

TANGIBLE – INTANGIBLE HERITAGE(S)

DESIGN, SOCIAL AND CULTURAL CRITIQUES ON THE PAST, THE PRESENT AND THE FUTURE

AMPS Proceedings Series 15.1



AMPS PROCEEDINGS SERIES 15.1

AMPS, University of East London
13 – 15 June, 2018

Tangible – Intangible Heritage(s)

Design, social and cultural critiques on the past,
the present and the future

EDITOR:

Maria Alessandra Segantini

SERIES EDITOR:

Graham Cairns

PRODUCTION EDITOR:

Eric An

© AMPS C.I.O.

AMPS PROCEEDINGS SERIES 15.1, ISSN 2398-9467

INTRODUCTION

Volume 1:

This publication is the product of the Tangible – Intangible Heritage(s) – Design, social and cultural critiques on the past, the present and the future held at the University of East London in 2018. It was premised on the following provocation:

In a time when the construction of New Towns is on the agenda in UK; when climate change threatens historic cities and landscapes in Asia; when the cultural industries turn our art and architectural history into economic models of development; when entire cities are being built from scratch across rural China; and socio-economic change is destroying industrial communities leaving people in the West in search for answers from politicians like Donald Trump, what can we mean by 'heritage'? Our built environment of buildings, towns, cities and infrastructures are always, at inception, visions of a future. They also become – very quickly – the markings of the past. Framed as architectural history, these markings tend to be what we think of when discussing heritage. However, heritage is more than this. It is equally a question of artistic and media representations of the present and the past; the social milieus we destroy or reinforce as economies fade or grow; the societies we construct through varying forms of city governance; the artistic and political legacies we use as points of rupture in building the future.

On this basis it suggested we cannot think of heritage in reductive terms, neither as isolated objects or images nor as a purely historic phenomenon. It argued that the decisions we take about this 'heritage' today are not only based on the past, they will inform the future. Consequently, in redefining heritage as a historic, artistic, design, media, social, political, and economic issue, it attempted to open up the concept to a reading that is interdisciplinary. In questioning these relationships over time, it sought to understand the past in light of the present and identify creative ways of operating in a globalised future.

This publication reflects the diversity of responses that emerged in the conference and is split into two issues. Both the publication, and the conference which it documents, were organised by the research organisation AMPS, the academic journal *Architecture_MPS*, the publication organization PARADE and the Department of Architecture at the University of East London.

TABLE OF CONTENTS

Chapter 1		
AJMER DARGAH: SUSTAINING THE IDENTITY OF A RELIGIOUS PRECINCT		1
Vinod Chovvayil Panengal		
Chapter 2		
ARCHITECTURE AS A RISK MARKER AT THE RISK OF URBAN TEMPORALITIES		13
Sarra Kasri		
Chapter 3		
SEARCHING INTERPLAY OF ART, CRAFT AND SPACE ON CONTEMPORARY DESIGNS AS A WAY FOR THE CONSERVATION OF INTANGIBLE HERITAGE		22
Özlem Karakul		
Chapter 4		
IDENTIFYING 20TH CENTURY HERITAGE - "GOTHENBURGISHNESS"		30
Sanja Peter		
Chapter 5		
EXPLORING BUILDING'S CLIMATIC ADAPTABILITY THROUGH CRITICAL REGIONALISM		39
Ahmed Kaihou, Leila Sriti		
Chapter 6		
ARCHITECTURE OF EMPTINESS IN FAVELAS : GREEN WALLS AND INDIGENOUS GRAPHISM AT MACQUINHO MORRO DO PALÁCIO, BRAZIL		50
Dinah Papi Guimaraens		
Chapter 7		
MINIMAL INTERVENTION DESIGN STRATEGY FOR TRANSFORMING TANGIBLE AND INTANGIBLE HERITAGE		61
Isun Aisan Kazerani, Hannah Lewi		
Chapter 8		
ROOTED IN THE PAST, THE BRIDGE TO THE FUTURE: THE BEAUX-ARTS HERITAGE IN THE GENESIS OF ARCHITECTURAL EDUCATION IN IRAN		71
Peyman Akhgar, Farshideh Kounani		
Chapter 9		
HERITAGE AS A FIELD TO WALK ACROSS: ENRIC MIRALLES'S REPRESENTATION OF A PAST VISION IN A FUTURE NOW.		83
Elena Rocchi		
Chapter 10		
DOCUMENTING INTERIM SPACES AS 21ST CENTURY HERITAGE		91
Krystallia Kamvasinou		
Chapter 11		
A STUDY AND DEVELOPMENT OF THE CREATIVE TOURISM STRATEGY MODEL FOR A WORLD HERITAGE SITE AREA AT THE HISTORICAL TOWN OF SI SATCHANALAI: PATHWAY FOR CONNECTING ASEAN TOURISM NETWORK COMMUNITY		101
Chaturong Louhapensang, Surasak Kangkhao		

