy, 1950, p. xviii). It is clear from the text and her other work that she regarded the question of biology and totality as psychological concerns. In summary, she concludes that her husband’s passionate outlook was “too positive an axiom in a world view of deepening negativism, too optimistic and single-minded in assuming man’s recognition of this emotional deprivation, too intolerant towards the salvations of the mind.”

Where there was an interesting connection between the Bauhaus and the idea of ecology in the UK was in the next generation of architects that became the first critics of modernism. Tom Avermaete, professor of architecture at TU Delft, makes the connection between Erwin Anton Gutkind, the originator of the idea of social ecology (Avermaete, 2009) and the members of Team 10, the Young Turks that broke free from CIAM in the late 1950s. While in London, Gutkind worked as a planner and published a number of planning books:

Creative Demobilisation (1943), *Revolution of Environment* (1946), *Our World from the Air* (1952), *Man and his Environment* (1952), *Community and Environment* (1953), *A Discourse on Social Ecology* (1953) and *The Expanding Environment* (1953).

Gutkind had a personal relationship to the first generation of European Modernists, the Bauhaus, Peter Behrens and Walter Gropius. He worked as the primary architect for a Berlin building firm, Gruppe Nord, for 10 years on the design of German Siedlung in the 1920s. He was part of the so-called 'Ring of Ten' who met at the office of Mies van der Rohe and included the Taut brothers, Hans Poelzig, Eric Mendelsohn, Ludwig Hilberseimer, Otto Bartning, Martin Wagner and Walter Gropius. In 1933, Gutkind fled Berlin for Paris and London. In 1956, he moved to Philadelphia to join the Faculty of Fine Arts at the University of Pennsylvania.

Gutkind's writing on social ecology was particularly useful to those looking to find a new way of thinking about design within the planning process. He came into close contact with the MARS group, the English branch of the CIAM in London in the 1950s. At the time Gutkind, wrote to the MARS group: "I am glad that at long last the Athens Charter has been recognised as what it is in reality, namely an utterly useless and nonsensical salad of meaningless phrases. It has nothing whatever to do with LIFE, for it neglects the greatest reality, the human beings whom it degrades to functions of the Functions on which it purports Town Planning to consist." (Avermaete, 2009) With the letter, he included a copy of his book *The Expanding Environment*, in which he explored how man created his dwellings and landscapes. His analysis tried to identify structural principles and patterns of settlements. He was particularly interested in the street as a historic form and how it guided development alongside communal or shared activity. Gutkind's approach influenced the 'stem and cell' model adopted by the leading French architects Candilis, Josic and Woods as well as influencing the work of the British Modernists and the Japanese Metabolists movement that lasted from 1959-1970 (Avermaete, 2009).

The theme of 'wholeness' was central to Gutkind's work, arguing "the goal of social ecology is wholeness and not a mere adding together of innumerable details". In this way, he articulated a broader concern among planners and architects that reason was being overwhelmed by instrumentalism. Giedion's *Mechanization takes Command* (Giedion, 1948) articulates a similar concern. This was a generation that approached the end of the war with a sense of trepidation about the capacity of mankind to organise production and public life without undermining the freedom of the individual and the richness of life itself. In the foreword to *Creative Demobilisation* (Gutkind, 1943), Herbert Read suggests that he has been invited to write the text because he is associated with the idea of individual liberty: "Planning

has become the catchword of our age; not merely, one suspects, because it is a necessity inherent in our historical situation, but also because it offers many people a welcome escape from the ambiguities of political action. It is the 'scientific' attitude in social relations, and to be scientific in our days is as good as being moral.”

Read was suspicious of this approach and was a believer in the human aspiration for freedom as the driver of progress and morality rather than science. He says that Gutkind, too, is well aware that although he is making plans, human beings cannot be ‘handled like docile cattle’. Read goes on to repeat Gutkind's warning that “A social relationship cannot be set up at the command of some authority or other, however enthusiastic it might be. It must grow.” (Gutkind, 1943).

Gutkind's writings articulate a common theme that can be identified in much of the literature on architecture and planning during this period. The relationship between reason (and instrumental thought) and the complexity of social life is an issue that concerns theorists and practitioners charged with postwar reconstruction. Gutkind looked to the social sciences to address the questions of man, human consciousness and his environment, preferring a psychological understanding of the question rather than the philosophical or sociological. He argued that mankind was estranged from nature in a way that earlier societies based on local settlements, local materials and vernacular techniques were not. He writes: “In these settlements the ‘I-Thou’ relationship between man and nature is reciprocal. In modern society nature becomes it and is objectified.” (Avermaete, 2009).

In this first early period of ecological thought, there is very little explicit discernable impact of these new ideas on architecture. However, the enthusiasms and interests of architects and planners in the question of ecology is evident in the literature. The relationship between mankind and nature is called into question as a consequence of the curiosity and anxiety generated by the overpowering influence of technology and administration in the lives of city dwellers. This question was temporarily suspended due to First World War, the rise of fascism and the displacement of many of Europe's most important architectural thinkers only to re-emerge again after 1945.

At the end of the period of the first phase of ecological thought, Geoffrey Scott wrote a book about architectural judgment called *The Architecture of Humanism* (Scott, 1914). Its publication was largely overshadowed by the onset of war and the emergence of the Modern Movement. However, it remains an important and useful text. Scott's argument is that by 1914 architecture and architectural criticism, while no longer classical, has become organised around a series of fallacies. Scott likens fallacies to winds, forces that that exist in the arts and society

and tend to exert an influence on the thinking and creative output of the architect. These winds or sentiments blow more or less strongly at any given time and often they merge and act together. They influence the practice of architecture and they shape how architects explain their work to others and in turn they become the standard for architectural criticism.

Scott is attempting to grasp the relationship between the ideas in the world and the output of the architect. This is not a simple task, as Scott himself remarked; we leave in architecture 'man's most unconscious record'. In other words, we can understand something about our history through the study of architecture, but we can't manipulate that record; architecture is witness to the tendencies of which we are rarely conscious. A fallacy is a flawed argument, an argument that can be taken as true, but when scrutinised fails to satisfy. At the core of every fallacy there is a truth and Scott argues that the fallacies associated with his time encircle and enrich architecture, but they cannot be deemed to constitute or determine practice or the basis of criticism. Scott's text is a thought-provoking polemic; it makes clear and conscious the thinking that underpinned architectural thought and criticism in 1914. As such, it is a useful reminder of how we might study and understand architecture. He asks us to step back from the popular way in which architecture is judged and think about questions that relate very directly to the discipline, which at its core is an artistic enterprise. What is interesting about Scott's work is that he predicts the emergence of the machine aesthetic that will form the basis of the Modern Movement. He describes three other fallacies: the romantic, the ethical and, finally, the biological.

Scott is less concerned by the development of naturalism and biological metaphors that had emerged in the work of the Art Nouveau Movement and more interested in how the 'philosophy of evolution' appeared to be influencing the way in which architectural history was conceived. For Scott, evolutionary thought has led to a wider understanding, but the emphasis on the scientific method of classifying objects has led to a levelling of all objects. What is important is where they sit in the historical narrative rather than the quality of the work.

For Scott, the biological fallacy was the belief that you could suspend judgment about the architecture of the past and replace it with a Darwinian-style analysis in which the present was always the host of the most sophisticated or successful expression of the discipline. The evolutionary approach to architectural history, says Scott, creates an environment in which standards of taste are multiplied and confused. Without any clear voice, architectural thought becomes subject to every passing 'gust of thought' sweeping through society, in particular poetic sentiments, the curiosity about science and the stir of social conscience. It could be argued that half a century later, this biological or evolutionary approach appeared to flourish

in the work of historians like the émigré Nikolaus Pevsner (Crinson & Williams, 2018). This attempt to organise ideas and to draw a link between ideas across a historical period is intended to aid an understanding, which in turn can form the basis of criticism and judgment not to act as an alternative to it and the author is mindful of Scott's insights.

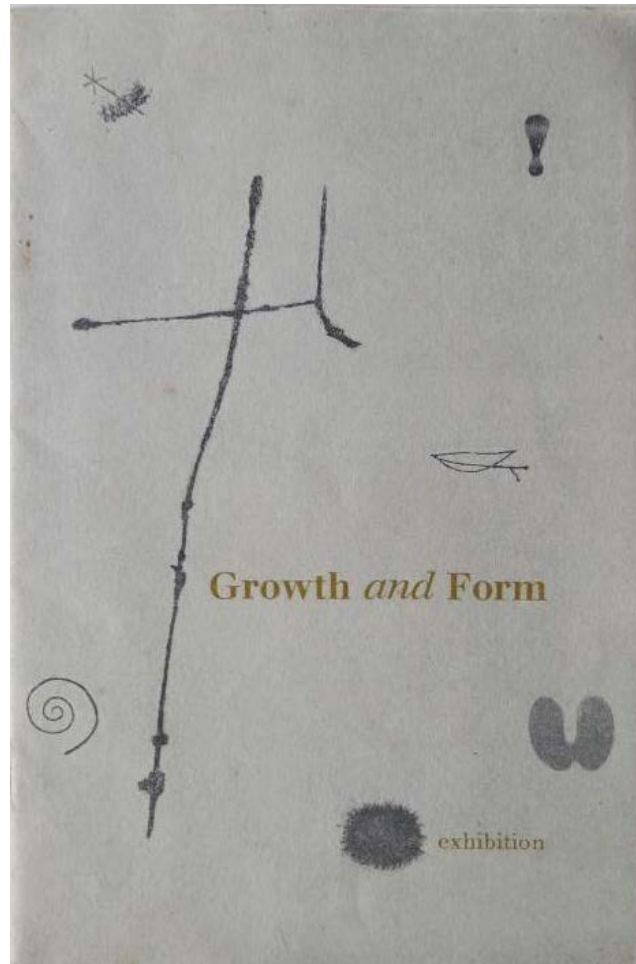


Figure 19 Growth and Form ICA, London, curated by Richard Hamilton in 1951. Catalogue for Growth and Form image from University of Dundee DArcy Thomson Collection.

6.0 Age of Ecology (1968 - 1974)

This chapter looks at the main trends in ecological and architectural thought in the immediate postwar period and the period from 1968-74, the Age of Ecology. It charts the evolving architectural culture in relation to broader social and political trends and then traces the distinctive elements of ecological thought. It looks at the work of architects, historians and writers in this period in an attempt to identify how ecology is presented and how it differs from ecology in the nineteenth century. The new themes that come to the fore in the Sixties and Seventies are: resource depletion, pollution and waste, systems thinking, computing and cybernetics, and the critique of technology and modern instrumentalism.

The individuals and institutions studied in the following chapters are from the UK and the USA. After 1945, the development of architectural theory was dominated by the American universities. Theory was strongly influenced by Europeans emigrating to the USA to escape fascism in the Forties and then several British academics moved to the USA in the Sixties and Seventies as an antidote to the austerity of postwar Britain. Even British architectural projects like the Independent Group looked to American product design and advertising as a source of inspiration and innovation. (Wrigley/McHale, 2011).

The interplay of ideas between USA and the UK is important in the evolution of both ecological thought and architectural theory. Kenneth Frampton and Anthony Vidler moved to the USA and Charles Jencks travelled in the opposite direction in the late Sixties. All three individuals saw environmental questions as important and have become more committed to the question of ecology over time. In the UK, the discussion around ecology is part of a broader response to modernism and the public policy of welfarism. In the USA, where modernism was never really associated with a radical social programme and where it was quickly appropriated as the aesthetic of corporate expansion, the discussion takes a different turn: ecology and the organic are associated with the counterculture movement and hippies.

This chapter also reviews the work of Paolo Soleri (1919-2013) and his idea of arcology (a mash of architecture and ecology). Soleri represents one of the most coherent attempts to link architecture and ecology and to build an ecological architecture. He also develops the idea of a 'new nature' in which the man-made versus nature dualism is abandoned, a trend which has become an important element of ecological thought. The work of Christopher Alexander and Bernard Rudofsky is also studied as the most focused expression of ecological

consciousness. Alexander's interest in design methodology, systems theory and computing makes an important contribution to emerging ecological methods. Rudofsky's campaign to reject modernism in favour of a return to the vernacular gives shape to the belief that the tacit know-how developed by local people building in local materials over a long period of time is a more valuable source of architectural knowledge than the conceptual thinking that emerged from the Enlightenment, the modern movement and the industrial production of building components.

6.0 The Age of Ecology

6.1 Early environmentalism

In the immediate aftermath of the Second World War, there was a social consensus and questions facing society were largely practical. How to physically rebuild infrastructure and urban centres? How do we avoid another war (at least in Europe)? How to stimulate economic growth? However, by the end of the 1950s, a more reflective discussion about the character and nature of modern society emerged and by the 1970s, any social consensus had evaporated, despite attempts to sustain it through the intellectual framework of the Cold War (Darwall, 2013).

The Princeton Conference of 1955 provides a useful record of environmental thought in the immediate postwar period. It was interdisciplinary, featuring more than 70 leading academics and practitioners - from geography, anthropology, planning, urban history and the natural sciences - presenting papers on the changing face of the earth and explored themes such as the ecology of waste, industrial demands on land, changes to local ecologies, the limits on natural resources, the impact of fishing and water quality, and even localised climate change (Thomas, 1956, p. 87). The full proceedings were published under the title *Man's Role in Changing the Face of the Earth* (Thomas, 1956). The editorial team included Mumford, Marston Bates and Carl O Sauer. Carl Sauer was a geographer, a critic of environmental determinism who in the 1920s had played a central role in the development of the idea of 'cultural landscapes' and 'historical ecology'. Bates, whose studies on mosquitoes contributed to the understanding of the epidemiology of yellow fever, was also the author of popular science books, notably *The Forest and the Sea* (1960) an introduction to the workings of ecosystems. Mumford, whose thinking on bio-technics provided an important link to prewar environmentalist and vitalist thought, proposed an approach to technology that wasn't based on waste and consumption, but on equilibriums – where you put back into the system what you

have taken out. These ideas had a significant impact on the ecological thought developed in the period after 1968.

Princeton doesn't often appear in the histories of the environmental movement or ecological architecture despite perhaps because the conference was led by technical experts in a variety of fields who were largely optimistic about their capacity to mitigate environmental damage caused by humans and lacked the moral or political energy displayed by the emerging environmental movements.

6.2 Popular Ecology

The period 1968-1974 has been described as the 'Age of Ecology' (Jamison, 2001) (Deviren, 2014). The term was first coined in 1969 by the BBC when it invited ecologist Frank Fraser Darling to deliver its Reith Lectures. In the USA, ecology became a household word following the first 'Earth Day' in 1970 (Darwall, 2013). The birth of political ecology and the emergence of a new environmental consciousness is often associated with the nuclear bomb tests in the New Mexico desert in 1945 and the publication of Rachel Carson's *Silent Spring* in 1962 (Worster, 1992). The Age of Ecology was a brief historical moment, but the ideas generated had an impact that extends beyond this discrete time period. The eco-architecture and arcology of the 1960s and 1970s produced very few buildings of significance, but Forty argues that all previous understandings of the idea of nature were transformed in the 1960s by environmentalism. The 1960s marked the moment that 'nature' became an imprecise yet powerful concept in architecture (Forty, 2000). The purpose of this chapter is to map out the emergent ideas contained in that imprecise but powerful concept, to understand the character of the mid-century naturalism.

The distinctive features of this period relate very strongly to significant developments in science and technology and the intellectual reaction to science and technology. Marshall McLuhan's description of a society that was driving into the future "looking into the rear-view mirror" (McLuhan, 1964) captures the ambiguity of the times. Ecological thought at the time was strongly influenced by the critics of technocracy and modernisation and those that embraced the new technology of cybernetics. As Sadler explains, Buckminster Fuller could not have developed his theories without Wiener's theory, which in turn relied on Bateson's work on the mind and McLuhan's ideas on the media.

Fuller viewed the world as a singular problem overseen through engineering. The figuring of the world's animal and mechanical contents as a single entity acquired rapid scientific development with the 1948 publication at MIT of Wiener's theory of cybernetics.

McLuhan theorized the emergence of a sort of ecology of representation through mass media and electronics, and Bateson speculated on an ecology of mind. (Sadler, 2008)

What were the elements of ecological thought in the Age of Ecology? Firstly, there were the first images of the earth from space which enabled mankind to think about the environment as a whole system, with natural limits, and even a natural equilibrium, which in turn led to a concern about the natural balance of the earth and the potential fragility of its ecosystems. Secondly, there was growing concern about the depletion of resources, particularly oil, which led to a wider discussion about scarcity and the limits to growth and the new consumerism. Thirdly, there was a growing anxiety about new technology. The war economy had led to very high levels of productivity, efficiency and technical innovation, but at the same time the liberal intellectuals, the left and the young people on both sides of the Atlantic reacted against the impact of industrialisation. Opposition to the consequences of industrialisation were not new, but the New Left and critical theorists provided a cultural critique of capitalist social relations in which the focus of attention was no longer exploitation, but the administration of society by a soulless ‘technocracy’ and the role of the media in defining ideological norms.

6.3 The Whole Earth and the Silent Spring

Hannah Arendt likens the shift in imagination that accompanies the first images of the whole earth to Galileo's discovery that the earth orbits the sun. For Arendt, the 1968 *Apollo 8* orbit changed the way in which human beings thought about their relationship to the world and their subjectivity. One of the most compelling aspects of this shift in imagination was the idea of the whole earth as a finite resource. “The expansion of the physical world view by *Sputnik* in 1957 strengthened the emergence of this new consciousness by circumscribing the finite limits of man's global habitat and the fragile balance of forces that sustain life within those limits”, noted John McHale (1969, p. 57).

Although ecologism was the inevitable child of the Sixties, it was given extra impetus by Rachel Carson's *Silent Spring* (Carson, 2000(1962)) and Paul R Ehrlich's *The Population Bomb* (Ehrlich, 1969) (Darwall, 2013). Carson's book argued that the introduction of chemicals such as DDT into the natural eco-system might damage the environment irrevocably. Carson's polemic against pesticides transformed how society understood the physical environment (Kinkela, 2009). Nature was reimagined, not as a powerful adversary but as a ‘defenceless victim’ (Worster, 1992, p. 341). Carson differed from earlier forms of American environmentalism, such as Thoreau, in that she promoted a diminished sense of subjectivity in the face of nature. “Ecologism differs from the transcendentalism of Emerson and Thoreau.

With the latter, the individual's openness to nature elevates him and shows him his uniqueness. By contrast, ecologism preaches man's intrinsic insignificance." (Kinkela, 2009). From the 1960s, the idea of man's intrinsic insignificance becomes an important element of ecological thought. The success of the space missions opened up a sense of possibility, but it also strengthened the sense of man as a small component in a much larger universe.

6.4 The oil crisis, resource depletion and scarcity



Figure 20 1972, Reynolds, Thumb House, New Mexico,

In the Sixties, the public meaning of ecology also became associated with “a revived fear of Malthusian scarcity, of approaching limits” (Worster, 1992, p. 341). Climate change was also explored by Emmanuel Le Roy Ladurie in his book *Time of Feast, Time of Famine* (Ladurie, 1971). In 1965, Adlai Stevenson, the US ambassador to the UN, made a speech in which he described mankind as passengers on a little spaceship dependent on vulnerable reserves of soil and air. The term ‘Spaceship Earth’ was the perfect metaphor for this finite world. Barbara Ward, a British environmentalist who wrote Stevenson’s speech, borrowed the term from British economist Kenneth Boulding of the Behavioural Sciences Institute at the University of Colorado. Boulding, who became increasingly interested in the environment after moving to the USA in 1948, argued that the USA no longer had a frontier economy or unlimited resources. The world economy should be understood like spaceman's world, as a closed system (Chisholm, 1972). In the context of postwar expansion and increased productivity, Boulding must have been a lone voice, but by the mid-1970s, in light of the oil crisis, the idea of limits to growth was mainstream.

The oil crisis and the outbreak of the Arab-Israeli War (1973) added to the power of Boulding and Ward's metaphor. The formation of the Club of Rome (1968) by Aurelio Peccei and Alexander King of the OECD indicated growing concerns about the slowing of the postwar boom. The Club was concerned with the inability of the market system to bring growth and stability to what became known as 'underdeveloped' countries and so set out to look at solutions to world hunger, environmental pollution, overpopulation and, at home, the disaffection of the working classes. The United Nations organised a conference on human settlements in Vancouver in 1976, known as Habitat 1.

In 1971, Barbara Ward founded the International Institute for Environment and Development (IIED) and the following year Ward and René Dubos wrote a pamphlet called *Only One Earth: The Care and Maintenance of a Small Planet*. Ward was not a romantic; she was driven by strong Christian values and argued for a sense of our "dual responsibility" to the planet and humanity. She was relatively pragmatic in her attitudes to economics and environmental control: 'We are a ship's company on a small ship. Rational behaviour is the condition of survival' said Ward (Darwall, 2013). Around the same time, Tony Crosland, a leading Labour politician, effectively introduced the idea of 'nimbyism' (not-in-my-back-yard-ism) into the discourse on environment when he accused middle-class conservationists of benefiting from development and then kicking away the ladder so that the poor couldn't come up behind them. In the 1970s, there were a number of conferences on the subject of environment.

Despite Crosland's desire to put a distance between the Labour Party and environmentalism, the idea of scarce resources and over-consumption had an appeal. In 1973, E.F. Schumacher's *Small is Beautiful: A Study of Economics as If People Mattered* (1973) attained something of a cult following. Schumacher became an international adviser on sustainable economics as well as converting to Catholicism and then taking up Buddhism and being dubbed the 'Sage of Surrey'. Schumacher's promotion of the doctrine of 'inter-mediate technology' as an alternative to industrialisation was not universally embraced, particularly in the developing countries, but it did start to influence radical politics in the UK (Darwall, 2013).

6.5 Mechanisation and technocracy

In the immediate postwar period, the experience of Hiroshima and Nagasaki had generated a skepticism about the value of technology. At the time, The Architectural Review (AR) wrote: "The most sinister thing about the atom bomb is not so much

that it may go off as that whether it goes off or not, its effects tend to be the same. Western Civilisation rests on its oars, awaits the issue. Result, an appreciable slowing down of what used to be called Progress.” (Haddad & Rifkind, 2014, p. 12)

According to Felicity Scott, by the late 1960s “faith in technological progress had increasingly given way to its dystopian counterpart” and “progressive social ideals informing the techno-optimism of an earlier generation, including modern architects, had been contested by evidence of modern warfare and the haunting prospect of global environmental and nuclear catastrophe” (Scott, 2007, p. 16).

Giedion’s purpose in writing *Mechanization Takes Command* (Giedion, 1948) was to reassert basic human values: “The coming period must bring order to our minds, our production, our feeling, our economic and social development. It has to bridge the gap that, since the onset of mechanisation, has split out modes of thinking from our modes of feeling.” (Giedion, 1948) In the text, he describes mechanisation as akin to an energy source like fire, with power, but blind and undirected. He warned that man needed to protect himself against mechanisation’s inherent perils; the fact that it was man’s own creation made it more dangerous. “Being less easily controlled than natural forces, mechanisation reacts on the sense and on the mind of its creator.” (Giedion, 1948, p. 714).

Like Haeckel and Mumford, Giedion yearned for a holistic approach to science and life. He had read and adopted methods from JC Smuts’s *Holism and Evolution* (1926) arguing that there was no static equilibrium between man and his environment, there were no closed circles and repetitive patterns (Giedion, 1948). “The human organism requires equipoise between its organic environment and its artificial surroundings. Separated from earth and growth, it will never attain the equilibrium necessary for life.” (Giedion, 1948, p. 721) In Gideon’s opinion, humans were seen as organic beings, animal-like in their responses and the product of systems of regulation that operate outside of their consciousness.

Up until the late 1960s, while Carson’s *Silent Spring* had highlighted the threats to biodiversity and Jane Jacobs had identified the threat to social diversity in the redevelopment of the city, there remained a strong sense that the application of science and reason would give rise to solutions. Jencks recalls that at Harvard in the early 1960s there a feeling was that “rationalism, the neo-Enlightenment and reason were still the dominant paradigm”. Academics

were working across disciplinary fields: “All of a sudden people jumped from one field to another and that's terrifically optimistic and they shared ideas and values.” (Jencks, 2015)

However, atomic fallout led to the formation of the Committee for Nuclear Information and the public seemed to develop an anxiety about science and technology that was articulated by members of the Frankfurt School, which had decamped to New York (Worster, 1992). In *Dialectic of Enlightenment* (1944) (Horkheimer, 1997), Adorno and Horkheimer argued that there were two approaches to moral reasoning and thought: on one side, the critical side of the Enlightenment dedicated to intrinsic value, order, ultimate purpose, liberation, to transcendence and, on the other, an instrumental aspiration to dominate nature and quantify the world. This intellectual backdrop underpins the critique of the Modern Movement explored by CIAM in its later years and by Team 10. The Frankfurt School provided the context for the emergence of the ‘critical’ in architectural thought. Environmentalists and the left complained that late modernism was problematic: “It turns reason into a merely instrumental mode; reasoning about means not ends. It leads to the spiritual alienation of women and men from nature and from there to the commodification and industrialisation of the living world.” (Worster, 1992, p. xi).



Figure 21 Drop City 1966 Brand <http://newlegendsmag.com/wp-content/uploads/2017/04/dropcity003.jpg>

6.6 Counterculture

The thirst for change in the US took the form of the counterculture. John McHale (1922-1978) reports that by 1969 there were about 80 new counterculture communities established in the US alone. Settlements such as Drop City and Libre in Colorado explored non-hierarchical social structure and looked at new ways of making shelter. At Drop City, artists, students and filmmakers bought a plot of land and started practising art and living in a community that mimicked the activity of Buckminster Fuller and the Black Mountain College. They made domes and zonohedra, built from the metal roofs of cars and other abandoned materials. The

project only lasted a few years, but gave rise to other initiatives such as the Criss-Cross cooperative, the Zomeworks solar energy company and, later, the discovery of interpenetrating fractal tetrahedra developed from the group.

These communities tended to be interested in cybernetics and embraced entrepreneurial culture: “The possibilities of a new contract between nature, man and technology explored by the counterculture and its communes, promoted and serviced by Brand and his Whole Earth Catalogue, cultivated a cybernetically orientated and entrepreneurial culture that spawned figures such as Steve Jobs, and profoundly influenced architectural culture both in the US and Britain and Europe.” (Spencer, 2016) These explorations had some limited impact on the architectural imagination, but as the proposals were largely autonomous settlements in rural locations, there was little they could contribute to the emerging discussion about urban context and everyday architecture.

As far as ecology was concerned, it was the hippies that gave clearest expression to ecological thought. Radical political groups addressing questions of war, race and class tended to see environmental questions as a secondary concern. It was only in the 1980s, when the idea of environmental justice emerges, that a link is made between issues of poverty and environment. McHale described the hippie movement as a ‘constellation of attitudes’ that included “a romantic revival of Art Nouveau, the old English digger idea, lifestyles and unconventional social forms”, but he argues at its core it marked a return to ‘community’. Alongside the hippies of Drop City were the student radicals or yippies (the Youth International Party), who were famous for their street theatre and putting up a pig for the position of student president. There is no single ideology associated with the counterculture; the wide range of ideas circulating within the movement were captured in the eclectic *Whole Earth Catalog*.

The *Catalog*, which was produced by Brand and his colleagues from 1968-1972, resembled a mail-order catalogue and was designed for readers that had adopted an autonomous and ecological lifestyle. It began life providing ideas for hippies that had dropped out, but soon became attractive to suburbanites looking to change the values associated with their lifestyle. Simon Sadler observes: “The *Catalog* took sustainability to be a concern for the citizenry at large, one best approached as a ‘design Wiki’, so to speak, refusing to cede to political and industrial hegemony, or to the supposition that nature is a limiting condition on society.” (Sadler, 2008).

Brand, a Stanford biologist who liked to build, produced the magazine with co-editors Lloyd Kahn, Jay Baldwin and Steve Baer, who had all worked together on Richard Buckminster Fuller's geodesic domes. It carried articles by Bernard Rudofsky, Christopher

Alexander, Ian McHarg, Mumford and won America's National Book Award in 1972. While architecture and design were key interests among many of the *Catalog's* writers, few had formal design training; contributors were polymaths, carpenters, ex-servicemen, engineers, mathematicians, photographers and scientists (Sadler, 2008).

The front section of the magazine was akin to a literature review for anyone interested in politics or ecology. It covered design and construction information alongside folk art, pattern finding, environmental restoration and technical investigation. Simon Sadler and Felicity Scott have written in some detail about the content of the *Whole Earth Catalog* and its impact on the architectural discourse (Sadler, 2008) (Scott, 2007). One compelling feature of the Catalog was that it proposed a form of ecological practice that did not assume a disassociation or detachment from mainstream society. It captured an interesting mix of enthusiasm for new technology with self-awareness and social understanding. Sadler argues that the reason it was not really popular in architectural schools and practices was because 'countercultural design touted an indifference to artistic form' as well as having an ambiguous attitude to modernity.

As a rule, the counterculture didn't share the outlook of the left. According to Sadler, Brand's diary reveals that the hippies were more concerned about individual identity and free will than the political issues of the war, race and feminism explored by the left (Sadler, 2008).

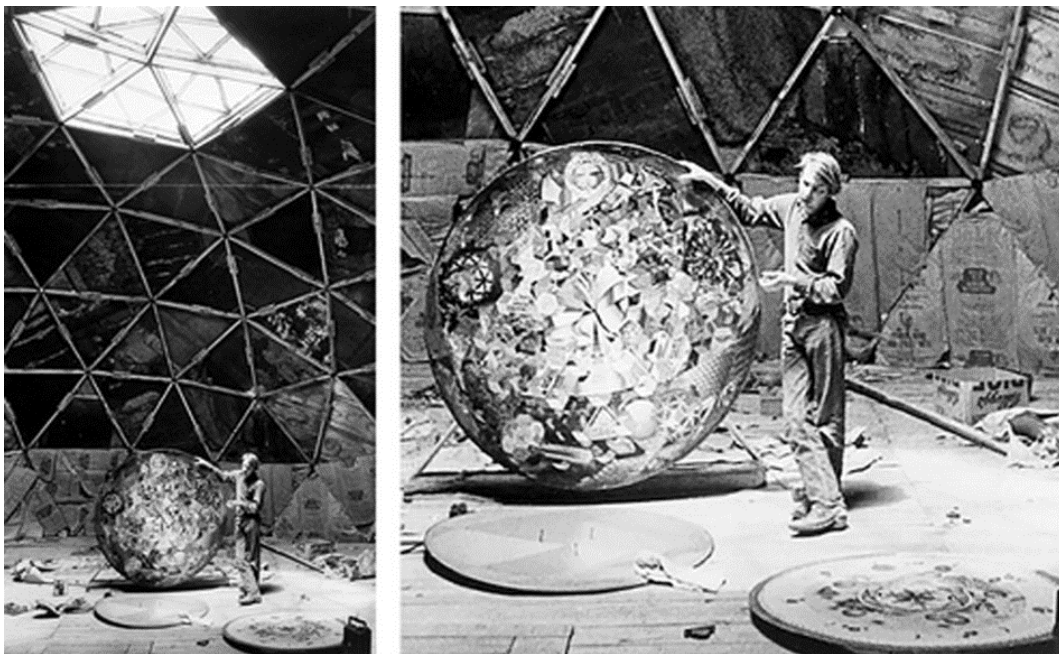


Figure 22 Drop City Interior <http://newlegendsmag.com/wp-content/uploads/2017/04/dropcity003.jpg>

6.7 Systems theory, computing and cybernetics

According to Reinhold Martin, the disruption of the Second World War left in its wake “a new and qualitatively different aesthetic-technological formation” (Martin, 2003). The practical experience of the war had placed project management and systems thinking on the agenda, but beyond this, systems analysis started to be applied to “society, technology and ecology, promising the transformation of environment and society” (Sadler, 2008). Postwar culture both embraced the technocratic and reacted against it with a critique of technocracy emerging from the New Left. A new attitude to aesthetics and technology found particular expression in the evolution of ideas about networks, systems, patterns, codes, information flows and feedback processes. Ecology was closely connected to these strands of thought. “Ecology is a very good example of the general systems approach”, argued Boulding (Chisholm, 1972, p. 28).

An interest in systems and networks had a particular influence on the architectural imagination after the war. For Martin, it’s evident as the kernel of an idea in the works of Mies van der Rohe and others, where the distinction between interior and exterior has been abandoned. However, it took another half a century and the development of digital design programmes for these ideas to be self-consciously and formally expressed. The General Systems Society at Stanford was founded by Boulding, Von Bertalanffy and others in 1954. In 1948, Giedion’s *Mechanization Takes Command* and Norbert Wiener’s *Epochs and Technology* were published and there is evidence that Giedion was in contact with Wiener (Martin, 2003). Wiener, as the inventor of cybernetics, was starting to explore ideas about how this new science might influence human subjectivity. He imagined a world in which the human subject could be disembodied and re-embodied and the location of the individual became less important. In retrospect, we can see that the internet has given us this flexibility, we still have a physical existence, but we can also be elsewhere virtually in the manner imagined in episodes of *Star Trek* and *The Tomorrow People*. Systems theory drew on Claude Shannon's information theory, Warren McCulloch's work on neural information processing, John von Neumann's binary systems work, and the writing of Norbert Wiener on cybernetics. Bateson, the husband of anthropologist Margaret Mead, looked at the emerging disciplines of computing, psychology and ecology and the crossover between them (Bateson, 1972).

In 1942, biochemist Isaac Asimov’s science fiction novel, *I, Robot*, introduced the idea of robotics into popular consciousness. At the same time, systems theory - which involved the study of communications, control, feedback in living organisms, machines, networks and organisations - became popular. Cybernetics was developed as part of both the military-

industrial complex and the counterculture. Although Horkheimer, Marcuse (1898-1979) and Lefebvre all wrote about technology as an alienating source of power, individuals within the counterculture movement saw the computer as a means of escaping from the overbearing control of the new modern authorities and corporate power. “The countercultural hippies - through systems theory - arrived at the idea that a personalised computer could allow realms of thinking and practice to create a whole. The computer could operate free from the technocracy - because it could be personalised.” (Sadler, 2008).

In *Architecture 2000 and Beyond* (1971) Jencks predicted the emergence of bio-form architecture a mix of biology and cybernetics. Vidler notes that both Banham and Jencks exhibited a real enthusiasm for the idea that new forms of architecture might be generated by cybernetics and research into DNA (Vidler, 2004). The possibilities of computer technology led Banham to suggest a complete rethinking of architecture as a practice of environmental control and in *Architectural Design* (1967), McHale proposed an organic partnership between man and machine (Spencer, 2016). By 1969, Roy Landau at the AA was invited to edit an issue of *Architectural Design* dedicated to cybernetics and including articles by Gordon Pask and Cedric Price. Architecture’s enthusiasm for cybernetics and natural systems was closely linked to its interest in the counterculture (Spencer, 2016).

Martin argues that Team 10’s work can be understood as an attempt to make sense of what today would be described as a ‘network’ (Martin, 2003). He traces the concepts of ‘trees’ and ‘lattices’ emerging from cybernetics in architectural thought and philosophy. He notes that in the early 1960s Foucault was already developing a vocabulary associated with networks and Deleuze’s idea of control society is also derived from this thinking (Martin, 2003).

6.8 Social ecology

Architects in the UK, despite operating in the shadow of the Modern Masters, were in search of a “new principle for architecture itself (Vidler, 2011). An interest in ecology coincided with a developing sensitivity to the limitations of the Modern Movement. Some of the ideas explored in early ecology found expression in the architectural discourse of the immediate postwar period. These themes can be described as shelter, the biological, the holistic and the systemic; all of these themes were connected to a discourse on ‘social ecology’.

The introduction to the Princeton report was penned by Erwin Anton Gutkind (1886-1968), a former Bauhaus planner. Gutkind’s ambition was to provide an intellectual framework for thinking about man and the environment in a way that drew on many disciplines. This new approach he called social ecology: “Something like a new discipline is needed, which for want

of a better name might be called ‘social ecology’” (Gutkind, 1953). For Gutkind, the bird’s-eye view, or ‘synoptic’ approach, provided the possibility for a new more holistic approach to environmental thought. “The synoptic view demands the appreciation of the whole nexus of relations in every detail and of the creative potentiality of every detail within the whole.” Gutkind’s work built on some of the themes set out by Haeckel in particular the idea of a unity or wholeness in life, a vitalist theme. “The main lesson we can learn from animal ecology is the need for studying human communities as a whole and in their total relationship to their physical and social environment.” (Gutkind, 1953). The idea of ‘wholeness’ is a feature of ecological thought in the postwar period and Gutkind’s writing provides some insight into the impulses and intellectual currents that are driving this outlook. In the introduction to his two-volume book, *Creative Demobilisation* (Gutkind, 1943), which was published during the war, he argued that a new generation needed to address problems in a new way. Ostensibly, the book is about planning, but the argument is that the struggle against totalitarianism and for democracy must be underpinned by a new outlook, a global one.

The idea of the earth, and mankind, as a single unit, a whole entity is implicit in Gutkind’s work in 1942. “The shrinking of the world is a matter of primary importance”, he writes. “Spiritual and material intercourse is increasing in time and space on an unprecedented scale. The outcome of this forces us to face the problem of a world administered as one coherent unit and to make the best use of the resources which Nature and Man have put at our disposal.” (Gutkind, 1953).

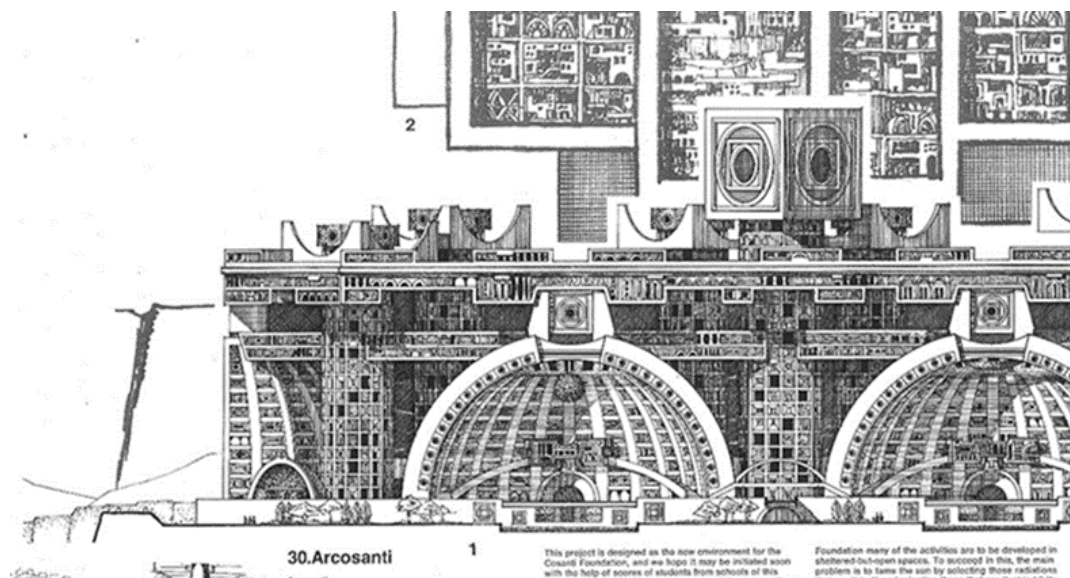


Figure 23 Paolo Soleri Arcology, *The City in the Image of Man* 1969 MIT Press

6.9 Soleri and 'second' nature

One of the most forthright expressions of the idea of ecology in the Age of Ecology was the work of Soleri in particular, his writings on 'archology' and his new settlement Arcosanti which was built in the Arizona desert. Soleri was an architect and urban designer who worked at Frank Lloyd Wright's Taliesin Fellowship from 1947-1949 and settled in Arizona. Soleri was a marginal figure that rarely figures in the architectural histories of the period, in *How to Play the Environment Game*, Theo Crosby described Soleri's work as one of the last 'genuinely utopian projects' (Crosby, 1973).

Soleri's early work won an enthusiastic reception from Sibyl Moholy-Nagy writing about an exhibition of his early work at the Corcoran Gallery in Washington (Moholy Nagy, 1970). At the time, Arcosanti was yet to be built – but Moholy-Nagy was hopeful that the workshop area of 'womb houses' would be the beginnings of a new settlement. Sibyl Moholy-Nagy provides an interesting link to the prewar discussion about ecology generated by Bauhaus staff discussed in the previous chapter.

Today, Arcosanti is run as a foundation and it has a critical mass although it could not be described as a city. The fact that Sibyl Moholy-Nagy was prepared to give the work such a generous review indicates that among the founders of the Modern Movement there was a sympathy towards an exploration of architectural drivers that were not mechanical or functional, but drew their authority from either tradition or nature. The exhibition included drawings of Soleri's first utopian proposition, Mesa City, which was made up of mushroom-like structures or villages. According to Moholy-Nagy, the thinking of Soleri was simple: if the process of urbanisation has led to cities which are densely populated and prison-like in character, then new urban forms must evolve. Nature might provide some clues as to how to form these new settlements. "Arcology is conceived as the stage beyond the city", wrote Moholy-Nagy; in place of modernist urbanization, Soleri proposed "an arcology (formed from architecture and ecology) ... a vast three-dimensional environmental structure which houses urban man in the most ecologically sound and concentrated way" (Moholy Nagy, 1970).

Although Soleri's building take on strange unfamiliar forms that are naturalistic in quality, they were also technologically sophisticated and represented part of the general move among the creators of utopian communities to embrace new technology. Soleri was both engineer and product designer as well as an architect and he was aware of ideas about cybernetics, systems theory and ecology (Busbea, 2013). Busbea links Soleri's work directly to the new materialism that would emerge two decades later: "The systems within which Soleri

inscribed architectural form were very much in line with the new models of science and aesthetics being elaborated in the decades following the Second World War, and can be understood as part of a lineage of alternative materialist thought, including the work of Henri Bergson, Pierre Teilhard de Chardin, Ilya Prigogine and Gilles Deleuze.” (Busbea, 2013).

Certainly the forms that he proposes in his buildings have a strong relationship to landscape like much of the contemporary work discussed in this research. At the level of ideas, there are similarities between Soleri’s approach to nature and Deleuzian thought. However, one of the distinct qualities of Soleri’s work in the 1970s is that it is highly optimistic. His new plans are driven less by an anxiety about pollution and more by a belief that creative solutions to environmental questions might simultaneously improve public and cultural life. Soleri’s *Arcology: The City in the Image of Man* (Soleri, 1969) contains a large number of Soleri’s drawings, some of which are fairly technical and formed the basis of the shared spaces at Arcosanti, and others that are more philosophical and suggest a new way of thinking about the city and urban infrastructure in the same way that Ebenezer Howard had imagined a garden city at the end of the nineteenth century. One of the themes that Soleri pursued was the idea of neo-nature – a world in which we exist that is a product of human activity. Soleri uses natural metaphors to suggest a form of creative production and governance that is inspired by natural processes. This idea of second nature was pursued by a number of Soleri’s contemporaries, most significantly by Banham in *The Four Ecologies* (1971). McHale used the idea of ‘Man Plus’ to explore the implications for the human body; it described the combination of humanity and scientific developments that aid human’s capacity to deal with problems thrown up by nature, such as kidney transplants. Richard R Landers pursued the idea in his novel *Man's Place in the Dybosphere* (1966), in which artificially created things behave in a life-like manner and traditional man/nature relations are superseded. By the 1980s, it had become a familiar theme in science fiction - *Neuromancer* and *Blade Runner* explored this idea of the augmented

individual - and then in the sociology of place and environment (MacNaughten, 1998).

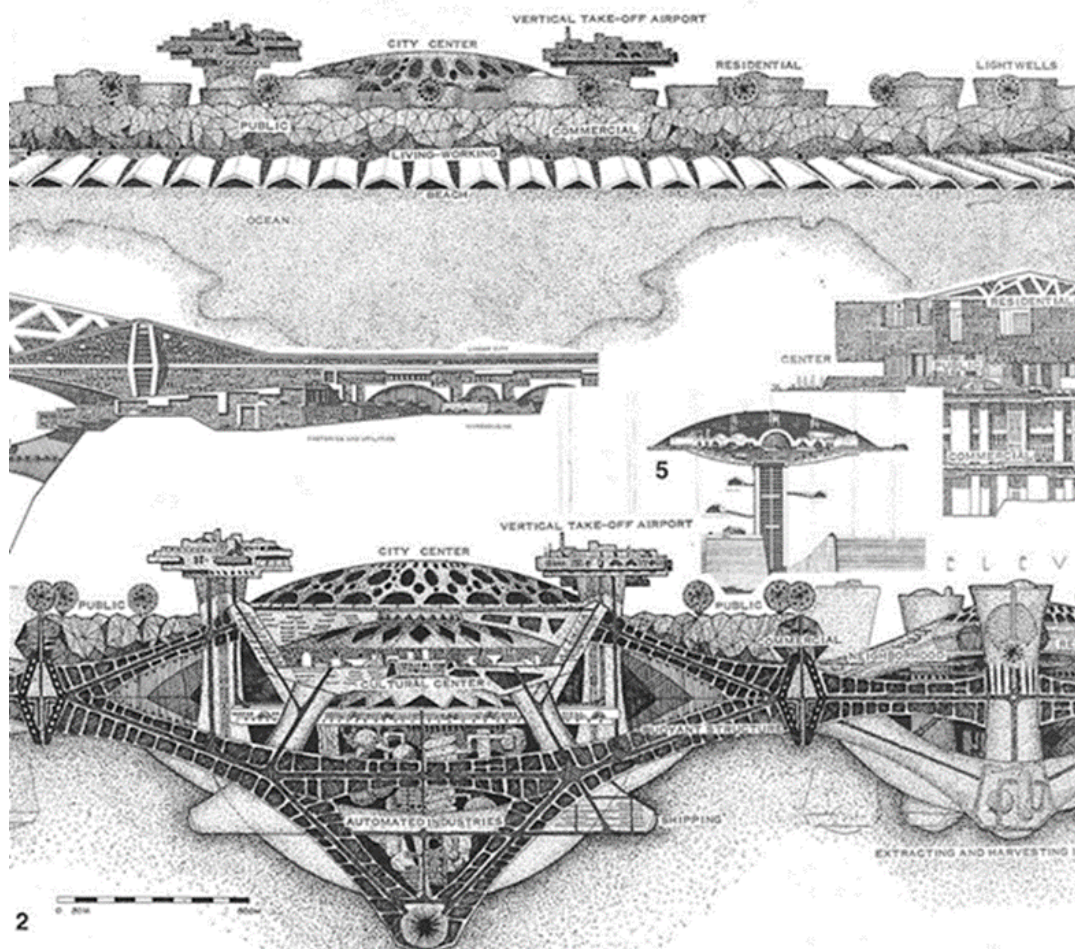


Figure 24 Paolo Soleri, *The City in the Image of Man*, 1969, MIT Press.



Figure 25 Paolo Soleri, Arcosanti

6.10 Christopher Alexander and systems theory

The individual that did most to explore the implications of systems theory in relation to architecture was Christopher Alexander. He was a mathematician, who chose to look at the design process and the development of cities as his subject matter. The influential text *Notes on the Synthesis of Form* was developed from the content of Alexander's PhD (1964), which itself was a development of the work undertaken by Alexander with Chermayeff in *Community and Privacy*, which includes numerous references to ecology (1965)

In *Notes on the Synthesis of Form* (1964), Alexander tried to 'split design problems into solvable small patterns by applying information theory' (Ockman, 2012). His work on systems has been linked to early parametricism (Jencks, 1971). Implicit within the work is the idea that we might be able to use human technology to imitate patterns or processes evident in nature. Alexander suggested that we can create tools for design that can be used by anyone to create work that is elegant and appropriate. In this early work, Alexander's interest is not the objects of architectural production, but the relations between them. As the work develops, it is the organic or intuitive elements of the design process that feature more prominently in his analysis. Alexander applied the systems approach to BART, the Bay Area Rapid Transport system, arguing that systems theory could address large-scale complex urban strategies. However, by the mid-1960s, Alexander's attention shifted to analysis and problem solving with the publication of *Pattern Language* (Ishikawa, 1977) and the essay 'A City is not a Tree' (Alexander, 1965). The essay looks at the ambiguity and overlap between building form and use and as such it represents a significant break from the modernist functionalist tradition.

The development of Alexander's sensibilities are paralleled by that of many other architects and critics in the 1960s. Similar themes can be found in the work of Jane Jacobs and Kevin Lynch. These themes that are also explored by Venturi in a key postmodernist document, *Complexity and Contradiction in Architecture* (Venturi, et al., 1984 (1966)). Alexander makes a distinction between what he calls 'natural cities' such as 'Siena, Liverpool, Kyoto, Manhattan' and artificial cities such as 'Levittown, Chandigarh and the British New Towns'. He argues: "It is more and more widely recognised today that there is some essential ingredient missing from artificial cities." (Venturi, et al., 1984 (1966))

For Alexander, we can look at the city as a tree or a lattice. Both are ways of thinking about how a collection of small systems make a complex one. Alexander argued that designers are limited by "the capacity of the mind to form intuitively accessible structures", which means they cannot achieve "the complexity of the semi-lattice in a single mental act". The semi-lattice

that provides a form for designers to think about the relations between sets of things and activities in the city is more subtle and complex than the rigid hierarchy of the tree. “This enormously greater variety is an index of the great structural complexity a semi-lattice can have when compared with the structural simplicity of a tree. It is this lack of structural complexity, characteristic of trees, which is crippling our conceptions of the city.” (Alexander, 1965, p. 157). Alexander's argument was that systems can educate designers to think about the complexity of layers and overlapping sets of activity in a successful city. This idea that we need to evolve a mode of thought that matches the complexity of natural and social relations is an important element in the postmodern imagination, but it also relates strongly to third-wave ecological thought.

Just as Alison and Peter Smithson make a strong argument for the importance of ‘association’ in the design of the modern city, Alexander too warns of the dangers of ‘disassociation’. According to Alexander, the mind has a basic psychological intolerance of ambiguity. Alexander’s thinking is connected to that of later theorists; there is an obvious parallel between Alexander's semi-lattice and Guattari's ‘rhizomes’ as a metaphor for ‘understanding’ rather than ‘logic’. According to Sadler, back in the Sixties, ‘systems thinking’ and ‘whole design’ “threatened to quite supersede the modern movement in design, deeming modernism isolated from wider cultural and natural systems”.

