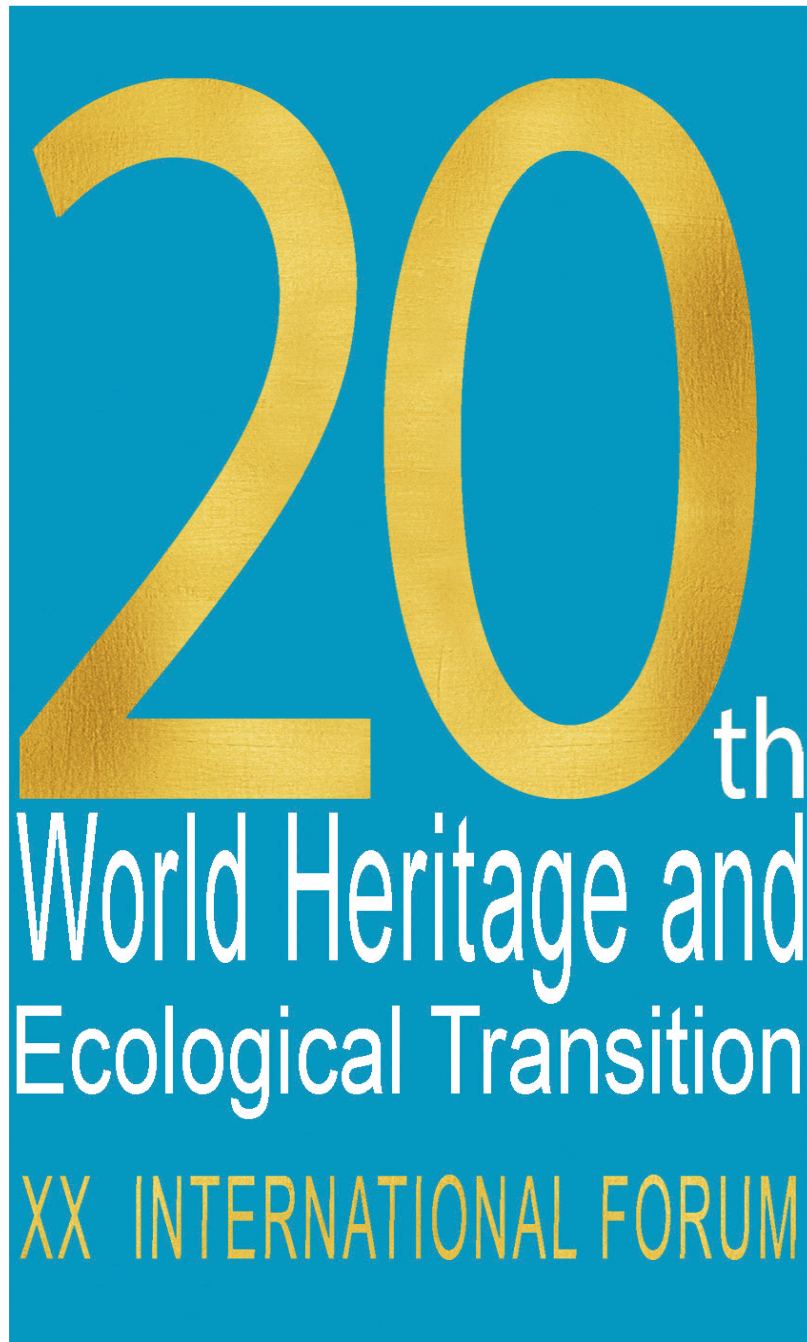


ARCHITECTURE HERITAGE and DESIGN

Carmine Gambardella

XX INTERNATIONAL FORUM

Le Vie dei
Mercanti



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Le Vie dei Mercanti
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Le Vie dei Mercanti_XX International Forum

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WORLD HERITAGE and ECOLOGICAL TRANSITION

Le Vie dei Mercanti

XX International Forum

Naples | Capri

8 - 9 - 10 September 2022

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Peer review

Scholars has been invited to submit researches on theoretical and methodological aspects related to Smart Design, Planning and Technologies, and show real applications and experiences carried out on this themes. Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected. Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

Conference report

300 abstracts and 550 authors from 40 countries:

Albania, Arizona, Australia, Belgium, Bosnia and Herzegovina, Brasil, Bulgaria, California, Chile, China, Cipro, Cuba, Egypt, France, Germany, Greece, India, Italy, Japan, Jordan, Lebanon, Malta, Massachusetts, Michigan, Montenegro, Montserrat, New Jersey, New York, New Zealand, Poland, Portugal, Russian Federation, Serbia, Slovakia, Spain, Switzerland, Texas, Tunisia, Turkey, United Kingdom.

