diségno 15.2024

unione italiana disegno
15.2024

diségno

ISSN 2533-2899

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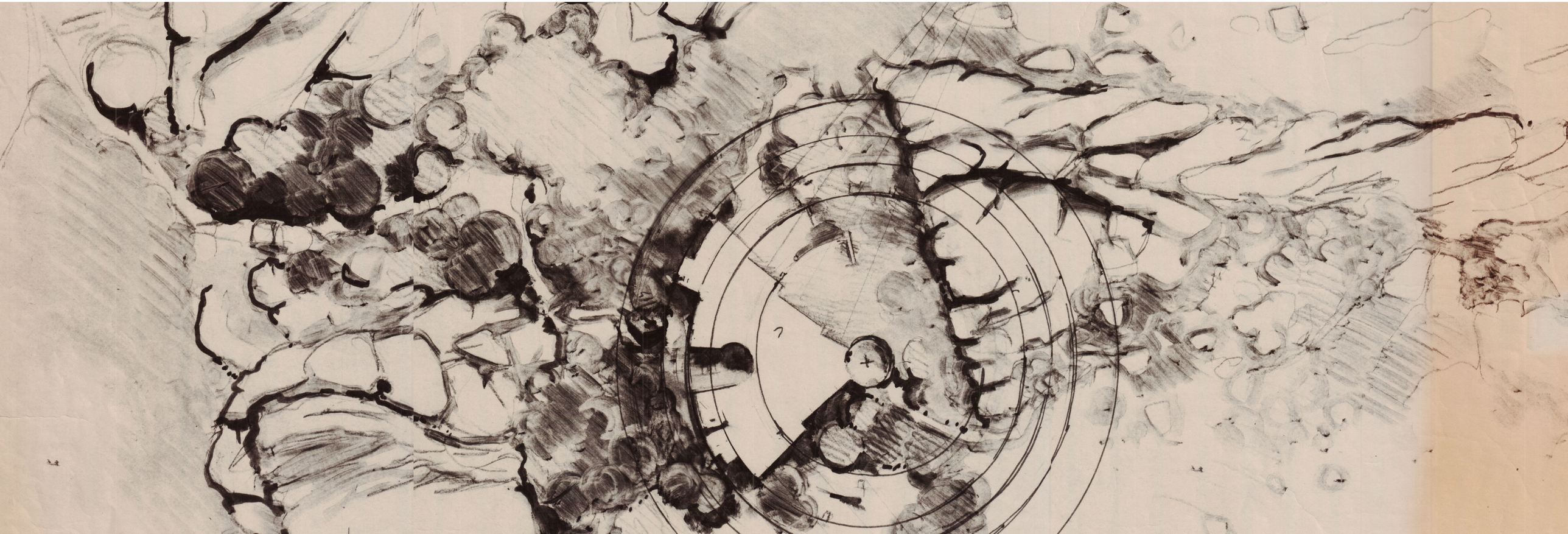

diségno

15.2024

REPRESENTATION INSIDE AND OUTSIDE THE LANDSCAPE

diségno

Biannual Journal of the UID Unione Italiana per il Disegno Scientific Society
n. 15/2024 - edited by Maria Grazia Cianci, Balmori Associates, Darío Álvarez
http://disegno.unioneitalianadisegno.it

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Cover
Alberto Ponis, sketch for Casa Hartley, detail.

The published articles have been subjected to double blind peer review, which entails selection by at least two international experts on specific topics.
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The journal *diségno* is included in the list of scientific journals of the National Agency for the Evaluation of the University System and Research (ANVUR) for the non-bibliometric area 08 - Civil Engineering and Architecture and is indexed on Scopus.

Published in December 2024

ISSN 2533-2899

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Editorial

Francesca Fatta

The topic of this issue 15 focuses on the theme of landscape representation and is located in an area common to various disciplines in the relationship between nature and culture; it is a complex area, rich in articulations and implications, but structurally permanent, even if historically variable.
Landscape design concerns a critical relationship between site, environment and anthropic signs: it expresses a significant index, a parameter revealing the deepest ways of thinking, local characteristics and transformative processes. Moreover, landscape is a question of fundamental importance for defining the status of art and aesthetics, and which deals in particular with the disciplinary tradition of architecture, both with regard to the extension of its field and to its theoretical consistency.
Representation Inside and Outside the Landscape is the title proposed by the curators Maria Grazia Cianci, Balmori Associates and Darío Álvarez Álvarez, with the aim of deepening the complexity of the theme in four focuses: *Landscape Drawing and Cultural Heritage*, *Landscape Drawing between Tools and Methodologies*, *Landscape Drawing between Imagination and Utopia*, *Landscape Drawing in Contemporary Design*.
The three curators are in fact distinguished by their specificities: Maria Grazia Cianci boasts significant experience in the field of landscape drawing and has directed the II Level Master *OPEN – Architecture and Representation of the Landscape* since 2015; Balmori Associates represents one of the most recognized international studios of urban and landscape design; Darío Álvarez Álvarez, professor of Architectural Drawing in Valladolid, is the coordinator of the *GIR Laboratory of Architecture, Heritage and Cultural Landscape*.
The critical readings that unfold in the following pages lead us towards a reading of the landscape through the critical tools of representation and lead us to the primary reflection on 'where' we are and 'how' we move within

https://doi.org/10.26375/disegno.15.2024.1

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our physical, mental and cultural enclosures. Between inside and outside, between where and elsewhere, we are always part of a landscape that changes and renews itself according to logics that are often uncontrollable.
We are increasingly talking about a 'palimpsest landscape' where the writing of a place is continuously subject to erasures and rewritings [Marini, Barbiani 2011]; this dimension of experience is the theme of representation that historically and operationally gives shape to the landscape. Therefore, the openings of the four focuses were entrusted to Mercedes Linares Gómez del Pulgar for the relationships with history, to Alberto and Julio Grijalba Bengoetxea for the procedures of representation, to Livio Sacchi for the utopian and metropolitan visions, and to Lucina Caravaggi for the links with design.
The *Image* chosen in this issue, commented by Elena Ippoliti, is the project drawing by Rem Koolhaas (OMA) for the 1982 competition for the Parc de La Villette, a representation that has become the expression of an innovative design method for landscape architecture.
In the *Readings/Rereadings* column, Rossella Salerno proposes an in-depth analysis of the text Kosmos, in homage to the figure and work of Alexander von Humboldt, discoverer of distant landscapes in an era of scientific revelations and measurements.

The reviews of some of the latest volumes published in the field of representation disciplines, the report of the most relevant events of recent months, and of the 45th International Conference of Teachers of Representation Disciplines titled Measure/Out of measure organized in Padua and Venice by the Unione Italiana per il Disegno (UID), follow.
In September, the UID bodies were renewed and in November Ornella Zerlenga was elected President of the association. Our best wishes to the entire new Technical Scientific Committee and its President for a peaceful and fruitful three-year period. I will continue in the role of Director of the journal for issue 16, already in progress on the theme *Drawing as a Language* edited by Enrico Cicalò and Valeria Menchetelli, scheduled to be published in June 2025. As always, I would like to thank the editors of this issue, the authors of the essays and columns, the reviewers and, finally, the Editorial Board and the Editorial Staff for the great work carried out with competence and generosity.
I wish everyone a good read with the hope that the contributions of this issue can once again serve as food for thought for open and shared research also with other disciplinary fields, bearers of innovation and new dynamics of exchange for scientific research.

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Inside and Outside the Landscape. Representation as an Interpretative Tool for the Landscape

Maria Grazia Cianci

Infinite dialogue

"Could it be that the secret of a landscape's enchantment lies in a certain harmony of forms and light, whose hold over us is as powerful and incomprehensible as that of a fragrance, a gaze, or a tone of voice? Or perhaps it depends on some unknown echo of emotions from primitive humans –those who, here and there, deified the most remarkable objects of nature– springs, rocks, peaks, great trees –and, unknowingly, by isolating them, giving them names, and imparting to them a sort of life, transformed them into true works of art; the most ancient art, that of feeling that an expression arises from an impression, and a particular moment becomes a monument of memory– a sublime gift of a prodigious dawn or sunset, the sacred dread of a forest, the exultation on the heights from which the realms of the earth are revealed? But if we are unable to reason clearly about such emotions, we must nevertheless acknowledge that we are less inept at reproducing them" [1] [Valéry 1934, p. 35] (fig. 1).

It's well known that the concept of landscape is a subject of interest for numerous disciplines, and the criteria for its analysis and study vary according to different expertise, methods, and objectives. Roberto Gambino stated that the landscape is simultaneously "a place of interdisciplinary convergence" and "a place of forking paths" [Gambino 1997, p. 27]. This makes the landscape not only an object to observe but, above all, a space, a place where different visions, approaches, and relationships intersect.

The complexity described by Gambino is eloquently expressed in an interpretation by Franco Farinelli, who

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Fig. 1. Anonymous, Views of the main crater of Etna and Agrigento with the Valley of the Temples [Cockburn, G. (1815). A voyage to Cadiz and Gibraltar, up the Mediterranean to Sicily and Malta, in 1810 &11, London: Harding 1815].

masterfully captures the intrinsic ambiguity of the concept of landscape. Farinelli asserts that it rests "on a single, unique expedient: on a word –and the case is truly rare, if not unique, in the history of scientific knowledge– that is used to intentionally designate both the thing and the image of the thing. That is to say: a word that simultaneously expresses the signified and the signifier, in such a way that it is impossible to distinguish one from the other" [Farinelli 1991, p. 11] [2]. This inherent ambiguity enriches the concept with meanings while simultaneously making it complex and elusive, difficult to define unequivocally (figs. 2-4).
Regarding the concepts of perception and interpretation, Christian Norberg-Schulz already identified orientation and place identification, as well as a sense of belonging, as among the basic functions of dwelling [Norberg-Schulz 1979]. It is precisely with respect to the value of perception as a tool for creating the landscape that the role of interpretation –and thus representation– becomes fundamental. "The eye sees the world, what the world lacks to become a painting, and what the painting lacks to become itself. It sees on the palette the color the painting awaits, sees, once completed, the painting that responds to all these lacks, and finally sees the paintings of others, other responses and other lacks. A definitive inventory of the visible cannot be made, just as it is impossible to catalog all the possible uses of a language or even just its vocabulary and constructions. A self-moving instrument, a medium that invents its own ends, the eye is what has been touched by a certain impact with the world, and it returns it to the visible through the marks traced by the hand" [Merleau-Ponty 1964, p. 58].
"A map of a territory is made to understand it and, consequently, to transform it. But before transforming it, it must be understood, and this understanding is achieved through its representation" [Cozens 1981, p. 98] [3] (figs. 5-8).
It is impossible to discuss the concept of landscape without considering the territory, the city, and the relationships between them. Landscape is a collective narrative, an expression of the nature of its people and their history; it does not exist independently of these elements. It takes shape when it is observed and experienced.
The contemporary city presents itself today as an increasingly complex organism in constant transformation, capable of reflecting and manifesting dynamic changes and crises in various fields, including architecture and society. This mutable and stratified nature requires an analytical and design approach capable of grasping its complexity by integrating methodologies and tools from different disciplines [Berque 1985].
The observation, analysis, and design of urban spaces must consider both the complexity of the subject and the implications of potential transformative interventions. These interventions not only need to meet functional and structural requirements but must also address a growing network of themes related to urban scale, socio-cultural dynamics, and environmental concerns.
In this context, multidisciplinarity becomes crucial: understanding the city can no longer be confined to technical or aesthetic domains but must intertwine contributions from social sciences, economics, sociology, ecology, and digital technologies. Every intervention on the urban fabric or the anthropized landscape modifies not only physical space but also human relationships, modes of production, and the cultural identity of places [Raffestin 1977].
Thinking about the city of the future, therefore, requires an integrated and systemic approach capable of interpreting the signs of the present to anticipate needs and challenges, fostering innovative and sustainable solutions. It is necessary to build a vision that reconciles respect for the historical and cultural memory of a territory with the demands for modernization and resilience required by contemporary society.
Significant examples of this cultural vision are evident in many contemporary design experiences. A notable example is the innovative methods for observing and representing the fluid data of the city, as seen in the projects of



Fig. 2. M.G. Cianci: a) City: Anthropized landscape, Rome 2018. Ink pen on paper; b) Countryside: Hilly landscape, Rome 2018. Ink pen on paper.

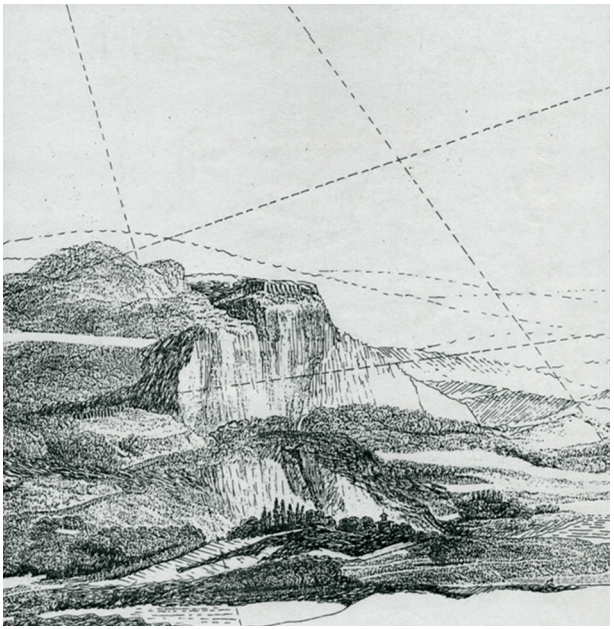


Fig. 3. M.G. Cianci, Order and disorder in the landscape: Natural landscape between hills and valleys, 2020. Ink pen on paper.

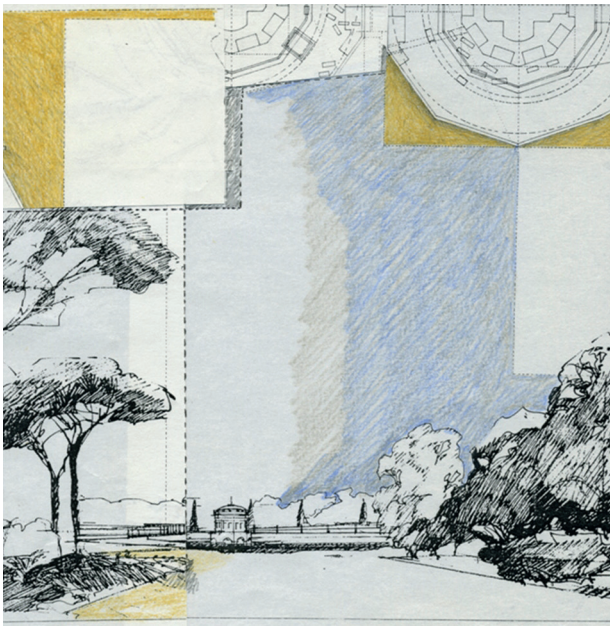


Fig. 4. M.G. Cianci, Landscape of Theodoric Park, Ravenna 2019. Ink pen on paper.









Fig. 5. A. Cozens, The Various Species of Landscape, 1771. A blot on vegetative variations no. 1 [Oppè 1952].

Fig. 6. A. Cozens, The Various Species of Landscape, 1771. A blot on vegetative variations no. 2 [Oppè 1952].

Fig. 7. A. Cozens, The Various Species of Landscape, 1771. Lagoon landscape with trees no. 1 [Oppè 1952].

Fig. 8. A. Cozens, The Various Species of Landscape, 1771. Lagoon landscape with trees no. 2 [Oppè 1952].

Carlo Ratti. He describes this methodology as a tool for "systematic exploration and a seed for possible futures" [Bistagnino 2019, p. 14]. This vision is based on the idea of continuous interaction between the analysis of urban phenomena and their projection into future scenarios, opening new interpretative horizons [Ratti, Claudel 2017] [4].
Making the image of the landscape visible is not merely about representing objective data but also integrating symbolic and cultural elements. Creating and representing the image of the landscape thus also means uncovering its deeper identity, attributing to it a significance that goes beyond simple visual description.
Representation becomes a key tool for interpreting the landscape, capable of revealing its complexities, dynamics, and latent potentialities [Schama 1997].
In this context, creative and design processes find a central and indispensable role in representational language, in its most advanced forms. Technological and cultural evolution has enriched the ways in which the landscape is observed, analyzed, and conveyed, making these practices a cornerstone of the contemporary panorama. Representation, therefore, is not just an end but also a means to imagine and construct new narratives of space, offering interpretative tools to guide design and cultural choices toward a sustainable future (fig. 9).
The necessity emerges, therefore, to engage with the complex phenomenology resulting from the interaction between two vast and ever-evolving themes: representation and the urban landscape, particularly concerning the city. This convergence creates a broad and often indefinable panorama characterized by a plurality of languages, methodologies, and visions that intertwine in an attempt to capture the multiple dimensions –esthetic, social, environmental, and technological– that compose the contemporary landscape.
In this scenario, attention is not limited to the mere visual translation of reality but expands into a critical reflection on the very nature of representation: how it interprets, shapes, and, in some cases, redefines our way of perceiving and experiencing urban and landscape spaces. The landscape, as previously stated, is not only a physical reality to be observed but also a system of relationships in which the visible interweaves with the invisible, where historical memory and technological innovation coexist and interact in an endless dialogue [Turri 1988].
The image of the landscape is not merely a snapshot of tangible reality but a dynamic synthesis between the visible and the invisible, between the objectivity of form and the subjectivity of perception (figs. 10, 11).

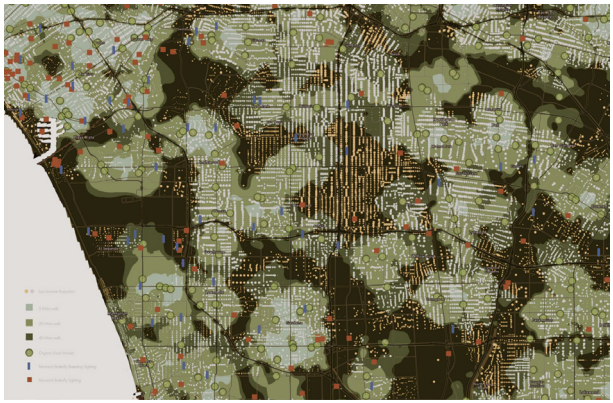


Fig. 9. C. Reed, 2022, Wild Ways: A Fifth Ecology for Metropolitan Los Angeles. Mapping analysis of South Los Angeles food desert and butterfly habitat (<https://issuu.com/gsdharvard/docs/wild_ways>).

By taking it to an extreme, we can affirm that constructing the image of the landscape means attempting to reveal its deeper identity, going beyond surface and appearance. This process implies a continuous tension between representation and interpretation: representation does not merely translate reality but becomes an analytical and critical tool, capable of uncovering the complex relationships that connect the elements of the landscape with one another and with those who inhabit and observe them.
From this perspective, the image of the landscape is never neutral: it carries choices, visions, and intentions that contribute to defining the meaning of the landscape itself. Representing the landscape is, at its core, narrating it, attributing a narrative that articulates its essence and designs its possible developments. It is a tool that not only helps us understand what the landscape is today but invites us to imagine what it might become tomorrow, guiding conscious and respectful transformation processes aligned with its identity.
The representation of the landscape –whether aimed at surveying the existing or creating something new– cannot be considered a passive or merely descriptive activity. It is always a design act. Drawing, photographing, and sketching are not actions limited to recording an image; they are productive gestures that already contain the seed of

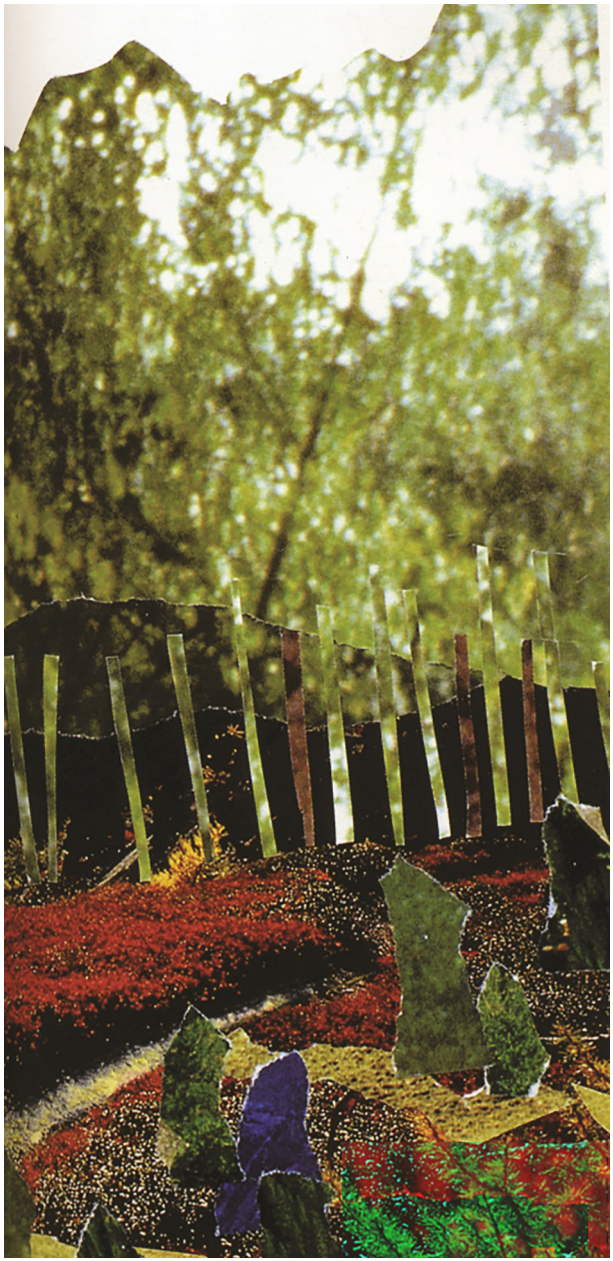


Fig. 10. G.P. Bagetti, 1825 ca., Landscape with waterfall. Turin, Palazzo Reale.



Fig. 11. G.P. Bagetti, 1825 ca., Wooded mountain. Turin, Palazzo Reale.

Fig. 12. Y. Brunier, Landscape with trees [Brunier 1996].



the project. This 'first glance' of the designer, expressed through initial figures –sketches, graphic notes, drawings– anticipates and prefigures the design process. It is in these original figures that the project's seed lies hidden, the starting point from which subsequent design developments will take shape through the production of further figures (figs. 12-15).
The figure is not merely a technical tool or operational support but the first language of the project, the *medium* through which the designer engages with the context and imagines the future. This concept highlights the central role of representation as the primary language of design invention, a language that, through marks and traces, translates vision into concrete possibilities.
To represent the landscape, therefore, does not mean merely returning its visual image but interpreting and reformulating it through the language of figures. Each figure, in its essence, carries a narrative, a transformation project that reconnects the past, present, and future of the landscape. Drawing thus becomes a critical and creative act, capable of revealing hidden potential, uncovering latent relationships, and constructing new possibilities for interaction within space.
In this process, representation is never an end in itself: it lives and evolves as a continuous translation of meanings, a device capable of giving shape to the invisible and rendering design intentions readable. Through the figure, the complexity of the visible is translated into a web of relationships and meanings that guide the project, transforming every initial glance into a concrete vision and every drawing into a projection of the future.
Thus, observation itself is already a design operation. Looking cannot be an action devoid of subjectivity; inherent in its meaning is the act of selection and interpretation, with the natural consequence of attributing meanings [Turri 2009].
An additional theme that can reveal further facets about the value and importance of representation in landscape design –and which must necessarily be addressed in this text– is the relationship between hand drawing and digital representation. The challenge lies in understanding how these two productive modes can be theoretically interpreted and coherently combined in the design process.
I firmly believe that the duality of these forms of representation is where the future of design invention is shaped, and

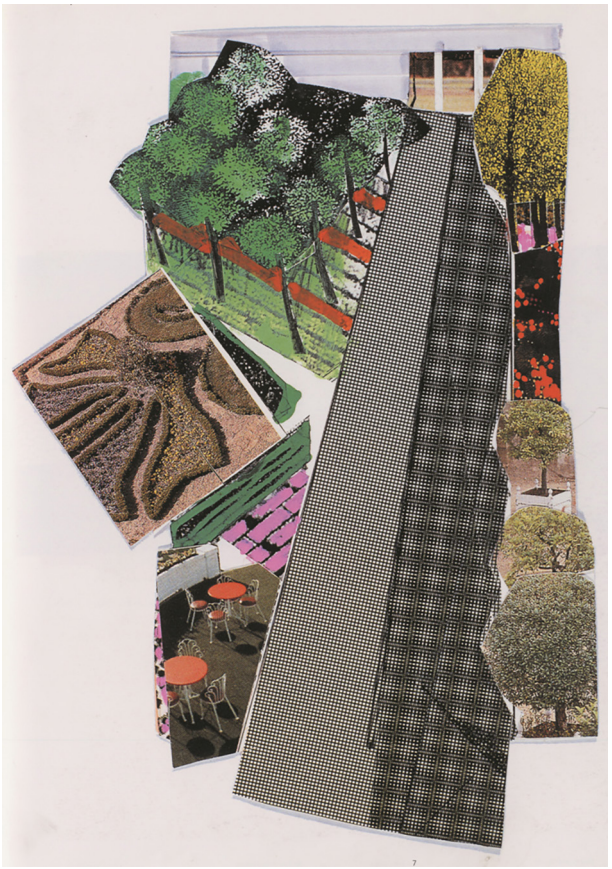


Fig. 13. Y. Brunier, European Patents Office, Photographic montages for the mosaic garden project [Brunier 1988] (from: Y. BRUNIER, Landscape architect paysagiste, Berlino 1988).



Fig. 14. Y. Brunier, Photographic montages and color experiments [Brunier 1988] .

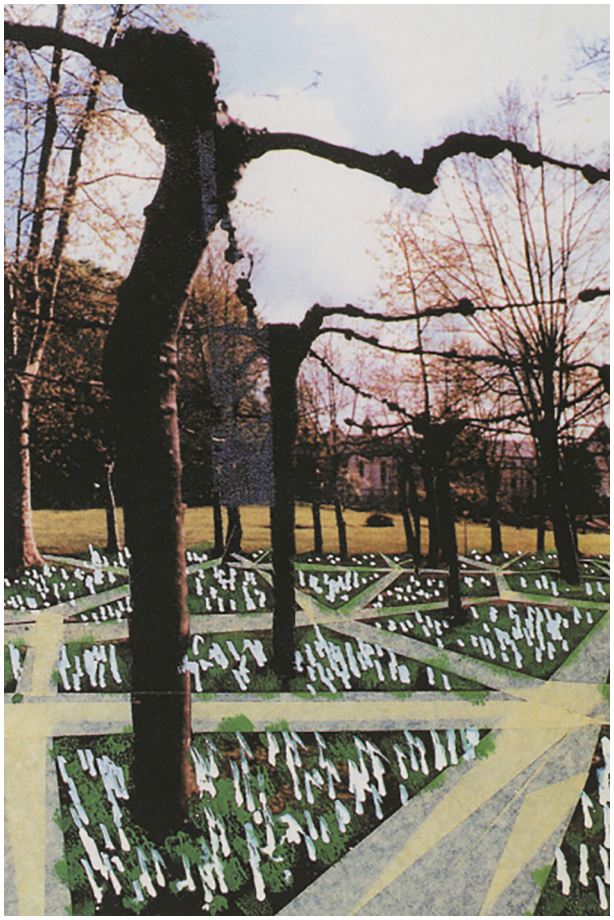


Fig. 15. Y. Brunier, Photographic montages and graphic experiments [Brunier 1988] .



Fig. 16. Canan Tolon, Experiments on "landscape fragments" (from: Pages Paysages, Distances, no. 5, September 1994).

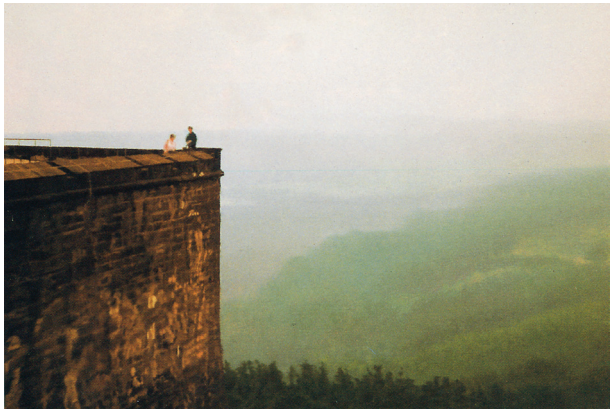


Fig. 17. Apfelbäume, 1987. Private collection, ph. Gerhard Richter (from: Pages Paysages, Distances, no. 5, September 1994).



Fig. 18. K. Orff, 2019, Scape, Public Sediment for Alameda Creek – Press Images, 2019 (<https://www.scapestudio.com/projects/public-sediment/>.

much of what has been discussed so far regarding the role of the figure in the design process hinges on understanding these two operational modes, not so much in their current interpretation but in a potential new interpretation.
As early as 1996, Franco Purini observed: "In the telematic age, it is possible that the 'historical' drawing will survive only as a sketch, an unrepeatable and decisive moment of invention" and further, "precisely because automatic drawing erases the original, the sketch will gain even greater value. If before it constituted the initial moment of a progression, it now becomes the logical counterpoint of a practice defined in the 'scientific' terms of a methodological sequentiality, self-verified in a ritual with esoteric tones" [Purini 2008, p. 41].
These words prompt reflection and recall another assertion: "And without a doubt, our age […] prefers the image to the thing, the copy to the original, representation to reality, belonging to being […] What for it is sacred is nothing but illusion" [Feuerbach 2012, p. 55] [5]. This statement by Feuerbach in the *Preface* to the second edition of *The Essence of Christianity* aptly captures the purpose of representations, which are necessary tools for knowledge.
As André Corboz also asserted, no landscape or territory can exist without an image that represents it [6].



Fig. 19. Robert Venturi observing the landscape of Las Vegas, photo [Venturi 1977].



Fig. 20. Denise Scott Brown observing the landscape of Las Vegas, photo [Venturi 1977] .

Similarly, throughout history, few places have remained undescribed in the notebooks of great travelers. The image of a territory is not merely a mental expression but, above all, a cultural, social, and historical reflection that influences and shapes the perception and relationship an individual has with the surrounding space.
Literature, through the words of Johann Wolfgang von Goethe, Michel de Montaigne, Charles de Montesquieu, teaches us to explore and perceive the nature of a place through its structure, sounds, and atmosphere.
During his stay in Italy, Goethe produced significant writings, meticulously describing the landscapes around him [Goethe 1991]. He drew and painted what he observed, striving to uncover its most remote secrets; through drawing from life, he interpreted these places, seeking to grasp their most authentic essence. His drawings and texts embody a perfect union, a synthesis of historical-scientific analysis and interpretative aesthetic analysis [7].
The landscape is revealed, taking shape not only through its constituent elements but also through their relationships and, above all, through the perception one has of them. When the observer looks at an object, the observed object becomes an image, and at that precise moment, the territory becomes a landscape: "A portion of territory, including the sky above it, becomes a landscape when we accept and discover it as a concretely lived sensory experience, allowing it to act upon us as an impression" [Hellpach 1960, p. 82] [8] (figs. 16, 17).
This statement by psychologist Willy Hellpach invites reflection on the concept of judgment and the moment when the transition occurs from a mere 'generic element' to a true landscape. For Hellpach, the center of this transformation lies in the perceptual moment, that precise instant when, regardless of one's intent, an object transforms into an image. Landscape perception cannot be confined to the visual dimension alone. Simply looking at the landscape is not enough to make it such; one must involve the entire body: hearing, smell, and touch all play a role in the perceptual moment with the same intensity as sight (fig. 18).
Thus, the landscape becomes, according to Hellpach, a complex and dynamic entity, a mirror of our soul, an extension of our thoughts, and it changes based on our experiences. When we look at it, we do not merely observe what is in front of us but immerse ourselves in it, allowing it to envelop us and transforming every element and detail into an impression that becomes ours.
"Before unspoiled nature, before the image of its various details represented to our mind (from the tree to the stream, the sunflower field to the hilly expanse), before its *spiritual physiognomy* responding to the spectrum of our most intimate feelings, we are convinced that there is something surpassing that vast and rich panorama of separate elements. That something, to our consciousness,

takes shape as an enveloping and infiltrating totality, an uninterrupted figuration of emotions and perceptual data, sentimental radiations" [Milani 2001, p. 22] [9].
Thus, the representation of the landscape is much more than a mere aesthetic exercise: it is a cultural act, a profound action, a way to recognize, interpret, and define our place within the world [Turri 1988].

Through art, literature, and other forms of expression, the landscape becomes a reflection of human identity, capable of narrating stories and inducing profound reflections. The continuous reinterpretation of the landscape reminds us that our relationship with nature is ever-evolving, shaped by time, culture, and imagination (figs. 19, 20).

Notes

[1] The text is a poetic passage by Paul Valéry from 1934, reflecting on the nature of the enchantment evoked by landscapes, comparing them to primitive art and the way human emotions find expression in the forms of nature.

[2] "And isn't it, today, precisely the difficulty, if not the impossibility, of such a distinction the most evident sign of our crisis, the crisis of our capacity for knowledge?" asked Wittgenstein, and the answer is still missing: "What happens if, far away, images begin to waver?"[Farinelli 1991, p.?].

[3] This quote opens last chapter of Cozen's text. The author is Alexander Pope, closely aligned with Cozens' theoretical positions. The entire text explores beauty and its applications; inventing landscape compositions is a complex practice, an operation that must stem from inner sensitivity, which surpasses operational practice in importance.

[4] Since their inception around ten thousand years ago, cities have been one of the most powerful engines of innovation in human history. However, their progress has not been linear: periods of relative stability have alternated with times of profound change, during which the fundamental elements of daily life have been redefined. Today, we find ourselves in one of these transformative phases, driven by major technological and digital revolutions that are reshaping the world of networks and the organization of urban societies. This text by Ratti, based on research conducted at the MIT Senseable City Lab, takes us on a journey to discover the metropolises of tomorrow, where technology and innovation not only change the face of cities and landscapes but also the way we live, work, and interact. Cities and urban landscapes, once seen only as physical settlements, are transforming into dynamic, interconnected systems where data and artificial intelligence play a crucial role in defining new forms of sustainability, efficiency, and inclusion.

[5] "[...] Or rather, the sacred enlarges in its eyes to the extent that the decrease of truth corresponds to the increase of illusion, such that the pinnacle of illusion is also the pinnacle of the sacred.": Feuerbach, Preface to the second edition of *The Essence of Christianity* [2012].

[6] An exhibition held in Mendrisio at the Teatro dell'architettura in 2020, titled *The Territory as Palimpsest: The Legacy of André Corboz*, curated by André Bideau and Sonja Hildebrand, highlights precisely this vision of the landscape. The exhibition showcased fascinating materials from Corboz's archive, preserved at the Library of the Academy of Architecture. The exhibition was divided into two sections: *How to Read the Territory* and *Knowledge Production and Historiography*. The materials on display and especially the archive dedicated to him explicitly bring the imagination factor into the study of the territories he examined. Corboz uses montage techniques and visual relationships between real forms of nature and surreal forms, that is, between reality and illusion.

[7] "[...] From time to time, we have splendid days, and the rain that falls intermittently refreshes the grass and plants. Here and there, one sees evergreen trees, so the absence of leaves on others is hardly missed. [...] Here, winter is hardly noticed; in the gardens, evergreen trees are planted, the sun shines brightly and warmly; snow is seen only on the farthest mountains to the north. The lemon trees planted along the walls of gardens are occasionally covered with cane roofs" [Goethe 1991, text date December 8 1787, p. 34].

[8] "Nature becomes a landscape for us only when we accept and seek it without a purely utilitarian purpose, as a concretely lived sensory experience, when we allow it to act upon us as an impression" [Hellpach 1960, p. 254].

[9] In the second chapter titled *What is Landscape*, Milani adds: "It is more than the sum of its parts, the individual fragments of our gaze scattered across the time of sensitivity, more than the attraction of psychic processes: it is the soul of an infinite and magical concatenation of forms. Its idea develops in history but also in the individual, through effects of time and space united in the rhythm of lines and surfaces that man instinctively knows how to compose" [Milani 2001, p. 37].

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Balmori Associates: Landscape Representation

Javier González-Campaña, Noemie Lafaurie-Debany

Introduction

The discipline of landscape architecture is undergoing a reinvention, becoming central to shaping public spaces through comprehensive approaches that address equity, social inclusion, the climate crisis and biodiversity and standing as a powerful design tool, fostering dialogue on the evolving relationship between humans and nature.
Within this renewal of the field, nowhere has the representation been more scrutinized than in landscape architecture, becoming main topic of the ongoing debate. While 3D modeling and rendering software have revolutionized design fields and unlike static forms of architecture, landscapes are constantly changing. They evolve with the seasons, years, and the elements, making it challenging to represent them in static frames, as was often done in the 18th-century picturesque tradition. Historian Malcolm Andrews critiques the tendency to 'fix' ideal landscapes in time, akin to pictorial trophies. Today's hyper-realistic renderings, similarly, freeze landscapes at one moment in time, limiting our understanding of their dynamic nature.
For phased projects, designers often create sequential drawings showing landscapes at different stages of growth, often necessary for construction or ecological restoration, which are valuable for showing flexibility in the use of space, adapting to various community needs over time. Capturing time in landscape drawings is crucial, as the survival and evolution of a landscape depend on its changing conditions, such as plants adapting to light as trees grow.

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This fluidity raises questions about when a landscape is 'complete' but actually a landscape may never truly be complete: it is always evolving, with only traces of its ongoing processes to be seen. Similarly, questions arise about the beginning of a landscape: the history and context of the site itself, shaped over millennia, are vital to the strength of a landscape design.
Therefore, landscape representation is most effective when it acknowledges that it is merely capturing a moment within a much larger timescale. Drawing serves as the language of ideas in landscape architecture, allowing designers to research, test, and communicate their intentions. These ideas may be expressed through sketches, plans, sections, or perspectives, and may be created using analog or digital techniques; but most probably, analog and digital processes are often intertwined throughout a project.
The design evolves in a non-linear way, with representation playing an integral role in its development. Rendering software like *Lumion* allows for the creation of polished perspective images at any design stage, but these images can sometimes make a design appear more resolved than it actually is. By altering these images, designers can better reflect the evolving nature of the landscape.
Process images are essential, as they express the unfolding of ideas, and the creation of forms connected to the living systems of a site. As conditions change, these drawings offer insights into how the landscape could be adapted in the future. Landscape preservation is more complex than architectural preservation and once a designed landscape is no longer maintained or visited, it disappears. Embracing process images is key in preserving the legacy of landscape design.
Balmori Associates, established by the visionary Diana Balmori, has been pivotal in redefining representational practices within the field. The firm's approach integrates landscape as a dynamic, living system, emphasizing the interconnectedness of ecological, social, and aesthetic concerns. Representation, for Balmori Associates, is not merely a tool for visualization and documentation, but an essential method for investigating the complex relationships between natural systems, urban spaces, and human experience. The late Diana Balmori, a trailblazer in the field, was renowned for her profound understanding of the interplay between natural systems and urban environments. Her legacy is characterized by a commitment to ecological sensitivity, aesthetic excellence, and interdisciplinary collaboration.

Balmori Associates is marked by a relentless pursuit of innovation and a deep-seated belief in the transformative power of landscape architecture. Our firm champions the idea that landscapes are dynamic, living systems that must be designed with an awareness of their temporal and spatial dimensions. Their work emphasizes the importance of creating spaces that are not only beautiful and functional but also ecologically resilient and sustainable.
The firm's innovative techniques in digital and analog representation have not only enhanced the visual communication of their projects but also deepened the understanding of the landscapes they design. By focusing on the interfaces and interactions within landscapes, rather than merely the objects within them, Balmori Associates fosters a more holistic and immersive approach to design.
Representation in design holds paramount importance as it transcends being a mere endpoint in the creative process. It acts as a vital bridge between conceptual ideas and their tangible realization, enabling designers to visualize, test, communicate and refine their concepts iteratively. Effective representation fosters clear communication among stakeholders, ensuring that the intended spatial qualities, ecological dynamics, and aesthetic values are accurately conveyed and understood.
This paper delves into how Balmori Associates continues to innovate in the realm of landscape representation under the leadership of Noemie Lafaurie-Debany and Javier González-Campaña. Their experimental approach, driven by interdisciplinary research and a strong ecological focus, offers fresh perspectives on the evolving role of representation in landscape architecture. The firm's BAL/LAB initiative exemplifies these efforts, exploring new technologies, techniques, and ideas that push the boundaries of traditional landscape design and representation practices. This research contributes to a broader understanding of how representation can enhance spatial awareness and engagement within designed environments, positioning Balmori Associates at the forefront of contemporary landscape architecture.

Representation in landscape architecture, a BAL/LAB

Since 2006, Balmori Associates has been split into two distinct segments. The first is a traditional landscape practice focusing on landscape as a constructed space, while the second, BAL/LAB, is a collection of research and

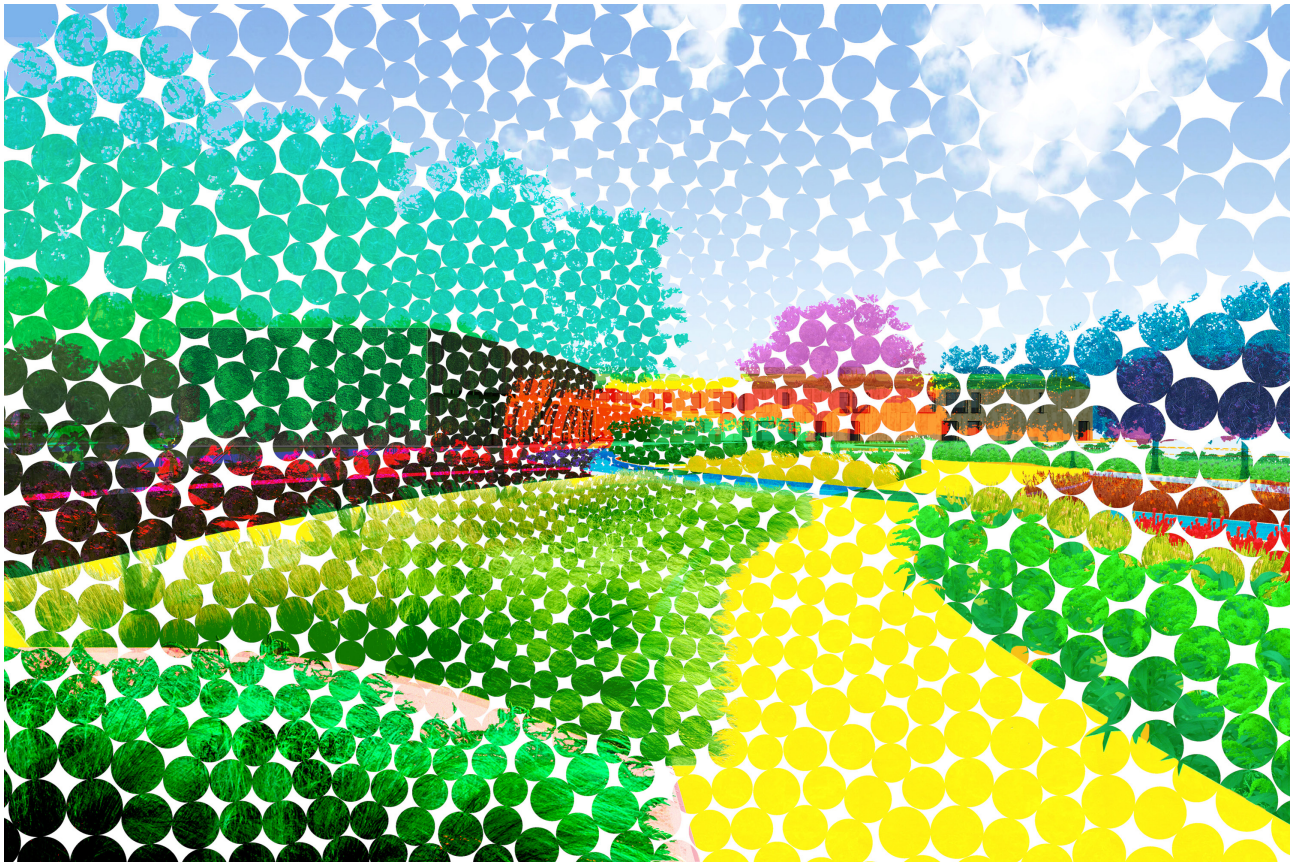

Fig. 1. Botanical Reserach Institute of Texas (BRIT) Fort Worth: the absence of contours around the objects allows space to flow thru the dot matrix, while the color intensity evokes the Texas sun.

experimental projects. BAL/LAB encompasses a range of endeavors including interdisciplinary collaborations, exploration of new technologies, self-initiated projects, temporary installations, floating landscapes, and zero-waste city concepts. A significant area of focus within BAL/LAB is the challenge of representing landscapes. Noemie Lafaurie Debany played a critical role in shaping BAL/LAB from its inception and continues to direct its innovative projects today, driving the labs' focus on forward-thinking and sustainability.

Representation within landscape architecture has become a contentious and heavily debated topic. The advent of 3D modeling and rendering software has transformed the field of design, and nowhere is this transformation more pronounced than in landscape architecture, which is undergoing a process of reinvention. With the rapid pace of urbanization and an evolving relationship with nature, landscape architecture has emerged as a powerful medium for articulating broader global dialogues. Innovative forms of representation –whether digital, analog, or hybrid– serve as

the most vivid indicators of emerging ideas and approaches. Modeling tools began to be widely used in landscape architecture around the late 1990s and early 2000s. This period saw significant advancements in computer technology and the development of software specifically designed for landscape and urban design. Tools such as AutoCAD, initially developed for broader architectural and engineering applications, became more sophisticated and tailored for landscape use to develop 2D plans. Additionally, the introduction of Geographic Information Systems (GIS) and 3D modeling software like SketchUp and Rhinoceros provided landscape architects with powerful tools to visualize, simulate, and analyze their designs in more dynamic and detailed ways.

At BAL/LAB, and throughout project design, we engage in drawing experiments aimed at rendering spaces. Our research focuses on enhancing the understanding of the landscapes we design, with the intention of making viewers more aware of the spaces created rather than the objects within those spaces. To this end, we strive to blur the edges between objects and emphasize their interfaces. One method we developed employs a dot matrix inspired by the halftone and Ben Day processes, reminiscent of Roy Lichtenstein's work (fig. 1). Another method focuses on patterns rather than contours, akin to the paintings of twentieth-century French artist Pierre Bonnard (fig. 3). In our drawings, we aim to represent the spatial qualities, character, and atmosphere of our designs. Yet, other experimentations explored techniques from theater design, manipulating elements such as perspective and layering to create a sense of depth in two-dimensional renderings. This approach transforms a flat image into a more immersive experience, allowing viewers to feel a greater connection to the space (fig. 2).

Fundamental principles

A core principle of our work is to establish a new relationship with each element of nature: soil, water, air, plants, and animals. Our goal is to change our interactions with these elements, treating them as integral parts of ourselves. This principle is reflected in our drawings, where soil and plant roots are given the same importance as the visible canopy of trees. We depict potential human interaction with the space using silhouettes –transparent black or white figures– instead of realistic



Fig. 2. Private Garden, Greenwich, CT, USA: experimentation with perspective and layering adds depth and seeks to create a more immersive experience.

photos. This approach minimizes bias, allowing viewers to imagine themselves in the landscape and focus on the space rather than fashion trends. Some perspectives and projects become dated by the depicted people and their attire. We also experiment with representing activities using hand-drawn figures to emphasize the flexible use of space and the temporary nature of activities.

Process of design and representation

Drawing is the language of ideas. It is the means by which designers generate and test concepts, and communicate design intentions to the team, the public, and clients. Ideas may materialize in plan or section views, perspectives, sketches with pencils on trace paper, transformations in Rhinoceros or other 3D software, collages, or physical models.

In our practice, analog and digital processes are intertwined throughout the project design (fig. 4). The evolution of design is not linear; it does not start with rough, intention-driven lines progressing to detailed, precise computer-generated ones. Instead, a diverse range of representation techniques is integral and fully integrated into the design process. Perspectives or computer-generated renders are produced in-house throughout the design's development. Some practices hire renderers at the end of the design process, often resulting in hyper-realistic images detached from the project's concept. The development of rendering software like Lumion allows

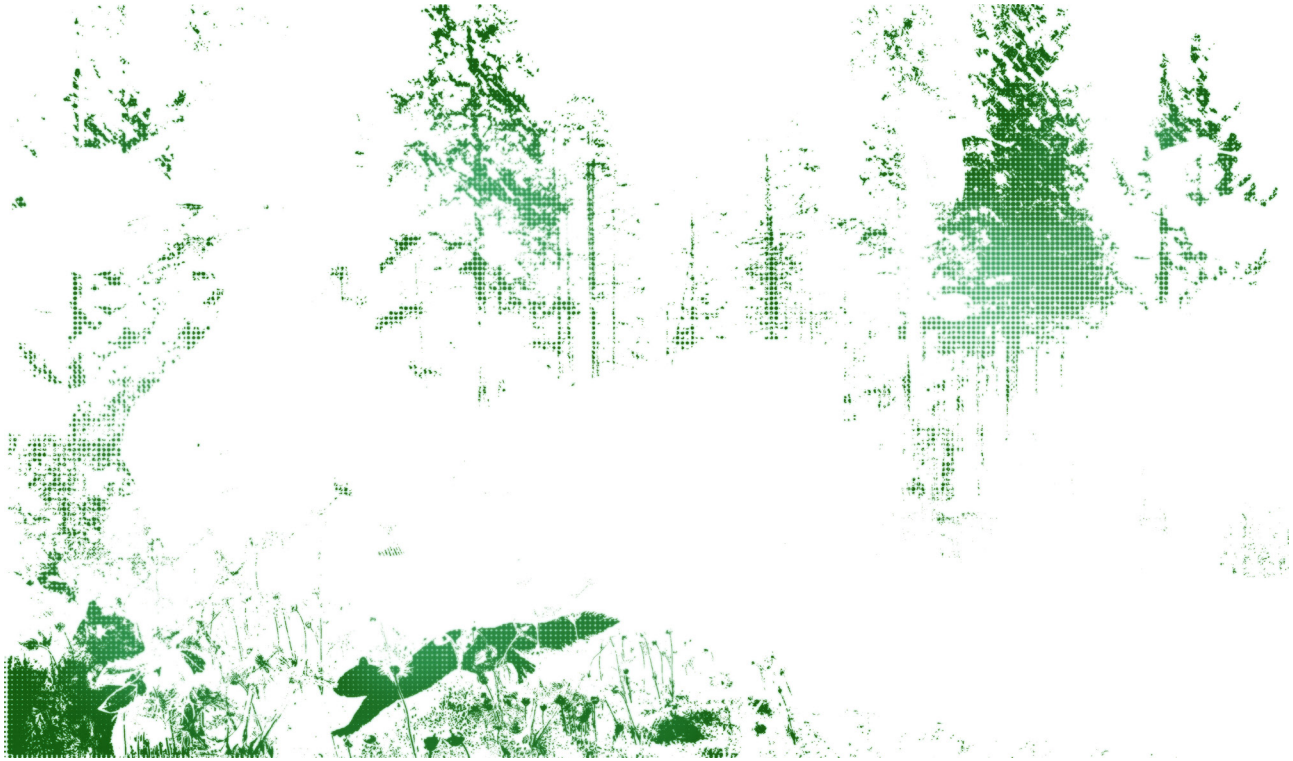

Fig. 3. Wild & US competition entry for St. Patrick Island in Calgary: patterns and colors shape the space instead of singular objects. The drawing carries the project's approach by prioritizing wildlife over human activities.

perspective images to be easily produced at any design stage. We use Lumion and then further alter the images created with the software (fig. 5). Recently, we have collaborated with a visualization company that integrates the design team early in the process, testing ideas and rendering alternatives.

During the COVID-19 pandemic, our studio relied primarily on digital tools for communication and design. Conference room meetings were replaced by *Microsoft Teams*, pin-up boards by Miro's 'online whiteboard', and live design reviews happened on-screen, becoming ephemeral. This shift highlighted a significant transformation in our design process: the reduction in traditional sketching on trace paper in favor of a more digitally integrated approach. With the transition to digital platforms, the process of generating and refining drawings became far more collaborative and dynamic.

Previously, much of our design work involved sketching by hand on trace paper, a method that allowed for individual exploration but often limited real-time feedback and collective input. The introduction of digital tools, however, enabled all hands to engage simultaneously in generating and modifying designs. This collaborative environment allowed team members to contribute ideas, make instant adjustments, and visualize changes in real-time, regardless of their physical location.

Digital platforms facilitated a more interactive and iterative design process. For instance, Miro's 'online whiteboard' provided a virtual space where team members could brainstorm, sketch, and annotate collectively, mimicking the collaborative nature of physical pin-up boards but with enhanced flexibility and equitable access for all to interact in our very horizontal studio structure. Similarly, real-time screen sharing during design reviews allowed for immediate feedback and revisions, creating a more fluid exchange of ideas. This digital approach not only streamlined the design workflow but also fostered a sense of collective ownership and engagement in the creative process.

Fig. 4. Madrid Nuevo Norte Landscape Masterplan, Madrid: the line drawing outlines the space's structure, while splashes of colors highlight the vegetation emphasizing the interface between landscape and architecture.





Fig. 5. Allegheny River Trail Park, Pittsburgh: after generating an initial image with Lumion, textures, plants, and contour lines are added to enhance the sense of space.

While preparing Balmori Associates' records for Yale University's Sterling Memorial Library, we prioritized archiving process images, not just final deliverables. Over 30 years of idea production since Diana Balmori founded the firm, the balance between analog and digital shifted from a majority of paper and physical models in the early years to mostly digital. Capturing and recording ideas and processes, not just final deliverables, is challenging, especially when they reside in software-specific file versions. In this context, redlining or sketches over printed material have been crucial for offering a more universally accessible outlook on the design process.

Artificial Intelligence in landscape representation

Artificial Intelligence (AI) has begun to play a significant role in landscape representation, encompassing the analysis, interpretation, and generation of visual representations of landscapes. Applications of AI span the fields of design, environmental monitoring, agriculture, virtual reality, gaming, and artistic endeavors. AI techniques include image recognition, where algorithms identify and classify different landscape elements such as trees, buildings, water bodies, and terrain types; generative models like GANs (Generative Adversarial Networks) which create realistic images of landscapes from scratch or based on input data; and remote sensing, where AI analyzes satellite and aerial imagery for landscape monitoring and assessment. Additionally, AI is used in simulation and modeling to predict changes in landscapes over time.
While AI offers significant benefits in landscape representation, such as improved efficiency through automated analysis of large datasets and increased accuracy with advanced algorithms, there remains a notable gap in its ability to foster innovation and generate new, imaginative landscape designs.

Representing time in landscapes

Landscapes are inherently dynamic, changing with the seasons, years, and even the daily play of shadows, tides, and clouds. Diana Balmori articulated this in her Landscape Manifesto [Balmori 2010] noting that "this lack of fixity is landscape asset". Yet, with the exception of

before/after images or phased projects, where drawings represent the landscape at various stages –year 0, year 3, year 5, year 10 etc.– most landscape renderings capture a single moment in time. Landscape renderings typically depict one hour of the day, one season, and a specific point in the growth cycle. Many of our drawing experiments have revolved around the representation of time in landscapes (fig. 6).
In the summer of 2021, Balmori Associates opened a garden installation at the Metis Garden Festival titled *Choose Your Own Adventure*. This project rethought our connection to nature following the COVID-19 pandemic lockdown, emphasizing natural phenomena such as gusty winds, wet bark, musky shade, dry air, sweet smells, hot stone, and crunchy gravel. The project evoked the ever-changing quality of the landscape and aimed to create a space that could only be experienced and not adequately represented or photographed. The garden challenged still-frame images reminiscent of the eighteenth-century picturesque. Malcolm Andrews described tourists seeking ideal landscapes as "'fixing' them as pictorial trophies to sell or hang in frames on their drawing room walls" [Andrews 1989, p. 67] –analogous to twenty-first-century Instagram. Yet, a landscape never occurs the same way twice, and its lack of fixity and hyper-sensorial experiences are emphasized through the garden's simple matrix. The representation of the garden in the competition submission remained deliberately diagrammatic: East/West planting bands intersected North/South hard material bands. The garden invited visitors to choose their own adventure through smell, touch, sound, taste, and sight.
Representing a constantly changing landscape is challenging. We have tested animation but often find ourselves limited by the specific techniques required to produce an animation that conveys our ideas. We have created sections and diagrams to address phased landscapes and plant growth over time and represented the same view across different seasons or divided into four seasonal views.

Peripheral vision and landscape

In Drawing and Reinventing Landscape [Balmori 2014] Diana Balmori stated that "landscape architecture is an art of peripheral vision. Peripheral vision is essential for understanding and appreciating landscape; central vision alone cannot capture it." To explore this concept, vision scientist Denis Pelli and Balmori Associates staff conducted an experiment to measure how restricting the observer's field of view affects their experience of a landscape's beauty. Viewing devices used included a tube and a truncated cone (with both ends cut off). The results indicated that restricting peripheral vision reduced viewing pleasure.
In 2011, under the leadership of Noemie Lafaurie Debany, Balmori Associates implemented the viewing cone concept as a series of planes with a circular opening, gradually rising from the ground at the Metis Garden Festival. As one progresses through the frames toward the St. Lawrence River, focusing on the floating islands, the field of view opens, the horizon widens, and infinite space offers itself to the viewer. This project exemplified Debany's innovative approach and vision in landscape design.
After testing peripheral vision's role by experiencing an existing landscape and designing an installation to demonstrate its importance, we pursued representing landscapes with peripheral vision. Initial tests applying a homogeneous filter to the image periphery failed. However, deforming objects within the image proved more successful.
The frame is crucial in the perceptual experience of landscapes, and the viewport in 3D modeling software plays a similar role in representation. By creating an outline, the frame defines a field and creates a view [Mitchell 2007].

Conclusion

The approach to landscape representation at Balmori Associates is fundamentally intertwined with the landscape design and the crafting of spaces, forming an integrated and holistic practice. This interrelation is not merely a methodological choice but a crucial aspect of the firm's philosophy. By intertwining representation and design, Balmori Associates ensures that the conceptual and aesthetic intentions are consistently articulated from the initial idea through to the final execution.
The BAL/LAB initiatives illustrate this integration, where experimental and interdisciplinary research directly informs practical design solutions. The innovative representation techniques developed within BAL/LAB –such as dot matrix patterns inspired by halftone processes, or patterns reminiscent of Pierre Bonnard's paintings– are not mere artistic exercises. Instead, they are carefully crafted methods aimed



Fig. 6. Madrid Nuevo Norte Landscape Masterplan, Madrid: this section depicts winter and summer, with deciduous trees casting shade on façades in summer. It reveals root systems, often overlooked but crucial to landscape.

at enhancing spatial understanding and awareness. These techniques strive to depict the fluid interfaces and interactions within a landscape, thereby guiding both the design process and the perception of the completed space.
Moreover, the firm's emphasis on representing the temporal dynamics of landscapes reflects a deep understanding of the inherent qualities of natural environments. By depicting landscapes at various stages of growth and through different seasons, Balmori Associates acknowledges and embraces the transient nature of their designs. This temporal representation aligns with the firm's broader ecological and sustainable design principles, emphasizing the importance of time in the maturation and evolution of landscapes. Such representation ensures that both designers and stakeholders remain cognizant of the long-term ecological processes and aesthetic transformations, thus fostering a more profound appreciation of the landscape's lifecycle.
Furthermore, the firm's exploration of peripheral vision and its impact on landscape experience underscores the importance of perceptual completeness in design. By empirically investigating how peripheral vision contributes to the appreciation of landscapes, Balmori Associates bridges the gap between sensory perception and design representation. This research informs both the creation of immersive, experiential spaces and the development of representation techniques that more accurately convey the intended spatial experience. Such endeavors ensure that the crafted spaces resonate with viewers, eliciting the intended emotional and aesthetic responses.

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Representation and Design in Historic Gardens

Darío Álvarez

A comprehensive landscape architectural project

In 1599, the Flemish painter Giusto Utens (?-1609) was commissioned by Duke Ferdinando I de' Medici to create seventeen large-scale lunette paintings to decorate the banquet hall of the Villa di Artimino. These lunettes depicted the most representative villas constructed by the powerful Florentine family over a century and a half, forming one of the most distinctive landscape programs in history. The villas, with their houses, gardens, and landscapes, were located in various areas around Florence, symbolizing territorial occupation and the Medici family's power, particularly during the eras of Cosimo the Elder, Lorenzo the Magnificent, and Cosimo I, Grand Duke of Tuscany.
The seventeen lunettes, fourteen of which are preserved, were painted by Utens between 1599 and 1602. They serve as a graphic record of these landscapes, representing a comprehensive project commissioned by one of the most culturally significant Italian families in 15th and 16th-century. Although the original designs of the villas have not survived, the collection of lunettes acts as a unified compendium of the project, brought together through the artistic vision of a single painter.
The villas are depicted from a bird's-eye view, employing a technique that establishes a sense of uniformity across the diverse examples and provides a perspective particularly suited for conveying not only the layout of the gardens but also their relationship to the surrounding landscape. These lunettes can be considered a pinnacle of excellence in the representation of garden spaces. Furthermore, Utens's

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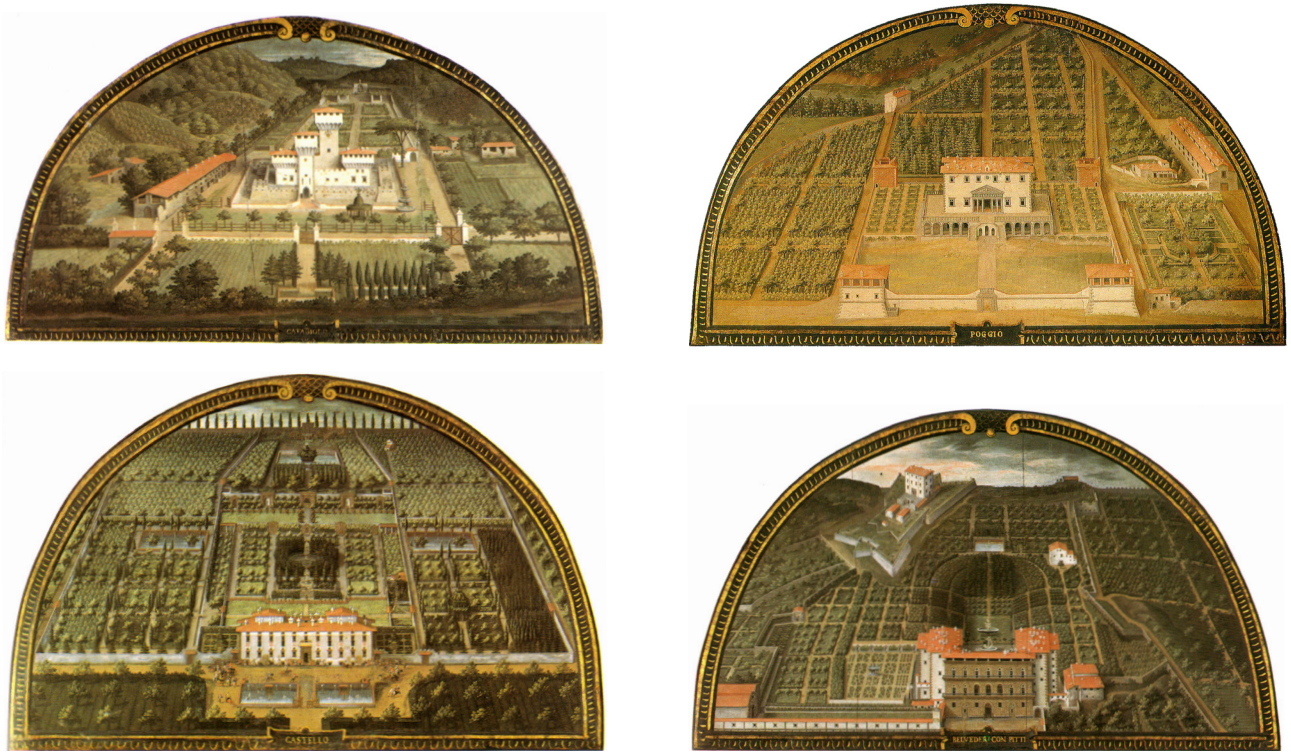


Fig. 1. G. Utens, Villa di Artimino, lunettes, 1599-1602. Top left: Cafaggiolo; top right: Poggio a Caiano; bottom left: Castello; bottom right: Boboli

meticulous attention to detail transforms these works into unique documents for the study and understanding of these historic gardens. Lets briefly analyze some of them.
Cafaggiolo (1451) (fig. 1, top left) is one of the earliest examples of transforming medieval defensive structures into villas with recreational gardens, based on a design by the architect Michelozzo. In Utens's lunette, one can precisely observe how Renaissance garden elements were gradually added to the medieval structure: axes, grids, pavilions, topiary, and avenues extending to the river and opening into the landscape. This represents an early attempt to create an orderly and rigorous project, akin to a primitive landscape manifesto.
Poggio a Caiano (1485) (fig. 1, top right) epitomizes the triumph of geometric precision and architectural rigor. Giuliano da Sangallo's layout extends from the house to the cryptoporticus and the grid-patterned gardens, and beyond to the surrounding agricultural landscape, all subjected to the same ordered structure and the entirety seamlessly integrated. Poggio embodies the classical order into landscape design.
Castello (1538) (fig. 1, bottom left) is a Mannerist apotheosis, featuring a meticulous representation of the narrative elements Niccolò Tribolo crafted to serve Cosimo I, Grand Duke of Tuscany's grand metaphor: Venus, the spring; Florence, the allusion to the circular labyrinth of the Isle of Cythera in the *Hypnerotomachia Poliphili* (1499); the rivers Arno and Mugnone; the Grotto of the Animals, and finally, at the highest point, the Apennines from which the entire epic narrative springs. By the time the lunette was painted,

the gardens had already undergone significant transformations. However, Utens takes a fascinating approach to recovering memory, as he appears to depict the initial project or an idealized version that was never fully realized. In this way, the painting gains a clearly projective sense, offering extraordinary information that is highly effective for understanding the intricate world of the Castello garden.
Boboli (1549) (fig. 1, bottom right) was commissioned by the Spanish Èleonora of Toledo, wife of Cosimo I, and designed by Niccolò Tribolo as an extension of Brunelleschi's Pitti Palace. Once again, the lunette provides valuable information, as the garden underwent significant modifications over time. The central area is depicted as an ordered valley with meadows and small groves bordered by pathways along the slopes, culminating axially in a pavilion with a pond at the highest point. For many, this space is seen as one of the reinterpretations of a similar feature –a hippodrome-shaped garden– described by Pliny the Younger in his Villa of Tusculum, as recounted in his letters. This serves as yet another reference to the influence of the ancient Roman world on Italian landscape culture in the 16th century.
Pratolino (1569-1581) (fig. 2) is arguably one of the most extraordinary gardens ever constructed. When Utens painted it, the garden was relatively new, so we can assume there is little imagination and a significant degree of reality in the painting. Utens faced a dilemma: Pratolino was a very elongated and sloping property, with the house positioned in the middle and two large gardens, one at the back and one at the front. However, in the lunette, the house appears at the top of the garden: Utens only paints the front portion and omits the back.
There is a logical explanation: if he had he painted the entire garden, it would not fill the width of the lunette. There is also a more conceptual, though riskier, explanation: the front garden was more innovative, with its winding pathways, which were much more interesting than the layout of the back garden. I tend to agree with the latter.
In the front garden, there are ponds, a sequence of cascades resembling artificial dams, grottos with automatons, fountains with automatons, and mythological scenes that also seem to include automatons, a world of wonders that Utens describes in great detail. This depiction becomes an excellent source of information, especially since the garden has almost completely disappeared.
Over time, the villa welcomed notable visitors, such as Michel de Montaigne, who praised its natural and

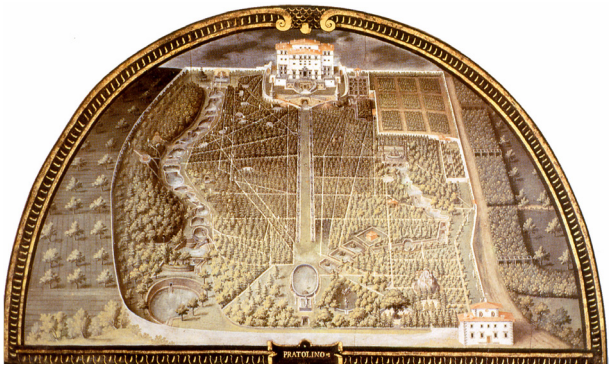


Fig. 2. G. Utens, Villa di Artimino, lunette, 1599-1602. Pratolino.

mechanical marvels. In the 18th century, what remained of the garden was visited by travelers such as the English architect William Kent. Undoubtedly, Kent found inspiration in this ruined garden to create other gardens in the English countryside, filled with references to the classical world for the enjoy of their owners. Eventually, the garden became the property of the Duke of Davidoff, who transformed it into a landscape garden, leaving few traces of its Mannerist past. Today, only a few elements from the lunette are still recognizable.

Plan and perspectival space

In his book *The Concept of Architectural Space* [Argan 1982], historian Giulio Carlo Argan describes an important shift in the 17th century in the conception of space in architecture, from an idea of 'representation' during the Renaissance to a very different one of 'determination' in the Baroque period. This shift enabled the transition from an 'architecture of composition' to an 'architecture of formal determination'. From our perspective, one of the milestones in this transition did not occur in the construction of buildings but rather in garden design, spearheaded by the Frenchman André Le Nôtre (1613-1700), who can be considered one of the greatest landscape architects of all time. We use the term 'landscape architect' rather than the more common 'gardener' because his art and technique went far beyond the simple act of gardening; he was a masterful creator of landscapes.

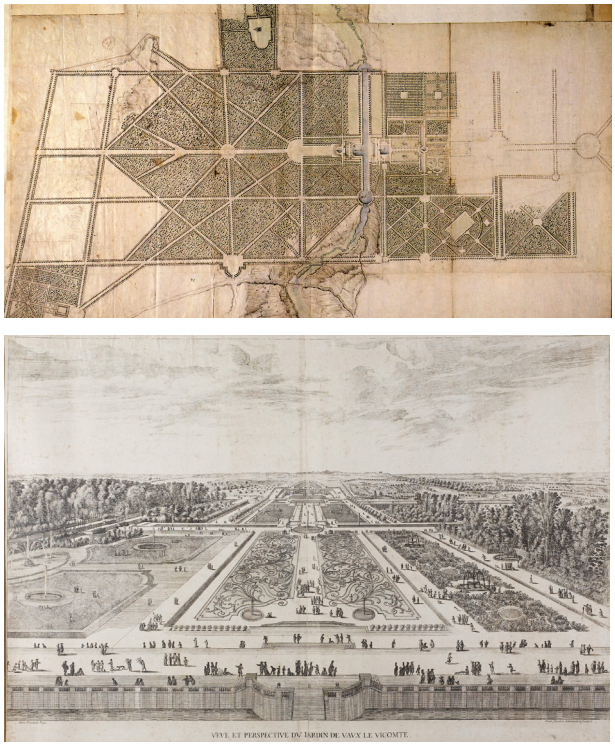


Fig. 3. Vaux-le-Vicomte. Above: A. Le Nôtre (attributed): plan; bottom: I. Silvestre, view.

In 1625, in a text titled *Of Gardens*, the English poet and politician Francis Bacon referred to the garden as a more refined and perfect art than architecture itself. Le Nôtre's gardens illustrate this reflection beautifully, particularly at Vaux-le-Vicomte (fig. 3) and Versailles. The former is remarkable for the intelligence of its design, and the latter for its mastery of large-scale planning, controlling a perspective that stretches nearly four kilometers. Le Nôtre's gardens are laboratories of spatial experimentation, exemplifying what Argan called the space of formal determination. Le Nôtre designed spaces purely for the eyes of the viewer, relying on the garden's plan while distorting it to extraordinary degrees to achieve unparalleled optical effects. This resulted in a rare perfection in the organization of all elements to construct perspectives that, as at Versailles, seem to strive toward capturing infinity, in line with Leonardo Benevolo's accurate definition [Benevolo 1994].

In the plan of Vaux-le-Vicomte, Le Nôtre developed a series of mechanisms designed solely to serve the viewer's vision. It could be said that this is a scientific garden, aligned with the philosophical and mathematical thinking of René Descartes [1], a constructed thought process, a discourse turned into a method in the form of a garden. Every element of the plan is intentionally deformed, elongated, or even hidden to create a sense of surprise for the viewer, who walks through a garden that is not what it appears to be. This is achieved with extraordinary precision in measurements, distances, and perspectival correspondences.

The garden thus becomes a giant anamorphosis, a type of representation intentionally distorted so that, from a specific vantage point, it appears perfect to the viewer's eye. Famous examples of this technique exist in painting, such as *The Ambassadors* (1533) by Hans Holbein the Younger, where a skull is cleverly disguised using this method. In the works of some contemporary artists like Felice Varini and George Rousse, anamorphosis becomes entirely experimental. At Vaux-le-Vicomte, the anamorphosis is embedded in the garden plan, which does not aim for complete compositional beauty but instead serves as a systematic foundation for spatial construction. This aesthetic departure from the plan reveals, beyond its Baroque inspiration, a hint of modernity. Ultimately, Vaux-le-Vicomte is much more than a mere garden.

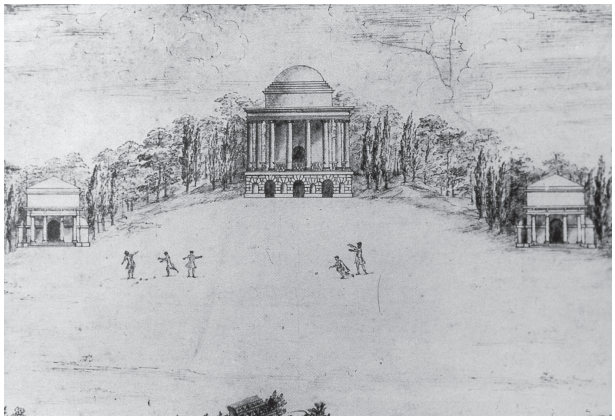


Fig. 4. W. Kent, garden scene.





Fig. 5. W. Kent, Rousham, 1738. Garden plan and drawing of the Valley of Venus.

Drawing as a tool for landscape design

During the 18th century in England, a true revolution occurred in the way landscapes and gardens were represented and designed. First, the geometric model imposed by French gardens across European courts faded away. Then, there was a turn to the past, creating a classical narrative as a starting point. Finally, this narrative became enriched with small architectural features scattered throughout the garden spaces, establishing a new spatial sense both in representation and design.
William Kent (ca. 1685-1748) –an architect, painter, decorator, and scenographer– embodied this transformation like few others. Deeply influenced by his friend, the poet Alexander Pope, who laid the conceptual and formal foundations of a new idea of landscape, Kent spent several years in Italy, studying architecture and gardens. He brought the vision of the classical world into the English landscape, effectively creating a new mythology in gardens such as Chiswick (for his friend and patron Lord Burlington), Stowe, and Rousham (fig. 4).
An excellent draftsman, Kent used graphic tools as a means of representing his ideas about garden spaces. His designs consistently followed a pattern: isolated scenes in which an open meadow occupies the foreground, populated by



Fig. 6. L. Brown, Wimpole, 1767. Garden plan with the arrangement of the trees.

people strolling or engaging in games or other activities. In the background, small-scale classical architecture, often directly referencing Italian culture, is framed by a final edge of trees –clumps or belts– that close the composition and focus the viewer's gaze. In this way, Kent created distinctly scenographic spaces in every corner of his gardens.
In the garden at Rousham, Kent worked on an earlier design by Charles Bridgeman, overlaying it with a sequence of scenes that revolve around the small Cherwell River, which acts as the garden's natural boundary. The layout clearly reveals this organization, with each scene separated by curtains of trees depicted in elevation, as if in an oblique perspective rather than a traditional plan. One of the garden's most iconic features, and one of Kent's most remarkable drawings, is the Valley of Venus. This representation captures Kent's genius: hybrid elements of grotto, waterfall, and bridge are arranged axially; carefully placed trees create depth; statues of two satyrs symmetrically spy on a bathing Venus; and figures casually wander through the scene, seemingly oblivious to its intensity (fig. 5).
After Kent's death, Lancelot Brown (1716-1783), a gardener trained under Kent at Stowe, took up the mantle. Brown developed a purely landscape-focused model, stripped of architecture and built with water, gently undulating terrain, and trees. These elements became the building blocks of a distinctly modern language. Brown was less concerned with individual scenes and more focused on overall spatial planning. For this reason, his designs primarily used plans, with trees depicted at their true scale, like in oblique or axonometric perspective, in a manner reminiscent of Kent's techniques (fig. 6).
Humphry Repton (1752-1818), a great admirer of Brown's work, adhered to his principles regarding the potential of sites and their improvement. However, Repton took representation as a design tool one step further, moving away from plans and returning to spatial representation, much like Kent. In this regard, Repton developed a completely innovative design methodology that can be seen as the origin of modern project mechanisms. In each project, Repton compiled his work into notebooks, which he later bound in red and called *Red Books*. These books included all his proposals for site improvements using a highly effective technique. A skilled watercolorist, Repton drew different views of the existing landscape and, by overlaying cut-out flaps within the book, showed the 'before' and 'after' of a scene. This allowed clients to see the transformation that



Fig. 7. H. Repton. Red Book, before and after of a scene from Wembley Garden.

would occur in their gardens simply by lifting the paper flap. The technique offered both a surprise for the client and satisfaction for the designer. In this way, Repton invented a method that, in some sense, has endured to this day in various formats and mediums (fig. 7).