“Whole design replaced modernism’s homages to craft and industry with methods taken directly from craft and industry, their capacity to yield information about materials and processes transferred intact to the whole designer.” (Sadler, 2008, pp. 108-129).

Systems thinking didn’t replace modernism, at least not for several decades. As architectural theory developed, it looked to history, form, type and the discussion of the city for sustenance. However, the systems theories developing in the USA had an impact in the UK. In 1962, a Conference on Design Methods in London was organised by DG Thornley and Christopher Jones; in 1965, another looking at ‘design science’ was held in Birmingham. In 1967, Geoffrey Broadbent and Anthony Ward ran a similar event in Portsmouth. Broadbent was interested in Kuhn's thesis on paradigm shifts and in design methodology (Bayazit, 2004 winter). By the 1980s, Broadbent was collaborating with Jencks on *Signs, Symbols and Architecture* (Broadbent, et al., 1980) (Anon., 1980); in 2008, he published *Eco-Architecture II* (Brebbia & G, 2008)

6.11 Rudofsky and anonymous architecture

Colquhoun noted that sometime in the 1960s the idea of a ‘new world made up of new materials’ gave way to a desire for solid hideouts in an uncertain, changing world. Bernard Rudofsky, who referred to the modern world as an ‘ebbing civilisation’, put the case for a return to indigenous architecture and he found an audience for his ideas. The so-called ‘primitive hut’ in its various forms, which at the turn of the century had been an exotic curiosity at world fairs, was becoming the subject of serious investigation by anthropologists and young architects. “Presented from a Western perspective, the cultural products and technical knowledge of supposedly organic societies were seen as a mode of resistance to that increasingly totalised modern condition.” (Scott, 2007, p. 216).

One of the clearest expressions of the early reaction against technology and science in the 1960s is the exploration of the archaic and the vernacular. The previous chapter recorded the work of Sibyl Moholy-Nagy's *Native Genius in Anonymous Architecture* (1957), which provides a critique of mechanisation and a celebration of vernacular buildings. Moholy-Nagy argues that the vernacular allows us to come closer to the original roots of architecture, not as romantic evasion from modern tasks, but as a tool to understand the spiritual and material character of the structures in which we live. She argues that even in the dwellings of Neolithic man, we can see what separates that which is human from that which is natural: “The herder and farmers of the Neolithicum made another decisive step in the genesis of architecture. Instead of submitting to an intrinsic environment, they adapted a selective environment to human needs.” She adds that the academically trained architect relies on his intellect whereas the anonymous builder relies on his intuition. This intuition gave us a sense of what was the right way to build and that long-established know-how or tradition been lost.

Bernard Rudofsky's work represents a more definite break from modernist traditions. In 1977, Rudofsky recalled how he had struggled to find support for the idea of an exhibition on the vernacular in the early 1940s. MOMA had rejected the proposal as ‘antimodern’ and in the early 1960s had still argued that a vernacular exhibition was not suitable for lay audiences. But by 1965, with the support of Jose Louis Sert, Gio Ponti, Kenzo Tange and Richard Neutra (and even Gropius), he had successfully convinced MOMA to mount *Architecture without Architects* (1965) (Rudofsky, 1977, p. 367). The show was a major success, although not among architects, the catalogue was reprinted numerous times and Rudofsky, with support of Piero Belluschi, dean of MIT, won funding to extend his studies. Today, Rudofsky’s thinking has been absorbed into the mainstream environmental discourse.

MOMAs decision to host the show is indicative of a change in mainstream thinking. Rudofsky promoted the vernacular as an alternative to the 'historical pageant' of grandiloquent buildings taught in architecture schools and as such his work marks the start of a critique of the discipline and the profession that stretches beyond an attack on modernism. Rudofsky describes his work as a "natural history of architecture" and used natural metaphors to talk about that history. "Does the disappearance of architectural species natural to the soil upset the balance of civilisations in the same way as the disappearance of certain animals and plants upsets the ecological balance?", he asked.

Rudofsky describes indigenous architecture as products of ways of life that are, "heavy on acute insight, albeit light on progress" and as "architecture without dogma". Implicit within his description is the idea that there are different kinds of knowledge and early settlements are "lessons of architectural savoir-faire". Rudofsky claimed that the primitive people that produced vernacular buildings had no desire to dominate the environment. At the core of this critique is the idea that today's man is divorced from both nature and understanding. "In a way he (prehistoric man) had a more practical wisdom than modern man, for what we call his primitive dwellings were dwellings governed by ecological factors", argues Rudofsky. *Architecture without Architects* was not just a celebration of the archaic. It was, according to Scott a "carefully crafted, polemical attack on the state of modern architecture" (Scott, 2007, p. 216) Rudofsky criticised the "narrow world of official and commercial architecture" and complained about the "disciplinarians hailing from frigid zones", which had led to dehumanisation. His work reflected an interest in the idea of spontaneously produced human ecology.

In the 1960s, the disciplines of human ecology and anthropology were evolving and generating public interest in the exploration of human customs, norms and patterns of settlement. The threat of cultural homogeneity made the pre-industrial towns of the Mediterranean and the dwellings of non-Western societies look appealing. "The unapologetically exotic images in Rudofsky's exhibition appealed to this countercultural refusal of Western culture's logic of progress, a growing reaction that fully took hold only in the 1960s." (Scott, 2007, p. 216) There was a widespread revival of interest in the primitive, which was in turn the subject of a polemic by Ayn Rand (Rand, 1999), which was titled *The New Left: The Anti-Industrial Revolution* when it was published in 1971 and retitled *The Return of the Primitive* in 1999.

The idea of the primitive was explored by a number of Team 10 architects and was also evident in Le Corbusier's postwar work. Rudofsky's exhibition made an impact on Maki

and his Japanese peers in the Metabolist movement with their exploration of group form. Aldo Van Eyck, one of the leading figures in Team 10, had undertaken a study on the architecture of the funeral rites of a Malian tribe, the Dogon, which had been published in 1961. Van Eyck's interest in design based on the idea of patterns of repetitive elements or clusters that related to both archaic and organic forms. "A house must be like a small city if it's to be a real house, a city like a large house if it's to be a real city", wrote Van Eyck (Strauven, 2007). He argued that the distinct identity of each element of the city was not undermined by the repetition of pattern or form, but enriched by the form of each cluster.

This new urban fabric would be organic and yet clearly ordered within a larger system. Van Eyck envisaged a situation in which: "All systems should be familiarised one with the other in such a way that their combined impact and interaction can be appreciated as a single complex system – polyphonal, multirhythmic, kaleidoscopic and yet perpetually and everywhere comprehensible." (Strauven, 2007) At the Otterloo Congress in 1959, Aldo Van Eyck argued that to develop a real contemporary architecture demanded an engagement with the primitive. "He considered that architecture, like paintings since Cubism, had to rediscover 'the archaic principles of human nature', the fundamental human constants shaped by archaic cultures since time immemorial." (Strauven, 2007).

Chapter 7 What happened to ecology?

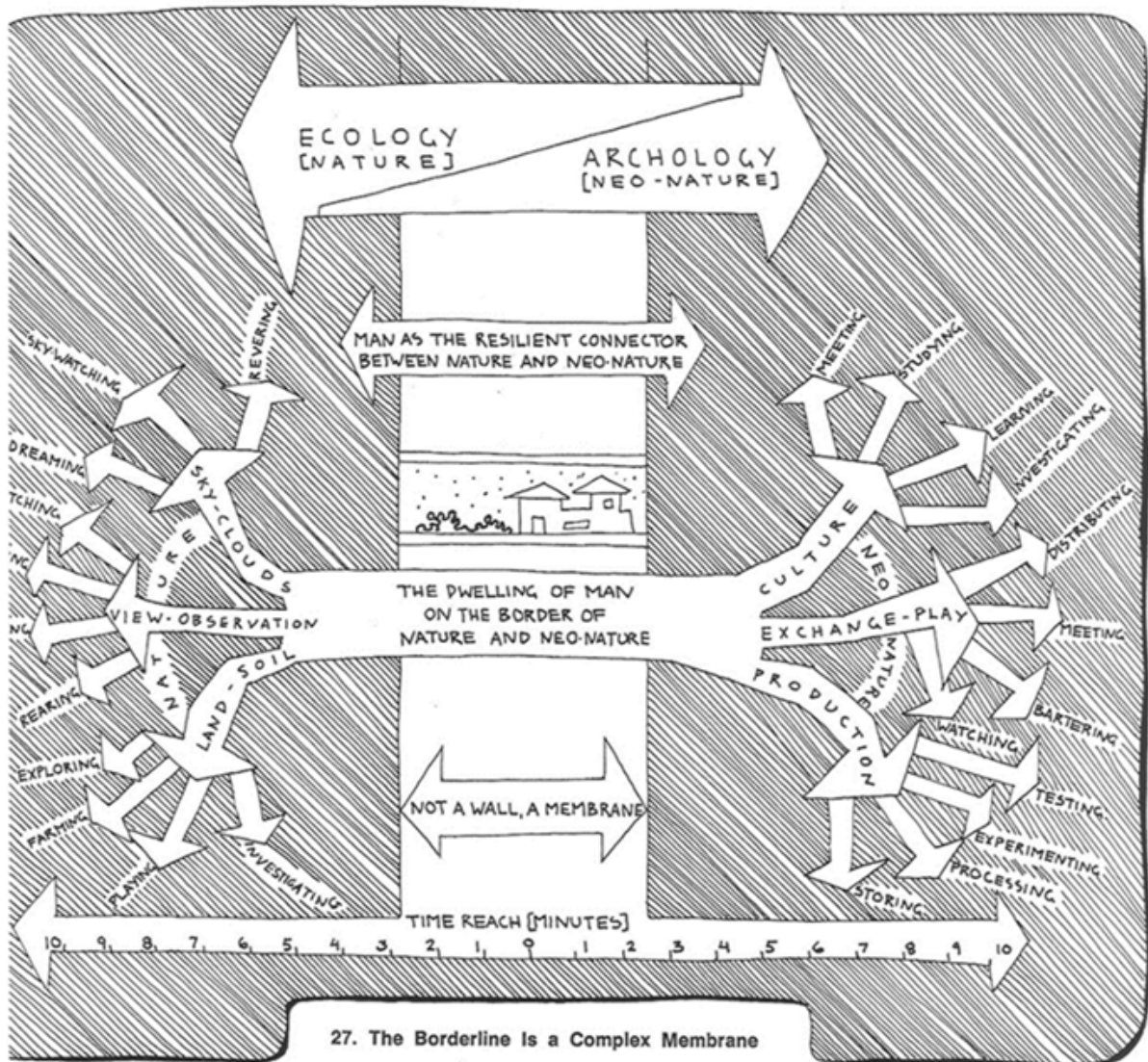


Figure 26 Paolo Soleri, *The City in the Image of Man*, 1969, MIT Press.

“I don’t think anyone acquainted with it in the Sixties has ever thought the ecological problem has gone away. Even though it went off the fashionable agenda and other things came to the fore, it’s always been eating away at everybody’s mind since it became so popular in the Sixties.” (Jencks Interview June 2015). In his 2008 Syracuse lecture, ‘Whatever Happened to Ecology?’, Anthony Vidler asks why ecology appeared to drop off the architectural agenda in

the mid-1970s. Ecology had become a household term in the USA in 1970 with the launch of Earth Day and in architecture, ecological questions were central to adjustments being made in the profession and architectural education. Jencks believes ecology disappeared off the architectural agenda for the same reasons it was marginalised in politics. “I realised ...that architects were poor players in a big heavy game of the power ... you couldn't be re-elected in democracy if you didn't care about people more than Mother Nature”, said (Jencks, 2015). In other words, the environmental agenda was understood as being in conflict with issues confronting the people such as employment and housing. Jencks' understanding is supported by Theo Crosby, who in *How to Play the Environmental Game* describes the dissipation of environmentalism in the face of competition from other radical social movements (Crosby, 1973). Bookchin, the environmental anarchist, argues that by the 1980s, dystopian bitterness and misanthropy had eclipsed the generous and 'utopian ambience' of early ecologism; so the failure was an ideological one. Sadler concurs by suggesting that “post-structuralism and the dynamic of advancing capitalism both raised question marks over the possibility of a rationally defined 'whole', 'nature', and 'reality' upon which ecological architectures depended”.(Sadler, 2008)

Vidler's attempt to answer the question looks more closely at architecture rather than ecology. He locates the problems with a broader failing of architectural theory to address anything beyond its own world. For Vidler, the demise of ecology after 1974 can be explained by the internal conflicts within architecture: the heated debates about formalism and social function. In an attempt to answer Vidler's question, this chapter looks at the discourse on ecology in the architectural literature in the period 1968-74, paying closer attention to the individuals associated with ecological thought and architecture (Vidler, 2008). The focus of attention of the chapter is the group of individuals identified by Vidler in his lecture: Buckminster Fuller, The Independent Group, McHale and Banham. The chapter pays particular attention to Alison and Peter Smithson, who were leading members of the Independent Group, but do not feature prominently in Vidler's analysis.

The chapter will explore the ideas of Buckminster Fuller and look at the idea of 'Spaceship Earth' that he popularised. The Smithsons and their interest in the idea of 'social ecology' was an essential element in their critique of the instrumentalism of modern planning and is rarely discussed in environmental histories of architecture. The Smithsons worked alongside McHale in the Independent Group before he moved to the USA to pursue an interest in Fuller, ecology and technology. McHale could be described as the archetype 'techno-utopian' and his writing provides an important record of ecology when it had a utopian

ambience (Bookchin, 2005). The chapter will finish by looking at the work of Banham, who popularised the idea of a new reading of architectural history and architectural criticism and wrote a number of books on environment and ecology. In conclusion, the chapter will chart the fallout from the Age of Ecology.

In the UK, this discussion of ecology takes place in the context of the emergence of the welfare state. The discussion about 'context' (Rowe) and 'association' (Smithsons) reflected an aspiration to create new environments that had a richness and complexity that seemed to have been lost in the development of the Modern Movement. This approach has occasionally been described as 'social ecology', but the description never really took off. The idea of 'community' and community architecture captured the profession's imagination in the late 1970s.

In the USA, the emergence of a counterculture in the 1960s, and an eclectic movement that was thrown up by a generation of independent youth, created space for ecological thinking. American environmentalism tended to be tied up with the 'critical' or radical view of US society, a position that opposed the wars in Korea and Vietnam and embraced the struggle for civil rights. This narrative begins in 1945 with the atom bomb, is followed by the publication of *Silent Spring* in 1962 and reaches a highpoint with the *Apollo 8* moon orbit in 1968. The story ends with the first Earth day in 1970. As Spencer argues, it appears to be the political tensions within that broad-based movement that put an end to the burgeoning ecological architecture as a mainstream concern (Spencer, 2016).

7.0 Architecture in the Age of Ecology

7.1 Fuller's 'Spaceship Earth'

One of the individuals most closely associated with new architectural thinking in the immediate postwar period is Buckminster Fuller with his plans for the Dymaxion House (1929) and the Wichita House (1946). According to Ockman (Ockman, 2012), the compelling quality of Fuller and his followers' work was that they suggested the possibility of material progress without the involvement of a social movement or social class to deliver it. Technology was seen as the agent of social change in the absence of a political force; consequently, Fuller's work was labelled 'techno-utopian' (Sadler, 2008). Buckminster Fuller published *An Operating Manual for Spaceship Earth* in (1969).

We can make all of humanity successful through science's world-engulfing industrial evolution provided that we are not so foolish as to continue to exhaust... the orderly energy savings of billions of years' energy conservation aboard our Spaceship Earth. (Fuller, 1969, p. 2)

Fuller provides one of the most important links between the discussion on ecology and environment and architectural design. His highly efficient Dymaxion House and the Manhattan Dome appear in many historical accounts of twentieth-century architecture (Frampton, 1991). In the 1950s, the US military became interested in Fuller's work, so by 1967, Fuller was able to launch the geodesic dome at the Montreal Expo. The highly efficient, lightweight structure captured the imagination of many young architects and the operating manual put the question of resources on the architectural agenda.

Vidler describes how Fuller experienced two waves of popularity in the UK during the postwar period. The first was in 1958, when he spoke at RIBA in London, addressing the relationship between man, nature and the machine, and the second was in the 1970s, when he returned (thanks to McHale) to lecture on the basic principles of 'shelter'. Fuller, an inventor, philosopher and technocrat was described as "a thoroughly American type of free-lance prophet" (McHale, 1970). His techno-utopian approach set the tone for ecological discourse in the USA. Like Haeckel, Fuller was not keen on ideology; however, unlike Haeckel, he embraced technology.

Fuller developed the idea of the spaceship further than Boulding as a practical metaphor for how each individual might live. We should all imagine that we were an astronaut in the space capsule – restricted what we could do and consume, Fuller suggested. The aesthetic of the capsule had a particular appeal to Fuller, who was interested in natural geometries and

prefabricated constructs, but it was also adopted by a number of architects, including Archigram, and was embraced by Banham. At the heart of the enthusiasm for the capsule was the idea that we could live in a highly efficient manner if we adopted new technology and were prepared to challenge architectural and academic conventions.

Fuller was enthusiastic about the new computer technology. “Man has ever-increasing confidence in the computer”, he said. He cited the use of the computer in the management of air-passenger landing systems as proof that we must trust the new technology. “While no politician or political system can ever afford to yield understandably and enthusiastically to their adversaries and opposers, all politicians can and will yield enthusiastically to the computers safe flight-controlling capabilities in bringing all of humanity in for a happy landing.” (McHale, 1970, p. 240)

Fuller had more faith in technical development than the political process. This attitude, in part inspired by the writings of Karl Popper (McHale, 1970, p. 246), was shared by a fair number of his fellow citizens in the 1960s. For Fuller, the political crisis – which was given clear expression in the student rebellions of the late 1960s – provided an opportunity for “planners, architects, and engineers to take the initiative.” (Fuller, 1969) Professionals should work together, he argued, in the same way as synergy operates in nature. The inference was clear, that there was a morality in the way in which the universe operates and man should imitate that natural morality. McHale, like Fuller, wanted to see the efficient and ecological management of society; the ecological imperative tended to demand that government act to enforce environmental policy. Fuller made a *One World Town Plan* for the new millennium in which there were no nations, but hubs linked by airlines. McHale was more cautious about the idea of experts and technicians replacing politicians, but he embraced Fuller’s supranational idea of planning, which evolved into an important element of environmental thought in the 1980s and 1990s.

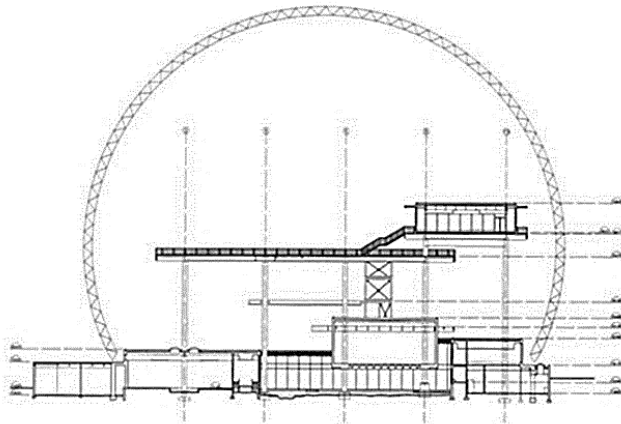
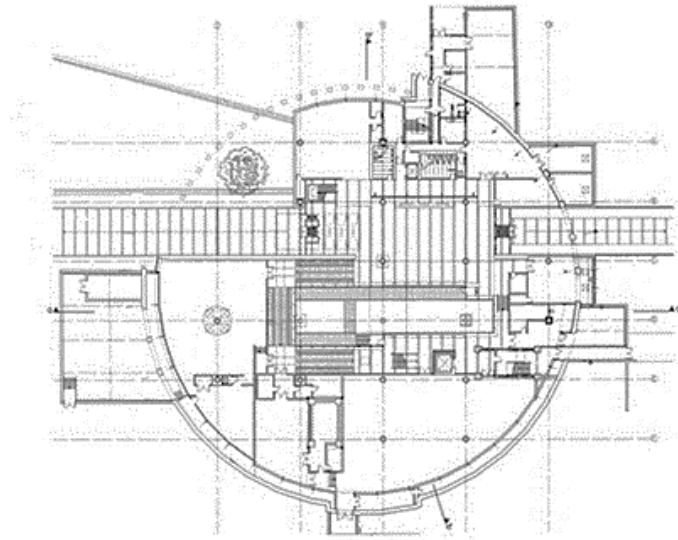


Figure 27 1967, Fuller Geodesic Dome, Montreal

7.2 The Independent Group

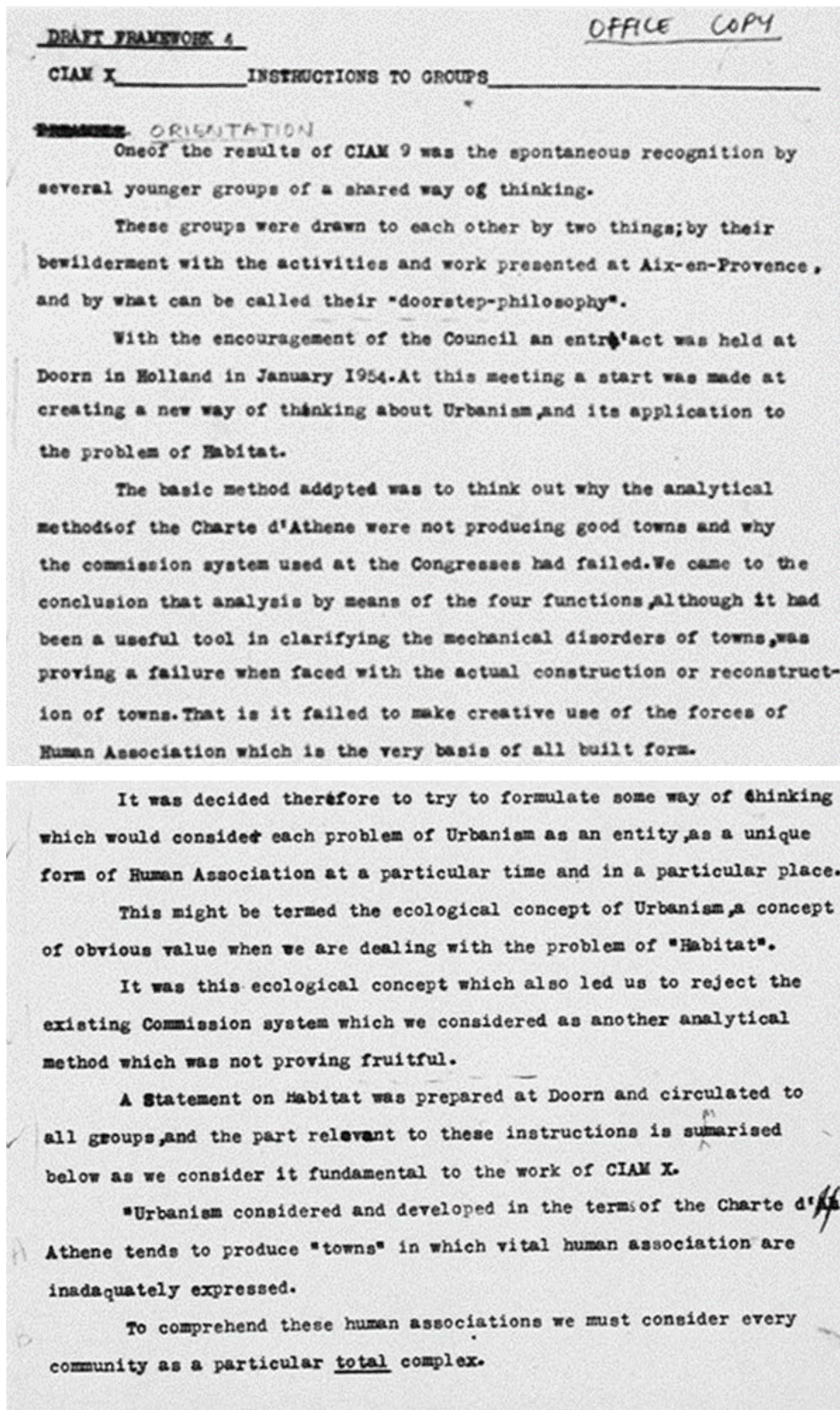


Figure 28 Memo for CIAM meeting Dubrovnik 1956 from the archive of A&P Smithson

The Independent Group, a loose gathering of individual artists, architects, sociologists, filmmakers and critics - including Banham, Alison and Peter Smithsons, Colin St John Wilson, McHale, Eduardo Paolozzi, Lawrence Alloway, Nigel Henderson, Richard Hamilton, William Turnbull and James Stirling - had a significant impact on the architectural discourse in the UK in the 1950s. Exhibitions and events at the ICA in the early to mid-Fifties included *Growth and Form* (1951), which took its name from the work of the nineteenth-century Scottish zoologist D'Arcy Thomson, consisted of a collection of objects and images, including X-rays, microscopic and telescopic images, of birds' eggs and animals' skulls. In 1956, James Stirling's contribution to the celebrated exhibition *This is Tomorrow*, designed with architects Michael Pine and Richard Matthews, consisted of a large 3-D model of an organic form that resembled the structure of bubbles. The accompanying text concluded that, in a world that was abandoning conventional forms and searching for new ways to make our environment, "the total plastic expression (architecture, painting, sculpture) will be in the landscape with no fixed composition, but made up of people, volumes, components - in the way that trees, all different, all growing, all disrupted into each other, are brought together in an integrated clump" (Crosby, 2014).

The naturalistic aspects of these exhibitions are rarely covered in the conventional discourse on British modernism and postmodernism. However, Doug Spencer argues that Richard Hamilton, who curated *Growth and Form*, was particularly interested in the overlap between biology, chemistry, physics and maths (Spencer, 2016). Although Hamilton was interested in the territory previously addressed by the nineteenth-century vitalists and Bauhaus emigres such as László Moholy-Nagy author of *Visions in Motion* (1947), he drew a distinction between the creative impulses of nature and man. Natural form was determined by physical laws and the complexities of art were driven by psychology, he argued (Spencer, 2016). Hamilton's interest in perception marked a shift in consciousness towards communication and computing. According to Spencer, "counter culture is all about perception, not knowledge". Individuals such as Hamilton and McHale gravitated towards countercultural movements and tended to explore theories of perception and communication and the Independent Group as a whole were fascinated by 'new modes of perception and immersive conditions' (Spencer, 2016).

7.3 The Smithsons' climate registers

If Soleri's work is symptomatic of ecological design in the USA during this period, Alison and Peter Smithson's work is indicative of what is happening in the UK. The Smithsons, in an

attempt to transcend the positivism or reductivist logic of modernism, were attracted to the 'organic', which seemed to allow for the possibility of new sites of social interaction. Modernism, while still the overriding framework for their practice, was deemed to be technocratic and overly utilitarian and without regard for human life. Explorations of biological analogies, organic form and structure alongside ideas of repeatable cells or units and indeterminate or endless infrastructure often drew on natural imagery and ideas of cell forms found in nature as a source (Colquhoun, 2002).

While Soleri's work sat on the margins of US culture, the Smithsons were working in the mainstream. Their work was not described as ecological, but there is within their writings and their design an increasing sensitivity to the question of environment. They argued that infrastructure should do more than facilitate community formation - it should give coherence to the urban structure. At the tenth Congrès Internationaux d'Architecture Moderne (CIAM) meeting in Dubrovnik in 1956, they joined with Jaap Bakema, Aldo van Eyck, Giancarlo De Carlo, George Candilis and Shadrach Woods to form Team 10. The team accused the old guard of the profession of becoming increasingly instrumental in its approach to design. They championed a contextual approach to architecture, 'connecting it with issues beyond its narrow formal scope', such as social and economic questions (Rappaport, 2005).

Although Team 10 members expressed a strong sense of the social programme in their work, they struggled to find a means of articulating this idea, except in a formal sense – for example, the cell and the collective. There was a tendency to rely on naturalistic metaphors to convey the ideas of 'human association' or 'parts and a whole'. Candilis and Shadrach Woods worked with the metaphor of stem and cell; the Metabolists in Japan explored new systems that could expand and retain their meaning in the same way that nature operated. Kengo Tange and the Tokyo Bay project were inspired by systems theory; Maki and other Metabolists explored organic group-form and studied additive typologies in precedents such as hill villages. The designers of the new megastructure proposals imagined a world in which the city had a fixed core or system; groups like New Babylon imagined the city as an open web.

One of the first explicit uses of the word 'ecology' by British modernists was in memo produced by the Smithsons in preparation for Dubrovnik, exploring the theme of 'habitat'. The Smithsons' 'instruction to groups' - a single page of foolscap - was an attempt to formulate a design approach that looked at the city as whole entity (Rappaport, 2005). As discussed, Gutkind linked the Bauhaus generation to the UK's Mars Group and encouraged the Smithsons and others to adopt a critical approach to the Athens Charter.

Gutkind looked to the social sciences to address the question of man and consciousness, emphasising the psychological nature of the issue. He described modern man as ‘estranged from nature’ in a way that his predecessors who lived in localised settlements were not. “In these settlements, the ‘I-Thou’ relationship between man and nature is reciprocal. In modern society, nature becomes ‘it’ and is objectified.” The vitalist theme of unity or wholeness is particularly strong in Gutkind’s work. “The main lesson we can learn from animal ecology is the need for studying human communities as a whole and in their total relationship to their physical and social environment”, he wrote (Gutkind, 1953).

The Smithsons tended to frame their critique of the Athens Charter in the same language of social ecology, human association and psychology; they described their new mode of thought as an ‘ecological concept of urbanism’. While CIAM had relied on technical data to inform urban design decisions, Team 10 argued for a richer reading of context in which every community constituted a complex whole. The Smithsons’ aspiration was to “try to formulate some way of thinking which would consider the problem of urbanism as an entity, as a unique form of human association at a particular time and in a particular place. This might be termed the ecological concept of urbanism, a concept of obvious value when we are dealing with the problems of ‘habitat’.” (Yale School of Architecture , 2006).

Although the Jencks interview portrays the Smithsons as diehard modernists, it is clear that as early as 1956 they were exploring postmodern ideas (NAI and TU Delft, 2005). At the same time as addressing the idea of social ecology, the Smithsons were at the forefront of early discussions about waste and recycling. After 25 years of peace, the UK was witnessing a rapid rate of consumption and the reaction of writers such as Theo Crosby was indicative of a general mood among radicals:

We will need to build a world without waste, where universal and decent sufficiency replaces the growing division between rich and poor. Above all, we must learn from the young the process of involvement and confrontation, to discard the logic of short-term solutions in favour of a poetic totality. (Crosby, 1973, p. 10)

For Crosby, the question of waste and efficiency sat alongside the issues of social justice and participation. This dual concern is reflected in the Smithsons’ work; it was only in the 1990s that the environmental performance of their buildings was given special attention. *Climate Register: Four Works by Alison and Peter Smithson* (1994) looks at what the authors describe as ‘the environmental resonances’ in their earlier work. The architects discussed weathering and the grounding of a building in its specific site and tied this approach to the idea that literature and narrative might be a good way to express and unpick the architectural imagination

(Salter, 1994). One of the buildings reviewed in the book was the proposal for City of Kuwait 1969-70 mat-building with a structure of services for heating, cooling, air-conditioning and lighting. The Smithson's argued that 'the language of architecture must evolve' from the design of these services.

Mat-building can be said to epitomise the anonymous collective, where the functions come to enrich the fabric, and the individual gains new freedoms of action through a new and shuffled order, based on interconnection, close-knit patterns of association, and possibilities for growth, diminution and change. (Smithson, 1974)

This idea that environmental conditions and patterns of social interaction might drive design processes was one of the key ideas explored by Banham in *The Architecture of the Well-Tempered Environment* (1969). The Smithsons also introduced the idea of a concept 'climate register', which allowed them to draw together; "seemingly disparate fragments of observations and ideas. It accommodates the uneasy relationship between the unequivocal physical and technical demands of the site and programme and the 'first-thought', the intuitive reading of context." (Salter, 1994, p. 7)

Sometime in the 1970s, the Smithsons started to see vernacular traditions and historic conventions as sources for answers to technical questions of environmental control and aesthetics. Breathing gutters, inspired by vernacular tradition and introduced for environmental reasons, were giving rise to a new 'spined-roof architecture' and a bony-backed ridge, which they imagined would contribute to 'architectectonic life'. In this context, the idea of climate is linked to a new sensibility concerned with site and place and an "architecture that carries resonances of the process of its making" (Salter, 1994, p. 11)

Although this work is not explicitly ecological, the language adopted by the Smithsons is a product of their desire to address the question of environment in a holistic fashion. They explain that at the core of their work is the attempt to forge a relationship between detail and strategy and they use a geological metaphor to describe this relationship: "In landform geography, the cycle of erosion is a concept that is understood in micro-scale (detail) and is equally valid at a macro-scale (strategy) of the physical world. The potency of this concept lies in the recognition of a relationship between detail and strategy in the development of the architectural proposition. It allows a kind of 'breathing space' in which to make judgments and to determine the emphasis of the work." (Salter, 1994)

7.4 McHale and techno-utopianism

McHale adopted many different mantles, from artist and exhibition designer to sociologist and architectural critic. He spent 1955 at Yale studying under the Bauhaus painter Josef Albers and, on his return to the UK, explored the USA's throwaway culture through collages of advertising imagery. His early work looked at the significance of the image and modern representation a decade before postmodernism. At Yale, he met Buckminster Fuller and by the early 1960s he had joined Fuller at the Southern Illinois University. While working with Fuller, he became increasingly interested in the world of science, futurology and ecology (Kitnick, 2011). In some ways, McHale embodies the dialectical tension within the ecology movement at this time (Jamison, 2001): he was fascinated by science and the natural world, but pessimistic about the possibility of social progress and political emancipation. The introduction to *The Future of the Future* (1969) explores the difficulties of Western civilisation dealing with the question of progress in the shadow of Auschwitz and Hiroshima. A year later, in *The Ecological Context* (1970), he argued that humanity has reached a point where it is potential to disrupt the global eco-system was significant. However, he wasn't a pessimist; he also argued that mankind had the knowledge and technology to develop strategies to address complex global systems, putting him in the camp of the 'techno-utopians'.

McHale was interested in the way in which an orientation towards the future was a strong feature of the discourse among his peers: "Our present generation now faces the future with the globally developed capacities that free man, for the first time, from many of the age-old fears of material scarcity, insecurity and competitive survival." (McHale, 1969) As far as McHale was concerned, it was only global institutional frameworks that prevented us from using our technical capacity to eliminate scarcity.

As a critic, McHale recognised the tendency to view technology as a substitute for social progress and change; he recorded a shift in US society from a commitment to political and economic action to 'a belief in the inexorable law of scientific progress' (McHale, 1970). He expressed an interest in nineteenth-century Romanticism and reflected on the fact that fear of automation and mechanisation of human life could be found in the thinking of the Deutsche Werkbund and the Modern Movement as well as in Ruskin and Morris. In response to the conditions of the 1970s, McHale developed a new understanding of the artificial and the natural in which man-made systems and natural systems can be understood as part of a continuum. "Until recently our technological systems were hardly considered as an organic part of ecology; hence little attention was given to this aspect of their function. Now, when there is pollution of

the air, earth, and water ... we begin to examine their pathology." (McHale, 1970, p. 246). For McHale, an essential ingredient of the ecological context was a reimagining of our relationship to nature in which human innovation and technology was embraced as part of the natural condition rather than being understood as a source of alienation. This theme reappears in the discourse on ecology in the 1990s.

7.5 Banham and ecologies

- 2 -

witchhunt (the mystique of antipollution being nothing but a variation of it).

Problems of Design and Environment only look like objective ones. In fact, they are ideological problems.

This crusade which puts again, but on another level, the theses of Kennedy's new frontier, as well as the fighting against poverty as the thesis of the great society (in France, the new society), constitute a complete ideological structure, a social drug, a new "opium for the people". In one sense, it would be too easy to compare napalm bombing in Vietnam with the loving care with which people here protect flora and fauna - one could make a fabulous list of all the evident contradictions in which this new idealism is sinking. But there is here a misunderstanding and the opposition between chlorophyll and napalm exists only in appearance: in fact, it is the same thing. In Vietnam, the fight is against communist pollution. Here the fight is against water pollution. To lock Indians and black people (in France, Algerians and Portugueses) in reservations and ghettos, that is also fight against pollution. It is the same logic that organizes all these aspects, the ideological process consisting in disguising in humanistic values some practices, such as fight against pollution, to oppose them formally to other practices, such as war in Vietnam, which are then considered only as a deplorable reality and an accident. We must clearly see that there is a same policy, a same system of values fundamentally operating here and that everywhere the established power has always fought against pollution, evidently against the pollution of the establishment itself. This enemy that each of us is invited to hunt and destroy is all that, in and out of himself, pollutes social order and production order.

It is not true that society is ill, that nature is ill. The therapeutic mythology which tries to convince us that if things are going wrong, it is due to microbes, to virus or to some biological dysfunctions, this therapeutic mythology hides the political fact, the historical fact that it is a question of social structures and social contradictions, and not a question of illness or deficient metabolism which could easily be cured.

All the designers, the architects, the sociologists who are acting like medicine-men, toward this ill society are accomplices in this interpretation of the question in terms of illness, which is another form of hoax.

In conclusion, we say that this new environmental and naturistic ideology is the most sophisticated and pseudo-scientific form of a naturistic mythology, which has always consisted in transferring the ugly reality of social relations to an idealized model of marvellous nature, to an idealized relationship between man and nature.

Aspen is the Disneyland of Environment and Design. We are speaking here about universal therapy, about apocalypse in a magic ambience. But the real problem is far beyond Aspen - - it is the entire theory of Design and Environment itself which constitutes a generalized Utopia, Utopia produced by a capitalist system which assumes the appearance of a second nature, in order to survive and perpetuate itself under the pretext of nature.

Jean Baudrillard, June, 1970
Aspen, Colorado, USA

Figure 29 Leaflet by Utopie Group at Aspen Conference, Getty Archive IDCA Friday 19 June 1970

During the late 1960s and early 1970s, architecture schools on both sides of the Atlantic chose to rename themselves as Departments of Environment (Ockman, 2012). In 1959, Berkeley became the College of Environmental Design with a curriculum focusing on architecture, city planning and landscape design. Other schools also demonstrated an interest in urban design. For example, JL Sert introduced discussions on urban design at Harvard and others became interested in the urban blight and the sociological discussion of cities. According to Jencks (Jencks, 2015), the school at UCLA (University of California, Los Angeles) employed a number of ecologists and renamed itself and The Bartlett in London adopted a similar approach.

Three books by Banham had a significant impact on architectural theory. *Theory and Design in the First Machine Age* (1970), *Los Angeles: The Architecture of Four Ecologies* (1971) and *Architecture of the Well-Tempered Environment* (1969) changed public perceptions of the relationship between culture, technology and design. Banham, who studied under Anthony Blunt at the Courtauld Institute, then Giedion and Nikolaus Pevsner, gave shape to the postwar understanding of modernism with his analysis of the ‘second age’ of the machine and mass consumption. In *Histories of the Immediate Present: Inventing Architectural Modernism*, Vidler describes how Banham’s experience of the US, and LA in particular, between 1965-1971 led to an expansion of his understanding of the term ‘the environment’ (Vidler, 2008).

Banham’s work, in particular *Architecture of Well-Tempered Environment* (1969), can be seen as the natural evolution of the work undertaken in Giedion’s *Mechanization Takes Command* (1948) discussed in the last chapter. In both texts, concerns about formal issues and aesthetics are put to one side in favour a focus on technologies such as electricity and their impact on design. In *Architecture of the Well-Tempered Environment* (1969), Banham argued that the separation of architecture from technology was a flawed modern idea dating from the 1750s. According to Banham, the power to heat and cool buildings should be a critical issue for the architect, but it had been largely overlooked (even by modernists) in favour of a concern about mass and structure. The preoccupation with mass meant that architects design thinking was trapped within design conventions that prevented an intelligent approach to power and energy. Banham’s thesis was that the reliance on power rather than concrete and selective structures began in the US with its lightweight timber structures and economic dynamism. In the US, engineering technology tended to generate innovative design solutions for factories,

transport buildings and greenhouses long before architects started to explore these ideas. For architecture to be ‘the most complete art of mankind’, architects must integrate technology back into design. For Banham, a controlled environment was the key to human progress; humans have long needed shelter to survive, but to flourish, man needed a controlled environment.

Los Angeles: The Architecture of Four Ecologies (1971) does not deal directly with the idea of ecology. Ecology is taken as given as a new ‘method’ or approach to understanding the city. Ecology was used to suggest not just buildings but the entire context, something that architectural theory was beginning to see as its subject matter. For the Modern Movement, context had related to the historical moment and the social demands of the time or the *zeitgeist*. The modern outlook was being superseded by a postmodern concern with place and geography. “Los Angeles prompted Banham to form an entirely new kind of architectural history, one that would take architecture as equal to, if not a secondary response to, the ecological conditions of urban settlement.” (Vidler, 2008)

Banham’s text can be seen as a critique of conventional architectural guidebooks and architectural history. He derides the ‘historical monograph’ and in the opening pages argues that it is “a poor historian that find any human artefact alien to his professional capacities” (Banham, 1971). The organisation of the book is such that illustrations and descriptions of specific buildings are included to illustrate a point rather than forming the bulk of the content, as you would find in more conventional guides.

Banham based much of the book on the work of the German geographer Anton Wagner, who after photographing the city in the early 1930s had produced *Los Angeles: The Development, Life and Form of the Southern Californian Metropolis* (Wagner, 1935). Wagner’s study was the outcome of an in-depth survey conducted on foot at the height of the Depression. He began with a study of the geological history of the region and was quick to identify the dynamic qualities of the city and observed the relationship between the land and the man-made structures developed to deal with natural elements and disasters in what became known as a ‘cultural landscape’.

Banham’s ‘four ecologies’ cover systems or eco-systems rather than styles or geographical areas. Alongside chapters on the fantastic architecture of Beverley Hills and Hollywood and the city’s everyday buildings (hotdog stands and drive-in stores), there are four chapters devoted to ecological elements of the city: Surfurbia (The Beach), wealthy suburbs with their narrow twisting roads and precipitous house plots (The Foothills), the endless city

blocks of the flat plain (The Plains of Id) and the freeway system – a new public arena (Autopia).

Banham draws a strong link between the topography of the place and the lifestyle and values of its residents. “The automobile as art-work is almost as specific to Los Angeles freeways as is the surf board to Los Angeles beaches”, he observes, alongside comments on the ‘urban lusts’ and ‘fundamental aspirations’ of the Angelenos. The specific housing typologies, such as the dingbats (two-storey walk-up apartment blocks made of wood and stucco) are observed like an animal species:

Within its vast extent can be seen its diverse ecologies of sea-coast, plain and hill; within that diversity can be seen mechanisms, natural and human, that have made those ecologies support a way of life – in the dry brown hills, the flood-control basins brimming with ugly yellow water, the geometries of orange groves and vineyards, the bustling topologies of the freeway intersections, a splatter of light reflected from a hundred domestic swimming pools, the power of zoning drawn as a three-dimensional graph by the double file of towers and slabs along Wilshire Boulevard, the interlaced rails and roads in the Cajon and Soledad passes, the Eastern and Western gates of the city. (Banham, 1971, p. 235)

What is unique about Banham's contribution to the development of the idea of ecology is the way in which patterns of human settlement, behaviour and aspirations are discussed alongside landform and bridge construction. The overlap between the discussions of natural, geological or biological processes and human patterns of interaction was clearly expressed in both ecology and architecture in many cases Banham suggests that one is an extension of the other. The conventional distinction between natural and man-made was eroded; a description of the city as seen from a low-flying plane demonstrates the flexibility and open-ended character of the ‘ecological’ approach, which reads the city with all its rich human activity as if it were a natural landscape.

The Los Angeles book was produced following a series of radio talks broadcast in the BBC in the summer of 1968. According to Vidler, the idea of ecology was “considered radical in art historical circles”. Vidler suggests that Banham's book raised the question of “What would be the nature of an architecture considered in relation to its ecology?” However, rather than marking the start of a new era of ecological thought, *Los Angeles: The Architecture of Four Ecologies* (1971) marks the end of the discussion about ecological architecture (Vidler, 2008). The discourse on patterns of human behavior and everyday life in architecture were explored through postmodern theory rather than ecology for the following two decades.

The reason for the demise of the Seventies discourse on ecology cannot be attached to a single issue, but the 1970 Aspen Conference was significant in identifying the limitations of

ecological thought at this time. Banham had been instrumental in establishing the agenda for the event which was titled *Environment by Design*. He provided the closing remarks at the end of the programme on the Friday afternoon and expressed a certain degree of frustration with the environmental movement as it stood in 1970.

We're getting arrogant, we're getting preachy, I hope one of the things we are going to learn at the school is how to be humble about the environment. We're already talking here as if we and nature are equals or we were Jehovah recreating the world again. We are very small environmental operators. We did not design the universe. The universe is not just our problem. We have not yet detonated an atomic device as powerful as the average piddling thunderstorm. We are very small operators in a scene where a lot of other species are environmental operators. You know our old friends the birds and the bees and the ants and the earthworms and the meteorological forces and all those. But we're really beginning to talk as if the environment was problems we alone could solve, and if everything that happened in the environment is our fault – which is very arrogant of us. (Banham Archives speech Aspen 1970).

What is significant about the 1970 Aspen conference is that, despite his concerns about environmentalism, Banham himself came under attack from Jean Baudrillard. In the open letter, Baudrillard lays out his critique of the conference and of environmental politics more broadly on behalf of the 'French group' Utopie, who had been invited to participate in the conference. It's a pretty robust polemic in which Banham is not spared. "Professor Banham has clearly shown the moral and technical limits and the illusion of Design and Environment practice", says Baudrillard. In the text, the 'Environment' is described as a myth and as having a mystique and environmentalists are criticised for their "boy-scout idealism" and "naïve euphoria in a hygienic nature". The statement describes designers, architects and sociologists "acting like medicine men" as if they have a cure for society's social ills as participating in a hoax.

The group's main complaints were that the social and political questions of the day had taken a back seat to environmental concerns and that this approach constituted a denial or silence over these issues. Moreover, the polemic argued that environmental concerns were a promotion of elite ideology that was attempting to use the environmental question as a way of neutralising and distracting its opponents at the same time as naturalising or normalising the current conditions. They argue that Design and Environment is not a new idea thrown up spontaneously by objective conditions, but an idea generated to coincide with an economic and political crisis. "It is not by accident that all Western governments have now... launched this new crusade, and try to mobilise people's conscience by shouting apocalypse." They argue that the environmental issue is the fallout of May 1968 in France and the Vietnam War in the USA,

an attempt to generate a sense of collective guilt. The ruling classes are proposing a 'holy union' to address the environmental crisis or 'permanent apocalypse' at the moment when their political power is called into question. Baudrillard's critique not only describes environmentalism as false apologetic ideology – he criticised the tendency to look at society from a biological, medicalised and therapeutic stand point.

“It is not true that society is ill, that nature is ill. The therapeutic mythology which tried to convince us that if things are going wrong it is due to microbes, to viruses or some biological dysfunctions, this therapeutic mythology hides the political fact, the historical fact that it is a question of social structures and social contradictions, and not a question of illness or deficient metabolism which could easily be cured.”
(Utopie Leaflet in Banham Archives Banham, 1970).

Utopie were not alone in this critique. Marcuse argued that student movement against the war Vietnam War had been the only movement that the American establishment had been unable to co-opt. Although he was concerned about the 'violation of the earth', he was also “uneasy about discussing the ecological movement, which has already by and large been co-opted” (Marcuse, 1972). The idea that the environmental movement had been co-opted was strong and appeared to be borne out by the evolution of a new discourse on sustainability in the following decades. The suggestion that Aspen was akin to the promotion of a Disneyland, a naturalistic utopia in which the contradictions of the capitalist system are overlooked, must have affected Banham (Crimson & Williams, 2018). Both Banham's own work and activity and the development of the ecology movement in this period capture the contradictions and tensions in the culture of 1960s in the USA and the UK. These tensions are also evident in the discourse on architectural theory.

7.6 Architectural Theory and Ecology

In the immediate postwar period, architects in the USA wanted to be involved in planning and, according to Ockman, teamwork became very fashionable. The period from the 1960s to the 1970s was one in which the profession shifted from an interest in systems thinking to environmental design. Ockman records how in the early 1960s the AIA (American Institute of Architects) president argued that the idea of architecture as an artistic project was outdated. The AIA promoted the idea of a design methodology in which design was based on rational criteria. Approaches adopted during the war were used to address complex logistical questions. Complex problems were to be addressed in a new way using systems analysis and operational

research; computation could be a mechanism to generate design solutions ((Ockman, 2012, p. 143).

Vidler describes a generation “in search of new principles for architecture itself” operating in the shadow of the modern masters while critical of modern planning (Vidler, 2011). Alongside the commitment to scientific approaches to construction and design, there was a growing aspiration to place architectural theory on a scientific footing. Summerson’s *The Case for a Theory of Architecture* was based on the assumption that it was possible to define a ‘philosophical conception of the nature of architecture’ (Summerson, 1957). He compared the development of a theory of architecture to the recent discovery of DNA and suggested that “the artist’s functions were at last to be explicable in mechanistic terms” (Summerson, 1957). In other words, the social question of human needs could be quantified scientifically and rationally in the *programme*; although the essential character of architecture had been expressed through the Classical, the rational and the organic, in the modern era, theory and the unifying drive behind design would be expressed through meeting public needs. “The source of unity in modern architecture is in the social sphere, in other words, the architects’ programme – the one new principle involved in modern architecture”, he wrote (1957).

In 1963, the AIA formed a three-man committee in an attempt to reorient the discipline so that it would be renamed ‘environmental design’ rather than ‘architecture’. Simultaneously, there was a growth in interest in human comfort within the man-made environment. The idea of analysing human needs came to the fore and the advent of central heating and air-conditioning systems provoked a sense that it might be possible to perfect the man-made environment.