Chapter 12	
PRESERVATION OF LANGUAGE & CULTURE: RESTORING SUSTAINABLE INTANGIBLE CULTURAL HERITAGE THROUGH MUSEUM VOLUNTEER WORK FOR CULTURAL EMPOWERMENT	111
Hirona Matayoshi	
Chapter 13	
THE POETICS OF SPATIAL REPRESENTATIONS FOR (IN)TANGIBLE CULTURAL HERITAGE: CASE STUDIES FROM SARACHIT COMMUNITY, SI SATCHANALAI, THAILAND	121
Koompong Noobanjong, Surasak Kangkhao	
Chapter 14	
THE TANGIBLE AND INTANGIBLE: INTERPRETING MODERN ARCHITECTURAL HERITAGE IN VIRTUAL REALITIES	132
Hannah Rushton, David Silcock, Jessie Rogers, Marc Aurel Schnabel	
Chapter 15	
THE IRANIAN POST-REVOLUTIONARY PUBLIC SPACE: THE TRANSIT(IONAL) SPACE	143
Niloofer Amini	
Chapter 16	
AN IMPLEMENTATION OF BUILDING INFORMATION MODELING (BIM) PROCESS IN MANAGING A UNESCO WORLD HERITAGE SITE IN SI SATCHANALAI, THAILAND	153
Supornchai Saengratwatchara, Koompong Noobanjong	
Chapter 17	
POST-INDUSTRIAL SITES- A NEW ERA OF PRODUCTION	164
Ting Chin	
Chapter 18	
PALACE OF THE ABOLITION: A CASE STUDY OF THE SIGNIFICANCE OF SERGIO BERNARDES	172
Maria Clara Filgueiras Lima Gabriele, Ana Elisabete Medeiros	
Chapter 19	
THE BORDER THAT PERSISTS EVEN IF THE WALL DOES NOT EXIST	182
Albertina Pretto	
Chapter 20	
CULTURAL VALUES AND COMMUNITY DEVELOPMENT AS REFERENCES IN APPLYING ADDITIONS TO HERITAGE BUILDINGS	189
Hanaa Moosa	
Chapter 21	
UNDERSTANDING HERITAGE AS PLACES: A RE-EXAMINATION OF THE BURIAL MOUNDS OF BAHRAIN	200
Ayesha Agha Shah	

Chapter 22		
UNEXPECTED OUTCROPS OF “HERITAGE” IN HISTORICAL CONTEXTS: THE HOUSE-SHACK OF THE POET VALENTINO ZEICHEN IN ROME	210	
Carlo Bianchini, Alfonso Ippolito, Antonella Romano, Simona Salvo, Martina Attenni		
Chapter 23		
THE CONCEALED LOCUS	223	
Nikolia-Sotiria Kartalou		
Chapter 24		
THEORY IN PRACTICE. DIGITAL DOCUMENTATION IN DEVELOPING EFFECTIVE METHODS FOR PRESERVING CULTURAL HERITAGE. THE STUDY CASE OF RAKSILA WOODEN NEIGHBOURHOOD IN OULU, FINLAND.	233	
Sara Porzilli, Anna-Maija Ylimaula		
Chapter 25		
ANALYSIS OF “APPROPRIATION” PRACTICED IN JAPANESE COMMERCIAL INTERIOR DESIGN BY SHIRO KURAMATA AND TAKASHI SAKAIZAWA	244	
Keiko Hashimoto		
Chapter 26		
LIGHT AND DARK SOUND: PUBLIC SOUND ART, ACOUSTIC DESIGN AND THE HERITAGE OF LEEDS, UK	253	
Matt Green		
Chapter 27		
THE REVALORIZATION OF THE VERNACULAR VILLAGES HERITAGE OF THE AURES REGION THROUGH AN ECO-TOURISTIC APPROACH	262	
Serhane Karima Imène , A.A.Foufa		
Chapter 28		
RE-READING URBAN HISTORY, COSMIC HEROES IN TRADITIONAL COMMUNITIES.	270	
Author: Yassmein Hamdy Mohamed Abdalla		
Chapter 29		
THE IMPACTS OF A POLITICAL QUARREL ON HERITAGE: THE CASE OF TRADITIONAL BAZAAR IN TABRIZ	282	
Ali Rad Yousefnia		
Chapter 30		
TOWARDS ECODESIGN. THEORIES AND PROJECTS FROM THE 20TH CENTURY UNTIL TODAY	295	
Davide Turrini, Marco Manfra		
Chapter 31		
GRAFTING CULTURE ONTO URBAN SPACE: THE EXPLORATION OF COMMUNITY-BASED PRACTICES TOWARDS SUSTAINABILITY IN THE CASE OF PAFOS, CYPRUS	305	
Evanthia Dova, Angeliki Sivitanidou, Evgenios Balasis		

Chapter 32	
SOCIOLOGICAL ECOLOGIES: ON THE URBAN-REGIONALISM OF AUGUSTE COMTE, RICHARD CONGREVE, AND THE BRITISH POSITIVISTS	319
Matthew Wilson	
Chapter 33	
WHEN THE PAST BECOMES THE FUTURE: DANISH ETHNIC HERITAGE AS A TOOL OF SURVIVAL IN AMERICAN TOWNS	329
Tina Langholm Larsen	
Chapter 34	
FROM 1970 JERUSALEM TO THE FUTURE: SIR NIKOLAUS PEVSNER'S FUNCTIONALIST VISION OF A TOLERANT ARCHITECTURAL WORLD	337
Ariyuki Kondo	