Representation and design in the 19th century urban park

In 18th century in England there were some early examples of urban garden creation, such as the interventions in Bath by John Wood I and II (1704-1754; 1728-1782), which introduced gardens into a sequence of three urban spaces: Queen Square, King's Circus, and the Royal Crescent. However, it was architect John Nash (1752-1835) who, in 1811, began defining a model for urban parks through a real estate project of high architectural quality promoted by the Prince Regent (later George IV): Regent's Park.
Nash had collaborated on several projects with Humphry Repton a few years earlier and learned garden design techniques from him, even adopting Repton's method of illustrating 'before and after' sequences in some of his projects. In the various iterations of the Regent's Park project over the years, one can observe the evolution and influence of Repton, although Nash consistently relied on the plan as the primary representational system.
In the first 1811 version, the garden –with its meadow, trees, and water features– was barely present on the plan, overwhelmed by numerous housing blocks. However, in the second and better-known version of the same year,

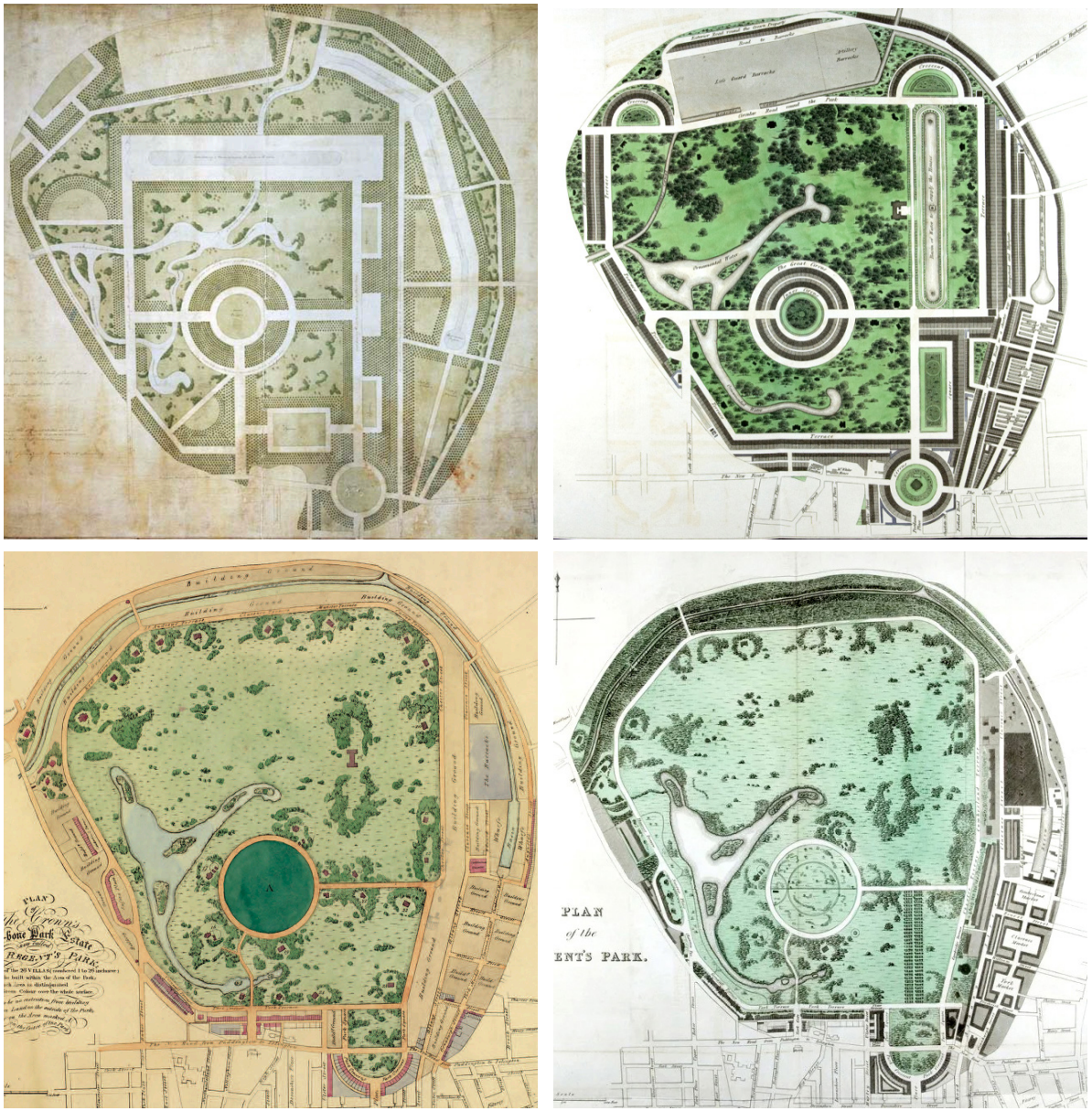


Fig. 8. J. Nash, Regent's Park. 1st Project, 1811; 2nd Project, 1811; Project 1825; Project 1826.

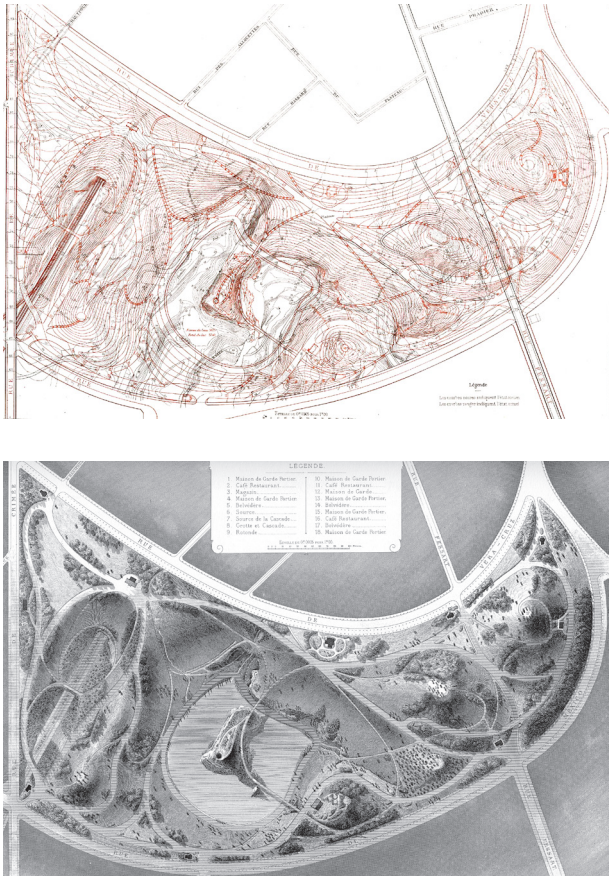
the garden gained prominence through the addition of a serpentine lake in the typical style of Capability Brown and a careful arrangement of vegetation. This phase of the project was highly innovative, achieving an elegant coexistence of housing and parkland that anticipated, by more than a century, the proposals of Le Corbusier. Ultimately, the speculative real estate venture did not fully succeed, leaving behind the final form of the park as we know it today, retaining traces of the original design (fig. 8).

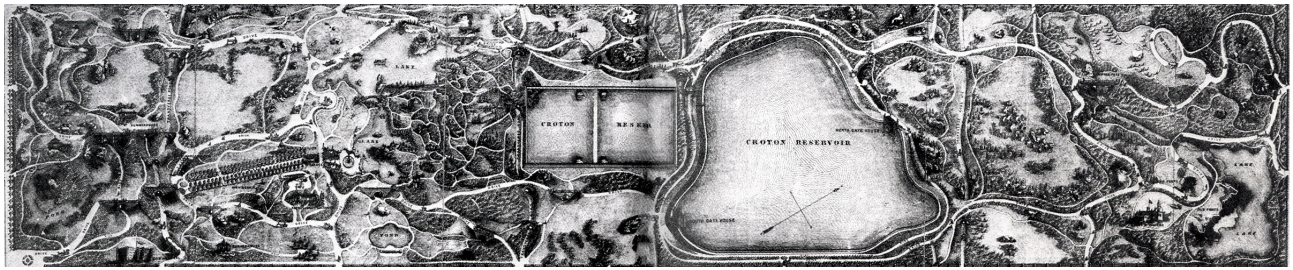
Much admiration is given to the transformations carried out in Paris by Baron Haussmann (Georges Eugène, 1809-1891) in the second half of the 19th century, with his large-scale urban redesign. However, it is often overlooked that, most probably, one of the most significant contributions came from the *Service de Promenades et Embellissements*, directed by engineer Adolphe Alphand (1817-1891). With the assistance of architects, engineers, and landscape designers, Alphand completely renewed the great Bois de Boulogne and Bois de Vincennes, created dozens of landscaped squares modeled after their London counterparts, and designed three new urban parks: Parc Monceau, Parc Montsouris, and Parc des Buttes-Chaumont. The latter is a marvel of garden history and an outstanding example of using drawing as a tool for landscape design, as illustrated in Alphand's own book, *Promenades de Paris* [Alphand 1984].

The drawings and engravings in Alphand's book highlight the importance of graphic representation in realizing the project. The site had previously been one of the city's abandoned spaces, originally a Roman-era gypsum quarry, later used for executions (where bodies were left hanging in the open), and eventually a landfill and tanning area, a true urban wasteland. The creation of the park marked a dramatic transformation and is one of the earliest examples –if not the first– of urban regeneration, a concept so common today.

In one of Alphand's plans, the park's pre- and post-intervention topography is represented with contour lines in gray (before) and brown (after). The drawing demonstrates the designers' skill in leveraging the terrain's natural features to craft a new, romantic topography within a project that remained highly functional from every perspective. Another drawing presents the park's layout with its full relief and orography. While a color version exists, the black-and-white engraving is exceptionally expressive and is considered one of the most beautiful drawings in garden history. At the park's center there is a lake with an island –a

Fig. 9. A. Alphand, Parc des Buttes-Chaumont, Paris. Contour and representation plans.





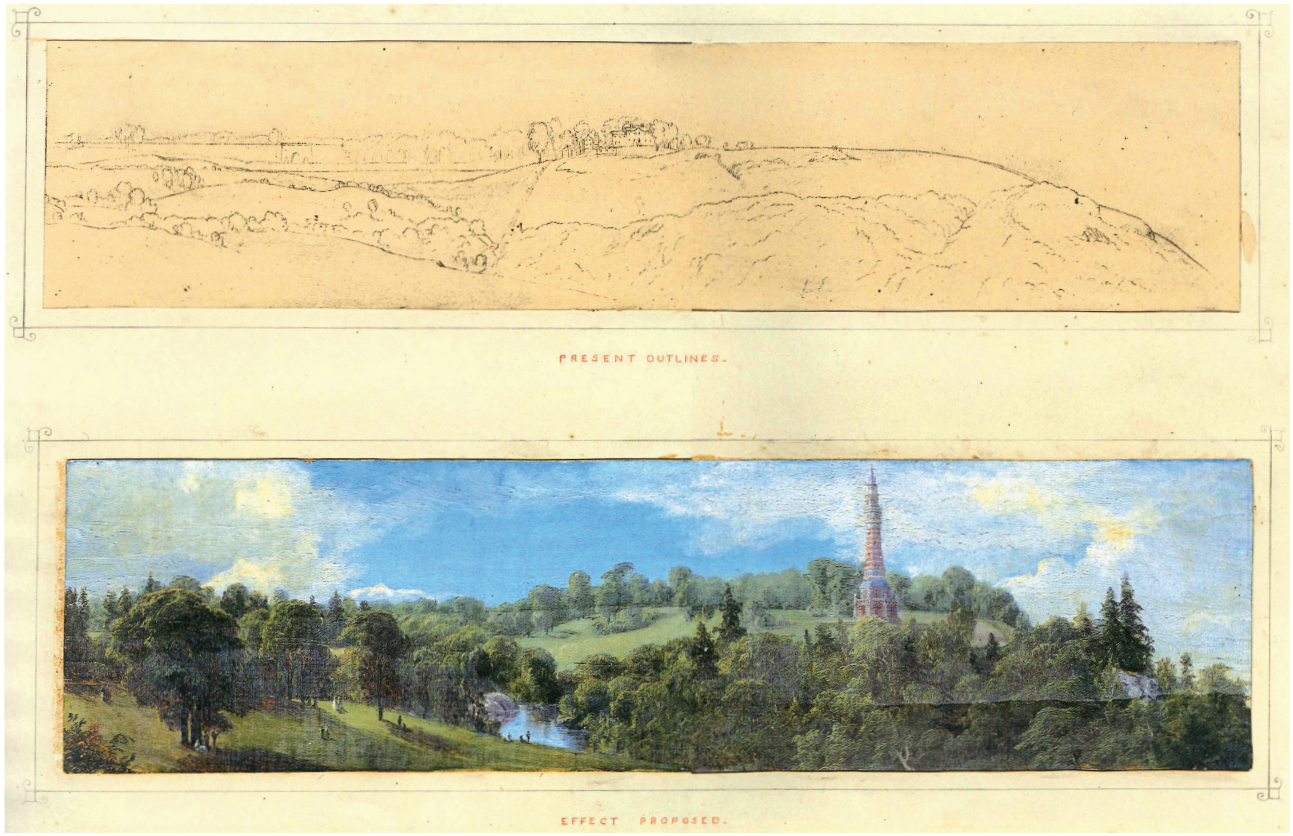


Fig. 10. F.L. Olmsted, C. Vaux. Competition plan of Central Park, New York.

Fig. 11. F.L. Olmsted and C. Vaux. Study No. 9 of the Greensward project for the Central Park competition. Bogardus Hill and Monumental Tower, showing "present outlines" and "effect proposed".



Fig. 12. F.L. Olmsted and C. Vaux. Study No. 5 of the Greensward project for the Central Park competition. "Across the lake from Vista Rock", showing "present outlines" and "effect proposed".

mound built on the quarry remnants– topped by a circular classical temple and connected to the lake's edges by two bridges: one a grand brick arch and the other a suspension bridge with a distinctly industrial aesthetic, both as elements of the park. The grotto and waterfall were built using part of the old quarry. Gracefully curving pathways blend harmoniously with the terrain's contours, masterfully modeled by the designers. The vegetation depicted in the plan was entirely planted on the modified terrain, adding shape and volume to the park's design with remarkable precision. On the left side of the plan, the integration of the pre-existing railway line with the new park layout is evident: a delicate and clearly modern exercise. The inclusion of technology and new advances within the urban park is seamlessly represented in the plan (fig. 9).

In New York, the Commissioners' Plan of 1811 established the framework for creating a central city park. However, as the century progressed, developers resisted losing so much valuable land, delaying the park's placement to inner Manhattan until it was finally approved in 1853, between 5th and 8th Avenues and 59th and 106th Streets, at a time when the city's development extended only to 40th Street. The first concept for the park was designed by engineer Egbert Ludovicus Viele (1825-1902), who created a well-known survey of the site. The commission was later assigned to Frederick Law Olmsted (1822-1903), who had a similar background as agricultural engineer, but had traveled through Europe and had been inspired by the new English parks within cities, particularly Birkenhead Park in Liverpool, created a few years earlier by Joseph Paxton. After administrative delays, a competition was held in 1857, which was won by the team of Olmsted and English architect Calvert Vaux (1824-1895) with their project *Greensward*. Their design depicted a truly Arcadian landscape in the heart of Manhattan. In their presentation, the team used a general plan but also included views showing the 'before and 'after' of the intervention, similar to Repton's method, which they continued to use throughout the project's development (fig. 10).

The plan meticulously represents all park features, interconnected by an ingenious four-level circulation system (transverse roads, carriage circuits, bridle paths, and pedestrian paths) and articulated by over 40 bridges designed by Vaux. The plan showcases Olmsted and Vaux's mastery of the park's overall organization.

The construction of Central Park was a colossal undertaking, demonstrating New York society's capacity to mobilize resources for such a monumental endeavor. Massive



Fig. 13. F.L. Olmsted and C. Vaux. Study No. 4 of the Greensward project for the Central Park competition. "Northeast view towards Vista Rock", showing "present outlines" and "effect proposed".

earthworks, extensive underground infrastructure, and the transplantation of tens of thousands of large trees transformed a continuous granite-strewn terrain into a nearly naturalistic landscape of lakes, hills, and pavilions. This carefully crafted environment, which Rem Koolhaas described as a "synthetic Arcadia," embodies the best ideals of the park (fig. 11).

The dramatic transformation is vividly illustrated in graphic representations showing the 'present outlines' and 'effect proposed', employing Repton's approach in the competition documentation and project development. The authors also used drawing and early photography to depict the site's barren state, with rocks visible in the original landscape that were later seamlessly integrated into new scenes represented in detailed watercolors. These illustrations capture the extraordinary transformation of the landscape, turning it into an almost unrecognizable masterpiece within a few years.

Today, when we observe Central Park from the tall buildings surrounding it, it appears to be a fragment of primeval nature preserved within the city. This illusion was precisely the authors' intent, but it is only when we examine the extensive graphic documentation of the project that we fully comprehend the scale of the transformation undertaken by Olmsted and Vaux, a monumental effort with an unparalleled result (figs. 12,13).

Notes

[1] We can relate the mechanisms of the garden to the *Discourse on the Dioptrics*, one of the chapters of the *Discourse on the Method*, published in 1637.

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The Pleasure of Architecture

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https://doi.org/10.26375/disegno.15.2024.5

diségno ISSN 2533-2899
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The Pleasure of Architecture and the Tenderness of the Landscape

Elena Ippoliti

After a first failed attempt in 1976, in May 1982, within the *Grands Projets* program promoted by François Mitterrand, a competition was announced for the Parc de la Villette on an area of 50 ha in a working-class neighborhood in the north-east of Paris that had hosted the slaughterhouses.
The competition notice was drawn up by François Barré, who since 1981 had been in charge, for the *Etablissement Public du Parc de La Villette*, of following the redevelopment process of the area and who would manage its activities for years, including the initiation and supervision of the design competition. The request is very specific: not a garden, nor a natural enclave, but "an urban park of the 21st century", in which a dense list of services and facilities would have to be able to interpret the dynamics and flows of urban sociality and express the ways of pluralist and popular cultural production of the metropolitan condition.
It is a season of great hopes placed in the ability of the project to have a concrete impact on the processes of urban transformation and, in fact, the projects presented in the first phase are 472. Only 9 groups of designers pass to the second phase [1] among which, in addition to the winner Bernard Tschumi, there is also Rem Koolhaas with OMA - Office for Metropolitan Architecture [2] whose project, although not winning, is destined to remain impressed for its scope of theoretical *manifesto* marking a turning point in landscape design that thus bursts into the debate on the contemporary city.
The competition was in fact the first opportunity for OMA to concretely experiment with the reflections on the contemporary city that it has been working on for years, condensed in *Delirious New York. A retroactive manifesto of the city of Manhattan*, published by Koolhaas just 4 years earlier [Koolhaas 1978] [3]. OMA will thus challenge the open space of the Villette by addressing the issue of the landscape with the same strategy with which it had addressed the metropolitan condition, equal in nature but different in degree [4].
The project –or rather program [5]– presented in the first phase interprets the park as an expression of the social dimension and metropolitan lifestyle, declining it with a proposed method that aims to put the culture of congestion into practice by means of the utopian device of the skyscraper [OMA, Koolhaas, Mau 1995, p. 937] [6].
From the model of the skyscraper, deprived of the third dimension, comes the "tactic of horizontal stratification" with which the area is divided into parallel bands that run from east to west. In each of these is allocated one of the approximately fifty activities envisaged by the program which,

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although autonomous, are characterized by permeability and the reciprocal interference relationships that they trigger. The distribution of the smaller elements, which in turn will interfere with the character of the bands in which they are allocated, is instead regulated by grids with variable intervals defined mathematically on the basis of the desired frequency. Finally, there is the system of main paths with the straight line of the *Boulevard*, which crosses the bands perpendicularly, and the broken line of the *Promenade*, which winds sinuously throughout the area.
In the first phase of the competition, the OMA program is essentially aimed at explaining 'how the park/machine works'. Thus the 'tactic' of metropolitan stratification is demonstrated by means of a non-hierarchical and flexible framework capable of holding together architectural specificity and programmatic indeterminacy, of incorporating the mutations resulting from interferences between the elements without producing upheavals of the initial hypothesis of the program [OMA, Koolhaas, Mau 1995, p. 921].
A geography of points, lines and surfaces that prefigures the 'park/machine' through the only possible figuration, the diagram, an abstract machine capable of guiding and anticipating the process towards "a real that is yet to come, a new type of reality" [Deleuze, Guattari 1987, p. 142] [7], which although already a figure is, so to speak, a threshold figure, that has not yet become a representation. The diagrammatic figuration allows us to grasp and highlight the relationships –functional, logical, temporal– of a system, bringing the non-visible into the field of the perceptive-visual and where it is the contextual reference, that is the assignment of a position in space, that conveys the substance of the message and gives coherence to the entire system [Anceschi 1992, p. 103].
Once the strategy has been established and the functioning clarified, in the second phase of the competition OMA instead focuses on deepening the 'how it appears', that is, the perceptive qualities or the aesthetic experience of the landscape. The phase therefore marks the transformation of the 'machine/park' into a 'landscape/organism' and the definitive transition from metropolitan architecture to that of Arcadia [8]. For this purpose, three different categories of 'nature' are 'staged': regions in which the vegetal dominates (surfaces), screens of trees parallel to the bands (lines), geometries of vegetal elements designed as architectures (geometric shapes - the Linear forest and the Circular forest). Such a geography could not be represented through one of the 'oblique' drawings [9] that already characterized the production of the OMA studio, with artificial constructions suspended in a territory that, although drawn, is absent so as to invert the perception of the figure/background relationship.
From this necessity takes shape the serigraphy *The Pleasure of Architecture* [10] made in 1983 by Alex Wall [11]. An anti-architectural drawing par excellence, "a conscious opposition to the serious and often pretentious architectural drawings of that period that were mystifying architecture rather than communicating it", as told by Willem-Jan Neutelings to Matt Page [Neutelings, Page 2020], similar to what Willem-Jan Neutelings [12] experimented in 1982 in *Typological study of Scheveningen* who on that occasion defined a style a style of drawing inspired by that of cartoons more functional to the analytical method of OMA. As Wall himself explains [13], *The Pleasure of Architecture* also draws inspiration from the skyscrapers of Roger Brown [14], one of the leading exponents of the Chicago Imagists, where the sequential repetition of overlapping planes is the device for telling the narrative sequence of the intimate stories of its inhabitants who reconstitute themselves into a community thanks to the building-space of the skyscraper.
But there is more. Wall's frontal representation shows a new geography that, although still made of surfaces, lines, geometric shapes, this time suggests, through careful theatrical direction and accurate backstage work, different aesthetic perceptions of the landscape exalted in their diversity by the dissimilar characteristics of the *Promenade* and the *Boulevard*, 'the secretive vs. the blatant': the view occluded by the compact mass of the trees arranged between the bands, when observed in the north-south perspective, or, when observed from east-west, the open view of the fields proposed by the aggregation of the various gardens; the backdrop of the linear forest against which all the plant and architectural components present in the southern part of the park stand out or the interior of the circular forest with column-like trees and roof-like foliage from which the light filters.
And there is no contradiction in the landscape inhabited by the figures busy with agricultural work, which remember rural landscapes, and by the figures engaged in swimming, running or playing tennis, to signify the recreational activities of the twentieth century, because such contradiction is resolved by the intimate formal-expressive coherence of the figural units and of the composition. Formal coherence which, in turn, harnesses experiential time in the space of the 'board' by mending spatial discontinuities and temporal leaps.
A figurative strategy, the one adopted by Wall, which has its roots in the tradition of the representation of inhabited space, in the 'portrait of the city' where the gaze is that of a

traveler, the spatiality is the plot of possible routes, the temporal dimension is introduced by the movement through space and in which the different points of view coexist without needing to be hierarchically arranged. A representation in which the linearity of the text and the organization according to the temporal sequence of the 'before and after' are undermined. A representation designed to 'stage' the spectator who, transformed into an actor, can set out on his exploration without following a pre-established path.
A particular 'feeling' sublimated by the *Carte du pays de Tendre*, the imaginary map that Madelaine de Scudery had François Chauveau engrave in 1654 to show the emotional itinerary of Clélie, the protagonist of her novel, in the form of a landscape. A map brought up to date in 1959 by the revolutionary exploration of the space of the city professed by the Situationist International and by Guy Debord's psychogeography [15] and, later, by Giuliana Bruno in 2002 who, with her *Atlas of Emotion* [Bruno 2002], introduces us to 'emotional geography', or rather to that capacity of places –real or virtual– to be "tender images" [Mangani, Pasquinelli 2007], vehicles of emotions capable of activating a sentimental transport, and of soliciting the narrative dimension, that is, the movement in space and time, in a continuous reference between memory/emotion/journey. A 'tender feeling' proposed again by the reinterpretation of the landscape as a theatre, as an emotional support, witnessed by *The Pleasure of Architecture* which completes the multi-scalar path, between the urban-social dimension and the individual dimension, experimented by OMA in the landscape architecture laboratory set up on the occasion of the competition for the Parc de La Villette.

Notes

[1] The other groups invited to the second phase are: Andreu Arriola & Carmen Fiol, Elisabeth Galì and Marius Quintana; Bernard Lassus; Gilles Vexlard; Alexandre Chemetoff; Sven Ingvar Andersson; Bakker & Bleeker; Jacques Gourvenec and Jean-Pierre Raynaud.

[2] The Office for Metropolitan Architecture - OMA was founded in London in 1975 by Rem Koolhaas (Rotterdam, 1944), Elia Zenghelis (Athens, 1937), Zoe Zenghelis (Athens, 1938) and Madelon Vriesendorp (Bilthoven, 1945). In 1978 it expanded significantly and established its headquarters in Rotterdam. During the competition years, Stefano de Martino, Alex Wall, Kees Christiaanse, Willem-Jan Neutelings and Zaha Hadid worked steadily with OMA.

[3] 1978 was a year that marked a change in the way OMA operated: until then it had been more of a laboratory of ideas on the architecture of the city than a professional studio. In particular, on November 16, *Delirious New York. A retroactive manifesto for Manhattan* was published [Koolhaas 1978], while the following day (coinciding with Koolhaas's 34th birthday) OMA's first major exhibition titled *OMA: The Sparkling Metropolis* was inaugurated at the Guggenheim Museum in New York. More than 50 drawings were exhibited, made by the large group of architects and artists who populated OMA and describing their visionary reflections on the city.

[4] The awareness of the analogy between the strategies of the metropolis and the fact "that 'landscape,' was a tactic applicable to the grazing field, as much as to the supermarket" [Aesopos, Simeoforides 1994, p. 133] had just been experimented, in particular by Elia Zenghelis, in 1980-1981 in the design of a series of small villas on the island of Antiparos in the Cyclades [Zenghelis 1981]. As Zenghelis himself recounts, the project was an unexpected watershed with which the term '*confetti*' was introduced for the first time, later used more emphatically in the project for the Parc de la Villette [Khosravi 2024, p. 4].

[5] Already in the mid-1970s, for OMA 'making architecture' meant making a project that was "almost purely program and almost non-form" [Koolhaas 1985, p. 4].

[6] "The program for the Parc de la Villette was a very important step in this series [of projects], because it allowed us to delve into the theme of congestion, which for us is the key component of any architecture or metropolitan project. […] The idea of this park comes from the American skyscraper, which embodies the superposition of a series of activities in a single building. We took this model and developed it horizontally" [Koolhaas 2016, p. 10].

[7] "Defined diagrammatically in this way, an abstract machine is neither an infrastructure that is determining in the last instance nor a transcendental Idea that is determining in the supreme instance. Rather, it plays a piloting role. The diagrammatic or abstract machine does not function to represent, even something real, but rather constructs a real that is yet to come, a new type of reality" [Deleuze, Guattari 1987, p. 142].

[8] This transition was already so evident with the Antiparos project that, in July 1981, the magazine Architectural Design dedicated a long article to OMA in which it underlined how the series of paradoxes that characterized their work had shifted from Manhattanism to Mediterraneanism [Zenghelis 1981].

[9] The formal and theoretical influence of the constructivist Ivan Il'ič Leonidov on Koolhaas and OMA is explored by several authors, including Roberto Gargiani [Gargiani 2006] and Francesco Marullo [Marullo 2013]. However, Leonidov was more than a reference for Koolhaas. He was undoubtedly a 'model', so much so that "Koolhaas dedicated his first long architectural article to him, analyzing the Narkomtjažprom project, from 1934, on the pages of *Oppositions* in 1974. Only eight years later, he returned to it, paying evident homage to it in the plates of his contribution to the competition for the Parc de la Villette in Paris" [Cohen 2010, p. 14]. In this regard, see also [Koolhaas, Oorthuys 1974] and Ventura Blanch [Blanch 2022].

[10] The color screen printing of *The Pleasure of Architecture* (1983, dimensions 30 11/16" × 20 3/16") is part of the important collection of

drawings assembled by Alvin Boyarsky during his tenure as chairman of the Architectural Association in London from 1971 until his death in 1990. This collection shows the role of drawing for Boyarsky not only as a tool of representation, but as a form of architecture in its own right, as also demonstrated by the ambitious program of exhibitions and publications curated by Boyarsky, including the book *Drawing Ambience. Alvin Boyarsky and the Architectural Association*, curated in 2014 by Marjanovic and Howard [Marjanovic, Howard 2014] for the touring exhibition held from 21 September 2014 to 14 January 2018.

[11] Alex Wall, designer and teacher at Harvard University Graduate School of Design, graduated in architecture from the Architectural Association in London, worked at OMA in London and Rotterdam from 1982 to 1989, after which he was associate professor of architecture at Graduate School of Fine Arts, University of Pennsylvania. From 1998 to 2013 he was professor of International urban design at Karlsruher Institut für Technologie, Germany.

[12] Willem Jan Neutelings (1959), an architecture graduate from the Delft University of Technology (1986), worked from 1981 to 1986 at OMA. In 1987 he opened his own studio in Rotterdam, first in association with Frank Roodbeen, since 1992 with Michiel Riedijk. From 1988 to 2000 he was a lecturer at the Academy of Architecture in Rotterdam and at the Berlage Institute in Amsterdam.

[13] From a conversation between Richard Hall and Alex Wall on November 11 2021 [Hall 2024].

[14] Roger Brown (1941-1997) lived and worked in Chicago and California. He graduated from the School of the Art Institute of Chicago in 1970. His work has been the subject of numerous solo and major group exhibitions, and his work is held in numerous public collections worldwide. He began exhibiting in the late 1960s, with a group of artists often referred to as the *Chicago Imagists*, who celebrated their use of imagery, figuration, narrative, and pattern, and created deeply personal and visually diverse works.

[15] The map was in fact published in the movement's journal to explain the theories on situationism and the techniques of drift and détournement [Notes Editoriales 1959].

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REPRESENTATION INSIDE AND OUTSIDE THE LANDSCAPE

Landscape Drawing and Cultural Heritage

Notes on the Representation of the Heritage Landscape

Mercedes Linares Gómez del Pulgar

"The eye, which is called the window of the soul, is the principal means by which the central sense can most completely and abundantly appreciate the infinite works of nature".
[Leonardo da Vinci 1975, p.11]

In the last three decades, a wide panorama of publications, theories and definitions on the landscape and its representation has opened up before us. In this brief text I will only try to offer, with the help of a few outstanding authors, some notes on the cultural reasons for a historical need that crystallized in the 17th century with the awareness of the landscape and the beginning of modern science, and that, four centuries later, has led to a concern on a universal scale: a new awareness of the loss of quality of the landscapes of cultural heritage. The optimism of those 'infinite works of nature' that Leonardo da Vinci wrote down in his notebooks seems very far away.

The landscape and the camera

The English philosopher Owen Bartfield (1898-1997) has suggested that the Aeolian harp and the *camera obscura* are the best symbols of the relationship between human beings and external nature, of the mind conscious of its existence in the world. In *The Harp and the Camera* [1] he analyses its conceptual history and its relationship with the evolution of human consciousness, introducing interesting reflections on the image that are very pertinent to our theme.

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

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The *camera obscura* surely had a medieval origin, although it may have been known in the classical world: in a dark room, the light that enters through a small opening projects an inverted image of the outside world on the back wall of the room. In this way, the complexity of the three-dimensional world is instantly reduced to the simplicity of two dimensions. The German Jesuit Athanasius Kircher (1602-1680, musician, botanist, Egyptologist and inventor) is credited with reworking this physical principle of light inside a box in which a tiny opening is closed by a small glass, which we now call a lens, with a mirror at 45° that projects the image onto the upper opening of the box. This and other no less dazzling inventions, such as the magic lantern, were recorded in his treatise on optics entitled *Ars magna lucis et umbrae*, published around 1645. If the camera is the origin of photography, the magic lantern is an evolution of the camera and, in a certain way, a precursor to cinema.

The *camera obscura* is the emblem of a radical change in the way human beings understand their relationship with the world. And more than an emblem, it is a symbol of post-Renaissance man. "It soon began to be used for practical purposes, in particular for making small-scale sketches of larger objects or associations of objects, especially for sketching landscapes. There, on the screen, the complex three-dimensional world in which we walk and move was conveniently reduced to a small two-dimensional image that the pencil only had to trace. In other words, this practical device produced, almost spontaneously, a result that many great painters had worked hard to learn to produce over many years, and in which they were only just beginning to succeed" [Barfield 2019, p. 36] (fig. 1).

Barfield here refers to the extraordinary gradual discovery of the secret of perspective, which he considers late in coming, considering the advances in geometry and optics in classical Greek art. The camera thus made it possible, through copying, to overcome the classical theory of art as an imitation of nature. "The next step in the camera sequence would eliminate even the pencil and the steady hand. For the camera obscura led to the invention of the daguerreotype and, thus, to that of photography" [Barfield 2019, p. 38]. Therefore, I believe that it is quite possible that this invention is at the origin and in the extraordinary development of landscape art in Europe which, as several authors have pointed out, allowed the appearance of the word 'landscape' itself at the beginning of the 17th century, both in Romance and Germanic languages [Clark 1949; Berque 1997; Baridon 2006; Maderuelo 2020]. "What exactly is there when our eyes are open but is no longer there when they are closed? The names of the various attempts to answer this question would fill a couple of lines in a dictionary […]. Forms, phantoms, idols, simulacra, effigies, films, are some of these names […]. But they all have a meaning similar, at least in part, to that of the word 'image'" [Barfield 2019, p. 41] (fig. 2).

The image of landscape and art

We can therefore accept the thesis that it is landscape painting that definitively alters the way of seeing the world in Western culture. One of its great theorists is Régis Debray who defends in his 1992 book, *Life and Death of the Image*, the indissoluble link that unites art to landscape, "a link that, beyond an automatic conceptual reference, tends to reveal such a necessary, mutual and vital dependence to the point of being able to hypothesize the probable disappearance of one in the face of the disappearance of the other" [Neri 2021, p. 24]. Debray's stimulating proposal is that "nature and art are abstract categories that do not really exist independently of each other. Some art has generated our nature. And some nature generated our art." [Debray 1992, p. 162]. The underlying logic seems evident: "There have always been mountains, forests and waterways around inhabited sites […]. But nature does not create the cult of natural beauty nor the presence of carved images aesthetic sensitivity. The spectacle of a thing does not come about with its existence. The proof: it took the West two millennia to establish, frame, make evident and highlight this outrage against God, this egocentric subversion, this artifice of interpretation that is the landscape […]. Reproduction preceded the original, the '*in visu*' formed the '*in situ*'. Painters awakened the sites, and the landscapes of our countryside emerged from the paintings of the same name. The gaze on nature is a fact of culture, a culture that was visual before it was literary […]. Historians of mentalities have taught us that the Mountain and the Sea are cultural institutions. The mediator notes that 'nature' and 'art' are abstract categories that do not really exist independently of each other. An art has engendered our nature. And a nature has engendered our art. Hence the question of today: when this nature is transformed, what remains of art? When this art disappears, what remains of nature?" [Debray 1992, pp. 161,162] (fig. 3). When rivers and mountains, hills and lakes, trees and animals, seascapes and clouds are shown "framed", they



Fig. 1. Katsushika Hokusai (1760-1849). Fuji from Gotenyama, in Shinagawa, Tokaido, from the series of thirty-six views of Mount Fuji (Fugaku Sanjurokkei), Japan, 1830-1832 [Neglia et al. 2023].The thirty-six views of Mount Fuji represent the most famous series of ukiyo-e prints, and the first one entirely devoted to landscape. These prints were the first views that later helped defining landscape –urban and natural– as an independent genre in the first half of the 19th-century.

allow the eye to select and show the subtle cultural and symbolic relationships that they maintain with each other. A triumphant pictorial genre, the result of a sensitivity long cultivated by precursors such as Joachim Patinir and Giotto, dominated artistic creation in the second half of the 17th-century and extended to artists such as Poussin and Caspar David Friedrich, William Turner, Claude Monet or Paul Cézanne, to name only some of its most conspicuous representatives, until the emergence of the avant-garde movements of the 20th-century and, with it, the decline of landscape art.

For Régis Debray "art and landscape are attitudes of conscience". For more than three centuries, the existence of the landscape in the eye and, with it, in individual and collective consciousness, has driven forms of representation whose modes of operation were clearly interpreted by Kenneth Clark in his pioneering work *Landscape Into Art* [Clark 1949]. Although these forms of representation of

Fig. 2. Boris Ignatovich, Eremitage, 1929. Gelatin-silver bromide 36.7 × 45 cm, Ludwig collection [http://www.nailyaalexandergallery.com/russian-photography/boris-ignatovich]. Photographer Boris Ignatovich (1899-1976), a great innovator in photography and photojournalism. Aleksandr Lavrentiev, historian and director of the Rodchenko-Stepanova Archive, has said of Boris Ignatovich: "The tonal richness of Ignatovich's prints are of pictorial qualities. He turned his photographs into art because he understood the essential: he did not imitate painting".





Fig. 3. Catania. The rebuilt city and its new streets after the eruption of 1669. An important phase of the study of landscape is to discover those hidden narratives through the deep investigation of the palimpsest of the territory through the study of cartography, maps and historical plans. Territorialization processes are manly based on historical cartography as one of the primary sources. This analysis allows us to detect and identify those territorial elements with patrimonial and natural value that have characterized the cultural landscape in different historical periods.

the world were not alien to the advances in the techniques associated with modern science, as Barfield has shown with the camera and as the information and communication technologies that have colonized our daily lives remind us every day, the landscape thus relies on technology as much as on the patient and sensitive gaze of human beings. As Rainer Maria Rilke has pointed out: "The latter are understandably the artists: poets or painters, architects or composers, solitary people at heart who, turning to nature, prefer the eternal to the transient, the deeply regular to the ephemerally grounded; men who, unable to persuade nature to participate in their lives, recognize their task in the duty to understand it, in order to find their own place somewhere in its grandiose order. And thanks to these solitary individuals, all humanity is drawn closer to nature. Is it not true that the greatest and perhaps most singular value of art lies in being the medium in which man and landscape, world and form, meet?" [Rilke 2010, p. 19]. These are thoughts that are as true as they are distant because we have the feeling that the landscape has been confined within the limits of a discipline, landscaping, "which has progressively isolated it, often in an inexpressive and digitalized simulation, relegated to a place of ornamental exercises and exhausted feelings that select from nature the quintessence of the pleasant and the fleeting, leaving everything else to weather reports and news of environmental disasters" [Neri 2021] (fig. 4).
Debray adds: "It is not that the desire for art and landscape has capitulated. On the contrary, it is stronger than ever, if one takes into account nostalgia. And that is precisely the delicate point: now a meticulous will is needed to revive the contours, to restore the prestige, because they have left behind the prose of everyday life and the instinctive character of the gaze. They have become matters of planning, celebration, direction, inspection and regulation; of landscapers and animators; land planning; management of natural parks; delegations of the plastic arts; protection of sites; ministries of the Environment and Culture. Landscape and art were once experienced, now they are constructed. As if they were being managed for a diligent survival. End of enjoyment, back to technical solutions. Assigned to regulatory reserves and green spaces, discarded from our everyday life centers, photographed, theorized and gridded, the postmodern landscape mockingly echoes heritage culture" [Debray 1992, p. 170].

The malaise of the landscape

The human being is not a 'lazy spectator' of nature, but a structural element of the world that contemplates, as Samuel Taylor Coleridge said, a part of nature itself; to the point that we have to accept that nature, and with it landscape, is the reflected image of our conscious and unconscious self. That "reflected image" is part of nature. And we can also say, in the absence of a more detailed argument in these brief pages, that the greater the degree of consciousness of the person, whom we can now qualify as an artist, the greater the heritage condition of the landscape. To this we must add, as Franco Zagari already pointed out a few years ago in the pages of this magazine [Zagari 2019, p. 13], the project must always be present in all types of landscapes and, we can add, this is even more true when it comes to the landscapes we love the most, those of heritage.
Nowadays, the concept of landscape has complemented the vision of the 1960s by expressing the need to include, in addition to maps and geographical and ecological plans which collect tangible and material data, the representation

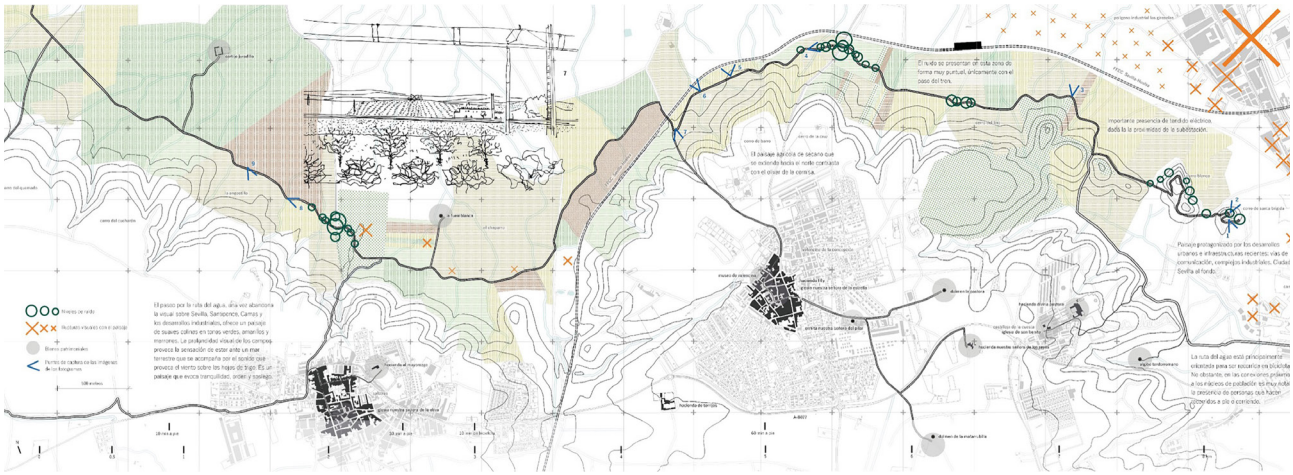

Fig. 4. Marina López, Graphic interpretation of information taken within the territory on landscape synthesis around the municipality of Valencina de la Concepción and the Ruta del Agua [López Sánchez, Linares Gómez del Pulgar, Tejedor Cabrera 2022]. The landscape is analyzed through data collection that records the visual and sound perceptions experienced during the walk. A system of graphic codes is used for this purpose, drawn on a map printed on paper, accompanied by written annotations, sound recordings, photographs and sketches, as shown in the image.

of those intangible layers that refer to the identity of a community, to its sociocultural condition. The contemporary idea of landscape encourages a holistic vision of heritage that, dispersed throughout our territories, demands an interpretation that allows us to define the interrelations between its components and the environment. Hence, the graphic and cartographic representation, a kind of chronicle of memory, will help us to develop the relationships between elements, routes, events and dynamics of activities that go beyond the understanding of the territory as a physical support, as we come to understand it also as a social and cultural network of production, collaboration and communication of the life of the human being who inhabits it.

The representation and analysis of territorial data linked to the cultural experience of our tangible and intangible heritage is one of the current challenges in reconstructing the landscape. Likewise, for the landscape project, the requirement to make the territory competitive through the potential of its cultural heritage with renewed models based on endogenous values of the places that make it up is a challenge [Linares Gómez del Pulgar et al. 2024].

In the current global context, Information and Communication Technologies (ICT) have become the protagonists of all the digital processes that we carry out daily, at all levels and scales. The technological revolution, access to large volumes of data and the preceding conceptual experience configure a space for research and graphic creativity in which the objective of the representation is not the visualization or validation of a formal and stable situation, but rather the possibility of showing other dimensions in the territory not always investigated by the usual cartographies, such as the unstable, the mobile or eventual, the simultaneous or the multidimensional [Vicente-Gilabert et al. 2023]. The drawing destined to project and communicate the specific creative idea is complemented by the use of Geographic Information Systems (GIS), graphs and experiential and perceptual cartographies, since they allow us to analyze all possible relationships between assets and the environment, all the links between the human being who inhabits the territory and the tangible and intangible heritage that, together, constitute the cultural landscape. Graphic representation is the emerging, holistic, artistic and scientific, creative and technical language, one necessary to encourage citizen participation, to promote dialogue between communities and thus contribute to a richer understanding of heritage,



Fig. 5. CRV Colonia Clunia Sulpicia, Peñalba de Castro, Burgos. Model of the Diputación de Burgos competition, 2017. Antonio Tejedor & Mercedes Linares. Under construction [Álvarez Álvarez, de la Iglesia Santamaría 2017]. The model interprets the idea of integrating the new building into the landscape of Alto de Castro, where the Roman city of Clunia is located. The existing vegetal territory expands over the roof of the Visitor Reception Center, sheltering in its interior the new public facility, without discontinuity of the vegetal mantle of the hillside.

ensuring with the project the sense of identity and territorial valorisation (fig. 5).

I conclude by returning to Debray, to raise a substantial question that he suggests is related to painting and that we can extend to all types of representation: "Today there is unrest in nature and in representation. The future of the forest is disturbing, as is the future of paintings. It is worth asking: can the landscape survive the failure of painting, or can painting survive the destruction of landscapes?" [Debray 1992, p. 169].

The question may seem misleading. Landscape art is based on the direct observation of the sensitive spectator of the world, including landscapes of destruction (as shown by the works of photographers Eduard Burtynsky or Emmet Gowin) while the representation of the heritage landscape is directed towards the action of the artist who physically intervenes to stop its deterioration or to breathe into it new social life and a renewed cultural value. Debray does not seem to take into account this substantial difference between the landscape considered as an object of representation and the landscape as the object of the intervention project. The first is suffering a crisis as a pictorial genre; the second is in danger in itself, regardless of its representation mechanisms.

It cannot be excluded that in this ghostly and weakened presence of nature in the current representation of the landscape lies the germ of a new current that can permeate knowledge and action on heritage and landscape through increasingly sophisticated technological tools, such as algorithms for interpreting satellite data of the Earth's surface,

and the use of GIS, CAD, BIM, graphs or experiential and perceptive cartographies, which are faltering in the face of the emergence of artificial intelligence. Although innovative at an operational level and full of attractive theoretical suggestions, we fear that the third landscape will not be of much help in recomposing the fragments of a conception of nature shattered by contemporary culture, whose scope and consequences, even, are difficult to perceive.

Wandering cautiously and sensitively between these two polarities crucial to the practice of landscape science –representation and landscape– in search of at least partial certainties, could be a perspective shared by artists, including architects, who draw on landscape and nature in their creative activity, shedding the contradictory illusion that one discipline alone is capable of constructing the future landscape.

Note

[1] The text includes the lecture given at Wheaton College, Illinois, on April 30, 1969, originally published in *Rediscovery of Meaning*, Middletown, CT: Wesleyan University Press, 1997, and in Spanish with the title *El arpa y la Cámara* [Barfield 2019]. Here we will leave aside the role of the harp, referring the curious reader to the original text.

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Between Painted and Real Landscapes: Storymaps for the Storytelling of the Phlegraean Fields

Greta Attademo, Alessandra Pagliano

Abstract

The research, which is part of the larger PNRR project PE5 – CHANGES – SPOKE 1 – HISTORICAL LANDSCAPES, aims to develop a comprehensive strategy for the knowledge and enhancement of the Phlegraean Fields, an area that, being subject to numerous and incessant geological, natural and anthropogenic events, is now characterized by a high degree of physical, cognitive and symbolic fragility. Starting from the paintings that have as their subject the Phlegrean landscape, the research develops some specific thematic paths based on distinguishing and identitarian aspects of the Phlegrean territory, to encourage a rediscovery of stories, values and meanings inherent in it. Taking advantage of new GIS-based technologies, such as ESRI's StoryMaps, a new digital narrative was constructed in which landscape paintings, without a necessary chronological line, have been intertwined according to a common narrative matrix and then narrated through descriptive texts, multimedia content and interactive maps.
In the maps, in particular, the geolocated paintings become the stages of a digital thematic itinerary that the user can take by assuming the same point of view used by the artists in the landscape views they painted. In this way, we aim both to bring to light the communicative value of such paintings, repositories of different landscape values, and to build new relationships between representations and real places, making the contemporary Phlegrean landscape more readable, or better intelligible.

Keywords: Campi Flegrei, painted landscapes, storymaps, interactive maps, thematic trails.

Introduction

The Phlegraean Fields constitute a vast and highly varied territory, whose complex matrix, based on the interweaving of landscape, naturalistic and cultural values, has always allowed its unique character to be well recognized. It is, in fact, a vast caldera which has been shaped over the millennia as a network of craters, lakes and volcanic structures –in some of them there are still effusive gaseous and hydrothermal manifestations– and subject to bradyseismic phenomena often accompanied by more or less evident telluric activity [Sansivero 2024, p. 1]. Dangerous and tumultuous as they are, the Phlegraean Fields have always fascinated human beings, whose settlements have layered a deep cultural fabric, intimately linked to the volcanic nature of the area and still visible today in the numerous archaeological evidence dotting the territory. Greeks, in fact, founded here Cumae, the first city of Magna Graecia, and later Dicearchia, the ancient Pozzuoli, attracted by the mild climate, the fecund soil and the abundance of fish in the sea and lakes; Romans, then, fully understood the enormous potential for wealth and prosperity that could flow from this region, employing the hydromineral springs and endogenous vapors for the construction of ports, cisterns and thermal buildings [Serpentino 1999, p. 7].
The intimate bond between human and natural signs, therefore, has always been the place identity value of the Phlegrean landscape, also testified by the artworks of numerous painters, engravers and vedutists who, over time, used to make this landscape the main subject of their

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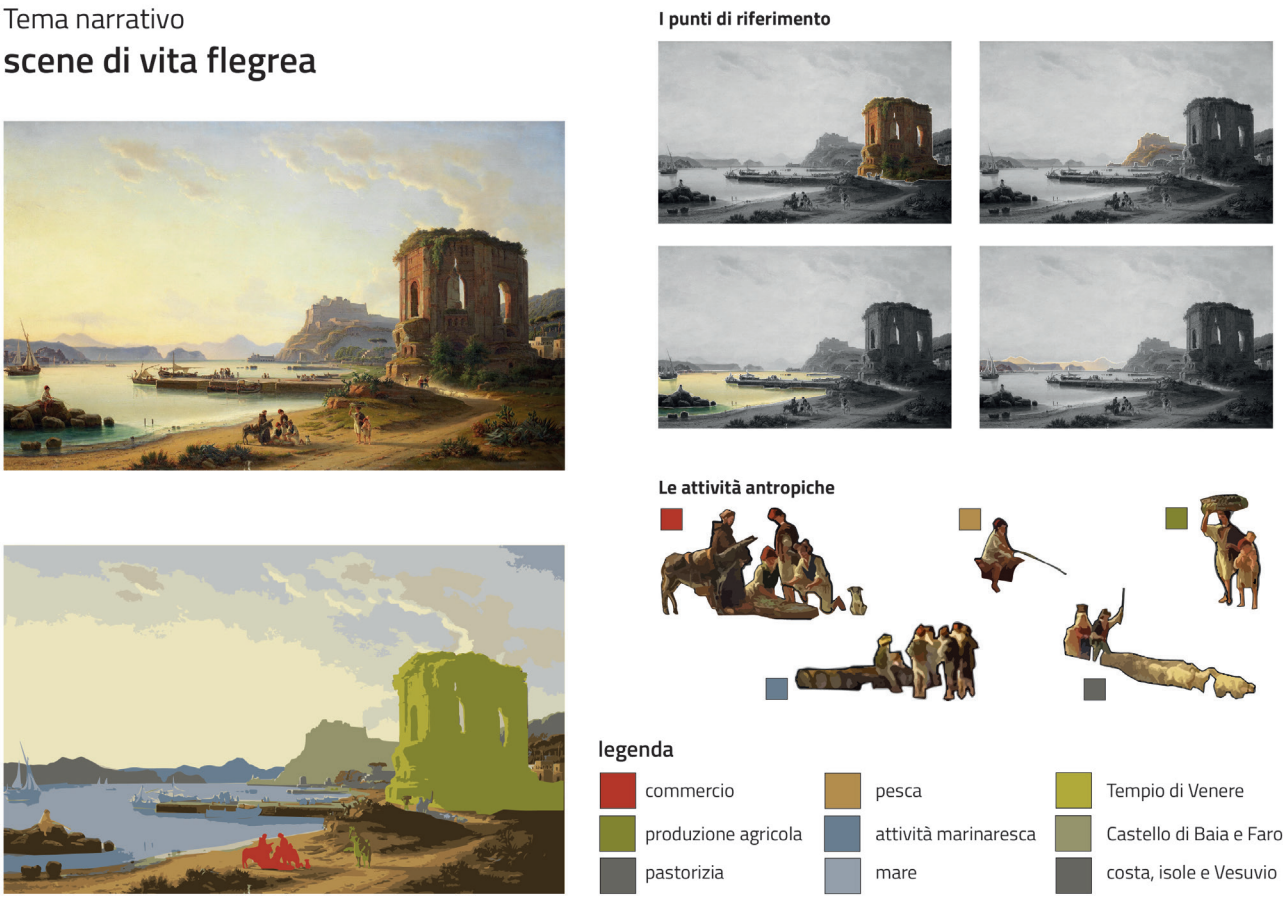
representations [Di Liello 2005, p. 9]. Today, however, the landscape is profoundly changed with respect to the past: volcanic activity, unplanned urban expansions, post-World War II deindustrialization processes, and more recent squatting have transformed the landscape into such a fragmented and disconnected system of signs so that its ancient meanings appear difficult to recognize and convey an overall perception. The critical issues detected concern not only the morphological fabric, but also the perception of the meanings that individuals project onto it: for example, let us consider the state of decay in which some areas of scenic interest are left or the countless cases of concealment of archaeological remains so that areas would not be declared unbuildable [Pagliano et al. 2020, p. 123]. In other words, cultural and landscape heritage has often been experienced as an obstacle, resulting in little citizen participation in its cycle of conservation, enhancement and management. The foundation of the Phlegraean Fields Regional Park in 2003 and the Phlegraean Fields Archaeological Park in 2016 were important turning

Fig. 1. Semantic and Pictorial Analysis of View with the Old Port and the Castle (1861) by Edmund Hottenroth (graphic elaboration by Greta Attademo).



points in setting a territorial development model based on the promotion of the Phlegraean district's landscape characteristics. However, the institutes have made mostly sectoral efforts, highlighting the ineffectiveness of isolated and circumscribed actions in such a morphologically complex, widely spread territory that is poorly equipped with services, access and transportation networks. The Phlegraean Fields looks, therefore, like "a puzzle composed of beautiful pieces that cannot be 'physically' connected" [Consiglio et al. 2019, p. 41], thus also causing a dispersion of histories, meanings, and values inherent in its landscapes. Starting from these considerations, the present research, included in the broader PNRR project PE5 – CHANGES [1], aims to identify a comprehensive knowledge and enhancement strategy of the Phlegrean landscape that, through the reconnection of cultural, naturalistic and historical-artistic heritage, provides a system in the overall re-signification of the territory. Knowledge is essential to protect this landscape, while storytelling of the achieved knowledge spreads that awareness, thus enabling emotional bonds between people and their own places, rebuilding that sense of belonging and responsibility towards cultural and natural heritage, which is often absent today. The semantic deconstruction of the painted landscapes to identify the multiple narrative cores present in the scene was the first approach for discretizing the images, followed

Fig. 2. Anton Sminck Van Pitloo, Lake Lucrino, 1820. Identification of the artist's viewpoint through exploration of the DTM extracted from Land Design (graphic elaboration by Alessandra Pagliano).

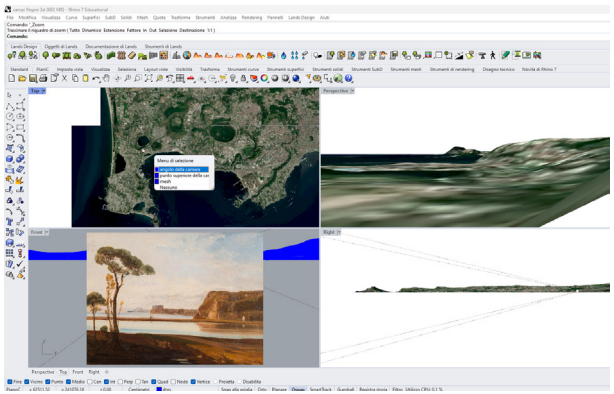
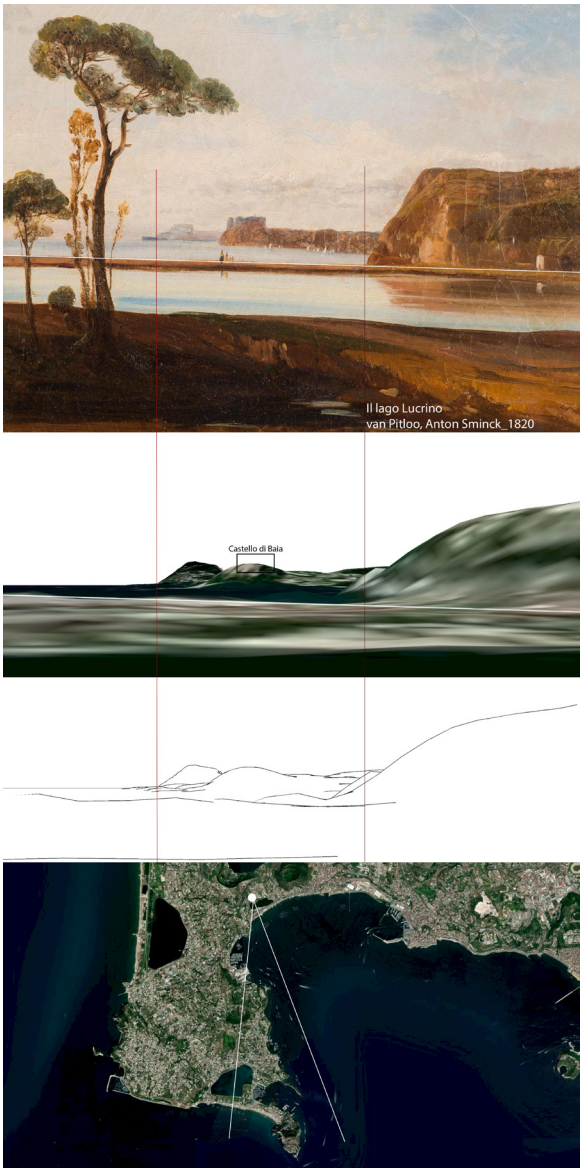


Fig. 3. Comparison of the perspective from the DTM with the painting Lake Lucrino (1820) by Anton Sminck van Pitloo: the viewpoint is in an accessible position along the lake's shore.



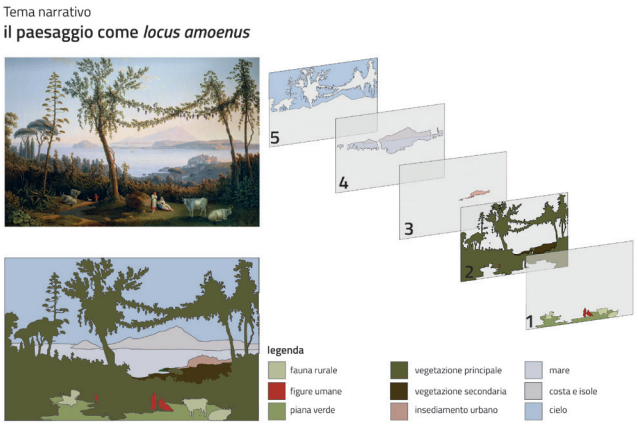


Fig. 4. Analysis of The Gulf of Pozzuoli (1798) by Jacob Philipp Hackert (graphic elaboration by Greta Attademo).

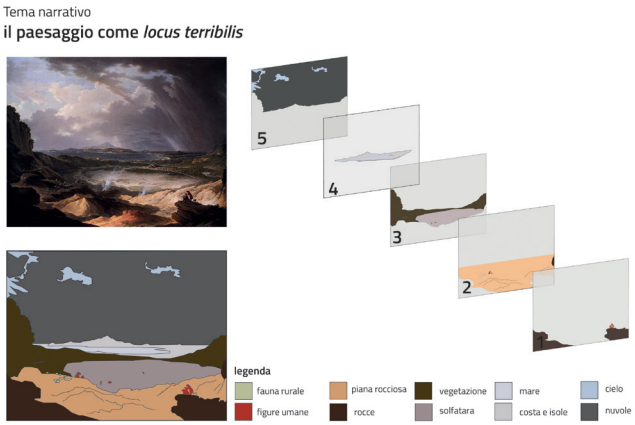


Fig. 5. Analysis of Veduta dei Campi Flegrei, Michael Wutky (1780) (graphic elaboration by Greta Attademo).

by the identification of the area of landscape view and the recognition of detectable orographic evidence (fig. 1). In that analysis, the possibilities of exploring the 3D territory in a Digital Terrain Model of the entire area, obtained from the Land Design software, plug in of Rhinoceros, (fig. 2) allowed us to identify that digital camera resulted to portray a coincident view with that one of the painting, comparing the skyline and the visible borders of the most recognizable landforms, so as to find the artist's point of view (fig. 3).

Landscape between images and imagery

Although the definition of landscape is not unambiguous, given its multi-dimensional and interdisciplinary nature that has led to an "overflowing debate" and a "babel of landscape" [Jakob 2009, p. 7], there is now general agreement that "the concept of landscape remains inherent to the perception and visualization of the territory and its multiple material and immaterial dimensions" [Balestrieri, Cicalò 2020, p. 54]. Marinelli asserted that landscape is "necessarily something abstract and personal, depending on our representational faculty as well as on the exteriority of things: a country can exist without us, not a landscape" [Marinelli 1917, p. 137]. Schama considered that "before being as a rest of the senses, landscape is the work of the mind. A landscape is made up of stratifications of memory at least as much as sedimentations of rocks" [Schama 1995, p. 7]. More recently, Meschiari describes it as "a primary paradigm of thought that has always accompanied us in our representations of the world" [Meschiari 2008, p. 11]. The purpose of the research is certainly not to arrive at an ultimate definition of landscape, which is already made explicit in any case in the European Convention of 2000 [2]; this excursus, however, highlights how landscape is understood both as a real place, given by the sum of the geological, structural and morphological characters of a territory, and as a mental place and, therefore, linked to the making and culture of a people, to its representation and vision of the world. These two sets inevitably have intersection in the subject who observes: the one who observes, not only with his eyes, but with his own cognitive frames and paradigms of thought, allows the landscape to exist. Viewing, then, is an experience able to encompass multiple aspects: observation, contemplation, interpretation, internalization. And thus, the question arises of how we can express, for the Phlegraean Fields, that inseparable intertwining of natural ecosystem, aesthetic image and sedimentation of historical-cultural processes [Gambi 1986, p. 103]. If we assume that the observer is the crucial node in understanding the landscape, it seems useful to make use of the 'gaze' of those who have always been able to grasp and communicate its

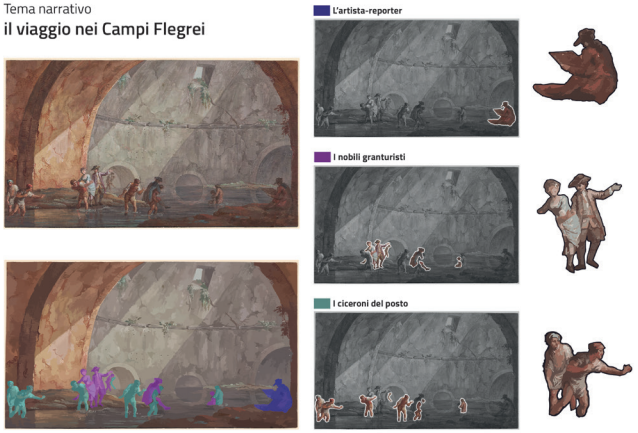


Fig. 6. Analysis of Viaggiatori nel tempio di Mercurio a Baia (1761) by Charles-Louis Clérisseau (graphic elaboration by Greta Attademo).

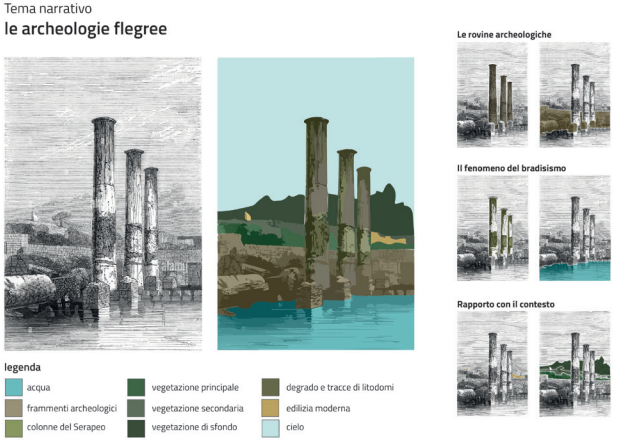


Fig. 7. Analysis of Vista del Tempio di Serapide di Pozzuoli (1836) by Charles Lyell (graphic elaboration by Greta Attademo).

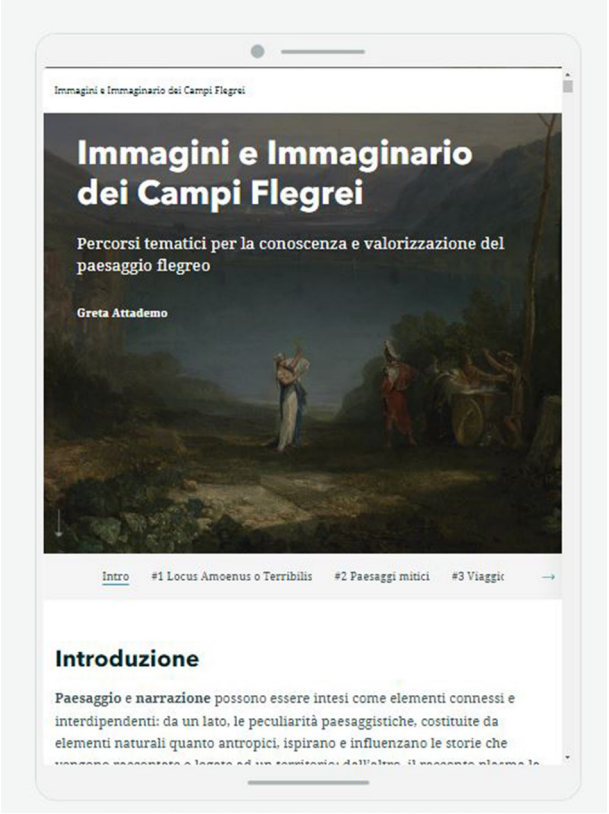
complexity, namely artists. The artist is, in fact, "the one who performs this formative act of looking and feeling with such purity and strength that he completely absorbs the given natural substance into himself and creates it anew as if from himself; while the rest of us remain more attached to this material and thus still tend to perceive this and that special element where the artist really only sees and draws 'landscape' [Simmel 2006, p. 28]. Pictorial images provide, on the one hand, a frame and a point of view from which to observe the visible world; on the other, an inventory of the representational elements that constitute that world [Thürlemann 2004, p. 29]. Indeed, the artists who represented the Phlegraean Fields over time were, sometimes, ante-litteram reporters, reproducing the observed scenery with an extremely detailed and faithful approach to reality, sometimes sharp interpreters, highlighting not what could be seen, but what was known or appropriate to know about that landscape. In both cases, the paintings were able to restore and synthesize the perception of the distinctive elements of the Phlegraean Fields, contributing to build an imaginary of identity values, peculiarities and memories of a landscape not only physical, but also mental. Indeed, landscape paintings are not exclusively the result of the artist's individuality, but also the mirror of tastes, knowledge and trends of a specific cultural, historical and geographical context [Clark 1985, p. 32]. By leveraging pictorial images, bearers of a visual memory of the changes undergone by the real landscape and containing stories and archetypes related to the mental landscape, the research intends to build a new narrative model of the landscape of the Phlegraean Fields and to deliver it to the contemporary community to live a more conscious and aware experience of the landscape.

Pictorial images for the construction of thematic itineraries

It is undeniable that, to learn about a landscape, humans need to make an articulated physical experience, characterized by an interweaving of sensory, motorial and communicative channels; in the specific case of painters, this experience, deeply processed, is translated into representations that can tell its multidimensionality and complexity. Narrative capacity constitutes a peculiarity of a landscape painting, unlike others, such as the Renaissance painting, which, being based on a privileged point of view in perspective space [Bohme 2010, p. 100], assume a more scenic than narrative value. Viewscapes by implementing an extension of the perspective frame, allow us to visualize within a single picture the images of a landscape that, in real experience, we could accumulate only by moving through it

[Febe 2017, p. 43]. While pictorial views are the result of actual experience, it is also true that images themselves can influence our thinking and perception of a landscape; in fact, according to Jakob, experience itself, referred to as "landscape-consciousness", is postponed in our century to its representation, to the "landscape-image" [Jakob 2009, p. 8]. Landscape images, therefore, can become an important tool for accessing knowledge and internalizing the meanings inherent in it and, therefore, it can invite people to visit as an anticipatory tool for real experience, however, always indispensable and irreplaceable [Baule et al. 2014, p. 202]. The research intends, therefore, to reverse the traditional knowledge path from reality to visual representation, turning pictorial images into a tool for narrating those perceptual and sensory data that constitute a fundamental part of the landscape narrative. If knowledge is the basis for safeguarding the landscape, storytelling enables the dissemination of that knowledge, fostering the creation of emotional connections between places and people and generating a sense of belonging and responsibility toward cultural and natural heritage. Since "landscape is not a single narrative, but contains multiple narratives" [Bellini 2008, p. 98], we decided to analyze a cross-sample of 225 paintings, engravings, views and genre scenes having Campi Flegrei as their subject, recognizing in each one the main narrative aspects of the landscape highlighted by the artist. In this regard, the numerous contributions that make up the historiographical landscape on Phlegraean iconography, which are fundamental for reading the images, have been interpreted by following another, less widely traveled path related to storytelling rather than representation. This operation made it possible to set up five thematic paths in which paintings –even very different and distant in time– are linked through the recognition of a common *narrative matrix. The first thematic path, Locus amoenous* o *terribilis*, emphasizes the perceptual duality of the Phlegrean landscape that can arouse contrasting emotions in artists [Di Liello 2005, p. 9]. In some cases, in fact, panoramic images, especially taken from the hills of Pozzuoli, Monte di Procida or Monte Nuovo, tell of an arcadian and incomparable nature to stand in ecstasy for, designating the perception of an idyllic place. In the foreground are often represented bucolic and rural landscapes, dominated by a rich vegetation of evergreen plants or vineyards (Fig. 4). The presence of animals and ordinary people, who appear to be in harmony with nature, also contributes to the stylization of the *locus amoenus*. In the background are usually found urban settlements and ancient remains; in the background are seas or lakes, whose calm waters become a symbolic expression of vital source. In other cases, however, the paintings evoke the dangerous and unpredictable potential of the Phlegraean region, embodying the Latin concept of *locus terribilis* (fig. 5). Hence the choice of depicting specific places rich in volcanoes, fumaroles and boiling muds, such as Lake Avernus, Grotta del Cane and Solfatara, presented as inhospitable environments ruled by a wild and untamable nature. The second thematic path, Mythical and Legendary Landscapes, highlights how the peculiarities of

Fig. 8. The initial frame of the Campi Flegrei storymap (graphic elaboration by Greta Attademo).



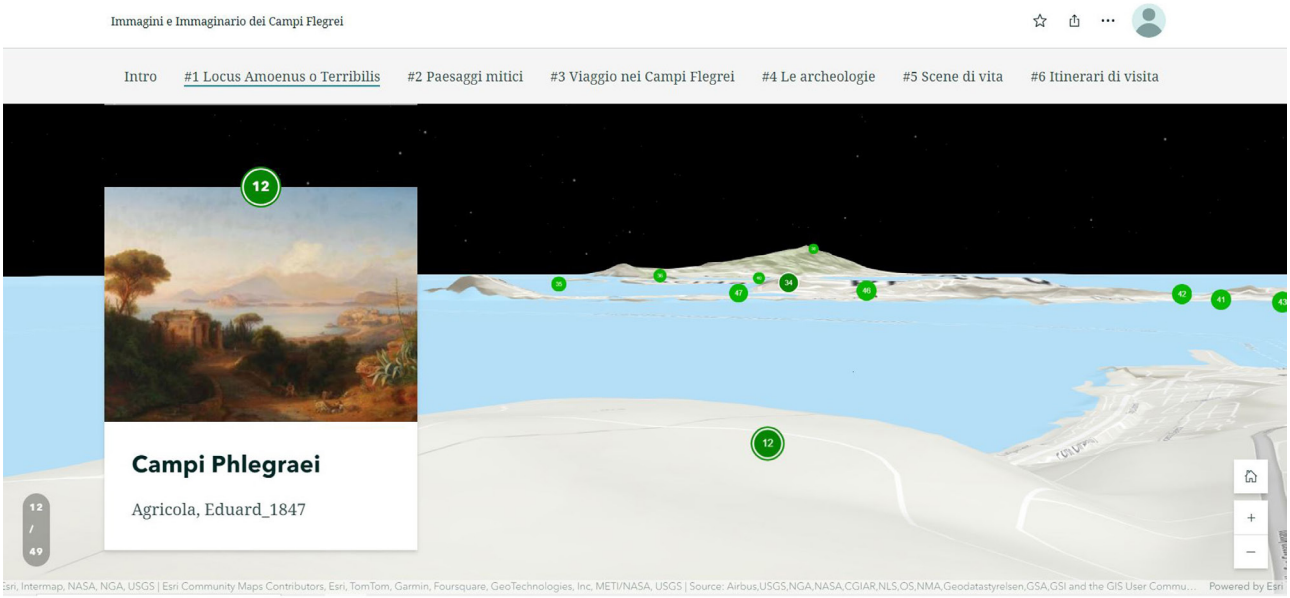


Fig. 9. One of the stages in the interactive map of the Locus Amoenus or Terribilis route (graphic elaboration by Greta Attademo).

this area have nurtured the rooting of extraordinary stories that make, even today, the Phlegraean Fields steeped in myth and legend. The epic adventures of heroes such as Heracles, Odysseus and Aeneas, located in the Phlegrean territory, have been transposed by artists into narrative scenes that emphasize the places most rich in mystery, such as the Antro della Sibilla Cumana, Monte Miseno and Lake Avernus. The third route, called Journey to the Phlegraean Fields, on the other hand, reveals the basic role of the artist when, starting in the 18th century, the Phlegraean Fields became a key destination on the European Grand Tour. Indeed, its task was to faithfully represent the natural landscape and archaeological stratification, in order both to document the steps of the tour undertaken by the granturists as well as to support the studies and observations of the scholarly travelers. For this reason, paintings were made on-site, the only method which allowed an authentic capture of the places [Di Liello 2005, p. 52]. The range of Grand Tour pictorial subjects is broad, but a common feature of these paintings is the tale of a journey made up of both adventurous and contemplative moments: Clérisseau, for example, depicts himself in the act of drawing noble Grand Tourists on the shoulders of local cicerones as they visit the sunken part of the Temple of Mercury in Baia (fig. 6). In the fourth route, Phlegraean Archaeologies, we highlight the extraordinary density of archaeological ruins in the Phlegraean territory, the main expression of the articulated cultural fabric that has settled over the centuries in this area. The iconographic sources belonging to this itinerary have a high documentary value: not only they show what the Phlegraean landscape must likely have looked like in periods for which we would otherwise have no other visual evidence, but they also show how many monuments, that are no longer visible or partially visible today, appeared. The representation of ancient presences, in the inseparable link with orography and the natural landscape, systematically records the changing territory and the different degree to which ancient landmarks are perceived at different historical moments. In the images of the early 19th century, for example, the artists, while taking traditional viewpoints, show unprecedented pieces

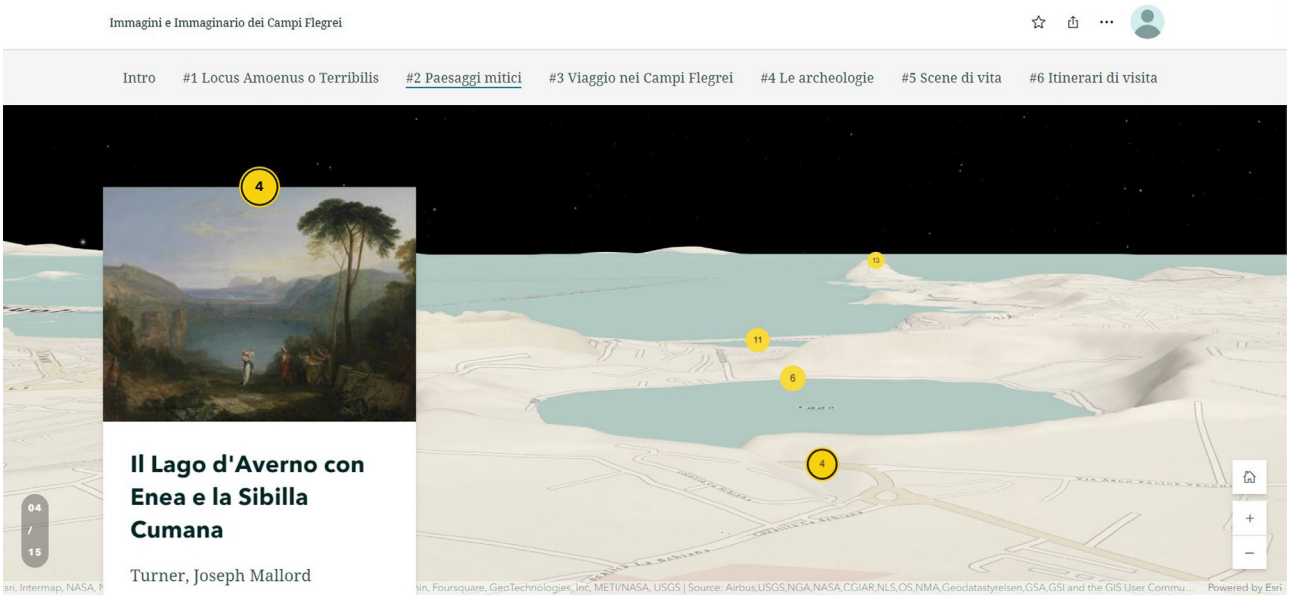


Fig. 10. One of the stages in the interactive map of the Mythical and legendary landscapes route (graphic elaboration by Greta Attademo).

of the landscape, bringing out new visual landmarks, such as the Arco Felice in Cuma and the Mausoleum of San Vito in Pozzuoli. In other paintings, the focus on certain archaeological finds diminishes as they gradually lose their real physical substance and are reduced to second-rate archaeological elements. But pictorial images also help to better interpret the current landscape. The paintings of the Temple of Serapis, for example, by showing the marketplace sometimes submerged sometimes resurfaced from the waters, help to understand the changes that the ground level has undergone over time and the rise of the sea level with respect to the three large cipolin columns of the Macellum, becoming a visual measuring tool of the phenomenon of bradyseism (fig. 7). The fifth and final thematic path, Scenes of Phlegraean Life, makes explicit that landscape cannot be defined merely through its material aspects; in fact, there is also a cultural heritage made up of customs, practices and cultures that contribute to determining the identity of the territory [Cardone, Papa 1993, p. 12]. This set of intangible resources can be narrated through genre scenes. These images, in fact, without celebratory or heroic purposes, intend to represent those realities made up of daily gestures, activities, trades and people's habits, helping to understand relationships, meanings and values that man has built over time with specific places in the Phlegrean area. One of the most represented settings is the Port of Baia, also because of its peculiar integration with the sea of the gulf, the Temple of Venus, the Temple of Diana and the Aragonese Castle. Hottenroth, for example, shows not only all the maritime activities related to the harbor, but also how the real life of the inhabitants develops around that place: shepherds walk with their pasture in tow, farmers carry baskets containing the products of agricultural activity on their heads, and merchants sell legumes to the Capuchin friars (fig. 1). The thematic paths produced, therefore, escaping the linearity of the historical and factual report, focus the attention on the circular relationships that the visual narrative establishes with the landscape. This operation of breaking down the timeline and hinging on a common narrative matrix allows us to recompose stories and meanings related to the Phlegrean landscape, counteracting that cognitive fragmentariness by which the territory is marked today.