From the XIX FORUM WORLD HERITAGE and DESIGN for HEALTH to the XX FORUM WORLD HERITAGE and ECOLOGICAL TRANSITION

In 2022 the Capri International Forum 'Le Vie dei Mercanti' will reach its 20th edition.

A Story of love for the Earth and its Inhabitants, Landscapes, Architecture, Cultural and Archaeological Heritage told by over 7000 Scholars and Academics from all over the World in an interdisciplinary way, by integrating skills, experiences, good practices in order to train talented people who care about the destiny of our Planet.

If the Future is an Eternal Present, the renewal of the Forum in these twenty years has produced a wealth of knowledge to guide those who govern and administer the Public Good, and citizens in their daily activities. A future that must be prepared in this era, that cannot ignore the ongoing climate change and that should not catch future generations unprepared.

A Present that transmits to the future the values that Humanity has passed on to us and that must be protected and transmitted as regenerative sources of Humanity itself.

Not coincidentally, the First International Forum assigned the topic 'From Luca Pacioli to the Eco-geometry of the Territory' to the participants.

An invitation to submit scientific contributions and good practices based on double-entry, legitimized by the measurement of tangible and intangible assets, in order to integrate knowledge and state it like entries in an income statement.

Therefore, if Luca Pacioli, tutor of the Rompiasi Venetian merchants family, suggested the method to legitimize the results of the activities undertaken, that is, through the measurement he indicated the survey activity as managing a heritage, which as such must not only be geometrically definable but must be also discretized into batches, noted in its multidimensionality, in order to produce a result whose added value can always be quantified and is given by the difference between the value of the asset, as we have received it, and the value reached for the activity of knowledge and management of the potentialities which are identified and stated as in an income statement; Eco-geometry, intended as a technological echo of reality, feasible through the use of digital and artificial intelligence to create forecasting scenarios, a model in which it is possible to measure all the components and relationships between the parts and to restore the matter, no longer as an instrumental covering to be described only in the geometric matrices generating the forms.

Once again Leonardo point us the way, conceptually anticipating the transition from analogue to digital and to the management of big data: "io vò pigliare quella licenza ch'è comune ai matematici, cioè siccome loro, dividono il tempo a gradi e di quantità continua la fanno discontinua, ancora io farò il simile, dando col miglio o renella nella comparazione all'acqua" (Codice Atlantico, f. 126, t.a.).

Through the topic of the next XX Forum World Heritage and Ecological Transition, I want to provide some interesting food for thought, to identify a lived place, a life

environment, as an integral of forms of organization of the elements that surround us, examined through the prism of a civilization; we will deal with an innovative project of measurement and representation of the natural and built environment that is no longer an expression of the relationships between society and the natural environment but a construction of the relationships between the future as an eternal present and the legacy of the past as an economic value. A vital commitment that binds people to the environment; an educational revolution that match skills to the new way of managing what is learned and measured; the ecological transition with the use of technological innovation shall have the aim of entering the body of the territory, of the buildings and of the objects, it analyzes all its components through a multi-criteria analysis in order to establish a rating which in itinere defines the added of the results.

Just as the rulers and merchants in the mid-15th century, on the margins of international trade, in an economy contracted for mercantile life, combined research and training in new paths, taking refuge in agricultural operations, in favour of the reclamation of uncultivated lands in relation to the search for energy and its distribution and established the reasons of the earth compared to those of the sea in a perspective of systemic response.

