Why an architect should be a Naturalist? Organising space by listening and feeling life: The case of the Community Herbarium of Azores, Portugal

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Architecture is a discipline that is thought from projection, that is, there is an organisation proposal so that a space can be inhabited. This research suggests that architects need to study and inhabit space and that knowledge is deepened by slowing down the gaze to allow us to observe and access a more complete understanding of territory. Through the naturalistic work and the creation of the Community Herbarium of Azores, the architect established a dialogue between architecture and other disciplines. By identifying and understanding the natural elements that form the landscape, the architect can also consider them as design materials, proposing a re-signification of the relationship between architecture and its environment. In that way, the experience of

Inhabiting the territory and stopping to observe becomes a tool for scientific knowledge, but also for creative action.

space and study of place – in a broader sense and with consideration of the introduction of other disciplines – opens the field of architecture, from an expansion of formal and technical possibilities in architectural design to an improved characterisation and organisation of living spaces.

INTRODUCTION

Architecture considers space and the lives within it. In this sense, the architect Alberto Cruz says "Architects are those who from life, from living, from intimacy, know how to read, know how to build the face that space has."[1] This vision coincides with the statement of Fernando Távora when he says that the architect "is a creator of forms, and organiser of space".[2] There is a similarity

1.
Cruz, A. (1959). *Improvisación del Arquitecto Alberto Cruz*. [online] e[ad] - Escuela de Arquitectura y Diseño PUCV. Available at: https://www.ead.pucv.cl/1959/improvisacion-del-arquitecto-alberto-cruz.

2.
Távora, F. (2008). *Da Organização do Espaço*. Porto: Faculdade de Arquitectura da Universidade do Porto. p.73.

here between the two architects, each acknowledging the architect's role to build and organise space. In this sense, Cruz states that to know life it is necessary to study and live it, "space is known through space and time".[3] This means that experience of life itself is essential for the comprehension and study of space and, therefore, of architecture. In this way, the time spent in a place, the exercise of taking time in front of things – which is opposed to current models of optimisation and efficiency – enables knowledge, not only rational but also sensorial and corporeal. This means that it is not enough just to read the space, but also to listen and feel it, as Cruz said. It is clear how this relates to naturalist thought and craft, and the relevancy of field work and organismic vision[4] of being in front of entities in action.[5] For example, Humboldt travelled through South America in an attempt to study biodiversity and classify – or *organise* – the different species and ecosystems, which also allowed him incredible life experiences with the possibility of direct contact with the study material.[6] Another case is Carl Linnaeus, who introduced a new way of taxonomic organisation of nature through the scientific binary nomenclature gender-species valid until today.[7]

3.
Cruz, A. (1959). *Improvisación del Arquitecto Alberto Cruz*. [online] e[ad] - Escuela de Arquitectura y Diseño PUCV. Available at: https://www.ead.pucv.cl/1959/improvisacion-del-arquitecto-alberto-cruz/.

4.
Being the study and understanding of the natural order the meaning of this, the focus that unifies the views is the concept of organism as a phenomenological entry and exit point. See: Greene, H. (2005). Organisms in nature as a central focus for biology. *Trends in Ecology & Evolution*, 20(1), pp.23–27.
This irreducible core is connected to fieldwork as a generative problematic dimension and to scientific theoretical conceptualisation to redefine natural history (organism-theoretical framework-naturalist praxis). See: Elórtegui, S. (2015). Historia natural: La discusión. Una revisión del concepto, el conflicto y sus ecos a la educación de las Ciencias Biológicas. *Estudios pedagógicos (Valdivia)*, 41(especial), pp.267–281.

5.
Elórtegui, S. (2015). Historia natural: La discusión. Una revisión del concepto, el conflicto y sus ecos a la educación de las Ciencias Biológicas. *Estudios pedagógicos (Valdivia)*, 41(especial), pp.267–281.