TOWARDS ECODESIGN. THEORIES AND PROJECTS FROM THE 20TH CENTURY UNTIL TODAY

Authors:

DAVIDE TURRINI, MARCO MANFRA

Affiliations:

UNIVERSITY OF FERRARA, ITALY

POLYTECHNIC UNIVERSITY OF TURIN, ITALY

INTRODUCTION

In the last decades of the twentieth century, ecodesign was structured as a socio-environmental design approach concerning both architecture and product design. This was spurred by international programs and actions related to sustainable development, preceded by the contribution of intellectuals and activists who have engaged in the progressive construction of a systematic critique of the indiscriminate exploitation of natural resources, pollution and unconscious consumerism since the 1950s. In this ideological substratum, certain views and alternative theories of American environmentalists stand out, for example Rachel Carson (1907-1964), Jane Jacobs (1916-2006), Barry Commoner (1917-2002) and Stewart Brand (1938), as well as sociologists and economists in the United States and Europe such as Ernst Friedrich Schumacher (1911-1977), Vance Packard (1914-1996), Guy Debord (1931-1994), Herman Daly (1938), Serge Latouche (1940), Jeremy Rifkin (1945) and Gunter Pauli (1956), coming to compose a complex cultural scenario characterized by a newfound awareness of production processes combined with a strong orientation towards independent creativity.

Today, ecodesign is a true interdisciplinary design criterion, characterized by diversified and multi-scale application scenarios, as well as by operating methods that enthrone the configuration of products, systems, spaces and services throughout their entire life cycle, with particular attention to the reduction of energy consumption and waste and to recycling¹.

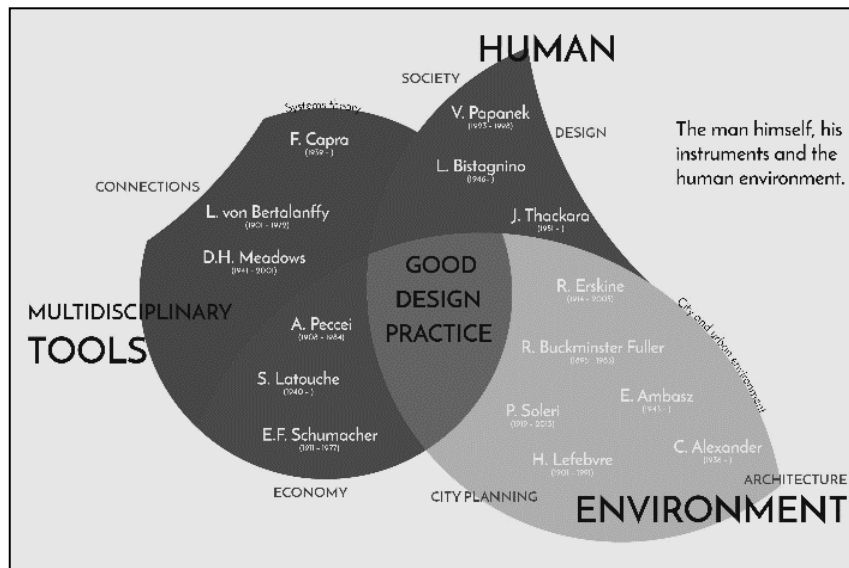


Figure 1. Marco Manfra, *Towards Ecodesign conceptual map*, 2018

FROM SYSTEMS THEORY TO SYSTEMIC DESIGN

Critical awareness of the complexity of issues related to environmental and social sustainability has developed over time according to borrowed holistic visions, in many cases taken from systems theory. The origins and early developments of systemic thought date back to the 1920s and 1930s in Europe and start from the new insights of organismic biology as opposed to reductionism.

In parallel, in the same decades the psychology of Gestalt, the new science of ecology and quantum physics provided numerous cultural contributions to the strengthening of this cross-disciplinary and process thinking. According to the systemic view, the world must be perceived as an interconnected network of relationships whose elements are defined through connections with the whole, according to the Gestalt principle, whereby "the whole is more than the sum of its parts".²

In the 1940s and 1950s the theory of systemic thought was interpreted through the development of specific disciplines such as tectology, the general theory of systems and cybernetics, which together constitute the core of the so-called classic systemic theories.