Prof. Carmine Gambardella
General Chair XX Forum 'World Heritage and Ecological Transition'
President and CEO of the Benecon University Consortium
UNESCO Chair on Landscape, Cultural Heritage
and Territorial Governance

Dal XIX FORUM WORLD HERITAGE and DESIGN for HEALTH AI XX FORUM WORLD HERITAGE and ECOLOGICAL TRANSITION

Nel 2022 il Forum Internazionale di Capri, Le Vie dei Mercanti, raggiungerà la sua XX edizione. Una storia d'Amore per la Terra e i suoi Abitanti, i Paesaggi, l'Architettura, i Beni Culturali e Archeologici raccontata da oltre 7000 Studiosi e Docenti provenienti da tutto il Mondo in modo interdisciplinare, integrando competenze, esperienze, buone pratiche per formare Persone di Talento che abbiano a cuore il destino del nostro Pianeta.

Se il Futuro è un Eterno Presente, il rinnovarsi del Forum in questi venti anni ha prodotto un patrimonio di conoscenze per orientare coloro che governano e amministrano il bene pubblico e i cittadini nelle loro pratiche quotidiane. Un Futuro che va preparato in questa epoca che non può prescindere dal cambiamento climatico in atto e che non colga le generazioni future impreparate.

Un Presente che trasmetta al futuro valori che l'Umanità ci ha consegnato e che devono essere tutelati e trasmessi come fonti rigeneratrici della stessa Umanità. Non a caso, il Primo Forum Internazionale affidò ai partecipanti il Tema "Da Luca Pacioli all'Ecogeometria del Territorio". Un invito a presentare contributi scientifici e buone pratiche fondati sulla partita doppia, legittimati dalla misura dei beni materiali e immateriali per integrare conoscenze e per declinarle come partite di un conto economico.

Pertanto, se la figura di Luca Pacioli, l'Istitutore della famiglia dei Mercanti veneziani Rompiasi indicava il metodo per legittimare i risultati delle attività intraprese, e cioè attraverso la misura indicava l'attività di rilievo nel senso di gestire un patrimonio, che in quanto tale non solo deve essere geometricamente definibile ma deve essere discretizzato in partite, rilevato nella sua multidimensionalità, al fine di produrre un risultato il cui valore aggiunto sia sempre quantificabile e dato dalla differenza tra il valore del bene, così come ci è pervenuto, e il valore raggiunto per l'attività di conoscenza e di gestione delle potenzialità individuate e declinate come in un conto economico; l'Ecogeometria, intesa come un'eco tecnologica della realtà, attuabile con l'utilizzo del digitale, dell'intelligenza artificiale per creare scenari previsionali, un modello dove è possibile misurare tutte le componenti e le relazioni tra le parti e restituire la materia non più come strumentale involucro da descrivere nelle sole matrici geometriche generatrici delle forme. Ancora una volta Leonardo ci indica la strada, anticipando concettualmente il passaggio dall'analogico al digitale e alla gestione dei big data: "io vò pigliare quella licenza ch'è comune ai matematici, cioè siccome loro, dividono il tempo a gradi e di quantità continua la fanno discontinua, ancora io farò il simile, dando col miglio o renella nella comparazione all'acqua" (Codice Atlantico, f. 126, t.a.).

Con il Tema del prossimo XX Forum World Heritage and Ecological Transition intendo proporre spunti di riflessioni per identificare un luogo vissuto, un quadro di vita, come integrale di forme di organizzazione degli elementi che ci circondano esaminato attraverso il prisma di una civiltà; ci si dovrà confrontare con un progetto innovativo di misura e di rappresentazione dell'ambiente naturale e costruito

non più espressione delle relazioni tra la società e l'ambiente naturale ma costruzione delle relazioni tra il futuro come eterno presente e l'eredità del passato come valore economico. Un impegno imprescindibile che lega le Persone all'Ambiente; una rivoluzione formativa che omologhi le competenze al nuovo modo di gestire ciò che si apprende e si misura; la transizione ecologica con l'utilizzo dell'innovazione tecnologica deve avere il fine di entrare nel corpo del territorio, del costruito e degli oggetti, ne analizza attraverso un'analisi multicriteria tutte le componenti per stabilirne un rating che ne definisca in itinere il valore aggiunto dei risultati.

Così come i governanti e i mercanti, verso la metà del quattrocento, al margine del commercio internazionale, in un'economia contratta per la vita mercantile, saldarono ricerca e formazione in Nuove Vie, trovando rifugio in operazioni agricole, in favore delle bonifiche dei terreni incolti in rapporto alla ricerca di energia e di distribuzione della stessa e instaurarono le ragioni della terra rispetto alle ragioni del mare in una prospettiva di risposta sistemica.