6.
Wulf, A. (2019). *La invención de la naturaleza: el nuevo mundo de Alexander von Humboldt*. Translated by M.L.R. Tapia. Barcelona: Penguin Random House Grupo Editorial. pp.78-128.

7.
See: Stearn, W. (1955). Linnaeus's 'Species Plantarum' and the Language of Botany. *Proceedings of the Linnean Society of London*, 165(2), pp.158–164; and Bennett, B. and Balick, M. (2014). Does the name really matter? The importance of botanical nomenclature and plant taxonomy in biomedical research. *Journal of Ethnopharmacology*, 152(3), pp.387–392.

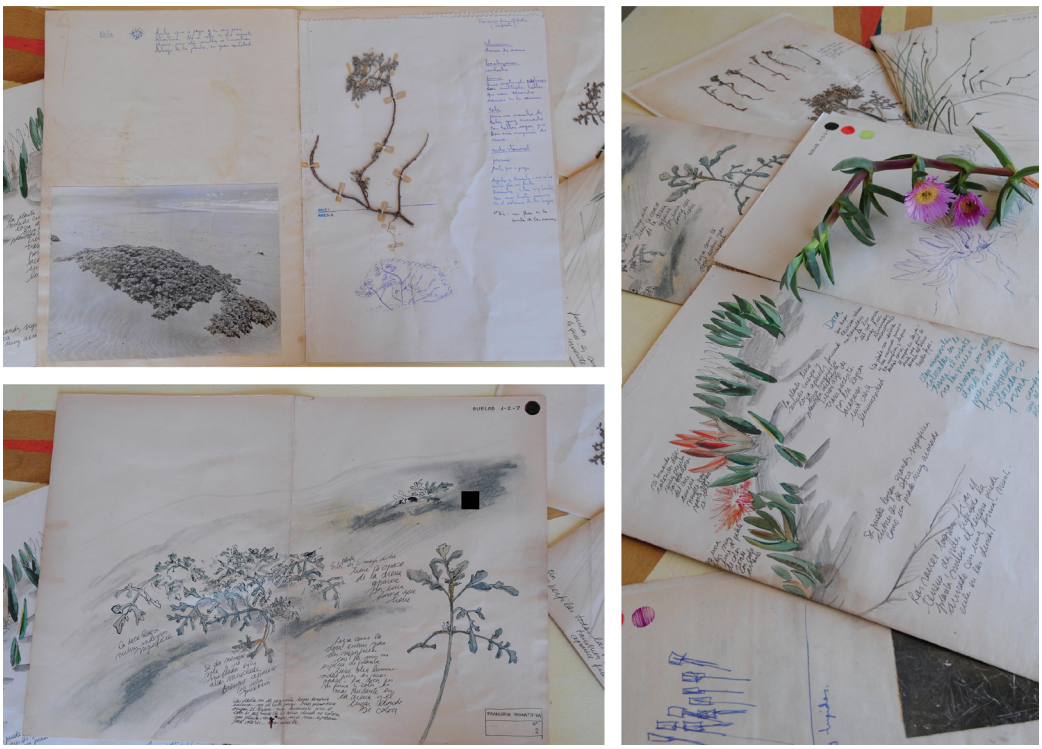
Naturalists also seek to order space but from the recognition and denomination of ecosystems, that is, how species are organised and relate to each other in a specific territorial system, which determines a certain typology of ecological space that can be characterised. Finally, the various landscapes are also perceptions of space which we evaluate considering culturally produced sensory dimensions. Therefore, there is in fact a direct relationship between the architect and the naturalist, since whether in architecture or in natural sciences, both seek an organisation that can even be taken to tangible spatial dimensions.

The exercise of building an Herbarium activates this lived time in front of things and allows the *dialogue of order and place* between architect and naturalist. For better understanding, an herbarium is a collection of dried plants and their most important parts, conserved and identified, along with information such as the name of the collector, or place and time of the collected samples. These elements are classified and used as material for botanical studies, research, and environmental education.