These theories describe the organisational principles of systems through self-regulation and feedback loop logic. The Austrian biologist Ludwig von Bertalanffy (1901-1972), author of the book *General System Theory* (1968), consecrated systemic thinking in recognising that living organisms are open systems that must nourish themselves through a continuous exchange of matter and energy with the surrounding environment, and intuitively their functioning as being distanced from equilibrium and linearity. In the 1960s and 1970s the comprehension and discussion of complex systems was further advanced thanks to the advent of computers and new non-linear mathematics: a mathematics of relationships and patterns that generates theoretical models such as the *complexity theory*, the *chaos theory* and *fractal geometry*. As Fritjof Capra said: "These models demonstrate the features of a coherent theory of living systems together with a mathematical language that suits it".³

And it was precisely the Austrian physicist and theoretician of systems Capra (1939) who highlighted the possible connections between systemic theories and the design sphere in three essential essays: *The tao of physics* (1975), *The turning point* (1982) and *The systems view of life* (with Pier Luigi Lisi, 2014). For Capra, the great challenge of the 21st century is design oriented to the development and maintenance

of communities and societies created in such a way as to "not interfere with nature's extraordinary and intrinsic capacity to sustain life".⁴ In accepting this challenge, the future designer, or simply the individual, must first understand the real organisational schemes that ecosystems have developed over millennia to ensure life.

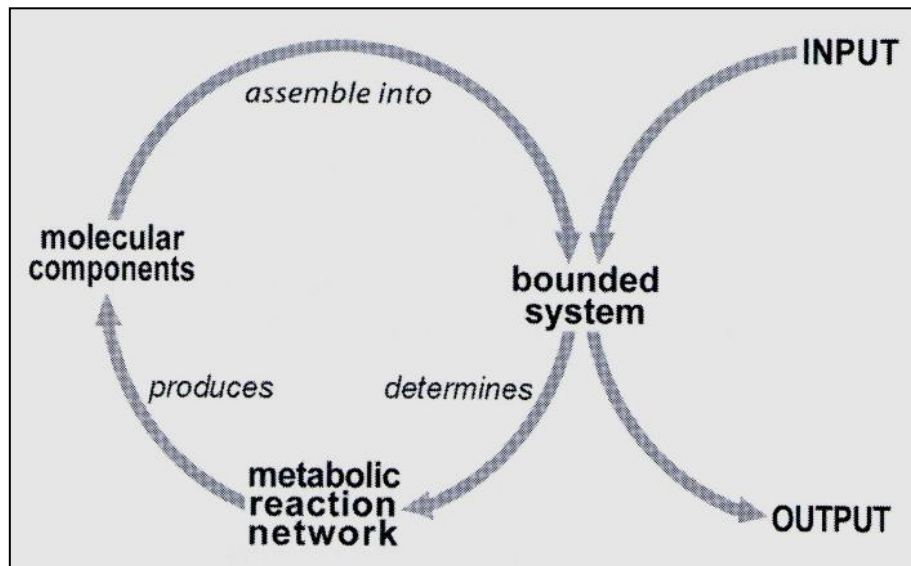


Figure 2. Fritjof Capra, *an outline of the cyclical logic of cellular life that is self-maintained while generating input and output*, 2014

The author identifies this essential knowledge as eco-alfabetisation. This ecological approach guarantees greater awareness towards understanding the world as an interconnected and constantly evolving system. All the crucial crises of our time, from the energy crisis to that of the environment, have been caused by a distorted perception of the world and worsened by the pretense of solving problems in an exclusively reductionist manner, rather than with a holistic and multidisciplinary approach which passes from "the parts to the whole, from objectivity to relationships, from measurement to mapping, from quantity to quality"⁵.

In the last twenty years an unprecedented synergistic relationship between systems theories and design culture has led to the creation, thanks also to the work of the Italian Luigi Bistagnino (1946), of the new systemic design discipline that is a catalyst for holistic, ecological and scalable solutions aimed at, as far as possible, a radical rethinking of society. To do this, systemic design methodology not only addresses the development of the product itself, but the entire "product-system", appropriately placed in a social, economic, environmental and cultural context. This economic-productive model is inspired by basic principles of ecology (such as interdependence and cyclicity) and generative science and, operating in a strictly local context, creates a dense network of relationships that can transform the output of a production system into a resource - input - for another, generating economic flows and new job opportunities. New agricultural and industrial production processes can work synergistically and autopoietically, guaranteeing respect for ecosystems, a tendency towards zero emissions and a transition to a desirable "new humanism"⁶.