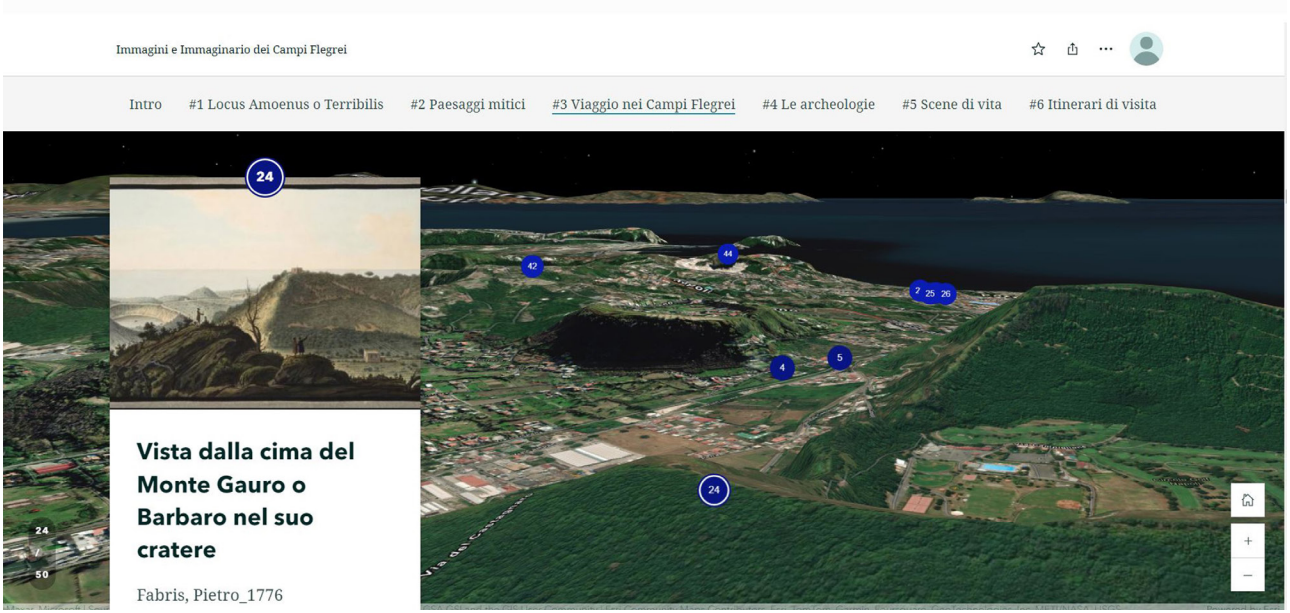


Fig. 11. One of the stages in the interactive map of The journey in the Phlegraean Fields (graphic elaboration by Greta Attademo).

Storymaps for enjoying the thematic routes

If the construction of thematic routes leads the attention to the preservation and protection of the historical landscape, exploring new ways of using those same routes pushes toward future models of territorial enhancement. Such fruition modalities must, however, consider the context in which they are applied; in the case of the Phlegraean Fields, in fact, attention has been repeatedly drawn to that physical and symbolic fragmentation of the landscape, which is difficult to counter with circumscribed and punctual interventions. For this reason, the concept of valorization is today renewed thanks to the opportunities related to new technologies of representation and communication [Balestrieri, Cicalò 2020, p. 63]: these, by supporting the construction of an elastic network of spaces, data and information belonging to both physical and digital contexts, can become a valuable strategy for stitching narrative links between places, artifacts and landscapes and for activating new relationships between local communities and cultural values based on emotional and interactive experiences. The most recent innovative approaches to narrative geography of cultural and landscape heritage are related to the use of new GIS-based technologies [Mauro et al. 2021, p. 24]. Telling stories through maps is certainly not new, however, current webGIS applications have been revolutionizing traditional cartography [Kirkby et al. 2014, p. 3] through the inclusion of multimedia content and heterogeneous information on maps, thus recovering the plural meaning of landscape [Casti 2018, p. 28]. In this regard, we decide to use Storymaps, an app from ESRi's online ArcGIS platform that, by combining the features of a web-GIS software with digital storytelling tools, allows multimedia content, such as text, images, hyperlinks and audio, to be associated with the maps. In fact, the dynamic and interactive structure of Storymaps makes it possible to strategically support landscape communication and promotion through creative and interactive methods of storytelling or, more correctly, placetelling [Pollice et al. 2020, p. 33]. Therefore, an interactive web page (fig. 7) has been built that is divided into five main sections, each dedicated to

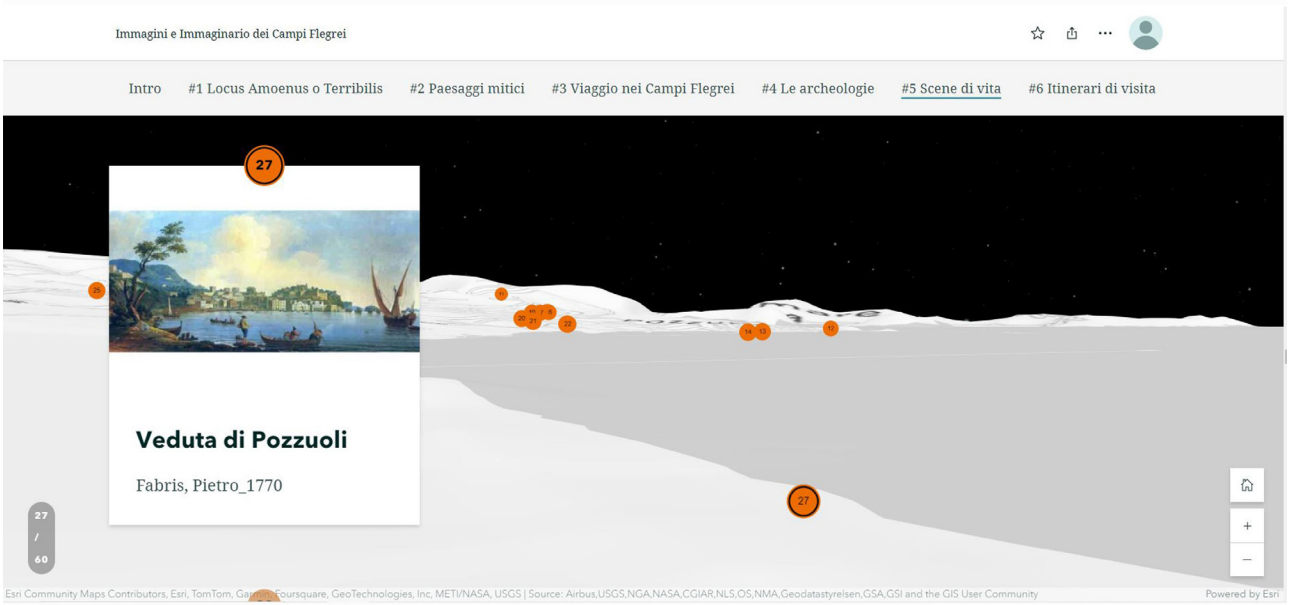


Fig. 12. One of the stages in the interactive map of the Scenes of everyday life route (graphic elaboration by Greta Attademo).

a specific thematic path, explored in depth through text narratives, graphic diagrams, videos, swipe images and interactive maps. The latter allow the Phlegraean landscape to be narrated by integrating different layers of spatial and attributive data to the maps. For each thematic transect, a base cartography has been selected, appropriately chosen in relation to the specific graphic features, on which the pictorial images related to the relevant route have been placed. This required, therefore, the identification of the point of view taken by the painter in each painting and its subsequent location on a map. The possibility of using 3D basemaps made it possible to visually verify the correspondence between the scene displayed on the map and the point of view assumed by the artist in the shooting of the painting, while always considering the pictorial and representational devices used in the construction of the image. Each painting has been then associated a pin, i.e., a visual indicator to mark its location and make easier exploring the map. The pins, customized in color for immediate understanding of the thematic reference path, have been associated with the metadata of the pictorial work, such as the author of the painting and the year it was made. Finally, the interactive map was embedded within a guided virtual tour that leads the user on a tour of a thematic route whose stages are covered by assuming the same point of view used by the painters in the views (figs. 8-12). This activates a new vision on the Phlegrean landscape: in fact, by making user's point of view coincide with that one of the artist's, the viewer experiences that experience of immersion that in semiotics is called "embrayage" [Febe 2017, p. 37], capable of generating an emotional and sensory involvement with the represented landscape and, therefore, with its real counterpart. The contact between the topographical view, necessary to build a quantitative and objective reference frame of the area, and the perspective painting, able to express the qualitative and perceptual dimension of the human sight [Quaini 1991, p. 13], provides the user of the virtual tour with the tools to build an overall and structured vision of the Phlegraean Fields, focusing attention on the iconemes, i.e., those elementary units of perception through which we build the image of the landscape [Turri 2013, p. 1].

Conclusions

The research identifies pictorial images and the innovative use of GIS, from the representation approach and not just as cataloging and data collection tool, as two useful ways for learning about and enhancing the Phlegraean landscape, with the aim of counteracting the physical and cognitive fragmentation in which it currently finds itself. New strategies for narrating and representing the Phlegraean landscape have been explored, guided by a communication project aimed at testing new contemporary modes of interaction that can raise awareness of the importance of memory and the collective identity that the landscape bears witness to. The paintings, not only thematically connected but also spatially distributed within the interactive maps of Storymaps, allow for the transformation of mere observation into a gradual process of knowledge acquisition, influencing the user's perception mechanisms and consolidating a mental dimension that is equally important in the dynamics of appreciation, understanding, and enjoyment of landscapes [Gazerro 2000, p. 81]. In a fragile and discontinuous landscape, characterized by fragmentariness and a high sedimentation of historical traces, our research aimed to construct a new geography of those places. This was achieved by employing digital technologies to overcome tangible and conceptual limitations, which included the creation of physical and thematic connections, as well as the integration of painted landscapes. These were presented using interactive maps, which served to foster the development of a novel imaginary of the Phlegraean Fields [3].

Credits

This paper is part of the PNRR – PE5 – CHANGES – Spoke 1 research, coordinated for DIARC by Prof. Michelangelo Russo, scientific coordinator of WP4 [4]. Although this article is the result of a collaboration, the paragraphs "Introduction", "The Landscape Between Images and Imagination", and "Conclusions" were written by Alessandra Pagliano; the paragraphs "The Pictorial Images for the Construction of Thematic Paths" and "Storymaps for the Enjoyment of Thematic Paths" were written by Greta Attademo.

Notes

[1] The University of Naples Federico II participates in Spoke 1– (Historical landscape, traditions and cultural identities) anded it isè leader ofdel WP4 – (Strategies of interventions on historical landscapes).

[2] Landscape is defined as "a certain part of land, as perceived by people, whose character results from the action of natural and/or human factors and their interrelationships": <http://www.premiopaesaggio.beniculturali.it/convenzione-europea-del-paesaggio/> (accessed 17 July 2024).

[3] The results of the presented research are available at: <https://storymaps.arcgis.com/stories/c33b7e2315f94c5d84fbccde0488743e> (accessed 7 November 2024).

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Between Geology and Architecture. The Representation of the Archaeological Landscape of Tiermes

Carlos Rodríguez Fernández, Flavia Zelli, Sagrario Fernández Raga

Abstract

In his paper The beholding eye. Ten versions of the same landscape, *Donald William Meinig explores an expanded definition of what landscape is, offering an analysis of the different forms of its observation, thus demonstrating the infinite potential of the concept, capable of adapting to the gaze of those who contemplate it [Meinig 1979]. The study highlights how the landscape is endowed with powerful physical, environmental, economic, cultural, psychological and aesthetic components.*
Among these, cultural heritage undoubtedly stands out, a powerful element by virtue of which human beings attribute value to a given place, especially if it is in the form of a ruin, the result of protracted interaction between human activity and nature.
This is particularly visible in the archaeological site of Tiermes, a man-made landscape characterised by a unique spatial condition, whose transformation by man has left us important archaeological remains, especially from the Roman era. In it, we find a convergence of morphological and topographical values that have captivated the viewer's attention to such an extent that it has been described as 'a gigantic architectural fossil'.
This paper briefly reviews the graphic and photographic documentation generated to represent the site under study, in a vision in which geology, architecture and archaeology overlap and intermingle, and then dwells on the most recent research that –through the use of new systems of analysis and representation of architecture– offers us a new interpretation and representation of the Tiermes landscape.

Keywords: topography, ruins, archaeological landscape, iconography.

Introduction

"The edges of your profile become the slopes of a hill, the crests of a mountain, inclines, and abyssal cliffs. Your cavities are caves, and from the cracks of the rosy rock, water flows silently. In the Part hides the Whole, and the Whole is the Part. You, stone, trace the diagram of a part. You are the landscape itself. Even more: you are the Temple that will crown the cliffs of your Acropolis" [1].
With these words, Dimitris Pikionis poetically measured the relationship between the natural material of construction –identified with stone– and the landscape generated by it, evoking a correspondence of meanings between the part and the whole. Through his topographic aesthetics, the Greek architect viewed architecture as the quintessential element of connection between geography and geometry, between art and nature, to the point of reading its artistic imprint in the very natural profile of the landscape [Centanni 2018]. This sentimental vision of the Acropolis landscape, in absolute coincidence between built architecture and the topography of the site, lends itself well to a contemporary reading of the archaeological site of Tiermes, an ancient Celtiberian-Roman city that rises majestically in a geographically



Fig. 1. Aerial view of the archaeological site of Tiermes, Soria, Spain (photo by LFA and LAB/PAP, University of Valladolid, 2014).

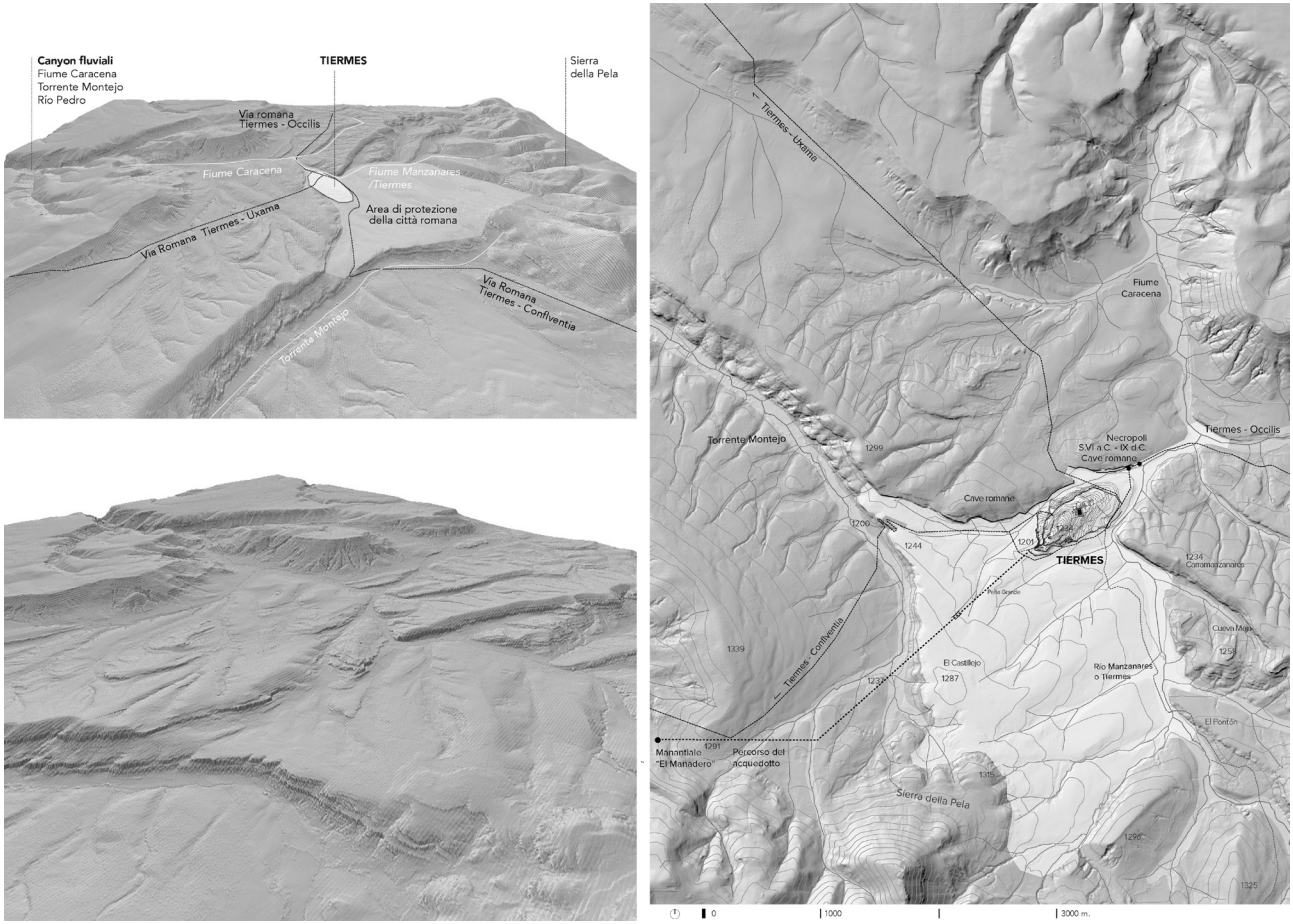
privileged setting, characterized by a natural topography of terraced hills in red sandstone (fig. 1).
It is a place inhabited and anthropized over the centuries, whose geological condition –inseparable from the architectural ruins present in it– is the basis of all the related iconography, since its rediscovery in modern times.
In it we can observe how, despite the passing of the centuries, the profile of the ancient city is immediately recognizable in all its representations, graphic and photographic. For its characteristic archaeological remains (we will see this later) but also for the presence of other elements, which form a *unicum* with the monumental emergencies, which belong to it and are reflected in them: the local stone walls, with its vast terraces; the vegetal elements, typical of the landscape of the Sorian hinterland and the light, imbued with the red color of the place.
The entire landscape and archaeological complex has been the subject of constant research and architectural experimentation since 2007 by the LAB/PAP Architectural and Heritage and Cultural Landscape Lab, a Recognized Research Group of the University of Valladolid [2]. This experience, which has continued for almost 15 years within the Tiermes Cultural Lab, created specifically with the Archaeology Unit of the IE University [3], is an opportunity to transform Tiermes into a true experimental laboratory, with a multidisciplinary vision, starting from architecture and archaeology, to create new systems of analysis and representation of the landscape that are configured as tools of great value for the definition of subsequent architectural intervention projects carried out on the site [4]. In this sense, starting from a study based on the plans and historical sources, appropriately combined with the new graphic works produced, it is possible to understand the landscape of Tiermes with a much broader and more complete perspective. In them, the classic tools of the most canonical drawing are combined with documents produced with new technologies, precious scientific tools for an extended study that includes the territory, geology and archaeology, all factors that have contributed to building the current vision of the landscape.

Tiermes as a *locus*

The archaeological site of Tiermes is located in the hinterland of Soria, in a particularly relevant environment, on a red sandstone hill, located near a large river area, whose shape is dictated by the presence of the Manzanares river at the head, the Sierra de la Pela ountains to the east and the Pedro river escarpment to the west, natural boundaries that allow for total defense of the urban area.
However, many resources were used in Roman times for the construction of large trenches necessary to overcome the abrupt changes in topography and thus connect Tiermes with nearby cities, giving continuity to the network of roads of the empire in a place a priori hostile to human settlement, as demonstrated by the fact that, currently, it is one of the least populated areas of Europe (fig. 2).
The largest part of the rest of the archaeological remains and conservations were those excavated directly in the rock, condition that render in some cases almost very difficult data and interpretation. If you deal with the rest of the buildings and urban infrastructure, foundations, indoor environments, scales, large tags and cavities that are visible without being able to see the excavated areas, we can recognize them at first glance and in these aerial images.
All of them built a magnificent anthropic landscape that dates back to the pre-Roman era in our days, in which the diverse era of occupation of the city and its period of construction and abandonment, like a huge palinsesto incised in its rock, modeling a 'gigantic architectural sculpture' [5] or 'a gigantic architectural fossil' [6], second to a fortunate expression by Blas Taracena that merge in an indissoluble way geology and architecture (fig. 3).The first trace relative to a human settlement in the area is from prehistoric times, with the occupation of the rock shelters at the foot of the Manzanares river, is part of the neolithic tribe. Proof of this

are the graffiti visible on the rock walls, which tell us about the spiritual life and the magical-religious symbolism of these populations. A first settlement in the valleys, due to agricultural development, was later replaced by the occupation of the highest part of the Tiermes hill, used as a defensive bastion against enemy invasions.
Roman dominion began in the 1st century A.D., when Appiano identifies Tiermes as one of the most important cities in the Celtiberian war (98-94 B.C.), during which the Roman consul Titus Didius subjugated the city and forced the Celtiberian tribe Arevacos who occupied it to abandon the fortified area and move to the plain [7].
In Roman times, the hill and the surrounding lands were largely urbanized, both on the higher and flatter levels, and on the slopes, where urban buildings were built on terraces, taking advantage of the steep slopes. It is in these

Fig. 2. Digital Elevation Model DEM05 (graphic elaboration by Carlos Rodríguez Fernández from the material of the Instituto Geografico Nacional de España IGN, 2018).



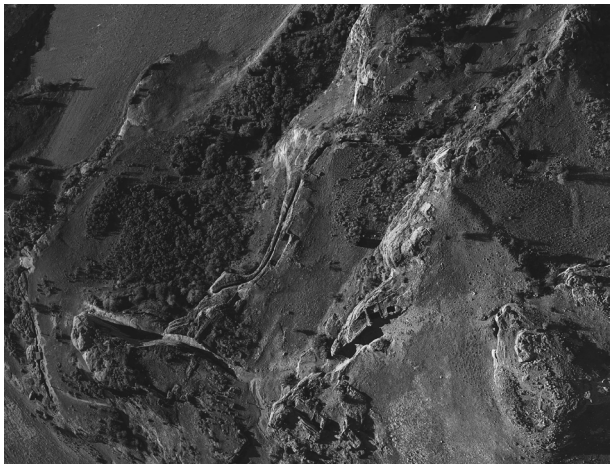


Fig. 3. Aerial photography of the West Gate Area of Tiermes (photo by LAB/PAP, 2017).

places, especially on the southern front of the city, where the anthropized landscape becomes most intense.
Furthermore, after the sudden abandonment of the Roman city, subsequent occupations were somewhat sporadic, making it difficult to perceive changes in the landscape over time. In fact, if we exclude a new moment of occupation in the Middle Ages –which corresponded to the construction of the Visigothic necropolis, the hermitage and the disappeared Monastery of Santa Maria di Termes–, the territory will remain almost uninhabited from the 16th century onwards, as Ambrosio de Morales tells us in his General Chronicle of Spain [De Morales 1574].

Tiermes, landscape of ruins

The rediscovery of Tiermes, at least in the chronicles, occurred in the second half of the 18th century, coinciding with the development of archeology as a discipline. This is how it is mentioned in the writings of Lafuente, Flórez and, above all, De Loperráez, who in 1788 created a chronicle of the city listing its most visible finds and remains [Casa Martínez 2013].
True archaeological interest, however, materialized only between the end of the 19th century and the beginning of the 20th century, a period in which the publications of researchers such as Nicolás Rabal (1888), Adolph Schulten (1911 and 1913) and the Count of Romanones (1910), who, through extensive documentation that brings together travel stories, prints and photographs, describes in detail the existing vestiges.
It is evident, from these first interpretations, how the emphasis is placed on the description of the ruins excavated in the rock [Dohijo, Arribas 2019], which become the main object of the texts (especially in relation to the fact that there are no excavations were carried out).
In Nicolás Rabal's travel memoirs, the ruins are presented to the reader with an iconographic apparatus created by Isidro Gil, clearly influenced by romantic painting, which will quickly become the referential image of the place.
In the engravings, in fact, the remains appear isolated and imposing, contemplated in their grandeur by tiny men, with special interest in the passage of time and the transience of matter, evident in the representation of the stones, with degraded wall systems and already invaded by weeds, a symbol of nature reclaiming the place.
The study published by Schulten, almost a quarter of a century later, also offers us a reading of the city in monumental terms, but is characterized by the inclusion in the documentary corpus of a plan (on a metric scale) of the upper part of the hill: before concentrating on the ruins, he feels the need to understand the environment of the place where the ancient city is located, making a detailed description of it. The representation places special emphasis on highlighting the geomorphological conformation of the relief as a natural defense, responsible for the inaccessibility of Tiermes.
A little earlier, the work published by Count of Romanones, the result of the archaeological excavations begun in 1909, focuses on the transmission of the heroic aspects of the population of Tiermes and the 'treasures' discovered, but it is presented a photographic report of enormous value for the purposes of our debate. In fact, the photographs taken this last time refer mainly to the most topographically relevant places, such as the large trench of the West Gate and the meridional canal of the aqueduct, and are accompanied by a planimetric diagram of the complex, which is not very precise, but it perfectly illustrates the same theme (fig. 4).
The plan highlights the terraces where the city was built and the intensive use of the edge of the hill, a natural wall

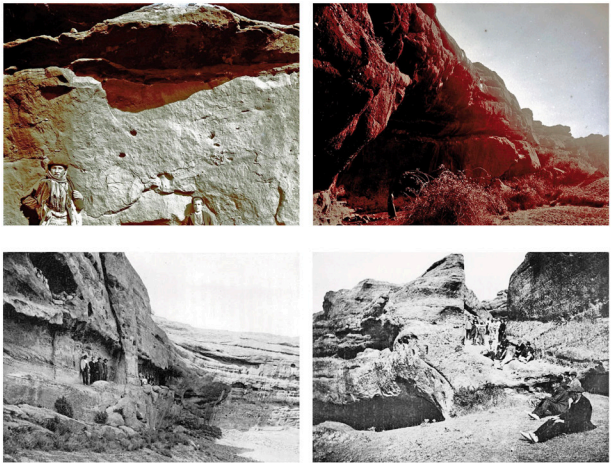


Fig. 4. Top: photographs by Juan Cabré of the rock shelters near the area (1910),Cabré archive, Institute of Cultural Heritage of Spain IPCE. Bottom: photographs by the Count of Romanones, of the aqueduct and western gate of the city [De Figueroa y Torres 1910].

that surprisingly did not serve as the edge of the city but was supported by houses and passages excavated in the upper part. Likewise, other archaeological remains have been identified on the plain that are not visible today, but that surely in times of peace extend the limit of the Roman city beyond its acropolis.
The photographic report, although more focused on the archaeological remains, offers us first of all a global vision of the city, represented from this side, which connects the rocky plateau with the medieval hermitage and the incipient vegetation. The environmental context is also the object of the photographs of Juan Cabré (1915), where the natural enclave is presented, in a representation of the place in which the man actively participates.
Before the Civil War, which has a clear background in archaeological studies, we must mention the work of Blas Tarracena (1932-1935), which presents us one of the most complete studies on the remains of Tiermes, focused mainly on the southern side. These texts are accompanied by the discussions of the architect José María Barbero, in which the technique is used to highlight the relationship of coexistence between the topography and the built environment, with indication of the level curves and the volumetry of the voids.

In the second half of the 20th century, a series of general plans of the place and aerial photographs were made that bear witness to the current landscape. From this moment, the planimetric drawings and interpretations of the city of Tiermes will constitute an important source of urban analysis.
The aerial photograph of the American Flight of 1956-1957 is a historical testimony of the agricultural plots and divisions for livestock farming arranged on several levels, following the natural terraces. These lines are also represented in the topographic plan drawn by Luis Argente (1979), which reflects with great topographic precision the relationship between these anthropic levels and the archaeological remains known at the time.
The subsequent excavation work and the declaration of the site as an Asset of Cultural Interest in 1999 caused the abandonment of these livestock structures. The topographic plan by José Luis Argente Oliver, as well as the one published by Teógenes Ortego [Ortego 1975], highlight the importance of the geological cuts of Tiermes and their relationship with the so-called rock architecture, as identifying elements of the archaeological landscape (fig. 5).

Systems of interpretation and representation of artificial topography

The layout and architecture of the Roman city are recognizable in the actual plan of the archaeological site, where the most ancient remains coexist with the medieval architecture, such as the hermitage and its necropolis, and with the contemporary infrastructures of the site, such as the entrance street y parking.
The investigation carried out by the LAB/PAP group is centered on the representation of the Tiermes landscape in its entirety, with a series of plans that consider factors of different nature. Each of them studied the aspects relating to the morphology of the hill and its topography. Considering the topographical aspects and their greater or lesser metric precision, in reality there is a great difficulty in representing the topography on general drawings, due to different problems.
First of all, the well-known coincidence between the terrain and the excavated archeology, which in many places invalidates the topographical elevation carried out, which does not adequately reflect the archaeological remains.

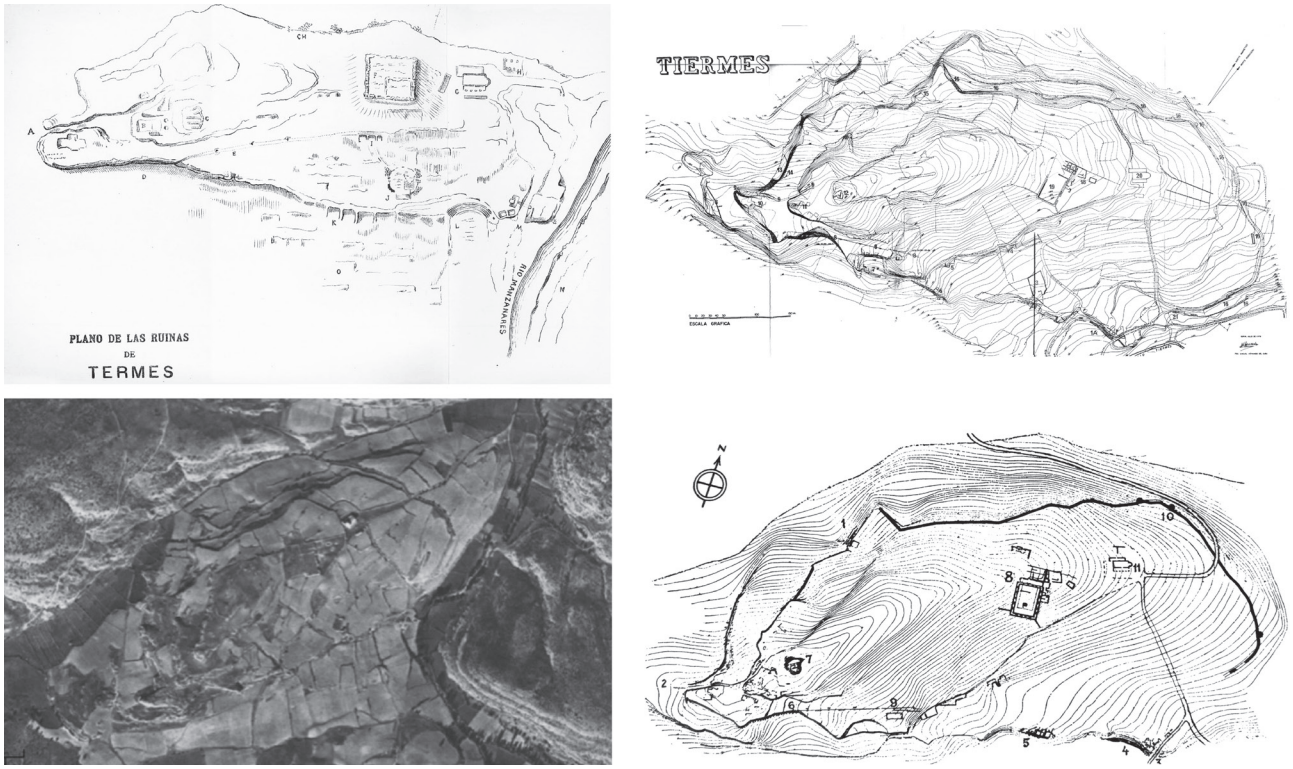


Fig. 5. Planimetry and orthophotography of Tiermes, made by the following authors: a. Count of Romanones [De Figueroa y Torres 1910], b. Argente Oliver [Argente 1980], c. American Flight Series B 1956-1957 (photo by United States Army Map Service. National Geographic Institute. Information granted by the Ministry of Defense CEGET), d. Teógenes Ortego [Ortego 1980].

Secondly, due to the hill topographic shape, with slopes that exceed the verticality at various points, it is not possible to create the usual representation with level curves, since these would cross each other. Likewise, it is difficult to superpose on plan drawings human, agricultural and foliage structures: walls, valleys, slopes, as well as the own vegetation and trees. And although these elements can bring valuable information about the urban landscape of Tiermes, when dealing with temporal structures that respond to different criteria of use, it is not possible to guarantee superposition with ancient structures, as occurs in other archaeological landscapes.

In this context, this information has been included and considered in the study carried out in recent years, summarized in a final interpretation with the representation of the landscape of Tiermes, in which the topography and the rocky edges as the main layer on which are superimposed the archaeological remains, risk being assumed by others visible in historical photographs.

The generated plan also shows the lines that structure the routes and points of interest of the actual landscape, which do not differ excessively from the ancient paths, governed in both cases by the same topographical logic. The document is oriented with respect to the geometry of the Roman forum (not much different from the cardinal

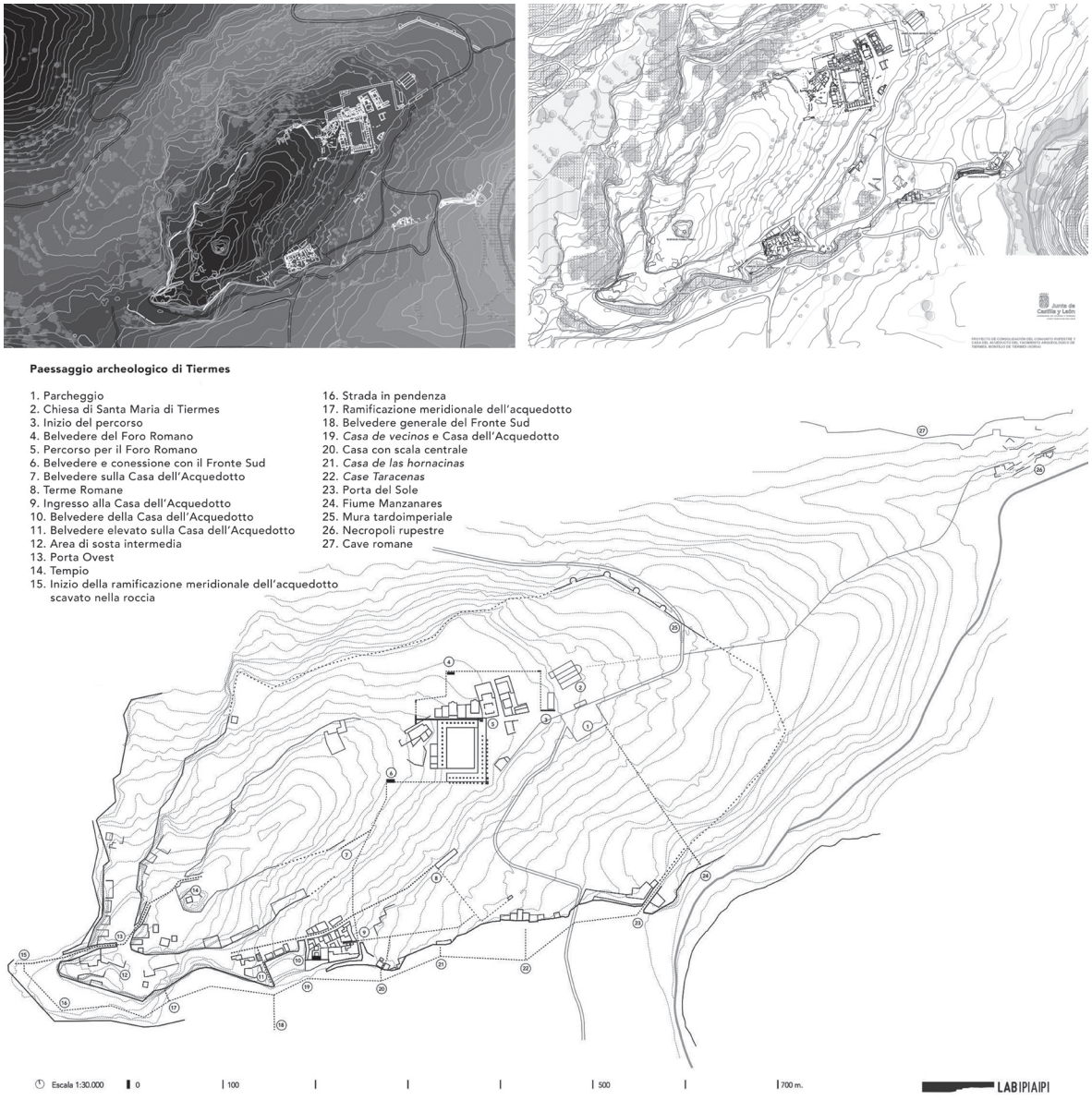
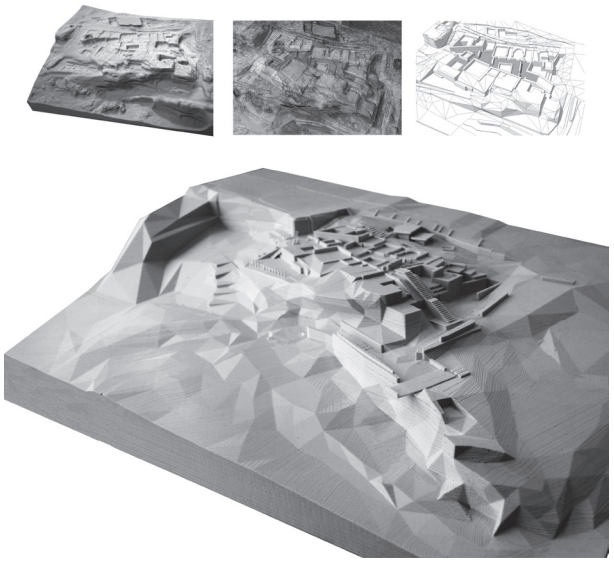


Fig. 6. General plans of Tiermes (graphic elaboration by LAB/PAP, 2010, 2010 y 2016).

orientation), clearly reinforcing an architectural order of reference in urban layouts of the Roman city (fig. 6).
Once defined both the location and the topographical transformation tools used in the territory, it is possible to carry out an analysis of the urban layout of Tiermes, where the starting point is the balance between the natural and the artificial landscape, therefore between the use of the existing topography and architectural building [Rodríguez Fernández 2019].
These two main questions derive from other physical or spatial characteristics, such as the organization and distribution of infrastructures and urban streets or the orientation of the sun and the wind, or economic aspects, such as the relationship between the use of the land and the coasts of construction or organization of the city and its political or even symbolic center, with a reading of the location of the most representative buildings.
The topography/construction combination allows us to understand and explain the urban layout of Tiermes starting from its geomorphological characteristics, in a discussion that is linked to a study of the territory as a modified topographic landscape, through a series of approximation levels that emerge from there the territorial scale properly says as long as the architectural scale of the buildings, and finally, starting from the main or vital conditions of the city as far as the secondary ones.

Fig. 7. Steps in the graphic coding process of the House of Aqueduct. Upper, from left to right: 3D printout of the photogrammetric survey, 3D Sketchup model and final architectural model. Bottom: 3D model of the final architectural model (graphic elaboration by Carlos Rodríguez Fernández 2015).



Photogrammetric surveys and architectural models

The drone flights carried out in recent years have allowed the acquisition of numerous aerial photographs, whose oblique point of view has offered us a series of largely unpublished data, which constitute a new approach to understanding the anthropic landscape of Tiermes and human interventions in relation to the territory. Another of the products associated with these photographs is the creation of precise photogrammetric surveys of some architectural complexes and with them the generation of three-dimensional models, which open up a new challenge in our research and a new approach.
The topographic information provided by these three-dimensional models requires, like the two-dimensional drawing, a process of interpretation and simplification, of which the research conducted in the House of Aqueduct before the architectural intervention of 2014 are a clear example. The photographic survey carried out shows the topography of the bare rock, at the foundation level: the beginning of the walls, the drainage pipes, the staggered levels between the different rooms, as well as some stairs and warehouses completely dug into the rock, present in the steepest areas. Equally relevant is the legible information on the interaction between the private house and the adjacent public roads, structures also dug into the rock, as well as the drainages and sidewalks. We are talking about a topography that has been completely remodeled by architecture in its favor. Furthermore, the process of natural erosion of the stone has led to a degradation of the structures that in many cases makes the topography practically unrecognizable in the photogrammetric model (fig. 7).
On the other hand, the drawings produced provide significant information on a structure governed by the laws of architectural composition, especially with regard to the construction of the plan: in fact, it is about regular walls and rooms (determined by the different known intended uses) as well as the paths and accesses and their relationship with the public space.

These two pieces of information are complementary: on the one hand, the metric precision and the different altimetric layers provided by photogrammetry; on the other, the geometric precision constituted by the plan already drawn and studied. Through both, a final three-dimensional model is built that exposes the architectural object in a recognizable state, restoring to the wor'n topography the geometry and regularity that are typical of architecture. In the 3D printing of these three-dimensional models, made on a small scale, the differences between the two are noted and it is recognized how the problem of representation is transferred to the world of three dimensions. The original model is closer to the real perception of the object, while the architectural topography represents an idealized situation. Halfway between the two positions, we find the process of representation and, consequently, the process of the architectural project.

Three-dimensional models, a global representation of the landscape

Recently, several more general photogrammetric models have been elaborated, covering wider areas of the archaeological site. The results obtained at present do not provide any relevant information for archaeological research, but they show a certain interest in relation to the contemporary view of Tiermes, seen as a topographically manipulated object with a marked character of plasticity. These spatial scale models give us a general idea of the whole and interpose the necessary distance between the spectator and the landscape to recognize the different elements and establish relationships between them, something that is not possible in a closer and more realistic view.
This collection of models and drawings includes those which, once again, combine morphology with architecture. The topographical relief of the site is superimposed on the most important and largest architectural structures of the archaeological site, such as the late imperial walls, the roman forum and the baths, as well as the main roads and aqueducts, all buildings or infrastructures adapted to the topography, which can be seen underneath them.
The relevance of these general models lies both in this way of explaining the configuration of the landscape as a combination of both factors –artificial topography and construction– and in explaining the constitution of the city from its own topographical condition, on a high hill occupied in its entirety, with the public buildings, forum and baths located in a central position, fortified naturally on the western side and without the need for it in times of tranquility on the eastern side. However, this condition of a defended acropolis was reinforced in the late imperial period, with the construction of a wall that enclosed part of the city on the eastern side, retracting and considerably reducing its size. This issue, which is difficult to understand in a visit that begins with the walls, is reflected in the general patterns (fig. 8).



Fig. 8. Upper: 3D model of the central Tiermes area created from the 2x2 km LiDAR laser survey (graphic elaboration by Carlos Rodríguez Fernández from IGN). Botton: Section and plan of the central area of the Forum and the Roman Baths of Tiermes (graphic elaboration by Carlos Rodríguez Fernández).



Fig. 9. Moralization project and visitor routes in the West Gate area. Plan and aerial photo (graphic elaboration by LAB/PAP).

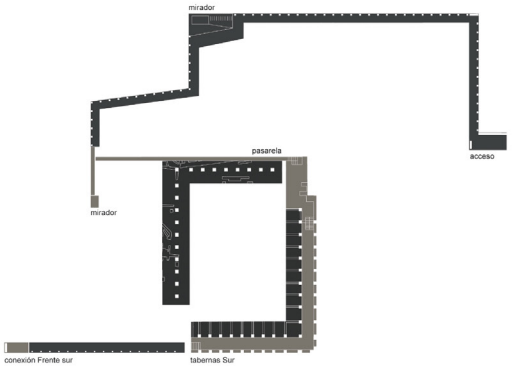
Representation systems and architectural design strategies

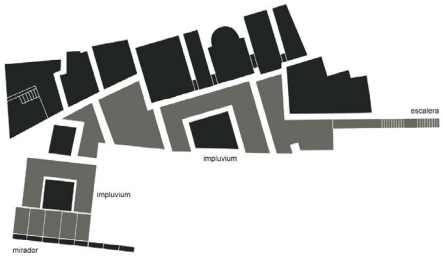
The study of the urban layout was fundamental in defining the system of routes for the enhancement of the south side of the archaeological site, carrying out a detailed analysis of the area from the largest scales to the detailed plans of the different areas, which then guided the choice of the architectural intervention mechanisms.

The design of these intermediate scale plans is based on the existing topographic plan, as well as on previous plans, which are reinterpreted using aerial orthophotos and on-site verifications. This is of decisive importance in the interpretation of a largely unexcavated and undocumented archaeological landscape. The aerial photographs, from different survey campaigns and taken at different times of the day, provide essential information for the identification of architectural structures that would be difficult to discover and interpret on the ground.

Photography in itself constitutes a representation of the territory on a much smaller scale than reality and

Fig. 10. Roman Forum and House of Aqueduct: project (graphic elaboration by LAB/PAP, 2014) and intervention carried out (photo by LAB/PAP, 2016 and photo of House of Aqueduct by Paulo Paiva Fonseca, 2017).









interposes a distance between the spectator and the landscape that contributes significantly to eliminating what obstructs the view, suppressing the most superficial aspects and revealing the true geometry of the remains of the city. The graphic method, using tools as important as geometry and measurement, acquires a predictive capacity in the analysis of the layout and functioning of the city, which yields surprising results that would be difficult to achieve without an archaeological excavation or the use of other documentary sources.

Proof of this is the discovery of a series of urban routes which, even without clear archaeological evidence, can be identified by measuring the depth of the platforms and the position of the buildings on the perimeter, the layout of which corresponds to the remains visible in the photographs and to the logic of the functioning of a Roman public road. By measuring these distances and applying architectural logic, these hypotheses can be easily argued (fig. 9).

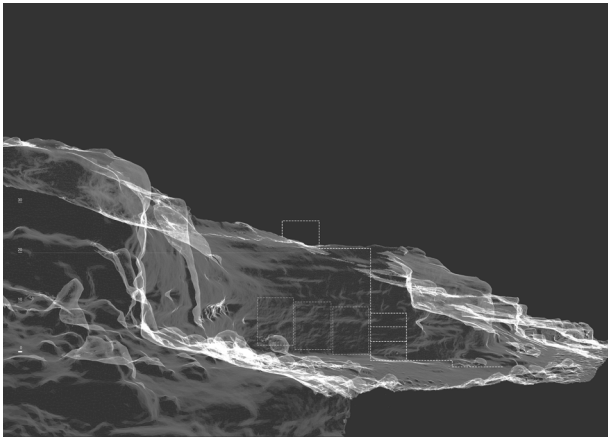
Drawing is therefore an intuitive, agile and easily applicable method in archaeological landscapes such as Tiermes, which almost always lack other archaeological sources or results. In this context, we could say that the architectural project is also halfway between suggestion or prediction and real verification; consequently, it shares with the survey an equally simple system of representation: it brings together lines, knots and more or less intense volumes that complete the graphic survey carried out, trying to make comprehensible what is not seen or has disappeared: a worn platform, a broken profile or an interrupted path, and which the eye and the drawing recompose in logic.

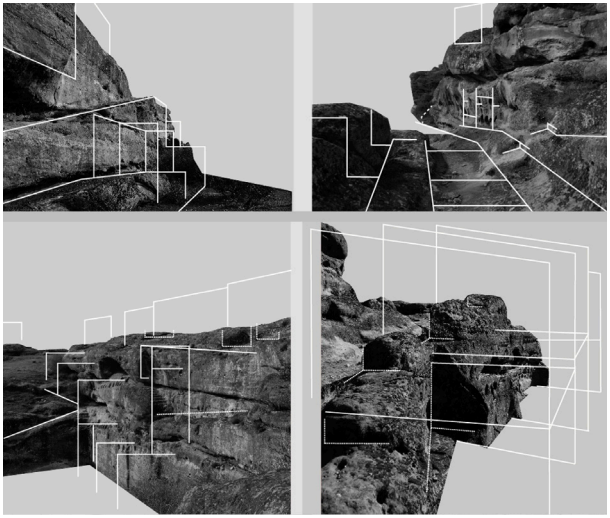
The architectural tools used in the architectural design are therefore largely derived from this same system of representation: the broken lines are transformed into small uprights that delimit the route or are inserted into a system of stone slabs that suggest the path; the intersections are recognized by large milestones, visible from afar, and the continuous lines are transformed into steel platforms that guarantee accessibility to the site.

This essential architectural language is the clear result of the graphic code used and is materialized with stone (the same stone as on the site, but in the form of gabions, a new format that allows it to be identified as a contemporary intervention); Corten steel (intended for the mobile elements, clearly superimposed or cut out in the rock) and concrete (which is configured in prefabricated slabs in colors close to those of the rock). These materials, in permanent dialogue with the sandstone of which the site

Fig. 11. Photogrammetric survey of the south side of Tiermes from a drone flight (graphic elaboration by Carlos Rodríguez Fernández, 2017).

Fig. 12. Graphic reconstructions on the traces of the excavated architecture of Tiermes. (graphic elaboration by Carlos Rodríguez Fernández, 2016).





is composed, ensure that the interventions along the route are perfectly integrated into the landscape, like representation codes on a map (fig. 10).

Conclusions: drawing and the architecture of the void

In such a difficult context, where the artificial topography of the rock is modified as much by ancient constructions and natural erosion as by architecture, contemporary interventions take on the difficult task of preserving the balance between scientific knowledge –that is capable of making the archaeological remains of the ancient city understandable– and, at the same time, enhancing the plastic value of the landscape of the ruins (fig. 11).
The rock and the archaeological remains, in their inseparable condition, find points of particular intensity, voids and trenches that increase the curiosity of the spectator, attracted by the excavated areas and the large incisions in the rock, in a landscape that "thus tends towards the sublime" [Argullol 1983, p. 32]. The viewer's gaze slides through the empty spaces of the Roman city, traversing its trenches, stopping in the rocky cavities, which unexpectedly become frames from which to observe the landscape.
The aqueducts of Tiermes are now trenches to be traversed, entering the telluric world of the rock, generating a new interaction between matter and void, between landscape and archaeology, of great intensity.
These platforms, modeled in the rock and seen from the highest point of view –where the ancient temple once stood– create a perspective that could have perfectly illustrated Jorn Utzon's famous essay *Piattaforme* e *altipiani: idee di un architetto danese* [Utzon, 1961]: the remains of roads and buildings, footprints in the rock that occupy all three dimensions, like the footprints of buildings that have disappeared, evidence of man's presence in the landscape and at the same time of abandonment and the inevitable passage of time.
In this precarious balance between archaeology and landscape, between the interpretation of the remains and the enormous presence of the rock and its traces, drawing is often the best way to combine both conditions, that of a city that has disappeared and that of the city that existed at a particular historical moment.
The graphic representations, like the same architecture used in Tiermes, suggest and complete the hollows of the rock, without altering its permanence or concealing its powerful presence (fig. 12).
Architecture and drawing have the capacity to transform the visitor into an active spectator, capable of interpreting what is still preserved and at the same time discovering in the traces of the rock and in the drawings the passage of time and memory, to the point of constructing with the imagination a personal Tiermes, like a new Calvino at the sight of Argia [Cianci, Calisi 2014]: "What makes Argia completely different from other cities is that instead of having air, it has earth. Earth completely covers the streets, the rooms are filled to the brim with mud, on the stairs rest other stairs in negative, on the roofs of the houses rest layers of rocky soil like skies with their own clouds. Whether its inhabitants can walk through the city, expanding tunnels of worms and cracks through which roots crawl, is something we do not know: the humidity exhausts the bodies and leaves them without strength; it is better to stay still and lie down, everything is so dark anyway" [Calvino 1972, p. 60].

Notes

[1] Pikionis D. (1935). Topografía sentimental. In *Tó 3o Máti*. Cited in Ferlenga 1999 and Álvarez 2011.

[2] Recognised Research Group of the University of Valladolid (Spain). Directed by Darío Álvarez Álvarez and Miguel Ángel de la Iglesia Santamaría with the following researchers : Nieves Fernández Villalobos, Sagrario Fernández Raga, Carlos Rodríguez Fernández, Flavia Zelli, Laura Lázaro San José, Ana Muñoz López and Lara Redondo González.

[3] Working team created by Dirección General de Patrimonio Cultural of the Junta de Castilla y León, in collaboration with the Archaeology Unit of the IE University of Segovia.

[4] Architectural interventions were carried out in the Roman Forum complex (2010), the House of the Aqueduct (2014), the southern branch of the Aqueduct (2018) and the Late Imperial Walls (2022).

[5] Darío Álvarez, paraphrasing the title of Geoffrey and Susan Jellicoe's most significant work, identifies Tiermes as a true 'Landscape of Man' [Álvarez 2015].

[6] Teógenes Ortego mentions this interesting statement by Blas Taracena in his guide to the archaeological site [Ortego 1975].

[7] Irene Nieto Ruiz realises a historical contextualisation of Tiermes in her Trabajo Final de Máster [Nieto Ruiz 2022, pp. 60-61].

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Knowledge, Representation and Communication of the Military Landscape of Sardinia During the Second World War

Andrea Pirinu, Giancarlo Sanna

Abstract

A mastery in the use of tools, methods, and graphic techniques essential for a thorough understanding and representation of cultural heritage has traditionally been recognized in the field of Drawing. Today, this capability is enhanced by the development of digital technologies which, when combined with the latest surveying systems, contribute to the creation of high-value scientific interoperable digital databases. However, beyond the necessity of detailed data acquisition, significant importance is also placed on the communication of architectural and landscape heritage, which distinguishes the various forms of historical settlements. Expressing and sharing the results and findings of these investigations play a fundamental role in raising awareness among those who inhabit these places and are part of them. This process fosters a 'new' sensitivity, an important goal for ensuring the protection of endangered heritage and an essential contribution to preserving its memory. In this respect, the landscape of the 20th-century wars in Sardinia serves as a significant example that is common to the coasts of the Western Mediterranean. It characterizes the urban contexts of Cagliari and La Maddalena and, to a lesser extent, the entire region.

Keywords: survey, representation, communication, historical military landscape, Sardinia.

Introduction

Sardinia preserves an architectural and landscape heritage linked to territorial defense of the highest value. Punic walls and Byzantine garrisons, medieval castles, coastal towers, and modern fortresses have reshaped the island's landscapes up until the first half of the 19th century using local materials and construction techniques shared across the Mediterranean area. Around the 1940s, a sentinel system designed by the Italian Military Engineering Corps was positioned along the entire coastal perimeter. Consisting of about 1,500 reinforced concrete bunkers, this new defense line created an almost uninterrupted network overseeing beaches, lagoons, isolated coves, and major urban centers. These works were conceived according to precise graphic models well-illustrated in the documentation kept at the Archive of the Infrastructure Department of the Army in Cagliari. The territorial scale drawing, developed on IGM maps and stored at the AUSSME (Historical Office Archive of the Army General Staff) in Rome, characterizes the design of the network; this condition directs the two different scales of investigation necessary for understanding this heritage: the architectural scale and the landscape scale. The former focuses on the dimensional, geometric, constructive, and material cataloguing of the models, while the latter on the analysis of the choices that determined the position and function of the defensive sectors and individual architectures. Recognizing and analyzing the existing models involves a series of interconnected operations

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aimed at creating interoperable and multi-scalar graphic models. This result is achieved through the reworking of heterogeneous base material consisting of current and archival graphic and photographic documentation, historical cartographic productions compatible with those available on the RAS portal, and field operations carried out with traditional techniques, laser scanner surveys, and UAV photogrammetric surveys. These UAV systems can observe the selected sites from a privileged vantage point, often characterized by degradation or reduced accessibility. During these operations, it is necessary to reflect on the limits to which data recording accuracy should be pushed if one of the objectives of the survey is to develop graphic forms that are simple to understand and share, especially enriched by a perceptual component related to the human dimension. In this context, it is worth considering Vladimiro Valerio's 2014 statement in his essay conclusion, asserting that: "the primacy of accuracy over expressive clarity is a fairly recent communicative and cultural derailment worth reflecting upon" [Valerio 2014, p. 91].
Previously we have highlighted the possibility of documenting heritage through digital graphic models characterized by remarkable precision and reliability. Among these, recent applications using UAV systems [Pirinu et al. 2021; 2022; 2023] and some integrating laser scanner surveys with photogrammetric surveys [Empler et al. 2022] for the study of 20th-century military architectures are noteworthy. This latter combination is necessary when intending to acquire comprehensive documentation of both the architectures and the context

Fig. 1. Selection of models in the containment arc of Quartu Sant'Elena (photos by Andrea Pirinu, 2017-2024).



in which they are embedded. 'Embedded' is the most appropriate term since we are dealing with 'industrial' models characterized by a significant underground portion necessary for *camouflage*.
The result obtained through digital surveying is undoubtedly of great interest for the study and protection of these defensive systems and serves as a useful support for all territorial transformation activities. However, it is the result of computer procedures that risk neglecting a necessary component for the study of the landscape that derives from direct experience: the perception of the place. Moreover, the outcome of digital processing, performed with automatic or semi-automatic procedures, produces graphic models accessible only to specialists, excluding from the debate those who are an integral part of these places and live there daily. Therefore, today's opportunity and challenge may lie in designing a graphic model derived from high-level computer procedures but characterized by easy-to-understand and immediate communicative graphics. These graphic expressions can, due to a data base acquired through highly performing digital tools, based on the set objectives and following a simplification operation, present less accuracy and produce a product useful for critical reflection and broad sharing. This operation does not result in a loss of information since the data acquired through digital tools are stored in an interoperable database, open to incorporating new multidisciplinary contributions, and even unconventional graphic forms.
Here lies the peculiarity of a 'hybrid' model, which is not a novelty as a tool for representing architecture [Parrinello et. al. 2019] and territory but today acquires new strength and meanings due to the available IT resources. The possible dynamic reading through digital tools meets the specificity of a constantly changing landscape, a complex and mutable element that can be conceived as a layering of informational strata [Colaceci et al. 2022] that must necessarily include and comprehend the 'time' variable. Therefore, the 'hybrid' model offers a break from the "uniformity in digital representation" [Pirinu et al. 2023, p. 304] since the inclusion of analogue drawings within a digital product facilitates the inclusion of the designer who becomes part of the place, participates in the construction of the scene, and adds unique connotations related to direct experience.
The proposed case study, located in the territory of Quartu Sant'Elena (CA), falls within an activity that for

over a decade has involved a comparison, within an Erasmus protocol, with similar experiences conducted in Spain [Martínez-Medina 2016] and constitutes the theme of a doctoral research involving the University of Cagliari, the University of Alicante, and the University of Rome, La Sapienza. The path undertaken so far has allowed for the recording of structures present along the Mediterranean coasts of Spain and Sardinia through predominantly planimetric graphic schemes and the initiation of an interesting typological catalogue. Census, cataloguing, and initial comparisons were subsequently integrated with surveys conducted at the landscape scale using UAV systems integrated with field reconnaissance [Pirinu et al. 2021]. This extension of operations to the landscape context has favored the acquisition of data relating to territorial contexts and their potential in terms of recovery and reuse. The outcome of an experiment aimed at forms of documentation containing scientific rigor and communicative capacity is a mosaic of graphic models with different levels of detail, where the military landscape is proposed as a stratification. This succession of reading plans can be identified, observed, represented

Fig. 2. Map IGM used by the Military Engineering for project representation. The bunkers highlighted are no longer existing or they are embedded in the current building fabric and not visible.

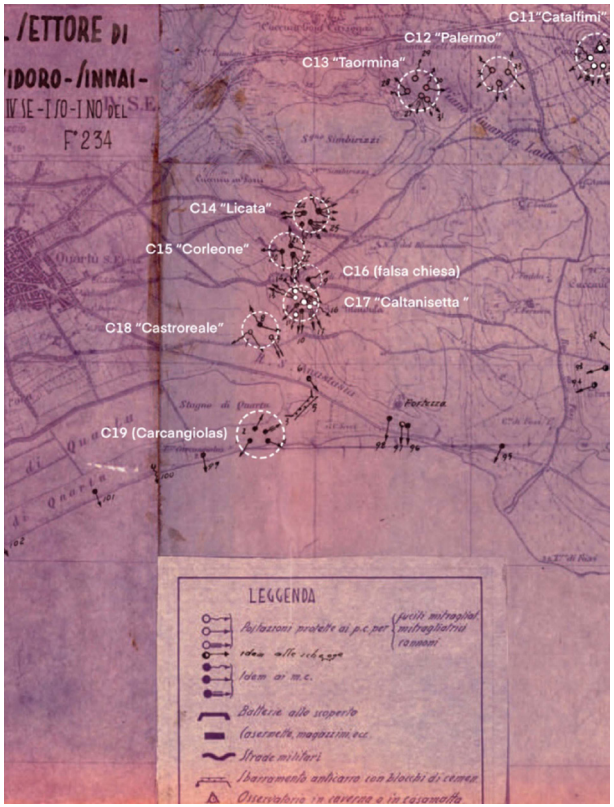


Fig. 3. Identification on a RAS map (1989) of the studied strongholds (graphic elaboration by Giancarlo Sanna).



and communicated through the integration of multiple information levels, where each layer represents a different aspect of the natural and built environment, which the 'hybrid' graphic model allows to observe individually and relate with the other layers and with the whole system.

The Containment Arc of Quartu Sant'Elena (1942-1943)

The containment arc of Quartu Sant'Elena was constructed between 1942 and 1943 based on a design by the Italian Military Engineering Corps. The defense line, composed of smaller structures compared to the models of the Atlantik Wall [Virilio 2012], was created with the aim of opposing an Allied landing and protecting the urban, agricultural, and industrial areas within the territorial context of Cagliari, the island's capital. This line consists of 107 reinforced concrete defensive structures, in addition to other military buildings such as observation posts (Cala Regina, Nuraghe Diana, Fortress) and the "C165 Capitana" and "Faldi" batteries at "Torre Mortorio" [Grioni, Carro 2014], organized into 19 strongholds. These strongholds comprise different design models and armaments based on their control tasks. The survey of existing structures has so far revealed a predominant abandonment of this architectural heritage, which nonetheless shows a fair state of conservation.

This contribution focuses particularly on a portion of the containment arc, specifically the strongholds located near Lake Simbirizzi, overseeing some access routes to the city of Quartu Sant'Elena. This sector has not been affected by the extensive urbanization that has characterized the Quartu countryside in recent decades and presents significant landscape interest. The investigation included a sequence of operations, such as the analysis of historical cartography and the survey of existing structures to acquire their dimensional, constructive, and landscape characteristics. This allowed for the completion of the cataloguing and comparison with archival drawings. Maps based on 1:25,000 scale IGM cartography constitute an important documentary source preceding field operation. A preliminary reading of the maps shows that the protection of Quartu Sant'Elena was entrusted to a network of small bunkers adapted to tactical and camouflage needs. This latter requirement led to the creation of unique design solutions and specific research interest.
Rural houses, tanks, and small religious buildings are some of the uses found in the countryside near Lake Simbirizzi and along the communication routes between the urban center and the cultivated fields to the east (fig. 1). The models constructed along the coast, ready to oppose an Allied landing, propose simpler designs that combine circular or quadrangular shapes (sometimes different from those indicated in archival documents), with the only exception of particular

Fig. 4. Aerial view that allows to distinguish 3 of the 4 bunkers belonging to the XIV "Licata" (photo by Nicola Paba).



Fig. 5. Aerial view of the fourth bunker belonging to the "Licata" and located near the shore of Simbirizzi Lake (photo by Nicola Paba).



interest being the reuse of the ancient Carcangiolas tower on Poetto beach and the Nuraghe Diana in the Is Mortorius area. The variety of formal solutions and adaptations to the site's topography, and their grouping into strongholds, determines the field operations and the creation of different areas of investigation. The first area (figs. 2, 3) is located between the coastline, the hill of Pitz'e Serra, and Lake Simbirizzi, consisting of the strongholds named "Licata", "Corleone", "Caltanissetta", "Castroreale" and "Carcangiolas", dedicated to controlling the numerous connecting routes between the Cagliari area and the territory. Most of these strongholds appear to be preserved, except for the "Caltanissetta" stronghold, which is obscured by recent construction.

Integrated Survey for the Study of the Military Landscape. The "Licata" stronghold

The "Licata" stronghold (figs. 4, 5), located not far from the urban center of Quartu Sant'Elena, consists of four bunkers, three of which are partially buried and positioned along the southeastern slope of a small hill overlooking Lake Simbirizzi. The fourth bunker is currently situated near the lake shore and is inaccessible as it is within private property. The study of this sector, as anticipated in the general discussion, requires the application of integrated methodologies at different scales of analysis.

Fig. 6. Strongholds XIV "Licata". Orthophoto obtained from the photogrammetric survey [Pirinu et al. 2022, p. 51].



After the analysis of the IGM map and an initial site inspection, the work program included a sequence of survey operations aimed at acquiring a comprehensive database that encompasses the architectural, technical-constructive, and landscape characteristics of the investigated sector. To this end, the execution of sketches and landscape readings through live drawing were combined with laser scanner scans, useful for recording the interior spaces of individual structures, and photogrammetric applications using a drone, necessary for acquiring the external 'skin' of a stratified landscape. Laser scanner surveying and UAV application specifically allowed the connection of internal and external metric and spatial information of the individual bunkers, as well as an understanding of the adaptation of the design to the site's morphology, thus the intersection between nature and artifice. The obtained data thus enabled a deeper understanding of the current state of the sites but, more importantly, facilitated the recognition and comprehension of the design choices defined from the graphic schemes present in the manuals prepared by the Italian Military Engineering Corps.

From an operational perspective and with reference to the tools used, the instrumental survey was conducted using a Faro Focus M70 laser scanner, specific for short-range applications, with a resolution of 12mm at 10m, sufficient for the intended objectives, i.e., architectural scale surveying. The reconnaissance was completed using 16 stations, 13 internal and 3 external, the latter necessary to connect the laser scanner survey to the photogrammetric survey.

Data acquisition for photogrammetric purposes was conducted with a DJI Spark drone, equipped with a 12.4 Mpx camera with a 4:3 aspect ratio and a 4.49 mm f/2.6 lens, equivalent to 25 mm on a Full Frame (35 mm) format. To achieve at least 1 cm of GSD, nadir shots were taken at a constant flight altitude of 15 m from the ground, while oblique photos were taken at 10 m from the surfaces. Once field operations were completed, the data was processed using Agisoft Metashape Professional software. With the SfM (Structure from

Motion) process, recognizable elements (Key Points) and matching points (Connecting Points) were identified, and then a Sparse Cloud was defined, processed to correctly align all images in the process. The data processing produced a Sparse Cloud of 650.000 points and a Dense Cloud of 24.000.000. The Dense Cloud was then processed with Cloud Compare software using subsampling, noise reduction, and SOR filter tools. The digital model thus obtained allowed the production of various outputs, including orthophotos, axonometric and perspective views, and environmental sections (figs. 6, 7) representative of the individual bunkers and their context. However, this initial series of models still does not allow a comprehensive reading of the military landscape. The completion of the investigation indeed occurs with the integration of the two processes attributable to instrumental and photogrammetric surveying.
Now the data acquisition is complete but the further objective of a representation capable of communicating results, through 'simplified' graphical models, to a wide range of users has not yet been achieved; this is achieved through the 'hybrid' drawing, which helps reduce the complexity of the digital survey and offers a mosaic of reasoned summaries that express and communicate the characteristics of the site.

Representing and Communicating the Military Landscape

Upon completing field operations and reprocessing the acquired data, we have a high-quality digital database capable of providing detailed information on individual bunkers and the landscape context, as well as creating a mosaic of graphic models useful for narrating the military landscape. These representations illustrate the shapes, internal and external volumes, and the materiality of these industrial objects set in the natural environment or anthropized landscape, and essentially, analyze the design at various scales of interpretation.

Fig. 7. Digital models of the Bunker N. 25 belonging to stronghold XIV "Licata" (graphic elaboration by Nicola Paba).



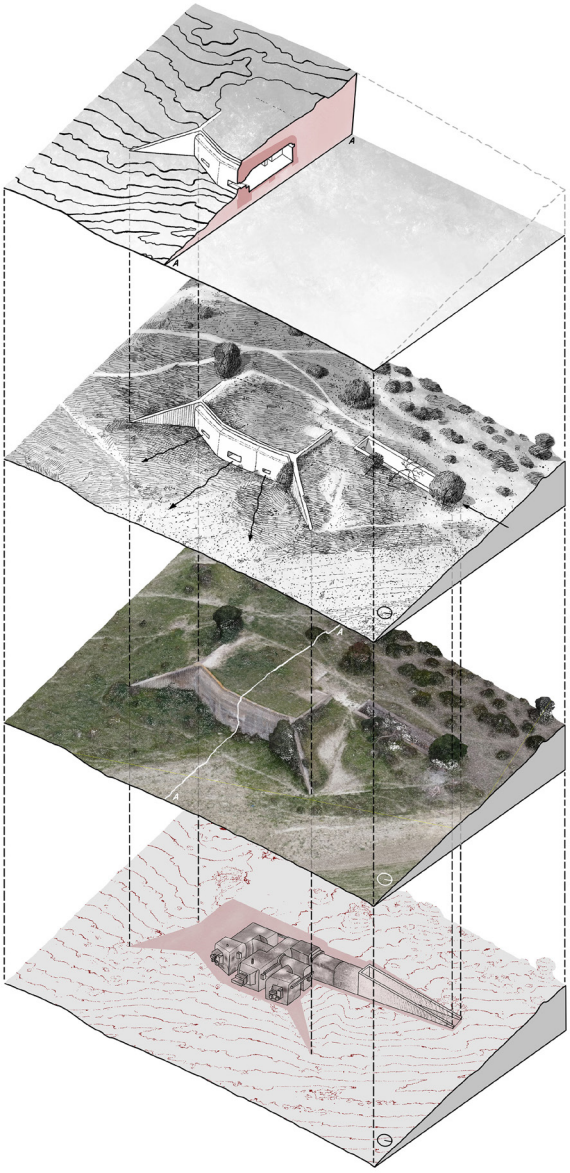


Fig. 8. Representation of the military landscape. Stronghold XIV "Licata" (graphic elaboration by Giancarlo Sanna).

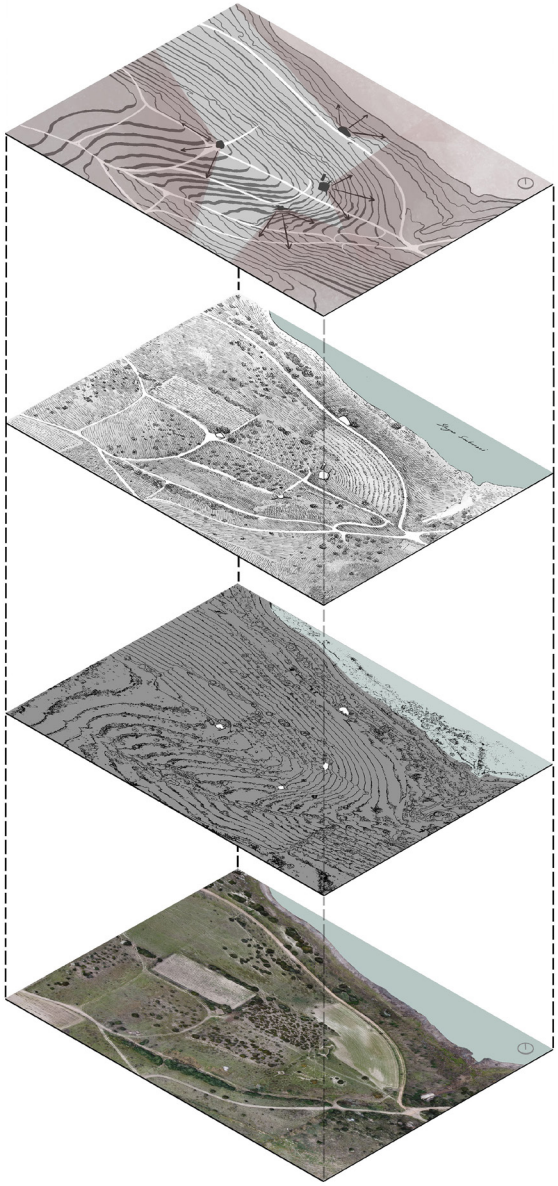
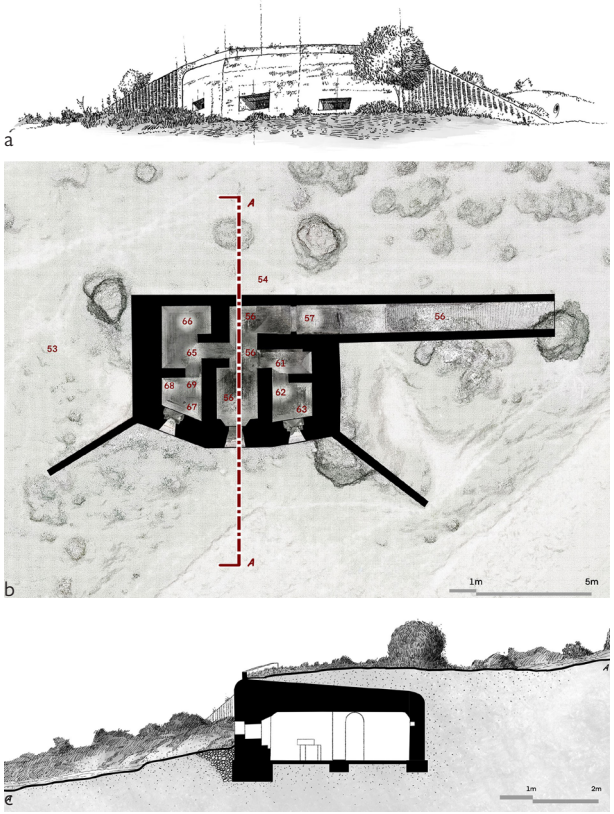


Fig. 9. Representation of the military landscape. Stronghold XIV "Licata", Bunker n.25 (graphic elaboration by Giancarlo Sanna).