CRAFT, DIALOGUE AND PLACE

There is an important relation between the discipline of craft, dialogue, and place, because through these three dimensions it is possible not only to exchange knowledge with other disciplines but also involve the community in their native knowledge. This initial disposition of openness proposes a change of paradigm in how reality is understood, re-valuing and taking the life experiences of the community, not through a critical reasoning, but from a corporeal experience with the place and a direct relationship with the territory.

The contribution that architecture can bring to natural sciences is the possibility of organising aesthetically whether it is the *space* or the *content* of an exhibition. Architecture – understood as organisation – can show and represent a message with plenitude. When the architect works with species of plants and brings in unusual materials, they are blurring the idea of a culturally produced aesthetic and re-constructing it with consideration of a new paradigm to include the ecological sense. That is, importing into the practice of architecture materials and ways that collaborate with ecological dynamics and in turn aid in the



Herbarium of Pino Sánchez to explore nature/space dimensions of the Open City of Amereida.

dissemination of a new cultural aesthetic in which a work of art incorporates biology and botany. Thus, the consolidation of place is given by space and community, but also by including nature as part of a process of cultural transformation.

Architecture also brings a structure of order to natural history, which results in a vision of form over standardised botanical curatorship, which normally limits the beauty of an herbarium which will only be stored in a museum for curators and scientific researchers. Architecture brings an openness through the public exhibition of things.

The realisation of an herbarium by an architect is an opportunity to promote the dialogue of craft and transdisciplinarity, where the discipline of architecture – which has certain cannons – is invited to negotiate with another discipline interested in the *doing* of things – meaning both doing and thinking are processes of the hands. In this sense it becomes

relevant to bring the example of Pino Sánchez, a Chilean architect creating formal herbariums over the 1970s, as a tool of expanding knowledge in the Open City of Amereida,[8] where he studied forms and space through the plants.

The contribution of natural sciences to architecture results in the architect engaging directly and with slow contact with the natural world, or in the case of an herbarium with botanical taxonomic science. Although knowledge of the natural territory escapes from the urban reality, it is possible to cross it with other realities in consideration of the city to address environmental issues, such as the loss of biodiversity, excessive pollution, and lack of clean water. These acquired dimensions allow the architect to organise space with more beauty, with more fullness to the extent that they are able to expand their spectrum of understanding about territory, incorporating other dynamic and ecosystem relationships often ignored due to a lack of knowledge but with important implication in the composition and construction of landscape. For its part, an herbarium also displays its own qualities as a sophisticated and key piece for science.

WHY BUILD AN HERBARIUM?

The construction of a local herbarium is not investment in an obsolete idea or in playful scientific romanticism. Herbaria are critical components of the biological research infrastructure, with plant specimens stored in herbaria are being used to document the impacts of change on humans and nature.[9] In the last decade there has been an increasing number of herbarium consultations by biological, environmental, ecological, and molecular biology

8.
"Idea, utopia, city that is not city (initiated in 1970), a cultural project of architects and designers of the School of Architecture of the Catholic University of Valparaíso (and other related persons)." See: Perez de Arca, R. and Oyarzún, P. (2003). *Escuela de Valparaíso: Ciudad Abierta*. Madrid: Tanais Ediciones. p.166.

9.
See: Lavoie, C. (2013). Biological collections in an ever changing world: Herbaria as tools for biogeographical and environmental studies. *Perspectives in Plant Ecology, Evolution and Systematics*, 15(1), pp.68–76; Rocchetti, G., Armstrong, et al. (2021). Reversing extinction trends: new uses of (old) herbarium specimens to accelerate conservation action on threatened species. *New Phytologist*, 230, pp.433–450; and, López, A. and Sassone, A. (2019). The Uses of Herbaria in Botanical Research. A Review Based on Evidence From Argentina. *Frontiers in Plant Science*, 10(1363), pp.1–10.