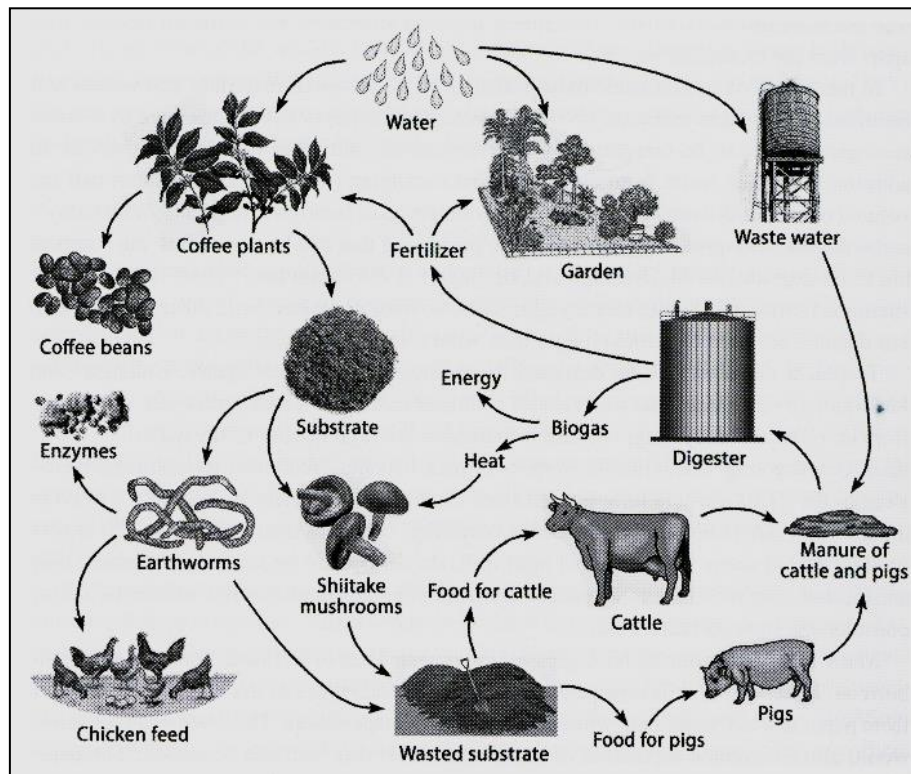


Figure 3. Fritjof Capra, ecological cluster of a Colombian coffee farm; systemic layout of input and output, 2014

SUSTAINABLE DESIGN AMONG NEW STRATEGIES, PRODUCTS AND SERVICES

One of the forefathers of design culture who was aware of the complex environmental and social problems was the American Richard Buckminster Fuller (1895-1983), who began his theoretical and design work at the end of the 1920s with a visionary and all-encompassing style, approaching the real with a holistic method featuring a careful analysis of nature and man.

Even before considering him an architect and designer, Fuller is a philosopher of living. His entire career is marked by innovative experiments aimed at solving articulated problems concerning the material and constructive configuration of objects and architectures, energy efficiency, energy supply, distribution networks, social and settlement organization, and the integration between living spaces and transport. For Fuller, the configuration of objects and environments changes in an intimate bond of reciprocity, people's uses and behaviors. In short, he is a philosopher-scientist of total design, anticipating many aspects of systematic and in some ways systemic design⁷.

This is why Fuller is referenced as a forefather of ecodesign.

The visionary Fuller philosophy aimed at promoting actions for the collective improvement of society was programmatically stated for the first time in the manifesto *4 Dimension Timelock* (1927-1928). The document speaks of lightness, adaptability, multi-functionality and recycling as basic themes for a new design of reality. In all this, every material, constructive and energetic aspect of the natural or anthropised environment is connected with the fourth dimension, that is, with the temporal dimension. Thus Fuller proves himself once again the forefather of contemporary ecodesign, which bases all its intervention strategies on an upstream analysis of the entire life cycle of objects and buildings that considers time as a major factor for the projection of design⁸.

Between the 1920s and 1930s Fuller designed modular prefabricated houses and aerodynamic vehicles, until in the 1950s he began studying the geometry of tetrahedrons or cuboctahedrons, which are the basic shapes of the organic or natural mineral world the designer is inspired by. The aggregation of these modular forms then led him to invent geodesic dome structures that became real multi-scale passepartout to resolve the design of the environment constructed by domestic, urban, and territorial dimensions⁹.

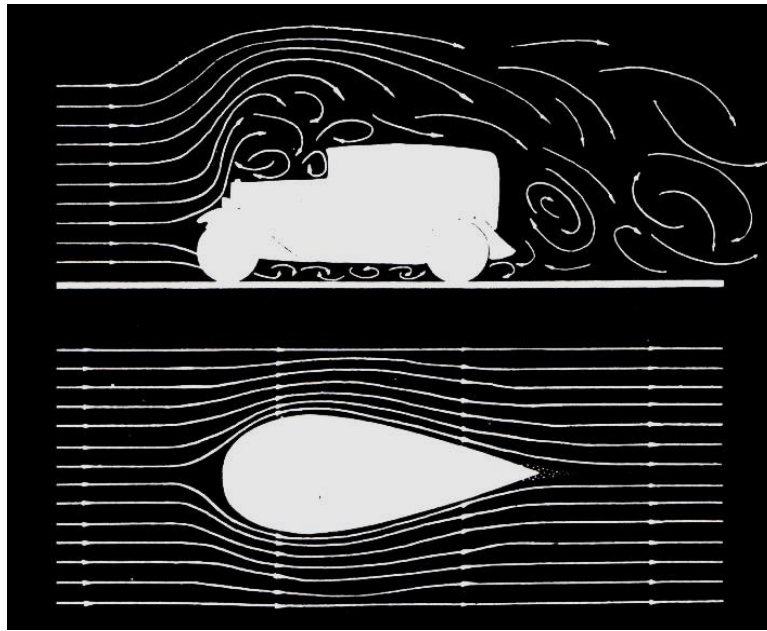


Figure 4. Richard Buckminster Fuller, aerodynamic studies, 1932

After a long process of theoretical elaboration and political activism, the environmental and social issues affirmed in the United States and Europe between the 1950s and 1960s became established as sustainable design practices, which were then variously applied starting in the 1970s.