A further step promotes the understanding and sharing of the results. This involves the decomposition and recompositing through the redrawing of digital models according to separate thematic reading planes, each represented individually (figs. 7, 8) to facilitate understanding the relationships that link the individual themes and each to the whole, according to the principles of the structuralist current [Docci, Chiavoni 2017]. The very nature of digital surveying allows isolating different informational levels and integrating them with graphic forms attributable to traditional drawing. The result is a 'hybrid' representation that combines the metric reliability of digital surveying systems with the communicative power of freehand drawing. In the proposed case study, the digital model of the entire stronghold XIV "Licata" (fig. 8) was 'dismantled' and highlighted the site's morphological characteristics, the road network, land use, and the positions of the individual bunkers and their visual cones, one of which was built entirely above ground. In this case, the redrawing with an IPAD using the Procreate application resulted in a grayscale synthesis, where the marks of cultivated fields and uncultivated areas are interspersed with a dense network of paths connecting the small concrete structures. A further elaboration produced an image that replicates a 'three-dimensional' map, strongly reminiscent of a model, a tool still widely used by designers today, showing the position of the bunkers within the entire sector. Through a similar process of decomposition and intersection of graphic models, an architectural scale sequence of informational planes (fig. 9) was created to examine the direct relationship of the structure with the terrain, also integrated by traditional drawings (fig. 10a). The insertion of the model, obtained from the combination of instrumental and photogrammetric surveying, allowed to observe the composition and the constructive/functional scheme of the internal spaces of bunker no. 25 belonging to the stronghold (fig. 10b).
Finally, a sectional operation (fig. 10c) highlighted the correspondence, in terms of shapes, thicknesses, and site positioning, between the built work and what was prescribed in the archival documents (fig. 11). These distinct readings, but in constant dialogue with each other, can be compared to panels in a comic strip. Taken in isolation, they have individual value; however, it is in their sequence and comparison that they gain strength, much like the panels that, put together in a storytelling, narrate a story with greater coherence, richness, and communicative capacity. This method is perfectly suited, even though diachronic readings, to the representation of a system in continuous modification such as the landscape.

Fig. 10. Bunker n. 25: a) sketch from life; b) plan with indication of the instrument stations; c) section and landscape context (graphic elaboration by Giancarlo Sanna).



Conclusion

The military heritage of World War II in Sardinia represents an important historical, cultural, architectural, and landscape legacy. Its preservation requires, first and foremost, a thorough understanding of the existing heritage; this action, in turn, requires the use of integrated

procedures for surveying and representing architecture extended to the landscape scale. The investigation protocol applied to the study of Compartment XIV "Licata", part of the Containment Arc of Quartu Sant'Elena, a town not far from the island's capital, highlighted the reliability of digital surveying in terms of data acquisition capabilities and the potential of a 'hybrid' drawing, which integrates digital and traditional techniques, for communicating a multi-layered, complex, and continuously changing system. The forms of representation and the outputs extractable at various scales of interpretation from the knowledge database, in comparison with archival documentation, have also allowed for a deeper understanding of the current state of the sites and the design characteristics of the defensive compartments and individual bunkers, a necessary step to promote recovery and enhancement actions, even within cultural itineraries.

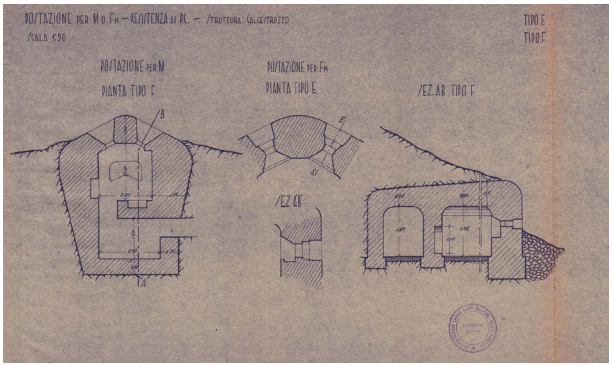


Fig. 11. Archive document showing a fully buried solution with only two artillery openings facing the landscape to be checked (Archive of the Infrastructure Department of the Army of Cagliari).

Acknowledgements

We would like to thank architect Nicola Paba and architect Raffaele Argiolas, members of the research group, for their qualified participation in the photogrammetric and instrumental surveying operations.

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Towards the Regeneration of China's Rural Landscapes. Zhang Ke's Achitectural Acupuncture in Tibet as a Case Study

Simone Barbi

Abstract

In contemporary China, the historicity of places fears a fate like Yang Yongliang's 'Phantom Landscape' series, which envision the dystopian consequences of the hyper-construction syndrome and market frenzy of late 20th century China. Nevertheless, the allure of cultural tradition still attracts the interest of a minority of independent firms that today embody the best practices in architecture, urban planning and landscape design in the country. In this scenario, in little more than five years, starting in 2007, ZAO/standardarchitecture has constructed a constellation of buildings in the Linzhi area of Tibet, with which it has responded to the request to boost the local tourist vocation with new accommodation facilities, experimenting with different forms of dialogue with the landscape of this remote autonomous region of China. The 'pressure points' of the architectural acupuncture prepared by Zhang Ke, owner of the indipendent firm founded in Beijing in 2001, are small- and medium-scale interventions that stand out for their 'archaic' modernity and for their profound understanding of the possibilities concealed in the interaction between architecture and indigenous building knowledge and techniques. Topographical sensitivity, with an almost geological matrix, inspires the settlement strategies of these architectural fragments, guaranteeing, without apparent effort, their sublimation in the hosting landscape.

Keywords: landscape, Cina, ZAO/standardarchitecture, natural stone, regeneration.

Dystopian visions

In 2006, artist Yang Yongliang began a series of figurative works, created with digital techniques, inspired by traditional Chinese landscape painting. The title of this successful research is *Phantom Landscape* [1], which engaged the artist until 2008.
Using "images of architecture as brushstrokes" [Yang 2006] [2] spread out to saturate the heavy mountain rocks, with profiles identical to those of the paintings of Song dynasty masters [3] such as Wang Ximeng [4], Dong Yuan [5] or Li Cheng [6], the artist prefigures immense rural megalopolises: dystopian landscapes that manifest the feeling of concern of a generation. After witnessing the destruction of historic districts in major Chinese cities, this generation fears for the future of its internal landscape.

Whereas ancient painters depicted landscapes to celebrate the grandeur of nature, Yang's works unmask the aggressiveness of the Chinese construction industry at the end of the 20th century –perpetrated for at least thirty years between the 1980s and the early 2000s and described by Arbasino as "alarming, with atrocious and shameless visual forms" [Arbasino 1998, p. 41]– with the aim of prompting a critical reevaluation of contemporary reality [Li 2016].
This seminal work was to be followed by others, similarly fascinating as they were disturbing, always realized as a series –Artificial Wonderland (2010); Moonlight; Artificial Wonderland II (2014); Journey to the dark (2017)– concerned with the same themes of hyper-growth and land consumption.

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Since 2019, with the work Sitting alone by the stream I, the dystopian tone of Yang's visions changes; the artificial mountains of Song's inspiration are no longer the result of an asphyxiating superposition of buildings, towers, infrastructures, antennas, cranes, but acquire a naturalistic dimension of unprecedented serenity; almost as if to testify to a rediscovered faith in the future, perhaps justified by the quality of the work carried out by a large group of young, independent architects who, during the first twenty years of the 21st century, were able to experiment with another modernity [Xue, Ding 2018; Pagnano 2022, p. 66], in tune with tradition and respectful of places (fig. 1).

Fig. 1. Detail of the Namchabawa Visitor Cente and its relationship to the landscape. Credits: ZAO/standardarchitecture.

Fig. 2. Construction site photo during the construction of the Niyang River Visitor Centre. Credits: ZAO/standardarchitecture.





The protagonists of this quiet revolution have been young Chinese architects who, after completing their studies in their own country, often followed by significant further training in Europe or the United States, decided to "take advantage of the many opportunities offered by 'market communism' to experiment with an alternative dimension to the chaotic and identity-free image of contemporary architecture in China" [Bucci, Vercelloni 2011, p. 21].

How to regenerate: two possible directions

The image of the contemporary Chinese megalopolis – whose density and impact on the human scale, or the linguistic schizophrenia of architectural episodes, were masterfully represented by the photographic works of Weng Fen [7] at the beginning of the new millennium– has recent origins; and the Beijing Olympics showdown, with the completion of the OMA CCTV, marks an important breaking point.
The slowdown of China's economic momentum, which culminated in the fall of 2023 with the financial collapse of state-owned giants in the construction industry like *Evergrande*, along with the saturation of cities –a result of a capitalist frenzy that, in building the present, recklessly destroyed large portions of the past, thereby compromising the future of its own memory [Shu 2013, p. 47]– has led China to invest resources in regenerating what already exists rather than continuing to consume land and build anew.
With great benefit to the community of independent firms led by architects born between the 1940s and the 1980s, who are sensitive to their disciplinary traditions and trained in the legacy of the Modern Movement, the future of Chinese architecture lies in a return to tailored, auteur-driven work, seeking a quality that was previously sacrificed for quantity, rather than continuing the expansion of megalopolises.
In the insightful analysis presented by historian Xiangning Li at Harvard in 2016 [Li 2016], the future of Chinese architecture can be seen as moving in two main directions: urban regeneration –understood as the transformation and reuse of existing buildings or the conscious introduction of traditional spatiality, techniques, and materials in new public and private architecture– and the development of rural areas.

Zhang Ke or "'Chineseness' Means Nothing to Us"

With the real estate market in major cities managed by state design institutes, these independent architects, when not working on smaller-scale projects in the suburbs, often found themselves operating in rural areas, which are less industrialized and high-tech. Observing the early results of this shift, Joseph Grima noted that the most interesting projects seemed to be those that had "abandoned any reference to the restrictive notion of 'tradition' to focus instead on the conceptual contextualization of their work, allowing themselves to be influenced by the limitations and opportunities provided by the locally available construction methods" [Grima 2008, p. 14].
Years later, during the conference *Recent Projects in Rural China* [Fung 2018], Professor Stanislaus Fung highlighted the influence of three architects –Liu Jiakun, Li Yichun of Atelier Deshaus, and Zhang Ke of ZAO/standardarchitecture– considered particularly important for having introduced construction-oriented approaches in contemporary Chinese architecture. These architects emphasized the role of building techniques as central to their design philosophy (fig. 2).
In an early interview, Zhang Ke confirmed this focus and described it as a potential justification for a broader research horizon, stating: "we are no longer interested in imitating the stylistic traits of the big names in Western architecture […] and we don't care about trying to distinguish or characterize Western architecture from Chinese architecture, nor do we think in generational terms. The idea of creating something truly Chinese just for the sake of showcasing it in the West doesn't concern us […] in this sense, 'Chineseness' means nothing to us. What matters more is introducing concrete innovations into the construction process. At some point, we might establish a dialogue with tradition and explore new ways of using traditional materials, but this is not an essential condition" [Grima 2008, p. 42].
In this context, in 2007 –just a year after the dystopias of Yang Yongliang's first Phantom Landscapes and a year before being included in Instant Asia, an important showcase publication featuring future leaders of world architecture from China, South Korea, and Japan– the young architect Zhang Ke [8], born in 1970, began a coherent body of projects located in the extreme landscapes of rural China, specifically in Linzhi, an autonomous region in Tibet.
This experience allowed him to embark on his own personal research, which can be positioned within the thematic frameworks of critical regionalism [Frampton 1983] and critical pragmatism [Xiangning 2016; 2018; 2023]. His work contributes to shaping a contemporary Chinese architectural modus, combining a sensitivity to local context with a pragmatic approach to construction.
Through a reconfiguration of the landscape, initiated by the creation of a diffuse infrastructure consisting of numerous scattered civic buildings across the territory –designed as architectural 'pressure points' that impose a minimal footprint on the sites and are strategically located– Zhang Ke's work in the Linzhi region not only supports the economic and social revitalization of a landscape in crisis but also serves as an exemplary case study of the concept of architectural acupuncture [9]. This approach is worth exploring for its potential replicability in the regeneration of abandoned rural areas.

Bringing experience into form

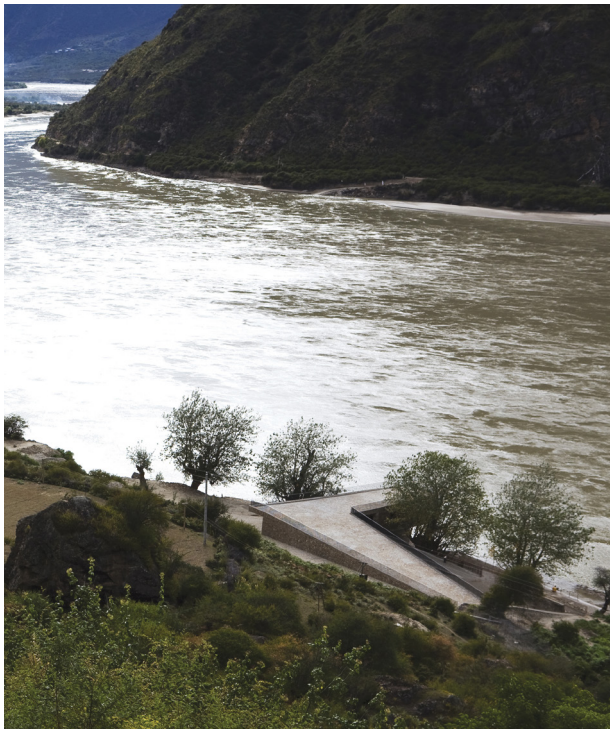
Not assuming that the construction process can be precise, Zhang Ke develops what he calls a "phased design, where the second phase corrects the mistakes of the first, and the third corrects those of the second" [Fung 2018]. In a lecture at Harvard [Ke 2016], he elaborated on this concept, embracing a 'visual logic of imprecision' in his works. He described his design approach as a 'design of tolerance', which stems from a 'protected continuity' rather than a pre-designed one, achieved by giving workers significant freedom

Fig. 3. Namchabawa Contemplation (overall view). Credits: Chen Su.



in defining the details of his projects. To accomplish this, Ke explained, "you have to know the contractors and understand the local construction skills you can find and use them in the project" [Ke 2016] [10].
The masonry of the buildings in Linzhi exemplifies this method: emerging only at the conclusion of the construction process, they were "impossible to design on paper!" [Ke 2016] [10]. Instead, they were 'designed on-site' by local villagers, renowned for their skill in cutting and assembling the stones of the 'mani' [11], the traditional Tibetan stone structures used for prayers and inscriptions.
This attitude, which can be described as a "bringing experience into for" [Pasqualotto 2001a, p. 57; 2001b, p. 15], draws Zhang Ke's research closer to the ancient Chinese *modus*, already the foundation of traditional thought and the archetype of *Shan-Shui* pictorial art [12].

Fig. 4. Yarlung Tsangpo River Terminal (fifth façade and its relationship with the river). Credits: Chen Su, Wang Ziling.



An indigenous modernity which aspires to be "extremely contemporary without shouting it out" [Ke 2016] [13]; where the somatic features of the new –hence the characters, the materials and the way of working and laying them– derive from the indigenous ones –purged of vernacular accents thanks to a geometric simplification aimed at the abstraction of the exempla of the Modern– because he is convinced that "despite the tension towards its global affirmation […] architecture is still a very local practice, after all" [Ke 2016] [13].

Along the Grand Canyon of the Yarlung Tsangpo River

"The 'noble man' finds his joy
[in] the mountain and [in] the water".
[Confucio, ***Dialoghi***, VI, 21, p. 109]

The Linzhi area is in the southeast of the Tibet Autonomous Region in China, at the foot of Namchabawa, a mountain 7,782 m above sea level, near the Yarlung Tsangpo, the river that flows at the highest altitude in the world.
In this area, in just over five years, ZAO/standardarchitecture has managed to construct a constellation of small and medium-sized buildings –Namchabawa Contemplation (2008); Yarlung Tsangpo River Terminal (2008); Tibet Namchabawa Visitor Centre (2008); Niyang River Visitor Centre (2010); Grand Canyon Art Centre (2011); Yarlung Tzangbo River Hostel (2013); Niang'ou Boat Terminal (2013)– which, responding to the demand to enhance the local tourist vocation with new accommodation facilities [14], have distinguished themselves for their construction quality and deep understanding of the possibilities that lie in the interaction between architecture and indigenous characteristics of the place.
Ke's landscape design in this Tibetan series is an *ensemble* of autonomous elements; differing in orientation, in the relationship that the sections establish with the site, in the geometries that govern their plan compositions, and in the *dispositio* of the volumes or parts that compose them.
The seven 'pieces', of which at least four are river architectures while the others are located inland, differ in size –the interior spaces vary between 400 and 7,500 sq m– and settlement approach; while all are united by the totalizing use of local stone in the façade and in the paved parts, finished with wooden fixtures and details and simply plastered interiors.
The Namchabawa Contemplation (fig. 3) is a zero-volume intervention, obtained by redefining a pre-existing plateau, located near an ancient, sturdy mulberry tree, one thousand

three hundred years old. Paved with white gravel, on which megalithic boulders and new benches made from roughly cut blocks arranged in two rows stand out, this contemplation space located along a scenic road, constructs the ideal space from which to contemplate the leap in scale of the nearby peaks and begin to become aware of the landscape.
The Yarlung Tsangpo River Terminal (fig. 4) is a pier located near the small village of Pai Town. Its simple L-shaped volume rises from the ground like an inhabited ramp that wraps around a series of poplars, then descends to the various levels of the river, which varies by as much as 8 m in a year. The very simple functional program –public toilets, ticket office, waiting room and a hall, which can be used as guest quarters– is resolved with pathways and terraces that follow the contours of the levels, accompanying visitors from the riverbank to the rooftop belvedere, suspended over the water.
The Tibet Namchabawa Visitor Centre (fig. 5) is in Pei Town, on a slope between the river to the north and the Namchabawa peak in the background to the east, next to the road leading to the last village, Zhibai, deep in the Grand Canyon of the Yarlung Tsangpo. It is a visitor's center that is also used as a civic center, reservoir and thermal power station for the local community, as well as a supply base for hikers. The building is designed as a series of stone walls set into the slope, rotated with respect to the access road parallel to the river, in the direction of the valley. To handle the required functional complexity, the building was set up as a system of volumes of different heights, made of straight, one-meter-thick concrete walls faced with local stone.
The Niyang River Visitor Centre (fig. 6) is a small tourist reception center, located near the village of Daze, along the Mirui path; a tourist road that connects Tibet to the province of Sichuan. Along the Niyang River, in the 20 km leading to the Brahmaputra Canyon, one arrives at this isolated pavilion. It takes the form of a large, irregular, porous boulder, hollowed out in the roof and on the sides by five deep frames opening onto as many horizons. The central courtyard connects four openings, which house different functions: a ticket office, a changing room for rafting and toilets. The construction employs and develops traditional Tibetan building techniques: the masonry is load bearing, composed of thick stone; the roof is obtained with two frames of beams of different sizes and covered with a monolithic 15 cm layer of clay, in accordance with the Aga technique.
The Grand Canyon Art Centre (fig. 7) is located at an altitude of 2,900 m at the entrance to Pai Town, opposite the Tibet Namchabawa Visitor Centre. The site faces Duoxiongla

Fig. 5. Namchabawa Visitor Center (overall view of the north-west elevation). Credits: ZAO/standardarchitecture.

Fig. 6. Niyang River Visitor Centre (overall view and relationship with the river). Credits: Chen Su.

Fig. 7. Grand Canyon Art Centre (overall view and relationship with the mountains). Credits: ZAO/standardarchitecture.







Mountain to the south and the Yarlung Tzangbo River to the north; Namchabawa is visible to the east. Seen from a distance, the building resembles an abandoned quarry, or a deposit of dormant boulders detached from the mountain. Identifiable with the 'plate and tower' type, the two-story composition of the exhibition plan libre is based on an irregular polygonal grid.
The Yarlung Tzangbo River Hostel (fig. 8), located along the slope of the river, near Pai Town, near the River Terminal built in 2008, is the largest and most architecturally challenging of the seven. More than 7,000 sq m of covered area accommodates one hundred rooms and communal facilities, distributed over four different levels, in nine bodies on one floor each. The volumes, covered by earth, shrubs and rocks, seen from the river, have convex façades, whose continuous glazing, set back in the shadows, is overlaid by a thick stone band; while the fifth façade picks up on the soft, irregular geometries of the nearby terraced rice fields. In the words of the designer "seen from afar, the hostel disappears like a few thin leaves floating down the river" [Zhang 2015] [15].
The Niang'ou Boat Terminal (fig. 9) is a successful attempt to deconstruct a complex program by distributing it across the landscape, over a 29 m drop, and presenting it as a piece of land art [16]. It is a zigzagging path in which each twist forms a platform, serving not only as a transition between circulations, but also as a pause for contemplation. Cut into two parts by the highway, the high ramp organizes the car park, staff dormitories, offices, conference rooms and theatre, forming a wide platform at an altitude of 3,000 m, guiding the visitor's gaze towards the magnificent meeting of the rivers. In the low ramp, which ends with a quay next to the water, are the ticket office, toilets, waiting room, canteen and kitchen. The main body of the terminal consists of a concrete frame, filled with rubble and stones collected from around the site.
All of these are architectures that are characterized by a certain 'archaic' modernity and a topographical sensitivity with an almost geological matrix. These are the manifestations of ideas that seek to root themselves in places, not by rewriting the vernacular characters, spatial or distributive, of pre-existing local exempla, but by privileging the dialogue with the orography through a careful re-foundation of the ways in which they are attached to the ground.

Drawing with landscape

In architecture, the way of representing the landscape in an operational way –specifically the relationship between terrain-building-context– finds its best tool in the cross-section.

Fig. 8. Yarlung Tsangpo River Hostel (fifth façade and relationship with the river). Credits: Wang Ziling.



If with the frontal section one shows the new 'face' of the existing building, one only partially grasps the measures and relationships between the things that make up the 'flat' and distant picture of the landscape; in the cross-section, the ground line gives back the characters and qualities of the places, allowing the designer to com-prehend them in the project. Through the cross-section, which can accurately hold together both the scales of the landscape in its elevational development and that of the individual buildings, the designer is able to control the measurements and relationships between the parts and the whole and determine exactly how to settle and build.
By observing these case studies as a single collective work, it is possible to derive a taxonomy of the different settlement strategies experimented to construct a useful toolkit for architectural design thinking (fig. 10).
There are five identifiable modes.
With the emergent embedding or 'vertical outcrop' the building and ground are welded together, keeping them distinct; to uncover volumes and make them visible according to a figure-background logic. The orientation of the building with respect to the contour lines is necessarily determined, and therefore to be determined on a case-by-case basis, by the specific environmental conditions, but by favoring a counter-soil position one can more effectively confirm the initial intention of enhancing the architecture.
With the protruding or 'horizontal outcrop' the volume of the building can be broken down to adapt it to the slope of the terrain, making it appear as an out-of-scale geometry of the orography. In this case, the long-sloping layout, parallel to the contour lines, allows the building to integrate with the terrain, going so far as to hide from it in extreme cases.
The 'Suspension' raises the body of the building to gain an unprecedented vantage point over the landscape, and, by drawing a greater permeability to the ground plane, characterizes the building's ground connection with extraordinary inter-exterior spaces.
With the 'superimposition', which can become in the most radical cases almost a 'tracing' or 'resemblance by contact', the building is defined starting from paths or large voids found in situ, going on to geometrize them, transforming them into volumes and consequently to inhabit. In this mode, orientation is subjugated to the sign to be traced. The relationship with the outside is a consequence and not an imposition. This modality, as seen in the case of the Niang'ou Boat Terminal, but, if considered at its 'degree zero', which can also be identified with Namchabawa Contemplation, can also be described as a form of land art-architecture.
The 'standing on a flat level' can be used to describe the basic mode of the building-ground relationship. The simplest technically but not as much in planimetric definition, since, free of constraints, it can enjoy freedoms that the architect often perceives as complications. In fact, the extreme articulation of the Niyang River Visitor Centre or the Grand Canyon Art Centre result in weakening the clarity of the whole, which is all too corrupted by unjustified irregularities or difficult to grasp, beyond an easy, but dangerously arbitrary, analogy with the forms of nature.
From the analysis of this research by ZAO/standardarchitecture, it can therefore be derived that any architecture that aspires to establish a harmonious confrontation with valuable natural landscapes, must, or can, start from one of these modes, consistently confirming its characteristics at all scales of the project; trying not to add architectural details, if not necessary, and to operate an extreme simplification of geometry, so as to reduce the authorial imprint and, consequently, attempt to realize a temporally indefinable work, 'found in' and not 'imposed on' the place.

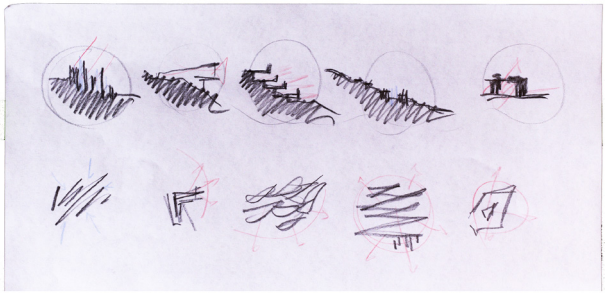
Fig. 9. Niang'ou Boat Terminal (overall view). Credit: Wang Ziling, Song Yuning.



Forms of incompleteness

"The theoreticians of Chinese painting –so wary of that which is accomplished in a particular form, and which does not 'avoid' complete realization– seem inclined to insist on the importance of non-saturation, so much so that as an exergue for their art they might write: 'It is necessary that, both above and below, there be emptiness and deficiency, and that on the four sides there be a distancing that allows passage, so that the object of representation may remain free –unbound– at ease'" [Jullien 2004, p. 11].
The work of ZAO/standardarchitecture in Tibet recalls these ancient principles insofar as its landscape fragments are, yes, always defined and recognizable, but never fully concluded (fig. 11). Oscillating between the concepts of unfinished, mutable, and incomplete or deteriorated, any artefact reminds us that "in the unfolding of temporal experience, it will be practically impossible to evade the sense of incompleteness" [Harrison 2017, p. 7]; or that architecture is a work that is never finished, in its half made of shadows, and always mutable in its dialogue with the Sun; or that the fourth dimension, entering the project without interruption, governs its destiny, and always prefigures its ruin. The latter, a condition apparently deplorable and to be avoided, according to one of the masters of the 20th century, is instead an essential quality of architecture. In fact, as is well known, Louis I. Kahn argued that architecture should be designed so that it can become good ruins, agreeing, perhaps unconsciously, with those who said that "after all, every builder only builds a forthcoming collapse" [Yourcenar 2014, p. 55].

Fig. 10. Building-ground relationship studies (transverse sections); plan layout studies (graphic elaboration by the author).



Of the work presented here, the category of conscious incompleteness is the one of interest. There are three forms that, resolved as 'collaborations', Zhang Ke uses to 'not saturate' the project with his own author's coinage, and, in so doing, leave his architecture 'free and at ease' to complete itself in time; time that may be the uncertain time of the project, the frenetic time of construction, or even the patient time of the geological eras that shape the landscape.
As already mentioned, Ke willingly leaves to the building site, and to the active collaboration of the workers, the possibility of completing 'on the spot' the design of the masonry equipment and thus the face of his architecture.
In the choice of materials, submitting his own eventual wishes to listening to the pre-existences, he selects only local ones for his architecture. Using thick stone for all the external surfaces of his various projects, he consciously seeks the fortunate collaboration of the 'great sculptor' [Yourcenar 2023], who, by corrupting the stone surfaces over time, scratching or patinating them, will enhance their qualities to sublimate the architecture within the landscape.
Another strategy is to have a collective approach [Kögel 2015, p. 2] to design, programmatically open to outside influences. In the specific case of this multi-year experience in Tibet, Zhang Ke has shared decisions on what to do with European firms and Chinese colleagues –Embaixada collaborates on the Niang'ou Boat Terminal; Zhao Yang on the Niyang River Visitor Centre– and with important local institutes: the Tibet Youdao Architectural Design Institute is mentioned in the credits of all the buildings, together with the China Academy of Building Research Architectural Design Institute; the latter, in the case of the Yarlung Tzangbo River Hostel is replaced by the Jizhun Fangzhong Architectural Design & Research Institute. By collaborating, Zhang Ke dilutes his authorial imprint; hybridizing his own visions with those of others, he corrupts his coinage, nevertheless achieving an outcome of great expressive force but managing to abstract it so much that it seems nameless and thus 'open' and 'unbound' and accessible (fig. 12).
Remembering, with Jean Luc Nancy, that "one does not determine the purpose of a place (this is the mistake of so many town planners, landscape architects). One can only let the place arrange itself according to its possibilities. One can give space to the place. This is called dwelling, or contemplating" [Nancy 2007, p. 81], Ke's method is concrete evidence of how this 'purpose' can be effectively translated into architectural design.



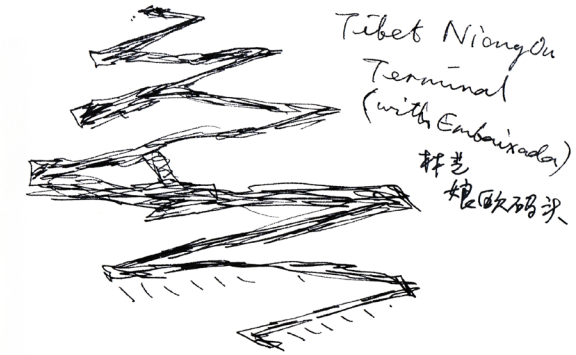


Fig. 11. Zan Ke, study drawing. Credits: Zhang Ke.

Fig. 12. Zan Ke, study drawing. Credits: Zhang Ke.

Acknowledgements

The author would like to thank Zhang Ke, owner of the ZAO/standardarchitecture firm, and his collaborators for their gracious willingness to engage in discussion and for allowing the use of the iconographic material.

Notes

[1] See the artist's website: <https://www.yangyongliang.com/phantom-landscape/6ynbiqfcqr0e4nx5ds52mewikxtlv0> (accessed 10 July 2024).

[2] See: <https://www.yangyongliang.com/phantom-landscape/6ynbiqfcqr0e4nx5ds52mewikxtlv0> (accessed 10 July 2024).

[3] "Paintings resemble the works of architects" [Shu 2013, p. 31].

[4] As an example: Wang Ximeng, Thousand Li of Rivers and Mountains, 1113. The Palace Museum, Bejing (China).

[5] As an example: Dong Yuan, Along the Riverbank, before 962. The Metropolitan Museum of Art, New York (USA).

[6] As an example: Li Cheng, Luxuriant forest and distant peaks, X century. Liaoning Provincial Museum, Shenyang (China).

[7] See: Weng Fen's series Sitting on the Wall and Bird's Eye View.

[8] Bachelor at Tsinghua University in Beijing and Master at Harvard Graduate School of Design in Cambridge, Massachusetts (USA), Zhang Ke founded the firm ZAO/standardarchitecture in Shanghai in 2001. Visiting Professor at the Harvard Graduate School of Design, he was a recipient of the Aga Khan Prize for Architecture in 2016 for his Beijing micro hutong renovation project called Micro Yuan'er Children's Library and Art Centre, Beijing. In 2017, he was awarded the Alvar Aalto Medal. In 2024, on the Venice Biennale, he exhibited his work in a monographic section at the Corderie dell'Arsenale.

[9] The 'architectural' declination of the metaphor of 'acupuncture', a practice of traditional Chinese medicine, used in this paper to define the strategy realised in the Namchabawa territory by ZAO/standardarchitecture, is intended to indicate a variation on the better-known technique of 'urban acupuncture', codified by the Finnish architect and sociologist Marco Casagrande [Casagrande 2010]. Interestingly, this modus operandi, which Zhang Ke implements but does not fully baptize, was taken up and codified by Tiantian Xu's DnA - Design and Architecture during a subsequent experience, carried out from 2014, serving rural communities in the Sonyang River Valley and published later by Hans-Jürgen Commerell and Kristin Feireiss [Commerell, Feireiss 2020].

[10] See: <https://www.youtube.com/watch?v=yxg-A9vU1xo> (accessed 10 July 2024).

[11] "'Mani' means stone or precious stone and is a term that identifies

widespread constructions that Tibetans erect to pay homage to the Buddha" [Chiorino 2011, p. 51].

[12] "Landscape is said in Chinese to be 'mountain(s)-water(s)' (shan-shui), or 'mountain(s) and river(s)' (shan-chuan); also in modern Chinese, landscape painting is said to be shan-shui-hua" [Jullien 2004, p. 165].

[13] <https://www.youtube.com/watch?v=yxg-A9vU1xo> (accessed 10 July 2024).

[14] The client of all seven interventions is Tibet Tourism Holdings.

[15] Yarlung Tsangpo River Hostel, Tibet: <http://www.standardarchitecture.cn/Index/Index/details/id/162.html> (accessed 10 July 2024).

[16] See the description given by the co-designers on their site: <https://www.embaixada.net/design/niangou-boat-terminal_40> (accessed 10 July 2024).

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Roman Countryside between Reality and Imaginary: the Representation of a Stratified Landscape

Linda Flaviani

Abstract

A landscape is always the result of the sum, on the one hand of natural and anthropic transformations and, on the other, of the readings and interpretations attributed to it: this is why its representation constantly oscillates between the 'inside' and the 'outside' of reality, or rather, between reality and imaginary. If each of these factors, objective and subjective, informs and enriches space with a different temporal imprint, each landscape presents itself as a diachronic record of several landscapes that have succeeded one another over time.
Faced with ancient landscapes marked by the condition of palimpsest, it is necessary to implement techniques and methods for representation to express both the character of stratification they embody and the dual nature, objective and subjective, that characterizes their description. Through a graphic exercise in two 'acts', this contribution intends to apply this tension to the landscape long referred to as the 'Roman countryside', a topos in iconographic representation since the 17th century.
The territory of the outskirts of Rome provides a model for the investigation of landscapes similarly connoted by the condition of the palimpsest, demonstrating how drawing, thanks to its inherent operation of synthesis, constitutes a powerful tool for analyzing and describing the transformation of space through the phases that have overlapped and erased in it, giving tangible form to what most intangible exists: time.

Keywords: Roman countryside, ancient landscape, rural landscape, drawing, time.

From territory to landscape

"To a sensitive, imaginative man who lives, as I have for a long time, a life of constant feeling and imagining, the world and its objects have, in a sense, doubles. He sees with his eyes a tower, a landscape; with his ears, he hears a bell ringing, and at the same time his imagination sees another tower, another landscape, hears another ringing. All the beauty and pleasure of things lie in this second world. Sad is the life (and it is like this for most) that sees, hears, and feels objects that only the eyes, ears, and other sensations register" [Leopardi 1928, p. 871].
Double the tower, double the countryside, double the sound of the bell: between the pages of his labyrinthine compendium of notes and memos, Leopardi postulated the existence of a dual vision and cognition of the world: one exterior, linked to the senses and appearances; the other entirely interior, fruit of man's imaginative capacity. Similarly, the territory, in the definition given by André Corboz [Corboz 1983, pp. 22-27], is a palimpsest formed by events of two types: on the one hand, by the constructive actions, gestures, and transformative interventions concretely carried out in places by nature and man; on the other, by the observation and direct experience of each subject, through perceptive actions and acts of conscience within cultural recognition. In other words, the resources and the physical-naturalistic and historical characteristics (the natural structuring of a territory) constitute the ordering and generating premise of the plots and structures ordered by man (the anthropic structuring) [1]. However, it is only through

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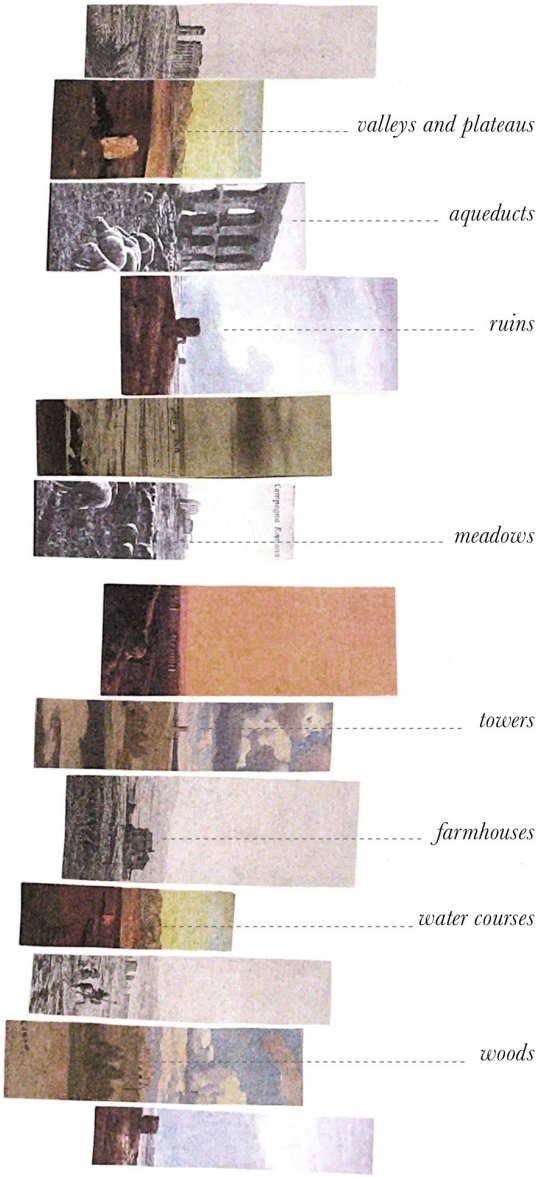
Fig. 1. From the study notebook: collage of landscapes of the Roman countryside (graphic elaboration by the author).



the gaze of an observer that the palimpsest of the territory thus formed 'activates' and finally becomes landscape.
"Every landscape exists only for the gaze that discovers it. It presupposes at least one witness, one observer" writes the anthropologist Marc Augé, pointing out that "this presence of the gaze, which makes the landscape, presupposes other presences, other witnesses, or other actors […] for there to be a landscape, it is necessary not only that there be a gaze, but also a conscious perception, a judgement and finally a description. Landscape is the space described by a man to other men" [Augé 2004, p. 72].
Through different modalities, tools and impressions, the mental representation and description of a portion of space has always allowed its understanding and control: "to represent the territory is already to take possession of it" [Corboz 1983, p. 25]. We could go so far as to affirm, using Corboz's words again, that "there is no territory without the imaginary of the territory […] as a project, the territory is somaticized. It can be spoken of; it has a name. Projections of all kinds cling to it, transform it into a subject" [Corboz 1983, p. 24]. Every landscape therefore carries with it a bundle of stories and representations that make up its shared image: its imaginary.

The drawing as 'synthesis'

Each of these external and internal, objective and subjective factors informs and enriches the landscape with a different temporal imprint: each landscape thus presents itself as a diachronic record of several landscapes that have succeeded one another over time. Faced with ancient landscapes marked by the condition of palimpsest, it is necessary to implement techniques and methods for their representation to express both the character of stratification inherent in them and the dual nature, objective and subjective, that characterizes their description.
As the architect and drawer Luigi Franciosini writes, drawing reveals: each creative process goes through the state of consciousness to discover elements and their reciprocal relationships within an "archive of images captured by experience. Hence an idea (a creative process) is produced (or rather influenced) by the images that agitate in our 'already seen', remaining profoundly conditioned by them" [Franciosini 2023, p. 38]. Similarly, Saint Augustine, in the incipit of the chapter of the *Confessions* dedicated to memory, referred to a treasure of ideas and images deposited

in the abyssal space of our mind as in an interior world: "I come then to the fields and vast quarters of memory, where lie the treasures of innumerable images of all sorts of things introduced by perceptions; where also are deposited all the products of our thought, and all the things introduced by perceptions. I then come to the fields and vast quarters of memory, where rest the treasures of the countless images of all sorts of things introduced by perceptions; where also all the products of our thought are deposited, and all that was sheltered and set aside, and which oblivion has not yet swallowed up or buried. When I am in there, I evoke all the images I want" [Agostino, Libro X, cap. 8, 12].

"The richer the articulation of this mental vision […], which arises from the integration and complicity between the real dimension and the immaterial and psychic dimension of memory, of affinities and consonances, the more intense the outcome of the communication will be" [Franciosini 2023, p. 38].

Faced with the temporal depth embodied in an ancient landscape, drawing proves to be a powerful tool for synthesizing the phenomena, transformations and impressions that are

Fig. 2. Diagram of the agricultural landscape of Rome transformation (graphic elaboration by the author).

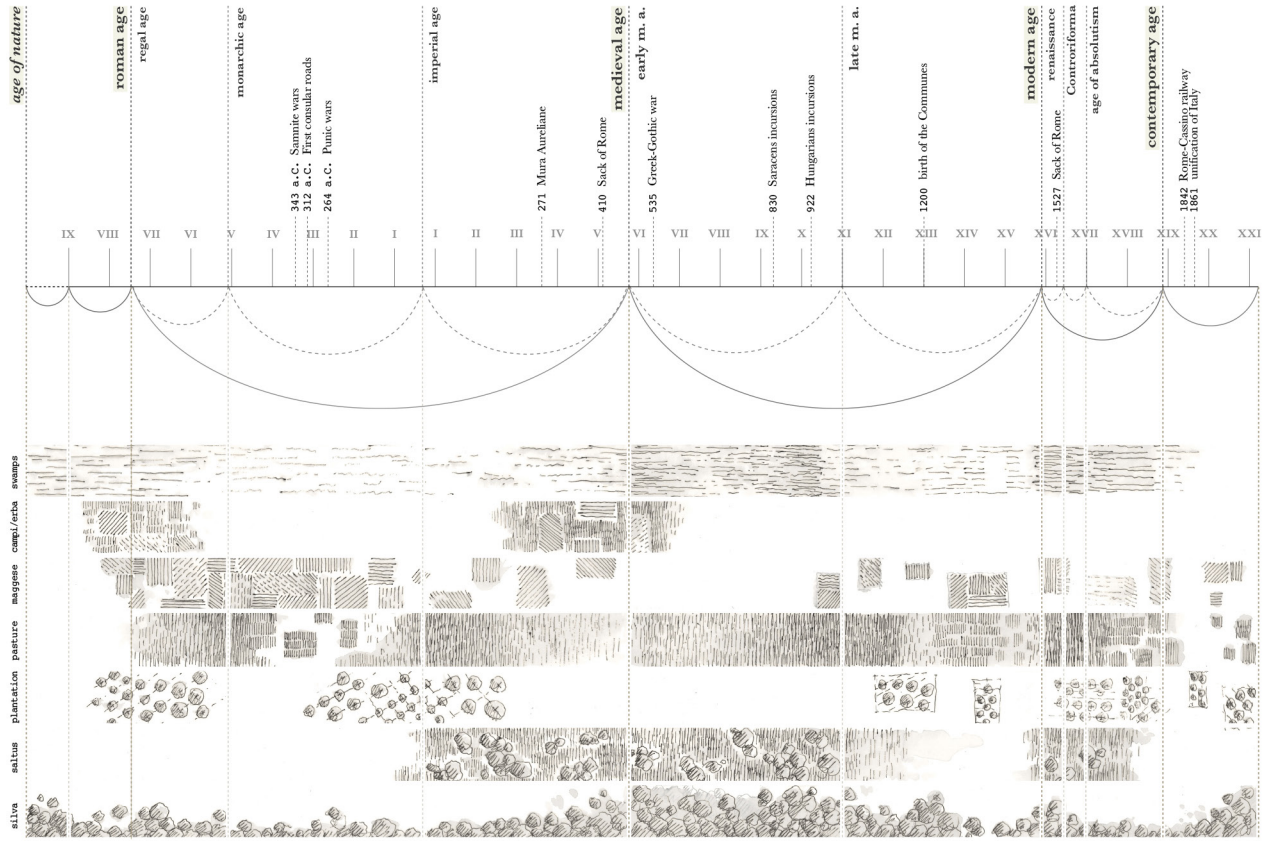




Fig. 3. Map of Rome's ancient linear infrastructures and natural systems (graphic elaboration by the author).

stratified in a portion of space and agitate in memory. In this sense, drawing is an exercise that, from a complex reality, tends "'to re-know', 'to divide', 'to re-compose': to go back from the interrelated image to the elements constituting its structure", whereby structure is meant "the essence of architecture, that hidden, latent order that is reflected in the quality of form" [Franciosini 2023, p. 38].
Based on these premises and on the conviction that, as Henri Focillon wrote, "the hand is action" [Focillon 2002 pp. 105-130], this contribution intends to address the tension of synthesis belonging to drawing to that ancient landscape long referred to as the 'Roman countryside', a true *topos* in iconographic representation from the 17th century onwards, when travelers on the Grand Tour began to cross the Alps to reach Italy (fig. 1). Through a graphic exercise in two 'acts', two possible methods will be explored to conduct a regressive and stratigraphic investigation with the intention of understanding the transformation that space has undergone over time until reaching its current state, in a 'decryption' of the ancient landscape.

Act one: drawing 'transformation'

Looking at a satellite image of the metropolitan area of Rome, the first impression will be that of a discontinuous urban form and of an open territory fragmented by the urban spread. Despite its centrifugal expansion, the city has nevertheless retained its distinctive polarity with respect to the surrounding territory, which, shifting the point of view further away, makes it appear as "a 'city in the desert': a massive concentration of buildings and population, 'floating' in the countryside" [Lelo 2016, p. 24]. This was not how it must have appeared a century ago, if we consider that two thirds of today's Roman built fabric is the result of the expansion that followed the Second World War [Insolera 1993, pp. 187-203]: "the Roman countryside is silence and desert" [Cederna 1956, p. 183], wrote Cederna in 1956.
However, the premises for the radical transformation of the Roman Agro from rural to urban was laid long before, with the repeated efforts to tame a hostile land. Through the almost cyclical repetition of certain forms, the agrarian landscape of Rome evolved slowly, opposing a particular 'inertia' to change so stated Emilio Sereni in his *Storia del paesaggio agrario italiano* [Sereni 1961, p. 410], a text that allows us to retrace the evolutionary history of the landscape of the Rome outside the walls in the light of the incessant dynamic relationship between city and countryside. Reinterpreting the formal categories described by Sereni, the first graphic 'act' sets out to depict this history with the aid of drawing, which, by resuming the characteristics of each formal phase of the landscape, proves to be particularly capable of describing its 'transformation'.
The outcome of this operation is a graphic (fig. 2) whose reading is supported by the description in the following paragraph and a glossary (tab. 1).

'Drawn' history of the Roman countryside

"The agrarian landscape is that form that man, in the course and for the purposes of his agricultural production activities, consciously and systematically imprints on the natural landscape" [Sereni 1961, p. 29].
As Sereni points out [2], we can speak of agrarian landscape starting from the Etruscan and Villanovan ages (8th century BC), but only the Roman conquest and colonization, with the definitive triumph of fallow land over the system of fields and grass, gave the form of this landscape universal

Ager	In Roman times, the cultivable land that extended outside the *suburbium*.
Agro romano	The vast rural area, flat and hilly, that extends around the city of Rome, coinciding politically and historically with the area of influence of the municipal government of Rome. The term was restored by Flavio Biondo in the 15th century.
Roman countryside	The vast undulating plain of southern Lazio crossed by the lower Tiber, which extends into the territory surrounding Rome as far as Anzio with the nearby hilly plain, including part of the Roman countryside, up to the border with the Pontine countryside.
Fields and grass	Agricultural system that provides for the coexistence of cultivated areas and grazing areas.
Castra	Born to fortify the *curtes*, small castles heralded the more complex structure of the castle. In the 11th century it included the walls, the keep or main tower, the baronial palace and the church.
Compascuus	In Roman times, the *compascuus* lands were areas intended for grazing "open to the uses of the communities or neighbouring owners" [Sereni 1961].
Curtes	Evolution of the domuscultae, small, enclosed settlements, more agricultural than military in nature.
Tillage	Processing carried out on land that has never been used for agriculture or has been uncultivated for a long time.
Domuscultae	Literally 'cultivated houses', agricultural districts established by the Church in the 8th century, described as "groups of small villages with one or more churches and with numerous farms cultivated in various ways" [Tomassetti 1910].
Feud	Feudal ownership of land consisted of the personal dependence of direct producers, owners of plots of land that they cultivated by paying the owner a rent in labor, nature or money.
Limitatio	Roman form of measurement and division of agricultural land, which is imprinted on the landscape by tracing two fundamental lines (*cardo* and *decumanus*) and others parallel to them, from which a regular grid results.
Maggese	Agricultural practice, which was formerly carried out in the month of May, which consists of carrying out a series of operations on poor land left to rest to prepare it for subsequent cultivation of cereals.
Massae	In the Middle Ages, a group of small agricultural estates.
Silva	Selva, wood, forest.
Saltus	According to the definition of Elio Gallo, a combination of woods and pastures, characteristic of the landscape of the imperial age [Sereni 1961].
Suburbium	In ancient Rome, a strip of land around the city walls extending from two to eight kilometers and intended for vineyards, vegetable gardens and productive activities necessary for the sustenance of the city.

Tab. 1. Syntetic glossary on the Roman countryside (elaboration by the author).

validity. The nomenclature used to identify the extra-urban territory of Rome dates back to these times: already in the Republican age, around the *urbs*, the city within the walls, extended the *suburbium*, "a strip from two to eight kilometers destined for vineyards, vegetable gardens and productive activities" [Cianci, Colaceci 2015, p. 2344], beyond which, up to the slopes of the Sabatini and Albani volcanoes, the marshy countryside of the ager developed.
The pastoral agricultural landscape with enclosed fields of ancient Rome integrated the forage base with woods and promiscuous grazing on public or '*compascuus*' land. It was only after the Samnite and Punic wars, with the profound technical, economic and social transformations, that the economy of plantations, mainly of vines and olive trees, took hold. Between the end of the republican age and the beginning of the imperial age, the pastoral economy prevailed over the granary culture, resulting in a new extension of the landscape of woodlands and pastures known as *saltus*. Finally, in the period of the lower empire, this process of degradation of the agrarian landscape restored the prevalence of the field and grass system with open fields.
The decadence of the Roman countryside coincided with the moment of the empire's highest power, when the land ended up in the hands of a few noble families who initiated the latifundia. Then, from the early 5th century B.C., the barbarian invasions caused the plundering, devastation and decay of the urban centers of life, continuing the process of disintegration of the pastoral-agricultural landscape, with the prevalence of fields open to hunting and grazing without defined forms and boundaries. The cutting of the arches of the aqueducts by Vitiges' Goths, who barricaded themselves in the so-called 'barbarian camp', caused the flooding and the subsequent swamping of the countryside.
In the early Middle Ages, the common need to defend oneself and contain the decline of agriculture led to the fortification of the countryside: the first castra were born to fortify self-sufficient agricultural centers, the *curtes*, *domuscultae* or *massae*. These institutions were the first centers of the landscape reorganization, but they were not enough to foster a true recovery of agricultural activity, on which wild pig breeding, hunting, and forests overgrown with wild beasts continued to prevail. The process of degradation of the agrarian landscape reached its peak between the 8th and 10th centuries, with the incursions of the Hungarians and Saracens. Then, following Charlemagne's coronation as Roman emperor, the feudal system and the granting of royal lands in remuneration for military service began.

age.	landscapes.	elements.
age of *nature*	landscape of *form*.	hydro-geomorphological structure: *valleys, plateaus, volcanic lakes, waterways*.
etruscan age	landscape of fallow fields and vineyards.	fields of geometric shapes; hedges, walls, roads; vines.
roman age	landscape of *limitatio*.	regular grid.
	landscape of viability systems.	roads and aqueducts.
	pastoral agricultural landscape.	closed fields and lands of the *compascuo*.
	plantation landscape.	vines and olive groves.
	forestry-pastoral landscape of *saltus*.	woods and pastures.
	beautiful landscape of the urban villa.	suburban villas; thermal complexes; Walls.
	landscape of open fields and grass.	field and grass system.
medieval age	landscape of ruin and the "dead" city.	ruins, spontaneous vegetation.
	landscape of the fortified countryside.	*castra*, towers, *domuscultae, curtes*, farmhouses.
	wild forest landscape.	woods, wild animals, hunting, free-range pig farming.
	landscape of transhumant pastoralism.	large transhumant flocks of sheep and horses.
	locally organized landscape.	Marrana water canal; mills.
	suburban agriarian landscape.	closed fields; tree and shrub plantations; local road network.
modern age	"beautiful" landscape of ruins (Reinassance).	sections of restored aqueducts.
	landscape of the inhabited.	*desert* of the countryside, except for wild farming.
	landscape of the Rome of Sixtus V.	*Acqua Felice* and *mostre dell'acqua*.
	landscape of the flat landfills.	reclaimed lands.
	landscape of villas and estates.	large estates.
contemporary age	landscape of railways.	railways; via Tuscolana and Appia Nuova.
	landscape of the great reclamation works.	reclaimed lands.
	landscape of *borgate*.	shacks along the Felice aqueduct and via del Mandrione.
	landscape of building boom.	*palazzine* and residential neighborhoods.

Fig. 4. Abacus of the main historical landscapes of the Roman countryside and the elements through which they reveal themselves (graphic elaboration by the author).

The evolution of the phenomenon of castellation and the slow revival of plantations made the period between the 11th and 13th centuries decisive for the reworking of the agrarian landscape thanks to the first reclamation, irrigation and tillage works. During this period, wild livestock farming was replaced by the resumption of large-scale sheep farming, more often transhumance. With the birth of the '*comuni*', between the mid-11th and early 12th centuries, the multiplication of feudal concessions and the increase in population density made individual initiatives on the landscape more incidental: it was the major '*comuni*' and seigniories that gave the greatest impulse to land reclamation and irrigation works.
The beginning of the Renaissance period saw a widening of the gap between northern and southern Italy: while the Po Valley increasingly represented the center of agricultural progress in Italy, sheep farming based on transhumance continued to prevail in the south. After the devastation caused by the Sack of Rome, the age of the Counter-Reformation represented a new period of political and cultural decadence. Despite the work of enlightened scientists, land that had already been reclaimed became swamped again, while others remained deserted due to malaria or were home to wild hunting and farming. Pastures and meadows spread again, while the cultivated areas decreased: this was a new chapter in the already well-known phenomenon of degradation of the agrarian landscape, which now contrasted with the remarkable technical capacity of the time.
Not even the age of the Risorgimento, unlike the central-northern provinces, marked important transformations in the regime of land ownership or in the agrarian systems of the Roman countryside. Thus, the Agro Romano preserved for a long time the traditional system of fields and grass and the predominant transhumant sheep farming. "The landscape still repeats the forms (or rather the absence of well-defined forms) that we have already been able to detect in the paintings of Poussin or Coleman" [Sereni 1961, p. 410]: this is the characteristic *inertia* that Sereni attributes to this territory.
Only the ideal impetus of the Unification of Italy and the desire to make Rome the capital of the Kingdom projected the almost abandoned and uninhabited countryside outside the walls into the heart of urban planning, intensifying the pace of land reclamation to prepare the railway infrastructure. However, the Agro's most significant transformation was yet to come. Very soon, rural and urban will no longer constitute a dichotomy, blurring into each other with no possibility of return.
Following a slow process of erosion of the traditionally agricultural open territory [Lelo 2016, p. 16], the Roman Agro, now barely recognizable in the narrow mesh of the urbanized –which, as it expanded, went on to occupy every available space– survives in fragments within the marginal city [Casadei, Franciosini 2014, p. 23] in the system of parks and protected areas that ensure the discontinuity of the urban region (fig. 3). These pieces form a system of residual 'lost areas', often sites of degradation waiting for a real estate valorization to be swallowed up and metabolized by the urban machine; yet, although their distinctive features are greatly altered by construction, "some places, more than others, still hold the capacity to speak to us of this land's recent past" [Casadei, Franciosini 2014, p. 23]: it is to the 'decryption' of this ancient and stratified landscape that the second 'act' of this exercise is addressed.

Act two: drawing 'stratification'

It has been said that a landscape is formed through the stratification of two types of elements: on the one hand, the transformations carried out by natural and anthropic actions; on the other, the readings and interpretations that are given to those transformations. In this way, many times overlay in each landscape: from the very long times of the actions that have molded the shape of the land to the narrower times of man's rewriting of the soil; from the cyclical times of the transformations of the territory to those measured in the briefness of our perception, or, again, to the immeasurable ones linked to the collective imagination of the past.
These times, that traverse and shape the landscape, crystallize, like imprints, in its elements. Summing up these imprints, we observe that time, in landscape, possesses a wider depth and a more fluid form than we imagine. "To the non-isotropy of space corresponds a non-isotropy of time" [Amadio 2009, p. 215]: a single, immutable time is replaced by a "plural one that, intersecting with space, becomes landscape" [Amadio 2009, p. 215].
Moreover, if each of these times informs and enriches the palimpsest, "each landscape presents itself in a diachronic sense, as a record of landscapes that have succeeded one another over time" [Amadio 2009, p. 215]. In the words of Franco Zagari, "in the same physical space we perceive

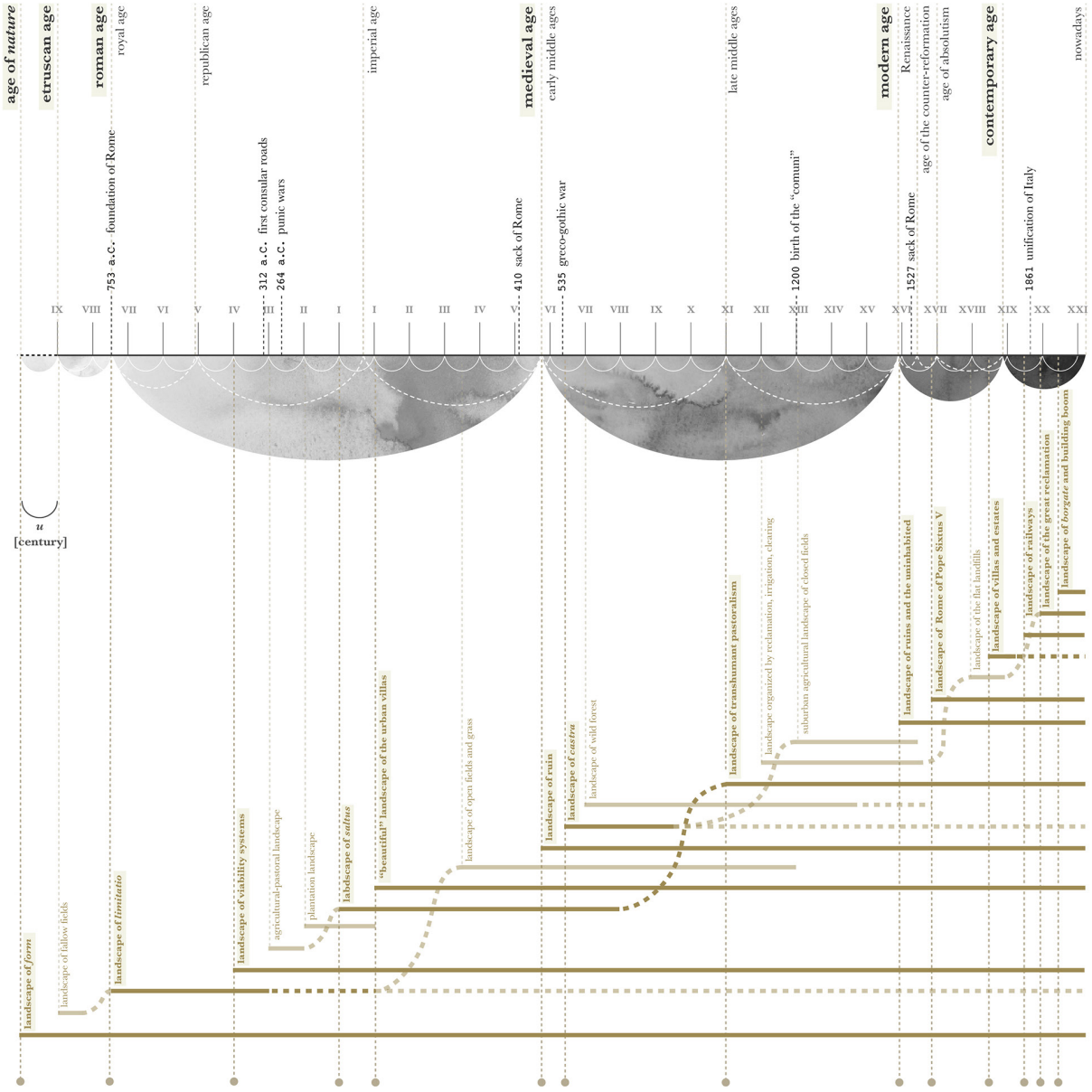


Fig. 5. The deduction of the main historical landscapes along the chronological timeline, whose unit of measurement is the century (graphic elaboration by the author).

the existence of several similar but different landscapes, and their existence is not precisely marked by an orderly rotation in the arc of hours, instead, vices, vocations, conflicts, synergies are released" [Zagari 2009, p. 211].
These landscapes, which present themselves to our eyes as «different and co-present arrangements in the same scene» [Zagari 2009, p. 211], survive through certain traces. Recognizing these traces, assigning them to a precise landscape, 'decrypting' the palimpsest is the operation that this exercise sets out to do.

Historical time and chronological time

Plural times are stratified in a landscape, corresponding to different landscapes: alongside a chronological time, marked by centuries and dotted with events, there is another time, fluid and multiple, which we will call historical time, and whose unit of measurement is the landscape [3]. On the line of chronological time, we can place the moments and events in history that have generated precise landscapes: the abacus in figure 4 collects, for each epoch, the landscapes identified and, under the heading 'elements', the traces through which they manifest themselves. Many of these landscapes have evolved into others, while others have survived through certain traces that are still visible: we will call them main landscapes, or macro-landscapes (fig. 5). Taking these macro-landscapes as the unit of measurement, we can scan the historical timeline in equal parts (fig. 6). This operation highlights the non-correspondence between the two timelines, "between a constant and regular rhythm, which can be divided into centuries, decades, years etc., and an irregular, diluted, syncopated or broken rhythm, articulated in landscape images" [Casadei 2016, p. 132].
In this investigation, along a chronological time span of more than 29 centuries, from before the foundation of Rome to the present day, 10 macro-landscapes are identified that take on different temporal quantities in themselves. The first line, depicting the classical temporal division into equal parts, is divided into as many segments as the number of centuries of the discussion. After having identified in it the salient moments in history that generated a landscape, that same line is again articulated through unequal arcs to subtend different temporal quantities. The next diagram, therefore, takes the landscape as the ordering principle: the timeline is no longer divided into as many parts as the number of centuries, but rather into ten portions, as many as the number of principal landscapes identified. Each age, thus, "is articulated into one or more landscapes, defining its own duration and therefore a commensurate capacity to influence the structure and image of the landscape" [Casadei 2016, p. 133].
This representation allows us to give tangible form to time: to visualize how and to what extent different cultures and ages have been able to take root and persist in the territory.
As can be seen in the diagram that follows this operation, between the different ages, placed side by side in chronological order, there is an overlapping of one unit: "this procedure is justified by the (abstract and debatable) assumption that the capacity of cultures to influence the image of the existing landscape is directly proportional to their historical duration and that each culture inexorably erases a quantity of traces of the previous one" [Casadei 2016, p. 133] and, in a certain sense, it is precisely in these overlapping arcs that the most interesting features are condensed.
This schematization, although obtained by a mechanical procedure, gives a credible result: the different ages and cultures appear to balance each other, providing the image of a stratified landscape and confirming its perception of today.
Finally, a final interpretative operation assigns each of the ten identified macro-landscapes "a predominant character, a synthetic and narrative image" [Casadei 2016, p. 51] expressed through a collage. Alongside this narrative image, each of the ten macro-landscapes is assigned a pattern that briefly describes its formative and settlement logic (figs. 7, 8), with the aim of capturing the lying figure and fundamental theme of each landscape.

Synopsis of landscapes of the Roman countryside

The first arc, coinciding with the age of nature, is dedicated to the landscape of geo-morphological and hydrographical form, which "already contains in itself the reason and explanation for subsequent developments" [Castaldi 1977, p. 49], and which we read today in the smooth alternation of valleys, plateaus and watercourses.
This is followed by the landscape of the *limitatio* of the Roman age, with its regular grid marked by the network of linear infrastructures of roads and aqueducts, characteristic constituent elements of the Italian agrarian landscape [Sereni 1961, p. 49].
The third image describes the landscape of the villas that, with the expansion of the Empire and the great availability of servile labor, capillary constellated the latifundia.

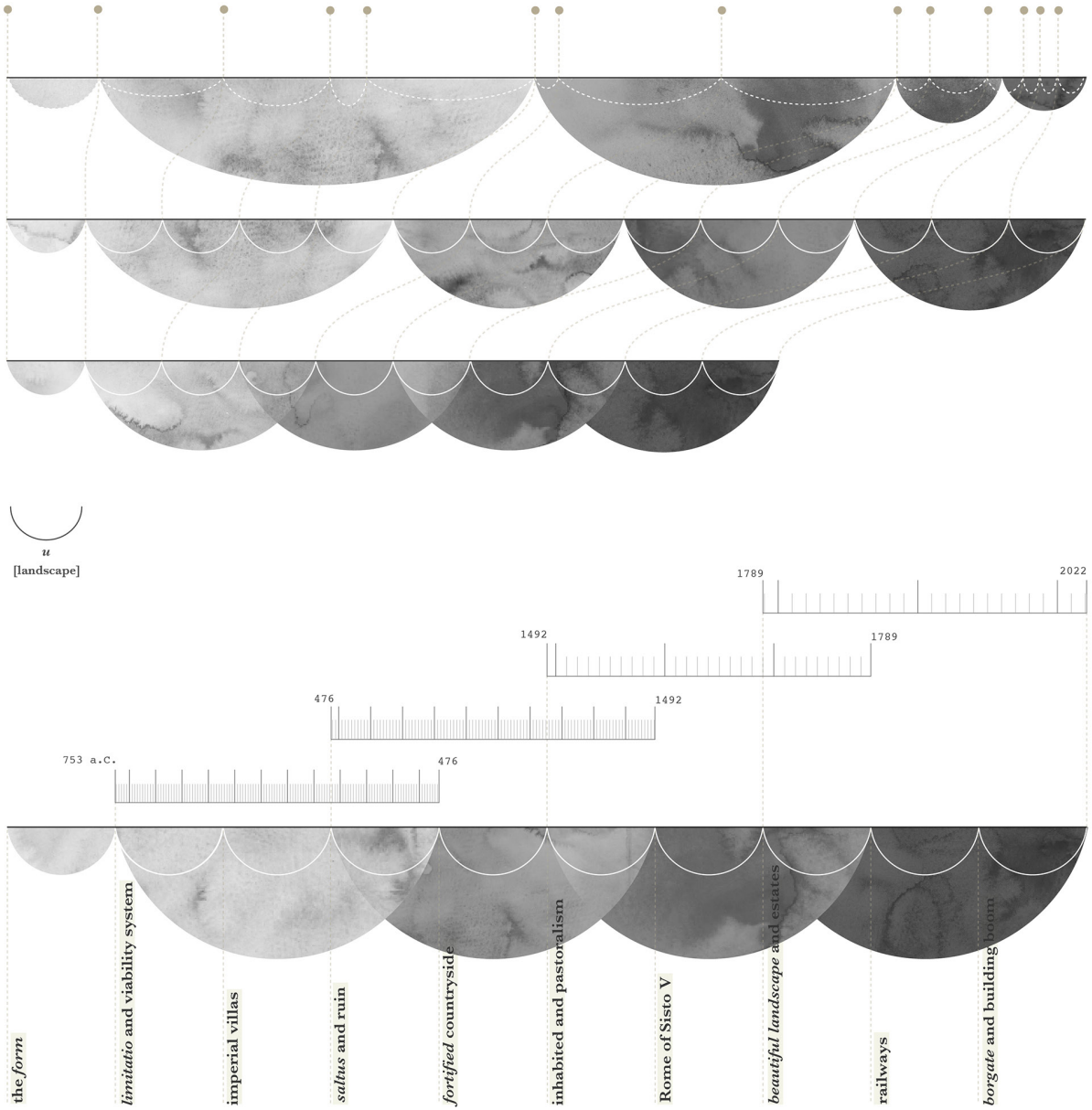


Fig. 6. The construction of the historical timeline, divided into landscapes (graphic elaboration by the author).

The landscape of ruins and *saltus*, then, is the result of the devastation and decay following the barbarian invasions and the new expansion of the forests in a widespread disintegration of the agrarian landscape.
The fifth landscape relates the phenomenon of the fortification of the countryside that arose from the common need to defend and stop the decay of agriculture, with the fractioning of the territory into self-sufficient agricultural and defensive districts.
The landscape of the uninhabited and of pastoralism leads back to the period of political and cultural decadence of the age of the Counter-Reformation, which recorded a new involution of the agrarian landscape: lands that had already been reclaimed returned to marshland, while others remained deserted due to the raging malaria or became the scene of hunting and wild livestock breeding.
The seventh landscape recounts the papacy of Sixtus V, an important moment in the social and economic reorganization culminating with the radical redesigning of Rome's urban structure, which included the construction of an aqueduct that reused the remains of ancient conduits that ran through the Roman countryside.
The eighth image portrays the 'beautiful' landscape of ruins and estates corresponding to the Age of Enlightenment in which, after centuries of neglect and oblivion, the Roman countryside became a *topos* in iconographic representation.
The ninth landscape describes the infrastructural interventions that affected Rome following the Unification of Italy, when, with the demolition of customs barriers, the railway became the agent of a national-scale re-elaboration of the forms of the agrarian landscape.

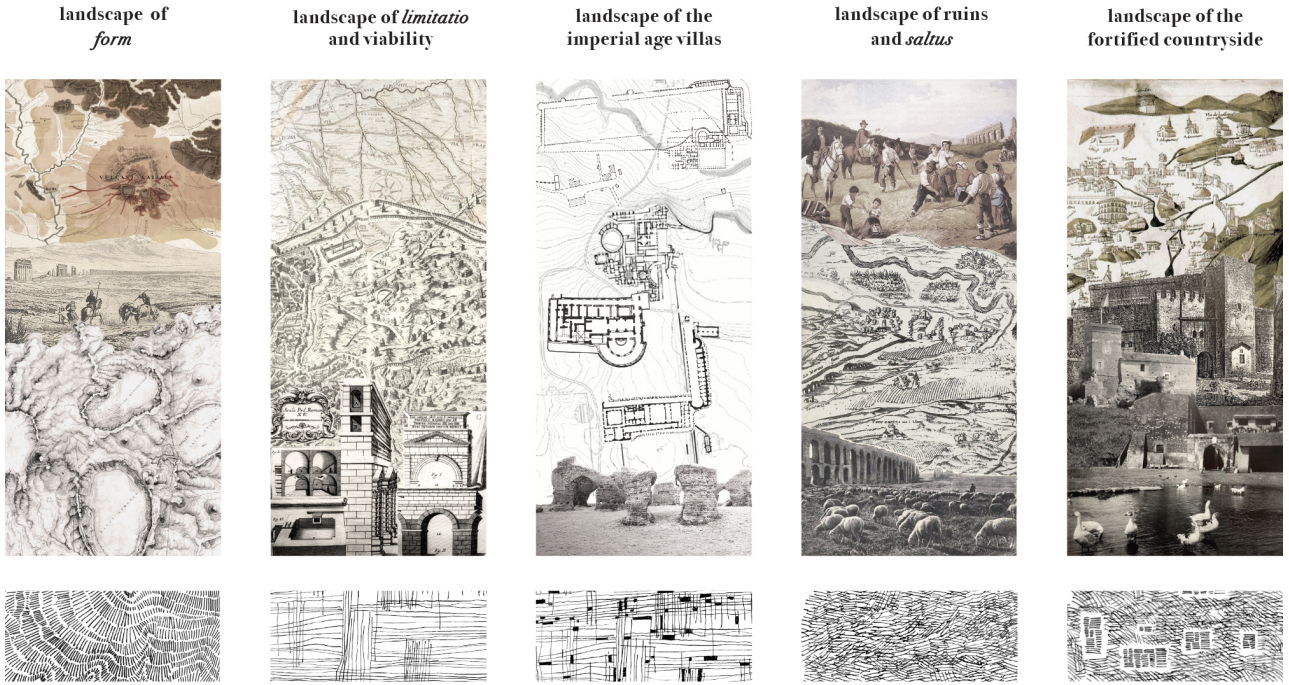


Fig. 7. The first five macro-landscapes of the Roman countryside, expressed through narrative images and patterns (graphic elaboration by the author).

Finally, the tenth and last image shows the growth of the post-war suburbs driven by economic and social housing interventions accompanied by numerous illegal settlements: concluding the synopsis of landscapes of the Roman countryside is the landscape of the borgate and the building boom.

Conclusion: drawing 'time'

The reading proposed by the two exercises, assuming a diachronic interpretative key, focuses on the territory of the suburbs of Rome, a privileged space in which the features of a rural suburb are maintained alongside the properly urban landscape and in which the considerable functional and semantic sedimentation translates to a rich and articulated image. Thus, in this scanning of space, a decisive weight is also assumed by forms of settlement that are manifested with more labile signs, but no less consistent in terms of material culture, demonstrating how the landscape is above all "the place of time" [Venturi Ferriolo 2009].
But the landscape is "a ray of arrows that continue in all directions, a space that always implies other spaces and whose limits are difficult to establish" [Calvino 1974, p. 14]: the territorial dimension of the Roman countryside offers itself here as an applicative case of a regressive and stratigraphic method of investigation that can be extended to landscapes similarly characterized by the stratification of different times.
In this way, this model of study can demonstrate how drawing, thanks to its own operation of synthesis, constitutes a powerful means of investigating the transformation of the

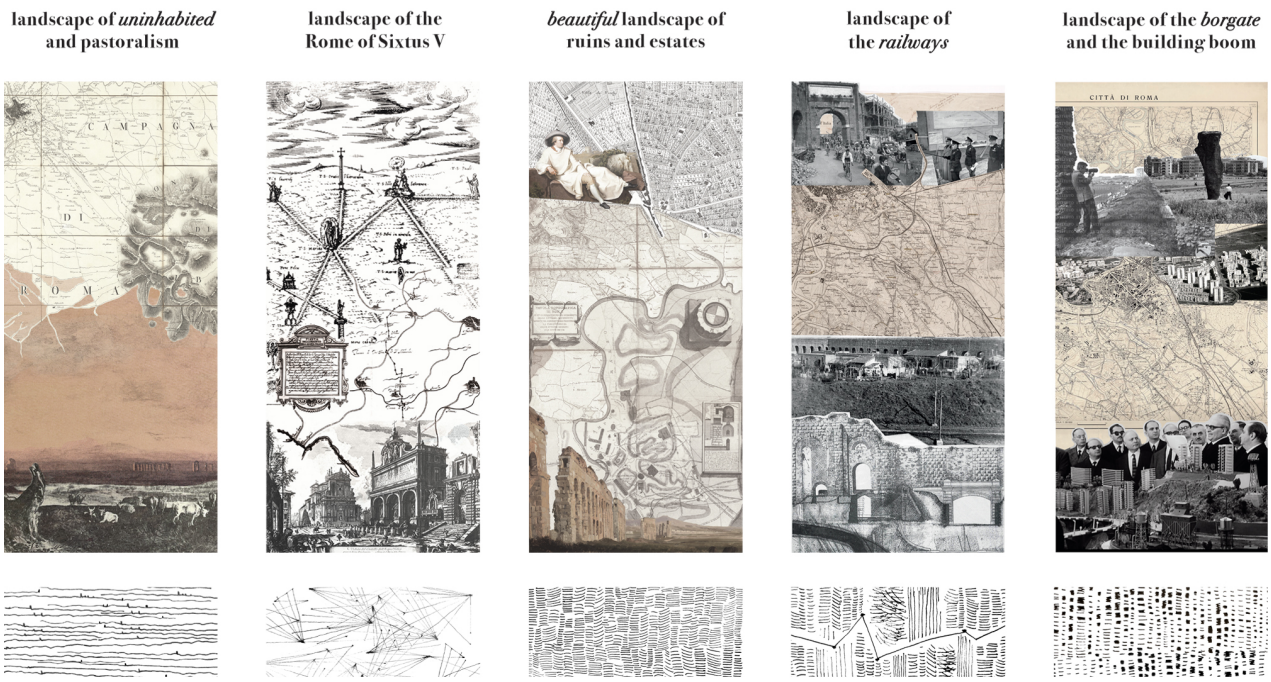


Fig. 8. The last five macro-landscapes of the Roman countryside, expressed through narrative images and patterns (graphic elaboration by the author).

landscape through the phases that have been layered and erased in it, with the aim of giving tangible form to that which exists which is most intangible: time.
"If you want to describe a place, to describe it completely, not as a momentary appearance but as a portion of space that has a form, a sense and a reason, you have to represent it crossed by the dimension of time, you have to represent everything that moves in that space, with a very rapid motion or with inexorable slowness: all the elements that this space contains or has contained in its past, present and future relations. That is to say, the true description of a landscape ends up containing the history of that landscape, of the set of facts that have slowly contributed to determining the form with which it presents itself to our eyes, the equilibrium it manifests at every moment between the forces that hold it together and the forces that tend to break it apart" [Calvino 1974, p. 7].

Credits

The considerations in this article are mainly the result of the studies conducted as part of the master's thesis obtained by the author in Architectural Design and History at the Mantua Campus of the Polytechnic of Milan (academic year 2021-22), with Prof. Luigi Spinelli (supervisor), Prof. Marco Introini (co-supervisor) and Prof. Cristina Casadei (co-supervisor), and entitled *The desert and the giants. The re-signification of the ancient aqueducts of the Roman countryside through the experience of its landscapes*. The analysis described in the third paragraph of the article in which, assuming a diachronic interpretative key, the timeline is scanned for landscapes, was inspired and guided by the similar work conducted on the territory of southern Etruria by Prof. and architect Cristina Casadei in her doctoral thesis [Casadei 2016].