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Kaleidoscopic ecologies. New scenarios, from ecological utopia to probiotic architecture.

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Abstract

Pandemic, climate change, population growth and ecology are today issues of global interest that require, on the one hand, immediate action, and on the other, long-medium term policies, strategies and projects that foreshadow a gradual and continuous change as in the case of the ecological transition. The ecological transition is a multiple challenge that must be faced on different levels: technological, political, economic, cultural and which needs to respond to both global and pointly emergencies. More than objectives it is in fact necessary to define methods that are constantly updated and adaptive projects. The paper intends to propose a series of experiments and projects that, between past and present, are committed to giving innovative visions to the ecological transition, in its various forms such as: Richard Weller's Ecological Utopias, Philippe Rham's Sensory Microclimatic Habitat and Neri Oxman's Probiotic Architecture.

The different experiences highlight an essential need to respond to the ecological transition through interdisciplinary skills. Thus, while the role of archistars fades a new figure is affirmed: the "ecological maker", a hybrid professional capable of including issues related to ecology in his field and capable of proposing a new culture of design that innovates and protect our planet.

Keywords: ecological experimentations, utopian, weather-based, nature-inspired, ecologicalmaker

1. Introduction

Mankind's curiosity towards what it does not know, towards the unknown, has always pushed it in the exploration of new horizons. Over time, Mankind has colonized new places and established itself all over the globe by modifying territories, building villages, cities and metropolises, until it reached space. Human curiosity, however, demonstrates a twofold aspect: on one hand the revolutionary and extraordinary ability to innovate, to improve, on the other an inclination to unconscious transformation, unconcerned about the repercussions on our planet Earth. Already in 1924, Vladimir Vernadsky *writes "The balance of the migrations of elements that had been established in the course of geological time is being broken by the reason and activities of Man "* introducing a first definition of what we now call the Anthropocene: the geological era in which Mankind incisively modifies the territories and climate of our planet.

In the general view, the Anthropocene data are seen separately: the loss of biodiversity that is leading us towards a sixth mass extinction, the first due to anthropogenic causes (according to the study of the Pacific Biosciences Research Center of Hawaii); the global pandemic, caused by Covid-19; the effects of climate change, increasingly evident in our cities, cause of erosion, floods, alluvial events and problems related to heat islands. To these conditions is added the data, not negligible, of the demographic increase in the last 100 years, with a percentage of 400%, from 2 billion in 1922 to 8 billion today. The Anthropocene is therefore characterized by a series of problems, and consequent risks, closely related to each other and able to mutually influence themselves.

It is therefore time to undertake a change of course in our consciences and embrace a more sustainable and ecological mindset, as Alessio Malcevschi points out *"Given the urgency to act, perhaps the answer lies not so much in inventing something new as in using what we have in a better way, which is much simpler and more feasible if we are willing to change the prototype of development from a linear economic model to a circular, regenerative and sustainable one "*. [1]

The term "ecology" was introduced for the first time in 1866 by the German scientist Ernst Haeckel, as a relationship between organisms (plants, animals, mankind) and the environment.

Since the birth of the term, different disciplines have borrowed the word creating a series of new specializations: urban ecology, landscape ecology, social ecology etc ... up to define an economic ecology, the so-called "*green economy*". The importance of ecology becomes a central theme at a global level, as demonstrated by the G20, in which the leaders of the main developed Countries gathered to define a downward agreement on climate, or as the 26th Conference of the Parties (COP26) which was attended by Heads of State, together with climate experts, activists and entrepreneurs, who have committed to agreeing a concrete action against global warming.

However, political commitment is not enough. The ecological transition is today a multiple challenge that must be faced at different levels: political, technological, economic and cultural and that must be able to respond to both global and local emergencies.

In this context, the arts and the macro-world of architecture are also increasingly projecting towards issues related to ecology while experiences, experiments and projects are multiplying, committed to giving visions and responses to the ecological transition in its different meanings.