One of the most symbolic careers in this regard is that of Victor Papanek (1923-1998), an Austrian-born American and pioneer in the applications of the concepts of recycling, accessibility and mobility. He designed products for UNESCO and the World Health Organization, as well as light vehicles powered by human energy and a taxi for the disabled for the car manufacturer Volvo. He developed systems for spreading seeds in difficult-to-access locations in order to reforest them, as well as the prototype of an educational television to be distributed in developing countries at the mere cost of nine dollars. In his essay *Design for the real world* (1971) and in his self-production manual *Nomadic furniture* (1973), with a multidisciplinary approach, Papanek proposes a concept of ecological, economic and socially useful design, which becomes a powerful tool man can use to design the environment, society and himself, solving real problems starting from participatory creative moments such as brainstorming or the matrices of morphological analysis¹⁰.

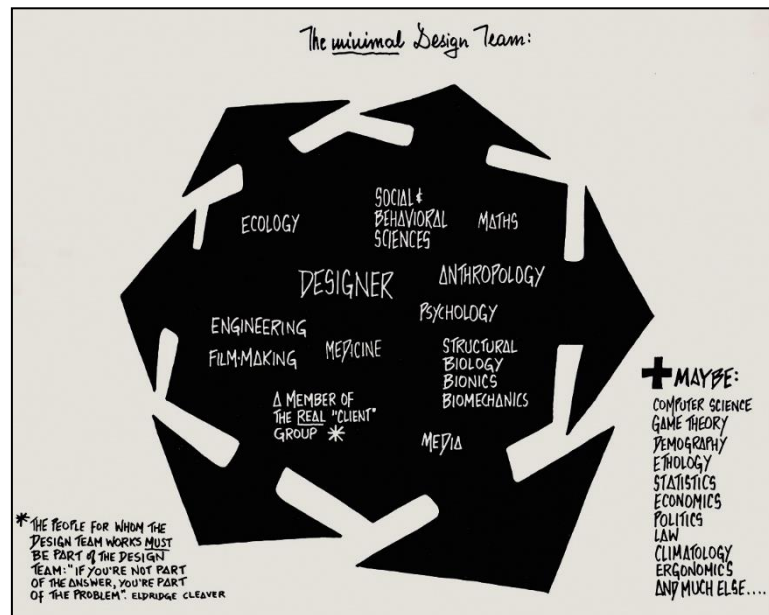


Figure 5. Victor Papanek, *The Minimal Design Team*, from *Big Character Poster No. 1: Work Chart for Designers*, 1969

Proceeding towards the new millennium, the British John Thackara (1951) more meaningfully and internationally grasped the testimony of a design that shuns passive consumption practices in order to trigger processes of environmental awareness, participation and resilience. Thackara is a designer and a great communicator, and has promoted a substantial change in the established paradigms of social organisation and technology since the 1990s. In 1993 he founded the network *The doors of perception* with offices in France and Bangalore, which brings together designers working in various fields and proposes radical innovations in the fields of education, health, conscious tourism, commerce and the media. His main essay entitled *In the bubble. Design in a complex world* (2005) supports a view of design aimed at local sustainable development, based on the assessment of the environmental impact of products, processes and services throughout their life cycle¹¹. Thackara recommends passing from a more manufactured-centered design to a more user-centered design, designing fewer objects and helping people have an improved quality of life with innovative infrastructures and services, for example in the field of food distribution directly from the manufacturer to the consumer or as regards evolved mobility¹².

CITY DESIGN BETWEEN A SYSTEMIC APPROACH AND PARTICIPATION

In the second half of the twentieth century the design culture focusing on environmental and social sustainability also addressed the urban scale, opposing itself to the consumption of agricultural and forest land, to pollution mainly caused by traffic, to the loss of a sense of community, to the increase of social differences in cities and to the phenomena of ghettoisation.

A pioneer of this opposition is the architect Paolo Soleri (1919-2013), who in 1960 was an advocate of the concept of arcology – a neologism formed from the terms architecture and ecology - to indicate dense "architectural organisms"¹³ conceived to be the means of all the elementary functions that make the life of a city possible while respecting nature. Contrary to the waste of land, time and energy of the so-called American ecumenopolis, the visionary architect came to elaborate the three key concepts of arcology: complexity, intended as the collection of several elements; miniaturization, or the extreme

reduction and compactness of that which is extension at multiple levels; and duration, intended as a context in which distances disappear and time becomes relative.

The topography of an arcology is presented as a compact, dense, three-dimensional and human-scale energetic nucleus. In 1965 in the magazine *L'Architecture d'Aujourd'hui*, Paolo Soleri announced his intention to create a large arcology prototype on some land sixty miles north of Phoenix, Arizona and in 1970, he finally began construction of the Arcosanti urban laboratory. Featuring continuous ups and downs, the compacted spaces were meant to favour the systemic interaction of every type of resource, from physical to intellectual, generating what Soleri defines as urban effect. At Arcosanti, the working spaces and areas for private life, community, exchange, culture and leisure interact and coexist, each with their own times and ways. The absence of cars, frugal life, the recycling of materials, waste reduction, forms of energy conservation and numerous greenhouses complete what has become an ecological society in a marginal land¹⁴.