Banham’s role in the discussion on architectural education provides a taste of the debates within the schools around 1970. He had been appointed as director of undergraduate studies at University College London (The Bartlett). He saw himself as a ‘Young Turk’ undermining the established conventions at a moment when the school of architecture and the school of planning were being combined and renamed the School of Environmental Studies by Lord Llewellyn Davies. In the US, the AIA, influenced by the experience of the war and the arrival of space travel, became enthralled with the idea of architecture as a branch of science and, as a result, the professional body instituted a number of changes to practice and education. By the mid-1960s, many schools of architecture had dropped their conventional disciplinary title in favour of the name ‘environmental studies’ (Ockman, 2012). Berkeley had been teaching an interdisciplinary approach to environmental disciplines since the 1950s when modernist William Wurster became the dean. In 1959, Berkeley’s Senate had agreed to a

reorganisation of the architecture school, the planning department, landscape and other relevant disciplines under the umbrella of 'environmental design'. According to Ockman, the decision proved controversial and within a decade Berkeley shifted its attention from environment to social and political issues, in particular low-cost housing, regeneration and community work and vernacular architecture (Ockman, 2012). Nevertheless, graduates of its Centre for Environmental Design included Hans Hollein, Edward Cullinan and faculty members included leading modernists, postmodernists and environmentalists, such as Christopher Alexander, Denise Scott Brown, Charles Eames, Erich Mendelsohn, Charles Moore and ecologist Sim Van Der Rym.

Banham referred to events in California as the 'Great Berkeley Disaster', but not because he felt the idea was flawed. He blamed the conservatism of elements of the faculty and seemed confident that UCL would not make the same mistakes. Unfortunately, he didn't pursue the UCL project because he moved to the USA. The proposed Bartlett course was not attached to any single professional qualification; it provided a foundation course for those wanting to go on to take a master's degree in a professional environmental discipline. He argued for a flexible curriculum in which students organised their own learning and staff delivered courses relating to the man-made environment when they thought appropriate. Staff, in order to avoid a situation in which the environment was defined as 'everything', would exclude certain issues at either end of the spectrum - political science at one end and microbiology at the other. Most critically, Banham imagined that the course might recruit community activists (from the ghettos) who wanted to develop their understanding of the political and institutional systems behind local social injustice and environmental damage.

7.7 The social and the formal

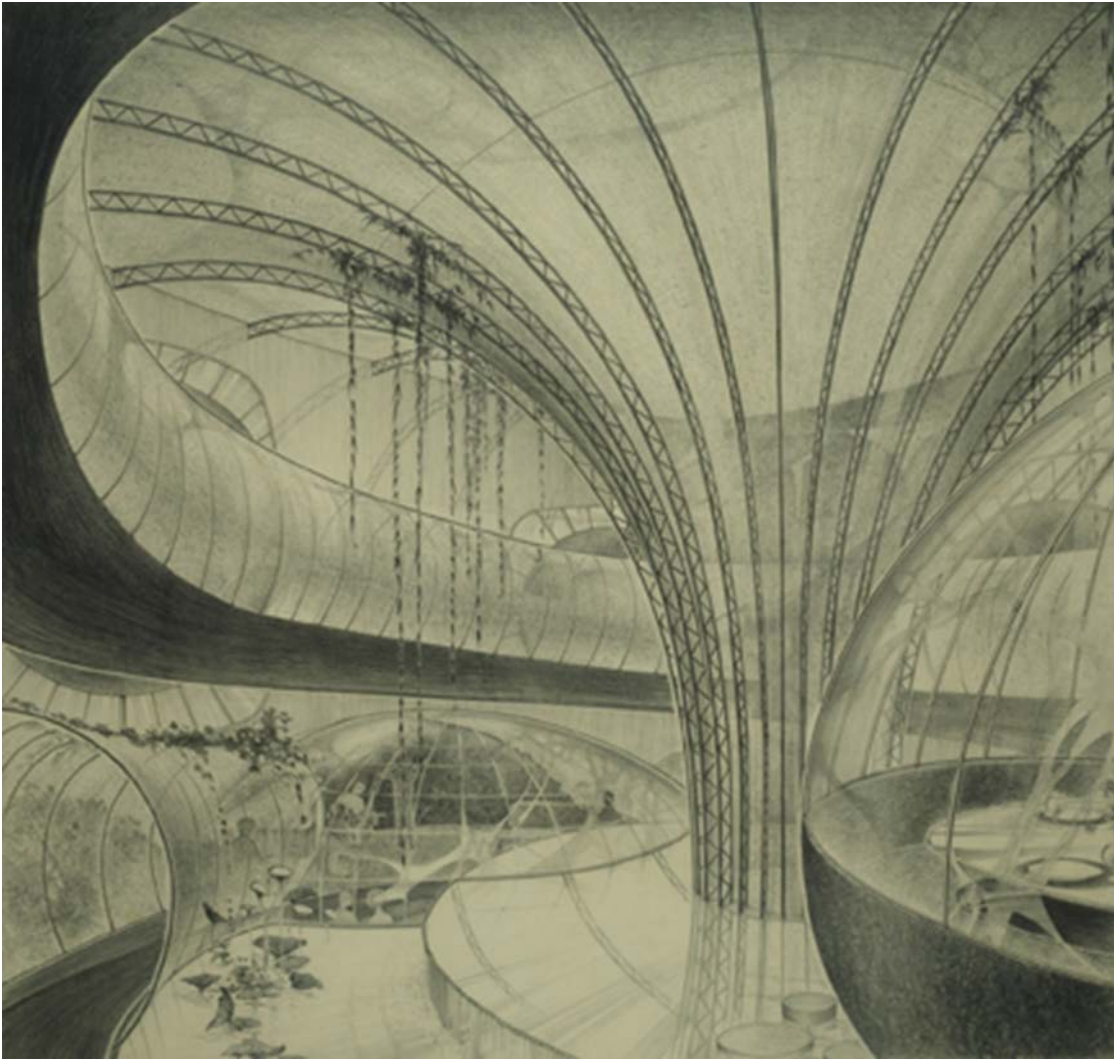


Figure 30 Garvey Round House, Urbana Illinois, Bruce Goff 1950.

The immediate postwar period is often characterised as one in which there was a battle between functionalism and formalism. The question of function appeared to address the social questions of the time, albeit in a technical fashion, while the question of form created a link to the basic principles of the discipline that had been abandoned by the Modern Movement. To Sibyl Moholy-Nagy, writing in the late 1950s: “The issue of form versus function has become virulent today: a pitched battle is being fought between the functionalists and the formalists.” Vidler argues that in the 1950s the idea (of programme) was extended by theorists like John Summerson to assume a central place as “a single ‘source of unity’ for modern architecture” (Vidler, 2007). When Jencks arrived in the UK in the mid-1960s, he was also witness to a fiercely divided profession. In *Modern Movements in Architecture*, (1973) he also uses the term

battlefield to describe the postwar scene: “It is full of old battle lines marked ‘New Empiricism/New Brutalism, one-off /repeatable, Art/Social Service, Indeterminate/symbolic and, in the late 60s, Pop/Non Pop’. Each label (or insult according to the enemy) marks the place and time where the battle was fought or where a flag was stuck marking new territory. The architect proceeds as in any battle, as a provocateur.” (Jencks, 1973)

By the end of the 1960s, this enthusiasm for science was starting to fade. On the one hand, the political culture on both sides of the Atlantic - in Europe the rise of the radical left and in the USA the development of the counter culture - forced social questions of freedom, equality and wages to the top of the agenda. “If the 1950s was characterised by a dialectic between the two cultures of art and science, the 1960s brought forward different, non-dialectical dichotomies: between two nations, one of affluence and one of poverty; between two societies, the black, the white, separate but unequal.” (Ockman, 2012, p. 153) And at the same time that questions of function, human need and participation were discussed, there was a questioning of the idea that scientific logic could be applied to architecture.

Those that were keen to explore the formal possibilities suggested by a naturalistic approach to design were marginal to the main stream debate. Individuals such as Bruce Goff who was both architect and environmentalist have until recently been largely over looked. His Bayinger House (1950) featured an indoor water garden. In other private houses he explored new organic and curved forms which suggested a radical change in lifestyle. In 2018 the New York Times ran a review of his work;

Goff, with his aesthetic idiosyncrasies and affinity for middle-class Midwestern clients (schoolteachers, farmers, salesmen, small-town newspaper publishers), still has lessons to teach us, 36 years after his death. His daring, elaborately imagined homes — he loved unusual shapes and made ample use of found materials — are often dismissed by cultural mandarins as overly futuristic and corny, but they possess a warmth, an earthiness and a wild ingenuity that serve as an antidote to the soberly luxurious, the pared down and the austere. (New York Times , 2018).

7.8 From ecology to sustainability

“The 1980s were not kind to environmentalism” writes Jamison. “Rather than moving forward and gaining new members and enthusiasts, the environmental movement tended to decompose and slit apart, for reasons that were not so much internal as external.” (Jamison, 2001) He identifies the development of neo-liberal policies from Thatcher and Reagan as the starting point of a corporate and governmental response to environmental issues.

The age of sustainability from 1974-1994 is one in which environmentalism is politicised and integrated into mainstream national and international politics. The main

developments in this period came through policy makers and regulators rather than designers. The word ecology is rarely used in this discussion. It remains associated with off-grid, low-tech development and self-sufficiency. In 1990, the first IPCC report was published, and climate change moved to the centre of the discourse on the environment.

The international community met at Rio in 1992 to discuss environmental policy and the event was well attended by NGOs. There were no legally binding targets to come out of the event, but Agenda 21 was introduced. This policy framework had an impact on local government in the UK and in turn did influence planning policy and eventually building regulations. At the Kyoto Conference, the policies drawn up in Rio were made into a protocol that committed nations to reduce greenhouse-gas emissions and saw the development of a carbon trading system. At Kyoto, the US vice president, Al Gore, argued that modern civilisation was, thanks to the scientific and industrial revolutions, undergoing a spiritual crisis (Darwall, 2013). By the time of the Copenhagen Conference in 2009, international initiatives to address climate change had reached something of an impasse. It was clear that the traditional tensions between economics and environment would re-emerge in the face of the economic crisis of 2008.

The 1986 Chernobyl disaster shifted environmental attention to the risks associated with pollution and, after 1988, a wave of concern about global warming had a political impact. Gore's *The Earth in Balance: Ecology and the Human Spirit* (1992) was written while he had taken time out from a presidential race. Gore's book blamed the West for ecological crisis and drew on the work of Thoreau and Muir as well as the later economic theory of EF Schumacher. Bush rejected CO₂ emission regulation at the G7 summit, but not from an ideological position. In 1989, Margaret Thatcher announced that environmental policies were no longer about national clean-ups, that they must be global (Darwall, 2013).

The transformation of ecological consciousness of the 1960s from a movement of hippies to a concern of mainstream politics can be understood in a variety of ways. Bookchin argues that the popular vigour of the early movement was sapped away by religious and quasi-religious cults and “an encounter-group mentality of the ‘personal as political’”. His concern early on in the development of the movement was that the USA would overlook the plight of the poor and politically marginalised.

Darwall defies some of the conventional narratives when he asks his readers to look critically at the impact of the oil crisis in the early 1970s. We often understand the oil crisis as stimulating an environmental consciousness, but Darwall questions this thesis, arguing that the recession and the oil crisis put environmental concerns on hold for several years rather than

stimulating them. According to Darwall, following the oil crisis, Nixon argued that the US needed to be independent as far as energy production was concerned – which meant increased oil production. It was a few years later that Carter talked about an ‘energy crisis’ and at the same time linked it to an apparent ‘spiritual crisis’. (Darwall, 2006). MacNaughten and Urry argue that after the 1992 Rio Summit ecology moved to the top of the global political agenda, but in the process “environmentalism appeared to have lost its critical voice” (MacNaughten, 1998). As such, sustainability became a policy concern rather than a radical concern, which meant it impacted on architectural practice but had very little impact on the architectural imagination and the writing of architectural theory. It was not until the end of the 1990s, when the discourse on ecology started to be associated with a radical critique of the status quo, that it became part of architectural theory.

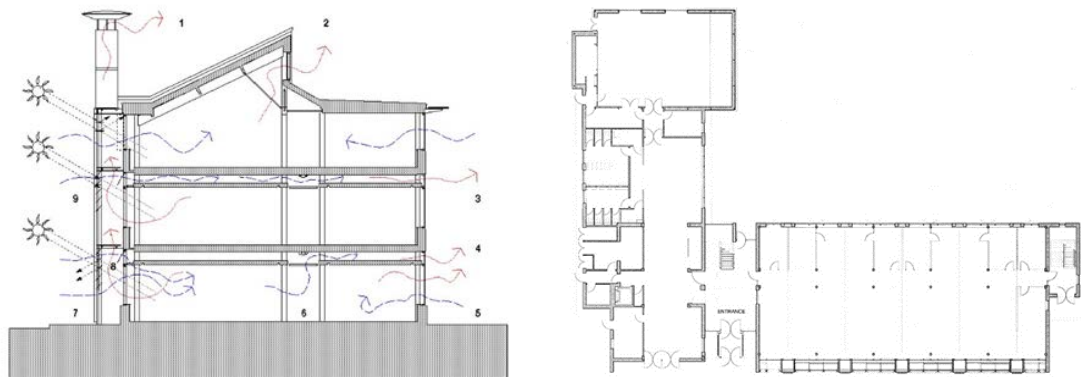


Figure 31 1996 Fielden Clegg Bradley, BRE Garston <https://fcbstudios.com/work/view/new-environmental-office-bre>



Figure 32 1996 Fielden Clegg Bradley, BRE Garston <https://fcbstudios.com/work/view/new-environmental-office-bre>

8.0 Ecology's Third Wave

8.1. The return of ecology

The fact that Stirling Prize for 2018 was won by Foster and Partners' Bloomberg HQ in the City of London, ostensibly for its 98.5 per cent BREEAM rating, is evidence of the imaginative power of the environmental imperative. Bloomberg has been subject to some muted criticism for its strapline 'the greenest office building in the world' (Alter, October 2017) given the high level of embodied energy in the bronze imported from Japan and the granite imported from India, but the building has been widely welcomed on the grounds that the corporate world is finally recognising its responsibilities to the eco-system.

What is clear about this discussion of prizes is that we can no longer describe the question of the environment as a secondary debate. Architectural judgment has adopted BREEAM as a legitimate measure of quality. The success of the Bloomberg project is evidence of the fact that environmentalism has emerged to form a significant part of the mainstream discourse on architectural values. For many, the fact that awards such as the Stirling are going to a green building is seen as a political achievement, but those that had aspired to combine environmental concerns with a critique of social injustice or even capitalist social relations now need to look elsewhere for ideas and a vocabulary that has not, in the words of Baudrillard, been 'co-opted' by the establishment. Whether you are an eco-tech enthusiast in support of Foster's work or you are eco-critical, it is undoubtedly the case that ecology plays an important part in public life.

"The new narrative of world history must have ecological processes as its major theme. It must keep human events within the context where they really happen, and that is the ecosphere." (Hughes, 2006, p. 92). Four important changes have taken place since the Age of Ecology. Firstly, there is broader cultural adjustment in society to be sensitive to the destructive side of human activity. Secondly, as a consequence we have readjusted our understanding of the relationship between men and between man and other living creatures. This new outlook is described as 'post-humanism' – it's an extension of the postmodern thesis that changes the way we see the natural world and frames a new discussion about our subjectivity. Thirdly, digital technology has had a major impact on the way we practice architecture and the way we build, as well as on all other aspects of our lives. Digital technology has changed our relationship to information and consequently our approach to knowledge and intelligence. In this context, an ecological imagination, that sees man and nature as one process rather than separate realms, appears to be enabling us to rethink our relationship to this technology not as an alienating force, but as part of our natural being. And finally the aspiration to bring man, technology and nature together, expressed by the vitalists at the end of the nineteenth century, is currently being fulfilled in the concept

of neo-nature or second nature and the cultural shift to blur the boundaries between the man-made and the given.

8.2 Anthropocene

This reframing of human history means we no longer describe our society as industrial or post-industrial society, but as the 'Anthropocene'. This paradigm shift, which takes place at a material and philosophical level, is described using a term that is borrowed from geology's timescale. Rather than working with historical conventions, the Anthropocene begins at the moment when man's impact on the earth was so significant that it altered the eco-system. The starting point of the period is often associated with the start of the industrial revolution, although others identify 1945 and the atomic tests as the origin (Morton, 2013) with the end point as the present. Central to the idea is the sense that we are living through a new paradigm or a new period in history in which our ambition should not be 'mastery' of nature but 'co-existence' (Latour, 2008). Rawes refers to a 'post-human turn' that "topples the anthropocene human from the sovereign position". Her definition of post-humanism is one in which all things (humans, animals, plants and objects) and the connections between them, must be considered. This approach to connectedness changes our understanding of human agency. It is beyond the remit of this research to explore this theme in any detail, but it is legitimate to argue that the idea of improving our connection to the world does, at some level, suggest a restraint on our ability to act according to will or passions. As such, it suggests a new kind of agency or subjectivity based on the condition of constraints, not specific constraints, but a complex web of constraints that could foster or legitimise a sense of inertia (Heartfield, 2002).

Harry Guger and Barbara Macaes Costa argued that the world of architecture was grieving over the loss of an 'anthropocentric world view' and declared that we were living in "an uncanny era in which human history has collided with geological time, giving rise to strange phenomena that are impossible to categorise in terms of opposition of human versus natural (global warming, mass extinction, pollution)" (Gugger & Macaes Costa, 2014).

The term post-human is closely linked to today's ecological thought and the Anthropocene. Post-humanist theory emerged from the attempt to make sense of a world in which robotics, communications, prosthetics, artificial intelligence, nanotechnology and genetic engineering suggest a qualitative shift in the relationship between humans and technology. It appears in a range of disciplines from geography to philosophy and is given popular expression in Francis Fukuyama's book *Our Posthuman Future* (Fukuyama, 2002).

8.2.2. Post-humanism

The idea that we are 'post-human' comes originally from science fiction, but has been adopted to denote a critique of conventional humanists' conception of mankind. The post-human subject is not an

individual, but an emergent embodiment of different identities that relate to the world from multiple positions. The traditional separation of mind and body is, argue post-humanists, being eroded and replaced by an understanding of our bodies and the world as one continuous entity. According to Pepperell, this understanding runs counter to conventional humanist understanding of human existence and as such calls into question both our approach to knowledge and our sense of subjectivity (Pepperell, 2003). “Humans have imagined for a long time that the ability to develop and control technology was one of the defining characteristics of our condition, something that assured us of our superiority over other animals and our unique status in the world”, he writes.

Our sense of ‘superiority and uniqueness’ is being called into question by the machines, argues Pepperell. His work is reminiscent of the discussion that emerged in the postwar period in Giedion’s *Mechanisation Takes Command* (1947). Giedion’s work marked the beginning of a critical analysis of the human condition and humanist values; today, we are witnessing the conclusion of that intellectual journey and a more modest appreciation of our place in the world and our relationship to other living things.

In philosophy and cultural theory, post-modernists’ attempts to criticise and deconstruct Enlightenment concepts have been followed up by post-humanists who declare that humanism is entirely redundant. Pepperell argues: “New theories about nature and the operation of the universe arising from computer modelling are starting to demonstrate the profound interconnections between all things in nature where previously we had seen separations.” (Pepperell, 2003). This process of questioning is evident in many strands of postmodern and critical thinking and so the post-humanist draws on the work of postwar thinkers such as Bateson, Norbert Wiener and, a bit later, feminists such as Donna Haraway as much as more contemporary philosophers such as Latour and Peter Sloterdijk.

It’s easy to think of post-humanism as just another ‘post’, as a superficial shift or a minor literary amendment. Architectural theory has not really taken account of the consequences of this change or to acknowledge the significance of this shift, but Scott Cohen tries to draw our attention to the enormity of the change. “That Nature has returned with a vengeance in architectural theory and practice goes far beyond the transmutation of the Vitruvian qualities”, he says, but very few have been prepared to explore what it might mean to transmute Vitruvian values (Cohen, 2014).

The post-human concept covers a wide range of strands of thinking, but at its core is a change in our attitude to the environment and subjectivity or agency. Buchanan has described this shift as being a move from the ‘ego-centric’ to the ‘eco-centric’. This post-human outlook has been developed in direct opposition to ‘humanism’, which is crudely understood as the development of human interests in opposition to natural forces. In its place is posited a philosophical and therapeutic outlook in which we understand our relationship to the world, or all other matter be it living or inanimate, as one of coexistence and mutual benefit of all. Similarly, Mostafavi (2010) cites Bateson's argument that contrary to the ideas of Darwinism and natural selection, the unit of survival is ‘organism plus the environment’. In summary, Zizek summarises this thinking in less enthusiastic tones: “The lesson this ecology is

constantly hammering is our finitude: we are not Cartesian subjects extracted from reality, we are finite beings embedded in a bio-sphere which vastly transgresses our horizon.”

Bateson wrote that “humans do not live and act against a natural background. Rather they are part of it” (Bateson, 1972) (Rawes, 2013, p. 283). Bateson developed the idea of ‘feedback loops’, the understanding that all actions in the natural world have consequences. This attitude aligns with ideas developed in science and social theory in the last decade of the twentieth century, such as chaos theory, as explored by Jencks (1999) and in theories of risk first set out by Ulrich Beck in *Risk Society* (Beck, 1992).

This outlook has implications for our attitude to the world in which we live, for social relations and for our understanding. Donna Haraway (Haraway, 2016) offers one of the earliest articulations of this idea. While challenging conventional ideas of subjectivity, Haraway rejects the boundaries that separate human, animal and machine. Katherine Hayles's work sits alongside Haraway's in promoting the idea that liberal humanism, which separates mind and body, is untenable with the development of information technology (Hayles, 1999).

The preoccupation with the human subject and individual will or agency that sits at the core humanist values has been replaced by an interest in non-human agents such as plants and animals or even non-living things such as computers. Along with this tendency is the move to place weight on social practice rather than individual subjects, an approach which comes from critical theory and might be broadly described today as ‘relational’ thought.

In summary, the post-human ideas associated with the Anthropocene are as follows. Humanism was the outcome of the Anthropocene, so post-humanism is the outcome of the critique of the Anthropocene. Human destruction of nature is illegitimate, human knowledge is compromised by the belief that we can control nature and human rights need to be understood in the context of the rights of other living things. Human intelligence has been held back by its commitment to rationalism and human understanding of social life has been restrained by a failure to appreciate the artificial nature of the construction of the human discourse.

8.3 Digital sympathies



Figure 33 2018 ZHA Morpheus, Macau

One of the most significant material changes that has taken place in architecture since the 1990s has been the development of digital technology. Digital technology has changed practice, construction, project management and education, and it has had an impact on theory. One of the defining features of the Anthropocene, as described by ecologists, is that it is complex, and it is increasingly the case that we view digital technology as the solution to complex questions. “Digital design theory has been marked from the beginning by the so-called Post Modern science of indeterminacy and related themes of complexity, chaos and non-linearity.” (Carpo, 2013, p. 59)

Exponents of the new digital technology often make a connection between the digital and the organic or natural. Digital forms are often understood as self-generating and as such is close to the activity of the natural world and life. Some argue that the digital approach to design embodies a spontaneous and vital creativity that connects all living beings. There is a sense that the swarm or the cloud produced by computer technology is closer to the natural forms produced and reproduced by nature than anything self-consciously and directly produced by man. The tendency to blur the distinction between the natural and the artificial is particularly strong when it comes to discourses on the digital.

“The Deleuzian cast is reinforced with reference to catastrophe theory- the geometry-event-space-transformation - and to the new biology”, notes Kipnis (Kipnis, 2013). Back in 1993, Deleuze published *The Fold: Leibnitz and the Baroque* (Deleuze, 1993). In it, he addresses the question of smooth and striated space. In the mid-1990s, the idea of smooth space was adopted in a fairly literal way by architects interested in exploring the possibilities provided by new computer technology. In this new emerging digital world, it seemed that building traditions and conventions that had developed in response to the particular qualities of traditional materials might be made redundant by new materials and new approaches to structure. New building forms, generated using new computer modelling technology and new digital materials produced through new bespoke manufacturing processes, while still in development, suggested a new approach to design and construction.

Deleuze’s smooth space was fluid, open, complex and varied rather than rigidly partitioned and it seems to suggest the possibility of a new architecture, or at least a new architectural language. The material used to produce these new buildings would, like the forms, be fluid and continuous. As such, in this new discourse there was very little distinction to be made between structure and skin or form and material – like a 3-D render – the material that made the form and that created enclosure were the same.

Three-dimensional printing, which relied on resin, became a model for what might be possible at a larger scale. In 1993, AD produced a special issue called *Folding in Architecture*, which included the work of architects such as Greg Lynn that embraced the possibility of new organic forms; Lynn called them ‘blobs’. In the essay collection, *Vital Beauty*, Tim Ingold, an anthropologist, uses Deleuze and Guattari’s idea of a ‘topology of the smooth’ to describe a complex and naturalistic approach to space. Describing their approach to space Ingold writes:

It is a topology, they argue, that relies not on points that might be connected geometrically, nor on objects that might be outlined organically, but on tactile and sonorous qualities of a world or wind and weather, where there is no horizon separating earth and sky, no immediate distance, no perspective or contour. (Ingold, 2012, p. 17)

This approach to understanding space simultaneously links new spaces to the idea of air, atmosphere and climate and, as such, space becomes a transient environmental question.

Within architecture, there are those that believe that digital technology will allow us to produce buildings that relate more directly to human behaviour and shifting functions and there are those that prefer to work with crafted materials, tectonic strategies and architectural conventions as a way of helping users feel rooted in a specific place and comfortable in site-specific buildings. The ideas of autopoiesis (Schumacher, 2009), design intelligence (Speaks

2011) or emergence (Gibson) are all arguments that support the idea that new technology is generating new solutions.

According to Schumacher, the new paradigm operates in the same way as natural systems, we can identify the complex patterns of behaviour and make sense of them, but they operate beyond human control. “Initially, the demand for environmental sustainability is just one more constraint that burdens architecture’s ability to deliver its societal task: the framing of social interaction/communication”, says Schumacher. However, ‘parametricism’ deals with the constraints and turns them into an architectural opportunity. By using environmental parameters, buildings enveloped become differentiated on the basis of sun exposure, wind and rain, etc. Environmentally adaptive differentiation can help the user understand and navigate their way around the building. (Polleto & Pasquero, 2012).

Those, like Schumacher, who argue for a new architectural language are sometimes referred to as the avant-garde, but their interest in formal experimentation does not necessarily equate with political radicalism. Tafuri’s argument that modern architecture appropriates the form of revolution without its social programme can also be applied to the contemporary discussion of the digital (Tafuri, 1979).

Spencer (2016) suggests that this new enthusiasm for complex and fluid forms corresponds with a shift in the political consensus to a free-market, liberal position. He sees the appropriation of the ideas of Deleuze and Guattari and a post-critical and projective approach to architecture as a reflection of a political outlook. The folds and blobs are a means of rehabilitating formal concerns at the expense of the social concerns of the discipline. For Spencer, notions of spatial liberty and formal fluidity have a relationship with liberal and free-market thinking; in this camp, he places Zaha Hadid, the former partners of Foreign Office architects Alejandro Zaera-Polo and Farshid Moussavi, Rem Koolhaas and OMA, Reiser and Umemoto and Lars Spuybroek.

8.4 Things theory

When *San Rocco* published an issue on ecology in winter 2014 the writings of Morton, a leading exponent of Object Orientated Ontology (Morton, 2013) and philosopher Graham Harman featured heavily in the editors’ attempt to situate today’s ecology. Deleuze argues that there is a new understanding of 'matter' and materialism, in which matter is continuous and fluid and the conventional architectural couplet of solid and voids is replaced by 'matter', which fulfils both functions and creates fluid or smooth space that is non-hierarchical.

New materialism is a broad concept used to describe approaches that operate under a variety of titles, which include: Object Orientated Ontology (OOO), Thing Theory, Actor-Network Theory and Vibrant or Speculative Materialism. The Winter 2016 issue of *October*, the US art-theory magazine, included the results of a questionnaire sent out to artists and art theorists on the issue of the 'new materialism'. Among its contributors was the architectural critic Hal Foster. The authors characterise the new materialism as a challenge to post-structuralism and its overwhelming reliance on theories of subjectivity (Joselit, et al., 2016, p. 4). The new materialists, we are told, attempt to see the reality of objects beyond human meanings and uses. They assume that humans and objects form networks or assemblages, and that they operate in relation to one another and that both consciousness and human agency operate across these networks. The new materialism expresses a shift from epistemology to ontology. In other words, from the study of the scope and nature of knowledge to the question of being.

Materialism is often described as a 'flat ontology', by which is meant that this way of thinking about being and existence tends to ignore the abstract and the conceptual in favour of the concrete world of things. Finally, the new materialists usually embrace the concept of the Anthropocene, the moment in geological time at which man's impact on the earth becomes irrevocably destructivity (Joselit, et al., 2016, p. 4). OOO rejects the idea that we should give greater importance to human existence over non-human objects. The school rejects Kant's view that objects become part of human cognition when they conform to the understanding of the human subject. It maintains that objects exist independently of human perception and that they have relations with other objects that extend beyond human understanding. Kant's approach is rejected as reductive, because it looks only at the relationship between thought and being and consequently ignores all other relations. The OOO approach rejects the idea of causation and determinism, arguing that we devalue objects when we say they reflect a deeper underlying substance or force. At the same time, it is deemed wrong to idealistically suggest that there is nothing outside of the language or discourse. So objects are independent from other objects and they are independent of the meaning attached to them at any specific time. Harman is interested in studying objects and their relationships, but he is not interested in how they correlate (Morton, 2013).

Morton argues that there are things and processes in the world that we have difficulty grasping or understanding – such as climate change – but which, as 'hyperobjects', exercise an incredibly powerful influence over our lives. In a similar vein, Castrec and Willems-Braun tell us that ecology is “a new way to handle all the objects of human and non-human collective

life” (Gugger & Macaes Costa , 2014). His interest is in the crossover between this school of philosophy and ecology (Morton, 2013).

Morton defines ecological thought as the ‘the thinking of interconnectedness’; the recognition of a mesh or open system that links all living and non-living things. Morton argues that OOO is the natural successor to postmodernism. Whereas postmodernists argued that there can be no meta-narratives, no universally accepted truths about the nature of the material world, OOO exponents say postmoderns did not go far enough in their rejection of ideology, they simply replaced one universal ideology with another, relativistic one.

Morton is not the first thinker to look at ecology, design and philosophy together, but he is significant in that he has developed a new area of scholarship around the subject. Morton is critical of the idea that nature is a ‘surrounding medium’, which is understood as distinct from the social world. “Putting something called Nature on a pedestal and admiring it from afar does for the environment what patriarchy does for the figure of Woman. It is a paradoxical act of sadistic admiration”, he writes (Morton, 2007, pp. 4-5). Morton's idea is used to support the idea that we should disentangle 'matter' from the notion of nature, which is not a fixed or permanent entity, but an ongoing contingent condition.

Here is the interesting paradox of the new materialism: it could be assumed that the focus on matter and objects leads to a greater sense of certainty and stability, and yet the opposite is the case. Although the new materialism appears to be about ‘matter’, in this evolving understanding ‘matter’ is a fluid rather than a fixed entity. Robert Alexander Gorny argues: “Ecosystem thinking theorises transient dynamics of material assemblages.” For Gorny, ecology is not connected to the idea of ‘natural balance’; this concept, he suggests, expressed in the idea of sustainability, is ‘an idiot's rhetoric’. Instead, it’s about disturbances and dynamic adjustment giving rise to a non-equilibrium. (San Rocco p. 56)

Modern and postmodern	The Anthropocene
OUT	IN
Emancipation	Precaution
Detachment	Attachment
Modernisation	Dependence
Progress	Entanglement
Mastery	Care

Figure 34 Table recording the shift in values associated with the Anthropocene since 2000, as discussed by Latour, Rawes and others, in a format reminiscent of Jencks's postmodern analysis produced by the author.

8.5 Architectural ideas and ecology

In the past two decades, the nature of ecology has changed because the context has changed. Of course, there are many changes, not least the slowdown in the world economy and the shift in the centre of the global economy to Asia, but the two factors above have had the most significant impact on ecological thought. This discussion takes place within a culture in which we are building and expanding, but many of our cultural values are predicated on unease about development, particularly the case in the West. There is a recognition on the part of environmentalists and developers alike that to protect the environment is to curb development, and to develop is typically, if perhaps not inevitably, to degrade the environment. Human beings seem to want both goods, while recognising their prevailing incompatibility. This section identifies thinkers who have emerged as key reference points in the emerging intellectual landscape. The chapter will look at some of the new themes emerging from the discourse and then look in more detail at those thinkers that are playing the most significant role in the shaping of ecological thought. The starting point for the review is the work of Deleuze and Guattari, followed by Spuybroek, Morton, Dallmayr, Rawes, Braidotti and Latour. In order to make sense of the current intellectual landscape, I have produced a number of tables that identify key themes in architectural thought in the decade up to the millennium and since the millennium.

8.6 Waste, scarcity and creativity

As discussed in earlier chapters concerns about resource depletion have been an important strand of ecological thought from its early development. Anti-consumerism was an important element in the ecological discourse in the Sixties and it remains an important issue today, particularly among the eco-critical. For Frampton, this discussion must be understood as an expression of the dominant values of society that are promoting both consumption and waste. What architecture provides in this context is a means to transgress the values of consumerism.

The consumerism is ultimately the engine, so to speak, that drives everything, but this consumerism is extremely negative. It is a waste machine basically and it has no other aim than economic expediency - it has no project. And particularly when you set that against the phenomena of climate change and this destruction of resources. I mean there is a very beautiful aphorism that I've always liked from Tomás Maldonado, which is that while you cannot make anything without waste, this is distinguishable from an 'ideology of waste... I think that the degree to which the consumer society is

absolutely transfixed by ‘an ideology of waste’ is a political, economic, historical condition. Coming out of that would mean to search for values other than consumerism. And at that point, the environment re-enters and so ... the question of architecture ... this question of architecture as a thing in itself. (Frampton, 2012)

Historically, the idea of scarcity was attached first to Malthusians’ ideas and population control, then in the 1970s to economics, when it was associated with oil dependency and discussions about the underdevelopment of large areas of the eastern half of the globe. In recent years, the issue of scarcity has been taken up by the left as a critique of the capitalist system. However, there is also a sense that the discourse on scarcity in the contemporary discourse is anti-growth and is focused on redistribution and recycling rather than more conventional left critiques of the failure of the capitalist economy to provide for human needs.

The discussion about scarcity is closely connected to the discourse about waste. As head of Westminster University School of Architecture, Jeremy Till led a trans-European research project called Scarcity and Creativity in the Built Environment (SCIBE www.SCIBE.org). Funded by Humanities in the European Research Area (HERA), the main findings of the study were published by *Architectural Design* (Goodburn, 2012). In the AD, Till argues that there may be a shortage of construction materials, but an abundance of recyclable ones, so the sense of scarcity is not given but constructed through policy and regulation to enhance the operation of the free market. Construction is both a social and physical process and the architect must understand they are not just dealing with stuff but “engaging with processes, flows and the politics of how stuff is produced”, writes Till (2013). Till argues that these constructed scarcities allow for the optimum expenditure of creative energy.

According to Till, the idea of scarcity is a social construct, which is used to hide or naturalise the social limits to problems. Till and Goodburn chose to make a distinction between real scarcity – such as poverty or lack of infrastructure - and the ‘ideology of poverty’, which they argue is promoted by those who benefit from the free-market economy who like to think of the world in terms of shortages (or demands) that generate demand which is then met by the extraction of value from the earth.

Drawing on the work of the American Marxist David Harvey and the Manchester-based British geographer Swyngedouw, Till and his colleagues have developed an understanding of the idea of scarcity that enables them to propose a left-leaning approach to ecological design issues, which they describe as ‘Marxian ecology’ (Goodburn). From Latour, they take the idea that the construction of the idea of ‘natural limits’ needs to be challenged, not by arguing for more resources, but by abandoning the boundaries between what we understand to be natural and human. As Goodburn writes in one of the founding texts of the

SCIBE project: “It is quite simply impossible to maintain any clear distinction between the natural and the cultural. There is no definitive boundary there, but instead a sense of metabolic relationships.”

The discourse on scarcity sits on the eco-critical side of today’s ecology. It is grounded in the critique of what many describe as the ‘technocratic approach’, problem-solving approach to ecological concerns. Susanne Hagan describes the output of architects such as Foster and Partners and Richard Rogers as ‘Trojan Horse of environmentalism’ (Hagan, 2015). It represents an attempt to limit man’s destructive impact on the planet through the use of technology, but steps away from more fundamental issues of human activity and social relations. For Hagan, the eco-tech environmentalism exemplified by Rogers, Piano and Yeang produces iconic green buildings and introduces cost-conscious clients to the environmental imperative without making the process a particularly conscious one (Hagan, 2015). Investment in new environmentally friendly technology is justified through life-cycle calculations and represents no challenge to the ethos of the market. For Hagan, this attempt to justify environmental concerns according to the logic of market efficiency makes a limited or even negative contribution to the process of changing the relationship between architecture and nature.

However, on the low end of the eco-tech approach sits the cradle-to-cradle thesis, which was developed by William McDonough, based on the understanding that nature could be the model for industry because ‘nature does not discard waste, but finds a reusable yield’. This thesis takes the natural entropy of living things as a model and argues that the role of the designers is to ensure that the building or product is produced with the process of it being deconstructed and reused in mind (McDonough, 2002). The ideas of McDonough strongly informed the themes adopted for the 2000 Expo in Hanover and the basic concepts have become known as the Hanover principles.

“Ultimately, we believe the principled practice of design will lead to ever more places and ever more products that honour not just human ingenuity but harmony with the exquisite intelligence of nature.” (McDonough, 2002, p. 225). However, this thinking, which is grounded in the tradition of energy economics, has evolved to adopt the logic of present-day science. McDonough’s Chicago Principles of 2003 emphasise the idea of material flows, regenerative cycles and technical metabolisms.

Ingersoll outlines an approach to design which imitates the behaviour of the natural world in terms of energy production and what might mystically be described as the ‘cycle of life’ (Ingersoll, 2012). Sim Van der Ryn who was discussed in the earlier chapter on the Age

of Ecology, is held up by Ingersoll as an example of contemporary ecological design. Van der Ryn's approach is aligned with the idea of Natural Capitalism, an ecological plan for industry put forth by Amory Lovins. In the 1980s, Lovins created the Rocky Mountain Institute, a leading ecological research centre. He proposed an ecological approach that could work with the existing economic system. Natural Capitalism was “a means of reforming the consumer society toward less wasteful, more ecological lifestyles by: 1) recognising the benefits of the conservation of matter and energy and demanding ‘resource productivity’, 2) treating industries as if they were natural organisms (or bio-mimicry), 3) converting consumer goods into services rather than private property, 4) investing in renewable sources of energy.” (Crysler, et al., 2012).

8.7 Architectural Deleuzianism

Deleuze is an ethically motivated naturalist who attaches himself to naturalism because he sees it as a project of demystification and human emancipation. The task is to liberate human beings from the realm of myth: the myth of religion, the myth of a false physics, and the myths of a false philosophy. (Ansell-Pearson, 2017)

One of the dominant strands in architecture thought over the past decade has been the enthusiasm for aspects of the work of Deleuze and Guattari. Their writing has become an essential reference point for architectural academics; it has helped to popularise the idea of the Anthropocene and the ecological imperative. They have formalised the interest in ‘new nature’ or the blurring of the distinction between the man-made and the natural world. They welcome the merging of the artificial and the natural world and look at technology as a means to solve ecological problems. For them, the nature-culture couplet is replaced by a continuum in which it is no longer necessary to make a distinction between natural and manmade things or even animate and inanimate beings. These ideas were explored in the Age of Ecology by individuals like McHale, but have really come to life in the light of nano-technology and the development of digital capabilities. They have also reframed our understanding of human subjectivity. According to Spencer, Deleuzian thinkers have embraced the very negative idea of a ‘post-Enlightenment being - environmentally adaptive and driven by affect rather than rationality’ (Spencer, 2016).

This new subject is flexible and amenable to being nudged or directed and is incredibly passive, incapable of critical reflection on its world (Spencer, 2016). Deleuze’s work with Guattari is a heady mix of philosophy, literary references, cultural theory, science and political commentary. Deleuze and Guattari’s work, in particular *Anti-Oedipus* (1972) and *A Thousand*

Plateaus (1980), is rich in ideas that inform an emerging appreciation of the man-and-nature relationship. Many of the themes identified in earlier discourses on ecology find expression in this work. The texts are difficult to read, but provide fertile ground for those looking for ways to think about the current relationship between humans, technology and the natural world.

Today, authors talk about a Deleuzian outlook in the same way we might have discussed a Foucauldian outlook a decade ago. If Foucault's work provided a critique of humanism, Deleuze takes us one step further on that path, arguing that the intellectual tools associated with humanism, such as reason, are a burden on contemporary subjects (Spencer, 2016).

Underpinning much of this thinking is not simply an analysis of changing material conditions, but also a reframing of the way in which we think about subjectivity. Architecture as a discipline developed in relation to humanism. For architects, the idea of the Anthropocene has transformed one of the fundamental principles that underpins conventional approaches to the discipline. If the purpose of architecture was to provide shelter and to give form to the ways in which human beings conducted social relations, then the cultural assumptions are called into question by the idea that we can no longer separate the natural and the social sphere. Under these conditions, design parameters and natural processes are seen together as equal contributors to what is known as 'design intelligence' - in other words, man and machines and nature all have the capacity to design.

Guattari is credited with coining the term ecosophy, although Arne Naess also can take credit for the term. Their work together addresses a range of questions from philosophy to psychoanalysis to politics. The backdrop to their work is a criticism of capitalism or IWC (International World Capitalism) as Guattari calls it and a critique of science and reason. Gary Genosko describes their work as 'neo-vitalism', a view of the world which understands the world as the outcome of complex and evolving systems (Genosko, 2001). What Deleuze provides, argues Genosko, is "essentially a philosophy of complexity, DeleuzioGuattarian thought negotiates not only the actual realm but the virtual one as well."

In *The Three Ecologies*, Guattari replaces the three registers of economic, environment and social sustainability associated with Brundtland with one new category – the mental or the personal replaces the economic (Guattari, 2008). In the process of exploring the mental, the meaning of the social is also redefined. Mental Ecology addresses the questions of our psychological well-being, not necessarily through psychoanalysis, but through a broader social recognition of our impulse and desires, a kind of social therapy which becomes an alternative to politics. Guattari proposes a new kind of politics that is without ideology or movements, but

expresses a coming together of subjects at particular moments to address specific issues. As psychiatrists, Deleuze and Guattari introduce therapeutic themes into their philosophical discourses and promote micro-practices, or small personal actions, as a new form of environmental transgression. They also propose a new way of developing knowledge that is founded on the rejection of the dualisms associated with modern and Enlightenment thought and attempts to address questions holistically – without seemingly developing a prescriptive ideology. Again, these themes have been explored in the nineteenth century and in the mid-twentieth century, but at these moments they are marginal or emerging. Today, they constitute the dominant paradigm (Spencer, 2016).

One of the reasons that Deleuze and Guattari have had such an impact on the discourse on architecture is that their work provides the most consistent set of references for authors attempting to think about the implications of digital technology. Looking back at high profile science fiction films over the past two decades, it is often the case that the speculations of the filmmakers produced technological innovations that were subsequently developed in the real world. The expression ‘life imitating art’ seems particularly relevant when thinking about films such as *Her* (2014) by Spike Jonze, in which the main character falls in love with his phone’s operating system – a voice-activated intelligent search engine similar to what we now know as Amazon’s Alexa or Google Home. A parallel process, you might call it ‘life imitating philosophy’, can be found in the writings of Gilles Deleuze. His ideas allow us to describe the virtual world, while Guattari’s writings on ecosophy allow us to think about the new approaches to thinking about the individual.

As Mario Carpo has noted, the development of digital technologies is highly disruptive technically and culturally for architects. “Architecture as we know it – an allographic, notational art of design that replaced building as a mechanical craft at the end of the Middle Ages – is part of the early modern invention of humanistic authorship.” (Carpo, 2013, p. 58) This idea of authorship and the authority of the architect has been the focus of considerable discussion throughout the 1990s and 2000s (see *The Project of Autonomy: Politics and Architecture Within and Against Capitalism*, 2008). However, the argument appears to have been won, at least for now, by those that argue that ‘authorship’ is a social construct that is unsustainable in the face of globalisation, social forces and conventions and the multi-faceted nature of subjectivity (Hays, 2012).

Despite the fact that Guattari is interested in subjectivity, it is not the creative subject in the conventional sense that he is extolling, but the troubled subject, looking for ways in which to make peace with the world in order to establish an inner balance. Art is

reconceptualized, not as act of individual will and intellect, but as the therapeutic outcome of a largely unconscious process. The place of the architect in this world is not as the constructor of new worlds, but as the therapist supporting clients in their attempts to feel comfortable in the environment as it is naturally given. In a similar manner, Latour provides a new understanding of subjectivity. He rejects the idea of ‘mastery’, which has implications for architecture as a discipline that has often described its best as masters. Most of the ways in which we make sense of building are predicated on humanist ideas. The idea that we make the world in our image and that the physical ordering of the world and the evolving knowledge of the world are positive or progress and potentially liberating underpins the modern discipline. If society chose to recast those basic sentiments then architecture would in some manner follow.

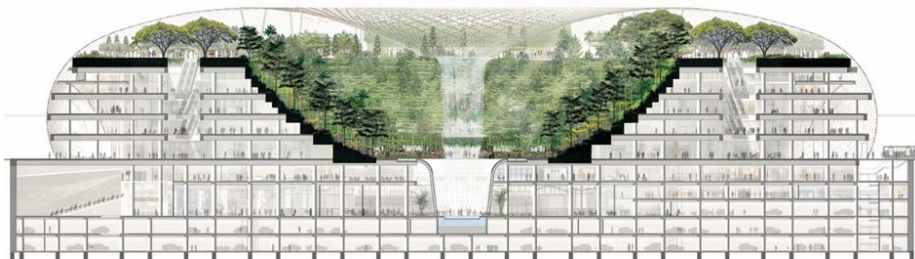
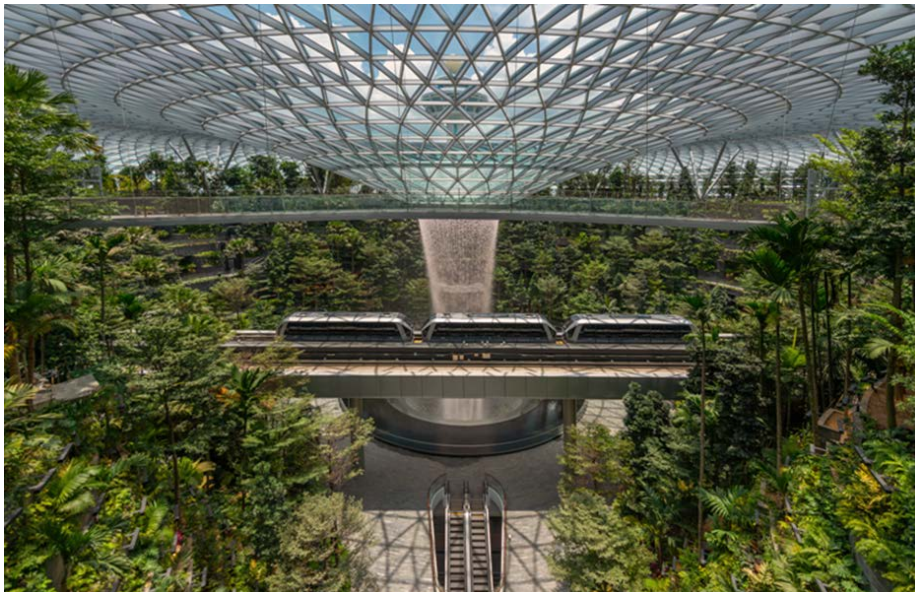


Figure 35 2012-2019 Singapore Supertree Grove, Safdie Architects and Grant Assoc, Airport Blvd, Changi Airport Singapore (SIN), Singapore,

8.8 New naturalism

In the third wave of ecology, the aspiration to rethink the relationship between mankind and the natural world becomes more prominent. Alongside the development of computer science in relation to design parameters and built form, there has also been a renewed interest in the natural sciences and how they might inform design decision making and user reactions, particularly in relation to the developing tradition of brain science and DNA research and behaviouralism.

Olaf Ginser and Gary Freedman are symptomatic of a new trend in architectural education. They lead a unit at the Berlage Institute in Delft on Ecological Modernity, which sets out to rethink ‘the metabolic relationship between nature and the city’, using Latour’s *The Politics of Nature* (Latour, 2004). They embrace the “progressive naturalisation of nature within the city” by which they mean the move to re-imagine the city as ‘another-nature’ rather than something set up in opposition to natural forces. Freedman identify strongly with Latour’s position that we need to replace “a science of objects and a politics of subjects” with a “political ecology of collectives consisting of humans and non-humans” (Freedman, 2014). Sylvia Lavin adopts a similar understanding in her writing. For Lavin, there is no such thing as the ‘natural’ world or ‘natural’ materials. The issue is the extent to which human beings have worked on something that determines whether we understand it as ‘given’ and natural or artificial and ‘man-made’. In *The Raw and the Cooked in The Return of Nature* (Lavin, 2014), she suggests that we revisit Claude Levi Strauss’s (1984) anthropological categories to appreciate that our ability to transform nature is a significant aspect of human development and to deny it through the use of ‘raw’ materials is naïve. Zeynep Celik Alexander has explored the fact that architectural theorists are not only embracing the blurring of boundaries between nature and culture, but are also participating in a redefinition of the conventional distinction between fact and value. She calls this tendency the ‘new naturalism’ (Alexander, 2014).