Considerations on the relationships between the natural and anthropized world, however, have also been addressed in the past, when the term ecology had just been coined and did not yet have the resonance it has today. The Farnsworth House, one of the projects that made Mies van der Rohe famous, in 1945, already showed an "ecological sensitivity" through the choice to keep the house raised from the ground according to a principle of **non-invasiveness**. The idea was born from the need to create an equilibrium with the surrounding environment where the Fox River, in case of flooding, would have invaded the house. As Mies did, Le Corbusier also raised the house on pilotis, making the built entity respectful of the context.

These are just some of the projects that we could define as "*intrinsically ecological*", since they are guided by an ecological sensitivity of the project - not expressly declared but which turned out to be avant-garde in relation to the issues of ecological transition over time.

2. From design sensitivity to global emergency

More recently, the Australian architect Glenn Murcutt speaks of *ecological functionalism* as an approach to an architecture that respects the environment, attentive to ecology, in harmony with the climate and the landscape of the place through the use of "simple materials". Ecology becomes part of the language of architecture.

In today's scenario, however, the issues related to ecology no longer refer to a sensitive and avant-garde approach but arise from the necessity to respond to contemporary needs through the definition of new paradigms. For this to be possible, it is essential to undermine the methods crystallized over time and leave room for an experimental phase in which the project is able to guarantee high levels of performance and functionality while respecting the planet.

Among the many, three experiments can be considered as a reference of project's new ways to respond, in different scales, to the needs dictated by this specific moment of ecological transition namely: the World Park Project by Richard Weller, the Jade Eco Park by Philippe Rahm and Aguahoja by Neri Oxman.

2.1 The World Park Project - Richard Weller (2017)

Richard Weller, Australian landscape architect and professor of Landscape Architecture at the University of Pennsylvania in Philadelphia imagines, through "The World Park" project, to restore the fragmented ecosystem pathways in which the most precious and threatened biodiversity of the planet is enclosed. The intent is to safeguard endangered endemic animal and plant species on a planetary scale with the aim of protecting 17% of the earth's surface (*700.000 times the Central Park area*), a target set by the Convention on Biological Diversity (CBD). [2]

The global park project develops through the definition of 3 trails that connect: the Andreanof Islands in Alaska to the Alberto de Agostini National Park in Chile (*The PAT-ASKA trail*); the city of Tarfaya in Morocco to the city of Hobart in Tasmania (*the AUS-ROC trail*); the city of Luderitz in Namibia to the city of Dörtyol in Turkey (*the TUR-IBIA trail*). (Fig. 1)

An ecological utopia capable of restoring the health of planet Earth for over 160,000 km², able to connect not only the most important biodiversity hotspots in the world, but also to create an infrastructure that supports ecotourism through a global pilgrimage route capable of creating new relationships with nature. [3]