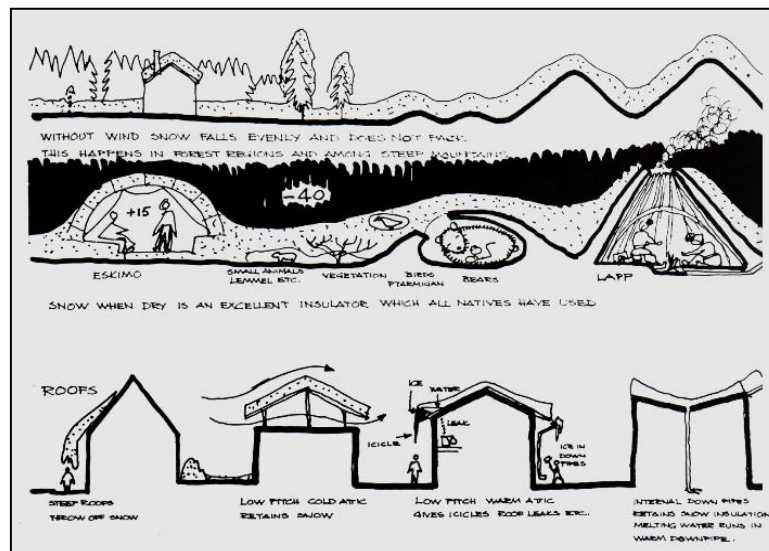


Figure 6. Ralph Erskine, studies on the benefits of the snow pack, 1959

In addition to the rapid and disordered growth of modern cities (sprawl), the loss of a sense of community is one of the major concerns of many militant urban planners, including the American Randolph Hester (1944). To solve these two interconnected problems, he proposed adopting a participatory type of urban planning for the creation of ecologically sustainable places oriented in a communitarian sense. Hester's approach is based on the concept of ecological democracy, which can also be found in the design philosophy of another central figure of the rise of ecodesign applied to cities: the England-born architect Ralph Erskine (1914 -2005).

He lived in Sweden from an early age and was deeply influenced by the Scandinavian environment. Throughout the second half of the twentieth century, Erskine promoted a concept of settlement based on self-sufficient communities that live while respecting the natural environment. The fundamental themes of his design proposal are an integration between architecture and context, the formation of organic communities and the construction of habitable cities. The active participation of the entire community and the careful evaluation of the climate and social environment are the cornerstones of his work. The architect's most symbolic work is the unfinished urban layout of Resolute Bay (1970-1978) - a city for Eskimos and Canadians - in the arctic belt of Canada. His theories on participation, social

spaces and design, linked to the climatic aspects of exposure to prevailing winds and the accumulation of snow, reach their maximum expression in Resolute Bay ¹⁵.

Through the experiences described above, the use of local resources and renewable energy, the restoration of green areas, new transport methods, systems for recycling and reusing materials and good participatory practices have today become guidelines for the theories and designs of the contemporary sustainable city, as in the emblematic case of the Ecocity promoted by the American activist Richard Register (1943), as well as based on the most authentic needs of man and on a design method that brings indispensable awareness and responsibility. These projects ultimately seek to satisfy new anthropological models, even before economic ones, while simultaneously facing the problems of individual comfort and the environmental and social sustainability of communities through minimal and specific practices that will hopefully become evermore widespread.

NOTES

* The paper is due to the common research of the authors. The writing of the introduction and the second paragraph is by Davide Turrini; the first and third paragraphs are by Marco Manfra.

¹ Wolfgang Wimmer, Rainer Züst, *Ecodesign pilot. Product investigation, learning and optimisation tool for sustainable product development*, (London: Kluwer Academic Publishers, 2001); Kean Yeang, *Ecodesign. A manual for ecological design*, (London: John Wiley, 2006); Carlo Vezzoli, *Design per la sostenibilità ambientale. Progettare il ciclo di vita dei prodotti*, (Bologna: Zanichelli, 2016).

² Fritjof Capra and Pier Luigi Luisi, *Vita e Natura. Una visione sistemica*, (Sansepolcro: Aboca, 2014), 90-91.

³ Capra and Luisi, 164-165.

⁴ Capra and Luisi, 11.

⁵ Fritjof Capra, “Una scienza per il vivere sostenibile,” in Luigi Bistagnino, *Design sistemico. Progettare la sostenibilità produttiva e ambientale*, (Bra: Sloow food, 2009), 180.

⁶ Claudio Germak ed., *Uomo al centro del progetto* (Turin: Umberto Allemandi, 2008), 9-10.

⁷ Anna Rita Emili, *Richard Buckminster Fuller e le neoavanguardie*, (Rome: Edizioni, Kappa, 2003), 12-20.