Notes

[1] "Every anthropic structure derives from a previous natural structure" [Cianci, Colaceci 2015, pp. 2342-2343]. "The resources and the physical-naturalistic and historical characteristics –considered as a system and in their mutual interrelation– are to be assumed as a primary and priority element, ordering and qualifying the anthropized territory. The historical plots and structures are strictly interconnected with the environmental plots and structures" [Calzolari 1999].

[2] The description of the evolutionary history of the agricultural landscape of Rome to which this paragraph is dedicated is taken from: Sereni 1961.

[3] The operation described in this paragraph in which, assuming a diachronic interpretative key, the timeline is scanned for landscapes, was inspired and guided by the analogous work conducted on the territory of southern Etruria by Cristina Casadei in her doctoral thesis [Casadei 2016].

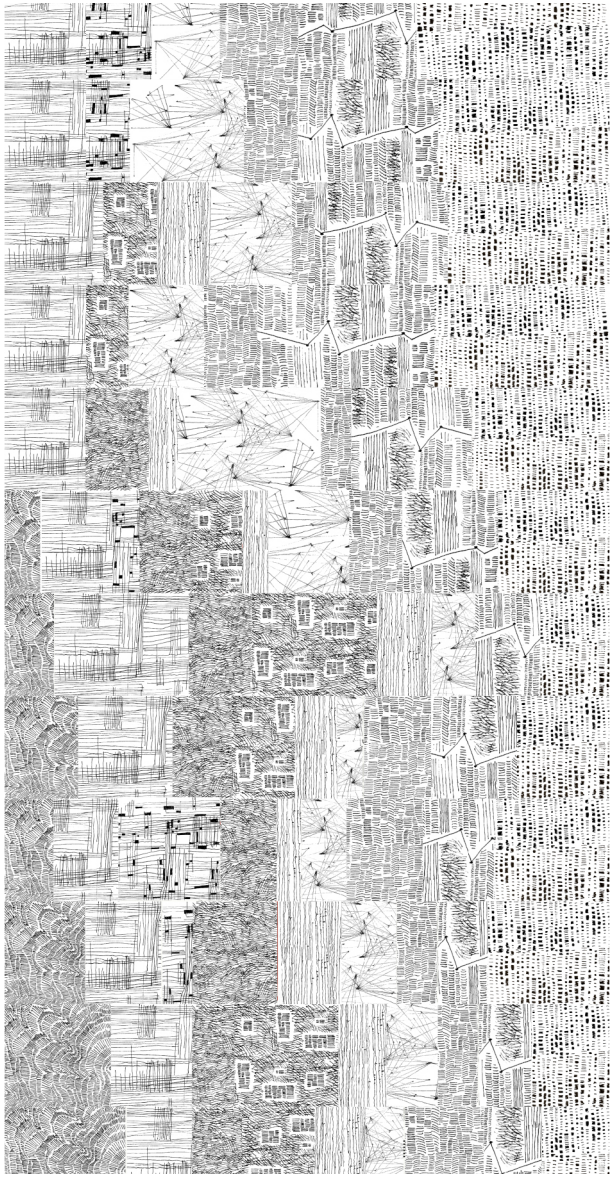


Fig. 9. With reference to a portion of urban space between Parco degli Acquedotti and Porta Maggiore, diagram of the detectable historical landscapes, represented through their respective patterns (graphic elaboration by the author).

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Landscape Drawing between Tools and Methodologies

On Architecture and Landscape. Some Fragmentary Representations

Alberto Grijalba Bengoetxea, Julio Grijalba Bengoetxea

Landscape architecture.
***Bergen Tomb*, Utterö. Sigurd Lewerentz, 1928-1929**

Between 1928 and 1929, Sigurd Lewerentz designed and built Theodor Anton Bergen's tomb on the islet Utterö, in an archipelago near Stockholm that can only be reached by boat. There are three known versions of the project [1]. The well-known sketches of the first two belong to the category of inquiries into architectural graphic representation. They are plans, elevations, sections and axonometries, typical of the architectural language with which the author is defining the program and the proposal of an implantation, at the same time as he is approaching the dimensioning of his intervention. These are creation and research drawings. In the first version, Lewerentz shows the decision to locate the excavated burial site, with a gravestone floating on the plain, a jetty, a path and two benches. The plan reveals the final decision to place the single slab on the plain overlooking the centre of the island, while the axis formed by the jetty, the tomb and the path regulates the position of all the elements (fig. 1).
The second is a map. The island is represented around its entire perimeter and is dimensioned with an encompassing grid slightly oblique to the north orientation already present. All elements have an exact position on the orthogonal grid that completes all its boundaries. We can see that the axis has been shifted so that the path is placed to the side of the tomb, making the floating tombstone the real organizing centre of the project. It still retains the east-west axial organization of all its elements, only altered by the position of the cross, which appears in perspective.

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

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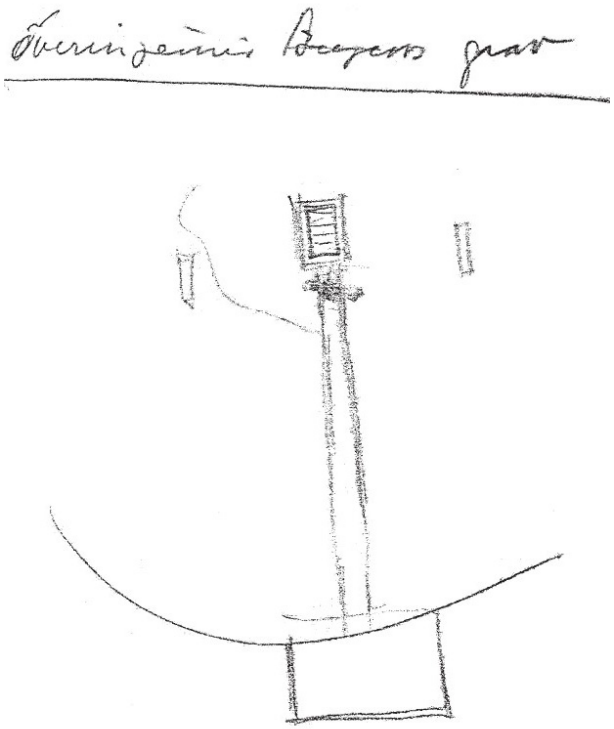


Fig. 1. Sigurd Lewerentz, 1928-1929. Bergen Tomb, Utterö. First version.

Surprisingly, with a dark shade of continuous lines parallel to the imposed grid, the representation reveals the sea, showing its depth with its color and reaffirming the need to reach it by sailing (fig. 2).
It is the third version, in particular the best known and most publicized sketch, on which we will dwell. It is not only an architectural representation for future construction. It also contains elements that we feel reveal something more. The sketch is an open system of representation, which adapts its content according to the needs at each point of the project [Montes, Jiménez 2001]. It is not a design drawing, in which one proposes, orders or gives form. It belongs to those representations of architecture and the territory that an architect draws up from the most intimate part of himself, for himself. It ratifies how we perceive, how we arrive, what we observe and how we are protected. It is a

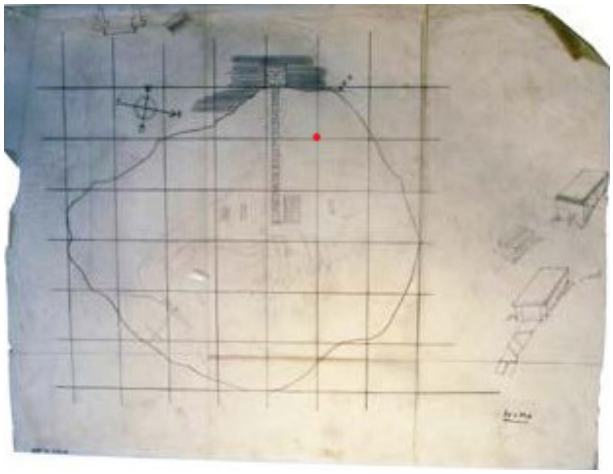


Fig. 2. Sigurd Lewerentz, 1928-1929. Bergen Tomb, Utterö. Second version.

search for the visual and sensorial experience of space in order to find the longed-for tranquillity and the feeling of peace radiated by the necessary eternity [2] .
Lewerentz seems to affirm, as Bruno Zevi or Peter Zumthor later did, that any representation is insufficient where there is a spatial experience, since time and movement interfere with our cognitive experience. The result exemplifies, as Gombrich proposes, that any representation has, by its nature, limits that we have to accept or try to overcome with other means [Montes, Jiménez 2001]. Lewerentz does so with this total drawing.
The ground plan of the tomb and the wooded elevation of the central clearing of the island are overlapped. The perspective is supported and arranged according to the contour lines. At the same time, the codes of vegetation, stone and shadows are altered. Because of its configuration, it traps us from the centre and forces us to make a circular perceptual movement from one side to the other. It challenges us in the search for the meaning of each of its elements. Its understanding depends more on our interpretation of the visual cognitive action than on the reading of the representation under the premises of tradition. In its various parts and variations Lewerentz presents us with an enigmatic drawing that is at once "anciently modern and modernly ancient" [Aretino 1916, p. 186] [3] (fig. 3).

Ancient, as it reminds us of archaic representations or the inverted perspective studied by Pável Florenski, which Erwin Panofsky explored in depth. In this way, it transgresses traditional representation to contain, in its totality, the graphic and symbolic expression of a moment linked to a place. But on a closer, more relaxed observation, these first attractive intuitions do not seem to materialize. Lewerentz does not change the sense of the visual cone to offer us the deconstruction of the scientific assumptions of geometric perspective, as Florenski proposes. On the other hand, despite the overlapping of plan, elevation and perspective, by means of the staggering method, it is not a single vision, but is presented as a series of representations. Modern, because despite the above, at the end of the 1920s the new experiences of the representation of modernity, the experiments of the cubist avant-garde or the new cinematographic language of David Wark Griffith o Sergej Michajlovič Eisenstein, with the incorporation of movement and time in their movies, suggest a different interpretation. It is not an alteration of the ground plan, it is not a new perspective, it is a series of representations… It is an overall drawing that contains the elements that allow Lewerentz to check the project from all the points in motion. It is a storyboard or an architectural traveling in a single multi-representation, which begins with a map in height, to end with a view of the quietness.

There are four contiguous vignettes, the map, the plan, the elevation and the perspective, which are configured as some of his projects from fragmentation, including its paradoxes, as José Ignacio Linazasoro has studied [Linazasoro, 2023].

First vignette, the map. The reading process begins with the island. The perimeter is drawn and the north is located. It is a codified map that has all the aseptic and neutral elements that this type of representation must have. It locates you in space, shows you where it is and what its physical environment is, and includes the topography with its contour lines.

With this, Lewerentz indicates that the whole island has become part of the tomb project. Utterö is no longer a reference to the site or a location where to place an architectural element. It is the garden that he proposed as a response in funerary monuments that integrates with the terrain, blending in without altering the landscape. This decision, although already present in the previous sketches, is evident in this last one. Not only is the representation of a burial site sought, but also the representation of a landscape.

The ground plan. Once we have understood the garden that he has turned the island into, intuitively and in a very subtle way, we are led to descend visually from the map to the plan. It is a change of scale. We stand on the jetty, which is the only element invading and emerging from the water, to find the place where we can set foot and enter the island. We can see how it widens to welcome visitors. A narrow path that takes us to the interior of the island joins and emerges with it. We walk through the hollow of the shallow vegetation that protects it, without reference to its scale, drawn exclusively in plan.

The traditional stone paving, which contrasts with the flowers and grass of the natural terrain, guides us. We follow it, already from a height close to the ground, with our eyes or with our fingers because, as Juhani Pallasmaa writes in memory of the sculptor Tapio Wirkkala, "we have eyes in our fingertips" [Pallasmaa 2012, p. 48]. For the Finn, it is our corporeal sensory experience, in relation to the passage of time and space, that allows us to know, explain, analyze and create. A back and forth process, from the inside to the outside.

The path is interrupted right at the bench in front of the grave. The slab on one side and a bench on the other. We remain still. It is at this point that the project becomes concrete, for it "is not just any place from which one cannot go and remain the same" [Martínez Santamaría 2002, p. 8]. We observe.

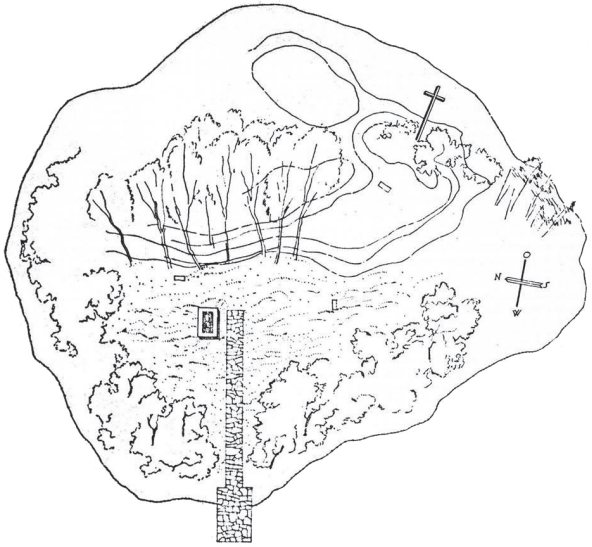
The tombstone, which was intuited from a distance, becomes evident at that moment. It floats over the garden and its shadow makes it present. It is an unnatural shadow. It is an impossible shadow. It is cast towards the south, something the architect was aware of after marking the north on the map. It is a resource, an underlining, that architecture has traditionally used to generate the three dimensions in a plan. Without ceasing to contemplate it, we sit on the bench. Time passes.

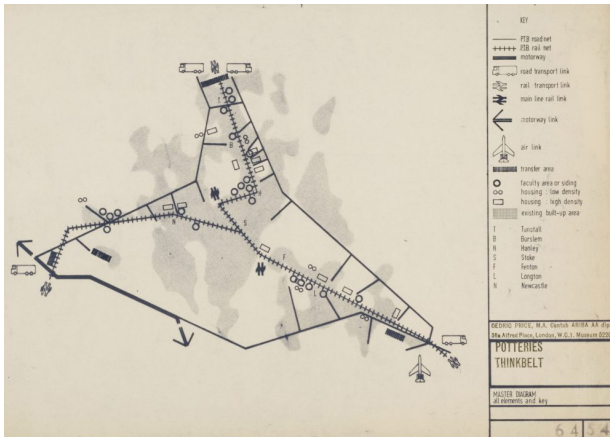
The elevation. After the moment of reflection, we look up. Again, there is a change in our gaze. We no longer look at the ground, but at the horizon. From the bench, as we stand up, we turn our gaze to the side.

Lewerentz changes our point of view with an artifice from vertical to horizontal and we discover the trees. The vegetation rises above the garden-ground. The trunks emerge above the contour lines in a game of double meaning. The curves have gone from being the horizontal element, codified and aseptic, to become the undulating vertical profile of the elevation, over which the trees grow. Lewerentz

Fig. 3. Sigurd Lewerentz, 1928-1929. Bergen Tomb, Utterö. Third version.

Fig. 4. Cedric Price, 1964-1966. Thinkbelt Potteries. Master Diagram.





uses this strategy to be able to move from the vertical to the horizontal projection and avoid the space of uncertainty between the two representations.
The vegetation protects and surrounds the central clearing where the tomb is located. Unlike the vegetation surrounding the island on the map, we can see its depth by its overlapping and staggering. Contour lines are replicated and trees take up positions near or far away.
The perspective. As we turn back, with the natural turn of our eyes, we discover the distant bench and the cross. The elevation has become perspective, aided by the same double play of meaning between curves and shapes. This time we can distinguish the different sizes of the vegetation altered in scale by the distance. Accompanied by the curved lines, the sandy area of the adjoining islet can be seen. The cross emerges and its lack of verticality helps us to shift our gaze to understand the interior space of the islet. This time, the shadow is to the north, there is no need to underline or use more resources. After the last silence, we return to the same path.
Between 1929 and 1931, Lewerentz would draw up an unbuilt proposal for his own burial with his wife Etty, on the adjacent islet that can be seen as we leave. He has been at rest in Malmö since 1975.

Landscape as Architecture. Potteries Thinkbelt, North Staffordshire. Cedric Price, 1964-1966

Cedric Price was born in 1934 in Stone in the county of Staffordshire, situated in the East Midlands, across the River Trent. Before the Second World War, North Staffordshire Potteries was a well-established centre of the English pottery industry, dating back over 250 years.
By the 1960s, everything had changed. The Potteries and their production methods were obsolete. The region had lost its strength due to the exhaustion of its coal mines, the rising cost of coal extraction, foreign competition and the use of new energy systems to support industrial production. All this had turned the territory into a disjointed region in search of a new future and an alternative definition.
In this context, Price decides to make this proposal. It is a self-commissioning, with no evidence of its realisation, no programme, no timetable and no financial support. As Stanley Mathews, who describes the proposal as a labour

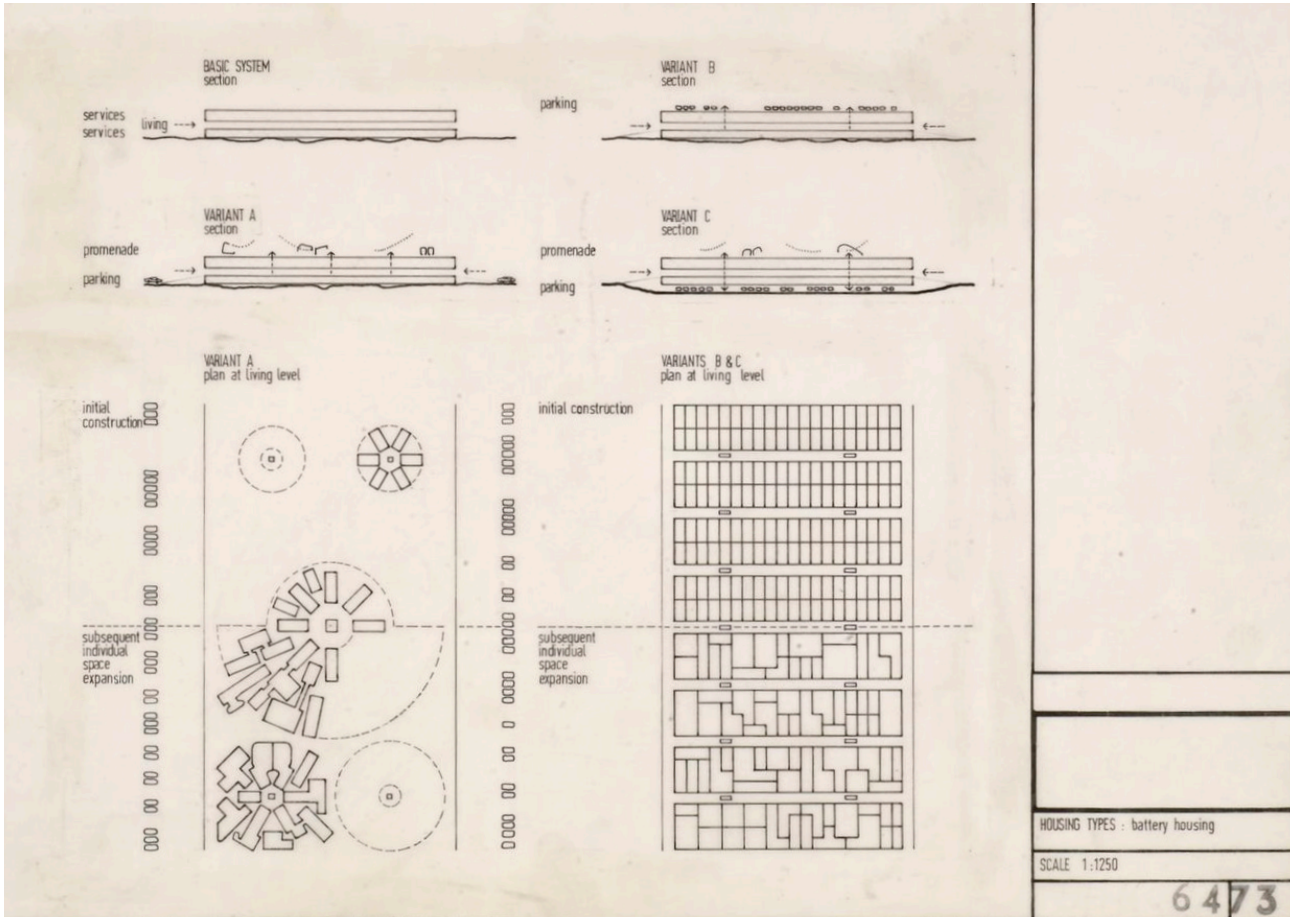


Fig. 5. Cedric Price, 1964-1966. Thinkbelt Potteries. Housing Types.

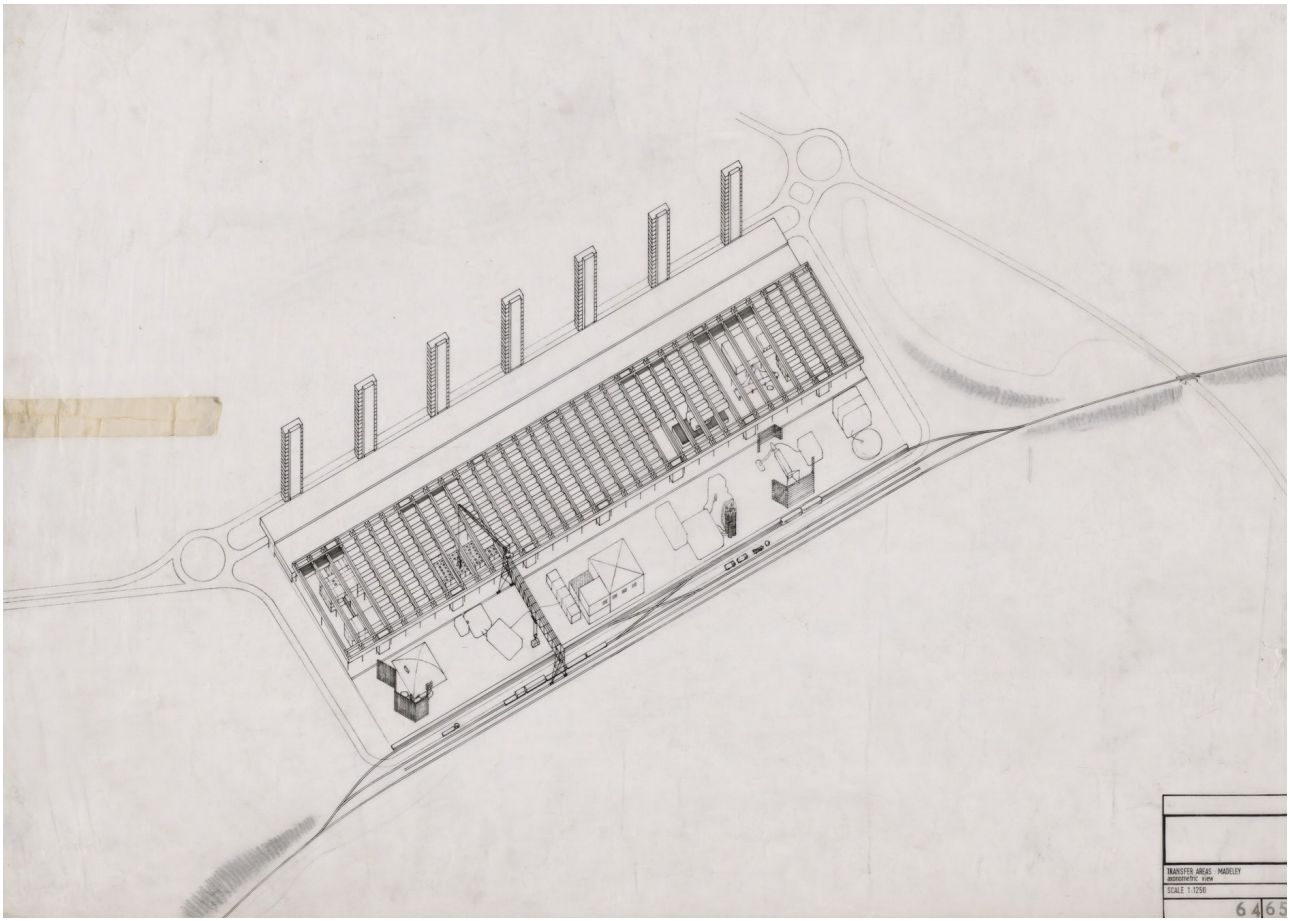


Fig. 6. Cedric Price, 1964-1966. Thinkbelt Potteries. Transfer areas.

of love, says, it is a response to the under-secretary for housing, Lord Kennet. It is an alternative capable of generating a new university structure and revitalizing a landscape described by Price as "unstable" and "useless" [Mathews 2001, p. 23]. On the other hand, the term 'thinkbelt' is difficult to translate, since apart from the immediate meaning of belt, Herreros relates it to "region or transmission […] to think, to generate thought as a result of a Productive process" [Herreros 2001b, p. 13].

The structure of the territory was, and is, extremely unique. The potteries were arranged throughout an extensive territory. This is articulated by a railway line, which was one of the first to be built in the mid-19th century and is still in a very good state of conservation. The proposal, from the beginning, was to recycle and integrate this peculiar territorial organization of infrastructures, in a project capable of rethinking the territory, by means of the railway network that connected the cities and the disused ruins (fig. 4).

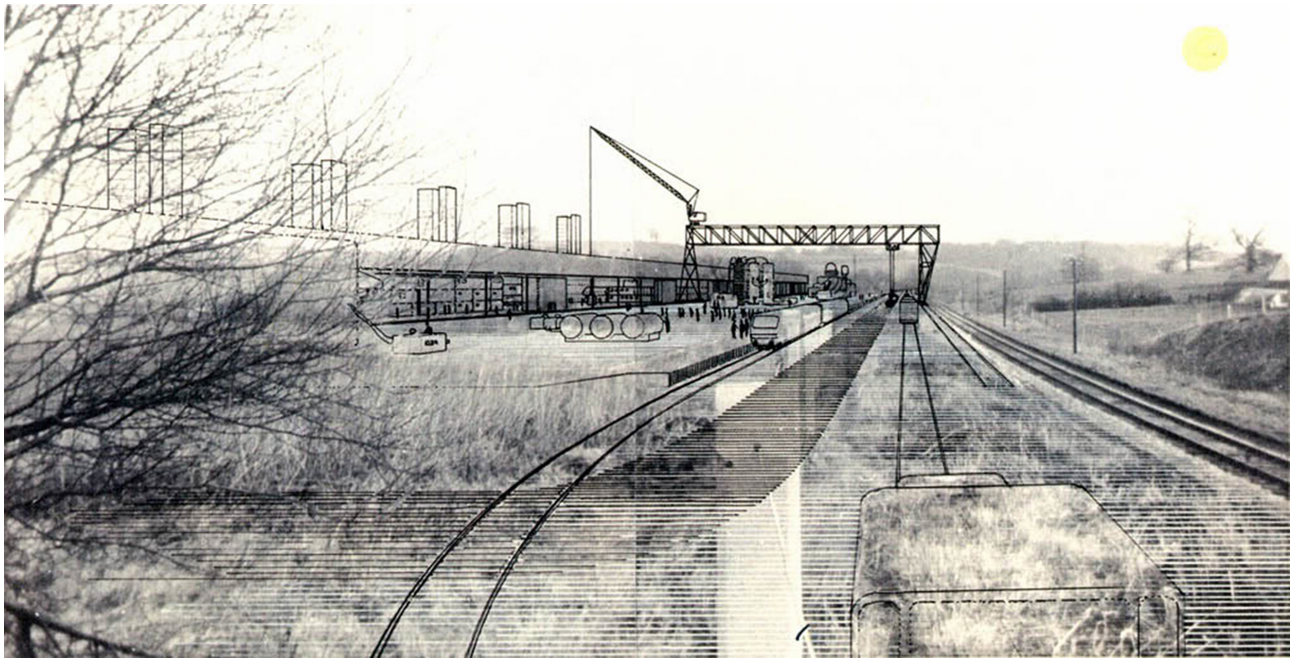


Fig. 7. Cedric Price, 1964-1966. Thinkbelt Potteries. Pohotomontage.

Price was seduced by the cybernetic theories of Norbert Wiener, defined by the feedback and interaction between people and machines. According to Mario Carpo, Price derived from this the idea of intelligent architecture capable of reorganizing, moving, reconstructing or mutating itself [Carpo 2023]. An action according to the use and needs of its inhabitants. In this way, he proposed a facility based on science and technology. He intended to create a university campus on more than 2,800 hectares, with more than 20,000 students, which would ultimately translate into some 40,000 new inhabitants for the county.
The proposed solution is not a university with a classical structure, against which he had taken a stand on countless occasions. He understood the university of the new times as an industry capable of promoting development, as a key part of a global philosophy. His brilliant idea was to make a virtue out of necessity, to take advantage of the local railway line, which was already obsolete, and to build a new decentralized campus around it, an alternative to those already known. The project is somewhere between the poetics of the most Dadaist 'ready-made' and British pop culture. "The answer is always technology, but what is the question?" said Cedric Price [Price 1979].
In the *Thinkbelt*, a series of mobile modules were designed to contain the main bulk of the classrooms, laboratories and other facilities. The unit of teaching time was exactly the time required for a typical journey. Arranged on the tracks, they would move along the territory in the middle of a complex organization affecting time and space. Nothing in *Potteries Thinkbelt* is fixed or permanent, everything is mobile and changing, in fact, movement and change are its raison d'être [Hardingham 2016, pp. 192-207].
The proposal, which is well known, is basically materialized in two types of documents: plan, elevation and section diagrams and photomontages redrawn on snapshots of the territory (fig. 5).
The plan and section drawings are diagrams of use, assembly and construction strategies, narrated simply as industrial

elements. Their deliberate graphic asepsis makes them extremely subjective and personal. It is the representation of a flexible idea of industrialized architecture, which the architect makes compatible in his drawing and anticipates the cybernetic design methodology proposed by Christopher Alexander in *Notes for the Synthesis of Form* [Alexander 2012]. It is the action of constructing by drawing, not the representation as an aspiration of a future reality. It is not a question of altering reality, but rather of codifying, reinterpreting and transmitting from the graphic, with an objective in mind [Cortés, Moneo 1976, pp. 80-83]. In short, it proposes an information of a mutable architectural object with the maximum economy of means. Architecture is the diagram and architectural drawing is the expression of that diagram (fig. 6).
The coherence that he achieves with these diagrams, which being reductive are in essence concepts, is what differentiates them from the sketch. The diagram thinks and responds with representations, for as Stan Allen explains in *Diagrams Matter,* it is an instrument for introducing organisational structures as autonomous entities in the design process [Allen 1998, p. 23]. The plan documentation, with the exception of the codified map of the territory, makes hardly any reference to the site. There is no other document, notation or indication that is not strictly technological.
It is an open autonomous system, where a catalogue of elements is placed in a field of operations. It is technique and not form that provides the answer, for as Price argued about progress: "no one should care about the design of a bridge: what should matter to them is how to get somewhere else" [Mathews 2001, p. 23].
Let's look at collages and photographic images. Everything changes in the line drawing on the photographs. It refers us to a landscape and to an exact territory. The landscape is the only immutable reality.
Far from a romantic conservative attitude, he accepts the territory and the landscape as it is. He naturally incorporates the line, in an indifferent layer, a superimposed glaze that can be modified, eliminated or substituted. He dilutes his architectural proposal in a contingent or eventual way, so that it can be exchanged for another. Everything is operative (fig. 6).
The pre-existences of the road and the non-place are delimited by a linear prospective drawing. The architecture is transparent, while the overhead crane is still in action. The movement of the trains merges with that of the students and the workers. Neither volume nor space are of interest, only the poetic action of movement, of inhabiting and building on the territory.
The line, just a line on an image, modifies the meaning of what is represented. Like the architect and draughtsman Saul Steinberg, Price, with a single stroke, alters the narrative of a photograph. A line that we hope will go outside the frame, as he sometimes did in other of his projects. In these collages, the simplest gesture of a representation becomes the protagonist that takes us into the future (fig. 7).
In these images he does not feel the 'restorative' nostalgia for a physical place, which, as Svletana Boym has described, is harmful because it clings to the institutionalization of memory, feeling from the present the absence of an idealized past that rejects the now. With its attitude, it refers to a reflexive nostalgia that is positive and overcomes all melancholy. He looks to the future from the present, with memory as learning [Boym 2015]. Price shows us that he has accepted the impossibility of holding on to the past in order to try to reconstruct it. He is able to admire the territory together with the patina of time and the common values still present, to abandon the impossible and arrive at a new time. A new landscape recognized and delimited.
Show what 'is' and less what is 'shown'. Essence, versus appearance. A statement on the praxis of the idea together with disciplinary drawing.

Architecture as Landscape.
Dipoli, Student Union Building, Otaniemi. Reima and Raili Pietilä, 1965-1967

In 1961 a competition was held for the construction of the Student Union Centre on the campus of the Otaniemi University of Technology near Helsinki. The future building was located within the development plan designed by Alvar Aalto in 1949, which was also the result of a competition. The plan included a new multi-purpose building. But if the project had been formalised in 1950, without delay, the result would have been different [Royo 2014, p. 85].
The site is a beautiful hill surrounded by forest and the characteristic rocky soil, which in Finland comes to the surface very easily. This natural environment had a strong influence on the Reima y Raili Pietilä's winning competition entry. The project primarily reflects the topography and the rocks.
Like many of his peers, he had a German education. He



Fig. 8. Reima y Raili Pietilä, 1965-1967. Dipoli, Student Union Building. Sketch.

spoke English, German and had a knowledge of French. The influence of German culture in Finland was common until after World War II.
Pietilä expressed his interest in German expressionist architecture and especially in Bruno Taut and Otto Bartning, although in some writings he distanced himself from Dipoli's expressionist interpretation. In the 1960s, in search of a Finnish architecture in the face of an international interpretation of his work, Pietilä states that the project "rests somewhere in Finnish culture without any parallels to international subcultures" [Royo 2014, p. 162].
In any case, he knew the special attraction that German expressionist architects showed for everything concerning the earth's crust, for all its precipitous coarseness. It is the triumph of the myth of the cave over the rationalist hut, the origin of all architecture: "let the perceiver learn to build with mountains", said Walter Müller-Wulckow in his book *Aufbau-Architektur* [Müller-Wulckow 1919, p.28]. Bruno Taut, too, in his monumental undertaking *Alpine Architecture* of 1919, intended to transform the entire mountain range into a fantastic landscape of grail shrines and glass-covered caves. The architecture of the earth's crust would take its glittering forms to all continents (fig. 8).
The project considers how to inhabit a cave in a large rock, for which he does not hesitate to construct a powerful copper volume not far removed from Wassily Luckhardt's *Formal Fantasie*s of 1919. The initial drawings of the Dipoli Centre, represented in charcoal sections, also resemble Hans Poelzig's sketches for the Salzburg *Festspielhaus* of 1920. The parallels between the floor plan sketches and the forms of authors such as Hermann Finsterling in 1920, or interiors such as the Scala restaurant in Berlin by Walter Wurzbach and Rudolf Belling, are revealing.
The other sketches of the project in elevation, plan and section are the most reproduced, studied or known. The drawings of the roof, the undulating and faceted roof of the multifunctional spaces, as well as the narrative studies of the growth in elevation and plan on the hill have been analysed in particular (fig. 9).
But undoubtedly the most surprising of all Pietilä's sketches is the one in which five human figures are placed in different positions among what looks like a group of rocks, but between which one can guess possible routes of stairs and walkways. It is an inhabited rock through which people move, enter and leave.
The second surprise is that this is the sketch he chose to comment on the project process in the 1987 documentary directed by Anssi Blonsted *The Seasons. Four journeys into Raili and Reima Pietiläs architecture* (fig. 10).
In the first sequence of the documentary, before the credits roll, he enigmatically states in relation to the search for 'the truth': "I meticulously note down the surroundings, I

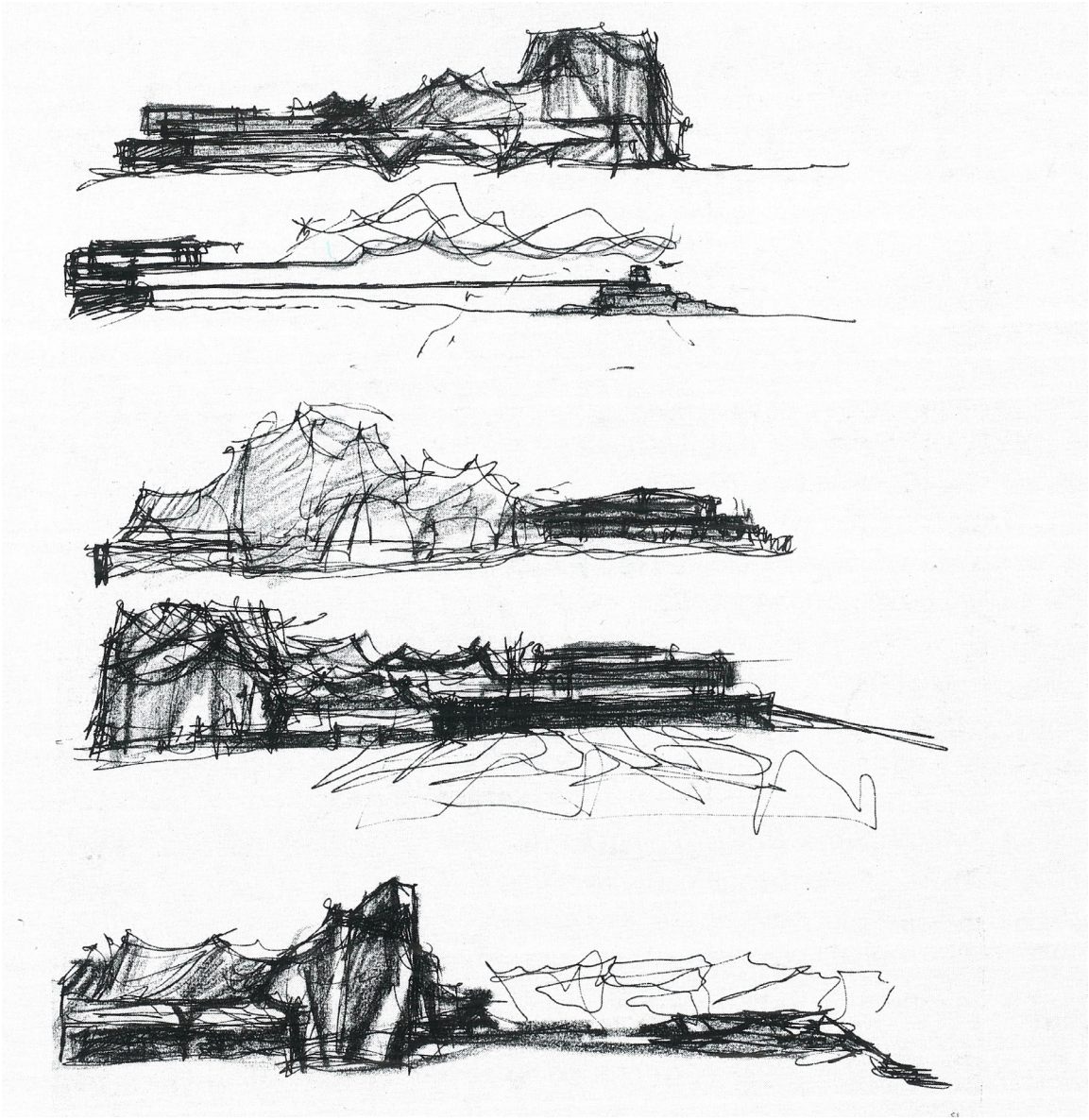


Fig. 9. 1965-1967. Dipoli, Student Union Building. Sketch.

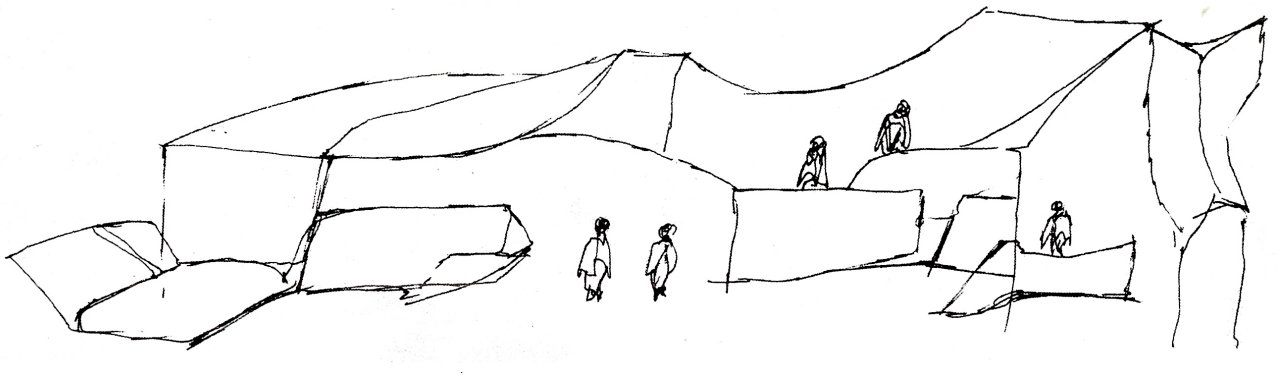


Fig. 10. Reima y Raili Pietilä, 1965-1967. Dipoli, Student Union Building. Sketch.

am content to interpret the truth through metaphors because in architecture it is enough to create a frame. Truth is what frames architecture" [Blomstedt 1988].
At the beginning, it focuses on the blowing up of a rock by delving into the inner visions, into the fissures produced by the deflagration. We are shown the interior partial images and the balances of the fragments of the stones in the resulting gravitations.
At the beginning of the project description, no plan, elevation or section representation is shown. Only four partial sketches, four static images.
It stops at the inhabited elevation. But it is not a complete image. Nor is it static. It begins with a zoom, a partial view, of its left side and moves over the elevation until it is completed on its far right. The sequence lasts 10 seconds, from second one to eleven, minute three. We never see it in its entirety. We walk through it dynamically, explicitly, from one end to the other. It is as if we were physically in the place and we are watching it with our eyes. We don't go back. It is a game that involves our senses and our memory (fig. 9).
The rest is the narration of a journey. The description of a commented architectural walk, in which reflection and memory merge. They are uninterrupted sequences, with no other narrative link than that of showing the building from the inside and the outside.
Turning back, the journey to Dipoli begins with portraits of the architect meditating, while his voice draws an analogy between literature and architecture: "he felt that the work of architecture had a more direct structural relationship to a novel than to a pictorial work" [Blomstedt 1988]. We know that Pietilä was a bibliophile from his studies of the writings of Malcom Quantril and Roger Connah. He himself states that he liked to study grammar and invent words. In the documentary he acknowledges Samuel Beckett as a reference.
At the beginning of the traveling of the inhabited elevation, he explicitly speaks of architecture as a succession of fragmentary visions, like literary aesthetics, which are linked according to a formal narrative plan. At the end of the tour, he concludes with the statement: "the spatial content is formed by a series of pictorial situations that the narrative tone changes" [Blomstedt 1988].
This sketch opens up a specific dimension of the mechanisms of knowledge and intervention in architecture, so that discovery and invention converge. It is more about knowing how to look, learning how it is, how it is interpreted or how it is articulated. It is a new reading or re-reading.
In Dipoli all faces and all sides of the exterior and interior are of equal importance. There are no clearly predetermined hierarchical relationships. The parts depend on the observer rather than on the object. He has drawn an environment of images in which sequence and displacement provide coherence. Everything is enveloped in a structure that gives it unity. To move is to accept simultaneities in time.
Everything is past and present at the same time.

Notes

[1] On the various sketches for the Bergen Tomb cfr. Fernández Elorza 2014.

[2] Fernández Elorza's doctoral work [2014] includes excerpts from Lewerentz's article, dated 1939 and never published, with the title *Modern Cemeteries, notes on the landscape*. This article is dated 1939.

[3] The expression is due to the Italian writer and poet Pietro Aretino in a letter to Giulio Romano [Pietro Aretino 1916, II, 2, p. 186]. The first to cite this expression when dealing with Renaissance art is Ernst Hans Josef Gombrich in his doctoral thesis on the architecture of Giulio Romano, published under the title: *Zum Werke Giulio Romano* in 1934.

[4] The documents can be consulted at the Canadian Centre for Architecture and in the bibliography proposed in the cycle of *Silent Architectures* Cfr. Herreros 2001a, and especially in the monograph Hardingham 2016.

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Connecting Communities and Landscapes Across Europe. Digital Tools and Participatory Practices for Green Education

Camilla Casonato

Abstract

A reading of the European Landscape Convention, combined with an analysis of European guidelines on education for cultural heritage and sustainability, underlines the importance of developing pathways that connect communities with landscapes, link schools with their surrounding areas and engage young people in practices that promote active, responsible citizenship. The aim is to involve them directly in formulating and pursuing goals related to understanding and caring for their local landscapes.
This reflection originates from a European project involving universities, art-based research centres, local associations and primary and secondary schools in Italy, Spain and Austria. Teachers, researchers and local stakeholders travelled across Europe to share knowledge and experiences, co-design teaching methods and field-test them in both ordinary and fragile contexts. The study thereby developed a set of practices focused on raising awareness, promoting and communicating the landscape, aimed at highlighting its various elements –both tangible and intangible– and their multiple representations. The paper analyses the results of the research, in particular a MOOC (Massive Open Online Course) designed to equip educators with theoretical foundations, methodological insights and best practices for landscape education, understood as cultural heritage and a key resource for sustainable development.

Keywords: landscape and sustainability education, MOOC, landscape interpretation, digital learning environments, participatory practices for proximity landscapes.

Introduction

The polysemic nature of the concept of landscape as a physical element with strong cultural connotations can only be defined and recognised by allowing perceptions and interpretations to emerge. It is necessary to examine not only the material dimension, but also the immaterial, innermost aspects linked to the different experiences and sensitivities of groups and individuals. Addressing such a complex situation requires crossing disciplinary and cultural boundaries, as well as identifying methodologies and practices that effectively connect communities and local areas in heterogeneous contexts. This contribution is based on a broader study carried out since 2017 at the CLIPlab (Cultural Landscape Information and Planning Laboratory) of the Politecnico di Milano, which investigates methodologies and practices for both formal and informal education related to local landscapes from a European perspective, particularly in ordinary or even degraded contexts. Research has been enriched over the years by dialogue with national and international institutions, as the experiences presented here also illustrate. Beginning with a definition of the topic and an overview of the issues it raises in European policy, the paper outlines the methodological and operational framework of a recently completed European project. It focuses on one of the research findings and initiates a preliminary discussion on its characteristics, limitations and potential.

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Teaching about landscape, heritage and sustainability

The interpretation of cultural heritage as a value system intrinsically linked to places and their interpretations has progressively emerged in recent decades [COE 2018; Smith 2006; Sonkoly, Vahtikari 2018; Waterton, Watson 2010]. This perspective highlights the importance of establishing connections between the recognition of cultural values expressed by places, participation, and the care of the landscape, particularly within the educational sphere. Between 1998 and 2022, European institutions produced a number of documents of heterogeneous (and seemingly unrelated) content and scope, yet nevertheless crucial when it comes to defining contemporary landscape education. The European Landscape Convention, published in 2000, and subsequent implementation documents [COE 2008; 2014; 2017; 2019], have contributed to the emergence of an open and expanded understanding of the concept of landscape. This perspective emphasises the interactions between human activities, cultural aspects and physical contexts, the importance of strengthening relationships between communities and their living environments, and the quality of the landscape as a foundation for social wellbeing. In the educational sphere, this approach necessitates greater attention to direct knowledge of the local area, the development of interpretative practices and the enhancement of perceptions and representations [Casonato 2022]. Two years earlier, a recommendation from the Council of Europe [COE 1998] had paved the way for a conception of education through cultural heritage as a set of transdisciplinary practices based on active methods and aimed at respecting common assets, valuing intergenerational dialogue and appreciating cultural diversity [Copeland 2017; Borgia et al. 2019; Bortolotti et al. 2008]. The approach proposed by the 1998 recommendation is based on a broad view of cultural heritage, understood as an evolving value system developed through an interaction between heritage and community. A few years later, this vision connecting heritage and society was revitalised through the development of the Faro Convention, which encourages viewing cultural life as an extension of the universal theme of human rights [COE 2005]. More than 20 years after the first recommendation, a new one has recently emphasised the importance of heritage, culture and landscape in addressing sustainability and global challenges [COE 2022].

The 2030 Agenda for Sustainable Development [UN 2015] can be positioned against the backdrop of the aforementioned issues, as it calls for the development of inclusive methodologies for quality education to foster cultural accessibility, reduce inequalities, value diversity, and promote sustainable communities (Sustainable Development Goals 4, 10, 11). The issue of sustainability is therefore crucial today in the context of education that considers landscape as a cultural system and heritage as a heterogeneous whole and widespread testimony. The connection between the quality of places, heritage and ecological transition is increasingly gaining prominence in European policymaking, as evidenced by the emerging New European Bauhaus movement [2021]. Nevertheless, the correlation between these different areas on a pedagogical level remains largely unexplored, and the recent development of guidelines formulated within the Joint Research Centre of the European Commission for education for ecological transition [COEU 2022; Bianchi et al. 2022] appears to offer no clear pathways for a holistic approach that promotes the connection between landscape, heritage and sustainability education. A field of investigation is thereby outlined which, building on the reflections of the scientific community and the demands of institutions, can lead to the identification of useful methodological tools and practices validated in the field, serving as common working materials for defining new educational horizons.

A participatory and interdisciplinary methodology

The project entitled *Edulands for Transitions. Exploring collaborative learning tools to connect school and landscape* [1], which concluded in 2024, addressed the challenge of methodological design for landscape and ecological transition education. Its aim was to transcend disciplinary, cultural and geographical boundaries, operating within a European dimension while remaining firmly anchored in fieldwork and local contexts. In line with these assumptions, a multicultural, multidisciplinary and multi-sectoral working group, driven by a shared interest in transition as both a cultural and social phenomenon, chose to focus on schools as the primary agents of change. The study therefore saw universities, schools of applied arts and research centres from Spain, Italy and

Austria collaborating directly with primary and secondary schools in the three countries. Researchers from universities and art-based research centres, architects, designers and filmmakers active in associations committed to raising awareness of the local area and its values, the public use of space, the connection between food, landscape and culture, the preservation of public space and participatory practices worked alongside teachers to co-design educational pathways and tools. Participants travelled to share knowledge and experiences, co-design procedures, test them and then discuss their findings, working in fragile contexts such as inland areas, high-density urban areas and neighbourhoods with high immigration. The research findings include tools to disseminate the processes and use them as a basis for further educational experimentation, including a set of guidelines, an interactive, open and incremental OER (Open Educational Resources) system and a MOOC aimed at teachers and educators.

A MOOC for teaching about cultural landscapes and transition

Far from being simple online transpositions of teaching materials or sequences of recorded lectures, MOOCs (Massive Open Online Courses) are specific educational products that have been shaped by dedicated methodological reflection over time. Designed to be used by a very large number of people (Massive), MOOCs are in fact actual courses, with a defined syllabus and learning objectives, and with supporting materials and activities, as well as an evaluation system; they are typically accessible via networked platforms (Online) and do not require prerequisites limiting participation (i.e. they are Open). From this general definition, it is evident that creating a MOOC requires various skills that extend beyond the content-related subject areas, incorporating aspects of communication, pedagogy and media for teaching. In this case, in developing the tool, the researchers worked alongside experts in the field to design the structure, define the teaching approach, manage the textual and visual communication and finally build a dedicated digital architecture. Specific expertise was provided by METID (Innovative Methods and Technologies for Teaching), an internal body of the Politecnico di Milano that designs and tests tools and methods for teaching innovation through a dedicated platform (POK-Polimi Open Knowledge) that offers courses for professors and students, as well as for professionals and the general public, in order to make the University's expertise available to the community in the spirit of the third mission.

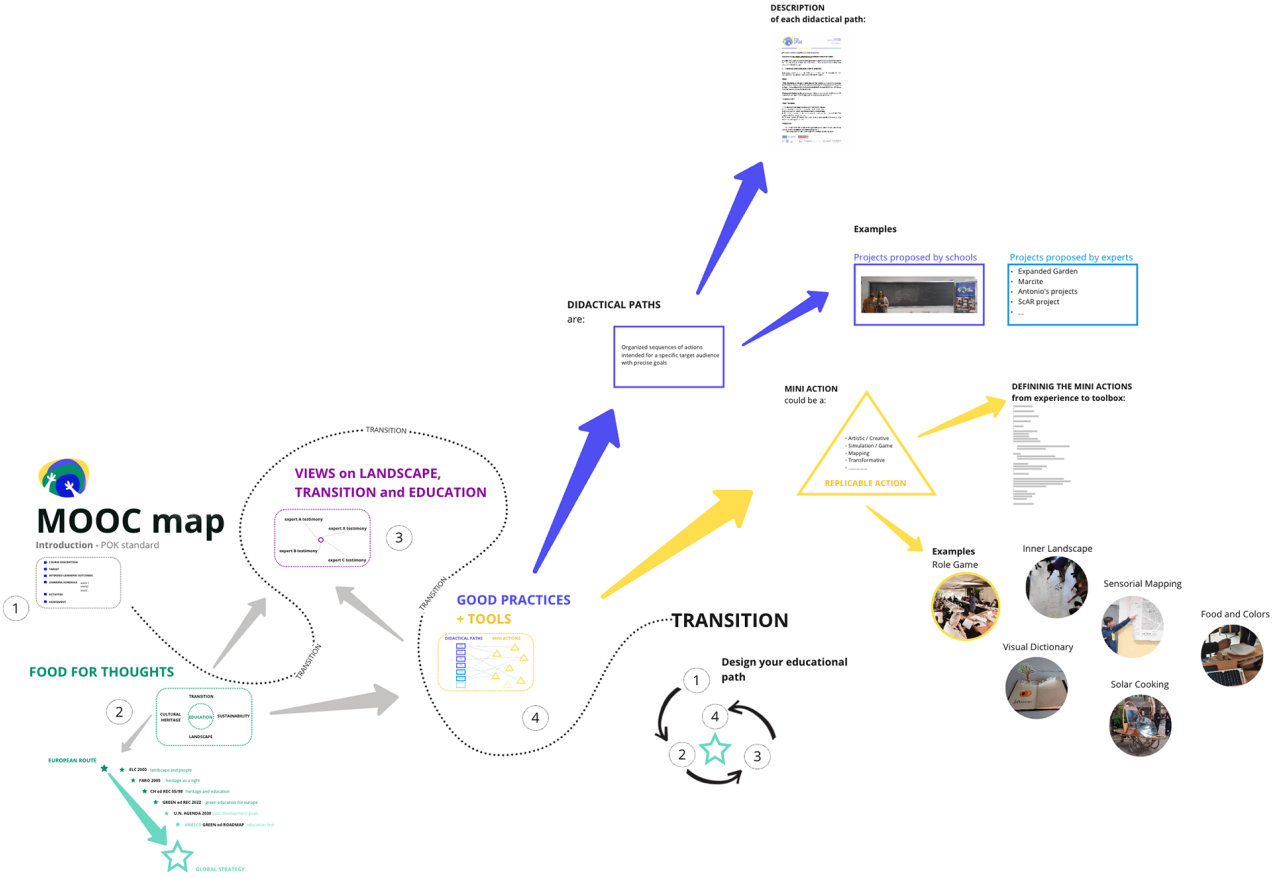
'Take actions to identify, analyse, and care for the landscape around us'

The teaching pathways that emerged from the *Edulands* project experience constitute the core of the MOOC entitled *Landscape education for ecological and cultural transition*, the main objective of which is to provide methodological cues and good practices for landscape education, understood as cultural heritage and as a primary resource for sustainable development. The experiences presented –as the motto that gives the section its title makes clear– are based on practices focused on raising awareness, promoting and communicating about the landscape, aimed at highlighting its various elements –both tangible and intangible– and their multiple representations. Operational formats have been developed from the experiences, which the course offers to actively guide users in designing pathways applicable to various contexts, particularly in everyday environments, including those in fragile landscapes and/or social situations. Underlying the approach is the connection between awareness, interpretation and promotion of the landscape, alongside that between landscape care, participation and quality of life. The course offers opportunities for in-depth study, guided activities, tested operational tools and examples of application which aim to stimulate, guide and enrich informed teaching project design and awareness of the complexity of the topic. The aim is also to foster an understanding of global challenges recognised for their impact on the environmental, social, economic and cultural dimensions of the European context.
The use of artificial intelligence tools (HeyGen Artificial Intelligence software) enabled the various experts in the European group to express themselves in their own language while creating the video contributions, which are central to the course. This then allowed for the release of a lip-synchronised multilingual version of their content. The MOOC is therefore accessible in four languages and is aimed not only at teachers but also at educators and practitioners working to raise awareness of landscape and sustainability issues, such as in contexts of civic participation and the development of active policies from below.

Teaching structure and content structure

The MOOC offers a linear training process, structured into weekly segments that clearly define the working time, and also awards training credits (fig. 1). Users are supported in verifying their skills and self-assessing their learning outcomes through structured periodic assessments, such as passing a test or solving an exercise using doodles –mainly image-based– or through more open, project-based assessments, such as creating a paper, uploading it and sharing it with peers (fig. 2). The course is complemented by a forum where participants can exchange ideas on the content and share materials produced during it. While providing the option for linear progression, the MOOC also allows for smooth, customised navigation. By engaging professionals, it was essential to enable each individual to orient their learning according to their interests and needs, giving

Fig.1. Collaborative conceptual map of the MOOC (created with Miro) used in the co-design and revision phases with the local and international group (author's elaboration).



users the opportunity to work more intensively where they felt they required additional input. This approach allowed them to adjust their engagement in different sections, for example by customising the exploration of available materials, conducting in-depth studies of topics and producing revision and teaching project design materials.

In the initial phase, the course offers training on key concepts: landscape, cultural heritage, transition and sustainability. The first section, titled *Food for Thoughts*, aims to focus on the topics and their interrelationships, guiding a systemic, transversal and targeted interpretation of the concepts, principles and recommendations found in scientific literature and European documents (fig. 3). The second section –*Landscape Views. Transition and Education*– proposes different approaches to interpretation and design 'of' and 'in' the landscape, offering lectures, activities and readings by international specialists from various disciplines. These range from the protection of historical landscapes and the design of public spaces to sustainability-focused design, with an emphasis on bottom-up approaches and the replicability of processes in diverse educational contexts (fig. 4). The teaching activities co-designed with teachers and tested in different countries constitute the body of good practices available in the third section entitled *Good practices. Ideas and experiences*. The section provides access to the Open Educational Resources (OER) [Open Educational Resources (OER)] developed by the Spanish partner, which can be explored through a structured visual communication project offering various interpretations [Open Educational Resources (OER). Search Homepage] (figs. 5, 6). The open and expandable set of *Learning Experiences*, all multidisciplinary, cooperative and creative, is indexed based on a participatory taxonomy. This taxonomy includes the various aspects of the concept of transition, the diversity of spatial contexts, the types of stakeholders and communities involved, the pedagogical approaches adopted (authentic learning, collaborative learning, peer learning and so on), and the types of collaborative actions implemented (including consultation, mapping, gaming and transformative action). Each experience is documented through texts, images and links to external resources, organised in a common format designed to guide teachers and partners in analysing the actions carried out locally.

Fig. 2. Images from the MOOC test 'Which of these images depict a landscape?' (source: MOOC Landscape education for ecological and cultural transition).

Fig. 3. Detail of the collaborative concept map of the MOOC: 'Food for thoughts' section, connecting to European directives and global challenges (author's elaboration).



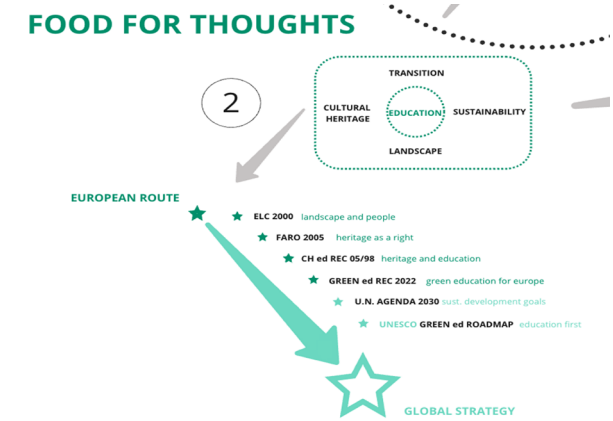
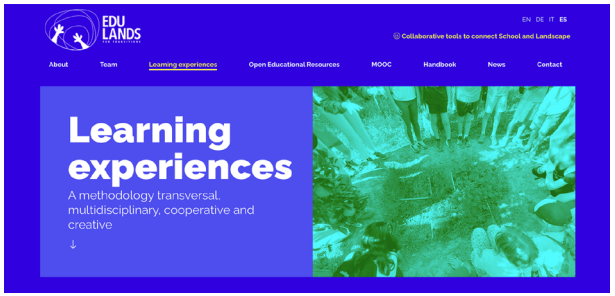


Fig. 4. Frame from the video lecture 'Participatory actions on the landscape' given by A. Abellán Alarcón, founder of Huerta Bizarra (Spain).

Fig. 5. Presentation of the 'Learning experiences' undertaken by schools and local and international partners (source: <https://edulands.eu/learning-experiences/>).





Due to its richness and variety, while constituting a valuable resource, this set of transversal practices posed a significant challenge in terms of effective and targeted use within a digital learning environment and a self-sustaining, purposeful learning pathway such as a MOOC. The risk was that users might get lost in exploring the practices without being able to identify exportable operational tools. The fourth section therefore presents a set of tools called 'MiniTOOLS', which extract replicable formats from field experiences, designed to be transferred and combined into new and original teaching pathways (fig. 7). The tools are described using graphic cards and presented either through a summary framework based on titles and keywords or through a visual gallery (figs. 8, 9). For each tool, it is possible to trace back to the source project. The section on practices and the section containing replicability tools are therefore complementary, allowing the user/educator to create 'round-trip' pathways between detailed and systemic descriptions in which to immerse themselves and a display of tools that are, in a sense, immediately available for use. These tools can be kept 'at hand' and combined with each other (and with others already part of their professional repertoire), adapting them to specific educational contexts and targets.

The fourth and final section, entitled *Your learning path. Designing and sharing*, accompanies the educator in designing their own learning pathway, reworking the cultural and operational tools provided. The process is divided into three steps: *Design your own learning pathway, Reflect on your idea and lastly, Build your diagram.* Following the indications provided by the platform, users are invited to construct a concept map using an easily accessible visual interface (the software selected for this task is Mindmeister) accompanied by a reflection text. By following a colour-coding system that distinguishes the conceptual areas of the diagram (materials, locations, tools used, timeline and so on), the maps –which will be published at a later date on the course forum– can be freely structured in terms of content and spatial arrangement while maintaining comparability of results (fig. 10). In this way, while the MOOC is the result of specific research, it is also presented as a digital environment for comparison and as a prototype of a tool to support the exchange of practices, understood as a contribution to the broader European reflection on tools for collaboration in educational design and the circulation of experiences.

Fig. 6. Dynamic visual interface of the internal search engine for the Open Educational Resources of the European project Edulands for transitions (source: <https://edulands.eu/oer-search/>).

Fig. 7. Detail of the MOOC collaborative concept map: connections between the good practice section and the replicable formats (author's diagram).





An accessible, collaborative and adaptable MOOC

Following the first exciting season of MOOCs, which became established in 2012, analyses of their effectiveness as teaching tools have revealed certain limitations. In particular, their ability to revolutionise higher education by making it widely accessible has been questioned [Reich, Ruipérez-Vallente 2019].
Pending the collection of sufficient data to analyse the results through the contributions of the participants, an initial assessment of the limitations and risks was conducted for the case analysed here, highlighting several potential critical points. Since the course is not part of an established training framework and targets a diverse audience, difficulties are to be expected in reaching potentially interested participants. The course also outlines an under-explored area of investigation and is therefore not supported by specific literature. Lastly, the possible gradual enrichment of the contents and working materials, which enhances its nature as a collaborative tool, will depend on the number of users –also linked to the intensity and effectiveness of the dissemination and promotion actions implemented by the international research team– the level of user involvement and users' willingness to engage with a quality teaching project design that is clearly and comprehensively communicated.
Against the backdrop of these observations, it is possible to propose a brief set of reflections and identify some preliminary risk mitigation strategies. The training area identified by the course necessarily requires time to be recognised outside the confines of the research. It does, however, address an emerging and relevant training need, as confirmed by discussions with high-level institutions and the active participation of teachers from three European countries in the co-construction process. The participatory dynamic with which it took shape, the needs identified through previous research [Casonato et al. 2022] and the interest shown by competent institutions at both national and European levels confirm the analysis of the need and the usefulness of the tool, particularly in light of further developments. After all, it is precisely the difficulty of reaching the target audience at short notice that identifies the MOOC, as a tool permanently accessible on a large scale, an ideal training vehicle. The dialogue initiated during the process with a broad and diverse group of partners and institutions opens up opportunities for development, animation and circulation,

Fig. 8. Gallery of 'Mini Tools', replicable formats extrapolated from the educational experiences field-tested by schools within the MOOC (source: MOOC Landscape education for ecological and cultural transition).



Fig. 9. Descriptive summary sheet of one of more than 30 'Mini Tools', replicable operational formats extrapolated from field-tested teaching experiences and provided by the MOOC (source: MOOC Landscape education for ecological and cultural transition).

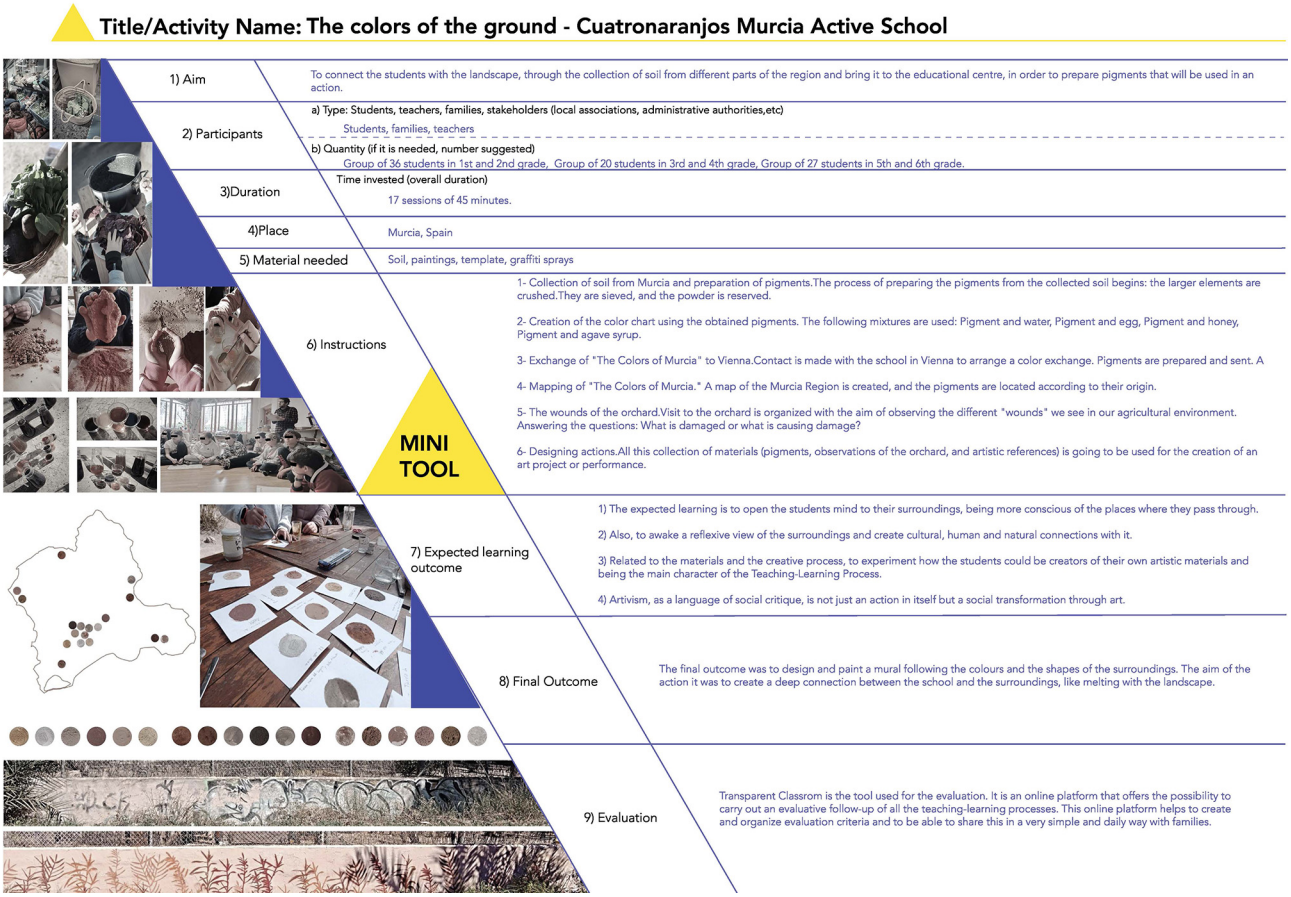


Fig. 10. Instructions for constructing concept maps describing the teaching projects that MOOC users are invited to design and share in the forum (source: MOOC Landscape education for ecological and cultural transition).

Now that you have the design idea and its characteristics in mind, you can open Mindmeister and build your diagram. We suggest you follow some simple directions regarding the colors to choose, so that all diagrams that will be shared can be easily interpreted:

- choose **BLUE BOXES** for recipients, needs, goals, constraints, timeframes, etc., i.e., all the indispensable elements;
- choose **YELLOW BOXES** to indicate materials and tools;
- choose **PURPLE BOXES** for learning approaches and methodologies;
- choose **RED BOXES** for intermediate and final outcomes (products) (a video? a poster? a web page?...);
- choose **GREEN BOXES** for work steps (timelines).



Now you can share your learning path with others on the Forum... and propose it to your students-if you haven't already!

also supported by the dissemination actions expected from the international researchers involved. The possibility of implementation, mediation and updating beyond the project deadline is, in fact, guaranteed by METID staff. Based not only on lectures but also on updatable documents (e.g. European guidelines) and on the interaction between proposed models and documented practices, the MOOC enables a continuous process of reworking and teaching project design, along with subsequent uploads by users. This potentially allows for continuous updating of the offer. In the face of the risk of low participation, the course is nevertheless presented as an autonomous product, with a rich and diverse experiential component right from the start, thanks to the participative, plural and multi-skilled nature of the process. The accessibility of the tool is also ensured by its open offer, its modular and customisable use, its free-of-charge availability, its presence on a platform maintained by an internationally recognised institution and the flexible nature of the proposed learning pathways.

When observed as a whole, the MOOC demonstrates that it aligns with the basic principles of designing learning spaces in accordance with the Pedagogy-Space-Technology framework (PST) [Radcliffe 2009]. In fact, it: motivates learners by promoting learning as an activity, supports collaborative practices, provides a learning context that can be customised to meet different needs, looks beyond tried-and-tested approaches, responds to various learning objectives, is learner-centred, supports different types of learning activities, allows for corrections and, last but not least, adopts multidisciplinary approaches. In line with the complexity that MOOCs have acquired over time, the case analysed also presents heterogeneous characteristics that initially identified precise and distinct types, combining them according to target, approach and content. The analysis of the tool according to established classification categories [Pozzi, Conole 2014] produces a fairly detailed interpretation, from which a strong ability to meet the effectiveness requirements of this type of tool emerges (tab. 1).

Fig. 11. A frame from the video lecture in the form of an interview with Tremeur Denigot, education expert at the Joint Research Centre of the European Commission, along with the cover of the lecture (source: MOOC Landscape education for ecological and cultural transition).



Tab. 1. Analysis of the MOOC based on 'the 12Ds', or 'dimensions', according to the evaluation system proposed by Conole [Pozzi, Conole 2014] (author's table).

Dimension	Description	Evaluation
Degree of openness	From relatively closed courses to courses created using 'open source' tools where participants are encouraged and share their products using creative commons licenses.	High. Uses open access tools chosen from those already in use in schools and encourages sharing their products using creative commons licenses.
Massification	From small groups to courses involving thousands of participants.	High. The course is available in four languages and is offered to anyone with an interest in the topics covered and is aimed at different categories of professionals.
Use of multimedia	From a low use of multimedia materials, to a high its of interactive multimedia.	High. Uses a varied set of multimedia materials and interactive tools (georeferencing maps, doodles for test quizzes, concept map building tools, OER search interface, forum). METID staff are available to interact with users
Degree of communication	From a low level of communication to courses where participants are encouraged to contribute to numerous discussions on forums, keep a personal reflective blog, etc.	Medium. Participants are encouraged to participate in the forum, upload their products and discuss them collectively.
Degree of collaboration	From little or no collaboration, to courses with significant levels of collaboration.	Medium. Participants are encouraged to use the forum and resources uploaded by other users as examples and items for comparison, but completion of required tasks does not require direct interaction.
Learning pathway degree of structuring/personalization	More or less structured, more or less personalized pathways, etc.	High. The course is organized in weeks and guides the user in a consequential and coherent path, however it allows a high level of customization (order of operations,available insights, intensity of commitment in the realization of products).
Quality assurance	From little or no quality assurance to courses undergoing revisions.	Medium. The institution delivering the course is reputable, however, no quality certification is provided.
Degree of reflection	From little or no reflection to courses that encourage high levels of reflection.	High. The course requires the production of products that require careful reflection and personal elaboration; it also requires reflective papers on the coursework.
Certification	Whether or not participants can receive badges upon completion of individual aspects of the course or receive certification for participation.	High. Participants who complete the course earn a Certificate of Accomplishment issued by Politecnico di Milano, a recognized institution for higher education (international level) and a recognized teacher-training institution (national level).
Formality/Informality	From formal educational offerings to proposals for informal learning.	Low. The course can be enjoyed as part of an informal by a person who is interested in the topics covered.
Autonomy	Degree to which participants are required to work independently and to self-regulate their own learning.	High. The course can be attended independently. The user is provided with self-assessment tests, in-depth materials, is invited to customize the use of resources (OER Learning experiences, MiniTools) and to apply instructional design methodologies in customized contexts (geographical context, type of landscape, teaching/educational target...).
Diversity	From homogeneous groups of students to very diverse students.	High. Participation is open to all, and the course is aimed at a wide range of users (teachers, educators, administrative and museum officials, practitioners of participatory processes...).

Conclusions

The documents outlining the European guidelines on landscape awareness, heritage education and sustainability mentioned in the introduction are well known. It is not, however, easy to discern their connections and identify their cross-cutting educational reach. Similarly, translating these guidelines into operational applications suitable for action in local contexts certainly represents a challenge, especially if we aim to adopt a perspective that transcends national borders, disciplinary limits and constraints linked to local educational systems [Branchesi 2007]. It then becomes crucial to provide educators with the fundamentals of a pedagogy that considers the cultural transformations that have occurred in recent decades –starting with the broadening of the concept of cultural heritage and landscape– and to demonstrate their relevance to the transition towards an environmentally, culturally and socially sustainable future.
Among the MOOCs available on the POK portal aimed at teachers, the one examined here stands out due to its diverse target audience, connection to a European research project, the interaction with a set of internal and external digital tools, international and extra-academic participation, variety of delivery languages, strongly multidisciplinary nature and the articulation of the teaching approaches adopted. In addition to reframing the experiences and findings of the international research group and orienting them towards teaching project design, the MOOC presented offers insights to broaden the debate, providing a direct voice to educators and enriching it with contributions from external guests. These include contributions from Tremeur Denigot, an expert in sustainability education at the Joint Research Centre, the European Commission's science hub for building independent, evidence-based knowledge to ensure European policies have a positive impact on society [European Commission. Science for Policy] (fig. 11).
The contribution consists of a series of clips targeted communications constructed in the form of interviews and debates with the MOOC leaders. This comparison enables us to examine the operation from a broader perspective, observing it from within the institutions responsible for developing education policies at European level. This passage reflects a clear intention that emerges from the entire structure of the course: rather than simply providing a package of lectures, it aims to activate a multifaceted, shared reflection on landscape and sustainability education as a complex topic and a field of experimentation and methodological co-construction. It seeks to leverage expertise, academic reflection, the work of high-level institutions, research experiences and theoretical approaches, combining them with the crucial resource of teaching reflection and bottom-up design –both very rich and challenging to exploit– rooted in the direct experience of teachers and educators. Underlying the collaborative process described is a shared desire to connect schools and local areas, communities and landscapes, bringing young people closer to practices related to active, responsible citizenship. This aims to engage them directly in formulating and pursuing sustainability goals, as well as in understanding and taking care of their local landscapes.

Notes

[1] The project was funded through an Erasmus+ call KA220-SCH (Cooperation partnerships in school education). Within the European team responsible for designing the MOOC described here is an interdepartmental research group at the Politecnico di Milano, coordinated by Paola Branduini (Department of Architecture, Built Environment and Construction Engineering) and supplemented by the author as the scientific project director at the Department of Architecture and Urban Studies. International partners, in addition to the Universidad de Murcia as the lead institution, include the Universität für angewandte Kunst in Vienna and Oikodrom (Vienna Institute for Urban Sustainability) <https://edulands.eu/> (accessed 30 July 2024).