sciences, among others,[10] even anthropological and ethnographic.[11] The planetary collection – *the Index Herbariorum* – of specimens is now immeasurable. The USA alone has 686 active herbaria that together contain over 78 million specimens,[12] and of the plant species that science estimates have yet to describe (over 70,000) probably more than 50% are found in herbaria and not in the natural environment.[13] Regarding local community, national park, or island herbaria, studies indicate that their value is very high as many of them focus their attention on species that scientists and the community consider important. A wide-ranging study of local herbaria in the United States indicates that these types of small banks are the ones that provide the greatest record of species that are vulnerable or at serious risk of extinction.[14] All this information places in the hands of the architect a sensitive scenario with serious implications for the development of a community's knowledge and how this architectural action is part of a global effort to understand the natural cohabited environment. The architect sensitises the community to certain issues, but they sensitise themself at the same time. Thinking by doing – and lingering over doing – allows a deeper reflection as a bodily experience. There is here a retrospective exercise of reimagining architecture to its minimum expression, to know what architecture means at the most basic level of the human and what this *thinking by doing* entails.

10.
Funk, V. (2004). *100 Uses for an Herbarium (Well at Least 72)*. [online] Division of Botany, The Yale University Herbarium. Available at: https://www.cvh.ac.cn/public/uploaded/files/support/20200519pvG1KBPN.pdf.

11.
Márquez, F. (2022). *Ruinas Urbanas. Réplicas de memoria en ciudades Latinoamericanas: Santiago, Quito, Bogotá* [project]. Santiago de Chile: Universidad Alberto Hurtado. Available at: https://ruinasurbanas.cl.

12.
Thiers, B. (2020). *The World's Herbaria 2019: A Summary Report Based on Data from Index Herbariorum*. [online] Available at: http://sweetgum.nybg.org/science/docs/The_Worlds_Herbaria_2019.pdf.

13.
Bebber, D., Carine, M., Wood, J., Wortley, A., et al. (2010). Herbaria are a major frontier for species discovery. *Proceedings of the National Academy of Sciences*, 107(51), pp.22169–22171.

14.
Marsico, T., Krimmel, E., Carter, J.R., Gillespie, E., et al. (2020). Small herbaria contribute unique biogeographic records to county, locality, and temporal scales. *American Journal of Botany*, 107(11), pp.1577–1587.

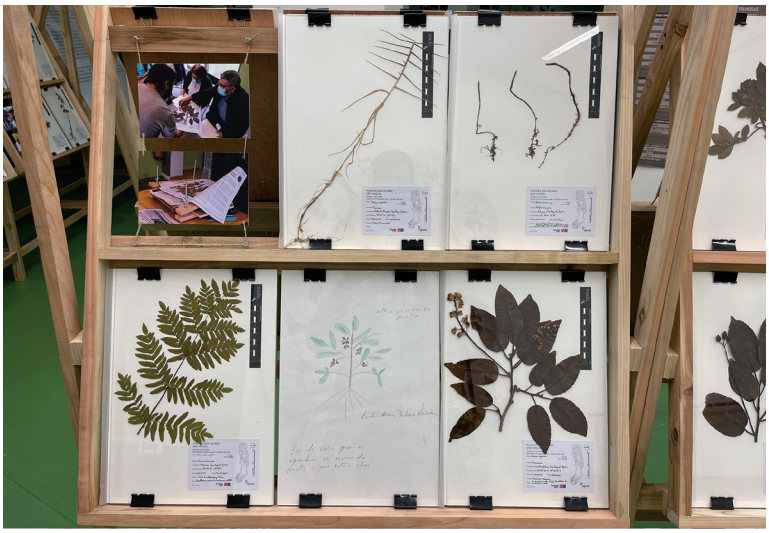
THE CASE: COMMUNITY HERBARIUM OF AZORES, PORTUGAL.

To clarify this approach, the case of the Community Herbarium of the Azores is presented, starting from the imprint and desire of an architect to study local biodiversity, specifically flora and fauna. It progresses to consider how architecture is capable of raising awareness of environmental problems, not through great technological advances as today, but through the mere fact that we share a habitat with other species – or co-inhabitants – that have different ways of inhabiting.