The eyes of the design disciplines are no longer on such fields as philosophy and literary criticism or comparative literature. Rather, they are on the other side of the humanities divide: on biology, ecology, neuroscience, computer science etc. – that is, on fields of knowledge whose disciplinary projects are informed by the model of the natural sciences and quantitative data. (Alexander, 2014, p. 1)

Architecture is not alone in this shift, Alexander suggests; art history is fascinated with neuroscience and history has become preoccupied with geography and its digital systems for data collection such as GIS (Rampley, 2017). Alexander argues that the shift in presentation of graphic material in architecture schools is not just a question of taste, nor part of the cyclical shift in fads and fashions that influence the curriculum in all architecture schools. She suggests that this new ‘naturalism’ cannot be dismissed as simply an enthusiasm for the ‘data’ in a world in which the accountant is king, but that the foundational principles of the discipline are to some extent undermined by this latest change. “More than a century ago, the neo-Kantian idea that mind cannot be reduced to a physical process became the dominant paradigm and in universities across the world and, as a consequence, a distinction was made between the methods used by science and those used by social theorists or humanities subjects; to put it crudely, the physicist was working in facts and the historian was dealing with values.” (Alexander, 2014)

Today, design is turning to the empirical results of the natural sciences to address questions of disciplinary knowledge and understanding. “The arrival of neo-naturalism signals not only a turn to different subject matter but ultimately also to a different epistemological and ethical program.” (Alexander 2014)

Alexander’s position is supported by the comments in the Sven Olow Wallenstein interview, in which he describes the tensions within philosophy between analytical and continental approaches and the dominance of the biological outlook within the analytical. He describes our age as a ‘reductivist paradigm’ in which philosophy increasingly draws on the biological sciences. “It’s a strong trend in the sense that mind is not just now part of nature, the mind is biology and you can have a biological analysis of art, aesthetics, ethics, etc.” (Interview Venice 2012). According to Wallenstein, this means that everything that we see as culturally structured as a result of social norms and ideas can be reduced to some other biological or physical process. This is not the responsibility of Guattari, argues Wallenstein, as he does not reduce questions of human action to simple motivations, but in fact demands that we appreciate their complexity. “The problem is when naturalism becomes reductive you say ethical choices can be reduced to some features of the brain or something like that and that I dislike because it becomes a new kind of determinism.”

Alexander’s ‘new epistemological and ethical program’ is often rehearsed through an exploration of ecological questions. In the past decade, ecology, with its rich array of scientific and social ideas, has provided the vocabulary for an emerging critique of mainstream values. In the introduction to *The Green Braid* (Tanzer, 2007), the editors argue: “Western knowledge

requires the acting subject (the scientist or 'self') separate him or herself from the object of investigation (the thing or 'other'). Over the centuries, the perceived scientific necessity to separate self from other, subject from object, had been generalised to a societal disconnect severing the individual from a larger network of relations." (Tanzer, 2007)

Tanzer and Longoria's critique rejects categories and ordering systems, which are recast as a means for ideological domination thought, as flawed and what is needed is a form of knowledge that promotes self-organising and non-linear systems. Deleuze and Guattari's metaphor of the rhizome has been adopted as a superior way to think about knowledge and understanding. "The rhizome is an a-centred, non-hierarchical, non-signifying system without a General and without an organising memory or central automaton, defined solely by the circulation of states", wrote Deleuze and Guattari in *A Thousand Plateaus: Capitalism and Schizophrenia* (Deleuze & Guattari, 1987).

So the discourse on living beings and physical matter has not led to the abandonment of science in architecture, but the evolution of biological science and computer science is increasingly informing architects' understanding of user behaviour and the design or decision-making process.

Inaki Abalos, a leading Spanish architect and academic working in the USA, has noted that although the use of natural form and visual metaphors is limited to a small number of practices, there has been a shift in attitude towards 'building experience' as a result of a new naturalistic sensibility. According to Abalos, the architect's working methods are changing to meet the ecological agenda in that 'constructive experience' is replaced by 'environmental models'. In other words, even where buildings are not explicitly green, there is a tendency to ignore architectural and building conventions as the primary source for design and to replace them with data and models relating to energy consumption and environmental comfort. (Mostafavi 2011).

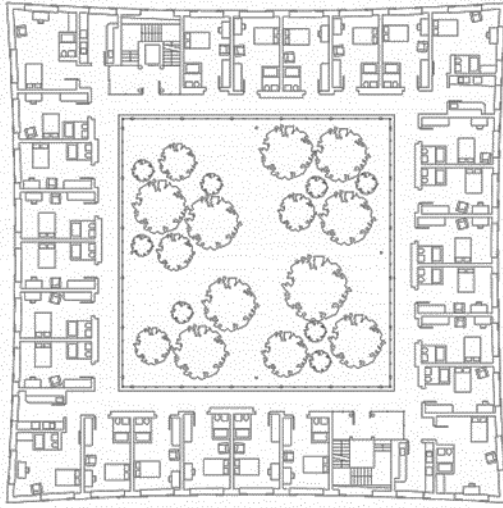


Figure 36 2016 6A Architects, Cowan Court, Churchill, Cambridge

8.9 New materialism

The interest in the new materialism reflects the many different ways in which material qualities of buildings have become a significant point of discussion in the past two decades. The idea of materiality is something that is familiar to most architecture students in the way that the architectural promenade might have been seen in 1960. For Hagan, the development of an ethical approach to environmental design relies on a more considered approach to materials as well as energy consumption (Hagan, 2000). Anthony Vidler expressed a desire for students to look even more closely at materials – not just their qualities and capacity to invoke feeling, but their origins and sourcing.

I gave a seminar a couple of years ago where we just took two materials, we took the titanium on the roof of Bilbao, and we took the bamboo on the floor of a Manhattan loft and we analysed them. First of all, we analysed where they came from and we analysed what their harvesting did to the communities where they came from. Did anything go back to the community? What was the energy used in the harvesting, or mining, what was the profitability to the community? Did it destroy the community? What it did to the ecology of the place...you know, strip mining in Uzbekistan and bamboo cutting in China. What was that ecologically? Then what was the energy used and the kinds of social and work processes used to get from the place where it was mined or harvested finally to be on the floor on the roof. It was an extraordinary exercise in research for the students to understand how bamboo is harvested, what kinds of semi-chain-gangs are used to harvest, whole villages disrupted and then whole hillsides opened up to erosion again and again and again. So just to talk about a renewable sustainable resource like bamboo in social, economic, cultural and energy terms. They even analysed the toxicity of the new glues that were necessary to use with

bamboo, the energy that was needed to be used in the cutting of such a hard wood as bamboo as opposed to a soft wood and so on. It was an extraordinary exercise ... it was a global exercise, but titanium went around the world three times before it became a little piece of thing on the roof.” (Vidler, 2012)

The Guide: Volume 22 2010 produced a survey titled ‘Publishing Practices’, which asked a sample of Dutch architects and teachers and students (150 in total) to name their most popular architectural book (NIA 2009, p21). The list contained many of the texts you might expect, such as work by Le Corbusier and Koolhaas. One of the high-ranking inclusions in the list was *The Atlas of Novel Tectonics* (Reiser & Umemoto, 2006).

The book is a fresh attempt to look at the question of architecture and design with a particular focus on the experience of the physical qualities of architecture. J Brillat Savarin's *The Physiology of Taste* (1825), a book about food and social life, is one of the primary sources for Reiser and Umemoto and indicates a move to look at architecture in terms of sensual feeling. This emerging interest in the direct experience of architecture and its impact on our senses is not new, but it has developed over the past decade into a significant area for discussion. The Canadian Center for Architecture, one of the leading architecture collections in the world, is currently running a research project called ‘Into the material world’. Introducing the research, the Center’s website argues that although we think of materials in terms of their static and reliable properties such as their texture, weight or integrity these are social constructs, “attitudes, understandings, and fashions that influence how we measure a material’s value are fickle, so the ways we define and relate to a material are also an evaluation of our own contingent cultural values”. The site goes on to proclaim that “by excavating the immaterial and tangential implications of use we trace the power of a material to calibrate our relationships, be they distant or intimate, with the world” (<https://www.cca.qc.ca/en/>).

Today, the interest in materials extends well beyond the discussion of ecology. Books such as Adam Caruso's *The Feeling of Things* (2009) suggest an enthusiasm to engage with the building fabric (Caruso, 2008). Hagan argues that the progressive ‘etherealization’ of culture has driven architects to adopt a renewed enthusiasm for the concrete qualities of building elements (Hagan, 2000, p. 77). This desire among architects to counter the de-materialisation of culture seems to coincide with evolving philosophical ideas of phenomenology that have been under discussion in architectural circles since the 1980s (Sharr, 2007). Hagan argues:

The phenomenologists are interested in the thingness, and this coincides with the interests of environmentalists – but for environmentalists the challenge is to include ‘an inclusiveness of signification and environmental performance’. (Hagan, 2000).

At the 2004, *Material Matters* conference held at the University of East London, Katie Lloyd-Thomas put forward a critique of ‘hylomorphism’ which is ‘the privileging of form over material’ (Lloyd-Thomas, 2007, p. 3). Lloyd Thomas argues that materials are under-discussed and carry a secondary status, which means they are excluded from theoretical discussion. In the classical philosophical tradition, form is the focus of attention and matter is treated as an inert and undifferentiated resource. As a consequence, we tend to see architects as the form-giver; the fact that material can either enhance or resist the architect’s ambition is largely ignored. Lloyd Thomas, drawing on a feminist analysis, concludes:

By characterising matter as inert – as that which is given form – the image of the architect as a kind of mythic form giver is reinforced and the processes and labour of construction are covered over. The very resistance that matter has to being formed are ignored. Materials must be extracted or manufactured, they must be worked and, once in situ, they must be maintained. And of course, materials are themselves active; it is a transaction rather than a one-way operation that occurs in the shaping of stuff. (Lloyd-Thomas, 2007, p. 4)

Anyone who has worked timber will recognise Lloyd-Thomas’s description. There is a two-way process between the timber and the person crafting it. However, the implication here is that a failure to really understand matter leads to a tendency to use materials as surface or decorative applications rather than according to their specific properties. The appreciation of materials is seen part of developing a more meaningful and authentic form of practice.

According to Leach, Deleuze has become the philosopher of choice for those developing a critique of ‘hylomorphie’ thinking, or the conceptualization of form in the human imagination regardless of matter or materials. Deleuze and Guattari suggest that there are two approaches to design. One is premised on an aesthetic ambition and tends to form building materials according to a preconceived template. The other is a structural outlook that allows for the emergence of forms from the programmatic requirements. (Leach, 2009). The second approach suggests that the design process is not the product of the individual will of the designer but a process of ‘becoming’, in which solutions ‘emerge’ from conditions or parameters. Spencer suggests this interest in emergence could become a cover for a complacency and accommodation to the status quo among professionals. As far as Spencer is concerned, Deleuzian theory is providing architecture with “a rationale for its current identification with natural laws, flat ontologies and new materialism” (Spencer 2016). This criticism is levelled at BIM, parametric design and intelligent design as well as the new materialism.

8.10 New Vitalism

Spuybroek is a Dutch architect, artist and writer, who set up a practice, NOX, in the mid Nineties. His organic design for the World Trade Center competition in 2001 attracted attention, as did his water pavilion on the island of Neeltje Jans (1993-1997). Jencks included his work in *The New Paradigm of Architecture* (Jencks, 2002). Spuybroek's buildings tend to have a 'continuous geometry', which means that there is little to distinguish the walls, floors and roof materials. He argues for a technological revolution, where powerful computing tools are deployed to replace simple repetition of elements by continuous variation. The computer is used as much in the design (CAD) as in the manufacture (CAM) and sometimes even in augmenting human experience.

Spuybroek first started exploring the idea of vitalism in architecture in *Vital Beauty: Reclaiming Aesthetics in the Tangle of Technology and Nature* (Spuybroek, et al., 2012), a collection of essays including one from anthropologist Tim Ingold and psychologist Professor Daniel N Stern. In the text, Spuybroek argues that 'vital beauty' produced by digital and electronic interactivity is about both object and process simultaneously. His interest is with both the essential qualities of form and the evolution of form through vital and restless, creative processes.

The Sympathy of Things makes an argument in favour of Gothic architecture drawing parallels between the nineteenth-century Gothic described by Ruskin and the digital design of today. At its core, Spuybroek is concerned with materiality - a light materiality. The Gothic is more alive and more animated than other architectural styles, he argues. Spuybroek is interested in the disruptions and imperfections that come out of the digital design and production process in the same way that Ruskin was attracted to the unique qualities of nineteenth-century Gothic craftsmen. He argues that digital technology allows for more creativity in design work than the traditional classical or modern approaches to design and construction, which he characterizes as outmoded and static.

Spuybroek's thinking is inspired by Deleuze's writings about 'smooth' and 'striated' matter. According to Spuybroek; "Gothic architecture is an architecture of relationality, of entanglement, an architecture that constantly forges new relationships and expresses them in every possible form and shape." (Spuybroek, 2016, p. 49). What is significant about Spuybroek's work is that it has provoked a reaction among writers such as Spencer and Rawes who are concerned that the promotion of the digital and the emotional (sometimes described

as the affective) might lead to the abandonment of the basic principles of inquiry (AHRA Conference 2016). When Spuybroek argues that Gothic is an ‘architecture of spirituality, not ideas’ (2016, p. 49) he is not just celebrating the sensual qualities of the Gothic, but rejecting the concept of architectural ideas. When architectural writers talk about affect or the affective turn, they are referring to the impact of a building on the sense of the user. Spuybroek does suggest that immediate experience is superior to intellectual reflection because it places us in an immediate relationship to other things and somehow sidesteps the experience of alienation. “Seeing is a concrete experience in which we single out one object amid our basic relatedness to things.” (Spuybroek, 2016, p. 50)

Some academics have made a direct link between a new approach to theory and Haeckel's original vitalism (described in the chapter on the origins of ecology) (Hagan, 2000). Rosi Braidotti refers directly to the idea of a ‘neo-vital politics’ (Rawes, 2013). Although there is clearly a significant difference between the conditions of 1866 and 2016, there is an implicit interest in the ‘vital’, which is evident in much of the literature on ecology and architecture (Genosko, 2001, p. 1009). For some thinkers, vitalism describes an interest in non-human energy and self-organising matter (Rawes, 2013, p. 27), a theme that connects to a parallel interest in the self-organising systems in the world of computing (Schumacher, 2011).

As far as Brook Muller is concerned, an interest in ‘living systems’ represents an important step forward for the discipline (Muller 2014). Muller welcomes the growing interest in how the way “buildings and landscapes interact in mutually supporting ways invites heightened levels of complexity and contingency”. As this new approach develops, the ecological project will be better placed to touch the public imagination, he argues. When Jencks published *The Jumping Universe* in 1997, his position was either derided or ignored by many in the architectural profession. Over the past 10 years, the idea of a cosmic order and a beauty and pattern to be found in chaos has become an assumption that many academics are open to – at least as a source for aesthetic ideas, if not as a coherent philosophical position.

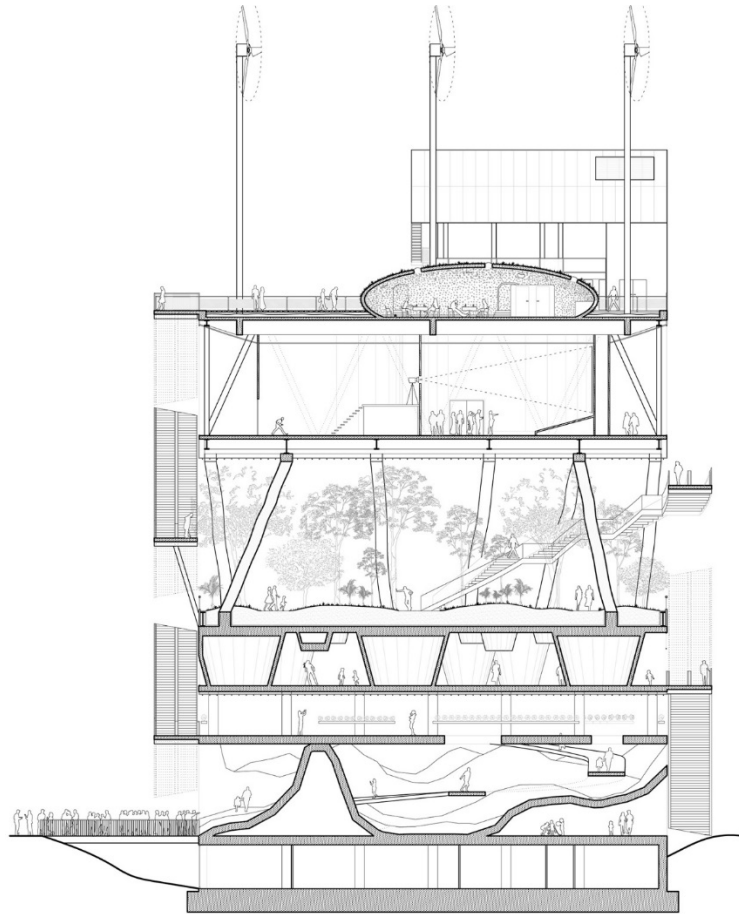


Figure 37 2000 MDRDV Dutch Pavilion Hanover, section from

9.0 Today's ecology and built form

9.1 Introduction

R2 | Wednesday, June 27, 2018

THE WALL STREET JOURNAL.

JOURNAL REPORT | THE FUTURE OF CITIES

Green Buildings. Literally.

'Biophilic' designs incorporate elements of nature both outside and inside. It's aesthetically pleasing—and makes people feel, and perform, better

BY KEN WELLS

MOST PEOPLE, when they think of "green" buildings, take that to mean structures built with energy conservation in mind. But, increasingly, buildings are becoming literally green, as cities and companies around the world embrace biophilic design—the concept of surrounding buildings with nature, even on their upper floors, and bringing the outdoors indoors by including natural elements in their interior design.

Planted terraces that wrap around buildings, indoor man-made water features such as ponds and waterfalls, plantings that can cover entire inte-



The Bosco Verticale apartment towers in Milan (left) have about 800 trees on their terraces. In Singapore, the ParkRoyal hotel has almost 4 acres of lush terraces, many with water features.

One high-profile event that epitomised the shift in the architectural discourse in favour of environmentalism and ecology was the Expo 2000 in Hanover. The first Expo to be held in Germany, the Hanover event was held on a 160-hectare site on the outskirts of the city and was organised on the theme 'Man, Nature and technology – Home of a New World'. The organisers, in keeping with the millennial theme, encouraged participants to explore 'future visions', but within the context of a world population that was approaching six billion (October 1999).

The Expo became a marker of the mood of the moment. Unapologetic utopian or techno-utopian thinking was scarce, but practical solutions to questions of population growth and urban density and man-made environmental damage were to be found across the national pavilions. Much of the content of the Expo 2000 dealt with renewables, recycling and 'respect for nature'. An Expo 2000 Masterplan was drawn up by Thomas Herzog and Michael Volz. Herzog, who had started his career exploring pneumatic structures, had gained a reputation for looking at energy-saving technologies (Rattenbury, et al., n.d.). Herzog and Volt's masterplan set out guidelines to encourage the use of natural daylight, natural ventilation and low-energy materials (Baird, 2001). The Dutch pavilion, designed by MVRDV, seemed to address a range of issues, from urban agriculture to landscape urbanism, and the Japanese pavilion by Shigeru Ban was made of 'waste' paper.

Herzog designed Hall 26, the main exhibition space; the hall roof had a span of 115 metres and was made up of three waves of a tensile structures, 29 metres tall at their highest point. Much of the building envelope was glass, but the large volumes, a heavy concrete floor and solar shading gave the building good thermal control and performance. A hybrid environmental-control system was visibly expressed in the plan, elevation and section; a triangular glass-clad ducting system gave the building a distinct aesthetic quality (Baird, 2001).

The Japanese pavilion by Shigeru Ban was formed from a grid shell of massive paper tubes (Maas & Koek, 1998), working with paper and other sustainable building materials – particularly on temporary structures – such as those used for emergency relief in disaster areas. Ban and Herzog’s work codified the developing work on eco-technology and those interested in the carbon footprint of materials. These were explicit expressions of the aspiration to reduce energy consumption throughout the 1990s; some of the less-explicit trends in environmental thought found expression in different kinds of naturalism.

Hanover marked the start of a new approach to environmental questions. Herzog’s work was innovative and influential, but what was evident at Hanover was a move by architects such as MVRDV towards a different kind of environmental sensitivity, which was not simply focused on energy consumption and materials, but also addressed the idea of environment holistically. The evolution of a renewed ecological consciousness in architecture was influenced by developments in philosophy and politics, particularly environmental politics.

The 10.8 million Euro Dutch pavilion was designed by MVRDV, and it focused on population density in the Netherlands. The pavilion gave concrete expression to ideas already explored by MVRDV’s founders in *FARMAX: Excursions on Density* and then *Metacity/Datatown* (Maas, 1999). Both books were future-orientated and packed with demographic information and data, but underpinned by an imperative derived from a rather gloomy ecological forecast. MVRDV’s Expo intervention came at the end of a decade in which Dutch architects, with their utilitarian neo-modernism, had made a significant impact on architectural practice in the UK (Hulsman, 1985) (Loosma, 2000).

The Dutch pavilion was designed by stacking a variety of different ‘landscapes’ on top of each other. Although the Hanover Expo was not heralded as a major success (visitor numbers were low and the internet is now awash with pictures of a derelict expo site), the Dutch pavilion became an important reference point, introducing a number of ideas about ecology into the architectural discourse.

Several of the ecological concerns related to land and the loss of agricultural land from development. The Dutch pavilion placed emphasis on vertical development, the idea of the

compact city, the longstanding Dutch tradition of making landscape and recognising landscape as an artificial product. It further explored the idea, already pursued by architects such as Bernard Tschumi and Rem Koolhaas, that public space might be extended to the building interior and that the building itself might be reconceived not as a series of floor-plates but as an extension of a landscape.

The Dutch pavilion contained landscape devoted to rain, forest and polder (low-lying land protected by dykes). The ground floor, which provided a ‘dune landscape’ above a ‘greenhouse landscape’, explored the possibilities of urban agriculture, while a ‘pot landscape’ on the top floor contained potted trees alongside digital screens. Reviewers suggested that the building, with its open and overlapping floors, could be understood as an eco-system.

Finally, aesthetically, the pavilion was expressive of its functions, but consequently chaotic (possibly ugly) rather than quiet and refined. As such, the pavilion can be read as a concrete expression of the idea that formal and aesthetic concerns were of secondary importance in the face of environmental demands. Winy Maas argued that we could no longer see architecture as a formal or aesthetic activity – that ‘beauty’ was a secondary concern in the face of the functional and ecological demands of the moment (designboom, 2018). At the time, this was understood as a reassertion of the values of modernism and functionalism, a polemic against the preoccupation with beauty form and disciplinary autonomy being discussed by theorists such as Peter Eisenman. However, over time it seems that this was less about the old argument over form and function, but rather an early attempt to assert the imperative for architecture to start to see environmental concerns as a primary rather than a secondary driver.

Since Hanover, MVRDV has continued to explore this theme and Winy Maas, the practice partner in charge of the job, has been responsible for an ever-expanding body of work looking at environmental questions - in particular, his The Why Factory (T?F) projects with students and practice. The project is now a global think tank run in conjunction with Delft University of Technology, in partnership with IIT and Columbia's GSAPP. The tone of its work is broadly optimistic: “The Why Factory investigates within the given world and produces future scenarios beyond it; from universal to specific and global to local. It proposes, constructs and envisions hypothetical societies and cities; from science to fiction and vice versa. The Why Factory thus acts as a future world scenario-making machinery.” (The Why Factory, 2018) Central to the organisation’s work is a series of books on environmental innovation: *Visionary Cities* (2009), *Green Dream* (2010), *The Why Factory* (2010), *The Vertical Village* (2011), *Hong Kong Fantasies* (2011) and *City Shock* (2012).

Winy Maas and T?F can be located at the most optimistic and possibly technocratic end of the spectrum of ecological thought. Books such as the ‘vertical village’ address the questions of population growth and urban expansion with visions of compact cities, high-rise buildings and urban agricultural projects like those set out in the Hanover pavilion in 2000. The impact of the pavilion on the aesthetic imagination was significant in that it marked a new aspiration to integrate public open spaces into the main body of the building and was evidence of the attempt to draw a strong connection between the surrounding landscape and the building floor plate, which is depicted as a singular continuous surface rather than a series of horizontal planes (see the work of Diller Scofidio and Renfro <http://www.dsny.com>, the architects for New York's High Line).

These ideas had been explored by architects interested in the digital arena in the 1990s, but had not been produced by architects directly exploring the question of environmentalism. At the level of ideas, the legacy of the project was also important in several ways. The media reporting on the project often described it as an exploration of the relationship between the natural and the artificial, but it can also be seen as an exploration of the literal planting or greening of buildings and the development of buildings as landscape. These two themes will be explored through the work of others before going on to look at the more directly naturalistic expression of ecological ideas in the work of today’s architects and ending with a review of ethical practice.

9.2 Literal Greening

The Vertical Forest Milan, or Bosco Verticale, is the first prototype of a sustainable residential building covered in trees designed by Stefano Boeri. Boeri is an academic, architect, planner, writer, publisher and politician. He has taught at Harvard GSD, the Strelka Institute, the Berlage Institute and Tongji University and published many books including *A Vertical Forest: Instructions booklet for the prototype of a forest city* (Corraini, 2015). His practice focuses on the relationship between the city and nature. The forest towers (the tallest of the Milan towers is 112 metres high) have been designed as a “a model of metropolitan reforestation that conceives vegetation as an essential element of architecture” (Boeri, 2018). Boeri’s ambition is to introduce bio-diversity into architecture. He presented his project, Forest City, at the United Nations Climate Change Conference (COP21) in Paris in 2015. The tower was one of four projects shortlisted for the RIBA International Prize this year (2018). When interviewed for the *RIBA Journal* Boeri said: “Over the last 10 years is that for an architect there are two main issues, climate change and poverty. We cannot avoid them and they cannot

be separated. We are in a position to improve both of them ... Our cities in Europe and the UK have to absorb people and carbon dioxide.” (RIBA Journal, 2018). He went on to say that architects need to work as part of a network, including the political network in order to take risks and deliver change. The language is reminiscent of the radicalism of the first Age of Ecology and yet the context is very different. Boeri’s work can be described as ‘literal greening’ in that a relatively conventional built form is transformed by the costly addition of planting and irrigation.

The term ‘literal greening’ has been used by Tabb and Deviren in *Greening Architecture: A Critical History* (Tabb, 2013). It is used to describe buildings in which the colour green is used or planting is used to form the skin of the building. The most visually arresting example of a green wall on a public building in Europe is probably Jean Nouvel’s Musee du Quai Branly. The efficiency of green walls has been subject to debate for some time. Only societies with plenty of water for irrigation and low labour costs can really afford to maintain these green facades. In China, there has been a proliferation of green walls and roofs in the last decade, but even in China they are often criticized for being labour intensive.

Didactic green buildings, those that wear their environmental credentials on their sleeve, were produced in the 1980s and 1990s, but they tended to be designed for and by those with a strong environmental outlook and for many of this group, the formal, aesthetic and tectonic issues discussed in mainstream theory debates were secondary concerns. For example, Sarah Wigglesworth’s Straw Bale House in Stock Orchard Street in London was designed to showcase sustainable materials rather than to look beautiful. (Although Peter Davey did describe it as one of the ‘wittiest new buildings in London’ in January 2002.)

Examples of literal green projects are increasingly evident in the world’s urban centres. One high-profile design project, the Burwood Brickworks redevelopment plan in Melbourne, is to be designed with the help of eco-pioneer Joost Bakker, a florist, to create a rooftop urban farm on the 2,000 sqm site. The building will be designed to meet the Living Building Challenge – the certification programme developed by the Australian government. LBC-certified buildings have a zero-carbon footprint, zero waste, produce more electricity and water than they use, grow agriculture on 20 per cent of the site, and are built using non-toxic and recycled materials.

9.3 Naturalism

There are many different ways in which contemporary architects take inspiration from nature. Sometimes, buildings are set into the earth in such a way that the transition between land and

building is invisible. Others design building forms or skins or elements of decoration that imitate nature. There is a growing tendency to look at the history of a place and its context as a natural history (Emerson, 2017). There is also a growing interest in ecological and ethical approaches to practice and collaboration. These themes do not capture the totality of the wide variety of ways in which ecology is firing the architectural imagination – but they have been developed as categories in the production of this text because they seem to describe the dominant trends in architectural production.

9.3.1 Landscape and ecological urbanism

One of the elements of the contemporary scene that has excited the architectural critics in recent years is the development of an architectural language that embraces landscape, not as an addition or context for architectural forms, but as a stimulant for architectural form. According to Ingersoll, the process of imitating nature is clearer in the development of landscapes than buildings. Landscape design conceptions work with natural components. Ingersoll suggests: “If buildings were conceived more like landscapes, that is made bio-mimetically, perhaps such criteria would work for architecture as well.” (Crysler, et al., 2012).

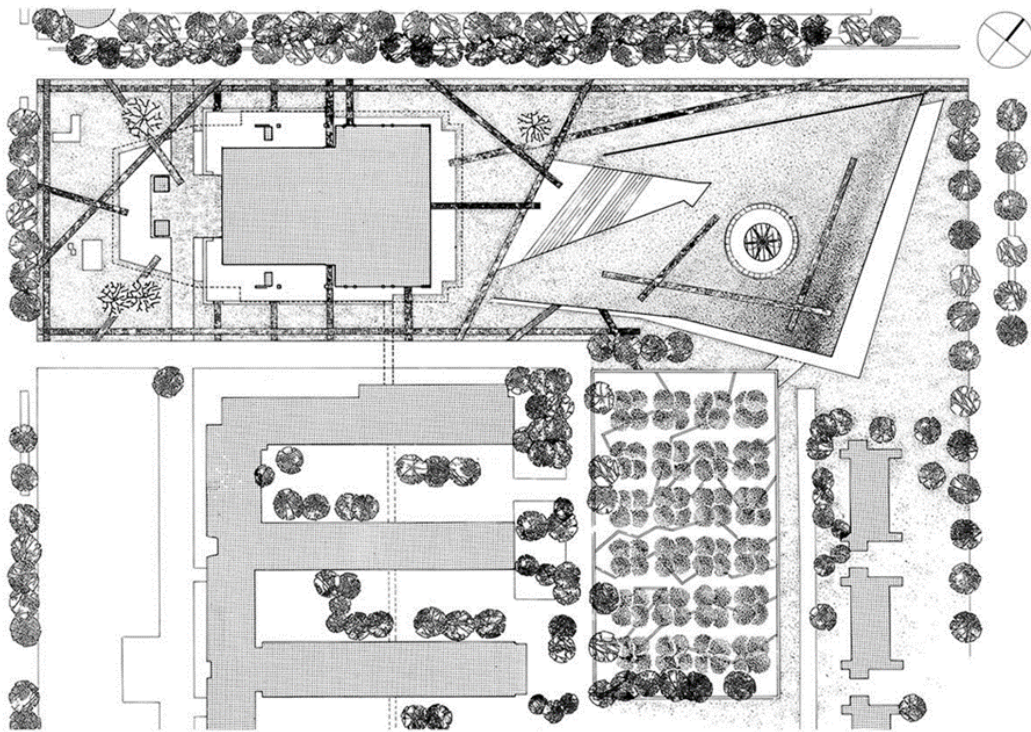


Figure 38 1997 Mecanoo, TU Delft Library

In Singapore Songline, 1995, Rem Koolhaas argues: “Worldwide, landscape is becoming the new ideological medium, more popular, more versatile, easier to implement than architecture, capable of conveying the same signifiers but more subtly, more subliminally...” Kenneth Frampton made a point in the fourth edition of *Modern Architecture* (2007) that you could now look at ‘topography’ as a significant driver in the design process alongside tectonics. More recently, Anthony Vidler and others have talked about an ‘expanded field’ for

architecture in which the boundaries of the discipline were extending and the incorporation of landscape is a significant element in this process. Alongside the development of biological analogies as a generator of form and structure, it was clear that the imitation of landform and the integration of building into landforms, so that they were indistinguishable, were significant new tendencies. The idea of architecture as a discipline is expanding to occupy fields that would usually have been considered peripheral appears in much of the theoretical writings of the post-2000 period.

In his essay on digital cities, Leach writes about “the expanded scale of the architecture of the metaphoric landscape” (Leach, 2006). The architectural imagination has expanded in scale and subject matter in order to embrace the questions of urban design and planning – and now landscape. Through work of landscape architects like Richard Corner, the concept of landscape has been given greater depth and breadth to create a situation where strategic attitudes to a regional infrastructure or parkland are combined with an ecological and aesthetic approach.

The most significant exponent of this trend at the level of ideas is probably Richard Corner and the practice that he established with Stan Allen Field Operations. Corner's approach has been given a title ‘landscape urbanism’. In the UK, this approach was clearly adopted by the emerging practice Foreign Office Architects in the design for the Yokohama cruise liner terminal (2002). The most extreme expression of this trend is Peter Eisenman's *The City of Culture of Galicia at Santiago de Compostela* (2011). Here the buildings are indistinguishable from landscape; they imitate landscape.

The merger between land topography and built form can be traced back to the work of Archizoom and Superstudio in the 1960s and 1970s and the land work of Robert Smithson. In the 1980s, an interest in landform, entropy and topography emerged (in opposition to the *tabula rasa* approach adopted by modernists). In 1997, Francine Houben of Mecanoo designed the new Central Library for Delft University in The Netherlands; the cone-shaped library is buried in the ground. Visitors could climb up the grass on the gentle incline of the roof and look down into the building. Alongside the development of biological analogies as a generator of form and structure, it was clear that the imitation of landform and the integration of building into landforms, so that they were indistinguishable, were significant new tendencies.

As discussed MVRDV's work provides a clear articulation of this outlook which focuses on landscape and much of the research work produce by the Berlage Institute in Rotterdam is developed within this framework. The work is driven by factors outside programme and the building object and therefore has a certain rooted quality. This sense of

location is not generated by a romantic engagement with place or a study of tectonic conventions. In fact, it is given a certain aura of objectivity because it is founded on a very extensive collection of data, which allows the design to define the specific qualities of the environments, whether they be topographical or demographic.

In contemporary China, where development is often rapid and on a vast scale, the adoption of landscape as a category incorporating strategic and logistical thinking and aesthetics is developing rapidly. Kongjian Yu, a Chinese architect, identifies a number of such projects in *Ecological Urbanism* (Mostafavi & Doherty, 2010). He describes this approach as ‘Big Foot Urbanism’ – a form of development that is not concerned with the constraints of the city and the attempt to force natural characteristics into a man-made mode of development. The metaphor relates to the unnatural tradition of foot binding that gave rise to a beautiful small foot, which compromised the ordinary functions of the body.

With Big Foot Urbanism, the city is no longer understood as the realm of the artificial; the rural landscape is incorporated into the city. The idea of EI (Ecological Infrastructure), a form of urban and spatial planning that places emphasis on securing the natural, biological and recreational qualities of a given environment, has developed alongside this approach. It demands planning on a national and regional level. Kongjian Yu and his practice Turenscape (Tu means dirt, earth, the land and Ren means people, the man, human being) represent a new strand of thinking that is close to the interests of present-day ecologists in the USA.

In the project for the Floating Gardens of Yongning Park, Yu adopts an approach which he describes as ‘making friends with floods’. At the Rice Campus at Shenyang Architectural University, the campus landscape has been turned into a site of agricultural production, with a patchwork of paddy fields providing places for the students to relax. The Red Ribbon project at Tanghe River Park Qinhuangdao City rests heavily on the idea of minimal intervention in the natural world. (Saunders, 2012).

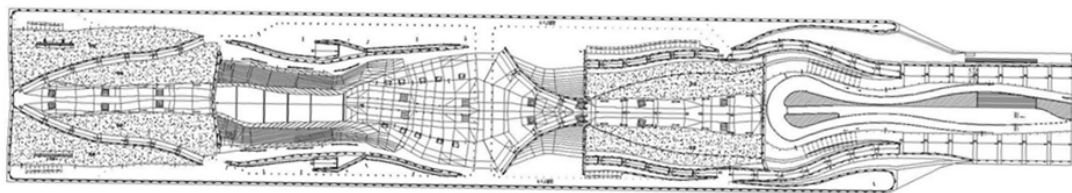


Figure 39 1995, FOA, Yokohama Ferry Terminal,



Figure 40 1995, FOA, Yokohama Ferry Terminal, PHOTO SATORU MISHIMA

9.3.2 Natural analogies

Architectural work that imitates nature comes in a variety of forms. Vidler and others regard ‘natural analogies’ as one of the four key drivers behind contemporary design (Tabb, 2013). Some architects imitate natural forms in the massing of their buildings, some adopt an approach to structure that is inspired by natural forms and others use the intelligent systems adopted by plants and animals to inform the design of environmental control systems or skins. Natural analogies are used to inform thinking on patterns of urban settlement and patterns of regional and local development networks, which has been described as ‘ecological urbanism’. These approaches might be described as formal, structural, behavioural and urban natural analogies.

One of the most significant contemporary groups adopting biological or natural analogies is a cluster of British architects whose practice began in the 1970s and were dubbed hi-tech, but are now classified as eco-tech. Over the past three decades, the practices of Norman Foster, Nicholas Grimshaw, Richard Rogers and Michael Hopkins (and Renzo Piano – although he’s not British) have evolved from the hi-

tech to the ecological. To this list we might add Ken Yeang, the Malaysian architect, and Arup, the global architecture and engineering practice. In the public presentation of their work, many of the architects listed use climatic and environmental drivers as a starting point for both the form, the organisation and the detailed construction of their work. Key concerns are the reduction of energy consumption, the use of passive or renewable and intelligent energy systems and the promotion of the idea of human comfort. This approach has been adopted by a number of very high-profile commercial businesses concerned about their public image, but also keen to maximise the use of high-value urban sites.

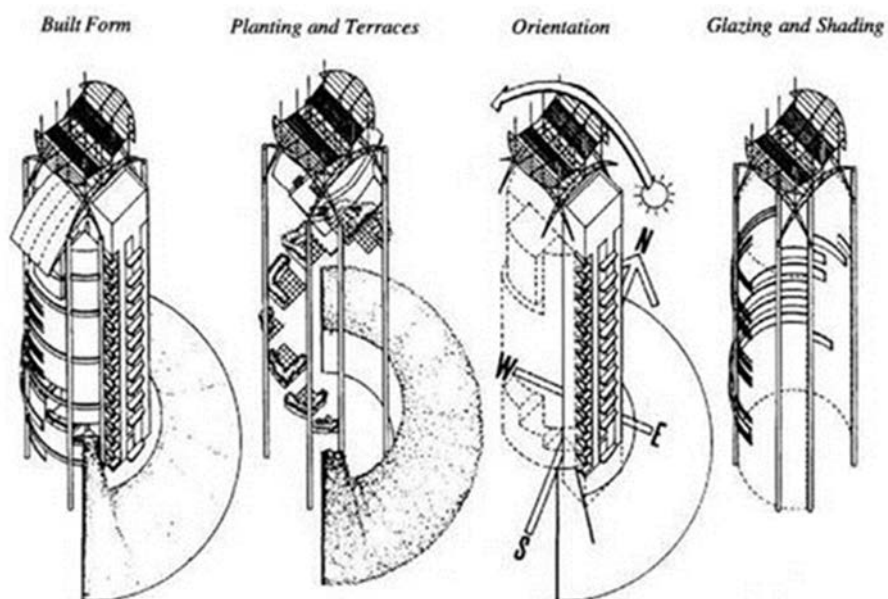


Figure 41 Ken Yeang's 1991 Bioclimatic skyscraper Mesiniaga Tower

Implicit within this work is the idea that passive, non-artificial or natural systems are superior to mechanical ones. Obviously, passive systems will use less energy and are therefore reducing the carbon footprint of the building, but there is an additional argument that using the logic of natural systems to control the built environment is also better for human well-being and a sense of agency. One of the first buildings to adopt this approach was Foster and Partners' Commerce Bank in Frankfurt, which was completed in 1997. The building was commended for its column-free space, the absence of a central core, refined façade engineering and, perhaps most importantly, its 'sky gardens', which appeared to have transformed the corporate tower into somewhere with a much stronger relationship to both the city and the user. This approach drew on the work produced by Rudofsky and Oliver on vernacular climate control and developed ideas about passive ventilation and sun shading. However, rather than adopting a vernacular aesthetic, they honed a highly efficient version of

the aesthetic of steel and glass modernism along with an Arts and Crafts approach to the articulation of building components. Renzo Piano's skill as a designer and his commitment to addressing ecological questions has made him one of the most popular 'starchitects' within the profession. Assessing his contribution in the AR (28 August 2012), Buchanan wrote: "Although initially a narrow technocrat, Piano's work has progressively broadened to cement sensitive relationships with context and culture, and empathic relationships with users."

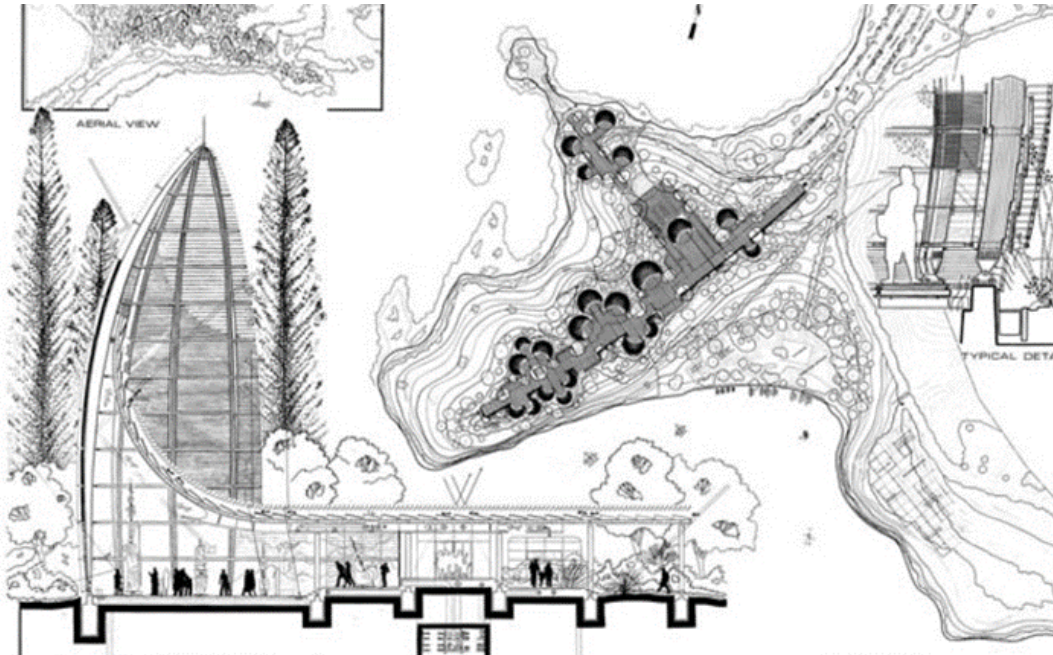


Figure 42 Renzo Piano's Tjijbaou Center in Noumea

The Tjijbaou Cultural Center in Noumea, New Caledonia 1998 must have one of the most frequently discussed, drawn and taught sections. The tall hut-like structures act to catch prevailing winds, which can be controlled depending on the time of the days to create a complex but passive system of environmental control. In this project, Piano also explored themes identified by Glenn Murcutt, the idea that it is the responsibility of the architect, not simply to minimise energy consumption, but also 'to touch lightly on the earth'. The centre is designed to be sympathetic to the building traditions and social convention of the indigenous Kanak people.

Piano's Californian Academy of Sciences (CAS) building in San Francisco, which was completed in 2008, is a clear of expression of many of the trends that have been developing in the eco-tech strand of contemporary architecture. In some senses, Piano's work embraces the new ecological imperative without abandoning the architectural drivers and aesthetics associated with the Modern Movement. As one critic wrote of CAS, "Piano's building is also

a blazingly uncynical embrace of Enlightenment values of truth and reason. Its Classical symmetry ... taps into a lineage that runs back to Mies van der Rohe's 1968 Neue Nationalgalerie and Schinkel's 1928 Altes Museum and even further, to the Parthenon." (*New York Times*, 24 September 2008).

The eco-tech approach focuses on the issue of efficiency rather than the aesthetically explicit and evocative exploration of natural forms. Rob Gregory, writing in the *Architectural Review*, describes CAS as a very 'readable' building, meaning it's both transparent and explicit in its intentions. A giant undulating grass roof covers the entire museum. Underneath the roof, which is conceived as an extension to the park (but isn't, because access is via the museum and entry fees are high), sits a large steel and concrete building punctuated by large light wells that provide the space needed for the natural exhibits, such as the tropical zone, complete with a butterfly platform at roof level. It was described by one reviewer (Nicolai Ouroussoff) as a form of "reparations for the great harm humans have done to the natural world" (*New York Times*, 22 September 2008).

9.3.3 Organic

Through the course of the twentieth century, the word 'organic' was used to describe architecture that was sensitive to the qualities of the natural environment and natural materials. The aspiration to create an organic, as opposed to inorganic or artificial, architecture was described by Bruno Zevi through the work of many architects such as Frank Lloyd Wright and the Finnish architect Alvar Aalto. Today, architects in Japan appear to have a particularly strong relationship with the organic tradition; individuals such as Kengo Kuma talk about the relationship between their work and nature and suggest that the character and the operation of the natural world informs their designs. The work is 'organic' in that it takes inspiration from the natural world, but unlike the energetic approach, maintains its relationship with traditional tectonic ways of building and uses of materials. Kuma's Concert Hall in Granada is a good example of a building in which naturalistic form, the honeycomb, has been made possible by new computer technology that has assisted in the design and will be used for the manufacturing of components.

If you look at the façade of Mecanoo's new Birmingham library, it suggests that even where architects are not imitating nature in building form, there is a renewed interest in the use of biological or naturalistic symbols to decorate the building envelope and a tendency to use environmental control mechanisms that imitate nature as the driving force behind design. Abalos argues that although the literal use of natural form may be limited to a small percentage

of practices, the shift in attitude towards building systems and components and how they are brought together is significant. He argues that working methods are changing to meet the sustainability agenda in that 'constructive experience' is replaced by 'environmental models'. So from the natural world we develop environmental models as the guide to design decision making rather than using tectonic precedents.

Today the imitation comes in a variety of forms. As with past work, the imitation can be decorative, natural visual motifs can be used to adorn a building. Hagan provides a useful starting point for this study of contemporary architectural production. She argues that we have reached a point in history where we are capable of imitating nature's complex designs at an operational level.

Vidler, in his exploration of biological analogies, cites the work of Greg Lynn, the designer of so-called 'blob architecture' as the inheritor of an interest in biological form. He argues that we can trace the impulse back to the influence of Darwin in the second half of the nineteenth century and extended through Art Nouveau to Reyner Banham and Jencks.

For Vidler: "The spatial arts now come together in their super-imposed expanded fields, less in order to blur distinctions or erode purity than to construct new versions, that for the first time, may constitute a truly ecological aesthetic." (Vidler, 2012) In Asia, the Japanese are leading a public discussion about the need to renegotiate the relationship between architectural design and the natural world. Perhaps the very naturalistic work developed by contemporary Japanese architects - such as Toyo Ito, Sou Fujimoto and SANAA - also fits this categorisation.

9.3.4 Bio-mimicry

One of the most literal expressions of architecture imitating natural forms and systems is bio-mimicry. Until recently, the idea was largely conceptual. However, Michael Pawlyn's practice Exploration, which was set up in 2007, has begun to have an impact, at least on the discussion of intelligent materials. Pawlyn worked with Grimshaw for 10 years and was central to the team that radically reinvented horticultural architecture for the Eden Project in Cornwall. He was responsible for leading the design of the Warm Temperate and Humid Tropics Biomes at the Eden Project and was responsible for developing Grimshaw's environmental management system.

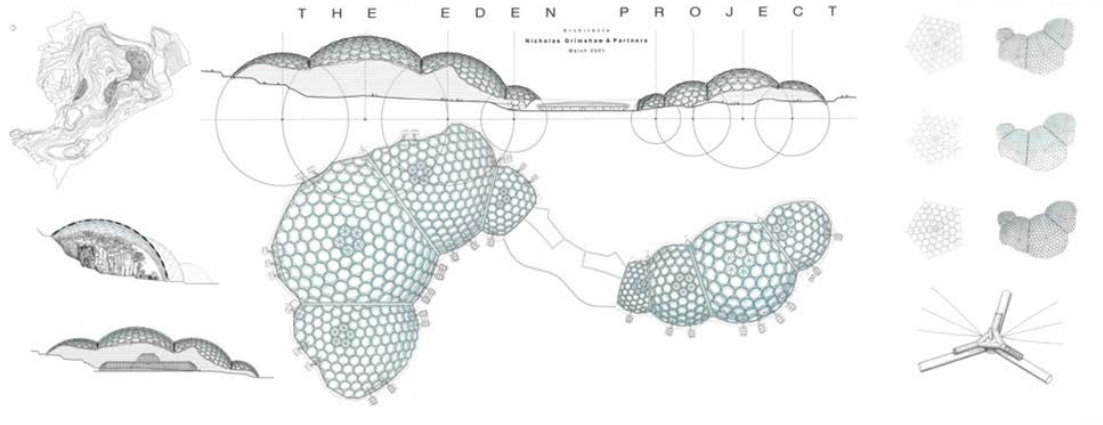


Figure 43 2000 The Eden Project, Grimshaw, Cornwall

Bio-mimicry takes natural forms and structures as the starting point for building form and organisation and studies natural systems for environmental control to provide ideas about passive environmental controls systems in buildings. The Eden Project was modelled on natural forms and the stack effect now used in many naturally ventilated buildings was developed from studies of ventilation in beetle hills. Pawlyn has argued:

There are three key challenges: radical increases in resource efficiency, a move from a linear to a closed loop approach to materials, and moving from a fossil-fuel economy to a solar economy. (Pawlyn, 2011).

Pawlyn describes the challenges facing today's architects as being “radical increases in resource efficiency, a move from a linear to a closed loop approach to materials, and moving from a fossil-fuel economy to a solar economy”. To date, the idea of bio-mimicry has made a limited impact on formal expression in architecture. It’s still relatively rare to find a building programme that will work with naturalistic forms, although small building projects and interiors increasingly look to nature and natural forms for inspiration. Formal concerns aside, Pawlyn's three drivers are often seen as a guide to practice. Even if projects do not formally imitate nature, the idea of project imitating natural processes is strong. So, for example, what Pawlyn describes as the aspiration to “move from a linear to a closed loop for materials” is influencing design parameters and the evaluation of design quality. The re-use of materials, the control of toxic treatment of materials and the consideration of local sourcing all form part of the pallet of aspirations discussed by architects and clients.

In the past decade, the possibility of creating biological building envelopes has seemed more plausible through the development of intelligent skins. And even where the technology does not allow it, the representation of the idea is becoming more popular, in the form of naturalistic

decoration, such as the façade of Mecanoo's Birmingham library or in the structure and form of buildings such as Snohetta's Maggie Centre in Aberdeen, which is designed to resemble a pebble.