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Shaping the Change: the Evolution of Landscape Representation and the Relationship between Man and Nature

Marta Rabazo Martín

Abstract

The representation of landscape has evolved in parallel with the relationship between humans and nature. Initially, nature was seen as a static material world. This romantic and picturesque vision changed with Darwin's Theory of Natural Selection, which integrated humans into the ecosystem. The introduction of the term 'ecology' by Haeckel in 1866 further emphasized the bond between humans and nature, highlighting species interdependence and ecological balance.
This conceptual evolution was reflected in landscape architecture, moving from aesthetic drawings to complex diagrams that depict the dynamics of natural systems. Contemporary designers use everything from quick sketches to detailed diagrams that illustrate natural processes and their interactions with the built environment.
Over time, landscape drawings have transfigured landscape architecture, blending technical information with profound artistic and historical sensitivity. Architects and artists like Ian McHarg, Lawrence Halprin, Christo and Jeanne-Claude, Diana Balmori, Robert Smithson, Bernard Lassus, James Corner, and Kongjian Yu have used drawing to explore and communicate new ideas about nature and landscapes. The proposed text will analyze this evolution and how contemporary drawings reflect an integration of scientific, aesthetic, and cultural approaches in landscape representation.

Keywords: evolution of landscape design, landscape drawing, contemporary landscape architecture, ecology.

Introduction: the evolution of the relationship between humans and nature

The perception of nature has undergone a constant evolution over time: initially, it was understood as the material world itself [Williams 1988]; later, a picturesque and romantic vision of a static and immutable nature was developed, from which society was supposed to learn for its construction. This view, prevailing until the mid-20th century and resulting in a clear separation between humans and nature, was only overcome with Darwin's Theory of Natural Selection [Eiseley 1959].
It was Ernst Haeckel, whose contribution was significant to the development and establishment of Darwinian theory, who coined the term 'ecology' in 1866, once again integrating humans as part of nature and laying the groundwork for the science that would develop from the 1940s to the 1960s. He also consolidated the assumption that nature is a collection of interrelated species, each inhabiting a biotope [Balmori 2010] in stable equilibrium. Only after several years emerged a new idea of a 'changing' nature, leaving room for external factors. Its implications for environmental sustainability began to be evaluated, while there was a growing tendency to dissociate it from aesthetics, which scientists saw as something to avoid, a human whim that distorts the natural [Balmori 2010]. However, the pursuit of beauty is considered an important aspect of sustainability, as stated in the manifesto of the *New European Bauhaus* [Scalisi, Ness 2020].

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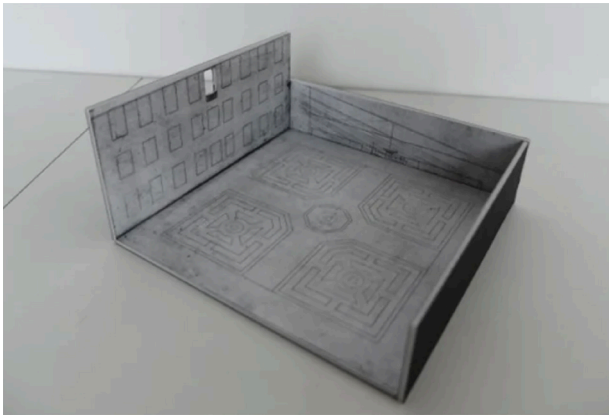
Here, the role of the landscape becomes essential: "landscape design is the art that engages with all aspects of a sustainable world: elemental forces, materials, humans, and other living beings" [Balmori 2010, p. 8]. It seeks to make the experience of sustainability pleasant and desirable, using principles, technologies, and forms with aesthetic values [Dal Falco, Veneziano, Carlomagno 2022].
Today, nature is perceived as multifaceted, "changed over time due to our actions, thoughts, and art" [Balmori 2010, p. 11], and capable of establishing intimate relationships between humans and other living systems to vigorously regenerate our cities [Xing, Jones, Donnison 2017] and move toward a more efficient, inclusive, and sustainable model of growth and management of non-renewable resources [Faivre et al. 2017]. The vegetation of our urban landscapes, as Gausa affirms [Gausa 2022], are complex, dynamic, and varied relational spaces, an active and receptive surface that constitutes a truly potential structure for the cities of the future, and no longer merely a 'category' or a 'theme': "Architecture and landscape, landscape and architecture, confirm new hybrid contracts with nature through two categories far distanced before but now in synergy" [Gausa 2022, p. 16]. This leads to a more programmatic definition of the landscape and its main role in the urban scene, as the concept of nature becomes increasingly hybrid, fluid, synthetic, and/or biological, and the city increasingly turns into an environmental system [D'Arienzo, Younés 2018].

The parallel evolution of landscape representation

The evolution of landscape representation is a fascinating journey through time, reflecting the development of artistic techniques, the perception of nature, and the representation of the environment in art. From Roman frescoes to modern digital representation techniques, landscape representation has undergone various transformations, showcasing cultural, technological, and aesthetic changes.
From ancient Rome to the Renaissance, mural paintings and frescoes incorporated elements of nature to decorate the interiors of villas, aiming to create continuity between spaces and enhance the feeling of spaciousness. Famous examples include *trompe-l'oeil* techniques that created the illusion of gardens and natural landscapes on walls, like the beautiful example in the Villa Fannius Synistor in Boscoreale [Department of Greek and Roman Art 2004].



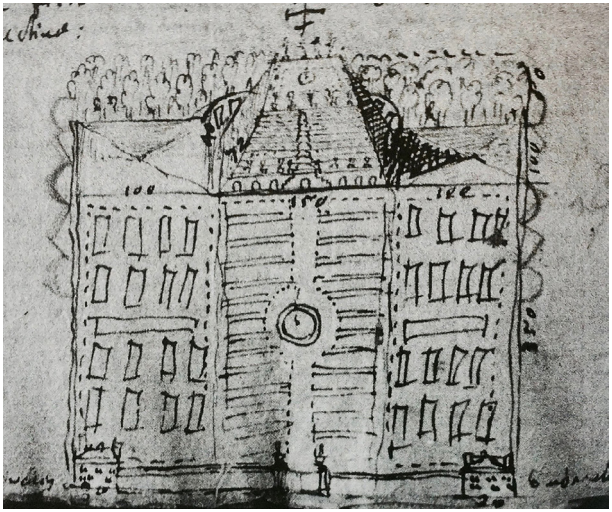


Fig. 1. Salomon de Caus, fold-out design for a trompe-l'oeil, , 1612. <https://www.philipsteadman.com/blog/the-arch-of-constantine-in-a-french-garden/> (accessed 22 December 2024)

Fig. 2. John Evelyn, Elysium Britannicum first encyclopedia of horticulture, 1659. The drawing shows the plan of a garden with a fountain in perspective. <https://thegardenstrust.blog/2018/09/15/john-evelyns-elysium-britannicum/> (accessed 28 August 2024)

During the Renaissance, the rediscovery and perfection of perspective radically changed the way landscapes were represented. Artists like Paolo Veronese used perspective techniques to create frescoes that not only adorned the interiors of villas but also showed fictitious views of the outside, blending reality and imagination. These representations were not only aesthetically valuable but also a display of their owners' power; frescoes often depicted not only the villa's landscape but also its surroundings, providing a panoramic view of the environment. This marked the beginning of humans projecting their views and landscapes: landscape paintings turned into a kind of 'picture' of the projected landscape.

Fig. 3 Christo y Jeanne-Claude, drawing of The Gates project with Central Park surroundings, 1980. © <https://christojeanneclaude.net> (accessed 28 August 2024).



In the 17th century, artists like Claude Lorrain (1600-1682), Nicolas Poussin (1594-1665), and Salvator Rosa (1615-1673) established landscape painting as an independent genre, influencing the development of English landscape design. While garden designers like André Le Nôtre (1613-1700) focused on the physical creation of landscapes during the reign of Louis XIV, artists like Paolo Veronese (1528-1588) and Giusto Utens (1558-1609) captured these spaces in their paintings, often adding aesthetic and symbolic dimensions. Their representations became more intricate, combining plants and perspectives in a single drawing to capture the polyhedral complexity of landscape.

This separation between landscape and its representation reached its peak in the 19th century when watercolour painting became a prominent technique for landscape representation. This medium allowed artists to capture the subtlety and luminosity of natural scenes with a freshness and spontaneity unreached by other methods. Watercolour became an essential tool for architects and landscape designers, enabling them to explore and communicate their design ideas effectively. Landscape painting set the rules that landscape designers would later adopt, turning representations into real landscapes. Notable examples include the work of Hubert Robert (1733-1808) and William Kent (1685-1748), former painters who became landscape designers, reestablishing a close collaboration between both fields.

With the development of the concept of the 'picturesque' in the 18th and 19th centuries, a new sensitivity towards nature and its representation emerged. The picturesque movement sought to capture natural beauty in its most rustic and least anthropic state, influencing both landscape paintings and garden design. This approach prioritized the creation of landscapes that resembled living paintings, where each view was carefully composed like a work of art.

Over time, landscape representations began to integrate technical and artistic elements more complexly. In the 19th century, figures like Thomas Hornor (1785-1844) advocated for the combination of exact plans with perspective views to create more complete and realistic representations of landscapes. This technique allowed artists to overcome the limitations of two-dimensional plans and offered a more dynamic and comprehensible view of space.

In the contemporary era, digital technologies have revolutionized landscape representation. Computer-aided

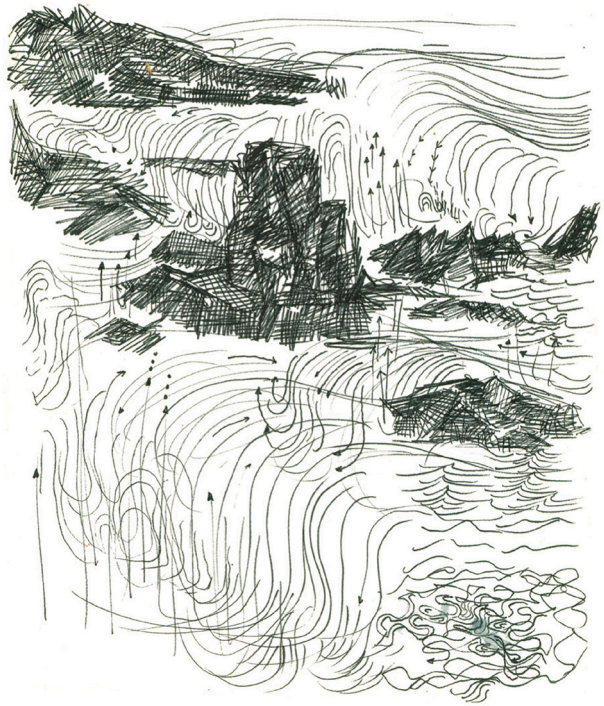


Fig. 4. Lawrence Halprin, study sketches on the movement of water, 1967. © <https://lawrencehalprin.com/about> (accessed 28 August 2024).

design (CAD) tools and 3D visualization allow designers to create detailed and accurate models that integrate both technical and artistic dimensions. These representations not only show what a finished landscape will look like but can also simulate its development over time, considering factors like plant growth and seasonal changes. With the emergence of ecology, landscape representation has evolved into a layering of systems that configure complex processes. The aim is no longer to achieve a final image but to represent the inherent dynamism of nature and its capacity for evolution.

In contemporary landscape representation, there is a conscious effort to integrate the broader environmental context into designs. This implies a more holistic approach, where small details and design interventions are shown within a larger panorama, transcending the limitations of the traditional frame and seeking a more integrated, three-dimensional, and dynamic representation of the landscape.

A complex approach: the contemporary masters

It is within this ecological and dynamic conception of landscape that this article aims to emphasize the effort required by its creators to find new ways of representing complexity. This text does not seek to offer a linear or unequivocal reading, but rather a non-chronological selection of some authors who have ventured at different moments in history to innovate and make new proposals, with different levels of risk, with the drawings and representations of their projects and interventions.

As we have seen, watercolour was for a long time the dominant technique for representing landscapes due to its ability to convey effects that are almost impossible to achieve with other techniques; this method can also be found in the work of modern landscape designers like Gertrude Jekyll. The information starts being composed using various methods and representation techniques, combining plants, sections, elevations and collages, the so-called integrated drawings. This complex composition appears simultaneously or even before the widespread use of watercolour. One of the first examples we can find where different views and plans of a garden are composed is the design for a *trompe-l'oeil* by Salomon de Caus in 1612 (fig. 1); something similar happens with an illustration in the *Elysium Britannicum* manuscript by John Evelyn around 1659 (fig. 2) or an anonymous drawing that combines an elevation, a plan, and a perspective, merging all in an ambitious visual game for the Château de Dampierre-en-Yvelines (France), designed by André Le Nôtre and Jules Hardouin-Mansart between 1675 and 1683. We can find again these compositions in Bernard Lassus' proposal for Le Jardin des Tuileries (1990) or Dieter Kienast's garden M in Erlenbach (Switzerland) in 1989, for example.

Adding written texts or notes to drawings and sketches is another way for filling graphic representations of projects with information, adding an intangible but essential layer to understand certain mechanisms and processes being pursued. Although today it may seem

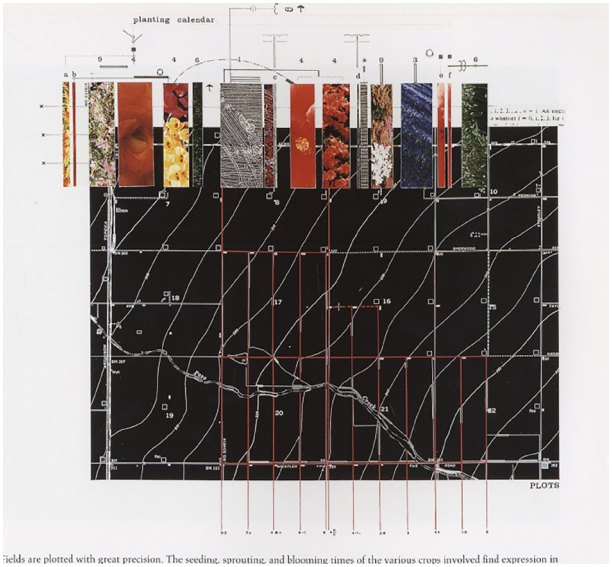
like a simple method, it is another way of creating integrated drawings. We find wonderful and varied examples such as Richard Haag's for The Big Moves Gas Works Park (1971), Patricia Johanson's for Ellis Creek Water Recycling Facility (2007), or Lawrence Halprin's numerous sketches throughout his career.

With the *Land Art* artist Robert Smithson, a change occurred in the object to be portrayed. In his text *A tour of the Monuments of Passaic, New Jersey* [Flam 1996] published in 1967, he documented a walk through a landscape completely anthropized by industrialization, mixing text, photographs, and maps: abandoned factories, pipes and drains carrying water away from the cities, with no concern for where they ended up, bridges, and other structures. These are everyday landscapes far away from the concept of a 'beautiful' and 'maintained' landscape. In 1970, he created *Spiral Jetty* in the Great Salt Lake, Utah, where through a large-scale sculpture made from local rocks, he sought to explore entropy and the passage of time, highlighting the constant transformation of the natural landscape. Smithson viewed his artistic interventions as a way to recontextualize nature, emphasizing its inherent beauty and fragility.

Robert Smithson's drawings are a crucial part of his artistic practice, playing a significant role in the conceptualization and realization of his *Land Art* works and other art pieces. They were often preliminary studies that allowed him to visualize and plan his works or helped Smithson resolve spatial, structural, and aesthetic problems before the physical execution of the work.

His proposal for *Floating Island to Travel Around Manhattan Island* (1970) is reduced to a sketch with some notes, and it was with just this little information that it was realized in 2005 by Balmori Associates under the commission of Minetta Brook and the Whitney Museum of American Art. In a few strokes and notes, he summarized not only the intention and dynamism of the project but also the relationship established between the natural and the artificial, a recurring theme in Smithson's work, between so many other concerns, abstract concepts that were essential to his artistic approach and interaction with the environment. These allow the viewer to understand how Smithson conceived his works in relation to the landscape in which they would be installed, reflecting his site-specific approach.

In summary, Robert Smithson's drawings are essential for understanding his work and creative process. They



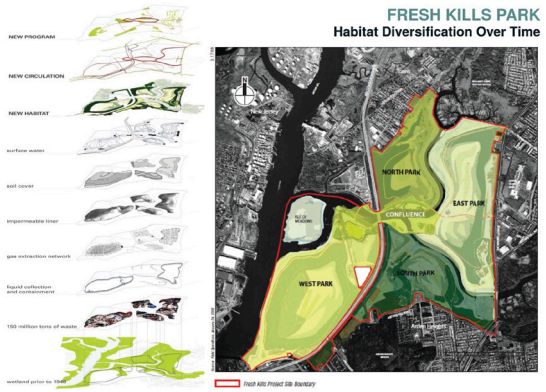


Fig. 5. James Corner, cartography with superimposed images from the book Taking measures across the american landscape, 1996. © <https://www.fieldoperations.net/home.html> (accessed 28 August 2024).

Fig. 6. James Corner, Fresh Kills project, Staten Island, NY, 2004. Diagram showing the different layers of the park. © <https://www.fieldoperations.net/home.html> (accessed 28 August 2024).

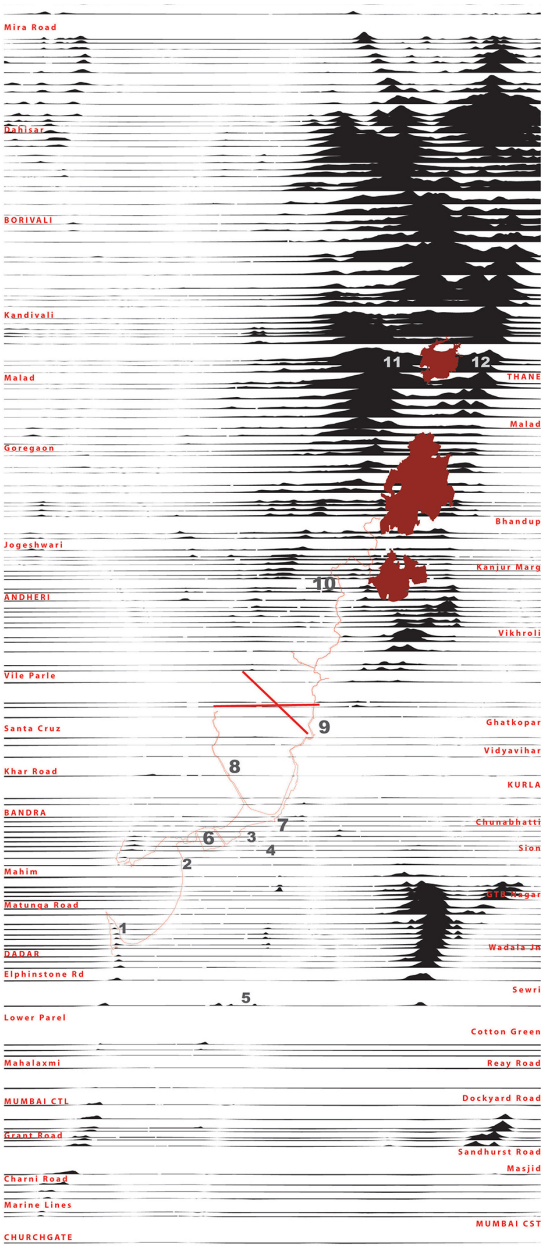


Fig. 7. Mathur and Da Cuhna, a series of sections analysing the morphology of the Mumbai estuary as the basis for a water management plan, 2009. © <https://www.mathurdacunha.com> (accessed 28 August 2024).

serve not only as tools for planning and visualizing his ambitious *Land Art* projects but also as artistic expressions in their own right, exploring and communicating the philosophical and scientific ideas that were key to his practice.

Close to the *Land Art* movement, in its more monumental form though, we find Christo and Jeanne-Claude. The couple, known for their 'wrappings' and large interventions in landscapes, such as *Running Fence* (1976) and *Surrounded Islands* (1983), created a new perception of the environment by wrapping architectural structures or modifying natural landscapes with fabrics. Just as Smithson invited the public to reflect on the interaction between the natural and the constructed, especially in his explorations of the concept of non-places and industrial landscapes, Christo and Jeanne-Claude also focused on the temporality of their works, as most of their installations were temporary, existing only for a short period before being dismantled. This approach highlights the ephemeral nature of art and the importance of the process, not just the final product.

The drawings of Christo and Jeanne-Claude are an integral part of their artistic practice (fig. 3), serving not only as tools for planning and funding but also as independent works of art that encapsulate the vision, technique, and process behind their monumental installations. These meticulously crafted drawings often combine various media such as pencil, ink, charcoal, watercolour, and collage, capturing the essence and monumentality of their projects. They have achieved great value in the art market, enabling Christo and Jeanne-Claude to sell them, along with other studies, collages, and models, to raise funds. In this way, the drawings were not only artworks by themselves but also crucial for financing the realization of their large installations.

We have already discussed the beautiful sketches full of annotations by Lawrence Halprin [Metta, Di Donato 2015], a prominent figure in the design of public spaces and urban landscapes, who used drawing not only as a planning tool but also to explore and express ideas about movement, social interaction, and ecology. Halprin's drawings are core to understand his innovative approach to landscape architecture and urban planning.



Fig. 8. Balmori Associates, analysis of existing and proposed Atlantic Forest vegetation in the project VIOL Corporate Towers in Sao Paulo (Brazil), 2017. Courtesy of Balmori Associates.

One of the most characteristic aspects of Halprin's drawings is his focus on movement through the space (fig. 4). Inspired by his wife, the choreographer Anna Halprin, Lawrence Halprin developed what he called 'scores' which are drawn sequences representing how people would move and experience space. These drawings capture the dynamism and fluidity of the spaces, reflecting his interest in the choreography of human movement within landscapes. Halprin also integrated natural and ecological processes into his drawings, such as water flow, vegetation, and seasonal changes, in an abstract way, distancing himself from romantic and referential representations. His sketches and diagrams frequently showed how these elements would integrate into the design, underscoring his commitment to sustainability and the harmonization of the built environment with nature.

In brief, Lawrence Halprin's drawings are a key manifestation of his interdisciplinary and participatory approach to landscape architecture. Through them, he explored concepts of movement, social interaction, and natural processes, creating spaces that are both functional and deeply connected to the environment and the communities that inhabit them. These drawings are not just design tools, but also artistic expressions that capture the essence of his vision for urban landscapes.

Equally beautiful are the drawings of Bernard Lassus [Conan 2004; Venturi Ferriolo 2006], a French architect and artist known for his work in the field of art and landscape architecture. In the context of Crazannes, a town in the region of Nouvelle-Aquitaine, France, Lassus created a series of drawings and designs for a project that sought to integrate art into the natural landscape and urban environment. These drawings are characterized by their focus on the relationship between art and landscape. In his works, he combines elements of nature with architectural concepts to create a visually impactful and harmonious experience. His designs often include geometric shapes and patterns that integrate with the environment, reflecting a deep understanding of the landscape and an innovative vision of how art can interact with space.

The publication in 1969 of Ian McHarg's book *Design with Nature* [McHarg 1969] marked a shift towards ecology and its new forms, laying the foundations for ecological planning, an innovative approach that introduced the idea of integrating ecological processes into urban planning. McHarg advocated for using natural systems as the basis for planning and design, emphasizing the importance of understanding the environment to create sustainable and resilient landscapes.

A few years later, something similar happened with James Corner's 1996 book *Taking Measures Across the American*

Landscape, published with photographer Alex S. MacLean [Corner, MacLean 1996], where he conducted a deep exploration of the American landscape, capturing its vastness and diversity. Through a combination of texts and photographs (fig. 5), the book reveals the complexity and unique characteristics of the landscapes of the United States, from urban to rural and natural areas.

This volume represents an innovation in landscape representation, as Corner manages to translate the experience of the landscape into images and texts that capture both its physical form and its underlying processes. The book is notable for its use of cartography, maps, and diagrams, which offer new ways of seeing and understanding the landscape beyond the visual, integrating ecological and cultural aspects. Furthermore, it highlights the intersection between ecology and culture in shaping the landscape. Corner shows how ecological processes, and human interventions intertwine to shape the landscapes we see today. This holistic approach is crucial in contemporary landscape architecture, which seeks to integrate natural and human systems in a sustainable way, influencing how current landscape architects understand, represent, and design in relation to the environment.

Taking Measures Across the American Landscape was also crucial in the development of Landscape Urbanism, a discipline that Corner helped define: a framework that addresses the intersection of landscape, urbanism, and ecology (fig. 6). The book demonstrates how detailed observation and representation of the landscape can inform urban planning and design projects that respect and harness natural processes.

Both Corner and McHarg share a concern for ecological processes and their influence on landscape architecture. While McHarg's work focused more on environmental planning and conservation, Corner expanded these ideas in the context of contemporary urban design, exploring how landscape architecture can be a way to address complex urban and ecological issues. Both have made significant contributions to the field, with McHarg laying the foundations for ecological design and Corner advancing these ideas in the realm of landscape urbanism, influencing how cities are designed and experienced today.

Following in the footsteps of these authors, who seek to redefine our ability to understand and represent the territory as the layering of systems it is, and above all, the search for answers to broader questions about our

Fig. 9. Balmori Associates, diagram of the Broadway Malls project (NY, USA) showing how a green corridor that crosses the island of Manhattan is actually a succession of urban habitats, 2017. Courtesy of Balmori Associates.



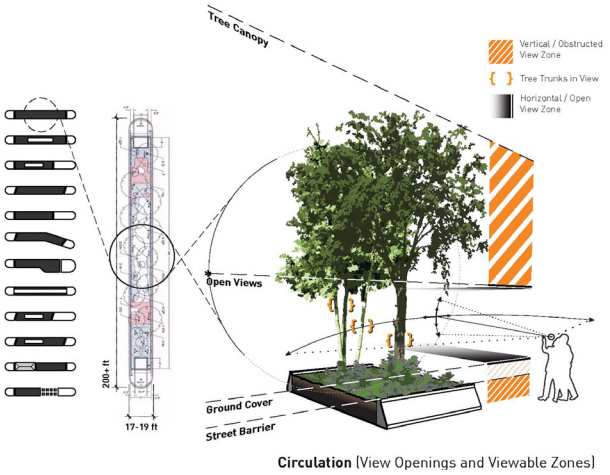




Fig. 10. Balmori Associates, digital rendering and diagram of the visual openings created in the medians of New York avenues in the Broadway Malls project (NY, USA), 2017. Courtesy of Balmori Associates.

Fig. 11. Balmori Associates, digital rendering of the environment created in the medians of New York avenues in the Broadway Malls project (NY, USA) 2017. Courtesy of Balmori Associates.

environment, we must highlight the work of Anuradha Mathur and Dilip da Cunha. In 2009, analysing the Mumbai estuary, they shifted from a traditional plan view to an infinite succession of sections, inviting a new way of looking at the territory and attempting to answer self-imposed questions such as 'What is a river?' or 'What is a city?' By analyzing abstract concepts, we can seek systemic solutions to problems like flooding (fig. 7). Diana Balmori, an influential landscape architect and urban planner known for her interdisciplinary approach and innovative vision of integrating landscapes into the urban environment, inherited some of the more complex characteristics presented so far [Balmori 2010; Balmori 2014]. Throughout her career, Balmori advocated for an approach that viewed landscape as an essential tool for addressing environmental problems and improving the quality of life in cities (fig. 8). Heavily influenced by the work of Alexander Von Humboldt, whose illustrations displayed data on the interaction between plants and animals in relation to altitude on a mountain, Balmori always sought ways to represent a landscape through the symbols of the underlying data, that is, the integration of scientific data and artistic representation (figs. 9, 10, 11). Just as Halprin did, Balmori persistently sought to represent the movement within her projects and their surroundings, a significant innovation in landscape representation, emphasizing the importance of capturing natural dynamics in all interventions. Her projects demonstrate how complex data can be visualized in clear and understandable ways, and her influence continues to inspire new ways of conceiving and representing the landscape. She managed various techniques, from mapping and digital modelling, which served to visualize how her designs would impact the natural and built environment, to dynamic visualizations that could show how her projects would change and evolve over time, adapting to environmental and urban fluctuations. Her interdisciplinary approach consistently integrated elements of art, science, and technology in her representations, creating visualizations that were both functional and aesthetically appealing.

Diana Balmori's innovative and visionary approach to landscape representation has left a lasting legacy in the field of landscape architecture and urbanism. Her projects and principles continue to influence how urban spaces are conceived and designed, underscoring the importance of integrating the landscape into urban infrastructure in a sustainable and adaptable manner.

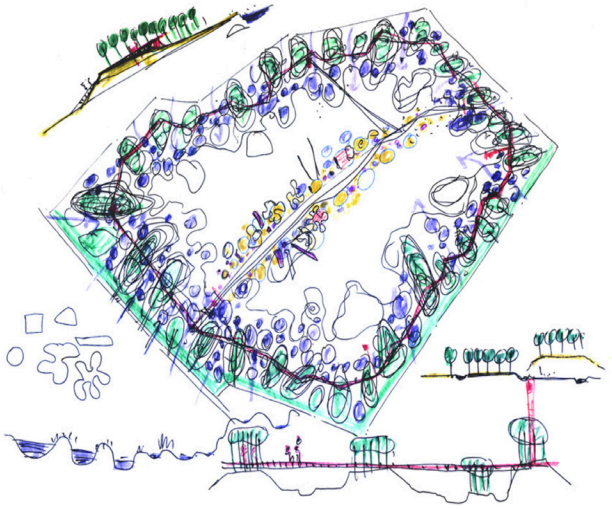


Fig. 12. Kongjian Yu/Turenscape, boceto de esponja verde para el proyecto de Qunli Stornwater Park, China, 2009. © <https://www.turenscape.com> (consultado el 28 de agosto de 2024).

Other recent successors who combine exemplarily the processes in the representation of their projects are the french landscape architect Michel Desvigne [Fromonot 2020] and the chinese designer Kongjian Yu [Padoa Schioppa 2019], founder of Turenscape. Desvigne advocates for simplicity in design, avoiding unnecessary decorative elements, which is reflected in his drawings: his projects and drawings often feature clean lines and a reduced palette of materials, highlighting the natural forms of the landscape. His goal is to capture the essence rather than reproduce it literally, using abstraction to illustrate the essence of a place, its ecological dynamics, with vegetation as his primary design material. His approach is both poetic and pragmatic, with a clear respect for nature and a long-term vision of the landscape, always seeking to portray the evolution of his projects over time. All of these characteristics are combined in some of his most well-known drawings, such as the diagrams for the Thomson Factory in Guyancourt (France) or the project for Greenwich Peninsula (1997-2000).
Ecological infrastructures and chinese landscape traditions come together in the work of Kongjian Yu, which is characterized by a deep connection with ecology, culture, and community, working with nature and proposing the restoration of ecosystems that are, in some way, degraded. This combination of technology is perfectly reflected in the drawings of his proposals, as demonstrated by the sketch for the Qunli Stormwater Park in Harbin City (China, 2009) (fig. 12), which illustrates the concept of the park as a large green sponge capable of storing and purifying rainwater.

Conclusions

The analysis of the evolution in the representation of the landscape and the relationship between humans and nature reveals a significant change in how the natural environment has been perceived and represented over time. From the earliest pictorial representations in Roman frescoes to the sophisticated contemporary digital techniques, we have seen how the landscape has mirrored the cultural, aesthetic, and technological values of each era.
Initially seen as a separate and static entity, nature has evolved into a dynamic, multifaceted vision deeply interconnected with human actions. This shift has influenced how artists and designers have represented landscapes, reflecting an increasingly complex and ecological relationship. Throughout history, representation techniques have evolved, from the use of perspective during the Renaissance to the incorporation of digital technologies in the contemporary era. This technical evolution has allowed for greater precision and a more faithful and dynamic representation of reality, integrating elements such as seasonal changes and plant growth. Moreover, the incorporation of ecological and sustainable concepts into landscape design has led to a more integrated representation: landscapes are no longer seen as mere static images, but as dynamic systems in constant evolution, where sustainability and beauty coexist and reinforce one another.
Thus, landscape representation has evolved from being a mere decorative illustration to becoming an essential tool for understanding and planning our interactions with the natural environment. It reflects the growing awareness of the interdependence between humans and nature and emphasizes the importance of representing the landscape not only as a physical space but as a living, dynamic system in constant change. Collaboration between

different disciplines has enriched landscape representation. Contemporary examples include the works of artists like Robert Smithson and Lawrence Halprin, who combined artistic techniques with ecological principles to create deeply reflective and environment-connected representations.
Through this overview of some of the drawings that have contributed to the evolution of landscape representation, we attempt to outline the continuous exploration and adaptation of artistic techniques and concepts to capture the essence of the natural environment that this field has developed. From Roman frescoes to modern digital tools, each stage in this evolution has brought new ways of seeing and representing the world around us. This journey not only shows technical advances but, more importantly, the changes in the cultural and aesthetic perception of landscapes, revealing a deep connection between humans (also as artistic subjects) and nature throughout history.
From ecology and sustainability to human interaction and aesthetics, each of these professionals has contributed to redefining how we understand and design our natural and urban environments. Through their innovations, landscape design has emerged as a vital discipline that connects art, science, and community in the creation of spaces that meet contemporary and future needs.

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The Use of GIS in Landscape Planning. Cartographic Representations between Knowledge and Action

Francesca Paola Mondelli

Abstract

This contribution reflects on the complexities and new challenges that representation faces in the context of landscape planning, after the innovations introduced since 2004 in the Piani paesaggistici with the Codice dei beni culturali e del paesaggio .
Specifically, an analysis is proposed of the different types of representations present in the Piani paesaggistici: the more interpretative ones are linked to the act of knowing, which in the Piani paesaggistici culminates in the identification of Ambiti di paesaggio; the more technical representations, on the other hand, are related to the sphere of action, which in this contribution refers to the practice of landscape protection through the activities of surveying, mapping and digitizing landscape assets.
The transition from analog representation of documents to the digital representation in the Piano paesaggistico, the significance of base cartography, and the interpretation of the landscape undertaken by the Regions, which is translated into the choice of graphic symbols used, are all themes of reflection that serve as a starting point to consider the relationship between representation and the planning/enhancement of the contemporary landscape, in light of the changes and the evolution of GIS techniques.

Keywords: landscape, planning, landscape areas, landscape assets, GIS

Representation and Planning

> "Representing the territory is already a way of taking possession of it.
> This map is not a mere replica, but a construction.
> One first makes a map to know, and then to act"
> [Corboz 1985, p. 25]

In 1985, André Corboz, in his renowned essay *Il territorio come palinsesto* [1985], reflected on the theme of territorial representation. Since ancient times, human beings have expressed the need to appropriate inhabited space through its representation in maps, icons, and ideograms. Even before the act of writing, the traces of rudimentary drawings of elements that characterized the lived environment served as evidence of human presence, expressing an ancestral form of communication and a need to control the territory. When humans draw and simplify the surrounding reality, they effectively take possession of it and recognize the natural environment as a place to inhabit, knowing its characteristics and planning its transformations. Throughout history, the representation of territory has taken on different forms depending on the function it was meant to serve, oscillating between more technical and scientific drawings (for example, medieval nautical cartography, with the *Carta Pisana* from 1275 as a remarkable example) and iconographies with a more philosophical and speculative value (such as the Ebstorf *Mappa Mundi* from the same period).
In more recent times, while representation techniques have significantly evolved and philosophical speculation has been largely set aside, at least in the fields of architecture and urban planning, the metaphorical and interpretative aspect has not been lost. It continues to

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coexist with more technical representations. In planning, one might assert that the former (interpretative maps) are tied to knowing, while the latter (technical maps) relate to action.
Many studies from the 'territorialists' school, led by urban planners like Alberto Magnaghi and Roberto Gambino, have focused on the role of representation as a means of knowing the territory. In this context, representation fulfills the task of constructing and communicating territorial knowledge [Lucchesi 2005], constituting the 'knowledge framework' in territorial planning. This framework includes the analytical maps of the plan, where geological, morphological, and hydrographic studies converge and intertwine [Gabellini 1996]. From these interpretative studies of the territory emerge and define territorial figures, or "territorial entities recognized for the specificity of the morpho-typological characteristics that persist in the historical process of stratification of different territorialization cycles. The cartographic representation of these characteristics synthetically interprets their environmental, territorial, and landscape identity" [Regione Puglia 2015].
Representation as action, on the other hand, refers in territorial planning to regulatory and/or prescriptive maps, which are associated with the body of rules. Indeed, the academic debate has often questioned whether these representations, within the plans, can fully accomplish the function of territorial regulation on their own [Lucchesi 2005], calling for the use of new tools. It is well known that in territorial planning, in cases of inconsistency between a drawing and a rule, the rule prevails. This demonstrates how, even today, despite the use of increasingly sophisticated and advanced representation techniques, territorial governance, in its prescriptive aspects, still cannot rely solely on representation, but finds words more reliable than drawings. Thus, drawing remains a primary tool for knowing and interpreting the territory within the realm of knowledge, but it still encounters limitations, in urban planning, within the realm of action.
The set of considerations expressed thus far find their field of investigation in the new generation of *Piani Paesaggistici*, introduced in 2004 by the *Codice dei Beni Culturali*. These plans are structured into descriptive, prescriptive, and strategic parts. The drafting of the plans, in which the actions of planning and landscape protection intersect for the first time, presents new complexities that have been expressed and resolved through the language of representation, both regarding territorial knowledge and its regulation, protection and transformation.

Landscape Plans

In 2004, the Cultural Heritage and Landscape Code (henceforth CBCP), incorporating the principles of the European Landscape Convention (ELC) [Consiglio d'Europa 2000] signed in Florence four years earlier, introduced in Part III the tool of Landscape Plans, through which "the State and the Regions ensure that the entire territory is adequately known, safeguarded, planned, and managed" [Codice dei Beni Culturali e del Paesaggio 2004, art. 135]. While Article 1 of the ELC highlights the importance of identity and cultural aspects for the recognition and definition of landscape, Article 2 affirms a more 'integral' vision of the landscape [Predieri 1969], extending its scope beyond mere 'natural beauties' to encompass the entire territory. This vision is reflected in the CBCP through the requirement to draft *Piani Paesaggistici* that address the knowledge, protection, enhancement, and planning of the entire regional territory.
Already with the law of June 29, 1939, No. 1497 *Norme in materia di protezione delle bellezze naturali, Piani Territoriali Paesaggistici* (PTP) had been introduced, aiming to subject protected areas to specific land-use regulations. Although these plans concerned only certain protected areas due to their 'significant public interest' [Codice dei Beni Culturali e del Paesaggio 2004, art. 136], the PTPs represent the first tools aimed at landscape protection. The PTPs drawn up under law 1497/39 were optional and limited to 'vast localities' (paragraphs 3 and 4, Article 1, now referred to as 'landscape assets'). With the Ministerial Decree of September 21, 1984 [Ministero per i Beni Culturali e Ambientali 1984], later converted into law on September 8, 1985, No. 431, the shift occurred from the 'possibility of drafting a Plan' to the 'obligation' to do so. However, these plans still did not apply to the entire territory.
The innovations of the new generation *Piani Paesaggistici* compared to the previous *Piani Paesistici* are multiple: (i) they concern the entire territory; (ii) they are drafted in cooperation between the State and the Regions; (iii) they incorporate within them the system of landscape assets as defined in Articles 136 and 142 of the Code, uniting in a single instrument the system of protection (under state jurisdiction) with that of landscape planning (under regional

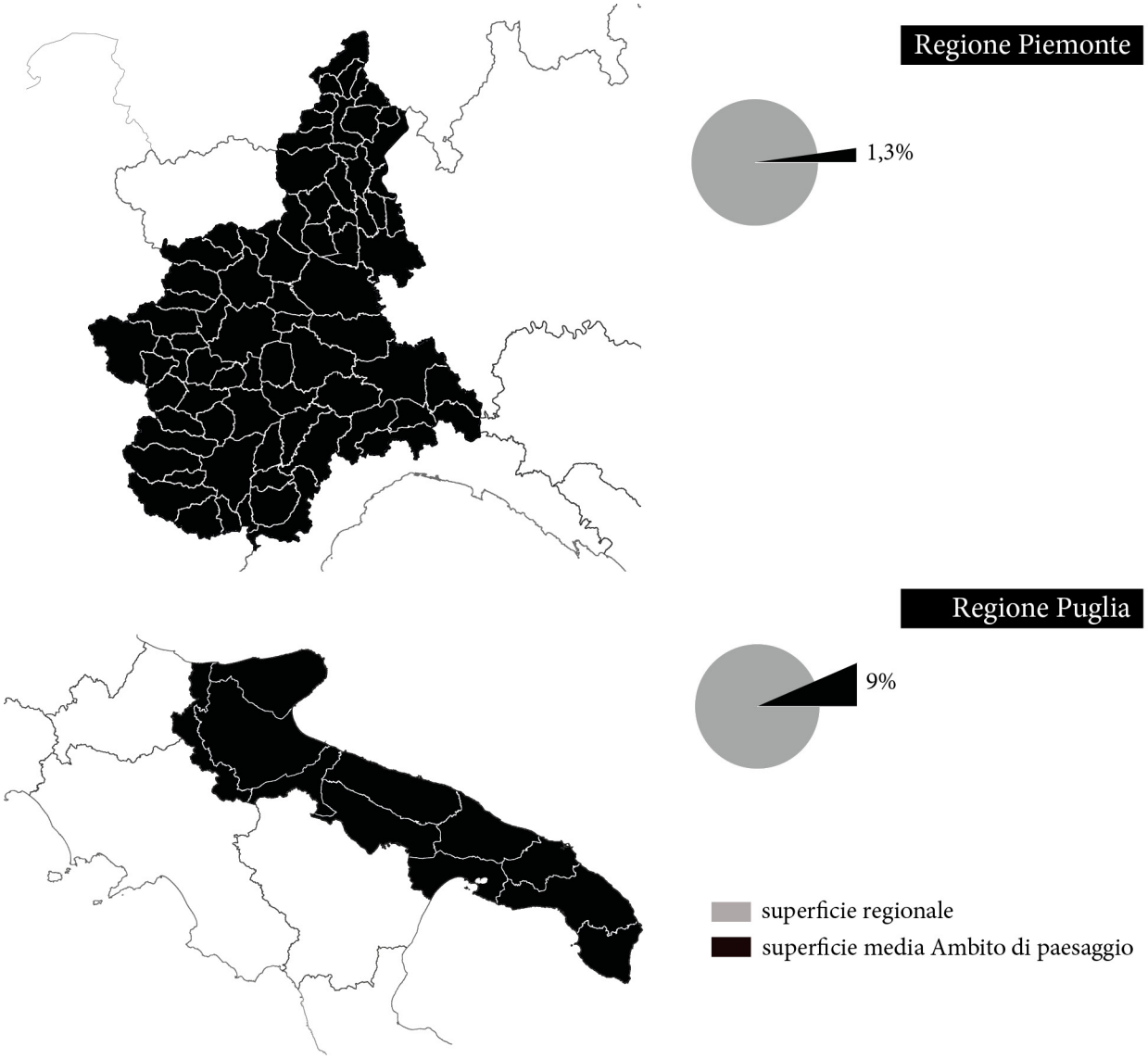

Fig. 1. Comparison between the Landscape Areas defined by the PPR of the Piedmont region (top) and the Landscape Areas defined by the Apulia region (bottom). GIS processing by the author.



Fig. 2. Landscape Areas defined by the Emilia-Romagna region. GIS processing by the author.

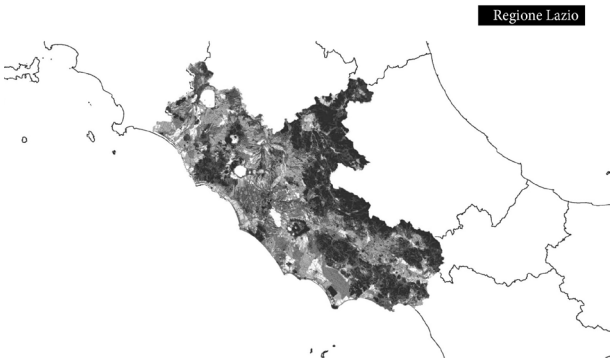

Fig. 3. The 'Landscape Systems' defined by the Lazio region.

jurisdiction), thereby definitively overcoming the dichotomy between planning and protection.
Article 143 of the Code defines the forms and contents of the Landscape Plan, which must include at least the following:
- the survey of the territory subject to planning, through the analysis of its landscape characteristics;
- the survey, delineation, and possible identification of additional "landscape assets" as defined by Article 134 of the Code: this includes both the properties and areas declared of significant public interest under Article 136, as well as areas protected *ope legis* under Article 142;
- the possible identification of further contexts, other than the 'landscape assets' indicated in Article 134, to be subject to specific use and safeguarding measures;
- the identification of risk factors and elements of vulnerability within the landscape;
- the identification of interventions for the recovery and requalification of significantly compromised and degraded areas;
- the identification of necessary measures for the appropriate integration of territorial transformation interventions within the landscape context;
- the identification of landscape areas and their related landscape quality objectives as indicated in Article 135.

For the purposes of this reflection on the role of representation within planning, in its dual function of knowledge and regulation/protection, two aspects will be considered. The first, essentially tied to the interpretation of the landscape, concerns the different ways in which the Regions have defined and represented the *Ambiti di paesaggio* as provided by the CBCP. The second, linked to regulatory and prescriptive aspects, focuses on the complexity of the process of surveying, delineating, and thus digitally representing *Beni Paesaggistici*, prompting a debate on the potential of using GIS for landscape protection.

The interpretation of landscape: Landscape Areas

In outlining the principles underlying landscape planning, the *Codice* states that *Piani Paesaggistici*, with reference to the territory in question, recognize its distinctive aspects and characteristics, as well as its landscape features, and delimit the corresponding areas" [Codice dei Beni Culturali e del Paesaggio 2004, art. 135, paragraph 2]. The definition of a landscape area, as can be seen, is not elaborated upon in the Code, leaving room for free interpretation by the Regions. It could be said that, within Landscape Plans, the identification and cartographic representation of Landscape Areas constitute the culmination of the knowledge and interpretative process of the regional territory. It is no coincidence that, for the execution of this task, regional offices have often relied on academic studies conducted through specific agreements, such as the involvement of the Polytechnic University of Turin in defining *Ambiti di Paesaggio* in the Piedmont *Piano Paesaggistico*.

A landscape area should correspond to a division of the territory that transcends administrative boundaries, providing a new image of the territory where perceptions and feelings of belonging and identity recognition, explicitly mentioned in Article 1 of the ELC, play a dominant role. Although only six *Piani Paesaggistici* have been approved in Italy so far, the work of defining *Ambiti di Paesaggio* is well advanced in most of the Regions.
This allows for an analysis of the different methodologies adopted and the varying interpretations given both to the concept of a landscape area and its cartographic transposition. While each Region has undertaken a unique and specific task for its territory, from the analysis of the cartographic documents, at least three different interpretative approaches can be identified, each corresponding to different representations.
The interpretation of a landscape area that has been adopted by most Regions involves dividing the territory into units with homogeneous characteristics, often grouping municipalities that are part of the same geographic system (a valley, a mountain range) or that share historical traditions or specific cultural traits. In this case, the representation follows the administrative boundaries of the municipalities belonging to the same area. The main difference observed is the scale assigned to the areas by different Regions (fig. 1): from Piedmont, which defines 76 Areas (later grouped into 12 macro-areas) with a smaller average size (334 km^2), to Puglia, which distinguishes only 11 Areas with an average size of 1,776 km^2 [Fondazione Scuola dei beni e delle attività culturali 2024a].
A second group includes those Regions that, in identifying the *Ambiti di Paesaggio*, have placed greater emphasis on the geographical elements and the morphology of the territory. In this case as well, the Region is divided into homogeneous units, but the reading of the landscape prioritizes large geographical systems such as mountains, plains, and river basins. As a result of this approach, the boundaries of the Areas do not correspond to municipal administrative limits.
A clear example of this interpretation is the representation provided by the Emilia-Romagna Region for its Landscape Areas (fig. 2): "The landscape areas present boundaries that are not precisely defined, but rather blurred. The perimeter conceptually becomes not a limit, but a transition zone, an area where the characteristics and objectives of adjacent areas integrate with one another" [Regione Emilia-Romagna 2004].

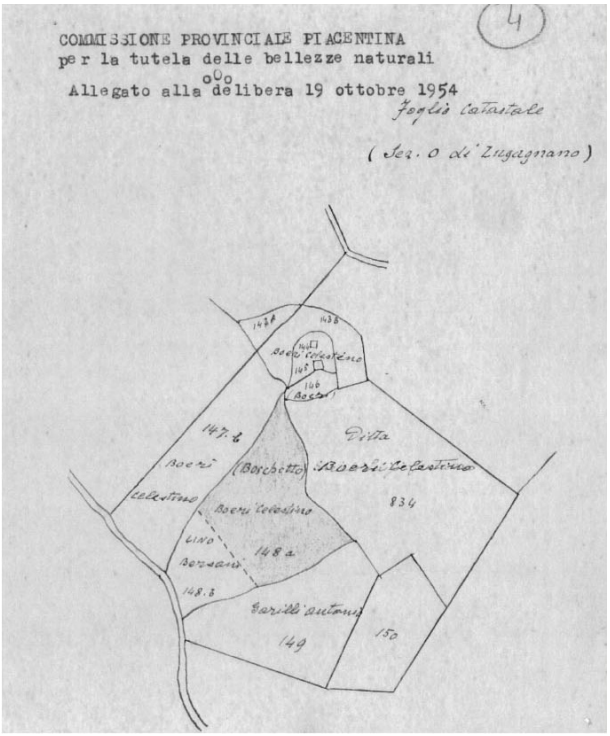

Fig. 4. Some examples of mappings attached to the DMs of Declaration of Notable Public Interest. Grove near the farm 'le Querce' located in the municipality of Lugagnano val d'Arda, 1955.

Finally, there is a third approach that has interpreted the *Ambiti di Paesaggio* as homogeneous 'systems' through which the territory is classified. This is the case of the Lazio Region, (fig. 3) which in its PTPR (Piano Territoriale Paesaggistico Regionale) implements this classification "according to specific typological categories" [Regione Lazio 2021], organized by the relevance and integrity of the landscape values. The resulting representation is entirely different from that of other regions: it involves a detailed breakdown of the landscape, recognizing, within each area, the presence of various systems, namely: (i) the natural landscape system; (ii) the agrarian landscape system; (iii) the settlement landscape system. Each of these corresponds to different levels of value and integrity and,

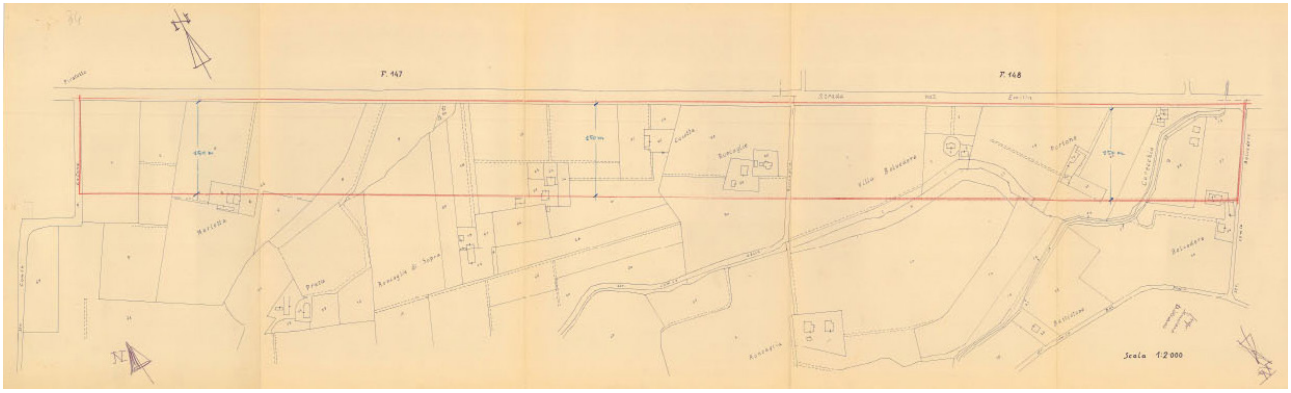

Fig. 5. Some examples of mappings attached to the DMs of Declaration of Notable Public Interest. Area of the Via Emilia between Piratello and Imola, 1965.

consequently, to different actions to be taken for conservation and enhancement.
These three different representations demonstrate how profoundly varied the interpretation of the landscape can be across different territories. For some, the landscape can be distinctly recognized and delineated by composing a set of territorial units, albeit with varying characteristics and extents; for others, the landscape cannot be subjected to precise boundaries but requires transitional areas where each environmental and cultural identity blends into the other; yet for others, the landscape cannot be described through boundaries, even blurred ones, but rather as a set of systems that reflect its inherent complexity.

Landscape regulation: Landscape Assets

While the knowledge of the territory and the interpretation of landscape characteristics may be reflected in highly differentiated representations –reflecting the legislator's decision not to provide specific guidelines for the definition of Landscape Areas– a different approach should be taken when drafting the technical representations that underpin the prescriptive frameworks of the *Piani Paesaggistici*, particularly concerning the regulations for the use of Landscape Assets. In this case, the presence of clear guidelines for representing protected areas becomes essential to ensure the clarity of the regulations.

The initiation of the drafting process for *Piani Paesaggistici* after 2004 brought with it the need to digitize the protection decrees (the declarations of significant public interest under Article 136), which until then were in paper format, and the areas automatically protected by law (under Article 142). The ongoing work of digital representation being carried out by the Regions constitutes a unique opportunity to reconstruct, using GIS technologies, a clear picture of the national protection system, which is currently lacking. The system of *Beni Paesaggistici*, in fact, remains highly fragmented, scattered across a multitude of regional portals, despite efforts by the Ministry to coordinate through information systems like SITAP, which nevertheless lack proper updating and coherence. Thus, with the drafting of the Plans, the Regions, along with the territorial offices of the Ministry of Culture (MiC), find themselves tasked with surveying, delineating, and formally defining the *Beni Paesaggistici*.
This task reveals evident complexities, not only due to the vast number of areas that need to be delineated, but also due to the transition from analog (figs. 4, 5) to digital mapping. This transition represents a primary cause for the delays in landscape planning activities, which have led to only six regions having approved their Landscape Plans to date.
The complexities inherent in the digital representation of *Beni Paesaggistici* can be distinguished between those concerning Article 136 and those concerning Article 142.

In the case of Article 136, "the survey consists of cataloging all acts and declarations of significant public interest, followed by their transposition, through digitalization, of the respective boundaries onto the most recent version of the Regional Technical Map" [Regione Veneto 2017]. Due to the lack of previous digitalization, the work almost always had to begin with the collection of all paper documents of the declarations of significant public interest, some of which date back to the 1920s [2]. It is important to note that the paper documentation consists of the text of the decree as published in the *Gazzetta Ufficiale*, generally accompanied by a hand-drawn map, which is sometimes imprecise or inconsistent with the description provided in the text. Moreover, the changes that have occurred in the territory over time (such as alterations to the road network or new subdivisions) often make it particularly difficult to identify the protected area on an updated cartographic base.
The Emilia-Romagna Region, although it has not yet approved its Landscape Plan, has gradually published the results of the survey of Landscape Assets under Article 136 on its portal, divided by province. The methodology used allows for the identification of all the complexities and various phases of the survey and cartographic representation process. As an example, we can examine the case of the Ministerial Decree (D.M.) of August 1, 1985, 'Declaration of significant public interest for the territory including Corno alle Scale and Monte La Nuda, located in the municipality of Lizzano in Belvedere'. The D.M. text states: "This area […] is delimited as follows: starting from Lake Cavone in a straight line (east) to the summit of La Nuda (altitude 1796.5), then along the ridge to a maximum altitude of 1825 meters (La Nuda peak), continuing northwest to Balzo del Fabuino, and from there north to Sboccata dei Bagnadori, then to an altitude of 1280 along the ridge, descending along the Cannella stream path to the intersection with the Cavone-Lizzano municipal road, following the path until reconnecting with Lake Cavone" [Ministero per i Beni Culturali e Ambientali 1985].
In the survey report for the restriction, the Scientific Technical Committee notes: "The text of the decree and the cartography reveal a significant discrepancy regarding the protected area. The perimeter description refers to Lake Cavone as the starting point for the delimitation of the asset; the cartography excludes Lake Cavone, placing the boundary much further north along a stream not mentioned in the text" [Regione Emilia Romagna, MIBAC 2018].

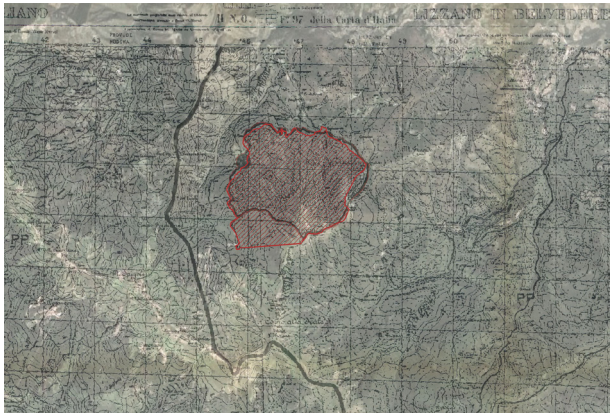

Fig. 6. Overlay between the original cartography bearing the perimeter of the August 1, 1985 DM constraint and the updated vector perimeter (2018). GIS processing by the author.

Thus, the commission's shared decision was to follow the indications of the decree text, including Lake Cavone within the restriction, as it is a key element of the landscape and is cited in the text. Consequently, as highlighted in the images (fig. 6), the digital representation of the asset deviates significantly from the original representation attached to the decree. The vector drawing, on an updated cartographic base, forces the planning process to deal with an unprecedented level of precision, resulting in an outcome derived from the cross-referencing of several elements: the text, the original cartography, and the updated cartographic base.
There are various complexities associated with the representation of assets under Article 142 (fig. 7), which refers to the categories of protected areas originally introduced by Law no. 431 of August 8, 1985, known as the *Legge Galasso* In this case, the protected areas are not identified by specific decrees, and therefore do not have cartography that, even if imprecise, delineates the asset. Article 142 lists, in 11 letters (from A to M), a series of categories of assets for which protection zones and areas are established, applicable across the entire national territory. For these assets, the complexity of representation sometimes lies precisely in identifying the natural element from which to define the protection zone, considering the variability of the element itself, which is not static but dynamic. An example of this is the coastline, which

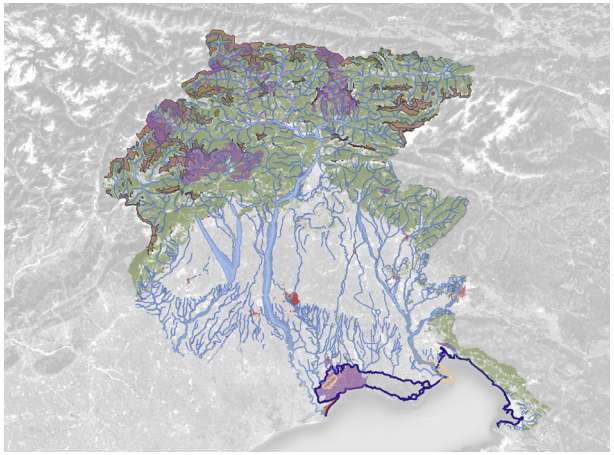

Fig. 7. The set of protected areas under Article 142 CBCP, PPR Friuli - Venezia Giulia. GIS processing by the author.

must be identified to accurately represent the 150-meter protection zone. The same applies to watercourses, which are protected along with their "respective banks or the foot of their embankments, within a 150-meter zone on each side" [Legge n. 431 8 agosto1985, Art. 142, letter C]. To try to provide greater clarity in the definition of these areas, over the years, the Ministry of Culture has issued guidelines through various circulars. In particular, Circular No. 12 of June 23, 2011, published the document 'Analysis of the issues and identification of possible solutions regarding the definition of criteria to be adopted for the survey, delimitation, and representation of landscape assets as established by the *Codice dei beni culturali e del paesaggio* in Article 143, to also be used as support', in which, letter by letter, definitions and survey criteria for assets are provided. However, these documents have not been sufficient to resolve doubts and ambiguities related to all asset categories, some of which still remain too vaguely defined, such as the "areas of archaeological interest" (letter M) [3]. As previously mentioned, it is important to emphasize the dynamic nature of many elements protected under Article 142 (e.g., forests and woods –letter G; or glaciers– letter E), which vary significantly, even due to climate change. This factor prompts a reflection on the effectiveness of using GIS systems for mapping *Beni Paesaggistici*, which, with adequate resources and expertise, could enable the continuous updating of the digital database and the efficient management and monitoring of landscape protection, which has so far been highly fragmented.

Conclusions

The *Piani Paesaggistici*, the first landscape planning and protection tools at the regional scale to be entirely drafted using digital and GIS-based technologies, have posed new challenges and complexities in landscape representation. Between interpretation and technical drawing, the use of GIS has proven indispensable in reconstructing the national framework of the protection system, which can be further implemented once the *Piani Paesaggistici* are approved in all Regions. In conclusion, after discussing the many critical issues encountered in the process of surveying landscape assets, it is important to highlight the potential of GIS as a tool not only for representation (and thus for ensuring the clarity of regulations) but also for managing and exercising landscape protection.
However, the full application of this tool in drafting planning instruments has not yet been fully realized. The transition from analog to digital representation is in itself a significant and essential innovation for territorial governance, but the representation methods used in Landscape Plans are still predominantly traditional, favoring maps with associated legends. GIS, on the other hand, could allow for the implementation of various forms of representation, including three-dimensional ones based on LIDAR surveys, which would provide a deeper understanding of the landscape in its multiple dimensions. As Pittaluga states, "landscape representation can benefit from traditional representations, but it must also take into account the opportunities offered by new image processing and communication tools, according to a process of decomposition and synthesis calibrated on the context as a whole and on the peculiarities of the place" [Pittaluga 1999]. The practice of planning should not be exempt from these considerations.
The work of delineating and representing the areas subject to landscape protection within the Plans, in fact, is the necessary action to enable their subsequent 'formalization', that is, the planning of the protected area, with an approach that seeks to go beyond the merely restrictive approach to landscape protection, focusing instead

on its enhancement. To this end, the type of representation used should move away from the simple 'zoning' of the protected area and offer the possibility of viewing the landscape from a design perspective, illustrating the changes the territory has undergone in the past (such as changes in topography, variations in tree cover, or the shifting coastline) and envisioning future transformations according to the strategic lines of the *Piano*.
The use of GIS allows for the constant updating and improvement of data, an essential element for landscape governance, as it is subject to continuous transformations in both its structural systems and the variation in values and the integrity of its elements due to human intervention.
Finally, it is important to note that sharing GIS data on the OpenData portals of the Regions also allows for the dissemination of landscape knowledge, which can easily become accessible to a wider audience through the creation of WebGIS that recompose the national framework. A clear example of this is the Web portal created by the Fondazione Scuola dei Beni e delle Attività Culturali, built entirely using GIS technology as part of the research project *La Pianificazione e la Tutela del Paesaggio*, aimed precisely at keeping the data on Landscape Planning in Italy together and constantly updated for maximum dissemination. From this perspective, it is important to always bear in mind the role that the European Landscape Convention attributes to citizens, who are the true producers of the landscape, beginning with their perception and awareness of it. Therefore, the dissemination of knowledge, protection tools, and plans and projects concerning the landscape is both a responsibility and an objective for those who work on the landscape.

Notes

[1] The Regions that have approved the Piano Paesaggistico are: Sardinia (PPR, 2006); Puglia (PPTR, 2015); Tuscany (PIT-PPR, 2015); Piedmont (PPR, 2017); Friuli-Venezia Giulia (PPR, 2018); Lazio (PTPR, 2021).

[2] The first protection decrees were published pursuant to Law No. 778 of June 11, 1922, "Legge Croce".

[3] The circular defines areas of archaeological interest as "the territorial areas that include emergent, point-like, or linear archaeological assets, either excavated or still buried, whose character derives from the intrinsic link between the archaeological remains and their landscape context, and therefore from the coexistence of cultural, natural, morphological, and aesthetic values" [Ministero per i Beni e le Attività Culturali 2011].

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Landscape Features in Italian-style Gardens: Machine Learning and Computer Vision for Symmetry Detection

Amedeo Ganciu

Abstract

Between 1304 and 1309, Pietro de'Crescenzi drew up the Opus ruralium commodorum, perhaps the first agronomic treatise of the medieval period, in which it is possible to find a first taxonomic classification of gardens according to the social importance of their owner. The formal rules of the Italian garden remained unchanged until the 18th century, but unfortunately, little 'original' evidence of these jewels remains, because they were destroyed, abandoned or modified over the centuries; very often the proof of their existence can be found in artistic representations or in the treatises of the time. In this research, the landscape features of the Italian garden are investigated, and some automated Machine Learning algorithms are experimented to find symmetries between the plant and decorative elements that characterise it. Although automated symmetry detection has already demonstrated applicability in several disciplines, it is recently showing a new and not yet fully explored potential in art through the development of computer vision; however, some procedural and algorithmic aspects present numerous challenges and problems. For this reason, starting from an examination of the state of the art of current Imaging Detection solutions, we evaluate their applicability in the search for symmetries within artistic representations of Italian gardens.

Keywords: Renaissance gardens, symmetry, machine learning, computer vision, Python.

Introduction: the characters of the Italian-style garden

The Italian Renaissance garden or even more simply the Italian garden, can be considered as the climax phase of the conceptual evolution and also of the agronomic technique of garden art. The emblematic image of the Italian garden is composed of formal geometries and symmetries created in the search for balance between paths and lowerbeds traced on the ground by realizing hedge borders, artistic trees, espaliers, and vine arbors, often accompanied by fishponds or scenic mechanisms such as games, fountains, or water clocks. Although the formal codification of the Italian garden is chronologically identified with Renaissance Italy, many of its precursor features can be found in the courtly period of 12th-century France, and almost simultaneously in the rediscovery of the Italian country villa. A number of alternative, secular and courtly visions of the garden, or verger in the French language, can be traced in medieval France, which are significantly detached from the culture of monastic gardens [Tosco 2018] deeply oriented more to productive-botanical purposes, developed on large landed estates and mostly resembling from farms [Germano 2022]. In literature, too, it is possible to trace an obvious reference to images and spaces, among which is the garden invested with new functions and values. The French term verger derives from the Latin word *viridarium*, meaning a place of love, pleasure, adventure, rich in symbols even of a magical character, in which amazing events can take place, enriched with fragrant flowers, gushes, trees rich in fruit [Kibler 1992]. For example, in the 12th-century tale Conte

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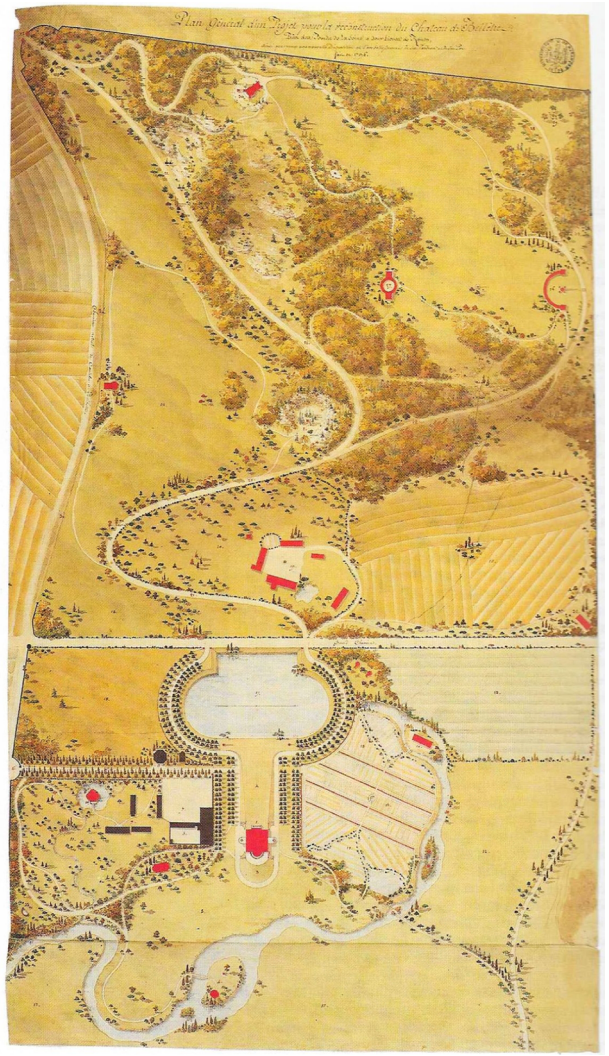


Fig. 1. Master plan for the park of the Château de Belletre in Normandy [Mosser, Teyssot 1999, p. 12].

de Floire et Blanchefleur, attributed to Robert d'Orbigny, a significant account of this period and of the garden is depicted, in which the vicissitudes of two lovers are narrated, occurring within the setting of three vergers: the first related to the first and youthful falling in love, the second the site of the deception and alleged death of the beloved, and the third with explicit references to the garden of the Emir of Babylon, exotic and distant, where the happy ending of the story finally takes place [Tosco 2018]. The functional and spatial organization of the late medieval aristocratic garden is enriched by the presence of the park, understood as an enclosed, forested area (from foris, a term originated precisely in this period to indicate areas outside the inhabited area), of considerable size, reserved for hunting purposes as a social and recreational activity for the wealthy aristocracy, adjacent to the castle or villa (fig. 1).

At the turn of the thirteenth and fourteenth centuries the spread of the neologism 'park' spread with pandemic character throughout Europe, and documentary sources indicate their creation mainly in France and England but also in northern Italy, for example with the 'barcho' of the castle of Pavia created by the Visconti after the conquest of the city in 1359 [Azzi Visentini 2004]. In parallel with the increasingly complex and elegant development of the courtly garden, which continued to have in the French aristocratic milieu its gravitational cultural centre, in Italian cultural circles a fascination for the country 'life', a metaphor of rest, refuge and virtue, flourished again [Sberlati 2004], not only in aristocratic circles, but also among intellectuals and more cultured landowners. In view of the mild Mediterranean climate, the beauty of the places, it cannot be surprising that Italy established itself early on as the epicentre of this phenomenon, which is reflected in the most significant agronomic treatise of the time, the *Opus ruralium commodorum* (fig. 2), consisting of twelve volumes compiled by Pietro de' Crescenzi between 1304 and 1309 [Savastano et al. 1922]. The treatise, which takes the form of a kind of manual of agronomy, in addition to discussing fishing, oenology, animal diseases, techniques of crop rotation and alternation, and generally the management of the farm, examines in Book VIII the study of the garden as a space of recreation and well-being for the owner [Sansovino 1522]. In more detail, a kind of taxonomy of the garden is illustrated according to the economic and social level of the owner: the simplest, belonging to the lower classes of small size, usually square in shape, with a herbarium and an orchard; a more complex garden typical of middle class landowners,

characterized by some architectural ornamental structures, still quite simple such as pergolas and pavilions; finally, a more complex level belonging to the higher classes usually surrounded by a wall, containing diversified spaces and functions, such as orchards, nurseries and fishponds, water features, wooded areas populated with animals, and even a palatium made of wooden materials and plant weavings. The historical geographic region of Etruria or, rather, the whole of Tuscany, long regarded as the most delightful area in the whole of Italy, becomes the setting for several of Boccaccio's works, including the Decameron in which the company of boys gather inside a 'magical verziere', to dance, sing, tell tales and live happily [Kern 1951; Usher 1989]. The Tuscan landscape exalted in Florentine humanism found in the Medici family the instrument for its consecration, beginning with Cosimo the Elder with the arrangement of the Mugello estates, particularly in the villas of Careggi, Cafaggiolo and Trebbio, probably under the direction of Michelozzo. They probably all had horti within which the patron hosted parties and delighted in a serene setting; however, establishing the exact ornamental arrangement of the garden in Cosimo's time remains a problem due to the scarcity of documentary sources [Tosco 2018]. Probably the gardens that have most consistently preserved the original characters are those of the Tenuta del Trebbio

Fig. 2. Summary and Chapter One of the Opus ruralium commodorum of Crescentino translated for Sansovino [1522].


SOMMARIO
DI TVTTA L'OPERA.

Nel Primo libro si tratta del sito della villa, delle fabriche, de contadini, & delle cose che ui bisognano per habitare. carte. 1
Nel secondo, della natura delle piante, & della cultura che richiede ogni qualità di terra o di campo. 28
Nel terzo, della cultura de campi campestri, della natura & della vtilità de frutti che se ne cauano. 82
Nel quarto, delle viti, & delle vigne, & della lor cultura, & della natura & vtilità loro. 101
Nel quinto, de gli arbori, della natura loro, & della vtilità che si caua de gli arbori. 115
Nel sesto, de gli horti, & della natura, tanto delle herbe, quãto dell'altre cose che nascono per se medesime. 215
Nel settimo, de prati, & come si fanno, & de boschi, & delle selue così naturali come artificiali. 278
Nell'ottauo, de giardini, & delle cose piacevoli che vi si fanno con artificio, quãto a gli arbori & alle herbe. 284
Nel nono, di tutti gli animali che si nutriscono alla villa così per vtile, come per piacere. 295
Nel decimo, de gli ingegni diuersi da pigliar le fiere salutiche & gli vccelli d'ogni generatione. 376
Nell'undecimo, le regole delle cose che si debbon far in contado, ridotte in compendio perche si tengano a mente. 401
Nel duodecimo, di tutte quelle cose che si fanno di mese in mese per ordine, da Gennaio fino a Dicembre. 427

DI PIETRO
CRESCENTIO
BOLOGNESE
DELLE COSE APPARTENENTI
A BISOGNI ET A COMMODI
DELLA VILLA
TRADOTTO PER MESSER
FRANCESCO SANSOVINO

LIBRO PRIMO.

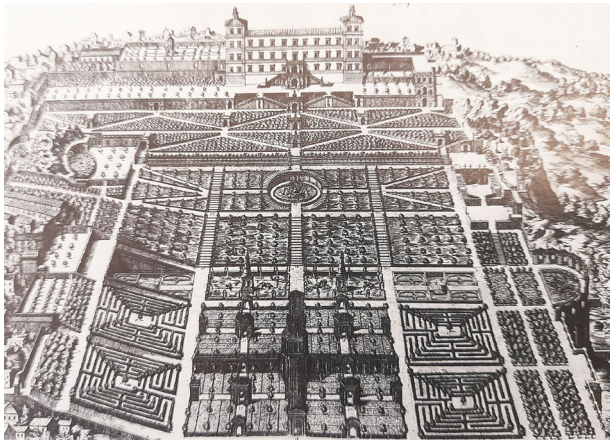
PERCIOCHE IL Coltivamento della villa per i suoi continui affari, richiede fatiche & spetialmente fortezza de gli habitanti, però mi è parso conuenevole in questo primo libro insegnar la dottrina di quelle cose che s'appartengono alla cognition della sanità de luoghi habitabili, & di alcun altre cose necessarie

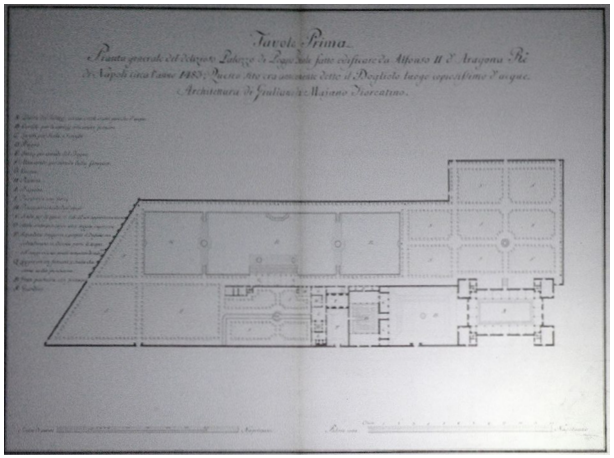
Piet. Cre. A

[Frati 2015], separated from the residence and bordered along the long sides by two parallel pergolas on which rows of vines develop and in the centre a checkerboard of square-shaped flowerbeds. The oldest depiction of this layout dates to the late 16th century and is contained in the lunettes of Flemish painter Giusto Utens [Agostini 2011]. The well-established characters of the garden-model, with the presence of the plant, hydraulic, architectural and landscape elements considered obligatory according to the canons of the period are found in Alberti, who dictates certain rules for their arrangement: the presence of box hedges, pericates that will allow people to enjoy both sun and shade, the arrangement of laurels, cedars, junipers arranged according to geometric figures at equal distances and with mutually corresponding angles (fig. 4) or as it was customary to say at the time *quinunx* [Tosco 2018]. Through the work of Giovanni, Cosimo's second son, the first intervention of a bucolic villa was realized, breaking away from the previous castellan characters. Its location was determined exclusively by landscape needs; the villa and the attached garden were, in fact, built on the side of the hill overlooking the city of Florence, and major terracing works were carried out for this purpose. The Fiesole garden is presented according to Cecil Pinsent's 1915 arrangement, and as with most cases few elements have survived to the present day that can suggest what the exact ornamental architectural arrangement was in the fifteenth century. Perhaps the most innovative character can be traced in the creation of two terraces or, rather, hanging gardens, immediately adjacent to the building, on the hillside designed in such a way as to 'open up' to the valley below [Frommel 2006].The contemplation of the panorama is a theme that becomes more and more intimately linked to the garden, and the arrangement on terraces in hilly areas or otherwise characterized by pronounced morphology turns out to be an increasingly recurrent feature of the period. The explosiveness of the magnificence of the art of the Italian garden grows rapidly, but unfortunately some of these jewels of the Italian landscape are permanently lost, such as the residence of Poggioreale (fig. 4), the realization of which is due to Alfonso d'Aragona, Duke of Calabria and legitimate successor to the throne of Naples. The design by Giuliano da Maiano with the participation of Fra' Giocondo and Francesco di Giorgio included an arrangement of gardens that developed from the sides of the villa on terraces. In front of the villa there was a cruciform garden in axis with the entrance that was populated by orange trees and other fruit plants

Fig. 3. Etching/pulley of the Gardens of Tivoli by Etienne Du Pérac in 1573 [Mosser, Teyssot 1999, p. 49].