Based on this commitment to deepen and at the same time to disseminate the natural heritage of the archipelago, the project of the Community Herbarium of Azores applied to the pilot projects *Mão em Mão* of Azores2027, within the application of Ponta Delgada and Azores to the European Capital of Culture. The project consisted of a set of activities whereby a scientific exercise was carried out for deeper understanding of the *Laurissilva* forest, which made allowances to involve the community and make them aware of native and endemic flora within the Azores. In this way, an herbarium was created through naturalistic observation, field work, drawing, and collection of specimens as a way to build knowledge based on experiences and relationship with the territory. The particularity of this initiative is that the community was included as part of the process, transforming them into authors of works of art and creators of collective knowledge. This allows increasing inhabitants' sensitivity and knowledge about nature, creating a sense of belonging with their common heritage, in which they are participants by observing, organising their space, and creating relationships with their territory.

39 participants collected over 100 specimens comprising 31 different species: recalling their contact with them, the traditional uses of the past, and creating new memories from their own experience. A new way of looking at and reconnecting with nature was established. Beyond the herbarium product, it is important to highlight that the way the process took place was fundamental, since it was developed with the community and had a great effect on the final result.

In order to increase the impact of the project, an exhibition was held. It allowed the rest of the community to have access to the



The content of the exhibition shows the plants but also photographs and drawings of the process of the project.

information gathered through the herbarium, proposing a new framework to re-signify and re-value the relationship with nature. Here, the role of the architect became fundamental, since their view and projection allowed them to contribute to the development of the project through different aspects. For example, conscious of the necessary sustainability, the architect favoured biodegradable, recyclable, and locally produced materials such as paper, twine, or Japanese cedar wood (an exotic plant produced locally). In addition, in the creative process of the structures and supports for the exhibition, the proposal sought to minimise waste, with a modular design that facilitated its construction and allowed the exhibition to be displayed in spaces with varying dimensions.

Another important aspect is the attention given to aesthetics regarding how the plants, photographs, texts, and drawings are displayed in the exhibition, helping to communicate the content with regards to beauty. That is to say, the plants and drawings are transformed into works of art. The composition of the exhibition space allowed viewers to observe and compare details to better understand and discover the unique beauty of each species. The exhibition also sought to highlight the process of collecting and community participation. To include it, the exhibition had a selection of photographs and drawings that reflect part of the work done.

Here smiles are part of new narratives: the connection with biodiversity and the drawings are a conscious way to convey and represent this re-signification of the relationship with nature. In addition, the underlying rigor and aesthetic care allow the plant samples to fulfil their function as materials for the divulgation of natural heritage, environmental education, and botanical study by academics and researchers.

The main objective of the project was to reconnect the local population with the native species of the Azores, while including the architect in this process. These species are seriously threatened by the presence of exotic and invasive species often better known by the locals themselves. Therefore, by (re)bringing the community closer to these native species, the awareness of the importance of biodiversity in general and the conservation of severely vulnerable habitats in the habitats are promoted.

CONCLUSIONS

Today, architects have lost a diversity of readings and materials, and the figure of the architectural office has become predominant. That is why, in the search to reconnect architects with inhabited space – and recognising that it is not only inhabited by human beings – the herbarium emerges as an opportunity to incorporate architecture into socio-ecological and scientific contexts of the Azores community. This tool, nowadays strongly revalued by science, becomes a fundamental initiative, since it generates transdisciplinary dialogue with specialists, allowing the architect to increase the breadth of the field of architecture.

Taking the architect to a frontier zone of their discipline allows them to import new visions in ways of organising space and practising architecture. This acquired sensitivity grants the possibility of incorporating nature and re-signifying the relationship between architecture and its environmental context, not only through a translation to form and materials, but also through the incorporation of territory as a living system. Therefore, architects are invited to go out and explore the city, but also nature, so their works can be a projection of this way of living: a sensitive way because they know, understand, and feel in a biological, cultural, aesthetic, and transcendental relationship with the territory.