9.4 Digital



Figure 44 2018 ZHA Morpheus, Macau

Innovation in computer technology is having a significant impact on the design of buildings and the manufacture and management of construction. Recent developments in artificial intelligence (AI) have raised questions about morality and what makes us human. It is possible to see computing and the natural world as polar opposites, as located at the two opposite ends of the spectrum on the scale of naturalness and artificiality. However, the current discourse on computation and nature tends to look for convergence between natural systems and computational ones, rather than differences. Discussion about digital architecture often strays into the world of the natural and the ecological. The Swiss Pavilion at the 2016 Venice Biennale illustrates this point. Designed by Christian Kerez, an architect who has consistently expressed skepticism about the use of natural analogies in architecture, produced an organic form from computation (Mateo, 2007).

The cloud-like project, named *Incidental Space*, sets out to provoke discussion about how architecture is experienced and produced. The fibre-cement structure is the outcome of a process of making and computation that is self-generating rather than the direct or precise product of the imagination of the architect. Kerez explained: “It was a combination of a physical model and also a very refined technology, and if you look at the result, it is both very sophisticated but it's also very primitive.” For Kerez, this way of approaching design avoids the historical questions of meaning and symbolism. “What we were looking for here is an openness in terms of meaning; it's not a symbolic space, it is not a referential space, it allows you to initiate a pure encounter with architecture”, he said. (Dezeen, 2016).

In the UK, the Architectural Association has been a key player in the development of architectural theory since 1968 (Leach, 2010). John Frazer was developing ‘evolutionary’ architecture from the mid-1990s. Frazer argues that the innovative work was not simply imitating nature but developing models that allowed for the ‘evolution’ of a design using repetitive forms and standard elements (Frazer, 1995). He defines evolutionary architecture as the following: “Architecture is considered as a form of artificial life, subject, like the natural world, to principles of morphogenesis, genetic coding, replication and selection. The aim of evolutionary architecture is to achieve in the built environment the symbiotic behaviour and metabolic balance that are characteristic of the natural environment.” (Frazer, 1995, p. 9)

Frazer’s approach had significant consequences for the architect and our understanding of the design process. Gordon Pask, in the introduction to Frazer’s book, writes: “The role of the architect here, I think, is not so much to design a building or city as to catalyse them; to act that they may evolve. That is the secret of the great architect.” (Fraser, 1995). Martin Weinstock elaborates on how new working methods are evolving that use computers to explore the generation of forms based on engines that are the mathematical equivalent of Darwinian models of evolution. He argues that from this method we are likely to see new architectural forms that have a structural and material behaviour that is derived from the logic of biological systems. These buildings and infrastructural forms will be closely and symbolically related to the ecological systems and processes of the natural world. (Weinstock, 2010)

“Architecture's current fascination with nature is a reflection of the availability of new modes of imaging the interior structures of plants and animals, of electron microscopy of the intricate and very small, together with the mathematics of biological processes. The new emerging architecture that relates pattern and process, form and behaviour, with spatial cultural parameters, offers new behaviours and adaptations to the changing ecologies and climate of the natural world.” (Weinstock, 2010)

Weinstock uses the term 'emergence' to explain how natural systems have evolved and maintained themselves, and suggests that it is an approach that can be applied to artificial intelligence, information systems, economics and climate studies. The AA's Design Research Lab (AADRL) is at the centre of the development of ideas about cybernetics and natural analogies. Theodore Spyropoulos, the director of the lab, is responsible for driving this agenda (see www.minimaforms.com). Colleagues include Gao Yan, Gary Freedman and Robert Stuart-Smith (rs-sdesign), the co-founder of Kokkugia and former employee of Sir Nicholas Grimshaw. Over the past decade, Kokkugia has been a leader "in algorithmic design and a pioneer in the development of multi-agent design strategies for architecture. Kokkugia's recent research include issues of building life-cycle and robotic fabrication." (www.kokkugia.com). Gao Yan is co-founder of dotA (www.dot-a.net), which looks at cutting-edge computation approaches to design agendas. A British-qualified architect who worked at Marks Barfield Architects on REALM (Research in Emergent Algorithmic Modelling), he joined the visualisation company CrystalCG because he is particularly interested in issues of complexity and parametric design.

Today, the AA runs graduate courses on sustainable design, emerging technologies and research clusters looking in detail at the implications of new digital technology on theory and practice. Patrik Schumacher, through both his practice as a director of ZHA architects and as a unit leader at the AA, has made a consistent effort to theorise these tendencies under the umbrella term 'parametrics', which he argues describes what should be the next universal movement to be embraced by the profession. Schumacher's own research work argues that the process of design is transformed through the possibilities generated in computational science. Architects are now in a position, argues Schumacher, where they can test a range of parameters and scenarios as part of the process of design using computers (Schumacher, 2011).

For Schumacher, this marks the start of a new architectural paradigm, that of parametricism, a new -ism to follow modernism and postmodernism. This outlook, which attempts to make sense from the possibilities thrown up by digital technology for architectural practice and theory, is shared by many leading architects and academics, including Mario Carpo in the UK, Picon, Kipnis, Thomas Mayne and Greg Lynn in the US. As the discourse on digital architecture has evolved, it has increasingly been linked to ideas of ecology. According to Douglas Spencer architects and architectural theorists have started to adopt "models of self-organisation, emergence and complexity, endorsed cybernetics, systems theory and ecological thought, denounced the failings of planning in favour of evolutionary paradigms, valorised 'flat ontologies' and enthused over metabolic processes" (Spencer, 2016).

Today, ideas about the convergence of the biological and digital are clearly expressed in AA students' work. The work also seems to draw on the idea of a taxonomy of design solutions, catalogues and displays of repeated images, each a slightly different iteration of the same basic elements forms or volumes, each demonstrating a possible design solution or a single moment in the evolution of a design idea. There is a strong graphic parallel between the presentation of this work and the drawings produced by Ernst Haeckel in the later part of the nineteenth century. D'Arcy Thompson's *On Growth and Form* (1917) is a common reference point for those developing ideas on this subject.

Ben Van Berkel and UN Studio's work is both academic and practical. Van Berkel and his practice partner, Caroline Bos, are interested in design models that, like Schumacher's 'autopoiesis', attempt to identify models for design work that are sufficiently flexible to evolve in relation to new conditions. Again, we see the idea of a way of working with computers that appears to mimic the operation of the natural world. While Michael Speaks, the dean of Syracuse University School of Architecture is very dismissive of Schumacher's attempts to make sense of contemporary design, he describes UN Studio's Design Models as a visionary piece of work that captures the essence of 'design intelligence', the title that he chooses to use to describe the new paradigm.

9.5 Materialism

Writing about the Jade Eco Park in Taichung, Taiwan by Phillippe Rahm, Mosbach Paysagistes and Ricky Liu, Gene King in the *Architectural Review* (King, 2017) asks: "What happens when liquid processes as slippery and elusive as condensation or evaporation are expressed in human thought, and, even more incongruously, in built form?" Rahm's competition entry there was not a single naturalistic rendering in the submission, the images look like energy charts. "The equations and diagrams of physics take on habitable scale at Jade Eco Park." (King, 2017) According to Rahm: "The design composition principle of the *park* is based on climatic variations that we have mapped by computational fluid dynamics simulation (CFD): some areas of the park are naturally warmer, more humid and more polluted while some of them are naturally colder (because they are in the route of cold winds coming from the North), dryer (because protected from the south-west wind providing humidity of the sea in the air) and cleaner (far away from the roads). We have augmented these differences of microclimates in order to increase the coolness, the dryness, the cleanness of the places that are naturally cooler, less humid and less polluted, for creating more comfortable spaces for the visitors." (Rahm, 2017).

In order to create these new climatic conditions, the architect invented a catalogue of climatic devices: (natural and artificial) cooling devices, the drying devices, the depolluting devices. The natural cooling devices are trees with specific qualities for cooling and the artificial cooling devices work using convection, conduction, evaporation or reflection. Anticyclone or Underground breeze is a convection cooling device in which air is chilled by underground heat exchange. Other devices called Night light, Vertical night, Stratus cloud and Blue sky drizzle, Moon light and Long waves filters provide cooling.

Although Rahm's work is about environmental conditions, those conditions are treated as both a scientifically quantifiable resource and the generator of atmosphere, as such they have a material quality, in the same way as Peter Zumthor's work, and his exploration of atmosphere is concerned with materiality. If you look at the work of leading Swiss architects, most notably Zumthor, questions of texture and material authenticity have become central to his most popular pieces of work. An academic interest in Semper – textiles and textures – is evident in architecture schools and design texts. Zumthor, who sits at the far end of the spectrum that can be categorised as 'Swiss architecture', is widely regarded as having popularised the discussion on materiality. Peter Buchanan argues that: "Zumthor is much more concerned than Piano with the depth of relationship, the materials and his craftsman approach to them elicit in us, by stirring emotions, associations and memories." In Zumthor's Bruder Klaus Field Chapel, in Mechernich, Germany, a cone of timber formwork was set alight from the inside to create a stunning, charred black interior of raw concrete punctuated only by a single hole at its peak.

The Herzog and De Meuron book, *Natural History*, which was published in 2005, pays particular attention to the questions of materials in the broader context of a discussion of what constitutes a progressive or forward-looking approach to architecture (Herzog, 2005). The tension between form and materials is central to their work. They have been criticised by some architects, such as Rafael Moneo in his review of the Eberswalde Library, for paying a disproportionate amount of attention to the façade of the building at the expense of the spatial qualities. In response to this criticism, Ursprung argues:

It is precisely the celebration of materials for their own sake that makes for one of the qualities of the spatial logic of the spectacle. Herzog and de Meuron's experiments have precisely the opposite goal: To create forms that make the materials speak. (Herzog, 2005, p. 33).

Herzog and de Meuron understand their work as a reaction to the architectural conventions that began with the Crystal Palace. Ursprung argues, and we can assume that he speaks for HdM, that much of contemporary architecture “functions as a stage set for an aging praxis of representation”. The argument made by Guy Debord that the modern condition of production gives rise to *A Society of Spectacle* (1967) underpins their work; it is a critique of the idea that building programmes can give rise to a particular expression. Hence they choose to name their projects with titles such as ‘house for an art collector’ rather than ‘gallery’. Abstract spatial expression is understood as the creation of spectacle, the production of something ‘empty’ or a void to be filled with things to be consumed.

Somehow a façade in which materials, images and decorative details have been carefully chosen is seen as contributing to public space in a more meaningful way than the iconic and spectacular forms that became popular at the end of the twentieth century. “Herzog & de Meuron’s ‘alternative to the representational system of the spectacle’ is therefore not about anti- or non-capitalist representation (whatever that might be), but rather a form of representation that can cope with the complexity and dynamism of the current situation and is thus, by definition, orientated towards the future”, writes Ursprung.

Herzog and de Meuron’s work is the most explicit expression of an approach which has subsequently become a significant aspect of Swiss architecture. There is skepticism about spatiality and an engagement with materiality that is evident in the work of a number of practices. Tom Emerson of 6a and even Caruso St John are British examples of practices influenced by this culture. Emerson’s recently completed student residence at Churchill College in Cambridge (2018) is a good example of this approach. The external skins are made up of recycled timber giving a building that has been carefully planned to mimic the essential organisational qualities of a Cambridge college - a rustic, raw, wild and dirty aesthetic that appears to have more in common with Cambridge’s postwar brutalist architecture than its older more refined college buildings.

9.6 Ethical practice

“The present historical situation is defined by a complete disconnect between two great alternative narratives – one of emancipation, detachment, modernisation, progress and mastery, and the other, completely different, of attachment, precaution, entanglement, dependence and care.” (Latour, 1993)

For Latour our era is one in which precaution, attachment and care have replaced those concerns associated with liberal democracy, such as freedom, progress and the mastery of

nature. Latour goes on to argue that in this new context, “the little word ‘design’ could offer a very important touch stone for detecting where we are heading”. Since the 1980s, architectural theory has developed a distinct relationship to practice. In the latter part of the twentieth century, theory evolved as a tool for ‘reading’ architecture as a cultural product as much as it a tool for thinking practitioners. While analysis of building in a broader social context makes an important contribution to cultural life, the shift has had a negative impact on the perception of theory in much of practice. More recently, academic institutions concerned with architectural theory have attempted to bridge the gap between theory and practice by giving a greater status and theoretical value to practical work, hence the title of the 2015 AHRA conference, *This Thing Called Theory*.

In the past decade, a significant gap appears to have developed between theory and practice. While practice is often understood as increasingly pragmatic, some areas of academia seem ever further removed from the production of buildings. Schools of architecture remain training facilities for architects and are largely concerned with the practical questions facing the discipline, but theory is more closely aligned with the research agendas of the wider academic institutions and, as such, has gained the reputation for being narrow and or remote.

Buchanan imagines that he speaks on behalf of a generation of architects and scholars when he says: “We desperately need to regain a sense of connection to and relationship with our surroundings and the planet.” This idea that the Modern Movement was responsible for the severing of a strong 'connection' between building and environment is not necessarily new. Hagan suggests that it can be found in a great deal of the literature on this subject even as far back as Banham’s position articulated in *The Architecture of the Well-Tempered Environment* (1969) (Hagan, 2000). The environmental question appears to provide an avenue through which architects can explore what it means to be ethical and ‘connected’.

The ecological and the ethical are terms that are increasingly linked. The most common was in which architects are deemed to be ethical is if they designed buildings that produce a minimal impact on the planet. One of the most high-profile strands of thinking is the movement that links waste and recycling to the energy discussion. Since 2000, the idea of Cradle to Cradle development has been successful promoted by McDonough and Braungart. According to Ingersoll, McDonough and Braungart and the cradle-to-cradle movement mark a distinct departure from early explorations of organic and natural architecture: “Designers need to keep separate the things that work biologically as ingredients of the biosphere and those that belong to the technosphere. While buildings can copy the natural processes of growth, breath, and

photosynthesis, they should also provide for the containment and reuse of their inorganic components.” (Ingersoll, 2012, p. 575)

This approach, an accounting of resources, is much more akin to early ecological discussions on scarcity of resources than to explorations of naturalistic form or imitation of nature. Cradle-to-Cradle buildings are not aesthetically naturalistic, but operationally ethical. Alongside a technical approach concerned with energy use and waste, there has been a growth in the number of young practices interested in what is often described as social sustainability. A form of activism has developed that combined local low-energy projects and community participation. In the UK, this work has in turn given rise to the formation of new types of ‘ethical’ practice.

One of the clearest expressions of the idea that the architectural profession should adapt its working practices to address ecological questions and adopt an ecological approach is the work of Rhyzom (www.rhyzom.net). Rhyzom was formed in 2009 by Atelier d'architecture Autogérée (Paris), Platforma Garanti Contemporary Art Center (Istanbul), AGENCY (Sheffield), Paragon Studios Ltd (Belfast) and Public Works (London). It is described as a “European interdisciplinary network which constitutes a cultural platform for mutual learning, support and trans-local dissemination”. It received support from the European Community in 2007 and since 2011 has been running under the umbrella of the Eco Nomadic School, researching self-managed farms, eco-villages, intentional communities, eco-networks and Transition Towns. The stated ambition of the project is to understand cultural production at a local level looking at “eco-cultures, local skills and alternative economies, traditional practices and cultures of resilience, rural/urban exchanges”. One of the most high-profile projects associated with the group is the Colombes project in France. In Colombes, a post-industrial settlement in central France, an urban agricultural project, called R-Urban, was the starting point for a number of ecological/architectural interventions. The ‘R’ in R-urban stands for resilience, but also recycling, etc. and it is a reminder that it is no longer possible or desirable to understand the world as divided into rural and urban settlements as the pattern of development is far more complex.

Doina Petrescu of Atelier d'Architecture Autogérée (AAA) was one of the initiators of the Colombes project. She describes R-Urban as an attempt to create “self-managed collective hubs” as part of a broader network. She believes these hubs will “host economic and cultural activities and everyday life practices that will contribute to boosting somehow the capacity and the resilience within the neighbourhood.” (AHRA 2016). These projects assume an open-

source framework and active participation by local people. They are interested in practices “which activate new types of socialites, alternative economies and ecologies, practices that are concerned with commons and communality, with the collective production of knowledge”. The vocabulary used in the texts accompanying and describing these projects draws heavily on the ideas of Deleuze and Guattari. So for example, R-Urban in its name makes the argument put forward by Guattari in *The Three Ecologies* (Guattari, 2008) that we can no longer make a distinction between the urban and the rural.

In the UK, academic projects, such as the SCIBE project on scarcity, have also explored the ethics of contemporary practice. Till writes, in relation to economic crisis, that “when hyper-capitalism hits the buffers, when the flow of commodities is staunched, buildings are subject to exactly the same measures as the other aspects of the economic world: reduction and control ... Most radically, scarcity upsets presumptions of the primary role of a designer.” (Till, 2012) As far as Till is concerned, scarcity provides the opportunity to re-imagine design not as the process of making new stuff in order to sell it, but in possibly making less stuff, in being more frugal and efficient in our creativity:

Scarcity challenges the very ineluctability of growth, and with it the premise of adding more stuff to the world as the sole purpose of design. Scarcity therefore strikes at the heart of normally received versions of design, in which innovation and creativity are announced through the production of the new... Scarcity opens up new fields in which design may operate, but only if one relinquishes the attachment to the object as the sole site of creativity. (Till, 2012)

A UK practice such as Assemble, which won the Turner Prize in 2015, is a good example of this approach. Assemble are interested in social sustainability – their work is more about process than product – although their buildings have a distinct aesthetic quality. Alongside Assemble, practices such as Architecture Zero-Zero (www.architecture00.net) attempt to address the nature of a professional service and its position of privilege by getting involved in projects like Wikihouse, an open-source project for designing and building houses.

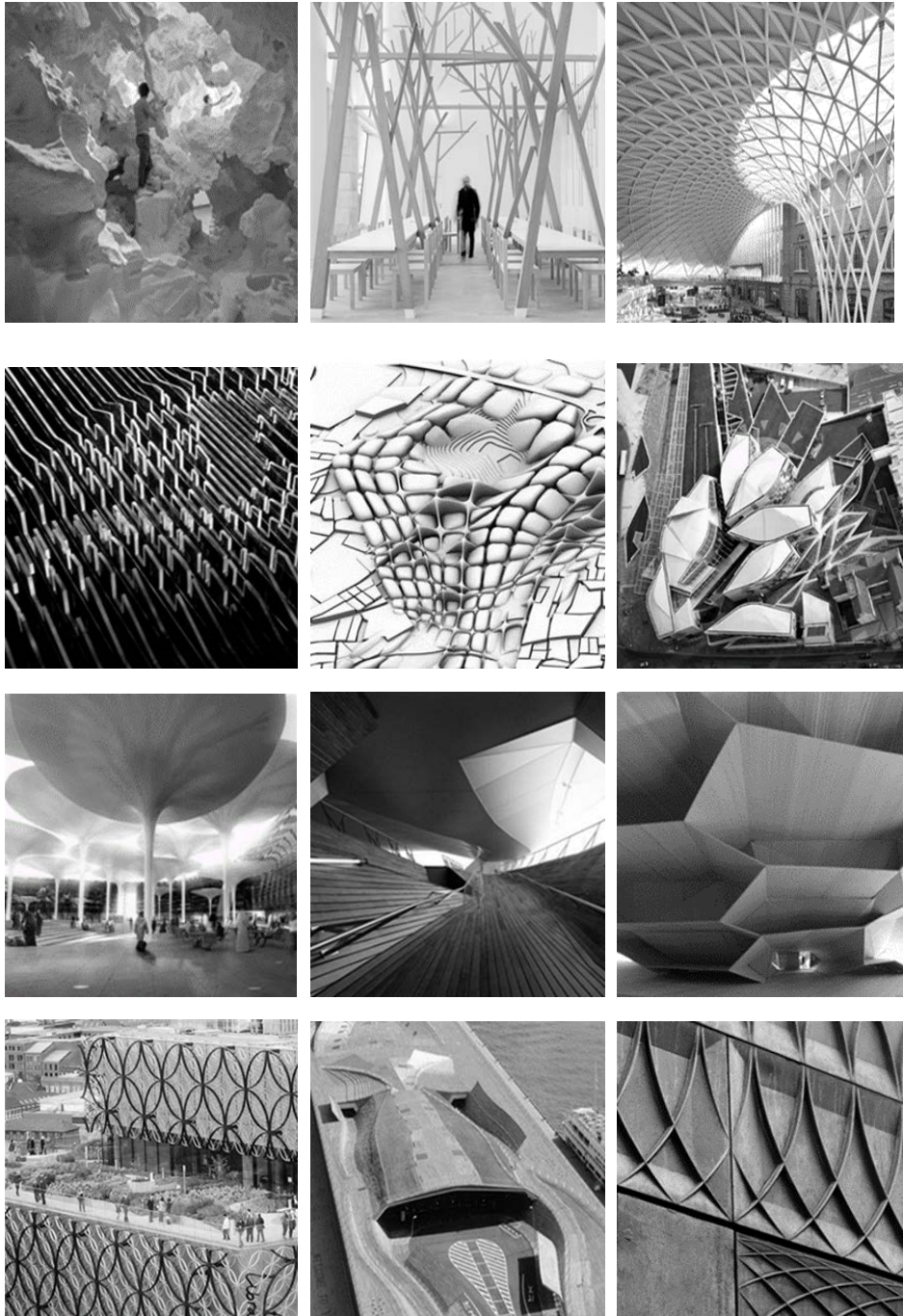


Figure 45 Naturalism in contemporary architecture, Images from projects described in text including; Christian Kerez Incident Space 2016 Venice Biennale, Cloud by Christian Kerez at the Swiss Pavilion at the Venice Biennale 2017. Photography is by Oliver Dubuis. One North Masterplan ZHA 2001-2021 Singapore (ZHA architects). ZHA Kartal Masterplan Istanbul Turkey 2006(ZHA architects), Granada Performing Arts Centre Kengo Kuma Architects(Kengo Kuma architects), Masdar Foster and Partners (Foster and Partners), Yokohama Ferry Terminal FOA(interior and exterior), Cantina Galicia in Cidade da Cultura de Galicia, Studio Nomada 2010(Dezeen) Scottish Parliament EMBT/RMJM 2004. Birmingham City Library by Mecanoo (2013) <https://www.mecanoo.nl/Projects/project/57/Library-of-Birmingham>, Kings Cross Station, London, 2012 by John McAslan+Partners. Image from John McAslan and Partners website www.mcaslan.co.uk/projects/king-s-cross-station. Paul Smith, London (2013) by 6A Architects (6A Architects <http://www.6a.co.uk/projects/selected/paul-smith>).

10.0 Ecological impressions

This chapter reviews the findings of the research undertaken and looks at the role of ecological thought in the wider discourse on the discipline of architecture and the future of the profession. This study set out to better understand the idea of ecology, its popularity and impact on the architectural imagination today and at specific historical moments in the past. The aspiration was that a better understanding of one of the key components of current thought might throw new light on today's architectural theory. The main value and contribution of the study is that it brings together material from a range of different sources in an attempt to provide an overview or 'big picture' of related, but distinct architectural ideas. I have drawn a big picture in words and attempted to map the relationship between ideas in a series of diagrams. The main diagram is included at the end of this chapter.

Perhaps the most significant insight of the study is that the biological or naturalistic imagination is never far from the surface of architectural thought. Even when architecture was at its most mechanical and scientific in the immediate postwar period, architects were drawn to the natural world as a source of ideas whether conceptual or practical. The idea of the organic metaphor in the work of Team 10 is an area that requires greater attention. The link made on the research between the idea of 'social ecology' put forward by Gutkind in London in the 1940s and the outlook of the Smithsons and others in the 1950s is a new connection not identified in any of the histories reviewed.

However, it is also useful to remind ourselves that the writing of the history of architecture at any moment in time is as much an unconscious record of our cultural values as architecture.

The birth of 'the environmental history of architecture' during the course of this research project is interesting, but such a history should be approached with caution. While we can trace certain strands of ecological thinking in the writing, and even the work, of some architects and historians, it is not always the case that an absence of a subject from the historical record means the subject has been overlooked. For this study, I looked at a great deal of architectural theory and history produced in the period from 1980 to 2000 for references to the environment and in all that discourse, there was very little of substance written about the environment, ecology and architecture. Architectural theorists and historians were preoccupied with our relationship to modernism and history. Perhaps they were attempting to go to battle in proxy wars to address critical questions of the present about the relevance of architecture in the postmodern world.

This study doesn't explain exactly why that happened, but it does suggest that architecture as a public art is inclined to follow the mood of society at large and its patrons in particular. Architecture, as discussed by Arendt, fulfills more than one role. It is important in its role of delivering permanent and familiar conditions, and it is also important in helping us to conceptualise change. The appropriateness of each approach must be measured against the character of the time, and really great buildings are often responding to both impulses simultaneously.

The discipline contains many different types of individuals fulfilling different roles, but within the arena of theory, we can say that the process of making sense of architecture and its relationship to society tends to take one of two approaches: it is either about sustaining and supporting a particular approach to design or it is about transgression and innovation. There are those that try to locate architecture within its context and focus on understanding the work in its own terms and there are those that believe that architecture has a capacity to be transformative or even transgressive. Some contemporary theorists such as Spencer extrapolate from this to suggest that we can talk about radical and progressive theories of architecture and reactionary and neo-liberal ones. This attempt to align approaches to design innovation with politics rarely helps us understand the development of ideas.

Given architecture is a discipline that allows us to explore how we might live and how we might live together and to propose different solutions to these questions, it inevitably suggests a degree of agency about our place in the world and our quality of life. What is critically important at the present moment of time is that sense of agency. Spencer correctly cautions that the rise of the digital and Deleuzian discourse in contemporary practice might undermine the sense of the architect as someone that can direct and refine decision-making. However, it might just as easily be argued that the ideas emanating from the eco-critical, left or feminist branches of architectural theory are also contributing to the undermining of a sense of agency within the profession.

What happened to ecology after the publication of Banham's *Four Ecologies of Los Angeles*? It slipped off the architectural agenda, but perhaps not because, as Jencks suggests, corporations were more interested in profit and winning votes. Rather, the very opposite may be true: that ecology had been co-opted by the government, particularly in the USA. As a consequence, it could no longer perform a function as part of a radical critique of society. Perhaps particular strands of architectural theory are largely driven by a critical outlook, as Nesbitt suggests. Perhaps postmodernism and modernism have remained at the core of architectural theory for 30 years after the end of modernism because there was a strong element within academia that felt the need to defend the modern.

The re-emergence of ecology today in architectural theory could be read as an expression of a number of different cultural developments. Most significant is that ecology is closely aligned with aspects of philosophy and political thought that could be lumped together under the umbrella of post-humanism. At the moment, post-humanism is an expression that only makes an appearance in theory texts that are a long way removed from the day-to-day concerns of practice. However, ecology is cropping up all over the place, firing architectural thought, planning discourses and building proposals. The impact of the post-human element of ecological thought is the one that needs most careful attention. A new understanding of subjectivity and creativity does have implications for the architect and architecture.

The final section of the study will look at the current discussion among theorists and practitioners about the purpose of the discipline and the role of the profession. It will look at the idea of

the expanded field, the sense that the discipline of architecture can and should extend beyond its existing boundaries. It will look at the place of humanism within architectural conventions and the consequences of its demise, and it will look at the nature of new approaches to subjectivity and identity, and how they might influence the profession.

10.0 Impact of ecological thought

10.1 The expanded field

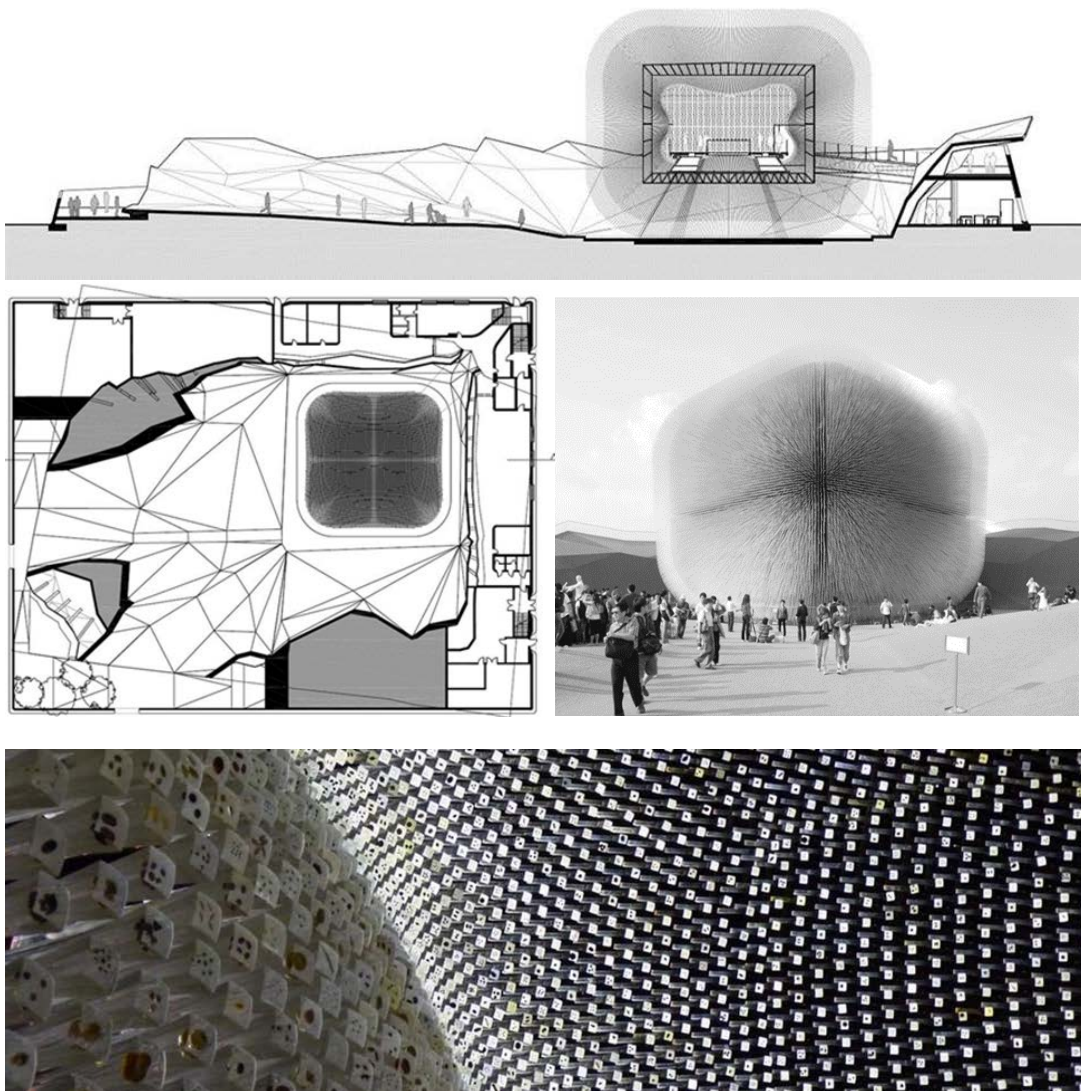


Figure 46 2010 Heatherwick, Seed Pavilion, Shanghai,

The boundaries of the discipline of architecture have ‘expanded’ over the past two decades (Vidler, 2004). The use of the term ‘ecological urbanism’ to discuss city design in its widest possible content is significant. Richard Corner’s written work and his landscape practice (in particular, the High Line) has had a significant impact on the way in which we think design at an urban scale. The extension of the discipline to include large-scale urban design and landscape infrastructure projects in both the West and Asia has led to the development of a range of new concerns and skills within the discipline from hydroponics to GIS.

Designers such as Thomas Heatherwick, Patrik Schumacher and Rem Koolhaas exhibit a wide range of skills not normally associated with the architect in the realm of landscape, digital and research, politics and sociology. A shift in scale and an interest in interdisciplinarity has led to a blurring of our understanding of what we mean by architecture. Peter Cook’s belief that ‘everything’ is architecture (Wallenstein, 2016), which would once have been considered a radical position, has a broader purchase in the profession today. The interdisciplinary character of ecology sits comfortably within this understanding of the discipline and has provided the vocabulary for some interdisciplinary discussions.

One illustration of the shift in the discipline can be found in the way that the AA’s former director, Brett Steele, described the school in 2011:

“In a world where the future itself seems both more immediate and less knowable than ever before, architecture finds itself at a crossroads ... Architecture is experimentation ... is learning and the pursuit of new and unexpected ideas... is only ever understood in relation to an imagined future...Central to our ethos is that we teach architecture not as it is already known, but rather in the image of what it may yet become.” (www.aaschool.ac.uk and www.aalog.net).

The sense of a discipline that is open and unbounded is clearly articulated and it’s an attitude that is evident in the interview with Anthony Vidler at the Cooper Union, in which he argues that the main challenge facing architecture is the diversity of the profession rather than any single intellectual battle (Vidler, 2012).

10.2 Changes in the profession

The emergence of ecology has been closely connected to the discussion about the future of the architect. In much of the literature, the two issues are entwined alongside broader discussions about technology and procurement. James Wines’s argument that environmentalism provides an opportunity to rediscover architectural values following the loss of the profession’s philosophical and artistic ambitions has been explored in earlier chapters (Wines, 2000).

The architectural profession has been changing throughout its history (Crimson & Lubbock, 1994). The shift from a gentlemanly pursuit to a global business was marked most explicitly when, in 1978, the RIBA lost its fight with the Monopolies and Mergers Commission and had to drop fee scale and allow advertising. Changes in the structure of the construction industry and its funding and changes in the character of the property market and the process of procurement have led to a change in the status of the architect. On the one hand, good design from high-profile architects is seen to add value to notable buildings. On the other hand, most design teams are now led by project managers rather than designers and most procurement begins with developers and their financiers, not end-users or clients. Many medium-sized practices in the UK were already suffering as a result of these changes even before the crash of 2008 and the subsequent thinning of the profession (Architects' Journal, 2018).

The character of Howard Roark, the arrogant and paternalistic architect played by Gary Cooper in the film version of Ayn Rand's *The Fountainhead* (1943), remains a reference point in the discussion about the future of the profession. He is the caricature that the profession longs to shake off, but in reality the 'Roark individual' is something of a straw man. The creative genius with a mission to modernise and an overbearing will is hard to find in today's practice; what is more palpable is a sense that the profession lacks an alternative to the moral imperative evident in Rand's unlikeable character.

Michael Speaks articulates the mainstream view on architectural heroism: "Though we live in uncertain times, one thing is certain: contemporary architecture is not driven by visionary ideas heroically realised in visionary form. Instead, contemporary architecture is compelled by the need to innovate, to create plausible solutions to problems that have been stated but whose larger implications have not been formulated. This can be accomplished by intelligence," (Speaks, 2010). Speaks's approach is demonstrated by Gary Freedman, the co-founder of SHaGa (www.sha-ga.com), a London-based office run on an 'informed design approach', who describes his work as the output of 'constructive collaborations' from within a network of building and urban specialists' specific expertise.

This pragmatic sentiment is often combined with a belief that the environmental question might provide the profession with a new focus. In *Ecological Urbanism*, Sanford Kwinter writes:

"Our historical cultural relationship to our environment is poised to transform significantly over the next short period of time." In the face of the 'unprecedented challenge' of the environmental crisis, he suggests that the 'design community' might "serve as an organising centre for the variety of disciplines and systems of knowledge

whose integration is a precondition for connecting them to clear political and imaginative and most important, formal ends.” (Mostafavi & Doherty, 2010, p. 105) Kwinter’s fellow academic, Preston Scott Cohen, is more explicit and critical. He argues that “the abundant literature on sustainability rests on the moral imperative provided by the current environmental crisis, which sets, as in Greek tragedy, the finitude of natural resources against the dismal and infinite cycle of human production and consumption. From this agon emerges the quest for a responsible architecture.” (Mostafavi & Doherty, 2010, p. 136). Cohen's assertion that environmentalism provides a moral imperative for a new ethical architecture is supported by many others with differing degrees of self-consciousness.

There are those that argue that ecology, in particular, provides a moral imperative in a manner that is more open and flexible than the idea of sustainability. In 2012, Roberto Bottazzi reflecting on an event at the AA in London and the fall from favour of the term sustainability wrote: “Today, we feel more comfortable with broader notions such as ecology; that is, we prefer more expanded concepts that allow us to think of these issues in more cultural or even metaphorical terms, beyond the more immediate technical challenges they may pose.” (Bottazzi, 2012)

Bottazzi argued that the opening up of the discipline to new fields such as ecology was a symptom of the profession’s quest for a new approach that could inspire theory and practice (2012). The search for a form of environmental thought that is open and flexible is echoed by other architectural theorists. Hagan describes ‘ecologism’ as “a new metanarrative has risen out of the ashes of postmodern relativism” and has “come to dominate conceptual models in the sciences, social sciences, cybernetics and urbanism”. She argues that ecologism has provided practitioners with an ethical and practical framework within which to act. She identifies a ‘new’ version of materialism, founded, not on Marx, but on an ‘ecosystemic’ or ecological view of nature (Hagan, 2015, p. 4).

This new sense of professional purpose, which has been called the ecological imperative sits alongside a broader ‘moral imperative’ relating to the people of the less-developed world. However, where in the past the outlook of Western architects was to assist in the modernisation of less-developed societies, the focus of attention is now on what we can learn from the spontaneous and autonomous urban forms that are developed as a result of scarcity and disaster. In the absence of a modern property market and an active legal system, the way in which people live together is regarded by some as a model for how we might design in the West. This romanticised view of the slum as providing the conditions for vital creative activity forms part of the broader discourse on urban ecology.

In *Notes on the Third Ecology*, Sanford Kwinter (2010) looks at the informal economic and social networks operating in the slums of Mumbai. For Kwinter, the spirit of ‘connectedness’ in the Dharavi slums is ethically superior to the mechanistic operations of the post-Enlightenment society. He describes life in the Dharavi quarter as being part of “an ancient ecological and urban web”. In 2012, journalist Justin McGuirk won a Golden Lion at the Venice Biennale for his exhibition about the Torre David in Caracas, Venezuela. Photographs by Iwan Baan showed the 3,000 squatter residents of the 45-storey skyscraper that had been abandoned following the death of the developer. The squatters’ autonomous activity and makeshift infrastructure is indeed a testament to the human resilience, but McGuirk suggests that it might also be a model for a new architecture (McGuirk, 2015)

In 2016, when Alejandro Aravena, the Chilean architect, was selected to curate the Venice Biennale, the president of the show, Paolo Baratta, argued that Aravena might be best placed, through his work on low-cost self-build/extend housing, to close the ever-widening gap between the profession and civil society (<https://www.dezeen.com/2015/07/20/alejandro-aravena-named-artistic-director-2016-venice-architecture-biennale/>). In this case, the vitality of the Chilean people - as much as Aravena’s design talent or procurement innovation - had become a source of inspiration (some might say cultural envy) among politicians and architects in Western Europe.

In the 1960s, Jane Jacobs and others defending the richness and diversity of urban life were dubbed ‘slum romantics’; today, the interest in the complexity and diversity of the city and city life as opposed to buildings sits happily alongside mainstream planning theory and policy (Jacobs, 1961). The idea of an ‘ecological urbanism’ that is attuned to the ‘natural’ and systemic workings of the city, as opposed to the conventional and mechanistic approaches of the technocratic planning systems, is having an impact on the way in which the profession behaves and is valued. The role of the architect, as discussed in the section on Deleuze and Guattari, is understood as a facilitator or urban therapist rather than someone making plans on behalf of others. This new professional, whether architect or planner, is seen as being more attentive to the wishes of the local population. Whether this constitutes an extension of or a diminution of democracy is the subject of a much larger debate which is starting to be addressed by architectural thinkers and philosophers such as Jodie Dean and Agamben.

10.3 Subjectivity and post-humanism

Perhaps the most significant manner in which the discipline has changed is in the rejection of humanism. This process has taken place unconsciously and has passed by with very little comment. Classicism may have been brushed aside by the modernists, but Le Corbusier's *Modulor* was a reminder that the intellectual foundation of the discipline lay with the core values of the humanist renaissance of the thirteenth and fourteenth centuries. Postmodern architects were interested in form, proportion and the convention and it seemed that there was no need to explicitly deconstruct the basic humanist principle that had underpinned the discipline for centuries. At a rhetorical level, the postmodern architect and theorist criticised the humanist meta-narrative and poked fun at the idea of the 'masters' and the 'canon', but the body remained 'the measure of things'. The emergence today of ecological thought and post-human philosophy, which is an explicit and codified rejection of the values of humanism, may have consequences for the way we discuss the fundamentals of the discipline. The full-blown rejection of humanism will eventually impact on the way we teach early history and basic design principles. Of course, it's already the case that many schools of architecture have abandoned the teaching of classical architecture and proportion in favour of thematic studies, and the study of the human body is often now about human comfort rather than looking at the human form as a guide to proportion or scale. However, post-humanism may have a more radical effect.

One explicit example of this change in thinking is the invention of 'ecological spatiality', in which entities do not exist 'in' space but create their own space. Peter Sloterdijk and Latour's explorations of ecology and philosophy through sphereology and Actor-Network theory lead to a new understanding of space (Giraud & Turnheim, 2014). Giraud and Turnheim note: "It is only once space has been freed from any notion of exterior and containment, and only once all entities have been released from their referential frame and all things have been flattened onto the infinite manifold of relations, that a true ecology – understood as a logic of habitation – can be articulated." (Giraud & Turnheim, 2014) For Giraud and Turnheim, ecology changes the relations between humans and between things. We no longer act on the world, but exist as a collection of elements within this complex mesh of relations. This change in the way we understand the world has a consequence for the way we think about buildings and how we make them. In this particular case, space is no longer something that we produce as part of a formal composition. Ecological spatialities are the outcomes of entities generating their own

space according to their own parameters. As a consequence, the architect needs to rethink his role as a designer.

This sense that ecology changes the rules of the discipline is evident in a great deal of contemporary literature. Such a philosophy or view of life might make, or appear to make, the teaching of conventional classical or humanist ideas of proportion and scale irrelevant. In *The Three Ecologies*, Guattari talks about the possibility of ecology giving rise to an ‘ethico-aesthetic’. Buchanan describes the development of ecological thought as the ‘exciting gift’ from sustainability to architecture. Buchanan believes that sustainability gives architecture, providing “purpose and dignity as it addresses very real and urgent issues so that after a couple of decades of wallowing by some of its most influential figures in fashions of form and theory, it will once again inspire influence in the shaping of our environment and culture” (Buchanan, 2011). The linking of ecology, ethics and aesthetics suggests that ecology may provide a mechanism for a reconsideration of the purpose of architecture. These changes are not insignificant; the emergence of ecology and ‘ecosophy’ provides a mechanism through which the role of the architect, our understanding of design and the purpose of the discipline might be redefined. Central to this thesis is the argument that human history must be reframed. Humanity’s wellbeing is no longer understood to be provided by material progress and personal freedom, but on the idea of accommodation to natural constraints.

Latour’s analysis of today’s conditions has a significant impact on those writing about ecology and architecture today. He characterises our world as one in which dependence and care are in the process of replacing freedom and detachment as core social values. “The present historical situation is defined by a complete disconnect between two great alternative narratives – one of emancipation, detachment, modernization, progress and mastery, and the other, completely different, of attachment, precaution, entanglement, dependence and care.” (Latour, 1993)

Thinkers such as Latour, Braidotti and, in the architectural realm, Rawes, are not pessimistically describing a world in which there is no sense of collective life, they just don’t see human collectivity as something fixed or intuitionally recognised and codified in terms of individual rights. For them, the post-human subject is engaged in ‘relational ethics’ and looks at the future as the ‘collectively shared project of becoming’ (Rawes, 2013, p. 37). Braidotti argues that we gain freedom through understanding our bondage. These sentiments are reflected in an ecological outlook based on endurance rather than mastery, and ethical practice in everyday life provides the key to a sustainable future rather than a plan (Rawes, 2013). This kind of approach to living and economics informs many of the small-scale participatory or

community projects being led by architects across Western Europe and the USA. Is it likely to inform the work of larger practices?

It's hard to say, but as James Wines suggests, "the rapidly growing field of eco-psychology is displacing this limited perspective through the realisation that mental disorders are frequently the consequence of humanity's alienation from nature" (Wines, 2000, p. 26) Guattari¹ argues that psychiatrists should be operating like artists and perhaps, in the near future, the role of the architect will be to provide a relationship to nature, or even comfort as much as shelter.

Guattari provides us with an insight into the post-human self, a self that is constructed through its environment. In his writing, there are echoes of the Frankfurt School's critique of market relations and its tendency to create cultural conformity, monotony and sameness. The culture of capitalism (Global Capital) is deemed by Guattari to mirror the mechanistic character of production. Under such conditions, the Enlightenment or modern individual, with a sense of free will, cannot survive except as an ideological construct of liberalism (Guattari, 2008).

In our new culture, the idea of transformation associated with modern subjectivity is replaced by transgression. Rather than demanding transformation, our daily activities become a means to assert our diverse identities, lifestyles, and microeconomic choices. Rawes describes this as reproduction or housekeeping (Oikos): small acts in everyday life. It's the polar opposite of what Hannah Arendt understood as public or active life in *The Human Condition* (1949). These transgressions form the basis of contemporary freedom, the freedom to choose how one is seen, what one is called and what to consume. In this post-human world, the political activist stands for diversity and against efficiency and rationality in public life. A new subjectivity gives rise to a new politics, suggests Rawes (Rawes, 2013).

The post-humanist rejects the Enlightenment or Cartesian conventions of duality and at the same time the idea of the dialectic or struggle. So in response to the 'aggressive oppositional' approach associated with traditional Western philosophy, Rawes proposes a less oppositional approach. This approach is not passive or fatalistic, she argues, but provides the basis for a solution rather than a critique. In this new paradigm, a conventional sense of agency is replaced by an ethical approach in which diverse individuals and groups co-exist. The idea is reflected in the concept of the 'common', which has become a popular expression in architectural discourse since it was used by David Chipperfield (and Pier Vittorio Aureli) in the title of the Venice Biennale 2014.

At present, this rather obscure discussion rehearsed in the informal European journals of the profession seems to be far removed from the experience of practice, where architects appear to be struggling on a daily basis to assert their authority in the face of a range of economic and political forces that make design considerations a low priority.

10.4 Environment by design

In conclusion, it is worth reflecting on the role of the architect in public and political life. Latour's "political ecology of collectives consisting of humans and non-humans" suggests a very different approach to our understanding of the act of design and, by implication, rights and political action. As Penelope Dean says: "As architecture continues to be a target of environmental reform, the ambitions of the discipline have shifted from a modernist notion of being able to design the environment to a subservient role as part of the environment by design." (Dean, 2009). What Dean seems to be suggesting is that the very concept of design, and alongside it agency, is being reimagined in the current environmental debate.

The veteran ecologist Tony Fry in *Design as Politics* (2010) looks at the inability of today's politicians to deal with sustainability. Fry argues that humans have created a 'world within a world' through design and, as a result, we have set ourselves apart from nature and become susceptible to the mantras of productivity and economic growth. The solution, says Fry, is to reject "failed political ideologies"; the book proposes a 'post-democratic politics'. In this, design occupies a significant role, as a 'vital' form of political action in an 'age of unsettlement'. Latour argues that design could offer an important touchstone for the future. The more we think of ourselves as designers, the less we will feel the compulsion to modernise, he argues. For Latour, design has replaced the word revolution. "To say that everything has to be designed and redesigned (including nature), we imply something of the sort 'it will neither be revolutionised, nor will it be modernised'." (Latour, 2008) As such, design is reimagined as a means to refine social life while maintaining the status quo.

The development of 'micro-practice', or small-scale community projects focused on creating local productive landscapes, may be read as part of this 'post-democratic landscape'. Michael Speaks consistently argued that 'post-vanguard practices' give rise to 'design intelligence' and were better able to adapt to the highly contingent environments heralded by the new millennium. The idea of 'urban agricultural' and vertical infrastructure opens up the possibility of a more adaptable and self-sufficient lifestyle. This new approach to urban life

demands a different contribution from the architect, whose role is not to make big plans, but to provide the framework to facilitate participation. This architect might be less concerned with imaging new spaces and more concerned with the engineering new lifestyles.

10.5 Conclusion

The ambition of this research was to identify some of the core themes and ideas underpinning ecological thought and to consider how those themes influenced architectural thought and practice. What became clear was that the relationship between ecology and architectural thought has taken different forms at different moments in history. This research project has proved to be genuinely interdisciplinary; demanding an engagement with history, philosophy, environmentalism and architecture.

The research has only scratched at the surface of the material available on this subject but it has succeeded in establishing a framework through which to think about these intersecting subject areas. The study provides a critical starting point from which to revisit the key historical periods and investigate the meaning and impact of one specific set of ideas and their impact on the discipline. Given that this is a new area of study, the ability to identify specific periods of activity and the nature of the impulses driving them contributes to the evolution of a more nuanced picture of architectural ideas in the second half of the twentieth century until today.

The study identified three particular moments in the last century and a half when ecological thought seemed to exert its most significant influence on the architectural imagination. By using ideas from the history of environmental thought, a young discipline, in parallel with ideas from architectural history, the author was able to identify key periods; ‘Emergence’, The Age of Ecology and ‘The Ecological Turn’ when there was a significant discourse about ecology among architects, educators and theorists.

‘Emergence’ describes the period when ecology became a biological discipline and a political position at the end of the 19th century. The ‘Age of Ecology’ in the late 1960s and early 1970s was the period when ecology formed part of the highly influential radical movements in the USA and in Europe. In this period the idea of ecology was adopted by architects and writers that were keen to locate or understand architecture not as the production of single buildings, but as part of a bigger picture whether that be an urban plan or another system or network. Throughout the second half of the twentieth century the interest in ecology and ‘systems thinking’ enabled architects to engage with both the new computer technology and emerging social mobility and welfare reforms. Thirdly the research identifies the present period, which began with the rise of a new wave of sustainable development policies after the end of the Cold War (1989) and has emerged in the past decade, as a fully-fledged

environmental consciousness or ‘The Ecological Turn’. This framework provides a new way of looking at the immediate past and develops upon the work of modern and contemporary historians but takes us beyond the simple binaries of ‘modern’ and ‘post-modern’ to a new territory which has been dubbed ‘post-human’.