Fig. 4. Planimetry of the Villa di Poggioreale attributed to Carlo Vanvitielli, Collection of Lord Bute, Victoria & Albert Museum, London.





with a fountain in the center. Moving towards the valley, one encountered an enclosure wall in which wind windows opened, allowing contemplation of the view. On the side ran a large fishpond divided into rectangular pools and traversed by walkways with platforms and water features, all around wide green spaces were designated for ball games. The expertly manicured green layout was enriched by inflorescences with artistic pruning, statues and precious marbles [Frommel 1994]. Thus, the garden of Poggioreale was no longer configured as an appendage of the villa, but rather constituted its environment of equal dignity coordinated and consistent with the architectural structure where each element, its arrangement in space was taken care of to ensure the well-being of the Aragonese court [Tosco 2018].Thus, it can be concluded that in sixteenth-century Italy, art in garden composition reached such a high level that French supremacy in this field, recognized until the late Middle Ages, is countered by the emergence even internationally of what is still codified as the Italian garden.

Symmetries and architecture

The relationship between mathematics and architecture has probably always existed, at least for as long as architecture has existed [Salvadori 2015]; from the simplest applications to define lengths, surfaces or volumes to the most complex ones in structural calculations, the mathematical tool has always provided help to improve the latu sensu quality of the man-made landscape [Mehaffy 2020], with an intense production of theories, proportions, scales, models [Padovan 2002]. Although the possibility of 'enhancing' aesthetics is sometimes regarded by many architects and designers as a mere matter of purely subjective taste, related to one's individual aesthetic goals [Taylor 1994], several researches have already demonstrated the relationship between environmental quality and psycho-physical benefits for people [Cold 1998; Van den Berg 2003]; however, what is still not well understood concerns the form these environments must take to produce well-being [Mehaffy 2020]. For example, Dosen et al. [2013], evaluating the hypothesis that certain geometric forms of architecture may influence well-being but also the individual's preference system seek to develop an appropriate mathematical conceptual apparatus to evaluate human perceptual responses to space. Again Hagerhall et al. [2004], investigate the fractal geometry

of natural environments discovering that there is a relationship between preference and fractal geometry and its size, suggesting that the latter may provide an explanation for the preference-nature connection. Interestingly, it can also be noted that the historical theme of symmetries, which in architecture has always been a defining element in any period and geographical context: from prehistory [Hodgson 2011], to the complex structures of ancient Egypt [Rossi 2004], to the architecture of ancient Rome's theaters and Vitruvius' De Architectura [Amadei 2015], via Asian, Indian architecture, and pre-Columbian art [Salvadori 2015], has not received adequate attention regarding its implications on the sphere of psychological well-being and individual preferences [Mehaffy 2020]. In landscape and garden architecture, the principles of order, symmetry, and balance find in axis control (fig. 5) a widely used technique [Eckbo 1964], which has evolved over time to become a kind of "toolbox" and which has allowed the Italian garden to evolve in its maturation process from a simple structure to a complex one, from an

Fig. 5. Master Plan of Villa Lante (left) and Villa d'Este (right) reproduced by Nieuwlandt, W. and the New York Botanical Garden with garden axes highlighted [Hu 2004, p. 82].

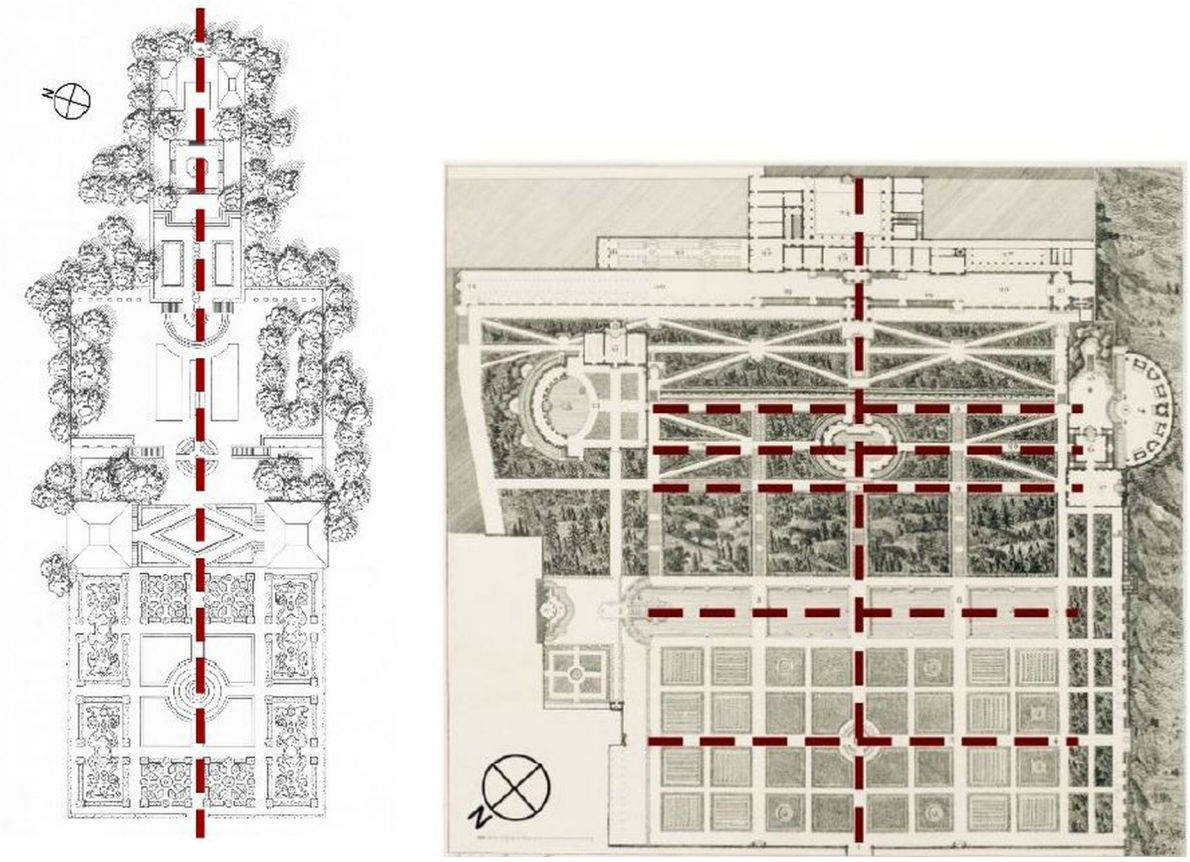
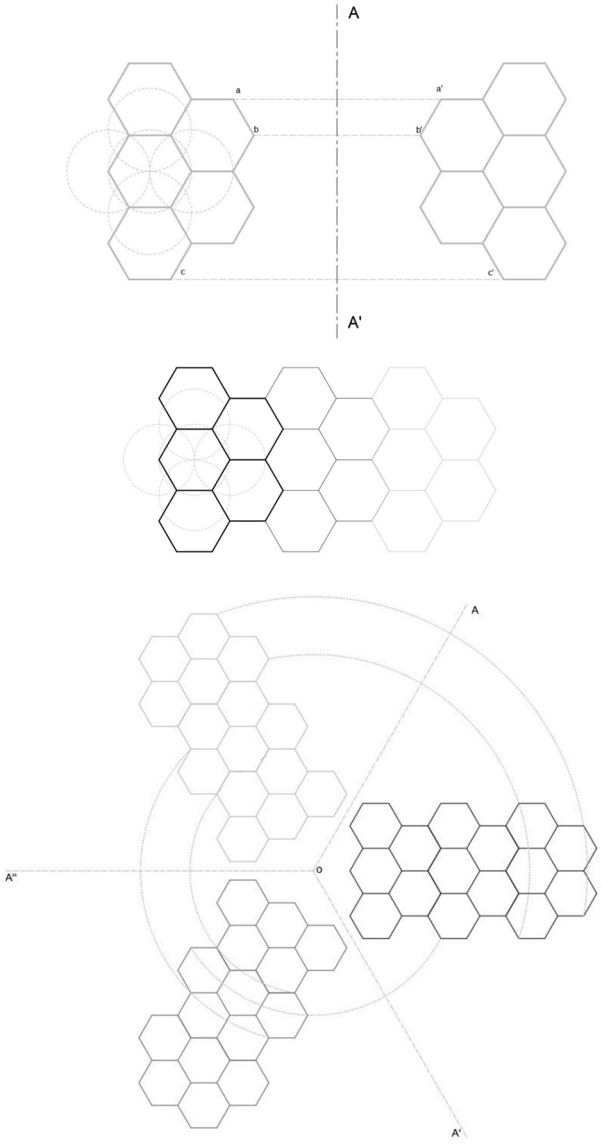


Fig. 6. Schematic examples of reflexive symmetry (top), translative (middle), rotational (bottom) (author's elaboration).



isolated element to a system integrated with the land and its surroundings [Hu 2024]. In mathematics, the term symmetry is used to refer to the invariance of an object with respect to one of its geometric transformations such as reflection, rotation, translation or scale variance [Weyl 2015]. Formally, two objects *A* and *B* that belong to the same space *S* can be said to be symmetric if there exists a transformation *T* such that *B=T(A)* [Mitra, Pauly 2008]. Reflected or 'mirror' symmetry turns out to be the most intuitive type in which any geometric configuration is reflected with respect to an axis. In this case it is used to say that *A* is the mirror image of *B*. In rotation symmetry, the geometric configuration is said to be such if it rotates about a point; there are numerous examples of this class, such as the iris of the eye, or a balloon in which its final shape is the result of the symmetry of the pressures of the gas it contains [Mehaffy 2020]. A translation exists if there is a correspondence between shapes that are not otherwise symmetrical with respect to an axis, such as may be the repetition of a pattern or frieze (fig. 6). Symmetries by variance of scale are similar to translational but occur when the transformation *T* occurs with respect to the size of the object, a very common example being fractal shapes. One should add an additional type, which actually cannot be considered a class in the strict sense as in the previous cases, represented by 'breaks' in symmetries, which occur when there is a perturbation of the symmetric rule. The latter is currently attracting a great deal of research attention to explain the formation of certain biological structures [Isaeva 2012], just as it has already been shown to have several applications in physics and cosmology [Weinberg 1979; Albrecht, Steinhardt 1982].

Machine learning per la *simmetry detection*

The environment in which we live or, rather, the events that unfold in it and that we perceive are often the result of multiple combinations between classes of symmetry [Park et al. 2008]. Usually, the human being's brain is extremely adept at detecting them almost instinctively [Conners 1989; Tyler 2003], conversely, the application of the computer for this purpose still presents some adaptability challenges especially considering that geometric objects or at any rate the elements of this universe can be considered to be practically infinite continuous

variables, whereas computers process finite arithmetic elements. In addition, one must consider that geometries with respect to which one wants to determine the existence of one or more symmetrical rules between their parts may be stored in different formats such as raster images, vector images, scanner acquisition result, which inevitably require different procedures and algorithms [Mehaffy 2020].The environment in which we live or, rather, the events that unfold in it and that we perceive are often the result of multiple combinations between classes of symmetry [Park et al. 2008]. Usually, the human being's brain is extremely adept at detecting them almost instinctively [Conners 1989; Tyler 2003], conversely, the application of the computer for this purpose still presents some adaptability challenges especially considering that geometric objects or at any rate the elements of this universe can be considered to be practically infinite continuous variables, whereas computers process finite arithmetic elements. In addition, one must consider that geometries with respect to which one wants to determine the existence of one or more symmetrical rules between their parts may be stored in different formats such as raster images, vector images, scanner acquisition result, which inevitably require different procedures and algorithms [Mehaffy 2020]. The development of symmetry detection algorithms has a long history in computer vision, even it is possible to date the first attempt to detect bilateral reflection symmetry before computer vision itself [Park et al. 2008]. Although, as seen, the classes of symmetry are diverse, the detection of bilateral reflection symmetry or more simply mirror symmetry and its oblique version has dominated the attention of researchers for several decades [Davis 1977; Kanade 1981; Gauch, Pizer 1993; Lei, Wong 1999], while it is only in recent years that there has been an intensification of research into the detection of other classes of symmetry [Hays et al. 2006; Podolak 2006; Prasad, Davis 2005]. Obviously, each research tries to demonstrate the potential of a specific strategy with some experimental results [Park et al. 2008], however, systematic comparison among all of them, perhaps through a standard set of objects or images, remains at present still limited [Žalik et al. 2022]. Some examples, however, can be found in Xiao and Wu [2007]; who develop an overview of symmetry detection algorithms for raster images; or, in Mitra et al. [2013]; they show the results of a comparison between algorithms for evaluating reflected symmetry in 3D objects; finally, Bartolucci et al. [2018]; they compared different methods applicable to biomedical spatial data. The algorithms just described, are certainly effective but still present two types of problems: the first is the specificity of their application, as indicated some are designed to evaluate a particular class of symmetry, the second concerns the inherent computer complexity of the tool or the need to resort to a specific software for its execution, often proprietary, and not opensource with inevitable limitations with respect to a possible customization of the tool. In addition, referring to the object of this research, it should be considered that very often the documentary source of the garden is very often a pictorial representation or woodcut that has inevitably undergone degradation over time, or the morphology of the land may have been altered over the centuries, and therefore one cannot proceed by applying current technologies for high-precision surveying. In view of these issues and especially the special nature of the research object, it was decided to adopt a method with greater adaptability, which is free and opensource and also more intuitive than many of the previously stated solutions. Summarizing it in a few lines before going into the details of the code: having acquired a raster source, and denoting it as set Z, one identifies or selects within it a portion that one can denote as object A, obviously such that $A \subseteq Z$, and of which you want to search for a transform of it $T(A)$. The portion may, for example, be a hedge maze, a peach orchard, an arbor, or more; of this one calculates the transform by rotating or reflecting it and obtaining $B=T(A)$. Finally, you query the computer by asking it to look for the transform $B=T(A)$ within the set Z. If successful, then:

$$\exists\ B \subseteq Z \leftrightarrow B=T(A)$$

that is, if the portion B exists and is contained within the set Z, then B is the transform of A within Z; therefore, A and B are mutually symmetrical portions of Z; otherwise:

$$\nexists\ B \subseteq Z \leftrightarrow B=T(A) \not\subseteq Z$$

that is, the impossibility of determining the existence of the B transform within Z will imply that A and B are not mutually symmetric portions of Z. The problem inevitably arises of how to teach the computer to find the object $B=T(A)$ inside Z. The solution proposed in this research is to teach the computer to play a kind of jigsaw puzzle,

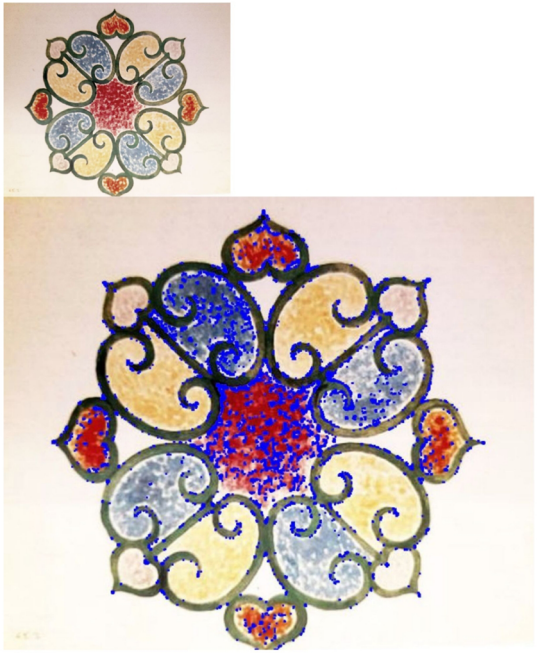
teaching it the basic cognitive processes used by people to identify one piece of an image among a hundred, a thousand, and more elements and figure out its correct position within the overall image. To illustrate the solution, take as a purely explanatory example the image that follows (fig. 7) and from which four tiles were obtained, stacked on the right. Trying to play around, we can assume that the totally gray piece, the first one starting from the bottom definitely belongs to the sky, however being able to locate its exact position in the image is impossible, any part of the sky would do, the second dowel from the bottom we can attribute to the top of the building, neither lower nor higher, thus there is a vertical constraint but no horizontal one, in fact any translation along this direction would be considered valid (limited to the building), instead for the third and fourth dowels it is possible to identify precisely their origin position in the image. In this case, therefore, it can be guessed that the discriminator for determining the position of the tessellation within the image is the presence of a strategic information graphic element: the corners. So to answer the initial question, one must teach the computer to recognize the angles within an image and in the portions, between which one wants to ascertain the existence of one or more symmetrical rules. In 1988, Chris Harris and Mike Stephens [1988], developed an algorithm that from a gray-scale transformed image electronically acquired in matrix form (in fact, a raster is already a matrix) allows angles to be determined by maximizing the function that evaluates the difference in pixel intensities in all

Fig. 7. Illustrative example of the methodology depicting Palazzo Venezia in Rome (source: https://turismoroma.it/it/luoghi/palazzo-di-venezia).



Fig. 8. Application of the Harris and Stephens algorithm, in the small image above a 16th century watercolour depicting a flower bed [Mosser, Teyssot 1999, p. 79], in the enlarged image the result of korner detection with blue pixels (author's elaboration).

```
#Planimetria di aiuole del XVI sec.  Test per determinare i korner
#Test con algoritmo di Chris Harris & Mike Stephens, 1989

import numpy as np
import cv2 as cv

filename = 'Acquerello planimetria aiuole pag 79.jpg'
img = cv.imread(filename)
gray = cv.cvtColor(img,cv.COLOR_BGR2GRAY)

gray = np.float32(gray)
dst = cv.cornerHarris(gray,2,3,0.005)


dst = cv.dilate(dst,None)

# Soglia per un valore ottimale, che può variare a seconda dell'immagine.
img[dst>0.005*dst.max()]=[0,0,255]

cv.imshow('dst',img)
if cv.waitKey(0) & 0xff == 50:
    cv.destroyAllWindows()
cv.imwrite('Risultato_KD.jpg',img)
```

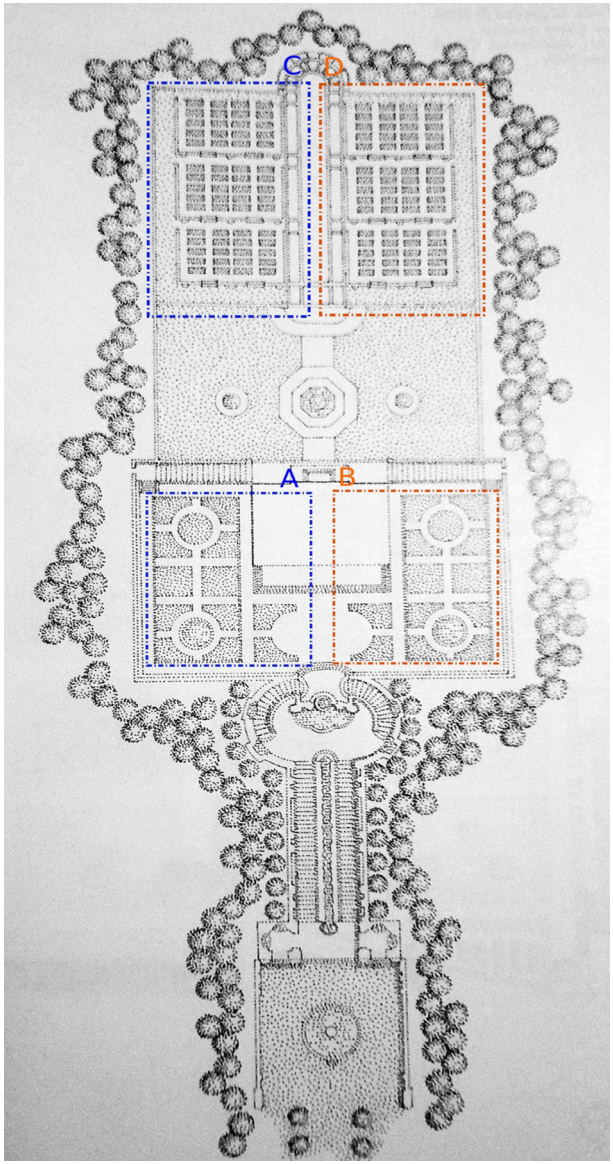


directions. The algorithm can be implemented within the Python programming environment, using the Open Source Computer Vision Library [1] (fig. 8). Harris's algorithm has problems and is ineffective when changing the image display scale. Continuing developments in computer vision and particularly in korner detection have allowed these difficulties to be overcome by providing a more performance-oriented toolset. For example, Lowe [2004] developed an applicable Scale Invariant Feature Transform (SIFT) algorithm, which was further improved by Bay et al. [2006], in terms of computational speed with the Speeded-Up Robust Features (SURF). Finally, the latest evolution is due to Rublee et al. [2011] with ORB (Oriented FAST and Rotated BRIEF), which is a more 'open' solution in terms of code accessibility than the previous two solutions. Subsequent to corner recognition, algorithms belonging to the family of enhanced 'Brute-Force Matchers' can be used to verify the existence of the *B=T(A)* transform within the *Z*-set, enabling them to operate on large datasets, such as FLANN (Fast Library for Approximate Nearest Neighbors), which conceptually can be explained as a solution that verifies and identifies the presence of corners in the *Z*-set, in the A-portion and in the *B=T(A)* transform, examines their distribution, and 'figures out' whether a given corner present in the transform also exists in the *Z*-set [Noble 2016; Muja, Lowe 2009].

Experimentation and results

The application of the algorithmic procedures illustrated in the previous paragraph was implemented by choosing as a case study a planimetry of the gardens of Palazzo Farnese found in Mosser and Teyssot [1999], at page 27. The image was deliberately acquired with a non-professional camera characterized by low resolution and without the aid of corrective filters or other mechanical zenithal self-leveling devices. The idea behind this particular choice is to test the korner and image detection algorithms on low quality, blurry images acquired from documentary sources that perhaps over time have also undergone physical deterioration of the paper support with consequent deformation of the image itself; in practice, the choice was made to simulate difficult operating conditions that might arise when operating on representations, even pictorial ones such as those described in the preceding paragraphs. Having then defined the case study (fig. 9), two portions

Fig. 9. The plan of the Palazzo Farnese gardens used as a case study on which two portions 'A' and 'C' are highlighted for the algorithm test [Mosser, Teyssot 1999, p. 27].



of the image indicated by two blue dashed rectangles and named *A* and *C* respectively were selected within it. Of these two portions, the respective reflexive and rotational symmetries were processed, and in addition, to test the algorithmic recognition capability, they were scaled and intentionally deformed. More specifically, portion *A* was first reflected and scaled to twice the scale ratio of the original and then rotated 90 degrees. Portion *C* was first reflected and then successively deformed by stretching it along the Y-direction by a percentage of 10%, 20%, 30% and finally 40% from the originally acquired dimensions. Following the determination of the respective *A* and *C* transforms, we first applied the SIFT algorithm for determining the kornerpoints and then the FLANN algorithm whose task is to compare them and through this step recognize the existence of one image within another. The complete code is given below (fig. 10), and a more detailed explication of it is given later.

Fig. 10. The scirpt in Python incorporating the SIFT and FLANN algorithms for kornerpoint detection in the case study (author's code compilation).

```
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt

e1 = cv.getTickCount()

img1 = cv.imread('Palazzo_Farnese_D_test_estremo.jpg',cv.IMREAD_GRAYSCALE) #
queryImage
img2 = cv.imread('Palazzo_Farnese.jpg',cv.IMREAD_GRAYSCALE) # trainImage

# Initiate SIFT detector
sift = cv.SIFT_create()

# find the keypoints and descriptors with SIFT
kp1, des1 = sift.detectAndCompute(img1,None)
kp2, des2 = sift.detectAndCompute(img2,None)

# FLANN parameters
FLANN_INDEX_KDTREE = 5
index_params = dict(algorithm = FLANN_INDEX_KDTREE, trees = 5)
search_params = dict(checks=100) # or pass empty dictionary

flann = cv.FlannBasedMatcher(index_params,search_params)

matches = flann.knnMatch(des1,des2,k=2)

# Need to draw only good matches, so create a mask
matchesMask = [[0,0] for i in range(len(matches))]

# ratio test as per Lowe's paper
for i,(m,n) in enumerate(matches):
 if m.distance < 0.4*n.distance:
     matchesMask[i]=[1,0]

draw_params = dict(matchColor = (0,255,0),
 singlePointColor = (255,0,0),
 matchesMask = matchesMask,
 flags = cv.DrawMatchesFlags_DEFAULT)

img3 = cv.drawMatchesKnn(img1,kp1,img2,kp2,matches,None,**draw_params)

e2 = cv.getTickCount()
time = (e2 - e1)/cv.getTickFrequency()
print( time )

plt.imshow(img3,),plt.show()
```

In the first part of the script, through the first three lines of code we import three libraries that are not originally present within Python and they are respectively 'Numpy" [2] which allows the management and advanced analysis on multidimensional matrices, such as a raster image that is nothing but a two-dimensional matrix; the library 'OpenCV' which as already indicated is the basis of many Computer Vision and Image Detection solutions, and finally the library 'Matplotlib' [3] which allows the creation and visualization of interactive graphs and animations within Python. Immediately afterwards and almost at the close of the code, two counters *e1* and *e2* were inserted, respectively, which allow to calculate the time (*e2-e1*), expressed in seconds, taken to execute the script between the two counters; this expedient was made in anticipation of a development of the research also directed to the quantitative evaluation of the performance of the different solutions that can be developed and implemented. Thus, analyzing the operation of the script between the two counters, we immediately find two lines that create the variables *img1* and *img2* within which will be stored, respectively, the portions of the image to be searched (#queryImage) and the base within which to search (#trainImage). In the following lines, we first start the SIFT algorithm for determining the kornerpoints in the two previously stored images and then save the result of this analysis within two new variables called *kp1* and *kp2* respectively. This result is then passed to FLANN's algorithm, which, as mentioned earlier, allows the comparison and merging of similar kornerpoints between the images being compared. The result is conditional on reaching a certain quantitative standard, which can be modified through subsequent lines of code. For a precise and detailed explication of how both SIFT and FLANN work, see the extensive OpenCV library documentation that is available online. The overall result is stored within a new variable *img3* that will contain the two images, the kornerpoints and the union of those determined to be coincident via line segments (flags). The final result is immediately available and displayed within a window created with the last line of code ('plt.imshow'). In the results obtained, the kornerpoints are represented by small red-colored circles in both comparison images, while the flags joining them are green-colored line segments. The execution of the code was repeated for all the previously indicated case histories, allowing us to observe and evaluate the script's ability for image recognition under different conditions, from simple reflection, to reflection-rotation,

Fig. 11. Top: recognition of the A portion reflected (left) and reflected-rotated (right); bottom: recognition of the C portion reflected and deformed by 10% (left), and 20% (right) (author's elaboration).

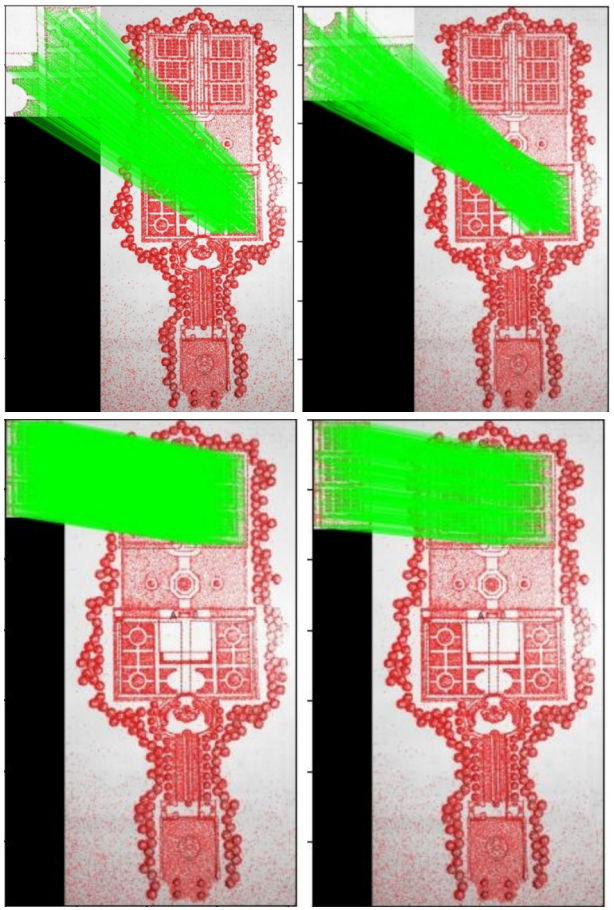
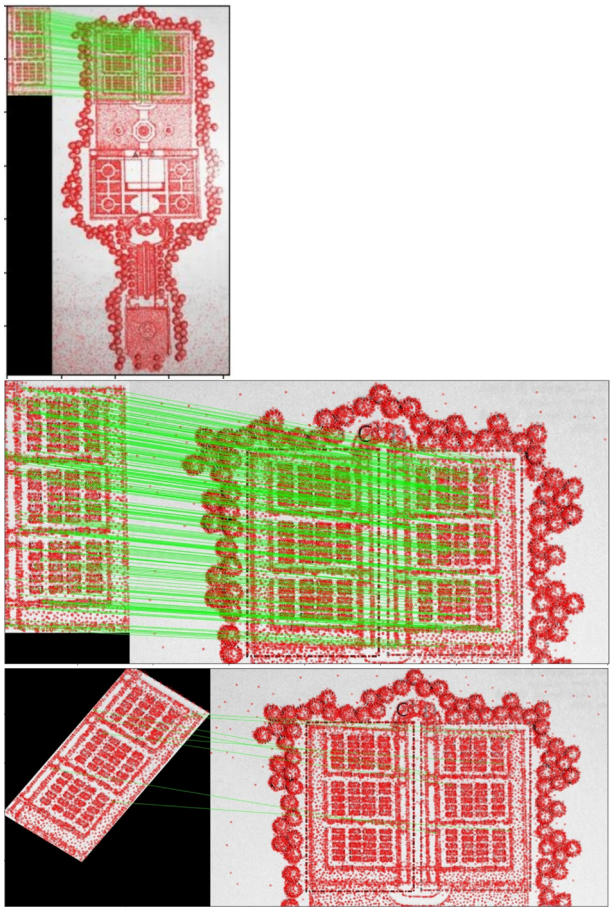


Fig. 12. At the top of the small figure is the recognition of the C portion reflected and deformed by 30%, and of which an enlargement can be appreciated; at the bottom is the recognition, again of the C portion reflected, by 30% and rotated by an angle of 45° (author's elaboration).



to intentional image distortion. The outcomes are shown in the following two images and then commented on. In the first two computations (fig. 11), one can immediately see the high effectiveness of the script if the portions to be recognized are only reflected but also reflected and rotated; in fact, one can observe the dense and thick cloud of green links that connect the image to be searched within the overall floor plan. Applying the script in the search for the *C* portion that was first reflected and then deformed along the *Y*-axis from 10% to 40%, it can be observed (fig. 11) how its recognition ability tends to be reduced, but still with a high numerosity of green flags. By raising the degree of deformation to the threshold of 30 percent, the reduction in the script's recognition ability is evident; the density of green flags is significantly lower (fig. 12), and then is further reduced if the portion is reflected, deformed and also rotated. The script's recognition capability is totally nullified by reaching the 40% deformation threshold, in other words, the code being unable to recognize any coincidence between the korners of the compared images, suggests that in this particular situation the *C* portion and its transform *C=T(D)* (reflected and deformed along a single direction by as much as 40%) would not be symmetrical.

Conclusions

In the research, the possibility of using some automated algorithms belonging to the branch of Image Detection and Computer Vision was tested and evaluated to instruct the computer in recognizing the symmetries existing in the typical spatial distribution of an Italian garden. Starting from an evolutionary historical analysis of the characters and events that stimulated and influenced the birth of the Italian garden, a number of documentary sources were identified that indicate how a large representation of these gardens has unfortunately been lost over the centuries, and the remainder have often been affected by revisiting, in some cases quite recently. Thus it has been ascertained that very often the only evidence of these treasures now lost or altered from the initial plans is found in artistic illustrations or very old documents that may have deteriorated, discolored, distorted or otherwise over time. For this reason, it was chosen to develop an algorithm and test its effectiveness under different conditions to understand its applicability but more importantly its limitations. The chosen case study shows the typical characters of the Italian garden and therefore, by definition symmetrical in the elements that compose it, but this was not the objective of the research, i.e. to demonstrate the existence of symmetries, as much as, if anything, to understand whether the proposed methodology was effective in teaching the computer to recognize these relationships allowing the experiment to be replicated in the future in more complex and less certain situations. As the results show, the outcome of the experiment can be considered successful within certain operational limits. Subsequent developments are already pointing in several directions: understanding and comparing the effectiveness and efficiency of the different algorithms with respect to a casuistry of potential case studies that is much broader than could be discussed in a single research study, census and categorize precisely the variety of case studies that could be presented and that would be used as a standard library for performance comparisons between algorithms, instruct the computer to recognize and distinguish within the representations the typical elements of the Italian garden, (hedges, tree-lined avenues, peach orchards, etc.) through other computer vision algorithms that are actually more frequently used in medical diagnostics through imaging. Initial results, which will be published in future research, seem to suggest the research direction can be considered as fertile and promising in results.

Notes

[1] https://numpy.org/.
[2] https://matplotlib.org/.
[3] http://opencv.org/.

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Landscape Drawing between Imagination and Utopia

The Representation of Landscape through Drawings and Utopian Visions

Livio Sacchi

We open our reflection with an examination of the words or phrases that are the key of this third topic: 'representation', 'landscape', 'imaginary drawings' and 'utopian visions'. It seems rather superfluous to dwell on the first one, 'representation', since we architects and teachers of the disciplines of representation have already written and spoken so much about it. We know that it is a term of medieval origin that indicates the 'image' or the 'idea' or both. We shall therefore limit ourselves to recalling what Hans Georg Gadamer observed on this matter: "That the representation is a picture –and not the original itself– does not mean anything negative, any mere diminution of being, but rather an autonomous reality. So the relation of the picture to the original is basically quite different than in the case of a copy. It is no longer a one-sided relationship. That the picture has its own reality means the reverse for what is pictured, namely that it comes to presentation in the representation. It presents itself there. […] Every such presentation is an ontological event and occupies the same ontological level as what is represented. By being presented it experiences, as it were, an increase in being. The content of the picture itself is ontologically defined as an emanation of the original" [Gadamer 2006, p. 135].

With regard to the term 'landscape', however, it should be remembered that this is a polymorphous concept and, above all, one that varies over time. Leaving aside its literary meanings, but also those closer to us, proper to the visual arts or geography, it must be said that, as architects,

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our interests are mostly addressed to landscapes that are not necessarily natural, but mostly humanized and more or less homogenous –think about urban and suburban landscapes, whether infrastructural, industrial or agrarian– but also to various particular phenomena related to specific human settlements –slums, suburbs, the CBDs or Central Business Districts– at least partially shared with sociology and economics and increasingly shared with ecology and environmental sciences in general. Also variable over time is the aesthetic value attributed to the landscape, with the foreseeable repercussions on the concept of protection and with the introduction of the concept, theorized by Rosario Assunto, of the 'wearing out' [of the landscape] as culture, taste and sensitivity vary, with all the consequences on the concept of identity, and how the latter is the result of a more or less inclusive cultural construction. Finally, the relationship between landscape and design is of great interest: seen as an inseparable binomial on the one hand, for which landscape is nothing but a plan; but also with skepticism on the other, in a defensive and, in essence, anti-projectual logic.

As for the phrases 'imaginary drawings' and 'utopian visions', even if we take for granted that in our case the discourse should be limited to architectural aspects, the field of investigation remains so vast as to appear difficult to control. Drawings, particularly those in which the component linked to the imagination is most sensitive, have the advantage of enjoying absolute freedom, much greater than that granted to built architecture. Imagination is, in fact, properly "the possibility of evoking or producing images independently of the presence of the object to which they refer" [Abbagnano 1964], a fundamental condition for mental activity itself; and it is synonymous with fantasy, a Greek word that indicates the faculty of the mind to create images and therefore a creative, rather than reproductive imagination, even if romantic thought in the 19th century distinguished between fantasy (artistic) and imagination (non-artistic). As for the freedom inherent in imagination or fantasy, architecture, understood as the art of constructing buildings, clearly has much less, subject as it is to a series of constraints; certainly less than arts such as painting or sculpture. The expression 'imaginary drawings' should, however, be understood as something that is an 'effect of the imagination' and, as such, 'has no basis in reality', even though the work of us architects is precisely that of imagining for the purposes of construction, that is, for the purposes of transforming what has been imagined into reality.

Finally, more specific than 'imaginary drawings' is the term 'utopian visions', which evidently brings us back to the notion of utopia. This is a theme that architects have been dealing with for at least five centuries. In fact, the publication of the booklet *De optimo reipublicae statu, deque nova Insula Utopia*, a kind of philosophical novelette written by Thomas More, the great opponent of Henry VIII, canonized in 1935, dates back to 1516. Like Plato's much older *Republic* or the later *City of the Sun* written by the Dominican Thomas Campanella in 1601, utopia has triggered endless and fascinating studies, conducted primarily on a graphic level, but also on literary and cinematic levels: just think of science fiction. The ambiguity inherent in the philosophical concept of utopia, mainly linked to the difficulties of its implementation, also recognized by Karl Marx and Friedrich Engels, who distinguished between scientific socialism and utopian socialism, is also present in architectural and urban utopia. Karl Mannheim, on the other hand, in his *Ideologie und Utopie* of 1929, considers utopia as something that is destined to be realized; utopia is rather seen as a theory that is realized, while ideologies are understood as transcendent ideas that fail to implement the plans contained in them. Stating his opinion on the controversial issue, Nicola Abbagnano wrote: "In general, one can say that Utopia represents an ideal correction or integration of an existing political or social or religious situation. This correction can remain, as has often happened and happens, in the state of a simple aspiration or generic sign, resolving itself in a kind of evasion from lived reality. But it can also happen that utopia becomes a force for the transformation of existing reality and assumes enough body and consistency to transform itself into an authentic innovative will and to find the means of innovation. As a rule, the word is understood more in reference to the former possibility than to the latter" [Abbagnano 1964], recalling, among other things, the scepticism inherent in the thinking of philosophers such as Horkheimer, Adorno and, above all, Marcuse: "The critical theory of society possesses no concepts which could bridge the gap between the present and its future; holding no promise and showing no success, it remains negative" [Marcuse 1964, p. 257].

The imaginary drawings or utopian visions in the field of architecture deducible from history are nearly infinite in number. Limiting ourselves to the most important ones of the 20th century, we must mention Tony Garnier's Cité industrielle of 1904; Otto Wagner's Unbegrenzte Großstadt of 1910-1911; Antonio Sant'Elia's Futurist

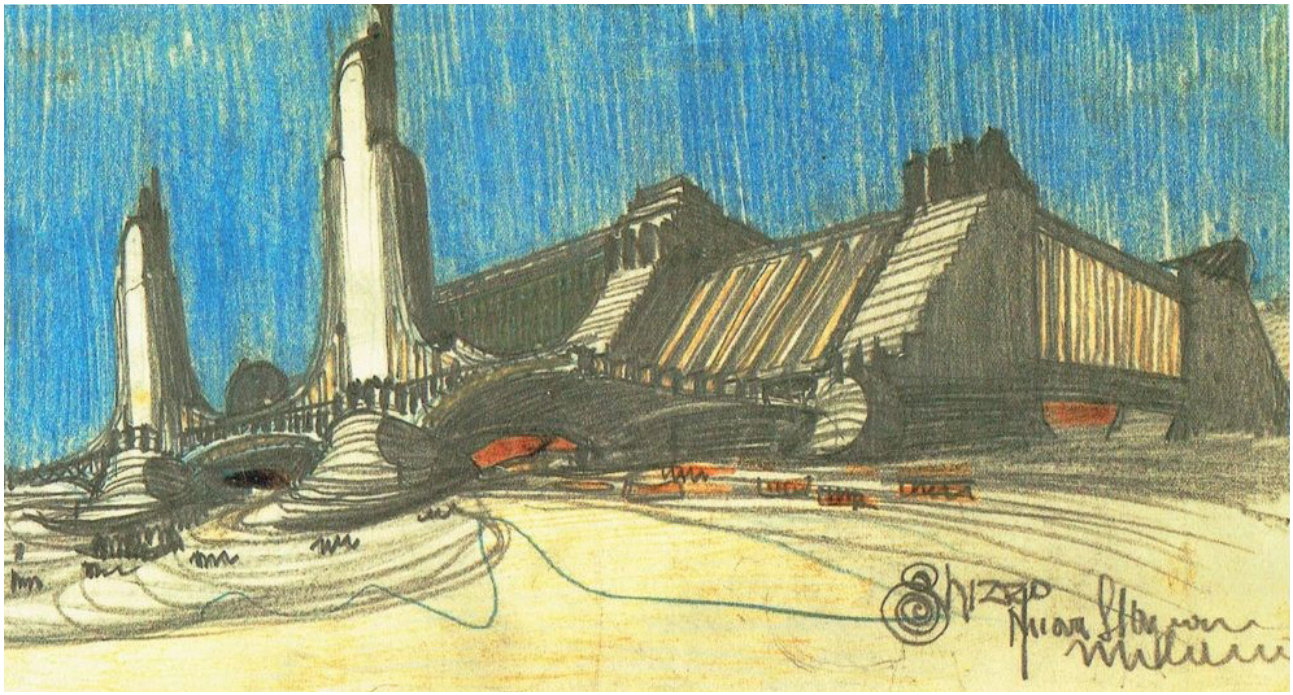


Fig. 1. Antonio Sant'Elia, La Città Nuova, Studi per la stazione ferroviaria di Milano, 1914. <https://www.aboutartonline.com/un-architetto-provocatorio-antonio-santelia-e-il-manifesto-per-larchitettura-futurista-verso-la-modernita/> accessed on 25 november 2024.

Città Nuova of 1914; Ludwig Hilberseimer's Modern City of 1924 and Le Corbusier's Ville radieuse of 1925; Frank Lloyd Wright's Broadacre City of 1935; and New Babylon by Constant (Constant Anton Nieuwenhuys), designed between 1959 and 1977. Also worth mentioning are the proposals advanced by architects as diverse as Ludwig Mies Van der Rohe, Adalberto Libera, Armando Brasini, Hugh Ferris, the aforementioned Archigram group, Archizoom, Superstudio, Hans Hollein, Richard Buckminster Fuller, Yona Friedman, Paolo Soleri, John Hejduk, Maurizio Sacripanti, Luigi Pellegrin, Paul Rudolph, Kenzo Tange, the Japanese Metabolists, Aldo Rossi, Franco Purini, Arduino Cantàfora, Massimo Scolari, Franz Prati, Giangiacomo d'Ardia, Lebbeus Woods and many others. Finally, we cannot fail to mention Vema, the city imagined between Verona and Mantua by Purini himself and a group of young Italian architects and presented at the 2006 Venice Biennale. What is the function of such representations of more or less man-made landscapes? Excluding that of an avowedly 'planning' type, that is, one that precedes or anticipates a building process, it is clearly a function of stimulating creativity, that is, of prefiguring what will only become possible much later, thanks to the development, over time, of building technologies and techniques: a function that we could define as 'prophetic', if it were not preferable to limit the use of this adjective to that which is, more or less directly, inspired by God.

Hence, there are three more questions, corresponding to an equal number of possible examples, to help us in our reflection. Did the aforementioned Città Nuova by Sant'Elias play a prophetic role, or at least an anticipatory one, with respect to what then was materialized in the



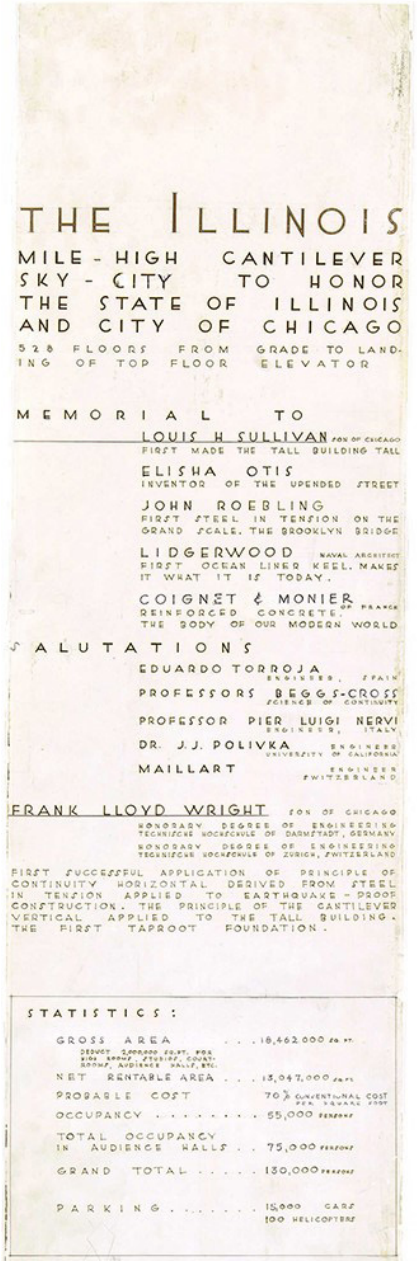
Fig. 2. Vincent Callebaut Architectures, Paris Smart City, 2050. Courtesy Vincent Callebaut Architectures. <https://amazingarchitecture.com/futuristic/paris-smart-city-2050-by-vincent-callebaut-architectures> accessed on 25 november 2024.

course of the 20th century? Perhaps it did, although it would seem to concern not so much our country [Italy], but rather what was determined and continues to be determined in other continents: in America or Asia, but also, more recently, in Africa. Can the Illinois, or Mile High Skyscraper designed by Frank Lloyd Wright in 1956 also be interpreted as a prophecy of what would happen in general in the future? More specifically, did it anticipate a tower like Adrian Smith+Gordon Gill Architecture's Kingdom Tower currently under construction in Jeddah? Perhaps so, not least of all because it looks very much like it, although the latter will be not a mile, but a kilometer in height, and although the construction site has been at a standstill for several years due to some unclear legal issues involving the project's financiers; completion of the building, which as we know will be the tallest in the world, is nevertheless scheduled for 2028. After all, Wright himself, with foresight, said that if we can't afford to build it now, we can't afford not to build it in the future". Was it that Archigram's Walking City and Instant City became a "force for transformation," that took on "body and substance" and "found the means of innovation," as Abbagnano wrote, to the point that it made it possible for Renzo

Fig. 3. Frank Lloyd Wright, illustration and data sheet for The Illinois. <https://www.artbook.com/blog-frank-lloyd-wright-skyscraper.html> accessed on 25 november 2024.

Fig. 4. Adrian Smith + Gordon Gill Architecture, Kingdom-Tower, Jeddah. <https://citymagazine.si/en/the-tallest-building-in-the-world-will-be-1-kilometer-high-kingdom-tower/> accessed on 25 november 2024.

Piano and Richard Rogers to build the Centre Pompidou in the centre of Paris in 1977? For the third time, the answer is, perhaps: yes.
The representation of utopian or invented landscapes has always interested architects. Italians, in particular, have dedicated themselves to it with passion and often excellent results: just think of some of Leonardo's drawings. But realized utopia has never really taken root in our country, apart from a few splendid urban plans, from Palmanova in Friuli to Grammichele in Sicily. Other exceptions are, for example, the European cities of Friedrichstadt, which Frederick I of Prussia had built just outside Berlin for the French Huguenots after the revocation of the Edict of Nantes in 1685, or Herrnhut, founded by Count Nikolaus Ludwig von Zinzendorf in 1738 in Saxony for the Hussites of the Moravian Church. Not so in the New World, where there are numerous examples of utopian communities, of both religious and socialist inspiration, that were actually built and lived in. But in these communities, the impact with the built reality often defused the architecture of any subversive charge, leaving the revolution –more social than architectural– almost exclusively a matter of design. Think, for example, of Shaker villages such as Sabbathday Lake at Poland Spring in Maine, built between the end of the 18th century and the first decades of the 19th century; or the Shakertown of Pleasant Hill in Kentucky, or the Hancock Shaker Village in Pittsfield, Massachusetts, dating back to the early 19th century. But also to the seven linear villages of Amana in Iowa, built on religious, as much as openly communist ideological foundations, which survived in self-sufficiency until 1932. Or to Robert Owen's New Harmony in Indiana. Or to the village of Zoar, in Ohio, founded in 1817 by the *Society of Separatists of Zoar*, a group of German Pietists originally from Württemberg (the name derives from that of the village where Lot took refuge, with his wife and daughters, when fleeing from Sodom), still inhabited by some families today. Finally, it would be interesting to analyze the motivations behind the frequent didactic experiments on the subject held in many Italian schools of architecture. This choice of proposing to students the



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FIRST MADE THE TALL BUILDING TALL

ELISHA OTIS
INVENTOR OF THE UPENDED STREET

JOHN ROEBLING
FIRST STEEL IN TENSION ON THE GRAND SCALE. THE BROOKLYN BRIDGE

LIDGERWOOD NAVAL ARCHITECT
FIRST OCEAN LINER KEEL. MAKES IT WHAT IT IS TODAY.

COIGNET & MONIER OF FRANCE
REINFORCED CONCRETE. THE BODY OF OUR MODERN WORLD

SALUTATIONS

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PROFESSORS BEGGS-CROSS SCIENCE OF CONTINUITY

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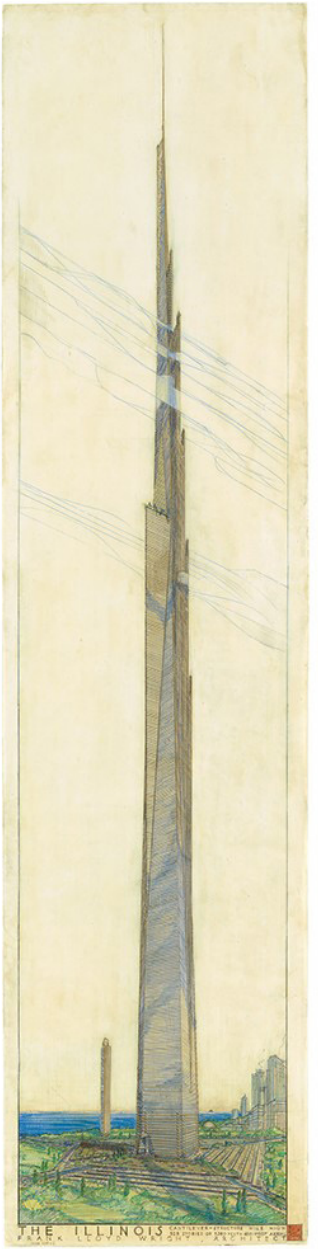
HONORARY DEGREE OF ENGINEERING TECHNISCHE HOCHSCHULE OF DARMSTADT, GERMANY
HONORARY DEGREE OF ENGINEERING TECHNISCHE HOCHSCHULE OF ZURICH, SWITZERLAND

FIRST SUCCESSFUL APPLICATION OF PRINCIPLE OF CONTINUITY HORIZONTAL DERIVED FROM STEEL IN TENSION APPLIED TO EARTHQUAKE-PROOF CONSTRUCTION. THE PRINCIPLE OF THE CANTILEVER VERTICAL APPLIED TO THE TALL BUILDING. THE FIRST TAPROOT FOUNDATION.

STATISTICS:

GROSS AREA	18,462,000 SQ. FT.
DEDUCT 2,000,000 SQ. FT. FOR HIGH ROOMS, STUDIOS, COURT-ROOMS, AUDIENCE HALLS, ETC.	
NET RENTABLE AREA	13,047,000 SQ. FT.
PROBABLE COST	70% CONVENTIONAL COST PER SQUARE FOOT
OCCUPANCY	55,000 PERSONS
TOTAL OCCUPANCY IN AUDIENCE HALLS	75,000 PERSONS
GRAND TOTAL	130,000 PERSONS
PARKING	15,000 CARS 100 HELICOPTERS





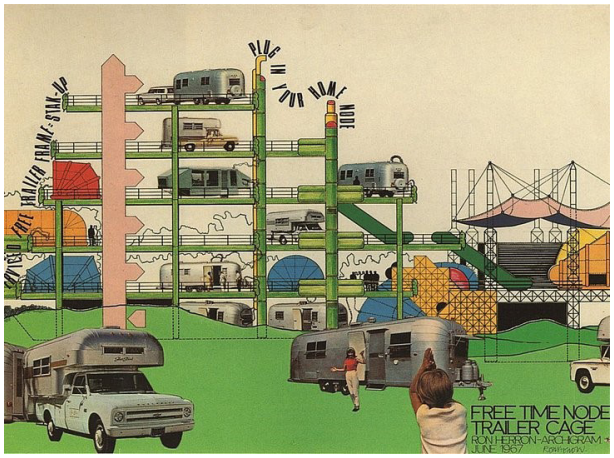


Fig. 5. Archigram visionary architecture. <https://www.penccil.com/gallery1.php?show=7204&p=687304273563> accessed on 25 november 2024.

execution of imaginary representations is probably due to the practical difficulties they encounter when dealing with the concrete reality of the project, a reality made up, as we have already mentioned, of constraints, regulations, budgets, structural and plant engineering requirements, etc.; but which also appears to be interpreted as an escape from the profession of architect, an "evasion from lived reality," as Abbagnano said, on whose psychological motivations we should perhaps reflect.

New Horizons

New horizons for the representation of imaginary and utopian landscapes are opening up thanks to artificial intelligence and, in particular, to the widespread use of platforms such as, for example, the Midjourney AI image generator, a formidable text-to-image tool for the conception of imaginary landscapes and new utopias. But the same applies to *Dall-E*, *Adobe Firefly*, *Stable Diffusion*, *DreamStudio* or *Leonardo*, all platforms based on artificial intelligence, which help us explore new fields more or less pre-figured by our imagination; for example, issues as novel as they are, perhaps, a bit gratuitous: what would a feminist or anti-racist landscape, city or architecture look like? Or, moving to a different order, what would a parametric landscape look

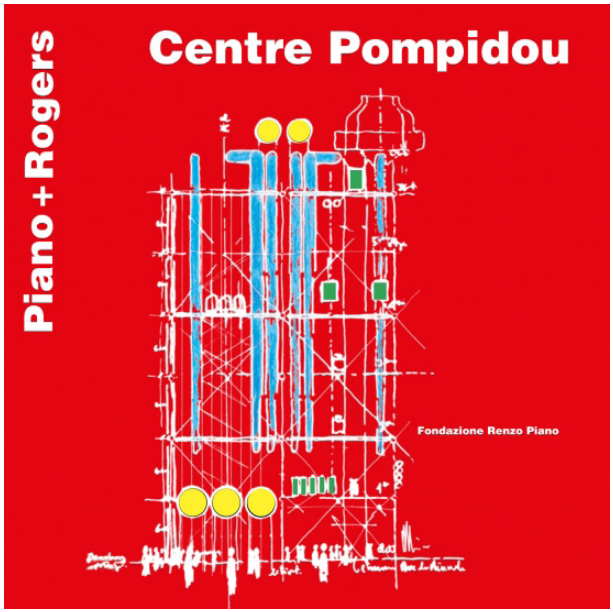


Fig. 6. Ninth monography cover of Renzo Piano Foundation. <https://www.fondazionerenzopiano.org/it/book/centre-pompidou-piano-rogers/> accessed on 25 november 2024.

like? Even if artificial intelligence produces new problems –from how one defends oneself against the visual garbage that constantly floods us from the web, to how one exercises criticism, in the etymological sense of the term, against such images– it nevertheless offers results that one can hardly fail to find interesting and, moreover, not too different from the scenarios outlined by the (non-artificial) intelligence of the best architects. In short, design has changed from what it used to be even just a few decades ago. We have moved from a phase in which our representations and the planning that went with them took for granted hierarchically ordered constructions within recognizable configurations, to a new phase in which control has, or at least seems to have, been lost, making way for the dynamism of increasingly experimental and destabilizing transformations. And this is not an updated re-proposal of what the avant-gardes had outlined at the beginning of the 20th century, or at least, not only. On the one hand, in fact, contemporary design cannot but be big data informed,



Fig. 7. Architectural concept works by Tim Fu generated from crumpled paper, massing, and sketch with using @lookx.ai_official. <https://x.com/parametricarch/status/1695114160944685484/photo/2> accessed on 25 november 2024.

that is, based on the data that we all more or less consciously provide and that make such buildings and cities responsive, that is, responsive and interactive; on the other, smart technologies and machine learning, in turn, lead to different forms of cognitive design, in some way at the intersection between man and the environment, capable of managing complexity with the help of artificial intelligence and thus of directing planning and governance. But even if artificial intelligence were to start delivering the desired results in solving complex problems, it would not be enough. A technocratic perspective assumes that everything can be analyzed and solved, ignoring the human factor with all its unpredictability: the buildings, cities and territories in which we live are instead, first and foremost, complex anthropic systems, within which it is essential to intercept the desires and expectations of those who inhabit them, in ways that, in addition to being scientific and rational, must also be emotional and participatory. This is a demanding challenge, which passes through a process of deconstruction, reinvention and re-signification. A challenge that, for us architects and for our schools of architecture, may not be too far removed from that taken up by painters in the second half of the 19th century when, with the advent of photography, they began to question what they were doing with it, and which forced them, in order not to be relegated to the sidelines, to take new paths, implementing different strategies from those they had been using until then, thus revolutionizing their art and, more generally, the whole of society.
It was Renzo Piano, with his usual simplicity, who said: "In my job you have to be a bit of a utopian, always believing that our work will change the world. Even if it doesn't…" [Rampini 2002].

Author

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The Urban Landscape of the 'Fourth City'

Gabriele Pierluisi

Abstract

The proposed contribution is offered as an operational reflection (drawings and text), on the becoming of the contemporary Hyperville in the era of the Anthropocene. Theorising, on the one hand, the status of the Fourth City as a design variant of the contemporary city and, on the other, a protocol of representation that interrogates the meaning of designing today. The description of the city becomes the premise for a different approach to the architectural question, in which the ethical and aesthetic category of the 'urban landscape' shifts the designer's attention from the architectural object to the representation of the landscape.

Keywords: Urban project, Ground, Fourth City, Hot digital, Urban Landscape.

Introduction

As is well known, cities, particularly large cities, are among the main contributors to the ongoing environmental crisis due to their global environmental impact. Indeed, in their current form of 'hyperville' [1], they are the evolutionary result of all phases of capitalism: from the first form of merchant capitalism in European cities at the end of the Middle Ages [Braudel 2014], to the globalized and digital capitalism of contemporary 'hyper cities'. Their form has evolved in relation to the expansion of the market from local to global; the city, from a contracted and enclosed form, has expanded and gradually colonized the territory. Today's major world cities have an extended and diffuse structure that embraces a geographical dimension; they are territorial conurbations.
These territory-cities or 'hypervilles' have changed their structure from centric and compact to multicentric, extended, and heterogeneous, similar to a fabric where territory and construction alternate as in a spongy surface; for this reason, they have been defined as 'urban galaxies' [2], where building matter and territorial matter alternate according to a complex geometric-topological logic.

Moreover, the urban has generally changed its status, moving from a condition defined around specific, historically determined centers to a condition of diffuse city where entire geographical parts are urbanized; for example, coastal areas or suburban residential zones, large building aggregations of productive districts, and peri-urban subdivisions of countryside areas [Indovina 2009].
The urban colonization of territory, which obviously has a strong environmental impact, can be read in two different and opposite ways: on one side as negative and to be fought, trying to go back by abandoning large cities in favor of a more measured, agricultural living dimension, where proximity and direct walkability prevail over extension. Where the contracted and dense urban form limits its territorial impact. Or conversely, the city, the large city, can be seen as an inevitable human condition of living, certainly to be reviewed and amended, but still a space where individual freedom and a democratic aggregative form of social exchange are guaranteed [3]. A place of politics and freedom but also centers of

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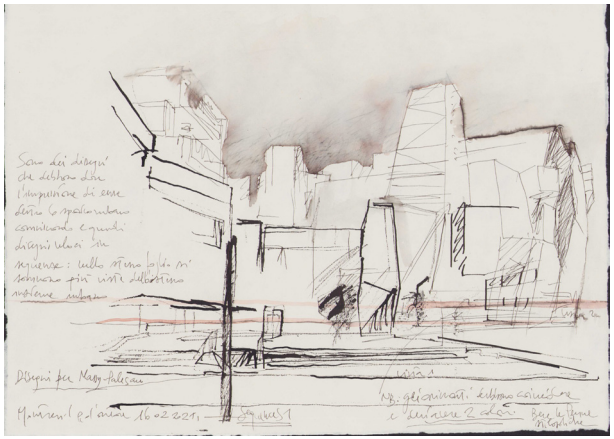






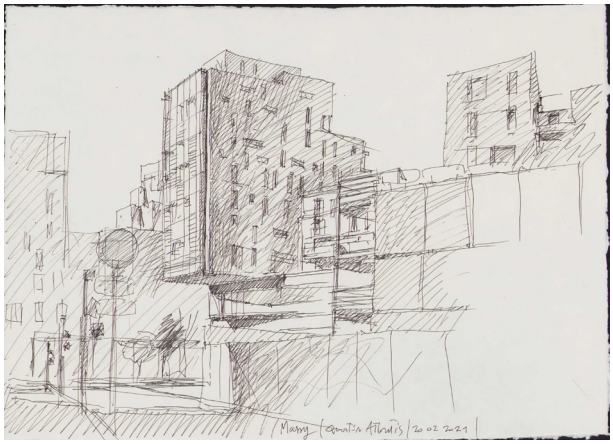


Fig. 1. Life drawings city of Massy. Ink and Lavis on handmade paper. A3 format (author's drawing).

Fig. 2. Life drawings city of Massy. Watercolor on handmade paper. A3 format (author's drawing).

Fig. 3. Life drawings city of Massy. Inks on handmade paper. A3 format (author's drawing).

Fig. 4. Life drawings city of Massy. Ink on handmade paper. A3 format (author's drawing).

culture and experimentation of alternative forms of living. The city of 'good', but also the city of 'evil' a condition in which the energies necessary for changes are often found [Purini 2022].
In this 'bipolar' reading of urban space, we must see the more general crisis of a cultural historical cycle: the crisis of modern thought [4]. In this sense, the critical reading of the 'modern' structures a new temporal regime [Hartog 2015], and it is not spontaneous in us post-modern humans, but is imposed on us by the consciousness of the Anthropocene era. That is, having necessarily found that the globalized, abstract, colonial, and extractive modern logic has imposed on the planet a new geological era, in which man with his mercantile activities is the main actor [5]. The climate deregulation and environmental crisis we are witnessing forces us to change our way of seeing the world. It imposes on us a different perspective based on the recognition of diversity and the equivalence of living systems and respect for ecosystems. That is, to overcome the oppositional dialectic between nature and culture [Descola 2015] that has structured Western thought.
In light of the cultural paradigm shift that the environmental crisis of the Anthropocene era imposes on us, looking at the city today is equivalent to seeing a field of ruins. We are in the same position as those who first discovered, in late medieval Rome, the ruins of the imperial city.
Like these first scholars of classical Roman architecture, today representing the contemporary city takes on the meaning of reinventing a new world from the ruins of the existing one.
The 'ruins of the modern' reinterpreted, reinvented, will lead us to discover a future city. Architecture, as the art of city construction, also profoundly in crisis, will be able, by reconnecting the discourse between building design, urban space construction, and landscape, to reinvent a way of making the city, but also at the same time its disciplinary being.
The ruin of a building is the point where its tectonics and its *utilitas* are zeroed out in function of *venustas*: this pure form enters into relation with the landscape and nature. The residual matter of the ruin becomes, symbolically and physically, dust, light, color, atmosphere.
To change the world, one must first come to represent an alternative vision of it. Art, including architecture, serves, to use a phrase by Paul Klee, rather than to render the visible to make reality visible [6]. These visions (as multiple as artistic expressions) open every possibility for further development.
In this sense, the architectural representation of the city can reveal in the current city the future city: that is, the post-Anthropocene city; that city that better corresponds to the new cultural paradigms we are building. An alternative culture to Modern culture, based on continuity between things, on metamorphosis, rather than on the juxtaposition of fragments or specialized knowledge. The aesthetic category that can take charge of this new vision is that of the 'urban landscape' which explains its oxymoron precisely in relation to the inclusive condition of the contemporary city where nature (landscape) and architecture (city) coexist in symbiotic form. It is precisely in the expanded and fractal form of the contemporary 'hyperville' that the two previously opposed terms of landscape and city, or nature and architecture, find a possible unity. The spongy fabric of this urban form implies the landscape and territory within the built environment and the built environment is immersed in the landscape, even, possibly, in its extreme form of Third Landscape [Clément 2016].

The Representation of the 'Fourth City'

The aim is to reveal, through representation, the future city emerging from contemporary *hyperville*. A city that elsewhere we have defined as the 'Fourth City' [Pierluisi 2024]. The 'Fourth City' mentioned in the title of this essay alludes to an attempt at classification, based on the identification of aggregative characteristics and urban figures that extend through the variable time of epochs [Guidoni 1978]. Excluding ancient cities and focusing on modern cities [7], the classification, made according to an ascending chronological criterion, identifies the 'First City' in that urban development that starts from the 13th century to culminate in the Renaissance city, where the urban system based on the perspective measurement of spaces is born and begins to be experimented with [Guidoni 1992; Mumford 1962; Benevolo 1993; Benevolo, Erbani 2011]. The 'Second City' is the Baroque one, where the play of perspective and gaze is sublimated in territorial anamorphosis and prepares the ground for the invention of the garden and landscape; the Baroque city as a figurative system extends its duration up to the pre-industrial



Fig. 5. Digital photos of the city of Massy (author's photograph).



Fig. 6. Digital photos of the city of Massy (author's photograph).

nineteenth-century city. The 'Third City' is the Modern city, covering a historical arc between the first industrialization and the global capitalism of recent decades; it is the city that coincides with abstract vision, typological specialization, technical progress, and zoning that involves the juxtaposition of objects of defined typology in an abstract space. The 'Third City', in its ultimate form, is the city that exists today: contemporary 'hyperville'.
And finally, the Fourth City: it is the contemporary city of the end of modernity, an urban form that must absorb the complexity of the living, with a history largely yet to be written; it is the city that sees the ecological transition of our world as central. It is contemporary 'hyperville' to which another idea of city must be superimposed, based on the new paradigms of environmental culture under construction. A city in mutation already partly present in contemporary urban space, but still to be defined in its image. It is therefore a theoretical object, a concept under construction; a city in the making, to be built through the design of its urban landscape, a design that superimposes on the existing city its radical possible alternative.
It should be noted that this critical reading of urban space relates two fundamental factors: the architectural object and the 'empty' space [8], that is, the building intention (project and construction) and the reading of the existing (place or territory). In other words: landscape and architecture.

The proposed urban categorization corresponds to four phases of this relationship between city and territory: the walled city, the perspective city still intra-muros, the city expanded over the territory based on centric perspective axes (it is the Baroque city that evolves into the industrial and Modern city) which becomes the infinite and abstract city [9], zoned and diffused of modernity, and finally a porous or equivalent city, in which there are only built fabrics interposed with voids as in an urban nebula.
The idea of a perspective system implies, contextually to the definition of centers and vanishing points, also the idea of limit, assumed both in its finite and infinite dimension: that is, the walls, the boundary and the form of the settlement, but also the idea of an infinite abstract space extended to all that is visible. Therefore, a relationship is established between internal space and external space to the city, at first clear: the city, the inside and nature: the outside. With the breaking of limits, this relationship becomes unbalanced, towards the total conquest of the external territory. A modern conquest that, due to its abstraction, excludes much of the colonized existing. Until the condition of the 'Fourth City' that assumes, like a spongy system, the voids within the built itself then, an exterior of another larger interior. That is, a gaseous fabric of punctiform and diffused places in which internality and externality are composed.
As Paul Virilio says [10], the 'true' outside is not habitable, we are confronted with the idea of an all "internal", as

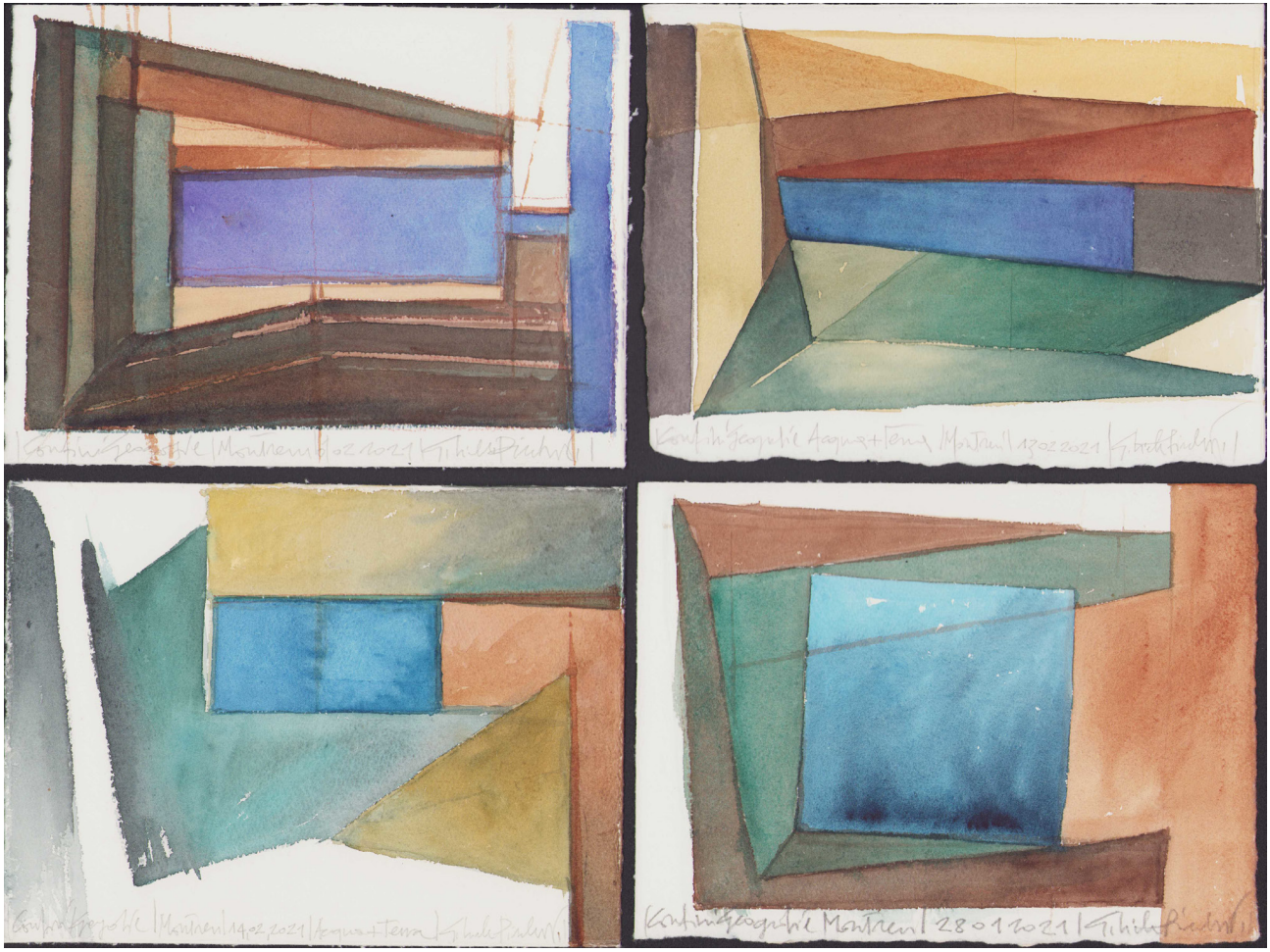


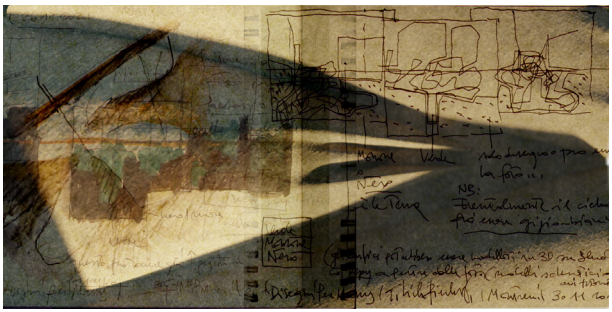
Fig. 7. Auxiliary images, studio productions. Four 'Protolandscapes'. Watercolors on handmade paper. Each A5 format (author's drawing).

today we act on atmospheric limits, with the aggression of the biosphere. Therefore the measure of an irreversible condition of internality and the idea of a limited vital extension both horizontally, on the earth's surface, and vertically, in the sense of the atmospheric 'film' of the habitable world [11]. The 'Fourth City' implies the understanding of the thicknesses of earth and sky as its characterizing data; the 'Fourth City' is all internal, a fractal organization where internality and externality fold into each other.
As can be deduced from the previous description, contemporary 'hyperville' and the 'Fourth City' overlap: that is, the concept of 'Fourth City' is nothing other than the existing metropolis looked at, described and rewritten, with other ethical and cultural values that emphasize the question of nature and landscape in urban reading. This change of emphasis in the reading of space allows the production of other "visions" of the same city, that is, to shift the reading from the existing to the project [12].
In essence, the represented landscape allows a new gaze, defined by a new culture, to transform itself into a new vision of the world, into the 'vision' of a new urban space [13]. Landscape representation has always had a design role in our history: the landscape image creates, makes act [14], a new vision of the world. In other words, the representation of landscape accounts for the relationship with the other than us, with nature, with the phenomenological complexity of the world. And it must account, today, for the new relationship with what is now the 'living' as substitutive of the idea of "nature" and therefore of a non-oppositional but metamorphic relationship with it [15].
The landscape image, like the image in general, must be interpreted as the result of work in the world [Rancière, Calderon 2019]. The image is the result of multiple experiences both visual and phenomenological in the broad sense, condensing, so to speak, in its fixity the set of questions that motivate it. Both projective techniques, cultural symbols, and sensory or phenomenological aspects.
And it is for this complex relationship with reality that it contains both the seen and the imagined, that is, it is at the same time reading and project of the world.

Research and Project: Artistic Practice, Reading and Invention of Space

The representation of the urban landscape of the 'Fourth City' is based on a working protocol that sees walking within the urban galaxy as a founding act. The





Figs. 8, 9. Auxiliary images, studio productions. Lands. 3D model, rendering and digital processing (author's processing).





Fig. 10. Landscape views of Massy, PCF Diptych. 3D model, rendering, digital painting, print on aluminum and acrylic paint. 80 × 80 cm (author's processing).

Fig. 11. Landscape views of Massy, 'Terre pour Massy, 2/3/4 Territoire'. 3D model, rendering, digital painting, print and colored pastels on paper. A3 format (author's processing).

crossing of the city operatively produces images, photos and drawings, which then in a second moment, in the studio, become landscape views. These two phases are configured as a description/project of an alternative city based on the new environmental sensitivity. Finally, these representations lead to actual imaginary alternative projects of city parts based on the new paradigms of environmental culture.
We have stated that the landscape image is the result of complex work in reality, we have also said that it derives from a double activity of reading and designing reality [16]. The further step to take is to connect this experience with research and in particular with research on the city. In this sense, it seems important to put forward the logic of an action protocol, which, in some way, verifies and allows the verification of reading and interpretation activity. That is, it allows the expansion of a subjective experience to a reference scientific community.
The experience of the world as subjective data –we could say phenomenological– is necessary for a synthetic vision of the landscape and to read a place beyond its analysis, and at the same time make the reading a project, that is, to put reading and invention in a single, circular process. It is indeed about giving space back to artistic practice rather than a purely scientific approach. Moreover, in the field of human sciences, particularly in anthropology, this descriptive practice of the study field has a broad scientific tradition. The further disciplinary shift proposed here is to compare this storytelling ability with the production of landscape images and therefore with the possibility of concretely bringing out new 'visibilities' of the existing in the fragrant presence of the image. It is a prerogative of knowledge that art has always experimented with, but which in this case becomes a protocol for reading the urban landscape [17] for project production.

Productive Algorithm

Based on the above, the productive algorithm proposed here [18] to invent the urban space of the 'Fourth City' works on two fundamental passages that coincide with two spaces of creation: Productions in situ, that is, in the space of the city, and productions in the studio.
In the space of the city, *in situ*, following preliminary analysis work, it is about perceiving the general sense of space,

that is, relating the crossing of urban space with rapid productive systems, such as sketching from life and digital photography. More than one image, what counts is the series of images produced, from which interpretative themes emerge. The urban reportage thus becomes a spatial reading that brings out specific characteristics of the place. It is a productive act structured on 'urban drift' and '*reportage*'; that is, on walking and the punctuation of walking through images. What documents an image taken from life, we know, is the relationship between observer and reality. That is, it is the transcription of the urban and relational 'work' between the author and the perceived urban reality.

The studio productions [19], or if we want *de visu*, are reprocessing of what we have seen and produced from life, made in another space, that of the studio precisely. This second phase of work is structured in at least three passages: the atlas of images, the production of landscape views, and the definition of specific urban project interventions.

The atlas of images assembles and orders, visualizing them, the images produced from life. To these must be added other auxiliary images, among which memory sketches of places and virtual three-dimensional models of these are important, which interpret them in their essential geometries and measurements.

The landscapes views are generated by the digital recomposition of the images produced in situ to which are added the renderings of virtual three-dimensional models or study sketches. The views are, in our specific practice, generally produced virtually, printed and reworked by hand: therefore they are a mix of digital and manual painting [20].