⁸ Roberto Grimaldi, *R. Buckminster Fuller 1895-1983*, (Rome: Officina, 1990), 19-26; Emili, 21-34, 85-95.

⁹ Grimaldi, 48-58; Emili, 107-120.

¹⁰ Victor Papanek, *Design for the real world. Human ecology and social change*, (New York: Pantheon Books, 1971), in particular, chapters 7, 9, 10; Victor Papanek and James Hennessey, *Nomadic furniture*, (New York, Pantheon Books, 1973), 1-10.

¹¹ John Thackara, *In the bubble. Designing in a complex world*, (London: MIT Press, 2005), 18-19.

¹² Thackara, 24-25, 41-49.

¹³ Kathleen Ryan, *Paolo Soleri itinerario di architettura. Antologia dagli scritti* (Milan: Jaca book, 2003), 50.

¹⁴ Ryan, 256.

¹⁵ Stefano Ray, *Ralph Erskine: architettura di bricolage e partecipazione*, (Bari: Dedalo, 1978); Peter Collymore, *Ralph Erskine*, (Florence: Alinea, 1982).

BIBLIOGRAPHY

Badalucco, Laura and Medardo Chiapponi, *Energia e design*, Rome: Carocci, 2009.

Barbero, Silvia, *Systemic design method guide for policymaking: a circular Europe on the way*, Turin: Allemandi, 2017

Bistagnino, Luigi, *Design sistemico: progettare la sostenibilità produttiva e ambientale*, Bra: Slow food, 2009.

Capra, Fritjof and Pier Luigi Luisi, *Vita e natura: una visione sistemica*, Sansepolcro: Aboca, 2014.

Collymore, Peter, *Ralph Erskine*, Florence: Alinea, 1982.

Emili, Anna Rita, *Richard Buckminster Fuller e le neoavanguardie*, Rome: Edizioni Kappa, 2003.

Germak, Claudio ed., *Uomo al centro del progetto, design per un nuovo umanesimo*, Turin: Allemandi, 2008.

Gorman, Michael John, *Buckminster Fuller. Architettura in movimento*, Milan: Skira, 2005.

Grimaldi, Roberto, *R. Buckminster Fuller: 1895-1983*, Rome: Officina, 1990.

Latouche, Serge, *Le pari de la décroissance*, Paris: Fayard, 2006.

Latouche, Serge, *Bon pour la casse. Les déraisons de l'obsolescence programmée*, Paris: Les liens qui libèrent, 2012.

Maldonado, Tomàs, *Design, nature and revolution: toward a critical ecology*, New York: Harp & Row, 1972.

Maldonado, Tomàs, *Cultura democrazia ambiente. Saggi sul mutamento*, Milan: Feltrinelli, 1990.

Manzini, Ezio and Silvia Pizzocaro, *Ecologia industriale*, Milan: Istituto per l'ambiente, 1995.

Meadows, Donella H. and Dennis Meadows, Jorgen Randers, *The limits of growth*, New York: New American Library, 1972.

Packard, Vance, *The waste makers*, New York: Mc Kay, 1960.

Papanek Victor, *Design for the real world. Human ecology and social change*, New York: Pantheon Books, 1971.

Papanek, Victor and James Hennessey, *Nomadic furniture*, New York, Pantheon Books, 1973.

- Papanek, Victor, *The green imperative. Ecology and ethics in design and architecture*, London: Thames and Hudson, 1995.
- Pieroni, Osvaldo, *Fuoco, acqua, terra e aria. Lineamenti di una sociologia dell'ambiente*, Rome: Carocci, 2001.
- Pietroni, Lucia, *Il contributo della Biomimesi per un design sostenibile, bioispirato e rigenerativo*, in «Op.cit», 2011, Vol. 141.
- Ray, Stefano, *Ralph Erskine: architettura di bricolage e partecipazione*, Bari: Dedalo, 1978.
- Ryan, Kathleen, *Paolo Soleri itinerario di architettura. Antologia dagli scritti*, Milan: Jaca book, 2003.
- Sbordone, Maria Antonietta, *Confronto critico tra Victor Papanek e Alain Findeli*, in «Op.cit», 2015, Vol. 153.
- Schumacher, Ernst Friedrich, *Small is beautiful. A study of economics as if people mattered*, London: Abacus, 1973.
- Tamborrini, Paolo, *Design sostenibile. Oggetti, sistemi e comportamenti*, Milan: Electa, 2009.
- Thackara, John, *In the bubble. Designing in a complex world*, London: MIT Press, 2005.
- Vezzoli, Carlo, *Design per la sostenibilità ambientale. Progettare il ciclo di vita dei prodotti*, Bologna: Zanichelli, 2016.
- Von Bertalanffy, Ludwing, *Teoria generale dei sistemi: fondamenti, sviluppo, applicazioni*, Milan: ISEDI, 1977.
- Wimmer, Wolfgang and Rainer Züst, *Ecodesign pilot. Product investigation, learning and optimization tool for sustainable product development*, London: Kluwer Academic Publishers, 2001.
- Yeang, Kean, *Ecodesign. A manual for ecological design*, London: John Wiley, 2006.