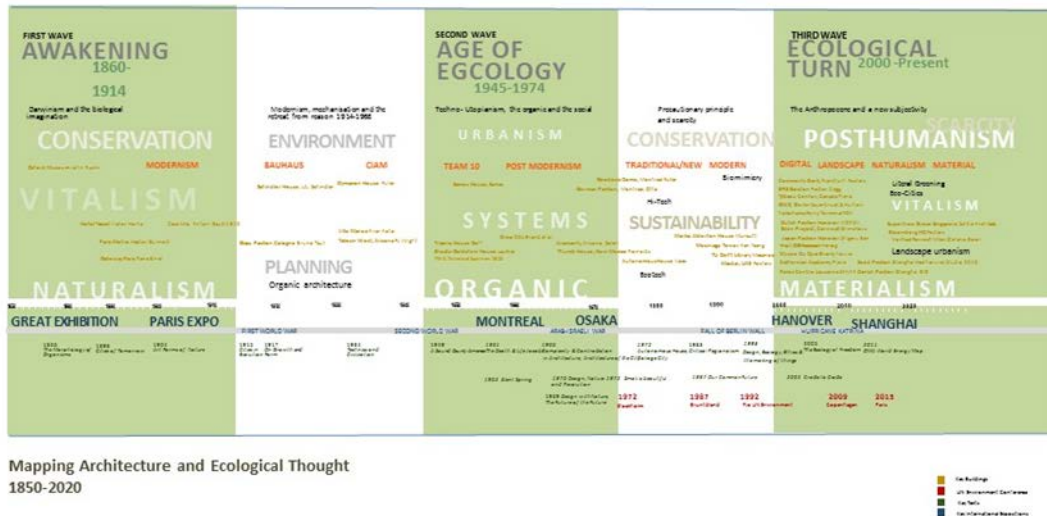


Figure 47 Mapping document produced by author 2019

In addition to providing a historical framework for making sense of the relationship between ecological and architectural thought, the study has attempted to deconstruct the idea of ‘ecology’ and to clarify some of the meaning behind the biological and political aspects of the idea. Having identified the periods when ecology is at the forefront of the public and architectural imagination, the study attempted to identify reoccurring themes within the ecological discourse. Three reoccurring themes have been identified as naturalism, vitalism and materialism. These themes provide a framework for thinking about theory and architectural production in the present.

For the purposes of this study naturalism describes an outlook in which the social and material world is understood as an expression of nature and natural processes. Vitalism addresses an atavistic outlook in which the idea of ‘life’ becomes an alternative to ‘spirit’ or ‘agency’ and all living beings are valued in relation to this life force. Materialism describes an intellectual approach which derived meaning from an appreciation of experience and the sensual rather than abstract or conceptual thought. This ‘new materialism’, which is evident in a variety of art forms, explicitly rejects the fact-value distinction associated with the social sciences. It aligns with strands of new philosophical thought which are attempting to make sense of the environmental crisis such as the work of Tom Morton.

There is a wide range of other ideas that have developed with the evolution of ecological thought; ideas about trade and globalization, systems thinking and computation, environmental complexity and the interdependency of living things. All of these ideas are giving shape to today's architectural imagination in the same way that mechanisation and urbanisation informed the development of design thinking at the start of the Twentieth Century. Within 'ecology' it is possible to identify a complex array of meanings and to map how these meanings have been adopted (consciously or unconsciously) by architects. In conclusion we can see that ecology is a very flexible idea which is used across a range of disciplines and political beliefs. As such ecology is well suited to our current age in which interdisciplinary thought is highly valued.

There are some aspects of ecological thought that were evident in the work of Haeckel and are still discussed today. An enthusiasm for naturalism and a concern about resource depletion are aspects of today's environmentalism, but there are also strands of ecological thought that are quite specific and relate to broader cultural trends. Attitudes towards the future, progress and growth have changed significantly over the past 150 years. Concerns about the unintended consequences of economic and social development have always been expressed, but the significance and weight of those ideas have shifted over time. The 2019 Oslo Architecture Triennial (OAT) has been curated by a network of young architect and activists who are based in the UK. OAT provides evidence of a shift in the architectural discourse towards a critique of existing forms of procurement and practice in which ecology and environmental ideas associated with it play a vital role.

The ambition of the 2019 OAT is to "explore the challenge of growth-based cities and test bold alternatives for the architecture of a new cultural economy." The curators have asked the creatives involved in the project to address the questions: 'What can architecture be when buildings are no longer instruments of financial accumulation? What kinds of spaces are built for cultivation, rather than extraction? What materials and technologies will be used when we can no longer afford value engineering? How will the architect of tomorrow play a meaningful civic role in the creation of new building types, urban morphologies, social habits, and cultural practices? How will cities be formed when it is human and ecological flourishing that matter most?'"

What this study identifies is that, although strands of ecological architectural practice emerged alongside post-modern thought in the 1970s to the 1990s, the 'Age of Ecology' had a very limited impact on the architectural imagination. According to Penelope Dean and Mark

Jarzombek the dominant form of thinking about eco-architecture in the 1980s and 1990s was part of the ‘techno-science trajectory’ (as Dean calls it). Whether it was Hi-Tech or Low-Tech the emphasis was on energy performance and renewables and as a consequence the academy and ideologically driven practice failed to address broader aesthetic or theoretical questions thrown up by environmentalism. In the past three decades this situation has changed. In architecture, as in many areas of cultural life including media and politics, the idea of ecology has been placed at the centre of the discourse. A concern about an environmental crisis has led to a broader discussion about lifestyles and values in which participants increasingly refer to and draw on ecological thought. In architecture, ecology is no longer understood as a technical issue, but is understood as an ideological and social concern.

In 2009 Penelope Dean suggested that there was a possibility of a ‘revised environmental agenda driven by ideas and concepts’ (Dean 2009). This new discourse she suggested might allow for a discussion of architectural fundamentals in a way that was more ambitious than the environmental discussions of the time. She wrote about an impetus that would ‘jump-start architecture with a more ambitious project, one capable of advancing a plurality of ideas and possible new worlds in an age of environmental concern.’”

These new concepts are still in the process of evolving but find some expression in architectural discourse and new buildings. Sometimes this can result in a literal ‘greening’ of buildings – e.g. the planting of trees on facades. In other situations the relationship is more subtle. Tom Emerson and 6A’s Cowan Court in Cambridge has not be labeled as green or eco-architecture. It is very far removed from the bio-mimetic systems, structures and skins produced by Pawlyn or the organic forms of ZHA. However, Emerson is interested in a new form of vitalism based on an engagement with history, biology and phenomenology. As such he joins a wide range of other contemporary architects who refer to ecology as one of the drivers behind their work.

Mapping the development of today’s architectural thought through the subject area of ecology allows us to look with fresh eyes at the content and significance of the Modern Movement and the Post-Modernists in a new light and outside the framework of the Twentieth Century. As such this study marks a stepping off point for a new approach to the history of the immediate past.

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12.0 Interviews

Frampton, K., 2012. *Interview with Kenneth Frampton New York* [Interview] (April 2012).

Jencks, C., 2015. *Interview with Penny Lewis Portrack* [Interview] (June 2015)

Vidler, A., 2012. Interview with Anthony Vidler at The Cooper Union, NY [Interview] (April 2012).

Wallenstein, 2014. *Interview at Venice Biennale by Penny Lewis* [Interview] (October 2014).



The interview with Charles Jencks sets out to deal directly with the changing nature of the discussion on ecology. What became clear through the interview was that it is very difficult to discuss the architectural history from the 1960s without reference to modernism and postmodernism, given that this binary understanding dominated the discourse. As one of the ‘founders’ of postmodernism and critics of modernism, Jencks is important in this debate. Jencks is also particularly important because as an individual he provides some intellectual continuity between the postmodernists and those concerned with nature. Although Jencks is committed to ‘Gaia’ rather than ecology, his intellectual and design work has played an important role in switching attention from the historic or architectonic to the expressive, the natural and the digital.

Jencks is also interesting in relation to the discussion on methods. His pulsating bubble diagrams were initially derided as simplistic and deterministic, but over the past two decades the idea of plotting the development in ideas in the same way that we might display GDP or public attitude surveys has become increasingly popular. The emergence of Big Data and the info-graphic as well as discourses on networks and institutional networks of power (Bourdieu) has given rise to the development of ideas diagrams of a similar character to those first drawn up by Jencks in the 1970s. There is an additional methodological issue here in that Jencks makes a direct link between his diagrams and biology. As such, he represents, within the discipline of architectural theory, a singular expression of the tendency to conflate social and biological processes.

The interview with Sven Olov Wallenstein was undertaken as part of the Venice Biennale in order to reflect on modernism in Scotland. It was methodologically useful to explore the relationship between architecture and ideas, particularly the ideas of Foucault and then Deleuze and Guattari, areas in which Wallenstein has written. Given that Deleuze and Guattari are such important reference points in the architectural discourse on ecology, it seemed appropriate to talk to Wallenstein about their ideas and popularity. Wallenstein expressed concerns about the instrumental character of the debate about sustainability – but from the viewpoint of an academic rather than an architect. There are some interesting parallels in his sentiments and some of the sentiments expressed by architects.

The interviews with Kenneth Frampton and Anthony Vidler were undertaken early on in the research and were addressing additional issues beyond those in the PhD. They did not really address the questions that emerged as the central issues of the study. They are more useful in relation to the question of method and the purpose of the discipline. However, since the interview with Vidler, he has given a very useful lecture that addresses the question ‘Whatever happened to ecology?’ more directly.



11.1 Interview with Charles Jencks at Portrack Ecology June 2015

PL: Part of my PhD is to look at environmental consciousness and its impact on design theory, architectural theory and to a certain extent practice but more focused on theory or ideas. And when you look at a lot of the literature on ecology, there's a pretty sort of philistine, slightly superficial way in which people tell the story of the evolution of the idea. So my focus is from '68 onwards, but obviously I've gone back and tried to look at the origin of ecology in particular and as the thing has developed I'm very interested in why in the past 10 years ecology has become probably the most popular way of discussing environmental concerns within architecture as opposed to sustainability, which is seen as a much more quantitative, management-based thing.

PL: What I'm really most interested from my interview with you is to talk about that early period and to try and understand why ... why it goes off the agenda if you like in the 70s, mid 70s and why perhaps history becomes the focus of discussion and then why you think perhaps it comes back on the agenda. I mean I would say way after Brundtland really it's not until the 90s, late 90s that it comes back on the agenda. Is that the same thing when it reappears as an idea, is it the same thing or is it the same vocabulary with a different content? So those are the kinds of themes I'm interested in.

CJ: Very good! I think first of all I don't think anyone acquainted with it in the 60s has ever thought the ecological problem has gone away. Even though it went off the fashionable agenda and even though...other things came to the fore which is...both of which did happen, but it's always been eating away at everybody's mind since it became so popular in the 60s.

I say as a person from the 60s that we never stopped thinking about it, it's just that we realised that people...I realised immediately that people like Shell Oil Company and the big multinationals were much more significant in changing and that architects were right poor players in a big heavy game of the power, power broking and in that power broking situation the multinationals - the 350 top, 550 top, depending on how you defined them then in the 60s - were controlling most of the economy. After all, 30-50% of the economy was in the hands of globally...was concentrating power which has continued to concentrate ever since but that was the first great error of the 'global village', the phrase of Marshall McLuhan, and we were all aware that that was happening at this ecological crisis...we were aware.

I was particularly aware that architects were powerless and frankly also aware that politicians were powerless especially democratic politicians because they have to be re-elected and every time the economy went down uh...the ecology issue disappeared from sight because it was politically...you couldn't be re-elected in democracy. If you didn't care about people more than Mother Nature. So, for those sorts of issues um...I think it looks like the ecological thing waned which is probably true in terms of efforts and you mentioned Brundtland, but I can remember zero growth as an idea in 1970 I think it was and so many... we were reminded of this every six months that it was unsustainable although the word hadn't become fashionable.

There were all of the environmental crises and...at the same time places where I became professor in Los Angeles UCLA set up a school instead of architecture, they got rid of architecture and called it the School of Environmental Study.

PL: Right did they employ architects then?

CJ: In London - The Bartlett [laughter] they gave all these kind of very practical earnest hippy, late-hippy techno nerds tenure, and more or less forgot about architecture.

CJ: Well, The Bartlett has its own story of course. Banham, Reyner Banham, was on the edge of it but he was much more sitting in environmental invention. He wasn't a bleeding-heart ecologist, he was a practical engineer type, ideologically working class, ideologically suspicious of architects and formalism in the coterie, in all those things which also exist like Colin Rowe.

You know there was a divide but as you know from my writing *Architecture 2000* and *Modern Movements* was about pluralism always from the beginning. I was fed up with America frankly because in America you know it's rather like Britain, first past the post.

The 60s was the period when the Vietnam War divided America, that's when I left and one of the reasons I did leave because (like life under Bush), there were the red states and the blue states except the colour coding was the reverse then. Red was blue and blue was red!

But everybody hated each other, it was the start of 'the great polarisation' and I must say the left and the hippies didn't help matters because they were so successful in the 60s that they kept grabbing the media that ever since then Ronald Reagan and Bush, prickly Bush, the older man and venomous Bush the young one had been dominating the Conservatives [...7.59] in America the chief party [...8.03] been able to isolate the centre, and the left and Obama and that's been the broad trend.

Architects follow power by necessity and sometimes by belief but rarely by belief.
Architecture is a utopian profession like doctors.

PL: Is that true today?

CJ: It always is, but maybe it's more cynical and co-opted than usual by power today. But remember Hannes Meyer (1889 –1954) who said in 1927 - remember this of architecture, it's always about the ruling class and power. From Marxist position and from any capitalist position because the only living capitalists alive are Marxist today because everybody [laughter]...we don't live under capitalism we live under as I've always been saying under socialism (?) - socialised capitalism that is. 40% of our budget in America goes to the Defence Department, whereas 40% of your budget goes into social things badly but still it's socialized.

Anyway to come back to your question on ecology, of course it was coined by the Germans as far as I remember in the 1860s and even Hitler became pro-ecology in the '30s, so fascism had its ecological alibi.

I've always felt and since writing Architecture 2000 it's been a major if not the major unifying baseline for the free world or whatever you want to call the common assumption of left, right and centre is that there is an ecological crisis. Even the deniers sort of go along with that and in its evidence is just getting worse all the time you know? I think...that...that species extinction is extremely upsetting from a moral and a personal point of view for all of us I think. So the loss of habitat which is causing it mostly and... but the rise of our economy is really the biggest reason because our economy has trumpeted since 1960, grown I don't know how many times and that's killing the ecology of the earth as we all know. And there's not the slightest chance that all the politicians laid end to end will surprise us! [Laughter]

It's clear that when the crunch comes and it's hard to say when it will come because it's still in dispute how fast is global warming, but there's no question that the seas are giving up.

I'm a great follower of Gaia and I suppose in a nutshell I moved to cosmology in 1980 and the universe is the measure of all things. I've moved to Gaia rather than ecology because I don't believe that man is the measure of all things, nor woman either and the human species is not necessarily...doesn't have a birth right and a legal ownership of the planet, even a moral right. If you read Gaia theory of Lovelock and Lynn Margulis, a great woman, they point out you know that the Gaia will bump us off if we're not going to be better to her. I think it's pretty obvious that's true, but it won't be by any means the end of life, no way! It will just be another hiccup in the chequered history of the earth the last 3.8 billion years when life has been around, it's been up and down, many species have gone extinct. We're losing species.

I think Gaia gets you outside of ecology and sustainability, well even ecology itself has become very sophisticated about the issue of balance. It's always been reset. There is an ecological succession no doubt and the basic hope of the '60s was that the rainforest would be the evolutionary high point of all ecologies, but they can be set in many different regimes and there's no guarantee of any outcome for long. I mean they just...it's like the economy, the economy is always hunting to be reset, and the catastrophe of economic theory is that the theory of how the economy works is always out of date compared to what we know. We know that economic regimes of capitalism, like Chinese capitalism versus Asian capitalism versus American capitalism versus British, they're all different sets. They're much more powerful than the ecology although in the end there's no question, Jonathan Porritt is right.

PL: Can we sort of go back to the 60s. You make the point that in this text when you're looking back you make the point in this text that you underestimated the important of the environment.

CJ: Definitely!

PL: I'm interested to get a sense of why you wrote the book and who the people you were talking to were when you wrote it? There is a sort of sense in which you're

talking about the question of optimism and pessimism and how there's a shifting attitude towards the future. I'm quite keen to try and appreciate and understand that because I think it's very easy for us to read history backwards, and just imagine that people thought the same way, whereas I would say even though there might be a sensitivity to crisis or an idea of the need for change at this period, it's also more optimistic than our culture is now.

CJ: Yes! Well I agree with the optimism of the 60s and especially about prediction which has shifted today because then there were a lot of blue-sky thinkers and the academies were supporting that and vice versa. In the '60s there were many big things like the Rand Corporation, the Hudson Institute, led by Herman Kahn who I met and talked to in writing this book, Daniel Bell writing on that sort of thing, I would say Harvard, where I was educated, there was the feeling was that the rationalists, the neo-enlightenment and reason were still the dominant paradigm and as a result of that a lot of professors were thinking across fields.

The great thing of the 60s was it was a...breaking of barriers and boundaries like any avant-garde...when the avant-garde triumphs in the 20s and the 60s all of a sudden people jumped from one field to another and that's terrifically optimistic and they shared ideas and values and breakdown the usual place of tenure and my world and my money, and trade unionism, and everything that makes everybody retreat into their...their own personal territory.

CJ: I think the basic shift was everybody was predicting, that was the way the newspapers had it, you could read Herman Kahn, he came to Britain, he lectured to 400 British businessmen on everything, you wouldn't find that today. He was doing it, a big fat man weighing 400 pounds and he'd swallowed the world! And he was fun, and he was tough, and he was cynical too, but he was generous.

He came from the Bronx and he was Jewish and said you know 'you schmuck you've got to get out of the Bronx if you want to go anywhere'. And he said...he didn't like Arabs so much, but he wasn't anti-Muslim. He always said well the only way to get America moving is to get 600 Japanese and combine them with 400 Arabs and put them in a room and scare the hell out of them. At that time Japan was the big fear for America. What he could do was he could understand hippies, he could understand the plurality, because whatever you think about the world then and today its global pluralism which ought to reign but what tends to drown is voices of nationalism, or...ever since of course nationalism and religions, the neo-religions, and tribalisation, all these postmodern negatives have come on the scene. Whereas in the 60s it was the last enlightenment period before the reaction set in.

PL: Didn't postmodernism introduce these outlooks?

CJ: Well yes in the sense that the good thing of postmodernism since I was a leader of it, I don't want to slag it off, but modernism had solved many problems at least theoretically of equality, sameness, mass production, and the generic. I'm not saying it really solved them but...and it opened up then the rights of minorities, cultures, all the people that had been left behind the gays, feminists, blacks.

CJ: Postmodernism was a kind of rainbow coalition of all those disadvantaged voices and pluralism. And I was a passionate...I remain a passionate pluralist, well one of the prices you pay with pluralism or you can pay, we hoped we wouldn't have to, but Architecture 2000 is about that, is accepting the modern world and the enlightenment, I never attacked either.

CJ: But after all you know what happened to the Enlightenment it led to mass produced death camps, the holocaust as many postmodernists have said. In other words it was...instrumental reason rather than blue sky reason, rather than universalist reason, it was applied-reason, it was techno-reason, all the things that gave

modernism a horrible name. And...and that was true too so the dark side of modernism had already been exposed by the death camps you know?

CJ: Lyotard said Auschwitz ushers in postmodernism and a thousand other people have said that, I never went that far. But I do think there is a case to argue that modern in its euphoric United Biscuit Company and General Motors, what's good for General Motors is good for the States! (...*is not good*). Soon everybody like McDonald's, the McDonaldisation of the world, the General Motorsisation of the world, that mentality you know United Biscuit Company wanted one biscuit 6 billion people okay! Yeah well that is the worst kind of hegemony in America, it was hegemony so...when...modern architecture and the enlightenment thinking became weak on minority cultures then postmodernism put it on the agenda. It's obvious to say but you can't do everything.

PL: So '68 and that period? '68 was the moment of postmodern rebellion?

CJ: Well it was actually... I think what it did after '68 America became very pessimistic and all through the '70s and then there was the oil crisis of 1973, but one doesn't remember...the 60s ended in 1968 because of Kent and Paris, and the brutality Ronald Reagan and so many governors using gas on the campuses. The cynicism of American power in Vietnam, all that turned the fathers and sons against each other and we've never really recovered from that frankly!

PL: Did that happen to you?

CJ: No my [laughter] my father and I got on very well! Well except he was a modern composer. I didn't like that but...but personally we got on very well. I never threw anything at my father! [Laughter]

PL: But a lot of other people of your generation did?

CJ: They were being gassed and even shot, remember Kent State, they shot six students, killed 'em! That's not funny! America was polarised and has been since and

the drug culture, there was a lot of irresponsibility with that and you know if you thought [laughter]...if you thought that was the future you would get out of America and I did! I was fed up with American foreign policy you know that was a big...personally...it's hard to separate what was happening in my personal beliefs.

PL: Why did you write *Architecture 2000*, what was the process?

CJ: This woman, French-American, called Mary Kling came to me in London. I'd written *Modern Movements* but not published it. She came to me and said we're doing a series would you write in the future? I had been picked up by Penguin Books and I knew the London scene very well, Anglo-American publishing was a big deal. Under her I commissioned Christian Norberg-Schulz to write his book *Existence, Space and Architecture* and I commissioned Martin Pawley to write his book on the future of housing.

CJ Pawley's was a radical book, he was becoming more and more radical in a way. He was a good friend at that time ...only 3 appeared and so because I'd been writing *Modern Movements* and talking about pluralism um...and then I got this commission in '69 I had to re-think fairly fast because I wrote it in a short time how you think about architecture as a whole and that forced me into this evolutionary trees, which I started producing for *Architecture 2000*.

CJ: I was talking of course to Banham. I was critical of *Archigram* but aware that they were shifting the paradigm and doing it on a superficial level. I wanted it to be a pluralist tract, and put it on a global level and it was quite successful! I mean it did sell a lot, was in print for several years.

CJ: That was '71 it was based on *Modern Movements*, but asset stripped and reconfigured as 6 traditions, and I think it forced me from memory to think of the 6 traditions of modernism which I later wrote about in *Modern Movements*. But actually of course the 2 came at the same time and were always an attack on the

modern theme, of modernism, you know the terrible monism, the terrible awful party line that my teachers Gideon and even Banham, and Vincent Scully followed.

PL: Was Gideon really as bad as he was made out to be?

CJ: No he wasn't! No he was a good man actually!

PL: Was he monistic?

CJ: He was very...well...you know Gideon was always more complicated than his polemic of Space, Time and Architecture appeared. But he divided history into constituent facts and intransient facts, and got rid of the transient facts. I had written History's Myth under Banham to show how you know crypto fascist this was this. I mean was a product of the 60s remember and so anyone who talks about me as a transient fact is going to get kicked in the arse!

CJ: And that's how I was treated by the Smithson's who kicked me out of a room when I showed Mies wrote to Mussolini, compromised with Vichy and had been incredibly implicated in the Nazi movement, signed anti-Semitic packs. I got thrown out of the room at The Royal Academy by the Smithson's and others lock, stock and barrel because they couldn't accept modernism as true, they had to accept it as the party line, a bit like a trade union. You have to always remember that modernism is a trade union and you've got to toe the line or else you end up like the Labour Party of Scotland when they finally get rid of you right?

PL: Well the trade unionism has an objective basis doesn't it?

CJ: It has an objective basis.

PL: Well so does modernism because it has to do with production. Remember that modernism is producing...the ideology that triumphed in all the American schools from Cornell to Harvard, and I got it straight, the great thing in my education was that I was the Corbusions all taught at Harvard. Corbusier, he was the Pope of Modernism and he designed the only American building the Visual Arts Centre and when he came to the school...I missed that, but when he came to the school they put a 20-foot-high banner of his face with his glasses you know looking very serious.

I went to his funeral in Paris by the way in '65 and I loved Corbusier. So when I got it in Britain I knew that the Smithson's were second-hand modernists and even Lasdun was a second-hand modernist. Banham was a new born-again Futurist...at least very creative but I never took so seriously the modern movement in Britain because it arrived 30 years late.

And it was tepid, on the 1951 exhibition, I more or less agreed with Stirling, Banham, and others, and Colin Rowe that it was tepid, it was compromised. So by the time I arrived on these shores ...well...as Jim Stirling gasped let's face it 'William Morris was a Swede' – it was his famous...put down! In other words it was the old British compromise of everything architecturally and Colin Rowe and Jim on the Corb side were wonderful and Banham etc. on the other side were wonderful! And they were breaths of fresh air but...and I liked Lasdun and the fact that I was going to work for him at one stage, and he wrote me a nice letter, typed by hand!

PL: He was a good architect.

CJ: He was a good man, he was always a very close friend Denys yeah! Anyway...I was a friend of modernists and I was brought up by modernists and I was a modernist but then when the revisionists came I went to Team 10 meetings in 1966, I was invited by John Volker and the British and I was attacked again by the Smithson's, that was the first attack and defended by Aldo Van Eyck.

That's where I met Kurokawa and Hollein and we became three good friends in the postmodern world from then on '66.

CJ: I could see that Team 10 was a classic revisionist situation, in other words they understood there was a problem of modernism but didn't want to leave a whole for fear of finding something worse! And so like Gorbachev under who could revolutionise Russia without getting rid of Lenin, he realised that the church was stronger than the revisionism and that's on the road to postmodernism.

CJ: I mean I went through a late modern period myself, as so many other people did, but I went onto post modernism and I could see from Jane Jacobs and.

CJ: To go back to ecology you know from the Silent Spring - Rachel Carson which has to be, along with Jane Jacobs, two women wrote the two foundation documents of postmodernism and they were right and Le Corbusier was more or less wrong!

[Laughter] I mean go to the heart of it and it took me 8 years to get there, 10 years. So, it's hard to change your ideology.

PL: If you look at Corb's life now and you look at the material after the war and the shift that takes place after the war, you can understand that anybody that went through that experience of existing pre-war and then operating post-war had already quite radically changed their conception of humanity and the place of architecture in relation to...it wasn't called postmodernism but it there was already a shift. There was already a change in the emphasis.

CJ: Absolutely right! You know there's an exhibition on in Paris, I couldn't get to it but on Corb just now, and there's a book out on him as the French fascist so finally how many years is it? I've been writing on his fascism for many years but finally there's a book on it in French! It takes a long time for people to recognise the truth anyway Corb obviously was tortured because he lost all his friends, his close friends, his helpmate you know Pierre Jeanneret stopped speaking to him. The woman who he worked with designing furniture wouldn't speak to him, and all the French intellectuals to the centre and the left turned against him when he went to...try to get a job. He didn't get a job because and this always endeared him to me because he was uncompromisable, he tried to compromise but on his terms you know? I can't remember if he said it is not I who should join the Communist Party, but the Communist Party should join me! I mean...he said more or less the same thing to the fascists and Vichy and they said get this creep out of here! Vichy get him out! He spent a year in a rented room trying to persuade them, but he was incapable. I think

he went to power because of what I've been saying, that he knew power was important and you've got to appeal to power and he had said he ends (Architecture Revolution). He knew power was important, he wanted to have a revolution in architecture and housing, and even ecology to a degree, he was moving in that direction and towards nature, definitely 1930 he moved towards nature and the peasant's culture, and the gardens, the garden world you know. He'd been there earlier but like Rem Koolhaas discovered landscape you know recently.

CJ: Yes I mean nature, he's discovering nature so...late but there we go! And so Corb had formulated these shifts and then when fascism took over Europe part of his ideology was always in favour of a unified culture of Europe. He was always looking for that and so he was weak on the problems, he tried to compromise with Vichy, or tried very hard, but he couldn't do it and then he finally had to retreat to the country himself with his wife and paint, and he painted his famous paintings, postmodernism actually. And everything comes out of those paintings, I mean Ronchamp comes out, Chandigarh comes out, all of his postmodern work in my terms comes out of it. And he's a broken man in a way but he reinvents himself in 1947 partly, and Unité d'Habitation of course is a very modernist building done with sludge, with primitive material. Anyway so all I'm saying is that Corb does go many of the next steps in the postmodernism...but remains a utopian socialist believer that housing is the problem.

CJ: Now if you ask me why ecology hasn't always been this...the great social question and the ecological question and, you know, they're very hard to reconcile and people fall usually on one side or the other. If you fall on the social side then you're accused of being anthropocentric. If you fall on the ecological side you're accused of being inhuman! [Laughter] And you know...to a degree you can understand that argument but my argument in Architecture 2000 is that pluralism is radical and there are six reigning traditions as I recall.

I tried to get at a deep structure of why those traditions exist and I didn't have the notion, it wasn't around then of 'chaos theory and complexity theory' of strange attractors, but you know in retrospect what I did have very much in my mind was Levi-Strauss's structuralism and biology of Darwin, and evolutionary trees.

The notion of a species of architecture, different from species of biology because they could mutate so fast, actually biology can mutate so fast by the way with epigenomics you know. I made the distinction there between biology and architectural species but all of those were...and there were some other books that influenced me besides evolution and you know Levi-Strauss but those were the 2 main ones.

PL: Sorry Levi-Strauss and the Origins of the Species?

CJ: Darwinism I mean...

PL: What would have been a key text in terms of Darwinism?

CJ: The key text was not natural selection which I think it's misguided but anyway... I used...in my first classificatory work this thing called numerical taxonomy. I read about it in Scientific American and applied it in modern movements to the American School and I showed...you become a computer basically, you know you take things to bits, into taxons and you figure out how much is Corbusier related to Mies van der Rohe's followers and you do taxons and then you get a better classification system. That leads to pluralism of species. These taxonomists were criticizing biologists and I learnt from them.

PL: How were they criticizing biologists?

CJ: Well because they said when you ask a biologist what is a species? They say species is things that can interbreed and how do we recognise things that can interbreed? Well it's whatever we professors say is a species that interbreeds, is a species.

CJ: Clearly numerical taxonomy was invented by young Turks to get those tenured professors into better shape and say no you take the whole genome and you look at it statistically and take all the taxons and why can't architectural history be as good as

biology was my...my plight and cry ever since because it isn't and no one is really interested in this but I'm sure it's right! [Laughter]

PL: It's a critical theory?

CJ: It's a theory that you know...well people like Anthony Blunt had written some uses and abuse of the terms Baroque and Rococo applied to architecture and he said there were 12 taxons of Baroque and he said importantly there is no single architect who has all 12! So there is no Baroque architect! Blunt I rather liked for some reason!

CJ: One other book is Kubler's *The Shape of Time*, *The Shape of Time* a beautiful title! And he looks at pots and vernacular things and shows classificatory things and makes the points of entrance and exit, and how hard *The Shape of Time* is to grasp. If you happen to be born at the right time and you're Leonardo da Vinci you've got a stranglehold on the next 30 years and I could see that's very true in architecture, in other words if you come on-stream with the right idea and you get what we call in economics, lock in, then you know there's only room for one Archigram around and one anything, and once they get lock in you know you could see that actually Foster and Rogers dominated British architecture for the next 50 years just completely, and Hoover up all the big jobs. So that's what *The Shape of Time* and other histories had shown.

PL: Is this similar to Thomas Kuhn's ideas? Wasn't that influential?

CJ: Yeah Scientific Revolutions yeah! Yeah Paradigm and Change! When I was teaching at the AA we were reading Thomas Kuhn and we were criticising the guru who we also loved, Karl Popper, because they had the 2 theories of how science works. Kuhn was looking at it sociologically and saying hey its paradigm, following the paradigm, troubles in the paradigm and then revolutions, you know? Paradigm shifts, that's the jump in universe it's not a smooth transition.

PL: So this explained...in a way this explained the avant-garde as well? I mean there was a lot of interest in trying to understand the avant-garde what had given rise to modernism in this period or -

CJ: Definitely! Yeah and I was very aware, I mean the economics of society, and taste, and fashion and that since the industrial revolution in 1800 let's say fashions had changed every 3 or 4 years and in the architecture movement we usually lasted 8...usually but...and I did a classification under...I think I wrote it up for AD and I classified my students who I was teaching at the AA and elsewhere, I showed that in 1850 there were 10 to 12 reigning styles. There wasn't just the classical and gothic, but there was these neo...there was the Eastlake style, the octangular (?) style, the neo-grec, although here was a sub class...and there were things like...the engineering style, and so I showed the pluralism there,

CJ: I think I invited...Isaiah Berlin I was really fond of him and if I didn't invite him to the AA...I think I may have, to give a lecture in '73 or 4, or 5. A brilliant man! And I said this to Peter Cooke the other day, I invited Isaiah Berlin who is my hero, remains...and now I think is more important than I thought at the time and his thing of value pluralism in quotes, value pluralism, which I don't know that he used at that time. But I think it's the most profound kind of pluralism, I was...very strong and I have been always a very ideological pluralist, but his theory of the value of pluralism with John Gray, the philosopher, the pessimist, today is a good friend, has written about under Isaiah Berlin.

Anyway Isaiah showed at that time the good and the downside of pluralism showing that there's no place where pluralism and liberalism absolutely meet and it's a bit like the ecology argument, in other words and Grey, John Gray takes this brilliantly, Americans now I think have value pluralists. I mean the intellectuals in the New York value pluralism.

CJ You can't guarantee through the liberal process that either truth will win out, or goodness you know? Or that reason will lead to the best reconciliation of values because values have to be fought for, created like architects create them. They are movements of desire, and will, and there's no way that you can measure on one scale whether these values are better than those values. And that's a deep truth whereas we...I...as a democrat, and a pluralist, and liberal, okay always thought that there was a calculus of truth and goodness that if we just thought and debated long enough we could come to one answer. And I'm afraid that Isaiah Berlin has shown conclusively and then it is true, that there isn't...that was my enlightenment naivety, and now...you know I suppose I'm pessimistic about a single outcome but now I'm optimistic because I think the postmodern.

CJ I'm sorry I'm jumping around but Maggie's Centres, we have 20 Maggie's Centres, they're all different! And I think we're a completely postmodern institution in that sense because in postmodern economics as opposed to a Newtonian modern economics. Under Bush, and Reagan and Thatcher if you asked an economic question they would assume there was one best outcome to the economic input sorry that's not true!

CJ The man who really conclusively showed that who ended up as a professor out in Stanford, this wonderful Irishman um...small, attractive, brilliant man whose name I'm blocking...anyway I met him and talked to him, he wrote a key paper to prove what I'm just saying about economics. And it was turned down by 73 of the primary western top economic reviews because it went against Thatcher, Reagan, Bush and the whole modernist economic paradigm oh what is his name?

CJ Anyway, it will come to me, um...and then finally, Scientific American published it in '94...1994's cover issue and it proved conclusively that chaos complexity theory in the universe and chaos complexity theory in ecology and chaos complexity theory in the economy all have the same uh...paradigmatic quality that they hunt for solutions and they may last in a regime, but the no regime is the optimum, the best,

there isn't a single solution. They can fall in many places and they are plural so pluralism is you know the name of the universe. And I wrote a chapter on plural verse and I'm finishing the multi verse in 2 weeks and I open it with the top world's scientists coming so...luckily the science now [laughter] we think we live in a multi verse, and it's been...since 1998 that has uh...been I would say among the smartest scientists, the odds-on bet. We can't prove it, but the head of CERN is coming over to this conference you know, Martin, Lord Rees is giving...is organising it with me and so...the multi verse I mean I'm getting...I'm sorry I'm jumping around but you know you can't stay in one place I'm afraid in life!

CJ: We should decouple if that's the word the economy by a lot in order to allow nature to get on with itself, you know we should have seas, areas where we don't fish, I suppose that's the paradigm now and let nature do its thing and mass agriculture, retrench and try to get more out of food while leaving more of nature to get on with itself, so decoupling. High growth that's always been the argument of the economist versus the ecologist that we can grow our way out of our contradictions and [laughter] well we know what...where that goes. You know this is the human condition because I was an eco-feminist, I had a friend of mine who's Californian, Charlotte Spretnak who influenced me in this book and *The Jumping Universe*.

CJ Charlotte Spretnak introduced me to the phrase eco-feminism and I was on an architectural award called the Aga Khan Award and there was a project, it came in from Ankara, an unbelievable project, and it had nothing to do with architecture except it was for the city of Ankara and was for planting trees for the Middle Eastern Technical University METU in 1960-61. It was set up by UNESCO and the modernists and of course Ankara was the city of modernism for Ataturk and they set up the Middle Eastern Technical University and all the students had to plant every year 10 trees and look after them. So in 4 years you had to plant 40 trees and look after them. They created by '94 32 million trees and changed the climate of Ankara, became the lungs, and brought back 150 species of plant and 240 species of animal.

So when it came up for a prize I suddenly said 'hey this is eco-feminism' because you know its mother earth getting aid from architects and ecologists. And it really had changed the temperature, the climate, and it was incredible. They said hey you can't give this an award because it's not architecture. I said hey the word earth depends on it and this is essential for architecture and Peter Eisenman was shouting what's this eco-feminism bullshit? [Laughter] I love Peter! And I hit him right back and said well Peter you know your mother was an eco-feminist probably! Anyway so I insisted, and we gave it one of the awards. The whole committee and we gave an award that year, it was '94 or '96 I can't remember and when we presented in Indonesia everybody was euphoric and the whole Aga Khan Award said 'Yeah, we agree with Mr Jencks!' [Laughter] It was a joke! But you know anyway from Charlotte she's a card-carrying eco-feminist and through her so am I.

PL: How would you describe the method?

CJ: I would say its structuralist evolutionary taxonomic in the way that I've just explained and is explained in that diagram.

PL: Is it important that as a theory it's really a social theory that you're borrowing from biology?

CJ: I forgot to mention Osgood and the Semantic Space because I'm not borrowing from biology exclusively. No its a truly eclectic theory I'm putting forward there which is one quarter of which is biological evolution to say that all of culture has an evolutionary component but it's not...it's not biological evolution and its cultural evolution.

Note: [Osgood, C.E., Suci, G., & Tannenbaum, P. (1957). *The measurement of meaning*. Urbana, IL: University of Illinois Press. Semantic Differential (SD) is a type of a rating scale designed to measure the [connotative meaning](#) of objects, events, and concepts. The connotations are used to derive [the attitude](#) towards the given

object, event or concept. Osgood's Semantic Differential was an application of his more general attempt to measure the semantics or meaning of words, particularly adjectives, and their referent concepts. Wikipedia accessed 7 July 2018]

PL: It's a metaphor in that sense?

CJ: No! No! It's using the methods and the insight, nothing is ever done for the first time it's always...there's a precedent for everything. That's part of history and genes, your genes are inherited and it's arguing for the historical continuities but...but novelty so novelty is real, so is continuity real.

That's where pulsating species comes from. Levi Strauss's structuralism said that there are deep structures, structuralism, the deep structures are there, that's what I call my pulsating blobs and they pulsate in an architectural way, in a particular way based on the schools of teaching so there's an engineering pulsation leading to the Parametric School if you like.

CJ: I'm simplifying here but for all sorts of psychological and social and economic reasons you know engineers study certain kinds of structures themselves, and get trained in value systems as well as just what they're learning.

CJ: So that's why there tend to be species of architecture and I got that idea from of course biology but also I got it from history, and I got it from Osgood's semantic space because semantics is very important. Values how do you talk about the continuity of values irrespective of biology and ecology? You do it through the mind and the mind is a... has a semantic space as it were and so that...and then I combined that with the pulsations. I think I may have invented something in a minor way in doing those diagrams and I've done over 30 or more evolutionary trees. Many...I mean very different ones and written it up in a book on diagrams if you want to follow that.

PL: What kind of a response did it solicit?

CJ: I think it was reviewed sporadically, um...I don't think it ever got a rave review, but it was highly read by students and students are always ripe for the next thing, the next new thing. And...it seemed to be a cross section of what was happening, a quick view, a snapshot view, what's going to happen next and so it sold well. I can't remember how many it sold but it was a continuous seller for maybe 10 years.

PL: There appears to have been a reaction against the attempt to place architecture in the border context of ideas?

CJ: Where's that?

PL: Here! I mean within architecture it's quite hard to solicit a discussion about the relationship between architecture and the border culture and in society.

CJ: Yes I was very...I was a typical 60s character, you know you cut across fields and let me say that again, you cut across linguistics, and politics, and I agreed with what he (Chomsky) was saying about America as being you know in need of de-Nazification, but that's going too far but it was a pretty grim place.

And I wanted to place architecture in the context of semantic space, linguistics, biology, evolution, structuralism and all that stuff and I was working with George Baird at the AA. You know we were a hothouse of ideas. So we were all doing it and we didn't think it was odd to do it.

PL: Is there something specific to architecture that happened sometime in the 70s? Even though I'm not particularly sympathetic to Patrik Schumacher I kind of think he's incredibly brave to try and develop some theoretical ideas and the hostility to him is sort of way beyond what he deserves.

CJ: I'm a great fan of Patrik, I mean I share your criticism of him because I've been pointing out for 20 years that parametric architecture. I suppose its Rowe and people

like that and their...there's an idea that the defense of the discipline demands that you...I can't quite put my finger on it. A lot of these people are also interested through Team 10 in... they say they're interested in contextualism but there's something about Britain that...

PL: Doesn't tolerate the attempt to locate architecture within a broader...I mean that's a ridiculous thing for me to say because there's now a whole industry in architecture schools but there's something about the...defensiveness within the discipline.

CJ: I mean of course you and I, we're all torn as architects between the necessity of our profession and getting on with it and being responsible architects and we have our own autonomy and you must learn about architecture not about all that other stuff that Colin Rowe and everybody else like me is talking about. I agree because there's a lot of theory mania that developed out of the 60s and 70s and has given that a bad name today but even at the time it was resisted within the schools.

CJ: At the same time (1960s and 70s), it was semi-popular, I have to say that there was always room for four or five rogue people like Colin Rowe, and Archigram, or me, so at the same time that we were beyond the pale we were the pale! [Laughter] I mean you know it cut both ways, I think that's just how an economist would tell you... an economy creates a market and it's the difference that makes the difference and if you too many people teaching straight line professional practice you need someone like Colin Rowe or someone from outer space to come in like Archigram to teach you idiotic things. [Laughter].

PL: Your work is a bit more analytical

CJ: I'm trying to understand what's happening more than the other people, I mean I'm critical I've just been talking about Rowe to people who are doing the Rowe thing, 150 scholars, can you believe? They just interviewed me on Colin Rowe in America, only in America would they do this for the MOMA, but I think the problem with Colin as in academic was that he played fast and loose with certain historical niceties.

However, having said that he did innovate and was a great voice to have so he cheated at being a historian often. But he cheated with creativity and you know I would always take the value of what he gave more than his utter contempt for historical accuracy. Anyway we're divided, we're always divided, that's what Isaiah Berlin was so good at.

PL: Value relativism?

M: Value pluralism but you could call it relative, you could call it relativism yeah!

CJ: What he said at the AA was incredibly funny, he said well the Germans became romantics because they looked at the French, and the French were much more beautiful than they were, and they decided well we'll never be as civilised and beautiful as the French, so we might as well be true, honest, brutal and ugly. And have character rather than beauty! I mean it was so funny it's a very psychological thing but it's interesting, and shocking anyway...but you can see the resentment of the Germans to the French. They were beaten by Napoleon, they were much less elegant, and they were hicks you know compared to the sophistication of the French. And they were less intellectual.

CJ: A funny thing I met Isaiah several times and I was in Israel, Jacob Rothschild invited me out there I don't know when it was 1992. Hmm! The Supreme Court! And Jacob was feted as 'the Rothschild', given the keys to everything in Israel. Son of Israel! And I was talking to Isaiah Berlin several times and he took the view as a value pluralist that every culture needs a home and needs a tribe and I said but you know it's not fair what the Israelis are doing. He said 'Charles look you've got to understand that cosmopolitanism isn't everything and the enlightenment isn't everything. I was slightly shocked at his being so Zionist sympathetic. Partly because the American Jews are so difficult as people and suppressing...well they do suppress the Palestinians.

PL: But maybe he wasn't being a Zionist, maybe he was making a point?

CJ: No he said I side with these people, they're my people and I understand, they're my home. And he was after all a Jew from Riga and the main thing about Isaiah he was also so English, from Oxford, and he had many personalities. He was the living embodiment of his pluralism.

CJ: I mean he always thought he was an inferior historian and philosopher. He said you know I faced with logic or positivism in all this...high powered stuff he said well I'm not a philosopher you know? But I think he was much more profound than the others anyway.

Int: Lets return to the response you got to Architecture 2000?

CJ: It was mixed! I mean I don't think anybody loved...no one loved the book but it was kept in print. It had...you know it had an effect I think, that's why it was reissued.

PL: I'm particularly interested in the parametricism for two reasons, there are some ideas that I'm trying to trace, one is the whole...I suppose it's what you're talking about the taxon, about compartmentalising, dividing, and what you talk about in terms of you don't use the word type but you used Corbs object type. And then obviously in the 80s type becomes very fashionable in the AA and various place for different reasons. Not as a prototype but as a form of historical analysis. I suppose what I'm trying to do is trace a link between Leslie Martin and a tradition which is about trying to almost get a mathematical method to divide...design the problem into something that becomes manageable and what you're talking about then in terms of parametricism and the emergence of computers, and people like Gregory Bateson. I'm just trying...I'm finding it very hard actually to compartmentalise, but I know that there are things that are in... they're in essence and then they kind of remain below the surface and then they suddenly re-emerge around 2000. But at its core it sort of...there was something going on in the immediate postwar period that it wasn't techie, but it was about maths, computers and also nature as well.

CJ: Yes I think you're right and it...you mentioned here somewhere systems theory that was very big, systems thinking and design methodology was directly related to systems theory and it had several different systems or methodologies. On the one hand there were Christopher Alexander's Notes on the Synthesis of Form which seemed to argue don't talk about semantics, don't get hung up on previous solutions. Look on every problem as a unique configuration of atomistic needs or functions and then design with an open mind as a problem solver. On the one hand but there were many schools...I can't remember their names, Brian Archer I think or whatever his name is, schools, The Royal College of Art, every school had a systems thinker and a design methodologist. Geoffrey Broadbent, who was a friend, and there was AD was pushing that, and American schools were pushing it because it was teachable.

CJ: It was a form of academic thinking to break problems down into their bits and to put the bits together and then come up with a synthesis, notes on the synthesis of form, don't be a formalist, don't be a semanticist. Now from our point of view, and I include myself in the idealist tradition of Corbusier, we looked on the evolution of types and type solutions as not negative the way Christopher Alexander was criticising them and I was criticising them, or the design methodologies, but as a normal part of culture. You can't throw out your culture, you can't throw out your platonic thinking about what is a house, what is a school and nor should you. It's a form of deracination or cultural brainwashing if you try as Alexander was trying.

CJ: So we had another idea of the system and Norberg-Schulz and others were the cultural version of this as was I. Norberg-Schulz was a good friend and Sandy Wilson teaching at Cambridge was his exponent. In fact they named the Cambridge School of Architecture 'Schulz Terrace' after Norberg! And I can remember a battle on the bus with Christopher Alexander and Christian Norberg-Schulz and almost throwing Alexander out of the bus! But anyway...in '66...so...you see how different kinds of methodology could divide people.

CJ: Leslie Martin was interested, he was eclectic but his great friend Lionel March who was a genius in a way. Lionel was a painter and a thinker. He wrote *Let's Build in Lines* and he did mathematical analysis and mathematics at Cambridge, and of course Alexander and March and the Cambridge School...it was mathematical, formal in a mathematical sense. Anyway but there were many ways of breaking up the problem of architecture into a methodology.

PL: And did it go out of fashion?

M: It was sublimated by all the other movements. Yes it went out of fashion.

PL: The history movement most of all?

M: No! No! No! I think that...the history movement was minor, I mean that was Colin Rowe and maybe the people I was with. I don't think it was submerged by them. It was more even High Tech and Late Modernism, in other words the concerns of the profession getting on and building huge late modern slick tech buildings.

PL: But it went out of fashion in schools too?

M: Definitely! It went out of fashion because it was considered pre-architectural and then of course people like Venturi and others said hey this doesn't even get you to architecture. Architecture is about form and precedence and modification so...and Alan Colquhoun and I was involved with this group too with George Baird. We published *Meaning in Architecture* which was a critique in 1966.

Int: That was a critique of design methodology?

CJ: It was a critique of methodology per se, well I have written critically when I was at Harvard in '62, '63, I found a magazine called *Connections* and did a critique of Alexander and WH Mayall (*Principles in Design and More Value by Design were published in the 1960s and 1970s*) it's a little bit over the top I have to say!

CJ: I compared them again to the concentration camps and saying when you have to systematically expunge from your mind all precedent and you can't think that's

exactly what you know the Nazis said when they had a new set of names for everything and said you can't use any other names, if you deracinate someone, get rid of their language, you brainwash them that's what the Nazis did with the final solution.

CJ: I can't remember what its word in German is but...I over...attacked them but I was worried that this supposedly neutral abstract bloodless design method would produce neutral abstract bloodless buildings and it did! I was right in a way!

PL: Maybe that would have happened anyway.

CJ: It would have happened anyway yeah I mean that was late modern economy!

CJ: So parametricism was...I mean the parametric as I read it from my teacher Sam Stevens at the AA who is a friend of Colin Rowe. Luigi Moretti had a magazine called *Spazio* in Milan '51, '52 and he wrote on parametric architecture, a beautiful article which we read at the AA and which said you know those things which you can parametricise as in a stadium for instance, the steps, the seats, the overhang, all of the things that you can give a number and a functional solution to you should parametricise. And it produces a kind of super cool objective generic architecture, however it just opens up then architecture to the other things which you...should have an equal say in its form, i.e. the space, the hepatic qualities, the material qualities, so you parametricise in order to have a kind of abstract cool universalism and then free up your creativity, rather than become a number cruncher!

CJ: I might try to convince Patrik to read any of this true parametricism he refuses to do it and he's a pied piper in a way. I agree with you that he's very interesting because he's trying to invent a whole new rigour of thinking about these issues. The problem is that he's not very creative or rigorous himself. He's more...a front for Zaha and he's a helper in Zaha in giving Zaha her linguistic set of terms of which he has 15 phrases which are formal terms, formal organisational terms or parametric organisational

terms. Like paradigm, or like a type, you could say they're linguistic or formal ways of shape grammars, you could call them shape grammars.