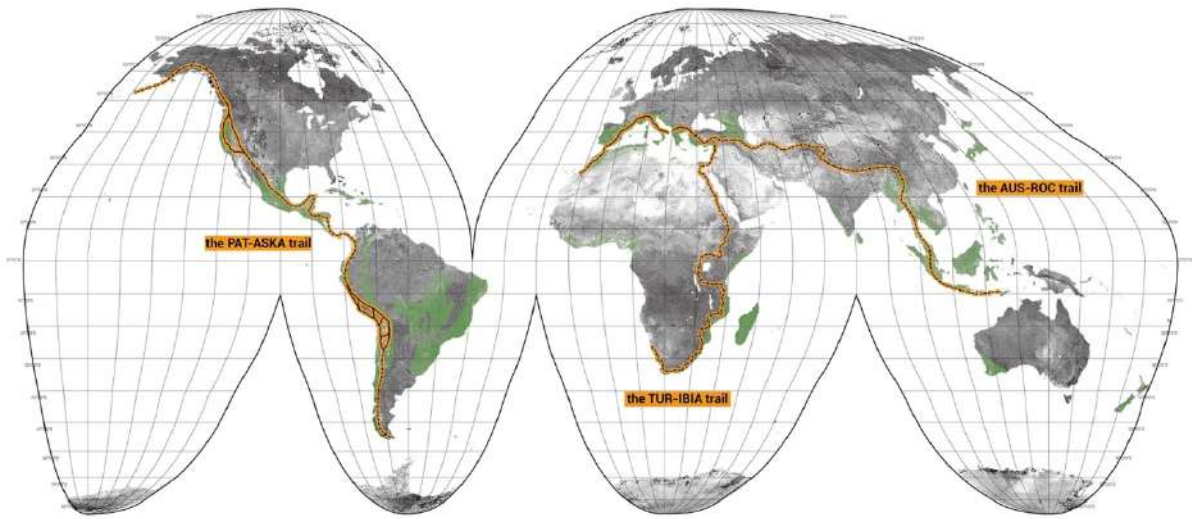


Fig. 1 Graphic reworking "The World Park Project" by A. Di Cinzio and S. Grusso

2.2 Jade Eco Park - Philippe Rahm (2013-2018)

Philippe Rahm, architect, is the head of the Parisian "Philippe Rahm architects" studio, whose works have drawn international attention for their ability to create synergies between architecture, psychology and meteorology. In particular, the Jade Eco Park project in Taichung, Taiwan, stands out for its desire to restore the fruition of the landscape despite the extreme climatic conditions, such as too hot or too humid (Philippe Rahm 2017) [4]. The park, which occupies an area of 700.000 m², is located on the site of the old Taichung airport. All the work is based on a mapping of existing climatic conditions thanks to which it is possible to understand which are the hottest, the most humid and the most polluted areas and which are the coldest. (Fig. 2)

The superimposition of the three maps defines a diversity of microclimates and sensory experiences located within the park, highlighting the different levels of livability. The reinforcement of comfort within the areas is possible thanks to the use of a series of devices, both natural and artificial, divided into three different categories: cooling, drying or dehumidifying, depolluting. Thousands of sensors have been placed every 15 meters to collect real-time data on temperature and humidity so that the devices can be automatically activated only when necessary. The Jade Eco Park represents a visionary spatiality in which skills on architecture, landscape, climate, meteorology and technology come together to create qualitatively more comfortable microenvironments for visitors, following a process that Rahm himself defines as "Architecture météorologique", an architecture inspired by meteorology. (Fig. 3) [5]

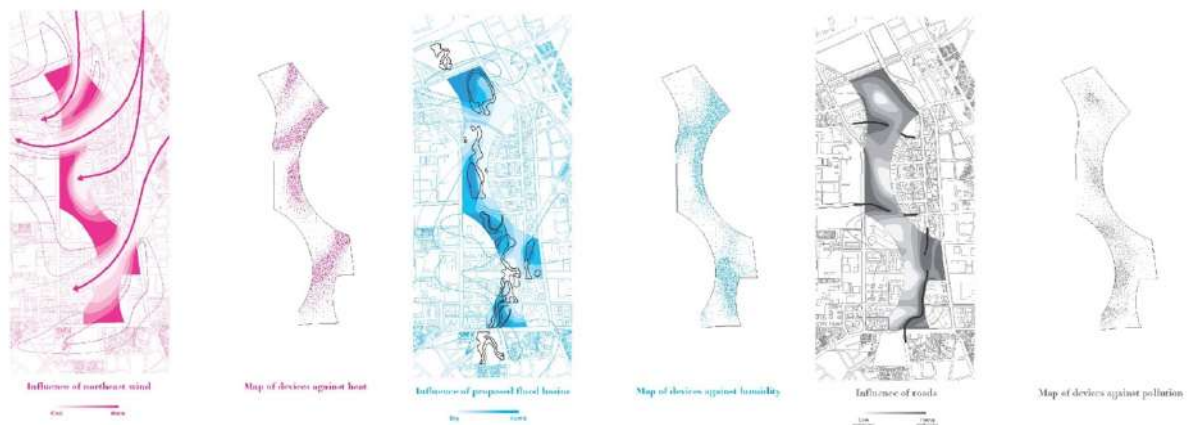


Fig. 2 Climate maps - Influences on the park © Philippe Rahm Architects



Fig. 3 View of the Jade Eco Park © Philippe Rahm Architects

2.3 Aguahoja - Neri Oxman (2019)

Neri Oxman is an Israeli architect and designer but also a professor at MIT, the Massachusetts Institute of Technology where, with his research group, he has started a real revolution regarding the possibility of using their Material Ecology for the study and design of a new biocompatible material that, at the end of its life cycle, turns into water. Studies and experimentations on materials took shape in 2019, in Aguahoja, a small pavilion, which was immediately purchased by San Francisco's MoMA, whose structure is made from shrimp shells, insects' exoskeletons and dead leaves, all 3D printed by a robot, shaped by water and colored with natural pigments. (Fig. 4)

The realization of the pavilion demonstrates how, even working with natural materials, it is possible to create extraordinary shapes and structures. At the base of this new material there are cellulose, chitin and pectin, three of the most abundant materials in nature – this means that it would be possible to produce them in large quantities saving us from the excessive use of plastic.

Oxman's is a small probiotic architecture experiment that could open the doors to important future alternatives and that highlights the importance of a relationship between architecture and nature, a seemingly elementary intuition but it is not so. Aguahoja is the expression of the ferment of contemporary architecture and design and also of a new reality in which, thanks to the use of new technologies, it is possible to realize a real methodological rethinking of the way of doing architecture and design.



Fig. 4 Aguahoja Pavillion - West elevation © Neri Oxman and The Mediated Matter Group

3. Conclusions

These three different experiences are the expression of a multi-level and multidisciplinary approach to the theme of ecology and how this can move at different project scales: global, urban, and design. The ferment and interest around ecology topic, however, have led to a sort of oversaturation of the term, which today seems to have become a common prefix to promote policies and strategies – as if the "echo" suffix could be a guarantee of success. What is happening is an abuse, instead, as well as an improper use of the term that leads to even describe as ecological all those actions and strategies that are completely insensitive to the future of the planet: a real "ecomania".

The most striking example is certainly the **city of Telosa**, a newly established city that is going to rise in the Great American Desert, in the western United States, designed by the Danish architect Bjarke Ingels together with his BIG studio and commissioned by the multimillionaire Marc Lore. Telosa is presented as the city of the future, capable of being the "synthesis of the best of current cities" (Marc Lore 2021) but its premises are very far from the concept of sustainability, if we think that the masterplan establishes to occupy an area of over 600 square km which could reach a maximum number of five million inhabitants in 2060. A new Dubai showing up from nowhere, but much larger than the Emirates capital and which claims to *"set a new global standard for urban life, expand human potential and create a project for future generations"* (Marc Lore 2021). What is proposed as a city role model, in reality is unsustainable not only at an environmental, but also at an economic level, due to the fact that includes an investment of 400 million dollars. (Fig. 5) [6]



Fig. 5 Image of the Telosa city © 2022 Junto Group LLC

Today, as in the past, human curiosity continues to show its duality: on one hand to innovate respecting the Planet and future generations, on the other to intensify the transformation for change, unconcerned about its repercussions.

The previously described projects show mutually different experimentations and outcomes, which however contribute to create a first taxonomy of what may be the declinations of the project in the ecological transition era, namely:

- **utopian** as The World Park Project with which Richard Weller imagines an ecological infrastructure able to protect planetary biodiversity and to bring mankind closer to nature, through the exploration of its trails;
- **weather-based** as Philippe Rahm's Jade Eco Park, whose project is based on the analysis of existing climatic conditions mapped via computational simulation that follows fluid dynamics (CFD) creating a new atmospheric landscape;
- **nature-inspired** as Aguahoja by Neri Oxman that is inspired by natural cycles through the use of a new material that comes from nature and returns to it when the pavilion completes its life cycle.

Despite the different nature and ambition of these experimentations, a common factor comes to life: the responsibility and the key role of the author. It is also clear that the results achieved owe their success to multiple and specific skills of the individual designer – or the team of professionals that revolve around the project.

What is certain is that the reformulation of the way of designing and the pursuit of objectives such as ecology and sustainability, have put in play professional figures with an original and innovative nature, the ones that Elena Granata defines as "*placemakers*", new protagonists who deal with "real processes of de-materialization of the world, giving birth to new economies, new possibilities of living and new forms of sociality". [7]

The ecological transition project brings out new professional figures that we could define as "*ecologicalmakers*", hybrid professionals capable of translating, through the project, a democracy made of: nature, animals and microorganisms. Referring for example to the previously presented case studies: Richard Weller is an architect–landscape designer, Philippe Rahm is an architect–meteorologist while Neri Oxman is an architect–designer–biologist.

In conclusion, we can say that the complexity and the responsibilities of contemporary design towards the ecological transition has decreed the beginning of a new generation of protagonists, declaring the end of the archistars era.

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