They're parametric in the sense that the computer has got all of these languages that people who are really top computer nerds and good people at it, like...who's the number 1, has been at least for 15 years, Greg Lynn! He can look at a building and tell you which part of form 'Z' they're using or what kind of computer they're using you know software? Software and parametricism are related as they were under the international style, organic architecture or any of the styles, of course. Styles and the parametric are important, they're formal syntaxes but you know they're not what Patrick thinks they are which is you know the future.

PL: In this period did you come across Gregory Bateson or is this a new thing that he's been rediscovered or...?

CJ: I'm trying to remember, Gregory, who was his father was it...the two Bateson's, father and son.

PL: Gregory is the one that's connected with systems theory. Gregory wrote a thing called The Ecology of the Mind.

M: The Ecology of the Mind I can remember...one of the theories was...in 1946 if I can recall it myself. I think Bateson made a big thing of this. But he got it from another thinker, and it's the mind...as a... oh god now what's the general phrase? It must be Bateson who really pushes this. It came from McCulloch I think is the name of the man, a heterarchy have you heard of that? A heterarchy! Yeah and it goes this way, the brain has all these modules you know, which are programming all these ideas and perceptions and so on. And none of them is actually in supercharge so instead of there being a homunculus inside your brain it follows the heterarchical principle of its a rule by different modules in an oscillating way and the classic example is the game of paper, scissors and stone! Paper, stone, scissors so...and you play that game and stone beats scissors, scissors cut paper, paper covers stone, A over B, B over C, C over A is the formal cheap quick definition of a heterarchy. And your brain is a heterarchy and it's a very good description of how your brain works because

sometimes in pluralism you see how heterarchy and pluralism go together like a horse and carriage! It shows that the brain has if you're thinking in one way that dominates, if you're thinking in another way then that dominates. But to say that any part of the brain is a fascist or totally always dominating is completely stupid. It isn't true of anyone. We are all mixtures of these heterarchies so it's a wonderful way again to think about pluralism. So Bateson I think was the man who opened that and the double bind, famous double bind of the Jewish son and the mother, Jewish mother is a classic double bind. You don't know that? [Laughter] Son why don't you love me anymore? You know oh mother I can't stand these questions! You can imagine what kind of heterarchy that leads to!

PL: And cybernetics?

CJ: Cybernetics well in 1966 or '64 Jasia Reichartt had an exhibition at the ICA on cybernetics which was really key for us cybernetics serendipity it could have been called. And all the architects went, Cedric Price went, I can remember was a big thing and it had Gregory...Richard Gregory there, who wrote on cybernetics, and Gombrich was writing on cybernetics. Information theory, a lot of philosophers and mathematicians, so cybernetics was a 60s take on the greater field of information technology and computation, and self organising systems.

PL: And that's the important thing the idea of self organising?

CJ: That's where for me it came from.

PL: Which is close to nature?

CJ: Which are close to nature definitely and which lead to the jumping universe and you know the self organising universe. Even my book of that title (The jumping Universe) came from cybernetics. But that was a big thing in American...it feeds into Architecture 2000 because the cybernetic revolution, and the information revolution, and computing were all considered the way of the future in the 60s. I believed it and it's become true!

The cybernetic theory was the most kind of basic and they always used the idea of a governor and feedback, so feedback of information on the system itself. Nature has feedback of course, and you as a person do, and I do, we all do ...homeostasis is a kind of feedback system. And over time evolution over time is feedback. All of those ideas are related directly to each other but they're slightly different versions each one.

PL: I'm trying to...really trying to get to grips with what happened in terms of you talked about a lacuna, but I suppose for me there's a lacuna that all these ideas exist in the 50s and 60s and then they disappear and there is a discussion on ecology which begins again in the 70s. It's a minority, by the end of the 80s into the 90s it becomes a mainstream discussion but it's not...it's not about...it's an environmental...there's an environmental consciousness but it's much more um...about energy consumption, its...really quantitative and narrow and then for some reason around the beginning of the new millennium all of these themes that are discussed in this period re-emerge particularly the use of the word ecology which isn't used that much. I mean do you have thoughts on how you would explain that sort of...that gap?

CJ: I think first of all you've described the gap and... I describe it in those evolutionary diagrams and show the blobs and pulsations. I'm sure you've looked at the literature and have a feeling that ecology as a word and concept disappears, and then re-emerges well that's a pulsation of a blob and probably if you did a computer search and show it statistically, your hunch is probably absolutely right. It's one thing to describe it which is very important, and classify it, the other thing is to explain it and you know like explaining all history. Why did the First World War happen? It happened for several intersecting reasons and I think probably the ones you know well are the most causative like the explosion of the global capital markets in the 80s with...combined with the deregulation of Reagan and Thatcherism leading to the attack on the left, the attack on the state, the attack on the...the welfare state, the attack on bigness, the attack on General Motors.

CJ: The whole postmodern attack which had a great deal of truth to it and coupled, maybe this is the reason, what happened with post modernism and post-Fordism in an economic level is that as far as I'm concerned post-Fordism was Fordism plus small group organised by computers. And that's what...where I was teaching at UCLA where I was a professor, the post-Fordist theory was that Ford Motor company which started to break up then and General Motors which did break up and all of the modernist enlightenment, United Biscuit Company went broke, everybody went broke. Hollywood went broke, all the bigness went broke, modernists lost their jobs, you know...people like Rogers and Foster couldn't get work in Britain.

CJ: There was a short period of 1980 to '85 except I mean if Lloyd's of London and then of course Hong Kong which were the saviour of Foster and Rogers, the late modern then re-emerged in the 80s late 80s but the period from 1980 to '85 was restructuring and in Marxist terms if you look at restructuring its always happening and post Fordism was a restructuring period when the modern big companies and nations couldn't hack it anymore because they were out created by the small fast changing computer led self-organising groups of less than well 20-30 people who were really the avant-garde in just innovating. You've got a thousand little industries in Los Angeles where I was teaching, you get in Milan for instance a thousand different furniture companies. The big furniture companies bought into the little and so there was a true post-Fordism meaning Fordism plus the small groups. That was the big restructuring from a Marxist sense and I think then Thatcher in '85 and Reagan, and globalisation you know the big bang occurred in the city, and Reagan got rid of any regulations. Ecology hit the wall everybody sold off the National Parks as fast as they could.

PL: Except for...hmm...at that point Thatcher herself starts to develop environmental policy?

M: There's another Thatcher trying to get out from underneath her horrible self, and she does of course go to Lovelock and Gaia, she recognises that Lovelock is right,

she was trained as a chemist. And of course Lovelock is a chemist too, and she understands his argument and she sees yes there is really a problem here so...I mean Thatcher was no fool! And... but she was an idealist of the free market to such a degree and she was trying to fight off her left and her centre, that she went along...she and Reagan did deregulate whatever...she sold off all the council housing. Now I'm not against selling off council housing as long as you're building new council housing but it's mad you know?

PL: But could you say she was responsible for a re-emergence of environmental thinking as a government sponsored thing?

CJ: I wouldn't give her too much credit on that but she probably...I know she was helping Lovelock and she did give one or two speeches, but she didn't put her money where her mouth was. I didn't see it. I may be wrong! She may have set up one or two think tanks but her basic...all of the truth, privatisation, and selling off big firms and deregulating you know in a way she was the result of Arthur Scargill and the idiocy of bigness of the unions. And this is one of the problems of living isn't it that you find one drunk pleading it to the left and another drunk pleading it to the right. And they wobble down the street deserving each other! And usually creating each other and you know that's true. I mean Scargill created Thatcher independent on Scargill for credibility. Anyway but who's defending Scargill you know he was a schmuck!

PL: Even if you look at say Frampton writing his 1980s addition of his modern architecture book, he sort of says oh...there was a lot of enthusiasm in the schools for ecological design and it disappeared. Can we just put that down to a major cultural shift to the right, or anti welfarism or something else?

CJ: No! I would say that these things are semi-autonomous. I'm not a determinist but if you just discuss the large forces of history then I think the ones I've just mentioned are stronger, but you know you can find...and this is a point of Architecture 2000

which I make explicitly both in the original I think and certainly in the new reprint is that we became very conscious that you've got to follow your own analysis and values and you...if you do as an architect like Ken Yeang, and ecology, and you get the future more or less right, the ecological problem is only going to get bigger as he understood. He was one of my students, and you commit yourself to that, you may go out of fashion for 20 years but by god you'll come back in! Because all of these things pulsate and something as big as ecology is never going to go away for the 200 years if we survive. And you can predict it. It's a postmodern movement, it's a modern movement, and it's a reactionary movement.

PL: All of those things?

CJ: All of them! It's a big subject and they're versions, they're different versions of ecology. I mean those I think are the 3 in architectural terms...its Prince Charles's new urbanism, is definitely a very strong ecological one. I don't want to split too many hairs and then there's the Glenn Murcutt you know...modern high-minded minimalist version and then there's the techno...eco-tech which is the Foster doing more with less version. And then there are various postmodern ones of all of the Greening, you know as well as the site and metaphor.

PL: Landscape?

CJ: Well yeah so there's not one way to be pro-ecology and there never will be.

PL: But there is one set of ideas that are very popular which I wondered if you had any thoughts about which is...which some of East Coast universities like Harvard in particular seem to have taken onboard as an theoretical framework which is quite a long way away from practice, which is um...Felix Guattari is very fashionable at the moment as a reference, he uses the word ecology. And I'm not quite sure that's...sometimes when you read your book talking about the...the slums basically in Latin-America that there was a campaign...there's a strong interest in that sort of people self organising element to it, but it must be very different I think from the 60s because we live in a different world and it's got a much more top down?

CJ: I don't know! I mean yes and no, the thing is that remember architects build only 5% of the world's buildings, I mean you should always remind yourself when we talk...when us architects talk together we're 5 percenters, and still self-build and people mucking around even with large parts of the environment is the rule.

There's trickle down of architectural fashions and styles and methods but they're trickle. I think the self-building mentality is still much stronger even though advanced techniques are used like Google shopping, the computer...everybody's is buying their things off the shelf. Even though it's Walmart...self-build it's happening and it's not going away.

PL: I'm interested in the five per cent's enthusiasm for that because you say it's a trend, the enthusiasm for the vernacular which ironically of course, the five per cent can't reproduce it because its spontaneously produced. Now Harvard professors are talking about Mumbai, the ghettos, and the vitality of the slum.

CJ: I wrote a book on adhocism that was a major movement that went into postmodernism and adhocism is about bottom up self-organising architecture by non-architects as a vital force. So the Mumbai way of building today and its fashion and the people who attack it as kind of slumming has always been around. In other words both the reality and the attack and frankly architecture is big enough to have the mumbo-jumbo Mumbai, the very creative slums. Slums are always creative because they have to survive without money and power. I bet it's horrible in a way and you know I think politically you should support your slum and give them infrastructure. I'm a profound believer that that's possible to really ameliorate and not de-vitalise and its tricky because if you go to South American in the big slums there you...I'm sure you know you can't go into them else you'd get murdered. And that's why they're actually designing those things over the tops of them. So you don't have to walk through because even the people who come from the wrong neighborhood can get shot. So we're talking about really cultural wars, class wars, and both of them together going on.

CJ: For instance the Aga Khan and his organisation in India, Pakistan, the Muslim world, is trying to do good in those situations. There was a Cambridge Pakistani who found out that if you can just de-pollute the rivers and organise how the slum exists along the rivers and provide housing and infrastructure everybody gains and in order to do that of course you have to convince the state that you should support the poor which of course we can't do anymore. No one would get elected on helping the poor in our welfare states.

CJ: I'm an old leftist in the sense I really believe the state has an obligation to build social housing and infrastructure in all the old modernist sense...but you can't do it the way they did it. When you do it you have to also legislate how it is bought and sold because as the Indians have found we all know in the West that as soon as the working class gets rich enough they want to sell their house.. so you have to legislate, you can't sell your house for 10 years, okay? But everybody should be encouraged to get up and get out and housing is a major role in getting up and getting out.

PL: Have you been to Harvard recently?

CJ: No, I know Mohsen (Mostafavi) and I know he's publishing things on ecology and taking a big view, I don't read them much.

CJ: It's the big deep structure of our society; it has to be thought about. In a way it's an eternally...I was going to say fashionable but it's a...there's a much better phrase. It's a compulsion ...it's the way that you and I and everybody are forced by necessity to face...I'm just searching for the word because it captures...you're not determined its... it's the ecological imperative, it's the imperative, it's an imperative, you cannot call yourself and educated person and not wrestle with it.

Any university like Harvard Graduate School who wrestles with the imperative, the ecological imperative, is wrestling with you know one of the major questions of our

time and I understand why architects now always gravitate towards it, or will, because for the next 200 years we're in...

CJ: I don't know where is my book on critical modernism, I'll just show you all my diagrams showing this. You can't get out of this situation, all you can do is say...the graph maybe 5 years old but...have you ever seen this book? It's the fourth or fifth edition of What is Postmodernism. It's called Critical Modernism 2007 it may answer you in a different way. These are the extinctions in a way. I can find the place where I discuss recent ecology. Yeah...Doomsday fatigue and critical theory. This is the same culture of fear. Global warming is never [reads something out whilst muttering here]. I flew over Iceland and took this picture from the plane you know where Greenland is not green, it's not even white anymore it's black! Black land! And this is...this is...2006 and I've photo-shopped it but you know this...so look at this...this is my diagram of all of the statistics. This diagram you can't deny, what you can do is you can push it that way and we have...warming, and Matt Ridley saying it's not as severe as you think. So the diagram maybe pushed this way, but you know...and we know that these strategies are not good enough strategies, survival strategy, and runaway warming.

CJ: Runaway global warming has been predicted now since the '60s and we know how it works and we know we can measure ice caps. The problem is doomsday fatigue now here is...everybody knows that Florida is going to sink, Holland is disappearing, Shanghai has gone, Bangladesh off the...you know this is doomsday prediction of everybody. All the UN bodies, and so...how do you survive that, because you have fatigue?

CJ: I think maybe another answer to your question of why did ecology disappear because people had burnout. How do you continue banging your head like...Jonathan Porritt for 40 years crying out...look out its happening, its coming! You can't! Jonathan can because he's a professional doomster! But not an architect and they disappear.

PL: It's slightly antithetical to the idea of architecture as well.

CJ: Well I mean yes in the sense we hire you as an architect and you maybe dead right in your doomster predictions and right in what you want to do about it but I just want to build a building. Its Shell, go to the American politicians, go to the 400-500, or 5,000 richest people or operate on the problem at the political level not on the level of architecture. Architects are very poor players, they're near the bottom of the food chain, and if you want to feel good as an architect then just look at landscape architects they're below you!

CJ: Think about landscape, there are people below them, but they're bottom feeders, we're all bottom feeders and we don't have the power. So naturally we have burnout and I think I wouldn't underrate the doomsday fatigue and burnout. And so to answer your question in a different way now if I'm going to be an architect and run an architecture school and I'm going to not give up hope I've got to think about something else. You know I fight as a citizen against global warming, I fight against extinction of species and I give 3% of my time to that but I'm not going to, why should I, I'm a human being. I didn't ask to be born now, why should I dedicate my whole life like Jonathan Porritt. By the way I respect him, I like his recent book and the good thing is it's about the future, the next 50 years to 2050 and it's called back casting rather than forecasting if you've not read it.

CJ: It's not typical...it's a typical ideological green issue and written by academics from America and they get each other. It's not radical, its green wash, it's how as a respectable academic you get tenure by green wash. That's being written about quite a lot at the moment about universities institutionalising sustainability and criteria, and if you don't...do your research with the title of sustainability in it.

PL: I haven't quite worked it out but in some way I think environmentalism does come on the agenda and its appropriated by government really and it's got a lot to do

with the shifts in international relations and the end of the Cold War and those kinds of things. And in a way that kind of turns the profession off it, it's seen very much as a sort of policy driven thing. And so perhaps -

CJ: Sure! It's a way of beating up the third world. I mean there are all those very unsavoury aspects of mainstream sustainability. Not to mention the ones that architects face directly, in other words box ticking hypocrisy, box ticking hypocrisy. I think you've got a compound answer why people are suspicious of it. It's a go away and bore someone else please you know because it's not serious its ideology. Its green wash and I'm afraid that that contributes to our fatigue.

PL: Yes and cynicism?

CJ: Yeah cynicism so...I'm sorry it has too many answers!

CJ: Well before I say anything if you read this AD you'll see that it's right...if ever there's a box ticking AD issue, okay straight out of what you've said so descriptively that's true. And there's none of the spirit of ecology so that that's why I go to Gaia.

CJ: You know there's something wonderfully idealistic in ecology which I always get renewed from, eco-feminism, or the work of SITE remember the American metaphorical ecology and de-architecture. And then all its idealism of the modern movement of living close to nature or the hippies. I embrace it for that...for those kinds of cultural reasons and also Gaia, intellectually Gaia is much more sophisticated than ecology because it isn't so anthropomorphic you know. Look...you have to take...a cosmic view of the planet if you're going to take spaceship earth, get off the spaceship and get off this anthropos view and Gaia is you know...well...it has to be framed within the cosmic I feel. It's...in the beginning was the universe for 9 billion years and then along came Gaia and spent 3.8 maybe 4 billion years, very soon it would start at 4.5, 6, 7 billion years ago, it's an easy number to remember 4.5, 6, 7 earth was formed, and you know...people don't know this but there was the evolution of matter of the elements. First of all there was element of evolution and

then there was...the elements gave way to the molecules and then the complexity of the 4,800 different what do you call them minerals, there's mineral evolution and then well...a quarter of the way through the mineral evolution along came life. And life didn't do anything for 2 billion years, the boring billions they're called, and then suddenly life and mineral evolution really took off and life invented with the mineral evolution a million...sorry sorry thousand new minerals you see. So...that's Gaia, Gaia is about chemicals, minerals, life as a package okay? That's the cosmic, that's...get real I say to all these ecologists, get real! And I've done one ecological scheme that I should tell you about its very touching to me, my heart it really touches my heart. It's a good place to end actually.

Previous note from Jencks:

From: C Jencks

Sent: 26 September 2013 11:13

To: Penny Lewis (sss)

Dear Penny,

Good to see you the other day on the Riviera.

I am sorry that our interview was so chaotic and I realised that what I didn't say was more important than what I did say. Maybe we can converse on the telephone; here is my London number if you want to continue. I realise that it was the influence in about 1984 of the Santa Fe Institute and its work on complexity theory as the science of the 21st century which I teamed up with that led to a lot of my new thinking at that time. Hopefully we can speak again soon. Best wishes, Charles

Sent on behalf of Charles Jencks

N Higgins, PA

11.2 Interview with Sven Olov Wallenstein Venice May 2014

Sven-Olov Wallenstein is professor of Philosophy at Södertörn University, Stockholm. His research interests include aesthetic theory, Modernism in the visual arts and architecture, German Idealism, phenomenology, and modern philosophies of desire, power, and subjectivity. Recent publications include *Nihilism, Art, Technology* (2010) and *Biopolitics and the Emergence of Architecture* (2009). Works in progress include translations of Diderot's salons and essays on art, Hegel's *Grundlinien der Philosophie des Rechts*, and Adorno's *Negative Dialektik and Ästhetische Theorie, Architecture, Critique, Ideology: Essays on Architecture and Theory; Foucault, Biopolitics, and Governmentality* (ed. with Jakob Nilsson), and an anthology of essays on Heidegger's philosophy of language and poetry (ed. with Ola Nilsson). From spring 2012, he has been the leader of the research project 'Space, Power, Ideology' and since 2001 he has been the editor-in chief of 'Site Magazine'. In 2008, Wallenstein published 'The Silences of Mies' a study of readings and interpretations of Mies's work. This interview begins with a discussion of Mies's work. This is an extract from the interview which addressed the question of modernism before moving onto the discussion on ecology.

Penny Lewis: My first question is: why write about Mies?

Sven-Olov Wallenstein: Why Mies...well when I wrote that book I was intrigued by the idea of silence. I'm not an architect, I'm a philosopher and I've been reading a lot of architectural theory and teaching and supervising PhD's and have been engaged in a lot of research. Having read Manfredo Tafuri and Massimo Cacciari, and many others who explored the work on Mies I discovered this idea of silence - withdrawal, negativity, renunciation - it seemed to be like a recurrent idea in a lot of the philosophical orientated scholarship on Mies. So I wanted to explore the implications of what this silence could mean. Of course that is tied together with other things in static theory, with Theodor Adorno for instance, his work on Beckett and with his work on John Cage - the idea of silence as a kind of ending point for modern aesthetics. So the book is really a reading of other readings for me, it's not a book on

Mies as such, it's a reading of other readings of Mies, trying to figure out what this topos of silence actually means.

PL: I am familiar with Tafuri's two volumes on Modern Architecture in which they talk about the silence in Mies's work. Why did you choose to focus on Mies specifically?

S-OW: I think 'Modern Architecture' is his key text. Tafuri is one of the great historians and he's also one of the most influential architectural historians for a philosophical audience because he has ideas that are more philosophically oriented. A lot of people read Tafuri who are not necessarily architects so in that sense he's very interesting. When I discovered him I had read a lot of Adorno. To me he was like the Adorno of architectural theory.

That's why I was interested in him and these lines about silence, or the withdrawal or the renunciation in the Seagram Building are key passages in his book. And it was also picked up by Cacciari who then continued to develop the idea. (Cacciari was also the Mayor of Venice for a while, for about 10 years). He connected it specifically to Heidegger, to Heidegger's understanding of technology, and then I found Reinhold Martin's book 'The Organisation Complex', he also starts from this passage in Tafuri and Francesco Dal Co's book and develops it from a different angle. So I found all these tropes about silence being interpreted in various ways and somehow wanted to bring them together into one systematic reading. This is why the book is called 'The Silences of Mies' because it's obviously a plural silence.

PL: How would you explain what Tafuri was trying to say?

S-OW: Its part of a chapter called 'The Activity of the Modern Masters After the War' where you have a series of endings, Corbusier, Gropius and others, and all have this sense of endings or a certain sense of waning, fading, loss of creativity, how modern architecture somehow peters out at the end, but there is one ending which is the 'tragic' ending which is a great gesture, which is the Miesian ending. I think this

is why this passage was then picked up by Cacciari in his interpretation as the key passage in Tafuri's entire work. That's of course Cacciari's reading so maybe I'm now reading Tafuri through Cacciari.

PL: So from Tafuri's point of view it's an expression of failure?

S-OW: Not of failure. Obviously modernism fails but it can fail in different ways, it can fail in a grandiose way which somehow doesn't just embody but incorporates the contradictions of the modernists idea and makes it into great work, like the final work. It has the same position as Beckett's plays would have in Adorno's reading and the old conversionist idea of silence. From my point of view not being an architect but being interested in the connection with Heidegger was important because Cacciari was a close collaborator of Tafuri's at the school here in Venice (Università IUAV di Venezia). He brought a more philosophically structured attitude to that kind of historical reading. Cacciari connects him to Heidegger who I was working on at the time so for me there was a point of convergence between many different things.

PL: If we leave Heidegger for now and explore the meaning as opposed to the reading of the silence of Mies that Tafuri is talking about. You said that it's not necessarily about crisis, or that it is about crisis, but crisis can have different qualities. I mean emptiness is another word that's used in the description of Mies's work. Emptiness and the silence, can they be inter-exchanged as expressions or is there something different about the idea of silence?

S-OW: Obviously in many contexts they can be exchanged - renunciation, withdrawal, emptiness, and this blank reflection etcetera, so there are a whole series of images, but in the literature the trope of silence is the recurrent one. You also find it in Michael Hays for instance and other texts. Tafuri and Da Co's book which was published in '76 in Italian, formed a kind of paradigm for other interpretations. Everyone kept repeating and reinterpreting and twisting this trope over and over

again. But what we are going to be exploring in the lecture today is perhaps a bit more systematic.

I think there are three basic ways to understand this silence, or there are 3 different silences, and the first one is a little bit in Tafuri and explicitly in Cacciari, where this silence is the ending of a certain metaphysical idea about architecture. It connects the history of philosophy and Cacciari connects it to Heidegger. It has to do with the way modern art becomes impossible in the face of modern technology. It's a kind of metaphysical ontological speculative reading of this trope of silence.

Secondly someone like Hays for instance is closer to the Frankfurt School and I think all of these things, all of which are already in Tafuri's texts are close to the Frankfurt School, the silence it's not so much a metaphysical ending but more like a socialist structure continuation, it has to do with art under capitalism. Silencing doesn't have anything to do with the history of philosophy and metaphysics, only in a mediated fashion, but it is fundamentally something to do with the contradictions of art under late capitalism; that the formal languages of architecture are emptied out because there is no commodification, and so it's more or less a socially oriented understanding. And these can be combined, and many interpretations tend to combine these two, but they are still distinct readings.

The third one I picked up from Reinhold Martin's book 'The Organisational Complex' it says that silence is in fact not just an act of renunciation but is something that opens up a different interpretation because the screen like quality or surface is actually not just an ending it is the beginning of a new kind of modularity. So it is a modulation that opens up the possibility for other repetitions in the future. For Tafuri this is a tragic moment which is then repeated as a 'farce' because his is the old Marxian history reading. And what Reinhold says is - no - its neither 'tragedy' or 'farce', it's the beginning of a kind of new modularity. So, from one point of view it looks like a silencing and on the other hand is already replete with a plethora of other discourses and possibilities that open up. Reinhold wants to get away from the sense

of ending and exhausting - so exhaustion is only one moment. Something is exhausted but something new begins, and I think this is the most interesting interpretation because it's a more productive one, and it shows how formal languages were reinterpreted and became the stock and trade of lots of modern architecture or more specifically modern corporate architecture.

PL: What about Mies himself. In your book you make a lot of references to his writings.

S-OW: Yes there's a lot of talk about Mies and I think he's kind of oracular in a way. If you read this collection of texts 'Das kunstlose Wort: Gedanken zur Baukunst' (The Artless Word: thoughts on the Art of Building) it's clear that he's not a philosopher - I mean he's influenced by Romano Guardini, a Thomist who nobody reads anymore. A great many modern artists read bad philosophy. But he had his own ideas for sure. I'm not a scholar of Mies and am really just picking up the interpretations of others. He might not have accepted this heavy philosophical reading, but he does talk about concepts like 'almost nothing', and he was definitely a minimalist artist.

PL: I'm sure I read somewhere that Mies' silence was due to the fact that he thought he didn't need to talk about architecture.

S-OW: But he did. You know the 'Artless Word' is a big book and he makes a lot of statements from the '20s onward. I think he was a very self-conscious architect. You know Beatriz Colomina wrote that he was always projecting himself and creating a persona for himself. In the 20s he was very conscientious about being part of the right avant-garde groups. He made all these theoretical projects in the '20s, the glass skyscrapers, which he surrounded by text and oracular statements so in a sense it's not unlike Corbusier in that he combines statements, texts and words in a certain way. So if there is a silence in Mies it is a very calculated and self-conscious silence.

PL: Still sticking with Mies, I know you're not a scholar of Mies and you're not a social historian either, but I'm very interested in that period in the US (the period

when a lot of European scholars have lost interest in him), when he's not part of the European avant-garde, he's doing something else. Architects like Alison and Peter Smithson looked to Mies in the post war period and he offers something. He appears to be striving to give expression to something that's important in the post war period. The Smithsons relate to that; do you have any sort of insights into what that sentiment or impulse is?

S-OW: I'm sorry, I didn't quite get the point you're making?

PL: In the 1950s p architects in Britain that identify with Mies like Alison and Peter Smithson are unusual. Most people in Britain would identify with Le Corbusier or they might identify with what happened in Europe or Scandinavia the 1930s. But the Smithson's identified with Mies because he expresses something about the peculiarities of the post war period - as if, at that moment, you have an option, you can go one way or another. There's something of a particular quality about his attitude, not his philosophy but his attitude.

S-OW: But what did they say, I mean I don't know them enough, I know a lot about them, but I didn't know they had a specific connection to Mies, what did they say about Mies?

PL: Well they spend quite a lot of time in their book *Modernism without Rhetoric* talking about why Mies still represents the aspiration to give form to the modernistic impulse. That's the basic thesis although it's more insistent about the relationship between form, and technology and architectural expression.

S-OW: I don't know so much about that so I'm reluctant to say anything, but I would say that what interests me rather is the way that Mies would connect with someone like John Cage for instance, the glass surfaces would be about emptiness that is also a fullness. What appears as a kind of formalistic reductivism is in fact also part of an opening up of the work, towards the work. You can see it in Rauschenberg's white paintings from '51 and the silent piece by Cage a couple of years later - and the work of the whole neo-avant-garde movement which has traditionally been perceived as a

reductivist or 'emptying out', but which is in fact a new type of exploration of how the work is opened up - how it loses its autonomy and becomes part of a context - how it becomes part of the corporeal situation of the spectator.

A lot of historical art scholarship today has asserted that the opening up of the work occurred in the 60s because of minimalist conceptual art are now pushing that transformation back in history. It began much earlier. I mean to use those horrible terms modern, postmodern, the postmodern began much earlier and what art historians are doing now is erasing this line - because the art historical canon somehow pinpointed the 60s as the moment it broke through - is now being dissolved I would say.

PL: Do you agree with that?

S-OW: Yes I think the truth about history is that we don't know. It's just a question of how we read history, and so I think from our point of view we need to move beyond this fetishising of the '60s and push those things back in history to see there is no clear divide anywhere in history.

PL: One of the problems with that is that you then have an interpretation of modernism that's a little bit one-sided.

S-OW: Yes or you can say that everything which is post-modern was also modern - obviously that's the end result. This division can be kind of a heuristic device because it allows you to see the differences as long as you don't believe too strongly in there being any particular moment in time where this division occurs but as a kind of heuristic tool, as a tool for investigation it can be used. As long as you don't put too much belief in the tool itself it can allow you to make discoveries but what was actually the true about the historical moment is only a question of our interpretation. That's of course something we view from our vantage point in time, how we read history.

PL: Is there good history and bad history?

S-OW: Yes of course there are bad histories and good histories. If you look at art history 'what is the true meaning of Picasso or Duchamp' as Hal Foster would say, and I agree with that. It's a kind of retroactive question - we rediscover moments because we find a reticence in the present. The same thing happens in the history of philosophy, we rediscover old thinkers; suddenly they become actualised because something happens in the present. So history is not a given in that sense. I think the problems with the kind of interpretations we find in Tafuri, Cacciari and also Hays is that history is there - that we need to discover what actually happened. But I think someone like Reinhold Martin would say that whatever happened is not really so interesting. The interesting thing is what happens if we look at history in a certain way? Which is obviously not to deny historical scholarship, but the facts are there to be interpreted and they mean something. Works means something from our point of view. If you listen to Beethoven from the point of view of Schönberg he would sound different obviously. And as Adorno would say, and I think Adorno is right, that one needs to listen to Beethoven from the point of view of Schönberg or Goethe from the point of view of Beckett - and we have no other option other than to look at it that way. I mean this is the way Goethe and Beethoven looked at history so in that sense we're doing the same thing.

PL: The danger of course for a younger generation of people is that they can then become indifferent because everything is a product of who you chose to look through the eyes of.

S-OW: Perhaps it's true, but I would say there is also the inverted danger, I remember Mark Cousins once said 'how can you teach people at the AA to become interested in baroque architecture?' you can't do it by giving them historical facts because they couldn't care less, and you could say 'you need to learn this because you want to become erudite persons', and they still couldn't care less. It doesn't work. The same thing with the history of philosophy, I teach history of philosophy, and you can't

teach 16th century philosophy saying you need to know this because it actually happened.

PL: Why not?

S-OW: Because it's an un-philosophical way of reading history because the texts are there, they're dead and they're closed and you memorise them and then you do an exam, or you repeat what's being said. Why would you do that?

PL: But as you say by restudying it throws light on your own situation.

S-OW: On your own situation - and you need to approach it from some point of view in time which is inevitably your own point, so you need to read classical texts from the present.

PL: One of the things that I think is quite interesting about architecture, and please don't be offended, is that because students don't have a broad liberal systematic chronological education then their relationship to philosophy can be very faddish. You write a book and then they say 'oh I need to know a little bit about Piranesi so I'll read a little bit about it' and so we have this strange sampling of philosophy and history. I would say the counter position to that is that if everybody had a little bit of an insight into everything we would be less faddish?

S-OW: Sure, I mean obviously that's a problem in philosophy. I've been teaching it for many years in various art schools and architecture schools and I know the fad problem. If an artist, an architect or a filmmaker reads, say Deleuze, and they produce a work or a design out of it then of course that's a moment of ridicule! Then again, you can't say as a philosopher 'I have the authority of this text and they mean this and that', you can't do that because every interpretation of a text - which also transgresses the disciplinary boundaries - an artist reads a philosopher, necessarily entails a transformation. Otherwise there wouldn't be any potential.

So if an artist, a painter reads Merleau-Ponty and does something with it its fine! So I can't say you are not allowed to do that, that's obviously completely unproductive. What I do as a philosopher when I used to teach in those schools, I'd say 'fine you can do whatever you want but if you know more about the concept you will actually be able to get more out of them - you will be able to use them in a better way if you understand their history, their ideology what they mean etcetera. You still have to do your own interpretation because you are not philosophers, but you could a better interpretation if you know the history of them'.

So in that sense I don't think there's a contradiction between having a lot of historical knowledge and then producing a new interpretation of them - and also an interpretation which displaces the work into a completely different disciplinary context - which is the context of art production or architectural production. So that's what I feel is my task as a teacher. I couldn't teach them art or architecture because they are artists and architects, but I can teach them a certain way of approaching philosophical texts that would allow students to get more out of the text - without attempting to make them into scholarly philosophers because I mean that has no point - they can't do that.

PL: The thing that I found quite interesting in *The Silences of Mies* is that right at the beginning it's almost polemical. It's sort of saying, people use Foucault in a certain way and there's a problem with that because that's a bit one sided, it suggest Foucault was not interested in agency. Mies is particularly interesting because he is quite unfashionable at the moment; not among certain people, but you wouldn't find tutors in studio referring to Mies much anymore. There's a general tendency to deride architects with a very strong sense of agency, individual agency, which I think Mies epitomises.

S-OW: Absolutely. Yes Tafuri and Cacciari also write about him as one of the last great artists - and his pronunciation is his stance - and even though he couldn't sign off the buildings himself because he wasn't part of the American Architectural Guild

- so in a certain way his signature was blurred and Philip Johnson had to sign them off.. But this also why he is such a strong presence in certain strands of critical theory that want to retain the notion of authorship.

Mies is in that sense also one of the last great authors, also Le Corbusier for instance. Whereas modern architects tend to be in groups and assemblages of people and they allow the idea of bureaucracy. I have a Swedish PhD student that I accepted to supervise just yesterday who wants to write about 'bureaucracy as agency', what kind of bureaucratic structure is actually behind the agency - how bureaucratic structures are actually the agency behind architecture. It's very close to Reinhold Martin's study about the organisational complex. So he's working on various official buildings in Sweden, how they were constructed during the 60s and 70s and really wants to get rid of the whole idea of authorship or at least make a more complex idea of authorship.

The fetishising of the author is of course then part of the late modernist paradigm - where you also find people like Adorno and Tafuri. That's why I say Tafuri is like the Adorno of architectural history, he knows that the author is doomed, but he can disappear in various ways. He can just fade away or die in a grand gesture. There's this great quote from Adorno when he speaks about Schönberg. He says that Schönberg puts a halt to dialectics, but dialectically! I think it's in his 'Philosophy of New Music' which was published for the first time in '46, '47. There's an English translation, just after the war. In it Stravinsky is the bad ending, Stravinsky is the eclectic, almost the proto-post-modern composer who Adorno hates at that time. But he likes Schönberg because he ends it dialectically. That I think is very close to the reading of Mies you find in Tafuri's book.

PL: It sounds like you're saying that we accept the fact that the author is doomed, that that's the condition? I didn't get that sense from reading what you were saying about the one-sided reading of Foucault.

S-OW: This one-sided reading of Foucault has already been accepted for the last 20 years.

PL: What's been accepted - the end of the author?

S-OW: No the reading that the core of his work was mainly oriented towards discipline and repression, is wrong.

PL: Determinism?

S-OW: Yes. It's just completely wrong and in his publications, the many lectures from the '70s, the huge body of work which has been published, you see that this idea of discipline - the 'Panopticon' from 1975 - is just one small idea that he was flirting with for a year or so. It's just part of a long, long development. His real issues are about agency and how to become a subject, and how to exert a certain freedom in relation to oneself which he calls 'subjectification'. Discipline was only a little part.

PL: Like Sartre?

S-OW: Not like Sartre. He thought Jean-Paul Sartre was too Cartesian. For Sartre freedom was always absolute and for Foucault freedom is always situated - located in a particular moment in time, and its conditions would constantly change. And so the task of philosophy is to uncover those conditions that both prohibit freedom and make freedom possible at each moment in history. I think a much more fluid Foucault has entered the discourse, but not so much the architectural discourse because the example of the prison was so visible. It was easy to use because, it had a form and a visual quality. So it's over-cited. I was doing research on a French group called the CERFI 'Centre for the Research of Institutional Formation' and it was actually the moment when Foucault, Deleuze and Guattari came into contact with Architecture (It was an avant-garde group. There's an anthology coming out called 'Deleuze and the City'). The group was led by Félix Guattari who was a psychoanalyst and a political activist. And in the group they got a commission to work on public facilities or public institutions - 'equipment collective'. They wanted to analyse why people desire, or why there's a demand for public facilities, it was kind of post '68. And at the time they had something very interesting called 'contract research' which was a completely crazy idea, or a very smart idea because the French government thought -

'okay we have all these revolutionary groups - we need to pacify them. Let's give them money so they can do research'. So anyway, they could apply for money to do research, you didn't need to have a PhD in anything. You didn't have to have any formal qualifications. You could be an activist or a crazy guy!

PL: Did the Department of Education do this?

S-OW: The Minister of Interior Affairs or something like that. So they gave them money, and we interviewed some of these people in CERFI and they said it was like having a drug dealer, 'we got free drugs for a couple of years and then they said no more money!'. Everything just collapsed. They did this research on public facilities - it was '70, '71 and Deleuze was involved Foucault gave talks and I think that's how their interest into 'space' began. It's one of the crucial moments in why 'space' becomes important. They worked in architecture on hospitals and prisons, the city as an idea, and I think a lot of that work then coalesced into 'Discipline and Punish' but it's a highly politicised and almost 'extreme left' radical splinter group. And you can see how political their understanding of space, the city, habitat, the building, the institution was. A little bit of that came into the prison analysis. But it also went through many other channels and he published several books which are still only in French - collective research projects on the politics of habitation and so on. They were analysing the fact that the French state in Paris began to analyse how people live, how many children they had in the early 19th century, social medicine. They were investigating the origin of that concept - also statistics were used, the hospital was one of the first key studies. How the hospital becomes a machine for analysing the city - and there was a popular book that came out in '77 that they all read called 'The Curing Machines', which is possibly also one of the sources for Corbusier's living machine because the phrase was taken from Doctor Jacques-René Tenon who came up with the idea in the 1780's when he said the hospital should not be a particular building that has a certain structure that symbolises authority and the history of medicine, but rather that It should be a curing machine dispersed throughout the city so curing could occur all over the place. So it's a kind of

dissolution of the concrete building so it becomes more like a diagram that extends throughout the city. From that point onward Foucault, Deleuze and Guattari's interest in space began in a very concrete empirical way.

I think this has been completely lost in the reception of Foucault because these books are not being translated, they are not being re-edited, I don't think any of these texts are translated into English, but you find them in weird archives in Paris where there is some research. So this is also one of the things that I wanted to bring up in the book to get a more nuanced image of what Foucault was doing - bio politics and the caring of life also originates in that interest in the hospital as a curing machine.

PL: This doesn't seem like 'fad' research to me. Of course it's from a position but it is real research.

S-OW: Sure. Many of these ideas have been known for a long time in philosophical scholarship but haven't been looked at in architecture at all. So when they asked me to write something on Foucault I wrote this book. It's a brief text. Obviously it could have been a huge book, but it was part of a series of small books looking at these issues.

PL: I'm looking at the impact of environmental ideas on contemporary architectural theory and um...I'm very interested in Guattari's popularity particular in the east coast universities at the moment. Do you have any insights into where that comes from?

SOW: Maybe because he's been translated a little bit and also, I think because people are discovering you know that he was not as important as Deleuze but in fact he was in fact there at the start you know? People say Deleuze when you actually look at it you can see that so much of the stuff in... both *A Thousand Plateaus* and others the whole interest in music, the interest in language, a lot of the concepts were in fact invented by Guattari whereas was the one who gave a more stringent (approach).

There is a biography by Francois Dosse, I think it's out in English and he's more like a journalist in some sense but he's also a trained philosopher, but he has these great scenes where he's describing how they're collaborating and Deleuze says sit down, you need to sit down and write! I can't sit down, he's walking around. Sit! God damn it sit down! It's impossible! So, he would just throw out ideas and concepts like this and Deleuze would sit down and make philosophy out of it. So, in a certain sense I think Guattari was the one who was full of ideas and concepts whereas Deleuze would make order into the system so in that sense. I think people also are rediscovering the energy of Guattari, it's just a mess because basically he couldn't write, or he maybe could write but he was uninterested in writing as (communication).

PL: Yeah it's just load of ideas dumped on a page.

SOW: Yeah! Yeah! Yeah!

PL: That explains why it's quite hard to look at, what about...given that you have some connection with the US schools what about why the US would particularly...it can't just be about translation.

I've noticed...people have talked about sustainability for a long time, but it wasn't compatible with the philosophical discourse but suddenly ecology seems to have opened up the possibility of talking about the environment.

SOW: Yeah but of course because it is a general issue in all the humanities because it is a global issue.

PL: No it is a global issue but it's interesting that its ecology is the form that it's taken as opposed to environment, or sustainability, or...I mean is it just because there are some philosophers that have talked about architecture but also used these words, I mean I've noticed people use ecology and architecture now to describe -

SOW: Perhaps it's because there are certain people you can pick up that belong to a canon of important thinkers, but I mean from...that's institutional stuff but I mean more...profoundly philosophically I think it has to do with the fact that many thinkers today are challenging this divide between nature and culture.

I mean obviously ecology is an old word, but it has perhaps become a new kind of umbrella term that could be used to discuss these terms and in Sweden we still speak about sustainability. Any application for research has to contain the words...my research on 14th century philosophy is very sustainable, it's one of those words you learn to hate because it has to be there all the time! You get like stuff from the university how does your research contribute to sustainability? It doesn't! [Laughter] So we haven't been hit by the ecology term yet, but it will come probably. I think ecology...used by Bateson and others -

PL: Yes Bateson is important.

SOW: He was also important, I mean Bateson is very important for the [...41.21] as well so it's a way of integrating the mind into nature in a certain way, which is also there in the [...41.30] very strongly so I think this is why the ecology term is a wider and perhaps more pliable concept that can be used to talk about different things.

PL: I think what you say about the biological imagination or a naturalism...a new naturalism where you break down the divide between biological methods and philosophical methods. I see that as problematic?

SOW: I think it's very problematic I have no great love for [...42.03] for instance, I think a lot of that is philosophical, it's just rubbish, but so there's a lot of stuff which I don't like. It moves too far too quickly, and it somehow discards ideas too quickly. But I think if there's something which I like there it is...I mean we used to have an analytical philosophy as you hear I'm a continental philosopher I'm not analytic you

know? Our department is the only continental one in Sweden, so we're hated by everyone else we're like the dissident group.

PL: Oh really! By continental you mean sort of historical -

SOW: No French and German oriented - I mean the kinds of problems we work on, the names we cite are not [...42.43] so it's a different type of philosophy and in England you find that in Essex and Warwick and other places, you go to Cambridge and Oxford they will speak about different things. But I mean in analytical philosophy I mean naturalism has been around for a long time.

PL: Has it?

SOW: Yeah. It is perhaps *the* strongest paradigm in the last 20-30 years and because...obviously because of the new research and biology and all these things it becomes even stronger.

PL: Who would be the main name associated with that?

SOW: I would say...this idea of reductivism used to be around in the 20s and 30s, people like [...43.22] physical sciences now it's the biological sciences, and I wouldn't know any great names there, you wouldn't know them. But I mean it's a strong trend in the sense that the mind is just no part of nature, the mind is biology and you can have a biological analysis, of art, aesthetics, ethics, etcetera which means that everything we perceive as culturally structured, layered norms and ideas are really reducible to some lower level which is now...it's used to be physics and there are some people like...for instance [...43.52] would say everything is physics.

Others would say no everything is biology! So it's still a reductivist paradigm, but I think it's important if it is important in the new ecology thing. I'm just speculating here of course, is that it's a non-reductivist thing, he doesn't say that everything can be reduced to something else, but he says that everything hangs together but it does not mean that everything still exists on the same level. I think this is what our problem with [...44.18] for instance, that he tends towards a [...44.20] reductivist whereas I think there is a passage somewhere in *A Thousand Plateaus* I think where [...44.31]

the kind of social structure and the bands of the government and all the people in the [...44.40] they say that they compare...some of the people to monkeys that have a certain way of organising their tribes and we say pecking order yeah, yeah. And saying obviously point here is not to say that [...44.54] is a monkey but to say that already the monkeys are [...44.50] it's not reducing something but saying what you thought was simpler, it's in fact just as complex as the higher level so it's a kind of inversion of the reductivist paradigm so it's a different kind of naturalism which I endorse. The problem is when naturalism becomes reductive you say ethical choices can be reduced to some features of the brain or something like that and that I dislike because it becomes a new kind of determinism.

11.3 Interview with Kenneth Frampton New York 2012

PL: OK I suppose if we're limited for time the basic question I would ask you is if you were to think about architectural education and start from scratch today what should architectural education be aspiring to, are there some fundamentals that you think are at the core? What a school might be?

KF: Well in fact I was thinking about it yesterday, I think one course that should be given is a building anthropology course that the lecturer would address him or herself to look at pre-industrial forms, ways of life and of housing and of settlement. I think this question of pre-industrial vernacular and settlement patterns of nomadic peoples would be worth having a course on. I think in order to, as it were, go back to the most primary aspect of building culture as opposed to architecture in relation to culture in general. The way of life of the species being in different climates, and different moments in time could provide a kind of grounding, a fundamental reference as a sort of pre-historical. I think that would be very good to have in the very early years of architectural education.

PL: Hasn't that been done before? It was done in the 70s wasn't it? There's Rudofsky...

KF: I suppose so, but the question is where was it done? I don't know there's a figure at the AA that was very interested in vernacular. Well Rudofsky Architecture without Architects yes but Rudofsky's book addresses the topic you know alerting the reader to these rather remarkable structures, but it isn't really going underneath to the question of myth or the wider issues of forms of clothing, and forms of production, in relation to built form. I think it's very interesting this question of clothing and material culture in the relationship of the built environment to material culture is seen as a totality. I don't think I don't think Rudofsky really did that. I think that it's hard to find people to do it but that could be seen as fundamental I think. And I suppose I still think that...that uh...that a studio curriculum should have a kind of typological base to it.

For instance, in Columbia, we do still give a housing studio in the first semester of the second year, but we do so without the students...the students who enter that after being one year at Columbia still haven't even designed a house. So I think that this kind of basic thing of a house as a type form, and in relation to furniture, the anthropometric dimensioning in relation to furniture and everyday life ought to be part of initial education. And then I think...I feel that the studio sequence should still be typological it should work through one generic building type to the next.

PL: Why?

KF: Well because I think that passing from house to housing to public buildings and what is involved in making a public building is useful. Then of course this brings me almost immediately to Hannah Arendt this question of the space of public appearance and so? What is a public building exactly and what is its relationship to the society and to the site, and so on?

I once tried to do this here and when I was at Imperial as Acting Chairman I thought then that if one had a first year and a second year which was residential fabric and then a public building, and if one moved to a third year (assuming that I'm still thinking in terms of this model of 3 years) I think there should be a long span building, you know a stadium or something of this sort, a swimming complex. I mean going from residential fabric to public building makes a certain kind of hierarchical sense but then for shifting to long span the criteria is different. It's not a particularly pragmatic type but rather it implies a pragmatic type but there is a different kind of space challenge involved. I mean you can only take the typological thing so far I think and then the other thing I think should be introduced more firmly into architecture, the core of architecture is landscape. I think this question of landscape should be taken more seriously. Indeed in the first year perhaps even to give a small landscape project you know would be pedagogically beneficial.

Then there's this whole history-theory thing I developed here and it relates to the book studies in tectonic culture. This kind of concentration of subject matter that is focusing on (for want of a better word) what we can call the poetics of construction. I think that is an emphasis that could be sustained in a history-theory thing.

I think somewhere there ought to be a course which tries to discuss modernity not only in terms of architecture but also in terms of political, social and economic development. I suppose ideally you could put these things together both architectural history and the political, economic and social, but this is getting a bit utopian I think. I do have this feeling, this uncomfortable feeling that over my own teaching for example, that if I had the capacity to go in that direction that the teaching of architectural history would be inseparable from cultural history. If one could fuse them together I think it would be educationally stronger, and one would have, one would be producing architects which had a mature idea of what the evolution of modern society has come from; what its aspirations were and what it is now. You know the sort of broader picture somehow rather than concentrating too exclusively on architecture, core architecture. But that's very demanding I think to find teachers that are able to teach like that to invent courses which would break up into components that would allow one to sort of fuse them, the cultural, material cultural history with more specific architectural history, a question of invention.

PL: One of the problems seems to be that...where there has been development of theory in relation to architecture it's been the reading and the interpretation.

KF: Yes.

PL: Rather than the subject itself and you must have followed that process?

KF:

Yes I kind of resisted you know the whole semiotics tendency that was so strong. You know in this book *Meaning and Architecture* which was published in the mid '60s...edited by George Baird that's where I, as it were, come out someone who's sort of unduly impressed with Arendt's *The Human Condition*. And actually what, put in its simplest sense I think I've gleaned from Hannah Arendt in the first place is some explanation of the difference between what the word architecture means and what the word building means.

The two of course fuse but the fact that they are different words which have different histories I suppose yes it's also to do with this idea of process. I think what's interesting with her notion of labour is that it is *process driven*, you know and very in a sense metabolic, she makes that quite clear. And I think of building as a kind of

extension of the human subject, as a kind of process never finished. And architecture as having a sort of more symbolic orientation and more concerned with permanence. The whole argument she makes about the transience of individual mortality through the work of the *homo faber*. It's very beautiful that passage where she says...the animal needs the help of the *homo faber* to ease his labour and assuage his pain or something like that. That is the *homo faber* is instrumental...as instrumental as a toolmaker. But then she says she also needs the *homo faber* in the other capacity as a world creating figure and storyographers, artists, she doesn't actually mention architects, but it obviously would be the same. And where she has this great passage that without sustaining something like that, I'm paraphrasing, without sustaining the world in the face of the passage of time in the face of individual mortality the story that the subject has to tell to itself would no longer be there. Everything would be swept away; there would be no memory in a way. She's alluding to memory. So I found all of that on her part very convincing.

PL: Baird also claims a sort of relationship to –

KF: He does yes. He does. No he does indeed! And actually when I went to Toronto recently you know we had some kind of discussion a bit about that. I mean he's written a more recent text yes a book in fact – a book!

PL: The Appearances of Spaces

KF: Something like that where he focused on this question of action, where he says rightly in fact that I have kind of ignored the third element action you know?

Where...you know...where she makes this point that uh...that man plural exists in the world and not just the singular and that the action of course is the quintessential political action and...yeah he's right –

PL: [...15.03] labour though as well?

KF: Hmm! He's right about that criticism of my...my interpretation of the significance of her human condition for architecture you know? Though I think the...you know...yes the political is unavoidable. I mean the action is unavoidable. I mean without the client and without the um...the intention of the client and so on you

know you can't really make the work in any case...so...um...yeah – maybe not very clear all of this but something like that.

PL: I suppose what Arendt allows you to do though is to um...look at the relationship between the thing itself and the context in which its produced, whereas um...I suppose Baird sits within a tradition where um...which seems to dominate a lot of academic discussion now where um...the thing itself almost seems irrelevant to the process not just in architecture but outside of architecture, intellectually, and there are so many circumstances whereby we've sort of lost the habit of discussing architecture within its own terms. We only ever discuss it in terms of...what its meaning is or how we've interpreted, or how other people have interpreted.

KF: Yes.

PL: That seems to be quite a dominant trend in American schools? Is there any way out of this kind of impasse that we seem to be in and does Arendt provide any clues to that do you think? Reinvigorating a discussion, the discipline in its own terms or am I suggesting there's a problem where it doesn't exist?

KF: Well I mean I think there are different traditions within the discipline and those traditions are worth examining in order to both ask the question what has architecture been in the distant past but also in the modern period and then secondly,...and...and what can it be in the present, like putting it as a question what is...what is this field in anyway case?

I mean if one could say that this is a redundant profession and field, and one could push it to its extremes and say that the social discourse or sheer economic survival is all that really matters. I mean one could reduce it to that sort of thing and to make the argument that science and techno-science are the dominant discourse and rightly so etcetera. I think against that is the, it is of course political, it would seem to be the case that the whole society and the world in a way is very driven, economically driven by capitalism and by consumerism.

The consumerism is ultimately the engine so to speak that drives everything. But this consumerism is extremely negative. It is a waste machine basically and it has no other aim than economic expediency it has no project. And particularly when you set that against the phenomena of climate change and this destruction of resources. I mean there is a very beautiful aphorism that I've always liked from Thomas Maldonado which is while 'you cannot make anything without waste' this is distinguishable from an ideology of waste.

I think that the degree to which the consumer society is absolutely transfixed by 'an ideology of waste' is a political condition, political, economic, historical condition. And therefore I mean coming out of that would mean to search for values other than consumerism. And at that point the environment re-enters and so...the question of architecture...this question of architecture as a thing in itself. I think I've always left out of my writing and thinking and all the rest of it, the whole issue of form so I think that some kind of discussion about form and formal order and rhythm and unity and continuity, in formal terms probably should be part of architectural education. *It* should be brought back into architectural education and discourse. Form as well as space, we tend to sort of think...we do still talk I think a bit in terms of space.

PL: It's not very fashionable.

KF: No it's not very fashionable and one notices you know that certain architects there is no space, I mean it's all on the surface. There's no space inside the buildings at all of any significance, any quality, they're simply without...it's just stuff, it's just volume but it's not space you know? But nevertheless I mean...when you talk to young architects they will still describe their schemes in terms of space. But they often don't describe the scheme in terms of the overall form you know? Or the rhythm of the form and so on you know? Or the formal unity, or the...etcetera, the continuity of the form. These terms are usually not used neither by the critics nor by the...the students.

PL: Is that Peter Eisenman's approach?

KF: Well I mean of course the...Peter talks about form but nothing else practically you know? But the risk of talking about...to reduce it to completely only form is of course formalism. You just...it simply...again you empty out the content from the other side you. You simply...are...discussing it as abstract form.

PL: So really it's about capturing the complexity of the thing?

KF: Yes. Not losing the...not losing the complexity of the thing you know? Yeah.

PL: OK.

KF: Yes! A bit rushed I'm sorry to say yes!

PL: A few seconds just saying when you met Hannah Arendt?

KF: I think I met her in um...in Toronto in '72 I think. It was a conference organised at York University on her work and she happened to be there, and I was there also with George Baird and myself and uh...actually Mary McCarthy also happened to be there because she was a friend of Hannah Arendt's etcetera. It was a very brief meeting you know, that's where I gave this labour, work and architecture for the first time and she did you know...whatever, she said you know I think it kind of works, she didn't say you know it's a kind of misunderstanding.

Dear Penny,

It is always a pleasure to hear from you. Let me start with the questions:

(1)

If I recall correctly the first edition of 1980 ends with chapter 4 of part III, entitled "Place, Production and Scenography: International Theory and Practice since 1962". As it happens 1962 was the date of Michael Webb's Sin Center which I still think of as the aboriginal Archigram work! You are right, there is nothing on the environment or sustainability except my critique of Milton Keynes and Melvin Webber. There is the quote from Claude Schnaidt on p. 287 followed by Superstudio's post-consumerist

vision, plus a reference to Maldonado's *La Speranza Progettuale* of 1970. I think that in 1980 climate change had yet to come into its own, so to speak.

(2)

When Bernard Tshumi became dean in 1988 he gained a certain notoriety by introducing computers and the "paperless studio", which was soon accompanied by the fashion for parametric design. In the early 90's Tschumi had one of those unguarded moments in which he said students were not interested in sustainability.

(3)

Ecology? Recently I received from France the proceedings of a conference staged in Pontigny-Cerisy from 30 August to 6 September in 2017 on the theme of *La mésologie, un autre paradigme pour l'anthropocène?* The key references behind all this are (a) a French philosopher named Augustin Berque & (b) a Japanese philosopher named Watsuji Tetsuro who in 1935 published a neo-Heideggerian thesis entitled *Fudo, le milieu humain* (There is an English translation). The report on the conference in French was published this year by Hemann Editeurs, 6 rue Labrouste, 75015 Paris.

For Tetsuro, *fudo*, the Japanese word for climate, goes way beyond our own concept of climate. This is altogether too much to deal with and still meet your October deadline.

In haste, as usual. You once sent me a book entitled *The North* which I have a feeling is still related to *fudo*. Is it possible for you to send me another copy? Good work with your PhD,

Kenneth

p.s. We last met in Edinburgh when Mackintosh's School of Art had not yet been definitively burnt to the ground, once and for all!

p.p.s You once wrote to me about the highlights of Scottish architecture but I have to confess that I was not too convinced by any particular example. Apart from the Sassenach's Benson and Forsythe and Richard Murphy and the erstwhile, indisputably talented, Glaswegian pair McMillan and Macstein, where are we today?

11.4 Interview with Anthony Vidler New York 2012

This interview was largely concerned with architectural education – but at the end of the interview I took the opportunity to talk about ecology.

PL: In Britain clearly there is an issue at the moment of funding and there is some uncertainty about where the profession is going, what's appropriate, in terms of what the core aspects of education should be. I was wondering to what extent that discussion is reflected in the US?

AV: Well the majority of schools in the United States are tuition driven, even the state schools and so the majority of schools have reached the limit of their ability to raise fees in relationship to their target audience. Most schools have adopted the traditional model of growth. So NYU and all those other schools are tuition growth either growth through students on campus in their sort of home seats or growth globally.

PL: You mean by establishing campuses abroad?

AV: By developing programmes that are global programmes that bring in revenue because of the global desire for certain kinds of education that are not necessarily satisfied within their own countries but also countries that are developing and have funds that allow for those kinds of interactions. The AA is like that in Britain, and certainly Columbia is doing a lot of outreach with studios in different places across the world. And that has also I think it's grown to its maximum at Columbia because of the space. The real problem with urban universities in this country is space. I don't know whether you've followed the NYU expansion plan which is sort of filling the available space to the point of claustrophobia. Anyway basically at Cooper of course we are not tuition driven; we are endowment driven and fundraising driven and that is not a very healthy concern in a moment of recession.

PL: Does the Cooper Union system give you any particular freedom in terms of setting your curriculum?

AV: Hypothetically yes, except we are subject to the standards of our accreditation boards just like RIBA Part 1 and 2. The National Architectural Accreditation Board (NAAB) has very, very, strong performance criteria that every professional programme, whether it's a 5-year undergraduate or a 3-year graduate programme has to follow. We're accredited in exactly the same conditions as Columbia's Graduate Programme or Princeton's Graduate Programme so there's no difference except for the 'B' as opposed to an 'M' in relation to the MArch/ BArch professional degree. So every 5-6 years they send a team with an AIA representative, National Architectural Accreditation Board representative, ACSA – the Association of Collegiate Schools of Architecture, that's the academic side represented, and so this team comes and it looks at a few years of work. It looks at all the work that's produced through an entire year, all the papers, all the marking of the papers, everything! And it's a huge effort to get everything together and they go through it, and they go through it with all the performance criteria and so on, so it's actually more rigorous than RIBA Part 1 and 2.

PL: Really - and is that useful?

AV: It's more rigorous because in RIBA Part 1 and 2 accreditation you can usually just get your friends to come back and do it. I will go back to be an examiner at the AA but here it's completely impartial, a completely national operation and you can't stack it at all. You get people from all over America with different ideas of practice and different understanding. Usually one can spin one's school if you're careful within the criteria and they have to judge a school on its own merits and its own uniqueness but there are points where they're completely unbendable usually in terms of the technologies and in terms of building practice and building professional practice and so on.

PL: Okay. One of the criticisms about the RIBA is that it's become very much driven by procedure, it's about you providing evidence that you've fulfilled the procedure as opposed to doing it.

AV: Yeah we do that. We have to do that. And then we write a report every year...to the NAAB and we have to talk about things that they talked about in their annual

review and their six-year visit and if they said that something needs to be done we had to report on how it's done and sometimes they come back in a smaller team in 3 years to judge on 2 or 3 performances.

PL: Do you think that in any sense that this is a problem?

AV: Nah! I mean it's been the same since I started teaching here in the States in '65 so it's a problem that we all get over.

PL: In Britain the danger is that the procedure becomes the basis on which the school determines its outlook is. Where you have strong schools you have a strong sense of identity – this isn't necessarily a problem for a large number of schools where there's increasingly a lack of a sense of where things are going, then the default position is compliance.

AV: We comply all the time, we comply, but we comply in our own way.

PL: Sure! But in America as a whole do you think that there's a culture of compliance?

AV: I think there is yes in some terms ... I would not say that architecture schools have a culture of compliance, I think they comply because they have to, because they want to turn out students that can be registered and can go and do their internships and take their licensing exams in the different states. Every school I've visited in the United States has a local regional character or urban character wherever they are. I find that in Canada, I find that in the United States, and I find there's no lack of individuality, vibrancy; I mean it's all part of where you are. I mean if you're in Arizona you have a different kind of school, a different climate, and different kinds of problems that you're training students to look at than if you're in New York. In New York you have different problems in Manhattan than you do in Brooklyn- so it's a different environment. Maybe also different student catchment so...uh...yeah I think that you know everybody complains about the National Architecture Accreditation Board and nobody really seriously worries about it.

PL: Okay! What about um...the universities in the sense of the idea of it being an academic discipline as opposed to a school of art, or a technical college do you think that's an issue?

AV: Most architecture schools in the States are in universities because that's how it started, it started at MIT, it started at Penn, um...and so...yes I mean its...there is no...I can't think except...well Pratt is in its own institute, Cooper is in its own institute so I...they're either in technical institutes or they're in universities but the majority are in universities.

And there's no question about...depending on the...on the nature of the university so the nature of the architecture school. So if the school is a...um...is a...there are some schools that are profoundly engineering and science based, um...Georgia Tech for example, uh...and that's where the research money comes from and that...the school has a vibrant relationship to technology. Um...on the other hand it also has a vibrant uh...PhD programme which is culturally based so...so you know but it is...it is true that um...I find the climate here...I mean I went seamlessly from Cambridge to Princeton and the only difference I found at Princeton, a positive difference, was that we weren't an isolated um...school of architecture calling ourselves Cambridge, we were a school of architecture with a single faculty across the whole of the Humanities, Social Sciences, and Sciences.

It meant that once you were a professor in one school you could teach...I mean I found at Princeton I was able to establish a European Studies programme which was totally...to do with literature, to do with history, to do with art, to do with art history, to do with social science, and so um...I found no difficulty. I found a great pleasure actually at being in universities of this kind. UCLA was slightly different uh...it had a very powerful relationship to LA as a city and so that gave different kinds of opportunities and different kinds of problems if you like, problems for the students to solve, problems to look at critically. Uh...Cooper [...11.31] the same

PL: Right. But in terms of the operation of the department they're given relative autonomy in terms of meeting the professional criteria and some of the discussion in

Britain is about the sort of clash between the demands made by the university procedures and then the demands made by the –

AV: I think there's been a reasonable flexibility here I mean I think that uh...uh...for example Harvard has over the years established a Professor of Practice which has sort of avoided the problem of professors um...attaining the kinds of standards that Humanities, Social Science, and Science professors need to attain to get tenure. Uh...in terms of...but you know Princeton we found ways to persuade the tenure committee of the university that architects could be judged according to standards that were parallel to those of the Humanities and Social Sciences, judged by the work, judged by competition, judged by review, judged by publication, judged by...and so on. And so we had no difficulty in tenuring Michael Hays, we had no difficulty in tenuring a range of architects in the school who were slightly more academically minded you know? Elizabeth Diller at Princeton was very easy to bring to the tenure committee because she was both...she did exhibitions, she did critical curatorial work, she did critical interdisciplinary work in architecture so that was...I think the schools um...select the faculty that both best recognises...sorry best um...responds to their particular...sense of where architecture is.

PL: I mean in a way the scale of the operation in the US provides more freedom, more flexibility?

AV: Yeah. Yeah. And also um...I mean the one problem is that uh...with the recession is that there have been far fewer entry level tenure track jobs. So I mean I know in Britain you don't...you have a sort of de facto of tenure but here we actually do have a tenure system. Um...and uh...it has blocked...the lack of the ability to retire of the senior professors because they need to work longer in order to retire with benefits and the recession which leads to budget cuts means there's far fewer tenure track openings. I have...a junior faculty member now who's gone and several former PhD students who are going for positions now and they're all going for...all of them are going for the same 3 positions, one in California, one in New York, and one in...one in the Midwest so it's very...its very disturbing to have to write very strong letters for 3 of your best students for the same position!

PL: Yeah. Yeah. Right. On the who you'd say then despite the recession um...you think that the state of architectural education in the US is positive at the moment?

AV: I think so and it depends school by school, some schools are very um...locked into sort of ideological or...um...uh...sort of architectural positions that definitively prevent their expansion in other dimensions, sometimes prevent their engagement in critical issues, um...but I think in the end because of the pressures of professional engagement and because most of the students you know work as they go through school in offices that have to deal with contemporary issues um...in the end most...most...I would say that most schools in the States provide...I wouldn't...you can become a really fine architect in almost every one of the schools. I find you know the differences are of taste and of uh...predilection and of geography.

PL: Okay. In terms of history and theory in the curriculum is there much discussion about its place, does that vary from school to school as well?

AV: I think it's absolutely about now, well history...has...always been in many universities a divided responsibility between art history and um...and architecture schools. Some architecture schools have their own architectural history staff, and some architecture schools rely on the art history staff. In Princeton we do both um...here we have our own um...and uh...in UCLA it was very much internal to the school um...I think that over the...with the emergence of uh...journals in the 60s and the way in which journals um...began to publish critical history, theoretical works, um...and the way in which we started PhD programmes in the 60s and 70s um...and those PhD students are now teaching in you know...almost every school in the country I think there's...there's never a question...I've never been in a faculty meeting where the existence of history and theory isn't seen as critical, isn't seen as absolutely essential.

PL: Right. I suppose the question is what's its relationship to the studio and then we could start to ask the question about what's relevant and –

AV: You know there's no...there's no...well what's the relationship of...anyway what the...the relationship of all course driven instruction to the studio is always going to be uh...in the first place made by the student, in the second place um...its...if it's about architecture it's the structural relationship that is to do with the discussion of architecture in the school um...most schools bridge history and theory in the studio by having the same people teaching history and theory in the studio. I mean most people who are teaching history and theory in architecture schools have trained as architects.

AV: Most people with PhDs in history of architecture and theory of architecture that have done their PhDs in architecture schools are trained as architects first. So...when I lecture...I lectured today on um...the work of the Italian rationalist Aldo Rossi, and company in the 60s and showed the students how all those um...concerns of typology, of the city, Rossi and his book [...19.26] the first to use urban ecology within a strictly architectural um...frame. Um...and...you know I demonstrated to them how in fact um...this whole movement in the 60s was in fact so deeply incorporated in their faculty and their programme that it formed part of the history of where they were now. So...you never don't make those connections and I teach in the studio, so you know I make the connections every day. I was taught by Colin Rowe who trained as an architect, did his master's with [...20.05] and then came to the desk with a stubby black pencil and lots and lots of tracing paper and started to design with you, you know?

PL: Yeah I mean there is obviously a strand of history and theory that is at a certain distance from the profession certainly in some British schools you get a teaching of history which is seen less as a critique of the profession.

AV: Yeah but most architecture schools...yeah but that's great because that means that um...uh...both the critique and the profession is put on notice to...and the student is led to be self-critical which I think is perfectly reasonable. It's never...I remember a moment where um...we had an accreditation visit at UCLA um...and...uh...it was a very...shall I say you know...the worst kind of pragmatic team right and didn't really understand LA even as a city. Um...and certainly didn't

understand uh...the fact that most of the major architects in LA were teaching in the studio in UCLA, including Morphosis and all those people right. And I remember at the end the leader of the team stood up, there's always an exit [sounded like] meeting, and the leader of the team stood up and said well as far as he was concerned uh...the schools are out of touch with the profession. And uh...Tom Maine who's a major professional stood up and he's very tall, stood up and said 'No no, let me correct you sir! It's the profession that's out of touch with the schools! Or rather...your profession that's out of touch with the schools.' In LA, our profession will take any student that's you know graduated from UCLA with eagerness, I have 10 of them in my studio and rely on them absolutely for everything I do. And you know its...these are discussions also within the profession, they're not discussions between schools and the profession. And certainly I don't find um...when I go to visit schools or when I go to visit professional organisations and certainly I'm a member of the Centre for Architecture which is the AIA...uh...chapter in New York, I mean they put me up as Educator of the Year, I mean there's no sense of fundamental division between the schools and the profession except in I would say...except in areas where the profession itself has stagnated or has become totally mired in...economically and socially in less...um...uh...in projects that don't demand the same kind of uh...questions that architecture schools are posing to their students. And that could be true in rural areas of the States, it could be true...but even there you've got the rural studio um...you get studios that are deeply connected to their environment.

AV: I don't want to be Pollyanna, I'm sure there's friction, I'm sure there's um...but it's not institutionalised in the same way as I find it in England.

PL: Well that's interesting! Um...and what...how would you explain that difference?

AV: Well in my day in England it was a class difference because the profession was run by upper middleclass and sort of semi aristocratic...all gentlemen of you know...but then I was schooled by the independent group at Cambridge who were themselves trying to usurp right, and given power by Sir Leslie Martin who while an aristocrat in a way himself, but aristocrat...he was brought up in the Midlands, went to school in um...the Midlands and came to London like...you know...the

Smithson's and uh...presumably once had an accent but got rid of it very quickly when he went for the RIBA meetings. But yes I mean there is a...I don't know whether there's...I would say the fundamental problem of architecture in America is diversity.

I: Diversity. Right.

R: It's really hard for women to gain the upper echelons of large practices, I think there's one in the echelons of 50 directors...and there...it's even more difficult for a person of colour woman or man! And you know it's also hard for upwardly striving people of colour or women to feel that architecture is the kind of career that will bring the kinds of rewards that they or their parents look towards. So medicine and law are the two favourites for example of Asian parents, and black parents. Um...you know...you can become Obama by going to law school, you can't become David Childs at SOM by going to architecture school if you're coloured, a person of colour.

PL: I mean just out of interest in terms of income is there a big gap?

AV: Well there was a huge uptake and down take depending on...depending on recessions.

PL: Because AJ has just done this sort of series of pieces on women in architecture yeah.

AV: I gather yes! Yes! The other thing...I was asking...there was one woman partners of SOM who was for a long time the only woman partner is now Dean at Penn, and I was asking her what...what went on at SOM and she said well all the women they hired found the big firms that are still run in the sort of madman 60s ways right, uh...that asked for sacrifices day and night, um...and continuity through the weekend that women who needed flexi time or women who wanted to step back and say I also want to raise a child um...found they were unable to um...stay there basically! And that's on top of the obvious male club discrimination which I have seen there and in other big firms over and over again.

So out of Cooper for example, our women students, who are often the very best students, um...and only still are 25-30 per cent of our student body um...but are often

the leaders of the student body, often the best designers, often the most intelligent in terms of...questions that you're going to ask me about ecology and environment. Um...they tend to go into small firms, small partnerships, or they will intern with a small firm and then go back and do a master's degree and/or PhD and go into teaching. Um...and they become the academics if you like of architecture. Um...and even the...um...the male students will prefer to go into either...they all form small partnerships by themselves and make startups and they've done that several times in the 12 years I've been here, and/or go into small firms and become the kind of uh...designers of those firms. We've had some success with one or two women in large firms but uh...they find it hard. Okay.

PL: Interestingly, when you were talking about Rossi you used the word urban ecology, does he actually use that expression?

AV: Yeah. He was one of a generation that was very deeply influenced by structuralism. And specifically structural anthropology and structural sociology and he was very involved in understanding the work of geographers especially in France and Italy. Geography much to my dismay is a subject that has been deeply neglected in the United States. It was probably sustained in Britain and France because of their various empires and the need to learn about different people's right?

Well you remember those maps...well I remember those maps of the British Empire in pink and

PL: I think they're embarrassed about that, so they don't do geography anymore!

AV: Which is terrible because in fact geography is one of the few things that my students know nothing about. If I asked them to draw a map they couldn't! Right? So geographers um...and urban geography at UCLA was very strong um...and now regional geography is coming back through landscape.

Right. Not landscape gardens or landscape design but landscape studies.

Actually English geographers like Dennis Cosgrove for example, who died recently but who was one of the great urban geographers of UCLA um...so there are certain pockets in which geography still operates but to me it's the...it's the pivot of

understanding ecology not simply as you know LEED specifications, or green design, but as an environmental question.

AV: I'm a Patrick Geddes fan right and so I believe that his relationship to entomology, his relationship to Thomas Huxley's teachings, his relationship to geography through his connections with French and Belgian geographers like and others made him a model of thinking about urban issues and uh...I think it's interesting that there are many PhDs now working in that particular area. I have a faculty member who's just finished her PhD at Princeton in the history of recycling and ecology – Lydia Kalipolitti and she um...she did her degree in Greece as an architect and then she came and did Material Science at MIT, and then she went to Princeton to do her PhD in history and theory of ecology.

She put out a special issue of AD quite recently and uh...so...there are...really various ways to enter the field of urban ecology or what I would rather think of as regional ecology because there's no urban anymore that's not regional, there's no region anymore that's not urbanised. I mean even in remote Tibet um...iPhones rule the world! And that means you're urban at some point. So...uh...yes what did you want to ask about?

PL: Well I suppose I've picked up that there's a kind of desire to map the history of the development of environmental ideas. There is a danger that we sort of read history backwards in that process and bring everybody in the fold right from onwards.

AV: No that's true! Well especially when you think of the bad odour of ecology in Germany between 1933 and...

PL: A romantic reaction against industrialization or an enthusiasm for nature is different I think from my starting point in '68 really because I think that you can probably trace a relationship between what you might describe as crisis theory, or a shift in theory, and development of environmental ideas. But I'm really interested in both the idea of the environment as a word when people first start talking about the

environment, but I'm also interested in the expression ecology because it's an idea that I associated with the 1970s but I've noticed particularly in American literature that its used a lot now in place of the expression sustainability which was very fashionable for a period of time and I think became problematic. But then you tell me Rossi used it, and obviously Banham uses it, but they mean systems...do they mean systems or what are they describing when the use it?

AV: For Rossi it was a description of the relationship between the urban and the non-urban. The relationship between human nature and nature. For him everything was form...I mean it was like...I understand the difficulty of words ... we're interested in a number of things.

Historically why we're interested in the questions that pertain to the context of architecture outside and permeating the individual building. One because urban design in this country became very much of a formalist operation without any understanding of...you know it became the vulgarisation of Collage City.

You know cutting, and pasting, and collaging to a certain extent that sense that architecture is a kind of tissue or texture that permeates and is permeated by its environment was somehow overcome by what in England became...the worst kind of picturesque townscape and here became the worst kind of collage city new urbanism. And so the need to look back at the '70s um...and surprise, surprise to find someone like Nixon as President being one of the most environmentally conscious of all Presidents so far. His political need to sustain the National Park system while he was bombing Vietnam is another question!

I was brought up in the '60s and '70s and was... totally offended by the deep divide that emerged between the sort of architects of form and the architects of environment, between the Christopher Alexander's of this world and the Peter Eisenman's of this world...and I was totally unable to understand that kind of autonomy idea.

I was totally interested in a figure like McHale who worked with Banham and who started his life as a sociologist, and moved into collage art, then moved into the Independent Group, and then moved and worked with Banham and I have to say if you read the Ecological Context published in 71-72 it could have been written yesterday by someone much smarter than most of our present day ecologists, or global warming.

I mean it's got a chapter on global warming so...yes we wouldn't want to bring back...the romanticism of nature, nor would we want to bring back any kind of fetishisation of nature because quite frankly nature in the raw has hardly existed for several centuries in terms of land till and usage and dis-usage, in terms of climate.

There's just no way to distinguish and so therefore it is an important understanding that a building envelope is not just like a skin, it is a skin, it's an important understanding to feel that at least you're driving towards a degree zero addition to the carbon footprint of the world.

It is those kinds of understandings that are absolutely essential if one is to even make a decision or compromise on what materials to use, what energy to use, what form to use, what relationships to...compliance to use and so on.

These are questions that are deeply important to bring to students notice, this is why we're all interested in both the history and theory of ecological practices, not to bring them back but also not to reinvent the wheel. Then beyond that how do we go forward in the conditions, what were the conditions that had to be analysed then, what are the conditions that have to be analysed now? And how do we analyse them?

How can we bring those kinds of specific knowledges that are important to understanding a more holistic vision of the ecological environment of architecture...how can we really bring them together?

We were all part of teams in the '70s where there was a sociologist, there was an engineer, there was this, but they weren't properly teams...the different specialisations didn't know how to transmit their knowledge one way or the other and certainly architects didn't know how to use that knowledge.

So I think it's very important early on in a student's life that they be part of at least one experience...research experience that brings certain questions to the table which involve the need to talk to other specialisations, other kinds of knowledges.

I gave a seminar a couple of years ago where we just took two materials, we took the titanium on the roof of Bilbao, and we took the bamboo on the floor of a Manhattan loft and we analysed them. First of all we analysed where they came from and we analysed what their harvesting did to the communities where they came from. Did anything go back to the community? What was the energy used in the harvesting, or mining, what was the profitability to the community? Did it destroy the community? What it did to the ecology of the place...you know strip mining in Uzbekistan and bamboo cutting in China. What was that ecologically?

Then what was the energy used and the kinds of social and work processes used to get from the place where it was mined or harvested finally to be on the floor on the roof. It was an extraordinary exercise in research for the students to understand how bamboo is harvested, what kinds of semi-chain-gangs are used to harvest, whole villages disrupted and then whole hillsides opened up to erosion again and again and again. So just to talk about a renewable sustainable resource like bamboo in social, economic, cultural and energy terms. They even analysed the toxicity of the new glues that were necessary to use with bamboo, the energy that was needed to be used in the cutting of such a hard wood as bamboo as opposed to a soft wood and so on. It was an extraordinary exercise...it was a global exercise, but titanium went around the world three times before it became a little piece of thing on the roof.

PL: When you that in the 70s you had these kinds of relationships, but architects didn't know how to make sense of them, you feel that that's different now?

AV: Well in Princeton we had the sense in the 70s that...we had Renee Dubois, we had all these people coming in and talking about the environment, and we had lots of experimental studios, we had the sociologists on staff in Princeton, Robert Gutman was the sociologist. Galen Craz, who's now at Berkeley, was on our staff, but it was very interesting, they immediately became sociologists of the architectural profession as opposed to bringing in urban sociology to inform the architectural profession of what they were most...in need of.

PL: Do you have any other thoughts about ecology and why particularly that word rather than sustainability, sustainability was an incredibly popular or is very popular in Britain but it's...

AV: It's become a popular word here too because...it rather than ecology appeals to municipalities, and grant giving agencies, and it seems to have a scientific ring to it that ecology does not. And its tied to that area of industrial fabrication which is called LEED certification which basically is a list of products.

PL: Yeah we have that in the UK as well.

AV: Performance requirements which you just tick off...check off and it doesn't matter whether the envelope of the building is actually designed in any way to solve the problems. It matters that there are a couple of solar collectors on the top or whatever. So we are not into that and we're not into...I don't know whether you have this in Britain...BIM system?

PL: Yeah. We do! We're being encouraged to really take it onboard and educate the students in it.

R: Well we don't do that here either! Neither will Mark Wrigley at Columbia. I have great allies here! Mark Wrigley at the public forum when asked about BIM in the

AIA Chapter by somebody who's become an enthusiastic ... said something about ... there is no way that we will academia will simply resort to teaching technical methods. If technical methods are necessary to solve a problem which is posed in an academic question then we will use any technical method in the book to try to solve it. And uh...you know I think he made some beautiful thing BIM, or BUM, or BAM! But as he said he prefers BAM – that's right he preferred BAM to BIM because it puts on a much better performance! That's the Brooklyn Academy of Music!

PL: We have exactly the same discussion all the time at the moment, well we're not winning that –

AV: But academically I think...academically I think we're moving away from sustainability only precisely because of its consumption by industry and by large scale developers who will use it to get through zoning requirements...and/or sell their own projects.

I mean the whole question of sustainability and the whole question of carbon footprint ignores the fact that in any urban situation 60-70% of the carbon footprint is produced by old buildings not by new buildings. One new building that transgresses the certification is not going to help the earth. What is going to help the earth is research into uh...retro fitting or reconstructing the historic fabric.

PL: I've just read your first Theory essay in AR in which you describe a 'crisis of theory' is that correct?

R: No I think theory ought to be always in crisis, because theory is a critical...is a critical thought process that always should be self...crisis driven.

PL: What's particular for the period after '68?

AV: I make the point that one of the problematics, I don't think it's not even after '68 it's after the 50s, after the 50s, one of the problematics really is that on the one hand you have an attempt by architectural theories...traditional architectural theories, to speak from inside architecture like the Renaissance. You have attempts to identify

where the authority of architecture comes from and there are theoretical construct about that authority.

So notice in *Towards the Synthesis of Form* (Alexander), the authority comes from the analysis of a programme, as if it was a computer programme. In Peter Eisenman's thesis on the formal principles of...it all comes from form.

For Banham, it all ought to come from an idea of the...environment...the *Well-Tempered Environment* right? Then you get a group of writers trying to pull those things together in what I would call a rather wet way which is like Norbert Schultz's *Intentions in Architecture* which rapidly becomes absorbed by a kind of phenomenological an idealism which for me is a fascism – I said it!

PL: But very fashionable!

AV: I know. It drives me crazy because...it drives me crazy in the same way that the nostalgia for nature drives you crazy! Because it's a part of that same hermeneutic that thinks of a world that was lost which was in fact, in my Marxist materialist view, never was that way. It was always terrible and it always always will be, therefore all we can do is to mediate the process of terror, of how it's terrible. My father used to say when he came home from the War Office during the blitz, my mum used to ask how it went and he said 'well quite reasonable considering the circumstances!' Or he would say 'so far so good!' So far so good I think is a much better...it's a much better philosophical premise than either being nostalgic or utopian.

PL: Okay but there must be moments when you could say –

AV: But I think utopian...I made this argument it's incredibly valuable theoretically to push the boundaries of criticism...almost like I've made this analysis of Plato and I've made this analysis of Thomas Moore, that they pushed the boundaries of thought and they think the problem is when those boundaries are thought of as solutions. I mean Plato never said it was the solution, he always said...Socrates always said well

it might be this, it might be that, and if it's this then it will be this. If it's that it will be that but we...it will probably never be either/or.

Thomas Moore you know never actually (the tyrannical religious fanatic that beheaded all the Protestants he could find) ...certainly didn't mean to say that his communist utopia would be put in practice. He wanted to push the idea of communitarianism...even a kind of primitive Christianity to the extent of saying what would a state be like if right...and used that to criticise Henry VIII's state. So I think that you know utopia is very important, actually the other person who raised this argument is...

AV: I was thinking you were saying what happened in the 60s? Well I think there were 2...that happened in the 60s, architecture theory in architecture um...sort of divided into itself right and divided into camps. Um...and then beyond that –

I: Sorry! Those camps are sort of internally orientated and externally orientated?

R Yes they were to do with architecture as a kind of semi-autonomous discipline based on high tech or based on the quotation of uh...of history, or based on pure form right? All based on computation, right so you've got Christopher Alexander or Lionel March and all those people on land use and built form at Cambridge. You've got uh...Peter Eisenman and the Institute for Architecture and Urban Studies, you've got um...Colin Rowe and his [...56.20] folks up at Cornell, you've got Chris Alexander and his computation turned hippy social in Berkeley and so on.

PL: Yeah!

AV: Right. So you've got those camps and then there was a new generation of really critical and philosophic thought that emerged in the structuralist and post structuralist moments in Europe.

That began to look at the kind of interconnections among disciplinary practices. It was I suppose fueled by the left, it was fueled by a re-reading of Marx's texts through the work of Baudrillard and others in France. It was fueled by a sense of needing to see beyond the boundaries of every single discipline that was framed as sort of

ideological apparatuses of the state, in some way like war and religion and all those other disciplines.

The smaller disciplines that came after, the very revealing enquiries into those disciplines and practices by Foucault...the revealing enquiries into the language of those disciplinary practices by Roland Barthes and the philosophic basis of those practices by Deleuze.

So there was a wholesale questioning of disciplinary practice at the same time as there was a reaction against the rule-based disciplinary practice of the state which came in conjunction with the protests against the Algerian War first and then the Vietnam War. That sort of interface right, at the same time as Foucault was writing his study of the relationship between the structures of law, the structures of medicine, the structures of imprisonment and the structures of hospitalisation, and those sorts of institutional studies, there came a sense that these could be part of the agenda of political opposition and political revolution to take it to its extreme.

PL: Where did you stand in relation to that?

AV: Oh I'm totally there!

PL: You're in that camp?

AV: Oh totally!

PL: You were the vanguard of that –

AV: I just can't stop being totally revolted by the practices of large scale legal and political and social institutions period!

PL: I'm just wondering though was anything lost in that process? For architecture not social progress, or whatever, assuming those 2 things might be connected –

AV: Well I think what was lost...was good. I think the male hegemony was lost and is...

PL: not entirely –

AV: Not entirely but there was a sense that it was not a majorly good thing. I think colonial and postcolonial hegemony was challenged certainly in the academy. I think

the questions of relations of architecture to its context and its place in urban and rural development was strengthened. I think that the revelation to students and architectural professionals in particular of...just the unclinking of the nefarious relationship between capital investment and politics and architecture. What it did was to unmask the fact that it's not the style which is political except ephemerally, but it's the engagement of architecture with big investment and big investment's corruption of the political process period!

PL: I don't disagree with you but without being negative about my own students now when I think about myself as a student and I think about my students now they are incredibly naïve and uncontextual in their thinking. So how do you explain –

AV: The definition of a student is someone who's not yet learnt!

PL: No! but when we graduated then we had a better understanding or we were more tenacious in our aspiration to understand the relationship between architecture and the broader world because there was more of a...context in which you thought about these things so you describe a process where ideas are being transformed but I experienced a process where actually ideas have been...to a certain extent shut down. That's why I said has anything been lost?

AV: But who shut it down? How did it become shut down?

PL: You don't recognise what I'm saying at all?

AV: I recognise that it's become more and more of a challenge to be a radical in a neo-liberal state, but at the same time I think you just have to look in different places, different techniques, different strategies and it's not the same war. It's a very different battle, it's a battle that that you know one had to fight in very different ways when politics shifted from mass politics to single issue politics right?

AV: The arguments I had with feminists, with post colonialists, with black power, with this and this, in terms of the single issue you know based on my generic understanding you know as a Marxist theorist, the arguments I had with those particular groups ... and yet my deep connection with many of them meant that ... I had to renegotiate my understanding of means and ends in relationship to political struggle.

AV: Right? As the occupy movement has done, you know the occupy movement so far when it hasn't made the mistake of becoming violent, the occupy movement is extremely sagacious. I think in not in fact becoming a single-issue movement, becoming a kind of large tent for opposition generically and then allowing for certain positions to develop within it.

AV: That's potential ... what I'm saying is that having tried for example mass demonstrations against the Iraq war in London, in Berlin, in Paris, in New York and failed, the juggernaut still moved right and still moves on. Surveillance as I've noticed in Britain I think the Cameron regime is now putting in a new and most incredible law that allows for the harvesting of every single bit of private information by the...quote unquote un-corruptible forces of order...as we've seen totally corruptible by every media that's...that's to be advanced you know?

AV: So any handout that's made...so you know...it's just that...you look for different areas. I think for example, if somebody was to do a really serious study of the kinds of uh...energy use in relationship to material harvesting and production there's no study done of it right? Where else can it be done but in academia right? That I think is you know...even Skidmore, Owings and Merrill now thinks twice before moving into a different culture and a different country without preparing its ground first, it's no longer just going to produce tokenism right or even if it does it does it with a different strategy right?

I'm a member of a group now which is led by one of our art faculty members who's a Lebanese filmmaker, has got together with a group of artists who rather than boycotting the new kinds of museums in Asia is working with the Guggenheim who is building a building in Abu Dhabi, working with the lawyers of Guggenheim to point out to them, and reveal to them, and research for them the working conditions of those...the construction crews in Abu Dhabi from Pakistan and Turkey.

You know they are step by step rather than simply boycotting and opposing they're trying to get the responsible west and the ability to guilt trip the west into...persuading the sponsors to actually modify the working conditions of workers in Dubai and Abu Dhabi.

So I think even our most radical members of faculty are working with a process and if they keep at it, and if its relentless enough it's a little bit like the process which those who manage to finally persuade Apple to look at Foxconn right and the conditions of working Foxconn right, even though Apple is going to be whitewashing everything it's going to have to do something in relationship to yearly inspections right? So it's a tiny step right but it's...the politics is now global in terms of it's not simply the condition of the working classes in Manchester in 1835 right? It's the condition of the working classes in a world which doesn't recognise the class struggle because its...it's sufficiently neo liberal to have converted it into monetarization.

PL: Monetarisation?

AV: So everybody has a possibility of rising so there's no class problem here, and it's even...you know in America it's even persuaded the white lower middleclass and working class that it's not a class, that it's not part of a class struggle, it's actually a struggle against winning, it's a struggle against uh...you know religion. It's a struggle against this, it's a struggle against that; look at the Tea Party it's a terrible waste.

PL: One more – pragmatism!

AV: Anyway I think that's why you have to be continuously on your feet to change your teaching strategies and to engage students who are otherwise disengaged, or unengaged because they've been...you know they've been through the Thatcher years, and they've been through the Blair years, and they've been through these years and most of the students I have here are students that have...you know have never had um...anything but...Johnson, Nixon.

PL: Sure. I think that question of social engagement is very difficult both in the context in which they operate and...I mean we do a lot of work with the students trying to look at the broader context of the work. Masters student but it's interesting because you find that they end up quite often...they have strategies that are like nudge or behaviourist strategies. They come to the thing not with a sense of we are part of humanity and we want to develop things that address needs defined by humanity, they come with the idea of we want to modify this kind of behaviour or we want to stop people doing this or doing that.

AV: WOW!

PL: I mean that's the context in which they grow up –

AV: That's so old fashioned!

PL: Well in Britain its quite mainstream, I mean the nudge strategy and happiness criteria and all that kind of thing is being pushed by the government –

AV: I'm glad I left!

PL: Well...you don't have nudge here, I thought it was an Americanism this idea that you can modify human behaviour just by design.

AV: But that's what we...basically just proved in the 60s you know? That's environmental determinism, that's Walden. That's 1948-84 or whatever. No we were totally against that stuff and are here too, I mean I think you will find very few environmental determinants right now certainly among the young faculty.

You have to be either very old like me or very young and somewhere in the middle there are some Conservatives that were brought up in the moment of architectural autonomy that won't budge right? Who say oh no not locality again, oh no not form again! Oh...whatever it is right? So the other thing about the United States is it's still a country of immigrants. And we have 30-40% of our students come either first or second generation from somewhere else – quite often Asia. It makes a difference in studying global problems. One because they understand that language...languages are different you know and not everybody speaks English in the same way or with the same fluency. And they also understand that many of them are first...I found this refreshing at UCLA too, first generations at college you know? Their parents you

know...worked in laundries to send them right? Which is why our scholarship programme is so valuable, but...so that makes it a lot easier because you can give projects to students to learn about even if they're second generation I've found students really wanting to learn about the Korean landscape you know?

We have a thesis, a fifth year thesis here which I guide where at the beginning of the year, it's a yearlong thesis I say you have a year to think clearly about something you think of as incredibly problematic in terms of you know humankind...humankind, but that architecture cannot solve but could mediate at the smallest scale and the biggest scale, whichever you want. Right?

And we've had projects that studied very seriously Mediterranean warming, and desertification, and identifying the hotspots, and then homing in on a site that is ripe for development in Crete for example. And develop a project of...of a sustainable completely self-sustaining uh...vineyard project right with water, and air collected at night and so on. So we have that and we have projects that design roof profiles for Mexico City that will capture water, filter water, and use the very spasmodic but incredibly intense uh...rain season to actually provide what's absolutely necessary.

We have a professor here, David Turnbull, who spends his entire consulting life in Africa and Asia on water projects of the smallest scale. He's just built a soccer field funded by the Carnegie Corporation in Africa, which underneath is a reservoir and has catchment. While soccer then provides connections in communities that otherwise have tensions, especially in Kenya the soccer field is actually providing a huge resource. The money which is given by the government to build a soccer field can also build a reservoir.

PL: Okay this really is the last question pragmatism, this phenomenon that emerged in the 90s –

AV: And disappeared very quickly!

PL: Has it really disappeared?

AV: Well...there are two things, the two words...pragmatism and pragmatic right,

Pragmatism in American philosophy is not pragmatic. So that was the first problem of the whole quote unquote movement. When we had a big debate at the Museum of Modern Art on it, it became very clear that the philosophers and the critical theorists were not talking about the same thing.

PL: There is a kind of philistinism or a kind of sort of ante theory sentiment, I mean I've seen Mike Speaks speak in Europe and I know that he seems to speak a lot in Asia as well, I mean he seems to have quite an aggressive sort of dislike for the idea of theory itself and the idea that we can construct some proper sense in what we're looking at.

PL: Is he very marginal or is he...?

AV: He's not an architect!

PL: Right. Okay. That doesn't answer my question though!

AV: I mean there are a lot of people speaking all over the place but my main (concern) is always to reach students in the way in which they are prepared to be reached. There are students who are prepared for small intimate and individual practices, students who...some of my students go and be...they're construction managers in big development firms, some of them go on to engineering schools, some of them go on to do PhDs in history, some of them go and work in large firms, some of them go on and work in small firms and they all...some of them go back to their home countries, some of them disappear forever, some of them are magnificent in school and then you never see them again!

Some of them are terrible in school and suddenly you see 10 years later they've flourished. And what rubs off I don't know. I mean I went to a conference where I was given an award for education at the ACSA this last time and they gave me what they call their Centennial Award so obviously no one else is going to get it for 100 years but um...there were 700 people in the audience and a lot of them came up to

me afterwards and many of whom I didn't even really know that I had taught, you know because they were in the room in Princeton in 1972 and who knew?

And they all said things like you changed my life, and I said I don't really want to go there – I don't want to know in what way I changed your life. But I think you...you tend as a teacher to...it's not about battles, it's not about theoretical battles anymore it's about wondering what kind of uh...intuition or what kind of idea will generate in this particular student something that will fire them to do something interesting, to do something that they're passionately involved in, to do something for themselves and for other people and it can be anything, it's very interesting. I mean...and now you know...sometimes it's a work of art, sometimes it's an installation, sometimes it's a uh...it's a play. I had a student who was really interested in drama, really wanted to be an actor, not a very good one, decided to go into architecture that was me too, um...and um...did a thesis where he took a particular play, a Shakespeare play apart and its themes and characters and played it through Staten Island in various places, found places where each scene would be appropriate, modified in project the scene, and it was just absolutely beautiful.

So you can do architecture in so many different ways, you can write architecture, you can video architecture, you can tweak architecture, and I think one of the problems which you know the generation just before me...I mean the generation just after me is having is that they are so resistant to social media. And there is only one way to connect with students and it always has been right, you know in some theories it was you had to smoke pot with them. In other eras you had to go drinking with them, other eras you had to be in the atelier with them, now you have to be on social media with them.

And that's fine but that's the way you get an idea through, if you can tweak an ecological idea it's an important idea for a student. I have a 19-year-old son...I text him, he will not be called, he won't answer his phone, but a text is immediately back.

AV: And that I don't...that I don't see when I go to England because my base is the AA always.

PL: Which is a very particular place.

AV: It's my world in England, it's the only place I've ever felt at home in because its international, because it's not stodgy, because it doesn't have rules that can't be broken, because you always find a host of interesting students, um...and you know...an audience. I don't know it's tough. I think there are people of Speaks' generation who were brought up as theorists and have found themselves uncomfortably overcome by the...the waves of theory that they are not themselves either keeping up with or somehow...attuned to or whatever and have...it's the neo con thing where you're brought up as a Marxist and you become neo conservative in your middle age which is what happened to a lot of Marxist's in America.

PL: What like Christopher Lasch and people like that?

AV: Well no even earlier than that...

PL: I mean I can see that, but I think perhaps there might be one legitimate thing which is the sort of idea that...that not every convention is repressive and not every convention is about the exercise of power and authority.

AV: No! No! No! It has to be...all these questions are not absolute, they're always relative to the problem, and they're always relative to the moment you know? I mean actually I think sometimes uh...you know for me you know I totally...I love detail right? I love the minimalist detail and I love other kinds of detail right? So there are certain works of Scarpa right that I absolutely love, those houses downstairs I detest.

PL: Why?

AV: I think they're kitsch. I think they're completely over the top nonsense ...he was at his best when he had something to fight against which was another building that he had to occupy in certain ways. But once he had to do something in the whole it just became stultifying and in fact the detail became a power over him you know? It's like Karl Kraus in Vienna in the '20s where he said I've learnt 5 different languages in my life and every one of them speaks me! He's spoken by his own language, that's what happened to Michael Graves, that's what happened to Danny Libeskind, you know

that's power, the power of a language which you develop and then you start to parrot it. It almost became very dangerous for Frank Gehry.

AV: I'm not into theories that say you know you have to reject this entire building because it was a product of capital. But I'm interested in students understanding what they're doing, I want them to know what they're doing. I want them to have a twinge of self-consciousness when they go into practice that practice is eternally corrupting and that to move through it you have to be aware of the level of your corruption.

I'm a Dean and I know that's powerful, I have a power, I have a pulpit, I speak, people listen. But I try all the time to demystify that in my own rhetoric because I cannot feel...I do not come down for a student in...you've got to be this, you've got to be that, you've got to be that like some earlier and later generations. I am totally self-confident that I can move quite fluidly intellectually among different fields, but I am also self-confident of my ignorance of a lot of fields, at which point I ask the student to go Google!

PL: [Laughter] Yeah! Okay.

AV: So I think...I mean I have a lot of friends who are like this; so I don't think architecture is lost.

PL: Are like you or like the people you're criticising?

AV: No. Like...are in a moment of...moment of uh...uh...adaptive theoretical pluralism.

PL: I am also in favour of an openness and a sensibility...I know I'm in danger of becoming an old fogey but...I suppose like you just measure it on the basis of the product, what's being produced.

I've looked at a couple of Kahn buildings, the Carpenter Centre, we don't even actually produce the level of ambition that is embodied within the work at the moment [...1.28.17].

AV: I don't find that totally, I mean I have a lot of young architect friends who study Corbusier and Kahn. I was at the Carpenter Centre a couple of weeks ago because I was on a review board for Harvard and you know...it's a great building, fantastic building, but it's also an impossible building because...they can't replace the glass

with energy glass because of the size of the panes right? And they can't double-glaze because it would spoil...

PL: Yeah no there are difficulties.

AV: And the amount of air conditioning that building consumes right? I mean this is the Banham problem that electricity was supposed to be forever. Um...

PL: Who's the equivalent of Kahn in contemporary America?

AV: Well Kahn's Richards Medical Building is probably the biggest failure of any research lab building ever. And it's still monumentally elegant but it's a complete...it was a failure from the time it was open. It just didn't serve any of the research purposes it was supposed to serve. So that –

PL: Am I just being romantic about this work? There's a kind of scale, a sense of what's appropriate at a level of public spaces, things like entrance...I'm thinking I've been to see quite a few contemporary buildings as well and just the question of entry and how you're greeted, and your relationship to it as a public institution –

AV: I teach that every day in studio.

PL: I know! I know but we're not as good at it as we were...I don't know whether we're losing something –

AV: Well I think there's a lot of bad architecture.

PL: Yes!

AV: But there always has been.

PL: But even the good stuff doesn't seem to like to have learnt from those conventions

AV: I'm not so pessimistic!

Note:

Robert Gutman trained as a sociologist but focused his research on the field of architecture. He was a key figure in bringing social science into the heart of architectural education and practice. He explored the relationships among public policy, architects, buildings and their users and became a special student of

architecture at Princeton and at the Bartlett School of Architecture of University College London.

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