Finally, the projects are actual interventions on urban territory, site-specific interventions for significant places in urban space. These projects are conceived starting from the previous work phases, particularly from the views, and described in images with normal project representations, 3D modeling, rendering, planimetry and bird's eye and human height perspectives.

We will present, as a commentary on what has been said, the design outcome of a research that led to a series of projects made for the city of Massy [21]. A small urban center south of Paris, which is part of the *Grand Paris* galaxy. Massy is a typical example of the Third City of advanced capitalism, a fragment of a multiform urban system managed by the market and a residual urban



Fig. 12. Design figures for the Place Grand Ouest, Massy/Atlantis. Watercolor on paper. 38 × 26 cm (author's drawing).



Fig. 13. Design figures for the Place Grand Ouest, Massy/Atlantis. Watercolor on paper. 38 × 26 cm (author's drawing).

planning ambition. In particular, the projects I propose deal with the re-reading of the new Atlantis District, designed by the Portzanparc studio, an emblematic space of 'hyperville', directly linked to the intermodal exchange systems of *Grand Paris*.
The proposed urban projects are built around two intervention strategies: on one hand, the absolute maintenance, we could say the sacralization, of all urban spaces still not built: the urban *friches* become in the project a fundamental part of the new landscape of Massy.
Moreover, on the other hand, four urban interventions are proposed based substantially on the use of a single material, earth. They are objects between Land Art and architecture that are based on a fundamental idea: territorializing the city rather than urbanizing the territory [22]. Architecture is imagined here as landscape infrastructure. Actual burials of the mineral part of the city, which allow, by linking them together, the continuity of existing landscape spaces. These burials also redesign the relationship between existing public spaces and the territorial landscape system.
The images proposed exemplify that reading/project process, described above, articulated in successive phases: from direct experience of the city, up to the actual design figures, a process that represents an interpretation of research methods through the project.
The main gaze that generates the projects, in the first phase of urban reading, is a decentered gaze that shifts from architectural reality to territory. What counts, and gives order and hierarchy to the vision, is what is not built, what is still to be built or abandoned. Those fragments of nature that intersect with architecture. This polarization of the gaze on the earth generates the projects.

Conclusions or Return to Painting as Project Matter

Indeed, this text seeks to outline another way of doing projects, another way of understanding therefore the architect's profession, also caught in the cultural crisis of the modern. That is, a project modality based essentially on the description reinvention of the urban landscape. Preliminary phase also to the architectural project. In this perspective, project and description merge and develop in parallel. That is, the project is already in the reading phase of urban space, then develops by explicating its figures in the 'landscape views' and finally becomes specific project design of another city.



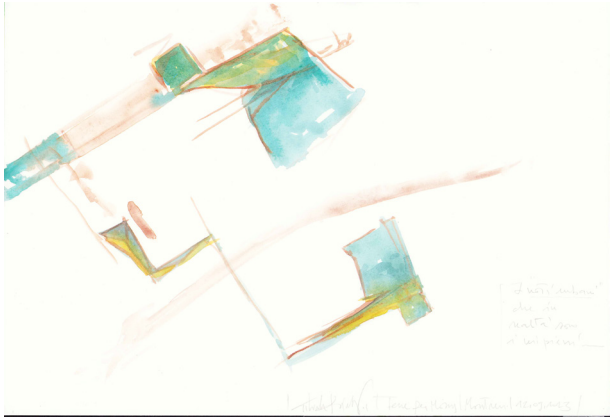


Fig. 14. Design for the Atlantis district of Massy, the four areas of intervention. Volumetric plan. Aerial photo and digital painting (author's elaboration).

Fig. 15. Design for the Atlantis district of Massy, the four areas of intervention. Watercolor on paper. A3 format (author's drawing).

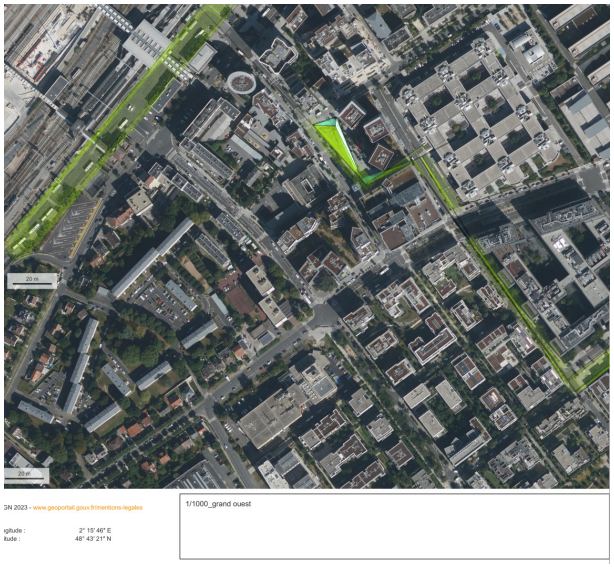
In some way, we return to a conception of urban space, starting from, and around, landscape painting (albeit in its contemporary form). Obviously, we must here understand by project the project of the image of a new city, it is practically, as in ruin and garden, only *venustas*. But as said, before actually transforming a territory, we must bring out new visibilities of it.

There are two fundamental factors that make the pictorial operation coherent and suitable for this theoretical setting: on one hand the idea of the figural [23] and on the other the technical question of painting as metamorphosis of its background.

The composition of landscape views historically coincides with the invention of landscapes, that is, with the superimposition and assembly of different views of parts of city or nature, which therefore in the completed picture generate a landscape other than the visible real. Examples of this are Canaletto's views of Venice or London which we know to be assemblies of multiple images of these cities, it has been demonstrated [Corboz 1985] that between his 'realistic' views and his 'Architectural Capriccios' the distance was minimal, indeed the 'Capriccio' explicates by extremizing it, the assembly process of the views. Another great painter-inventor in this sense was Hubert Robert [Corboz 1978], but one could also cite in this regard the Piranesian *Campo Marzio*, in which the Roman archaeological data, and the original landscape of the city of Rome, become a starting point for the invention of a new city. Or, more in relation to the representation of natural landscape, the pictorial work of Nicolas de Staël.

In particular, what painting does is bring out new 'figures of invention' from the visible data. And it does this through the technical process of image composition. This process internal to its production generates new forms. That is, it makes new figures appear.

Painting is important for our thesis in another sense too: precisely in terms of technical making, it shows us plastically how the world is only minimal transformation of an existing support. Painting reduced to its technical essence can, in fact, be interpreted as constant variation of its background [Nancy 2010]. Think in this sense of the extended experience of European informal art from Alberto Burri to Antoni Tàpies. But also in so-called academic painting, up to the threshold of twentieth-century avant-gardes, the final figures of the painting derive from the evolution in light and shadows of the neutral matter of the background.



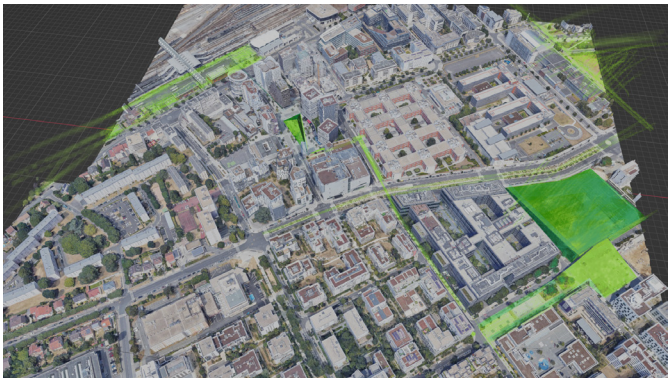
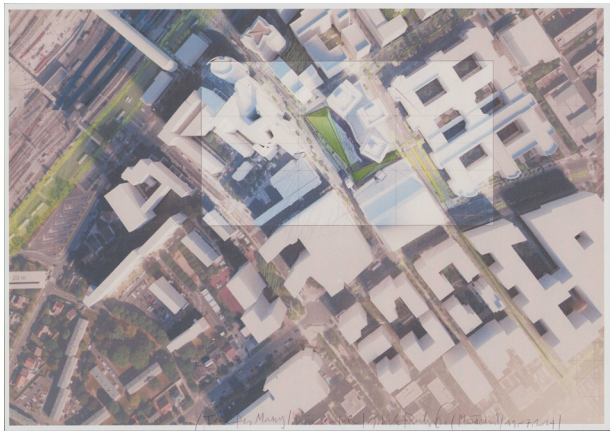


Fig. 16. Left. Design for the place Grand Ouest, of the Atlantis district of the city of Massy. Volumetric plan. Aerial photo and digital painting (author's elaboration).

Fig. 17. Right. Design for the place Grand Ouest, of the Atlantis district of the city of Massy. View from above. 3D model and digital painting (author's elaboration).



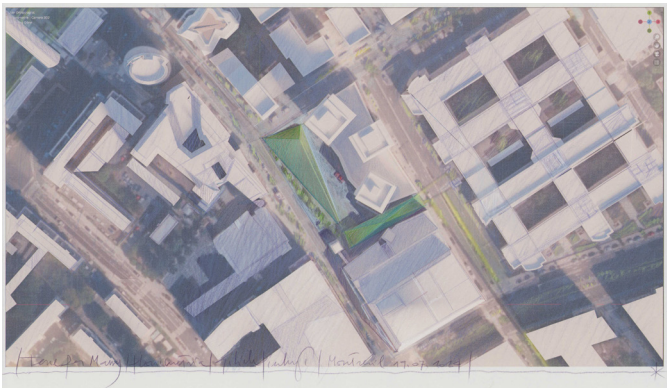


Fig. 18. Left. Design for the place Grand Ouest, of the Atlantis district of the city of Massy. Zenithal view. 3D model, rendering, print and colored pencils on paper. A3 format (author's elaboration).

Fig. 19. Right. Design for the place Grand Ouest, of the Atlantis district of the city of Massy. Plan. 3D model, rendering, print and colored pencils on paper. A3 format (author's elaboration).

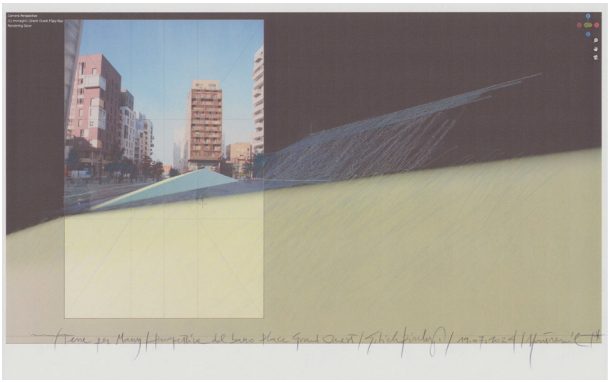


Fig. 20. Design for the place Grand Ouest, of the Atlantis district of the city of Massy. Perspective from below towards the North. Photograph. 3D model, rendering, print and colored pencils on paper. A3 format (author's elaboration).

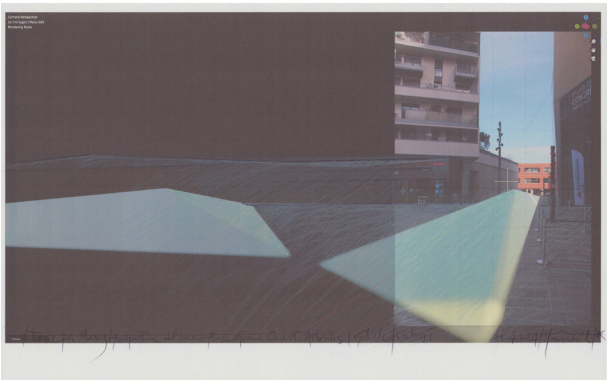


Fig. 21. Design for the place Grand Ouest, of the Atlantis district of the city of Massy. Perspective from below towards the East. Photograph. 3D model, rendering, print and colored pencils on paper. A3 format (author's elaboration).

To have images think of painters like Turner, Corot, Böcklin, Édouard Manet and Claude Monet.
The painting is the result of work transforming the matters of its background. This metamorphic capacity, which is at the basis of the image, seems to us symbolic of another way of acting on reality through the project. That is, to imagine the world as metamorphosis of the existing rather than as abstract and a-contextual *ex novo*.
In this sense, the landscape image, in its specific declination of urban landscape, seems to us the operational category through which to pass in order to build another way of doing projects.

Notes

[1] The definition is by André Corboz and connects the form of the current city to hypertext, as a contemporary way of knowledge structured on non-traditional and complex hierarchies between its parts [Corboz 2009].

[2] For the identification of the metropolis as galaxies [Anselmi 2005].

[3] For the two readings of the contemporary city and its environmental impact, reference is made as examples, for and against the big city [Sacchi 2019; Faburel 2020].

[4] Here we choose to cite among the many possible authors, the thought of Bruno Latour [2012; 2017; 2021; 2023], Philippe Descola [2015; 2022], Marc Augé [2017], Augustin Berque [2016], Baptiste Morizot [2023].

[5] See in this regard the IPCC (Intergovernmental Panel on Climate Change) reports on the evolution of our planet's climate situation, in particular the IPCC Sixth Assessment Report, 2023. <https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf>.

[6] "Art does not reproduce the visible; it makes visible" [Klee 1998, p. 34].

[7] Mubi Brighenti tells us about the historical dating of modernity: "Authors like Arendt and Foucault, in particular, lean toward a 'short' modernity, forged in the second half of the 18th century. This is because Arendt associates modernity with the French and American revolutionary processes, while Foucault associates it with a set of new power technologies and the episteme of human sciences. This differs from the 'standard' historical dating, which identifies the beginning of the modern era towards the end of the 15th century (Foucault indeed refers to the 16th and 17th centuries as the 'classical age'). Not all authors agree: as a historian of the state, for example, Schiera has proposed a pre-dating, according to which modernity emerged as early as the 11th century, with the era of communes and then lordships in Italy. For Schiera, indeed, the fundamental tension of modern government, that between disciplining and melancholy, would be identifiable from this historical moment" [Mubi Brighenti 2020, p. 230]. This latter dating seems particularly in agreement with the history of urban planning and urban landscape figures. It echoes, moreover, the reading of the development of capitalism made by Braudel [2014].

[8] Note that the idea of 'void' for the unbuilt is a modern reductive concept. In contemporary logic, the 'void' is, rather, a biological 'all full' of vital energies and living alternatives to the human. In our world, all internal, nothing is empty [Coccia 2022].

[9] It is interesting to note the analogy between the perspective grids of the Renaissance constructive 'rule' and the abstract, isotropic, and measurable plane of the zoned city of the Modern Movement [Corboz 1993]. The abstract grid is also an implicit or explicit but determining icon in the 'work plans' of CAD or modeling programs.

[10] "outside is always inside […] outside, it's the exodus, the exosphere of a space unfit for life" [Virilio 2005, p. 153].

[11] As we know, the troposphere (part of the atmosphere where we can live) has an average thickness of only about 15 km.

[12] See for this interpretation Caquelin [2013] and Rancière [2020].

[13] For an example of these metamorphoses between culture and image, think of perspective and humanist culture, the baroque garden and the idea of nation-state, romantic landscapes and the idea of the sublime, modern urban civilization and the 'Third landscape'.

[14] For the interpretation of image as act, reference is made to Belting [2004] and Bredekamp [2015].

[15] For the genesis and crisis of the idea of 'nature' Morizot [2023] with Descola and Pignocchi [2022].

[16] In this regard, Giancarlo De Carlo says: "unlike analysis, which by definition happens before, reading happens during: it is already design. One reads with a designing mind, that is, already having in mind the sense of transformation that the project aims to accomplish; otherwise, it remains mute and also deaf and anyway meaningless. The project follows the reading, but also precedes it. One continues to read the place, in fact, while designing the transformation of the place; and one proceeds by alternations along an itinerant path that by successive oscillations approaches the solution. This way of designing I call tentative, not only because it attempts solutions and pushes them into a sequence of hypotheses until it reaches them, but also because it induces temptation in the project site and its territorial surroundings" [D'Onofrio 1996, pp. 83-90].

[17] In essence, the proposed research work area is determined within different cultures: on one hand, the cultures relating to what the Anglo-Saxon world has defined as Visual Studies, and thus the relationship between image and the visibility/invisibility of the world as a political sociological act. On the other hand, reference is made to that turn in scientific thought called Spatial Turn, originating from geographic thought, in which taking into account space as a place of action and its specific spatial knowledge, allows an advancement of scientific research in general. Finally, it refers to that experiential artistic type of productive culture that is synthetically defined in Luigi Pareyson's aesthetics by the phrase: "art invents by doing its way of doing" [Pareyson 1996, p. 10].

[18] In reality, this work system has always been part of the writer's research, starting explicitly from doctoral research on the Roman landscape.

[19] Today the 'studio' should be understood as a structure spread across two distinct productive spaces: the virtual space of the computer, the virtual studio, and the space of the physical studio. In this second space, productions alternate between work on the table and view and work on the wall. In virtual space, work is carried out both on images and with 3D models of the place from which to produce other images.

[20] This is a mixed production technique that elsewhere we have defined as 'Warm Digital' [Pierluisi 2011].

[21] The work I present is the personal part of an international research: *La représentation de l'architecture et du paysage urbain en tant que méthode de lecture et de transcription conceptuelle des perceptions visuelles urbaines liées au mouvement, à des fins de requalification*. Research leaders: Maria Linda Falcidieno and Enrica Bistagnino, Department of Architecture and Design, Polytechnic School, University of Genoa. Gabriele Pierluisi and Annalisa Viati Navone, Research Laboratory National School of Architecture of Versailles. Genoa/Versailles 2021-2024.

[22] For this idea of territorialization of the city, reference is made to Alberto Magnaghi's studies on the urban Bio-region [Magniaghi 2014].

[23] For the term figural rather than figurative, reference is made to Deleuze's famous text on Francis Bacon [Deleuze 2002], but also to a book by Didi-Huberman [2009] on Fra Angelico.

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Architecture as Image of Landscape

Fabio Colonnese

Abstract

The concept of paesaggio/landscape was born and develops within representation, within the mimetic practices of artists, the same practices that closely concern architecture itself, not only in its ideational and constructive process but also in its semantic mission. Thus architecture participates in the construction of the landscape in many ways at the same time: it contributes through buildings that ignore it or with buildings that instead imitate the image, the form or the processes that form the landscape itself. But designing the landscape means operating both on the tangible level of the territory and on the intangible level of the ideas that orient its perception. In this sense, architecture also participates through buildings capable of influencing individuals and changing their way of observing the environmental components. A general reflection on representation introduces first the birth and then the contemporary evolution of the landscape in order to frame the theoretical contribution implicit in some modern and contemporary designers who have adopted the landscape as a medium to re-establish architecture itself – from Le Corbusier to Rem Koolhaas or Enric Miralles – or to provide it with at least an apparent compatibility in terms of environmental sustainability.

Keywords: Le Corbusier, Rem Koolhaas, representation, architecture as landscape, imitation.

The question of representation

Western art is based on the imitation of nature, which has been practiced for centuries through a myriad of tools and forms that mediate and articulate its meanings. At its core is *mìmesis*, the ability of artists to reproduce visible reality through representation. For Plato (*Republic*, X), representation is above all a deception, a fiction, a falsification. Both in its version of 'copy' (*eikastiké*), which is faithful in all aspects, like a sculpture, and in its version of 'semblance', which is the picture under a given perspective, like a painting, a representation is nothing but an illusory evocation of the phenomenal world which, in turn, is an imperfect imitation of the world of ideas, illustrated in the famous myth of the cave.
Aristotle expands the discussion by questioning the potential of poietic action, capable of recalling structuring forms in their generality rather than in their particularity. In this way, he finds the possibility of bringing the spectator closer to the world of ideas and producing, through identification with the actor, 'catharsis'. He therefore suggests the possibility of imitating not so much, or not only, the form or image of nature but its principles and processes. In this sense, representation is intended as a combination of a technical component (*tékhne*), which is necessary for the reproduction of sensitive aspects, and a moral component (*areté*), which is necessary to evoke the world of ideas [Ugo 2004, p. 10]. This idea shifts representation from a purely sensorial level ('it looks like') to a hybrid one, which involves the mind on an analogical level ('it works like'), too. On the one hand, resemblance requires the spectators to know the

https://doi.org/10.26375/disegno.15.2024.20

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Fig. 1. Santiago Calatrava, Concept for the Quadracci Pavillion at the Milwaukee Art Museum, about 2000. Courtesy of Santiago Calatrava Architects and Engineers.

object evoked by the representation in order to recognize its properties – think of the Plinian foundation myth of drawing, the human profile traced by Calliroe to depict the image of his departing beloved, which has meaning only for those who know him [Mindeguia 2024]; on the other hand, analogy requires their cerebral involvement, that is, a sensitive knowledge that no longer investigates the 'truth' but rather the 'verisimilitude'; not only the 'apparent form' but also the 'structure' and the more or less visible 'relations' between the parts. In this way, analogy becomes the very foundation of creativity as: "the human capacity to integrate abstract ideas in order to perfect the entities of the real world" [Braghieri 2013, p. 104].

Imitation, which bridges the distance from the original through the artist's capacity for abstraction and the observer's capacity for interpretation, also plays a role of mediation between the built environment and the theoretical, social and cultural contents that underlie its development. In this way, representation orients not only the knowledge of the phenomenal world but also its project, which can tend towards: "concordance or discordance between the interior idea of the world and the world as it is, as a measurable entity" [Purini 1992, p. 57].
Architecture is obviously a privileged field of study to observe the infinite nuances of this conflict between subjectivity and objectivity. Architects have produced and keep

on producing forms that refer to nature both directly, through observation and study [1] (fig.1), and indirectly, through artistic precedents, above all to access their semantic basin. In this sense, more or less consciously, they have developed a sample of 'symbols', 'icons' and 'indexes', to borrow Charles Sanders Peirce's semiotic triad [Sander Peirce 2003, p. 153], which refers to the natural world: the 'symbol' is the relationship that links a word to a precise meaning by habit, tradition or convention, like the text engraved on Roman monuments; the 'icon' recalls a meaning through visual similarity – the pyramids are mountains, the columns are trees, the windows are eyes and the dome is the sky [Ambrosi 1996, pp. 93-96]; the 'index' suggests a meaning in a metaphorical way, like the parts of the architectural order and their references to the human body or other natural elements [Hersey 2001]. These are therefore categories that communicate their meaning through a process that is preferentially connotative (the symbol), denotative (the icon) or a combination of the two (the index); at the same time, they are destined to be widely misunderstood and reinterpreted, since the nature of the architectural elements is polysemic.

The question of landscape

A particular case is that of architecture that not only questions the 'natural origins' of its elements and processes, like the famous hut-manifesto of Abbay Laugier [2], but that aspires to imitate more or less anthropized nature through its currently most successful cultural-perceptive incarnation: the *paesaggio* (landscape).
Much has been written about landscape in recent decades, both in the critical-literary field and in the Italian and European institutional field. This mass of studies has had the most obvious effect of broadening its semantic and operational field, almost as if landscape constitutes the key to accessing and making comprehensible the complexity of the contemporary world. The concept of landscape is today adopted in every kind of situation –'everything is landscape!' [3]– and includes every situation and adjective. It appears to be slowly pushed along a path of 'objectification' –the landscape as a physical object– that cancels out any qualitative value and ends up confusing it with different concepts and subjects, such as the territory and the environment, with which it obviously has

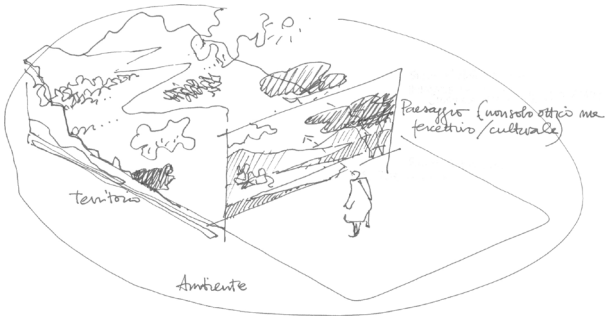

Fig. 2. Concept of relationships between territory, landscape and environment (drawing by the author)

fundamental relationships (fig.2) However, the landscape is above all the outcome of a perceptive act. It embodies the visual relationship (therefore cultural and functional) between the viewer and the territory that surrounds him, not so much for how it appears objectively but for how it is individually perceived; above all, the landscape acquires meaning for what women and men recognize in it or for what its 'signs' communicate to them.
On the other hand, the *paesaggio* –a term that in Italian evokes the villages inserted in the bucolic views of the Roman countryside painted from the late 16th century onwards– has a remote origin. The expression *facies locorum* (look of places) used by Pliny the Younger to contemplate the Lazio countryside through the windows of his villa in Laurentum is taken up by Petrarch and filtered through the experiences of Tuscan painting of the 14th century and the early explorations of linear perspective developed by Giotto [Tosco 2012, pp. 108-109]. The modern concept of landscape is therefore strongly fuelled by artistic practice.
In *Gremlins in the Studio* (1865-74 ca.; fig. 3), the American artist Martin Johnson Heade depicted the landscape of the prairie as a model placed on a wooden board on easels. In this way, he made both the pictorial origins of the concept and its inevitably fictitious vocation of representation and staging, explicit. Eventually, the modern landscape is grafted onto the concept of perspective, which finds one of its main applications in the theatre, if not even in *anamorphosis*, the 'constrained view'. As Franco Farinelli writes: "for a landscape to exist at least three […] things are necessary: […] a subject who looks and

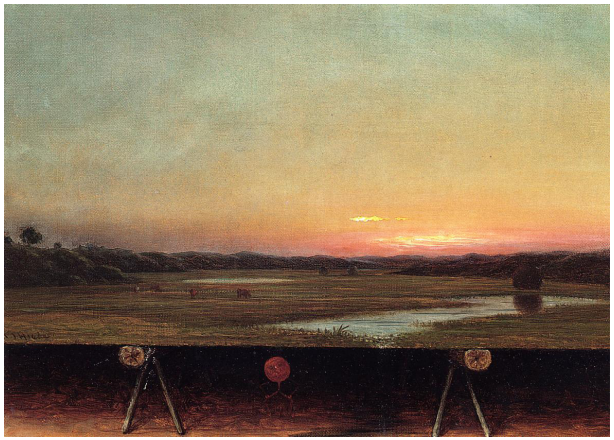

Fig. 3. Martin Johnson Heade, Gremlins in the studio, about 1865-74 [Stebbins 2000, p. 218].



Fig. 4. Rupestrian residences in the area of Goreme, Cappadocia, 2014 (drawing by the author).

something to look at but also the widest possible horizon, therefore a hill that functions as a vantage point" [Farinelli 2003, p. 41]. It is no coincidence that the bird's eye view spread in parallel with the creation of 16th-century gardens in suburban estates, whose geometric design of the ground, often a pure expression of power, required a high point of view to be exhibited [Colonnese, Schiavo 2023]. In this sense, the discipline of landscape is as close to environmental planning as it is to the theatre or media studied today by visual culture.

From this point of view, any presumed resistance to considering the city or other anthropic structures as extraneous to the concept of landscape falls away, as does the need to add adjectives to the landscape itself (natural landscape, urban landscape, etc.). At one extreme of this field of existence, one can consider the landscape of the Cappadocian rock-cut habitat, where human settlements are an integral part of the territory and it is difficult even to distinguish what is natural from what is no longer (fig. 4); at the other extreme, one can place, for example, some visions developed by the architect Luigi Pellegrin, where the modular settlement system seems to almost ignore the territory, indirectly demonstrating its universal capacity to colonize every place on the planet [Carpiceci, Colonnese 2021]. However, the possibility of recognizing the human presence, even in its signs on the territory or in the point of view of the image, is an inalienable condition. It is precisely by leveraging this predisposition that the creators of *Star Wars* (1977) managed to transfigure the Alpine, Saharan and Amazonian landscapes into alien worlds, thanks to the simple addition of an actor in a space suit in the frame [4].

In semiotic terms, the landscape therefore manifests itself peculiarly in the form of an 'index' and requires recognition and cultural interpretation by the viewer. Here the Aristotelian approach to the question emerges. Similarity is not only the result of vision, the ancestral biological device that guaranteed the survival of our ancestors, but also a value judgment based on ideas and, therefore, on the cultural system that a certain civilization has developed and adopted, which obviously has equally interesting political implications.

Beyond exceptional cases in which absolute power dedicated itself to shaping the territory in its own image, before the industrial era a landscape was built over the course of generations. Its forms were therefore the outcome of processes carried out by an entire community, which was obviously able to decipher them and, to some extent, recognized itself in them. However, this phenomenon, which today is associated with the concept of local identity, was absolutely implicit, conditioned by the recurrence of daily activities, which attributed to places above all a value functional to their own needs. Instead, it was travellers who highlighted it. Foreign artists and travellers,



Fig. 5. Formal categories defined by Venturi and Scott-Brown in Las Vegas and their relationship with the car speed (drawing by the author).

strangers to the territory, were often able to grasp, with an 'innocent' and 'aestheticizing' eye, the essential elements of a place [Urry 1990], even without understanding all the connections and processes. It is no coincidence that the role of landscape in the construction of cultural identity has been pursued from a nationalist perspective throughout the twentieth century, especially in relation to the construction of railway and motorway infrastructures and the development of mass tourism [Colonnese, Rosa 2021]. In this process, a central role has been played by representation or, better, by representations, which distil, elaborate and combine the elements of the territory until they are fixed in a shared 'image'. The different representations –they too can be oriented towards symbols (from description to cartography), icons (from landscape painting to many souvenirs) and indexes– operate a selection of the elements present, interpret them in a hierarchical and cultural key and combine them in a specific spatial configuration [Colonnese 2022]. This process is affected both by the medium that welcomes the representation itself –from the snowball to the selfie– and by the medium that orients the perception of the territory by organizing its components in time and space. In this sense, theoretical devices, such as Leon Battista Alberti's 'perspective window', and mechanical devices, such as means of transport from bicycle to train, contribute to structuring the same territory in different forms of landscape. In the work of Robert Venturi and Denise Scott-Brown on Las Vegas and its exuberant 'architectures' [Venturi, Scott-Brown, Izeneour 2018], the categorization of the sign (symbol), the 'duck' (icon) and the Decorated Shed (index) acquire meaning and effectiveness in relation to the speed of the observer and the field of vision offered by the car (fig. 5).

The souvenir that distils the 'identity' elements into an image or icon –the postcard of the Gulf of Naples with the maritime pine in the foreground and the cone of Vesuvius in the background, for example– testifies to the final

outcome of this process in a touristic key. At the same time, landscapes themselves can become 'rhetorical figures' through which to interpret apparently distant natural phenomena and artistic expressions in an analogical way. Think of the collections of 'figurative stones' or of Leonardo da Vinci, who invited us to scrutinize: "the stains of mold on a wall, the stains of walls, or the ash of a fire, or clouds or mud" to find "compositions of battles, of animals and men, as well as various compositions of countries and monstrous things" [Leonardo da Vinci 1947, II, part 67]; or think of the landscape interpretations of Giorgio Morandi's still lives, which seem to have had such an influence on Aldo Rossi's projects, probably thanks to the architect's familiarity with models and multi-scalar perception. It is no coincidence that his concept of 'analogous city' has many affinities with that of landscape.

Designing the landscape

In operational terms, the holistic nature of the landscape, where near and far, artificial and natural, tangible and atmospheric elements merge together, calls for a multi- and inter-disciplinary approach that can be directed in at least two different directions. Being the outcome of human perception, the landscape can be modified by operating both on the subject ('who is looking at') and on the object ('what is looked at'). To operate on the latter, it is possible to intervene on the territory with all the architect's tools, from infrastructures to the ephemeral, but always taking into consideration the 'human' point of view, with all the ambiguities of this adjective. To operate on the former, it is necessary to intervene on his or her 'gaze', that is, on the culture and expectations of those who look at and use the elements that make the landscape.
That attitude can already be found in the architecture of Le Corbusier, who also took the landscape into great consideration in his artistic project, often implicitly. It is no coincidence that *Le Corbusier: An Atlas of Modern Landscapes*, the major exhibition Jean-Louis Cohen and Barry Bergdoll organized in 2013 at the Museum of Modern Art in New York, certified the centrality of landscape in his research and used the rhetorical and analogical potential of landscape itself to present the materials into four sections – the landscape of *objets trouvès*, the domestic landscape, the architectural landscape of the modern city and that of the territory.

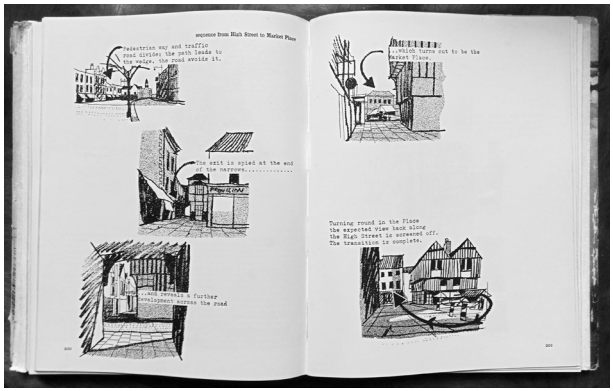

Fig. 6. Gordon Cullen, Sequence of sketches from High Street to Market Place, Evesham [Cullen 1962, pp. 200, 201].

The very idea of *promenade architecturale*, developed by Le Corbusier from his residential projects onwards, can be interpreted (also) in this way [Samuel 2010]. It is an evolution of certain kinetic devices of the picturesque garden, which has its origins in England in 18th-century and a lasting influence throughout the 20th century, eventually informing the concept of townscape developed by Nikolaus Pevsner [2010] and the group of *The Architectural Review* journal during the Great War years (fig. 6). In the picturesque garden, the 'pictures' set up from specific viewpoints to enhance the contrast between natural elements and eclectic, often ruined, follies were hidden until the last moment by zigzagging paths among the trees. Even in the famous houses designed by Le Corbusier, the trajectory of the path hides the destination until the end, to reveal the final 'picture', generally a view of the surrounding landscape, like an epiphany. In this sense, the sequence of spatial plastic events that precedes the final 'postcard' has the dual task of producing opacity and disorientation and of educating the visitor's gaze through original combinations of colours and plastic forms that will serve to interpret the landscape itself. Not to mention the fact that the final picture often also shows the path taken to reach the building, revealing from above (from a vantage point) a form that until that moment had remained hidden because it was an integral part of an individual experience lived in the limitations of one's senses.

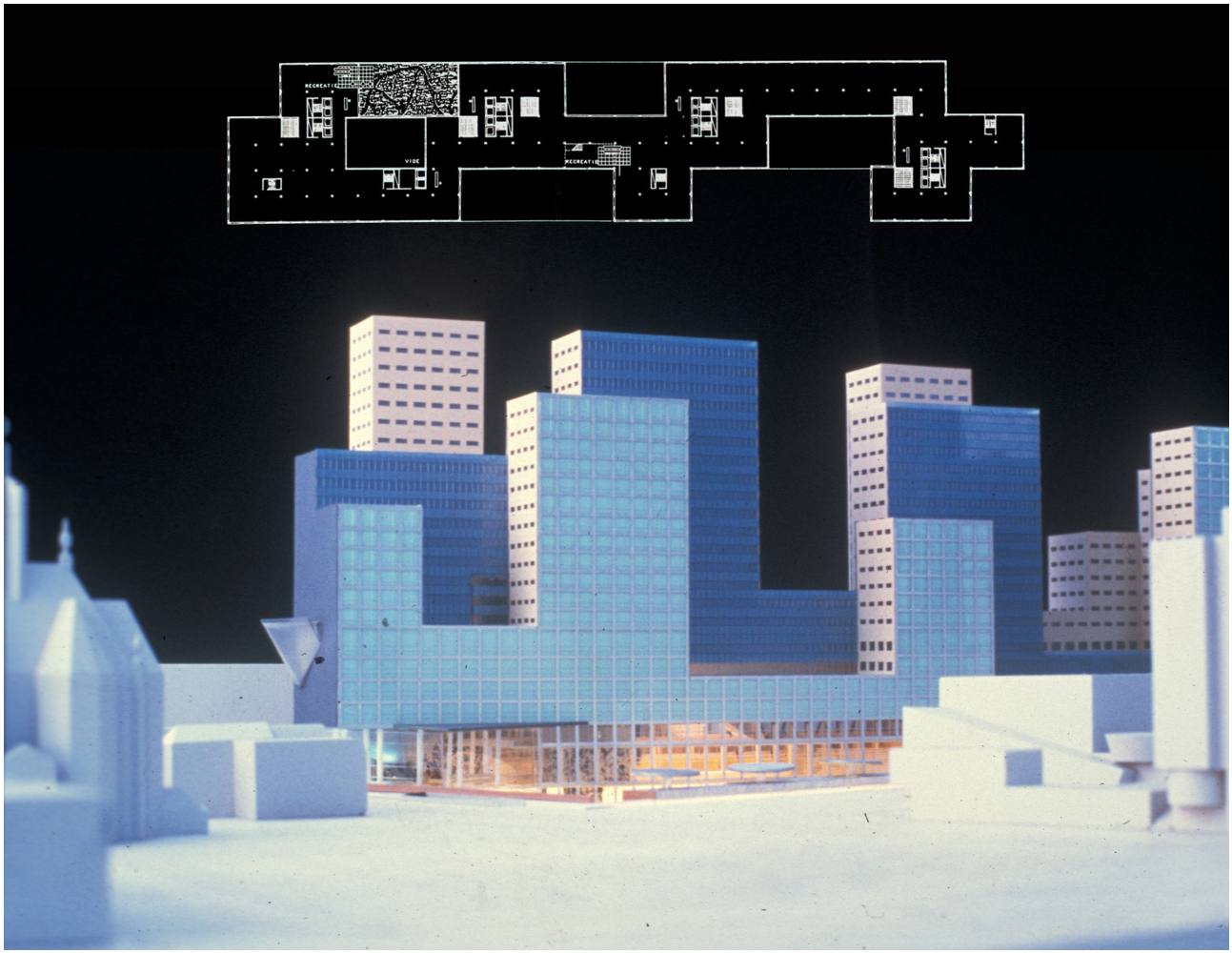

Fig. 7. Rem Koolhaas/OMA, The Hague Civic Hall, 1986. Maquette and third floor plan. Courtesy of OMA/AMO.

An essential element for experiencing this sort of 'gardens' in the form of a dwelling is the fluidity of the path. The continuity of the *promenade architecturale* is ensured by an original use of stairs and ramps which, combined with the *pilotis*, the *toit-jardin* and the *fenêtre en longueur*, contribute not only to staging the landscape but also to adopting its forms and materials. A similar attention to the 'mobile subject' is also found in the work of Rem Koolhaas, another architect strongly interested in the landscape [Colonnese 2021]. For Koolhaas, and for his already fundamentally post-modern gaze, the landscape becomes a 'figure' to transform the 'delirious' New York into design material and to break a whole series of modernist architectural categories. On the one hand, as in the Kunsthal in Rotterdam (1987-1992), he updates Le Corbusier's research, upsetting the measured and Cartesian nature of his buildings with inserts that refer to the natural world; on the other hand, it reduces the landscape to an icon and uses it as a design material and critical device. To quote Plato, in the former case, it imitates the 'form' of the landscape; in the latter, it imitates its 'appearance'.

The 1986 project for the City Hall of The Hague is emblematic of the latter approach (fig. 7). Koolhaas extracts the icon from the landscape of New York, from the skyline formed by the superposition of its towers seen from afar. The landscape is then interpreted through the spatial structure suggested by the experience of the train or the theatre, which reduces the territory to theatrical wings that run parallel. The City Hall is formed by the juxtaposition of three parallel buildings, each of which has an articulated profile, as if it were already the sum of different buildings. The study sketches preserved in the archive of the OMA studio, moved a few years ago to the Netherlands Institute of Architecture, reveal the designers' interest in the perceptive outcome of the volumes from points of view that rotate around them. Created by sketching views of the digital model, they seem to imitate the landscape-scale views of Manhattan along the trajectories offered by the bridges. While the external surfaces of the bodies present different façade solutions and colours depending on the orientation, to demonstrate the multiplicity inherent in the process, the internal spaces show a great spatial continuity, both at the level of the service plate on the ground floor and at the level of the different floors, where the offices are freely organized around the grid of pillars and elevators (fig. 8).

The Hague City Hall project is indebted to New York not only for its urban landscape but also for the 'schizophrenia' that

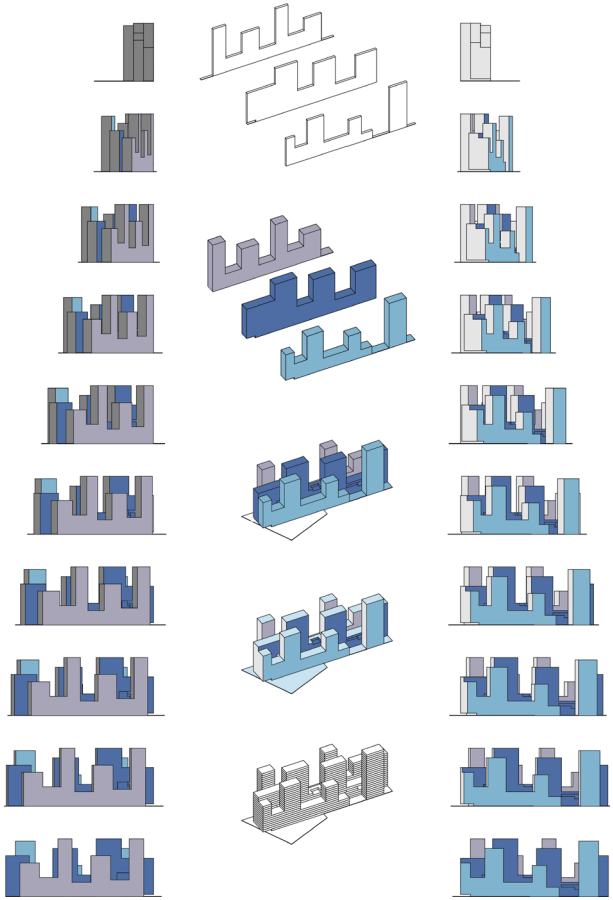

Fig. 8. Rem Koolhaas/OMA, The Hague Civic Hall, 1986. Genetic and perceptive analysis from viewpoints moving around the building by 10° steps (drawing by the author).

Koolhaas found in the internal organization of American skyscrapers. Analogously, the City Hall shows no evident relationship between the interior, extremely flexible, and the exterior, formally generic, as well as between the levels. The mechanical juxtaposition between the elements is only an expedient that serves to embody a certain idea of urban landscape and leaves no trace in the plan. Koolhaas seems more interested in enhancing the formal variety of spaces that are formed at each level through the interaction, more or less casual, of the three bodies.
Koolhaas had already experimented with something similar in 1982, in the project for the Parc de la Villette in Paris, which has attracted endless attention from critics. Here too, the horizontal surface of the park, as if it were a section of a skyscraper arranged on a horizontal plane, is divided into a sequence of long, narrow strips associated with a certain typology of vegetation and services. The overall image seems even more indebted to theatrical scenography, with the different strips forming permeable wings intended to look like an intricate forest. However, here too, Koolhaas appears particularly interested in the possibility of overcoming the schizophrenia of the reference model and observing the unpredictable interactions that should be generated over time between the strips.
On the contrary, Koolhaas imitates the 'form' of the landscape in a series of projects developed between the end of the 1980s and the beginning of the 1990s. In the project for the Hotel and Conference Centre in Agadir, Morocco (1990), the architecture is generated by reproducing a portion of dune territory and inverting it to form the ceiling of an enormous box. The resulting covered and open square, pierced by columns of various sizes, houses generic boxes and includes streets and excavated patios around which the rooms and services are organised. As stated by Koolhaas himself: "The landscape, which is generated with its concave and convex domes, with the forest of columns, its wells of light, is a modern interpretation of Islamic space" [Koolhaas 2005, p. X]; an interpretation that moves from the Arab urban landscape to return to the natural one, almost to close a circle.
While in Agadir the architecture is placed in a natural context, the subsequent University Libraries of Jussieu are designed for the centre of Paris (1992). In this case, Koolhaas ideally encloses a fragment of natural landscape of surfaces with variable slopes inside an immense and generic glass cube that refers to the volume of a traditional building (Fig. 9). The project appears to be a tribute to

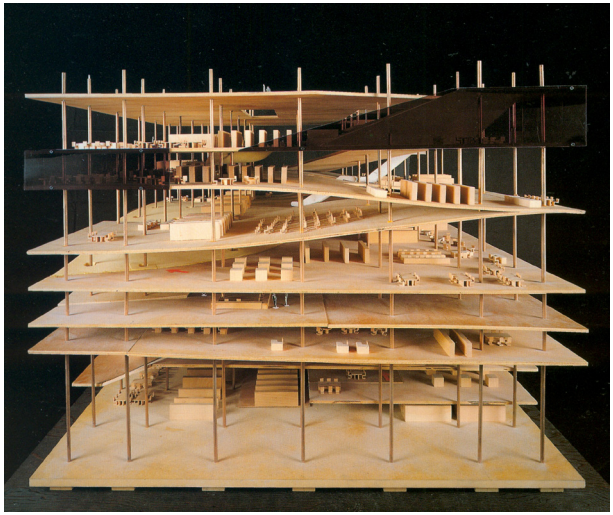

Fig. 9. Rem Koolhaas/OMA, Jussieu Libraries in Paris, 1992. 1:100 model view. Courtesy of OMA/AMO.

New York schizophrenia, to the surrealist taste for the *objet trouvé* and to the oblique utopias of Claude Parent [2004]. However, here too Koolhaas is not so much interested in the architectural form as in the way in which it is able to revolutionise construction, perceptive and housing habits. As in a process of colonisation of a natural place, it is the local slope of the non-horizontal surface of the libraries (about 35% of the total covered area) that determines the compatible functions. For example, the areas with slopes between 2 and 4% are suitable for hosting reading rooms, warehouses, bars and cafes, while those with a greater slope are equipped with horizontal floors or host amphitheatres and simple circulation spaces.
The spatial organization naturally reverberates on the movement and perception of people who must accord the apparent freedom of movement with the need to compensate for the slopes with their own body, accentuating their self-awareness. At the same time, the reference to the landscape also influences the design tools. In particular, the design communication combines traditional drawing with the contour lines used in cartography, urban iconography and the *à poche* technique developed by Giovan Battista Nolli in his 1748 Map of Rome with the sections of the geologists with non-homogeneous parameters.

Considerations

'The landscape', wrote Franco Zagari: "is a living entity that changes over time, a sum of infinite individual actions that interpret and modify a place in accordance with or in contrast to habits, rules, laws" [Zagari 2006, p.13]. Architecture is a fundamental ingredient of this entity that exists as long as there are people to look at it and to reflect themselves in it. With an extraordinary narrative stratagem, Petrarch, after climbing Ventoso Mount, had already expressed the need to leaf through Augustine's Confessions, almost to reflect the visual order captured in the territory in the spiritual order to which his being aspired [Tosco 2012, pp. 109-110]. This possibility of capturing the human dimension in an overall vision is one of the secrets of the success of the *paesaggio*, a term that, with its implicit reference to the village and the human community, underlines precisely this aspect much better than the Anglo-Saxon 'landscape'.
Architecture, a sophisticated sign of human presence in the territory, therefore contributes in a fundamental way to the construction of the *paesaggio*. It contributes directly, as a physical presence that indicates human activity and participates in the transformation of the territory, but also indirectly, as a spatial experience and observation point that orient and frame the gaze of the observer. This second aspect is particularly present in the architecture of Le Corbusier. The Swiss master grasps the possibility of educating the gaze and perhaps also the body of those who seek the landscape. Many of his buildings constructed around a *promenade architecturale* are the demonstration of how a thoughtful sequence of spatial experiences can play a central cultural function in this discourse.
At the same time, architecture can adopt the landscape as a 'design material'. It can be an attitude limited to a few and secondary elements or it can involve the very conception of a building. For example, Koolhaas has used landscape as a medium to undermine a whole series of conventions linked to the practice of making architecture, to dimensional issues, to the relationship between interior and exterior, to the centrality of function, movement and narration with respect to form, etc. While imitating its "appearance", as in The Hague, or its 'form', as in Agadir or Paris, Koolhaas appears attracted above all by the processes of mutual interaction that these compositions can generate, in an attempt to imitate the principles of nature in an Aristotelian way without them being subjected to a formal imperative. His *reductio ad iconam* of the urban landscape appears particularly original, obviously



Fig. 10. Enric Miralles and Benedetta Tagliabue, Extension of Utrecht Civic Hall, 1997-2000 (photo by the author).

favoured by his great sensitivity towards the media, especially the popular ones. An icon, or an explicit and evident representation, exalts the referent and, at the same time, the distance that separates it from it: a distance that can take on critical and ironic connotations as in the case of the City Hall of The Hague, which seems to underline the secret desire of the Dutch to compete with the American metropolises or simply to have a mountain, as in the case of the University Library of Utrecht designed by Mecanoo in the shape of a hill (on the other hand, it is certainly not a coincidence that Dutch architects, who tread on emerged lands that exist only by virtue of the prodigies of engineers, reveal a peculiar sensitivity to landscape themes).
Precisely in Utrecht, Enric Miralles, with the new City Hall (fig. 10), seems to suggest a third way towards the landscape, or an Aristotelian approach to architectural mimesis. It is not only the attention to the paths and the interweaving of geometric and structural patterns but rather the general formal indeterminacy and porosity of the layers that set up the expansion of the old building (and that constantly link the near and the far, the old and the new, etc.) that suggest an architecture built with the means of the landscape. It is an architecture that recalls the words of Massimo Birindelli [1983, pp. 121-162] regarding the 'irreducibility to object' of the works that he defines as 'non-bourgeois' because they do not enjoy well-defined limits or mobility, like a painting in its frame. These works, like rock-cut architecture, show a



Fig. 11. Ateliers Jean Nouvel, Shaaran Hotel in Arabia Saudita, 2018-. View from virtual model. Courtesy of Ateliers Jean Nouvel.



Fig. 12. David Chipperfield Architects, Assemble, and Jane Irwin, Dairy Road Residential neighbourhood in Canberra, 2022. View from virtual model. Courtesy of David Chipperfield Architects, Assemble, and Jane Irwin.

great complexity as they are inextricably intertwined with the physical context near and far as well as the intangible ones of memory and uses. The consequence is that they arouses annoyance and irritation because they elude pre-established categories and, above all, make it impossible to 'reduce' them to a 'bourgeois' dimension as well as to an icon. Ultimately, such a proto-industrial attitude is fully demonstrated by many examples of 19th-century architectural and urban representation, where the authors used to extrapolate the buildings from their context, 'perfect' them and even provide them with the missing facades to insert them into an ideal typological catalogue for the modern city [Colonnese 2023, pp. 122-130].
However, compared to these projects from just a few decades ago, the raise of the environmental paradigm on the agenda of the Western world (and not only) has drastically changed the scenario today.The critical success and the ability to penetrate the collective imagination of a building like Stefano Boeri's Bosco Verticale (vertical forest) (2007-2014) in Milan have indicated the possibility, or perhaps the necessity, of chasing the forms of the landscape through a direct use of natural materials. It is a form of camouflage that mitigates the visual impact of the architecture itself and also brings environmental benefits, albeit with very high management costs. Boeri himself was called to replicate the same approach in other places and on a much larger scale, effectively orienting the architectural research of many other colleagues towards similar horizons.
At the same time, the crisis linked to the energy transition has been suggesting the study and recovery of technical solutions for the control of temperature and humidity that belong to an ancient bioclimatic culture and that end up influencing the architectural form itself and the settlement criteria in places. For example, the Shaaran hotel (fig. 11) designed by Jean Nouvel's Atelier in Saudi Arabia (2018-) as an architecture carved into a mountain takes up technologies and camouflage canons explored by communities that in the past had the need to hide from the sun as well as potential attackers.In other cases, it is instead simple 'greenwashing', the exaltation of vegetation to respond to the need to give an environmentalist connotation to the project. This seems to be the case, for example, of the residential complex in Canberra designed in 2022 by David Chipperfield Architects, Assemble and Jane Irwin and presented by perspective views full of lush plants that eventually hide the architecture itself (fig. 12); however, such a ploy could find justification in the Australian context for which the project is conceived.
Years ago, in the practice of architecture design offices, the insertion of vegetation was often the last ideal layer to be placed on the project's illustrations, often to manipulate the apparent size of buildings or to hide the less resolved parts. Today this attitude seems to have become exasperated, migrating from the field of representation to that of the actual building. A result is that architecture is starting to be conceived primarily as a three-dimensional frame to support and encourage the growth of natural elements. In this sense, a populist 'exhibition' of nature seems to be gaining ground. Despite its environmental benefits, it in fact legitimises a certain widespread disinterest in the traditional aesthetic questions within architecture and risks devaluing centuries of subtle reflections and refined artifices designed to stage the complex relationship between architecture and landscape.

Notes

[1] Biomorphic architecture, which imitates natural forms, has taken on anthropomorphic zoomorphic connotations since the Renaissance but more recently has turned towards geo-morphism. In this context, it has also addressed processes, developing a series of approaches characterized by various key words (Green, Eco, Passive, Sustainable, etc. up to the holistic concept of Biophilic Design) that focus on the optimization of energy resources and natural materials in the architectural production process. For a brief review, see Ahmed and Rasul 2023.

[2] In the years of Giovan Battista Piranesi and Johann Joachim Winkelman, both Marc-Antoine Laugier (1713-1769) in 1753 and Antoine Chrysostome Quatremère de Quincy (1755-1849) in 1788 emphasize the central role of analogy and reorient imitation from the forms of nature to the rules of its formation, while Wolfgang Goethe reflects on its dynamic and evolutionary value through the concept of "morphology".

[3] Not to be confused with the tout est paysage of the Belgian architect Lucien Kroll (1927-2022) who embodies his original holistic and participatory approach to the project.

[4] I thank Lorenzo Moneta for this 'image'.

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Distance in Art or the Art of Distance: the Illusory Search for Depth and its Treatment in the First Landscape Representations

Fernando Linares, Isaac Mendoza

Abstract

The act of looking at a landscape carries with it an intention. The landscape-image has been a changing aesthetic invention. Between the 14th and 16th centuries, art moved from narrative symbolism to naturalistic iconicity, accepting landscape as a pictorial genre. With the Renaissance, an authentic landscape view began to develop through deductive reasoning and the visual experience of the image, thus surpassing the basic and flat medieval iconography. The Renaissance perspective, as a 'symbolic form', helped to value space as something different from the flat surface on which it is painted, although it was not the only system used to represent the three-dimensional spatiality of the scene, being one more among other possibilities. more perceptive and intuitive. This writing aims to reflect on a diachronic vision on the evolution and development of the illusory concept of distance or remoteness in the figurative representation of the landscape during its initial formulas, understood as a realistic search for the depth generated from the first terms to the backgrounds. Of the pictorial scene –whether real or imagined–. In this trajectory, the importance of the drawing treaties and manuals spread throughout Europe during the 16th and 17th centuries as recipe books or basic principles of said learning stands out. Due to its influence, it is worth highlighting Leonardo's Trattato della Pintura as the first attempt to codify all these resources and devices 'of illusion', and whose validity has still remained valid in the representation of landscape to this day.

Keywords: landscape view, representation of the territory, depth, distance, Art history

Background: state of the art

The pictorial means of representation that express the volume of bodies and spatial depth were formed little by little. It is evident that, if in a representation two bodies have the same real size, if one of them appears smaller it is because it is further away from the viewer. Gibson said that our mind, when scrutinizing reality in search of information, operates with two basic questions: "what is it? And where is it?" [Gibson 1974, p. 25]. For Gombrich, "the innocent eye, almost by definition, cannot perceive size" [Gombrich 1997, p. 254], it needs to conjecture it, that is, form a judgment about its shape and position based on indications or observations. Linear perspective –Albertian– tries to project a unitary space through a figurative plane; it simply responds to the description of infinite mathematical space, but it is devoid of the psychophysiological conception, of the perception [1] of spatiality that has become somatic depth: "when perspective stopped being a technical-mathematical problem, it became an artistic problem." [Panofsky 2003, p. 49]; therefore, the "scientific perspective is not the most adequate basis for naturalism" [Clark 1971, p. 39].

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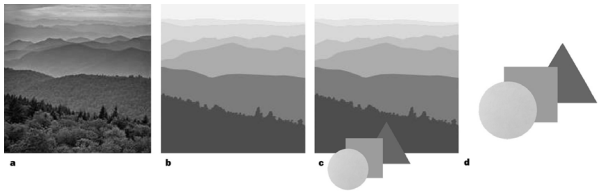

Fig. 1. A. Landscape photographic background with overlapping topographic planes (atmospheric perspective). B. Shots with different lighting and depths in the distance (lightning towards the background). C. Incorporation of figures in the foreground. D. Geometric figures overlapping in proximity (darkening towards the background). Graphic elaboration by the authors.

According to Goethe, the love of landscape passed through the pleasure of "very deep seeing" [1989, p. 57]. Ortega y Gasset stated that, throughout artistic history, "the painter's point of view changed from the near vision to the distant vision, and at the same time, painting, which began with Giotto because it was a bulk painting, became hole painting" [2010, p. 278]. This means that the artist's attention has followed a shift: first he focused on the foreground, on the figures, and then he moved to the background, to the hole, to the emptiness of the scene.
It is then that this fictitious spatial effect on distance contains the same information that is found in the environmental optical sample of the –supposedly– real environment of that landscape. Thus, the artist will look for an equivalent artifice on paper or canvas, which offers an analogy of that subjective sensation of closeness or distance perceived *in situ* on the scene, from the first shots to the last shots and close to the horizon. This substitute will be caused by an accumulation of different sensory impressions related to the different gradations of form, light and color that the eye observes; in the same way that would happen with the control of the relief or foreshortening of bodies [2].
It is obvious, as a first indicator of depth, that the closest objects overlap or project onto the furthest ones. Ching defines this phenomenon of overlaps as "continuity of contours" [Ching 1982, p. 50]; and Gibson, of "eclipsing of forms" [Gibson 1974, p. 60]. Arnheim also analyzes the superposition of figures, calling it "overlap" [Arnheim 1979, p. 141] from whose formal interferences he says he obtains visual delight (fig. 1.d). Every formal representation, a simple drawing that produces a



Fig. 2. Left: Seascape on the theme of The Odyssey: Ulysses' landing at Circe, 1st century B.C.; mural. Right: Country views, Villa Albani, Rome, 1st century A.D.; mural.

volumetric suggestion from a flat surface, "strongly supports its three-dimensionality in evident leaps of clarity. Furthermore, these jumps contribute to generating very pronounced depth variations on a reduced representative surface" [Mariani 2021, p. 67].
The different light scales of the landscape make the distances also appear different to our eyes (fig. 1.a). In the close-ups –proximity–, tradition was established on the invariant of the clarification of what is closest (fig. 1.c). Thus, for example, the sensation of curvature is more evident when the transition from light to dark occurs more quickly, accentuating the relief effect. The gradient of tones –in reality, the precise visualization of the dark that transcends the light– has been commonly used in art to generate the illusion of depth; even in the representations of architecture, such as elevations and sections –gradually darkening the posterior surfaces–. However, in the distance –from the landscape–, that sensation changes and the clearer gradients will be those that indicate the deepest, the last planes already close to the horizon (fig. 1.b).

The first attempts at distance coding

The art of creating illusion from shading and volumetry is known as "*skiagraphia*" [Gentil 2011, p. 59], a technique already used by Apollodorus of Athens (ca. 180 B.C.-120 B.C.), highly valued and praised in Ancient Greece. The visual effects of depth were already known in the 1st century B.C. in Rome. Their painters were already capable of achieving three-dimensional realism in the figurative scenes on the walls of their villas by varying the same color with different intensities. Thus, the seascapes on themes from *The Odyssey* found in a domus

on Via Graciosa (1st century B.C.), Rome, already reflect a dilettante control of distance, highlighting the one dedicated to the arrival of Ulysses to Circe. Like the murals of the Albani villa (1st century AD), which show a countryside landscape with convincing planes of different depths (fig. 2).
In the paintings of the Middle Ages, the representation of landscape backgrounds was considered frivolous, a simple decorative delight that could distract from the religious understanding of the work. Medieval art was like writing or a language in which the images were the words –*ekphrasis*–. In the 12th century, Saint Francis of Assisi rejoiced in visual sensations for revealing divine creation. The images began to be more figurative than symbolic, paying greater attention to the chromaticism and volumetry of the bodies.
The figures in the foreground and the background of the landscape constituted the same practically neutral plane –coplanar vision– and without relief –generally the image stood out on a monochrome background–, their size considering the function of the symbolic hierarchy that it had in the image. With the naturalistic vision, the landscape signs would become detached from the scene, taking distance and moving away. Artists began to paint what they saw, and what they saw had depth.
Timidly, breaking the medieval flatness, Giotto (1267-1337) in *The Donation of the Cloak* (ca. 1296) abandoned the Byzantine models, replacing the golden backgrounds of sacred art with a natural setting, constituting one of the first attempts to represent a landscape with a certain sensation of reality –its mountains appear relief and verisimilitude–. Thus, years later, Ambrogio Lorenzetti (ca. 1290-1348) in *Effects of Good Government on the Countryside* (ca. 1338) created the first modern landscape in the History of Art with the evident intention of generating true depth, elevating the gaze and reducing the figures in the distance. It was also he who perfected the method of Duccio's ceiling coffers (ca. 1255–1318) in *The Holy Supper* and extrapolated it to the floor in *The Annunciation* (1344) as a pattern of tiles, making it possible to better appreciate from now on the distances of the certain bodies within the scene and generating distance towards the back wall. This successful horizontal checkerboard, understood as a coordinate system, would be repeated in an almost sickening manner by the artists of the *Quattrocento* (fig. 3).



Fig. 3. Top left: Giotto, The Donation of the Cloak (ca. 1296); fresco (270 × 230 cm); Basilica of Saint Francis in Assisi, Assisi. Top right: Ambrosio Lorenzetti, The Annunciation (1344); tempera on panel (127 × 120 cm), National Art Gallery of Siena, Siena. Bottom: Ambrosio Lorenzetti, Effects of good government on the countryside (ca. 1338); cool; Palazzo Publico, Siena.

By improving the naturalistic vision, the narrative of the painting also benefited. The technique of shading –intonation– began to be used in the Early Middle Ages to recede surfaces close to their contours, highlighting the points of greatest luminosity and generating the perception of relief. It is normal that painters used this resource with a certain freedom and little rigor. In *The Annunciation* (ca. 1390) by Maestro della Madonna Straus this license is evident. The light in the painting comes from two sources: the angel is illuminated from the left and the Virgin from the right, but the relief of the scene is produced from this incongruous combination of light. And in *Mary in the Enclosed Garden* (ca. 1410) by the Master of Paradise in Frankfurt, the composition extends the laterality of the wall diagonally to achieve greater spatiality of the garden. All of these works are timid attempts to test new visual experiences about depth (fig. 4).



Fig. 4. Top left: Maestro della Madonna Straus, The Annunciation (ca. 1390); tempera on board (200 × 190 cm); inv. No. 3148, Accademia Gallery, Florence. Top right: Master of Paradise from Frankfurt, The Garden of Paradise (or Mary in the Enclosed Garden) (ca. 1410); mixed technique on board (33.4 × 26.3 cm); Städel Museum, Frankfurt am Main. Bottom left: Master of Boucicaut, Flight into Egypt from Book of Hours (ca. 1408); miniature (fol. 90); Jacquemart-André Museum, Paris. Bottom right: Paolo Uccello, The Annunciation (ca. 1420); gold and tempera on panel (65 × 48 cm); Ashmolean Museum, Oxford.

The revelation of depth in the Renaissance

In our vision of proximity, the eye and brain associate to establish that the darkest is far away and the lightest is close. The difficulty that the first Renaissance artists encountered was mainly due "to that difference between what they really saw from a certain point, according to the laws of optics, and what they perceived subjectively" [Montes 2008, p. 54]. They "used a background of medium-low lightness and then graduated the outline of the shape on top of it with a pencil or black chalk –usually darker than the background–. Later they refined the illuminated parts with white chalk" [Mariani 2021, p. 66].
Distance began to become evident in the 15th century through the mastery of linear perspective, multiplying the surfaces or planes of representation –near, middle, far–. With it, the elements of the landscape move away. They are no longer "fixed satellites" [Roger 2007, p. 77] arranged around the central icons, forming the second narrative level of the scene. But perspective was never an end in itself, but only a means; As Wölfflin said: "what matters is not the measurement of depth in the represented space, but how that depth has been made effective" [Wölfflin 2002, p.92]. Piero della Francesca (ca. 1412-1492) controlled the perspective method with a superb effect of distance and delicacy of color. Thus, "the space of the landscape scenes begins to take on depth with the help, on the one hand, of the multiplication of the landscape planes and, on the other, with the reduction of the details that are distant" [Roger 2007, p. 77].
According to Panofsky, it was the Master of Boucicaut (active ca. 1390-1430) who discovered atmospheric perspective [3] and the perceptual effects of depth in the landscape, observing that "objects lost part of their substance and color, their contours fading into the distance" [Panofsky 1998, p. 63] by interaction of light and the vividness of color. In the *Flight into Egypt* from *The Book of Hours* (ca. 1408) the sky lightens on the horizon, the meadow becomes vibrant and fades into a light brown against the background; With the indefinition of distant objects, which seem wrapped in fog, a sort of Van Eyckian aerial perspective was obtained. The space was defined on numerous levels, among which there were figures or other elements, increasing the spatiality of the scene and anticipating the later developments of Flemish painting. For Vasari, however, in reference to spatial three-dimensionality, it was Paolo Uccello (1397-1475) who was the first who, in the fresco of *The Annunciation* (ca. 1420), represented "with grace and proportion the wide space and distance" [Vasari 2002, p. 221] (fig. 4).
Regarding the interior spaces, in the fresco of the *Trinity* (ca. 1425), Masaccio (1401-1428) was a pioneer in representing the depth of a unitary space in perspective –of Brunelleschian inspiration– with great verisimilitude. Shortly after, Robert Campin (ca. 1378-1444) achieved a perfect spatial configuration in the *Merode triptych* (ca. 1427), relying on an intuitive frontal perspective and degrading



Fig. 5. Top left: Masaccio, Trinidad (ca. 1425); fresco (667 × 317 cm); Basilica of Santa Maria Novella, Florence. Top right: Jan van Eyck, Virgin of Chancellor Rolin (1435); oil on panel (66 × 62 cm); Louvre Museum, Paris. Bottom: Robert Campin, Merode Triptych (ca. 1427); oil on panel (127 × 64.5 cm); Metropolitan Museum of Art, New York.

the tone of the vertical walls towards the background. The first two panels –especially the central one– are uniformly bathed in a diffuse light that hides its source and models the relief of the volumes; while the third –right– finds the fullness of distance in a balance of chiaroscuro and penumbra, illuminated externally –perfecting the effect in his *Santa Barbara*, 1438–. Of its backgrounds, Clark would write: "they are as clear and crystalline as when we look through a telescope in the opposite direction" [Clark 1971, p. 36].

The artifice was surpassed by Jan van Eyck (ca. 1390-1441) in the *Virgin of Chancellor Rolin* (1435), opening the view of the interior from the bottom and introducing the landscape from the front to expand the depth. However, Dirk Bouts (ca. 1415-1475) and Rogier van der Weyden (1399-1464) –with compositionally similar models: *The Pietà and Saint Luke drawing the Virgin*– clearly used the principle of arrangement by parallel planes, both in the figures and in the scene, obtaining less truthful results (fig. 5).

Artists were mostly content to represent what was far away smaller than what was nearby, painting it in the same way and with the same thoroughness. Everything in these paintings is close-up, that is, everything is painted from close-up: "It seems as if the painter had gone to the distant place where it is and had painted it, close up, far away" [Ortega 2010, p. 279]. Sassetta (ca. 1400-1450) in *The Meeting of Saint Anthony and Saint Paul* (ca. 1440) simply resorted to reducing the size and texture of the elements in the composition to achieve the effect of distance on a diffusely illuminated scene –without



Fig. 6. Top left: Stefano di Giovanni, known as 'Sassetta', The Meeting of Saint Anthony and Saint Paul (ca. 1440); oil on panel (47.5 × 37.5 cm); Samuel H. Kress Collection, National Gallery of Art, Washington. Top center: Giovanni di Paolo, Madonna of Humility (ca. 1442); tempera on board (61.9 × 48.9 cm); Museum of Fine Arts, Boston. Top right: Masaccio, Saint Peter heals the sick with his shadow (ca. 1425); fresh (230 × 162 cm); Brancacci Chapel, Church of Santa Maria del Carmine, Florence. Bottom: Fra Angelico, Annunciation (ca. 1450); fresh (312.5 × 230 cm); Cloister of Saint Mark, Florence.



Fig. 7. Left: Giovanni Bellini, The Garden Prayer (1459); tempera on panel (127 × 81 cm); National Gallery, London. Center: Andrea Mantenante, Transit of the Virgin (1461); mixed technique on board (54.5 × 42 cm); Prado Museum, Madrid. Right: Geertgen Tot Sint Jans, Saint John the Baptist in the Desert (ca. 1485); oil on panel (42 × 28 cm); Gemäldegalerie, Berlin.

shadows–, raising the horizon to increase the visual field: "as a figure moves away from the foreground, the observer has to raise his eyes, as well as lower them as he approaches him" [Cabezas 2001, p. 320].
Thus, the schematic paintings of Giovanni di Paolo (1398-1482) would already be perfect synthesis of the keys to depth; his *Madonna of Humility* (1442) shows a landscape with crops delimited by a grid of perpendiculars –an axonometric pseudo-perspective template to generate the territory– that move away towards the interior. "The views of the gentle hills of the Italian panels and the backgrounds of the Flemish *madonnas* sought to make the viewer's eye travel from the interior to the exterior to create a contrast between closed space and atmospheric infinity" [Mariani 2021, p. 142].
Throughout the 15th century, cast shadows were of great subtlety, and generations of artists applied them competently to simulate relief; such is the case again of Masaccio, who resorted to his own shadows cast faintly on the ground [18] in the fresco of the Brancacci chapel, *Saint Peter cures the sick with his shadow* (ca. 1425) to facilitate reading space. Also appreciated is the effect of depth caused by the radiant light on the flight of shadows in the capitals of the *Annunciation* (ca. 1450) by Blessed Angelico. Later, the cast shadows became less important; they were even discouraged [4] (fig. 6).
The artists, little by little, were solving the problem of depth, but they gave little interest to the values of setting and light. To achieve the spatial illusion it was necessary, parallel to the development of perspective, to become aware of the environmental qualities of light, color and shadows. Thus, Giovanni Bellini (ca. 1427-1516) in *The Prayer in the Garden* (1459) extended the color by glazing in successive layers to achieve a better effect of distance on a fully illuminated landscape, softening the contours of the mountains, calming the contrasts and simulating "the loss of visual acuity with distance" [Maderuelo 2005, p. 232]; achieving a more truthful perception of ambient light and depth. Perugino also used to progressively reduce contrasts to accentuate the distance; in addition to being a great builder of vast spaces.
The interest in how things are encouraged us to perfect the verism of the perception of the distance from the foreground to the background. In *De pictura*, written around 1435, Leon Battista Alberti (1404-1472) addressed various detailed instructions on how to achieve effects of distance using linear and aerial perspective techniques, recommending that if what was seen had confusing contours, the painting should imitate them as well: "If distant things are painted very finished, they will seem to be close" [Alberti 1827, V.,p.150]. In this way, the painters began to get rid of the recipes when executing the 'far' and, moving away from the *clichés*, they were achieving a greater sensation of depth, dominating the light, the nuances of color and interlocking the nearby elements with the distant ones. Thus, keep in his *Transit of the Virgin* (1461) imposed a preconceived idea on the base plan: a perspective grid –in the manner of Lorenzetti– combined with a non-coinciding double perspective: –interior-chamber and exterior-window– to generate greater distance, losing sight of the landscape. In addition, Geertgen Tot Sint Jans (ca. 1460-1490) in his *Saint John the Baptist in the Desert* (ca. 1485) finally managed to extend the depth of the landscape to almost the entire painting; however, the main character seems like an addition to the scene (fig. 7). Leonardo da Vinci (1452-1519), as a great observer of visual appearances, studied the projection of light on objects, their own and cast shadows, and wrote it down throughout his life in his miscellaneous *Trattato della Pintura* [5], as his first attempt at observation. rational nature. He had to combat the erroneous belief that the shapes of the landscape are shadowed in direct proportion to their distance from the viewer, an idea already collected in the 14th century in Cennino Cennini's manual (ca. 1370 -1437), *Il libro dell'arte* (1390), where they were described multiple techniques and artistic recipes prevailing at that time [6];

among them, referring to obtaining depth, in its chapter LXXXV recommended: "when you have to paint mountains that seem further away, darken the colors a little more, and when you want them to seem closer, use lighter colors" [1998, p. 131].

Leonardo's notes on distance

The Renaissance meant the predominance of naturalistic seeing over symbolist doing. The message would now reside in what the eye could capture. Leonardo warned of the insufficiency of geometry –perspective– to represent the entire phenomenology of perception and carried out numerous studies on atmospheric effects, such as his *Storm in a Valley* (ca. 1506), which, although apparently a landscape, is only a subjective study on cloud formation.
Da Vinci left interesting notes written in his treatise regarding the decrease in bodies and the decrease in color due to the effect of distance [7]. At the outset, he defined linear perspective as: a test "with measurement and by means of visual lines about how much smaller a second object appears with respect to another first" [Da Vinci 1827, V., p. 145]. His belief about the effect of depth was completely opposite to that of Cennini –applied by Sassetta–: "There are many who in a country or open countryside make the figures darker the further they are from sight; which is the opposite" [Da Vinci 1827, V., p. 65], because for him: "the more remote a dark thing is from sight, the clearer it will appear; and, consequently, the closer it approaches, the more obscured it will be" [Da Vinci 1827, V., p. 141].
For Leonardo, the figure of an object is perceived as less exact depending on its greater distance from the observer; That blurring, as the Master of Boucicaut already anticipated, would make it seem more remote [8]. Sight could never, without the help of the different tonal gradations of colors, know the distance between different aligned objects [Da Vinci 1827, V., p. 165]. And he stated that distance attenuated the color tone: "If the same color is placed at various distances and always at the same height, it becomes lighter in proportion to the distance from the eye looking at it" [Da Vinci 1827, V., p. 51]; Thus, the proportion or decrease of the colors is proportional to their distances from the point of view; thus denying Cennini's postulate that dark tones are perceived as further away [Roger 2007, p. 79].
Among his advice, Leonardo recommended not defining too much what is small and what is distant: "the painter should not conclude too much of small parts of those objects that are remote" [Da Vinci 1827, V., p. 137]. This is because the figures that first move out of sight and become confused are the smaller ones. And, although Leonardo did not mention it, the same would happen with the textural value, which evokes the tactile roughness, the grain or the modular arrangement of a material in perspective, making it more difficult to appreciate it from a greater distance [9].
Leonardo also dealt with a more subjective topic, such as the perception of environmental effects such as fog or mist –which he called 'dense air'– on the vision of bodies in the distance, or those caused by excess or lack of light, which affect the forms: "he who has denser air in front of him will seem further away" [Da Vinci 1827, V., p. 138]. He stated that "the first thing that is lost from sight when a shadowy body moves away is its outline," and as the distance increases, "the shadows that divide the parts of the bodies that touch are lost", and so on until that "only a mass of a confusing configuration is perceived" [Da Vinci 1827, V., p. 130], recommending blurring distant elements, enlarging the objects on which it is visually superimposed [Da Vinci 1827, V., p. 146] and coloring with its color the most distant [Da Vinci 1827, V., p. 65].
However, he never attributed this 'blurring' simply to the deficiency of the human eye's acuity in the distance. Already in practice, his landscape studies show his great ability to represent distant objects in a convincing way, using the perspective and tonal gradation techniques exposed in his notebooks; as happens –regardless of whether it is a real or figurative view– in his landscape of the Arno Valley (1473), where Leonardo elevates the land line in the manner of a 'horizon map', contrasting the harsher close-ups and dark, and gradually blurring the details of the scene towards the distance; even by simulating a certain perspective grid on the plots of distant lands (fig. 8).
Leonardo understood light as a determining factor in the image and would dose it precisely over the landscape to avoid strong contrasts. For him, "aerial perspective is the relationship between light and the atmosphere according to its density; from this relationship the spatial visibility of depth is born" [Mariani 2021, p. 112]. He also resorted to the ambiguity of the forms by blurring them



Fig. 8. Top left: Leonardo da Vinci, Storm in a Valley (ca. 1506); sanguine (20 × 15 cm); RL1240gr, Windsor Castle, Royal Library, Berkshire. Top right: Leonardo da Vinci, View of the Arno (1473); pen and ink (19 × 28.5 cm); inv.436E, Uffizi Gallery, Cabinet of Drawings, Florence. Bottom: Raphael Sanzio, first cartoon of the series The Miraculous Fishing (1515); tapestry cardboard on charcoal and multiple sheets mounted on canvas (360 × 400 cm); Royal Collection, on loan to the Victoria and Albert Museum, London.

–*sfumato*– to produce effects of distance through glazing, calling this phenomenon *prospective de'perdimenti*, blurring the color as the distance increased. This can already be seen in the distant mountainous blurs of the *Virgin of the Carnation*, or in those of *La Gioconda*, where he combined both types of representation on the same background. Certainly, the contrast between scientific analysis and its emotional emphasis was what stimulated Leonardo's representation.

Controlling depth through light

The 16th century recognized in principle the planimetric composition of distance, that is, the generation of parallel layers of different gradients. This effect is evident in Raphael Sanzio's (1483-1520) *The Miraculous Fishing* (1515), where the shapes are captured as if in a layer, concatenated as a relief; the figures prevailing as the dominant plane of the painting (fig. 8). In the 17th century, this correlation of layers was broken, replaced by the in-depth look, which forced the viewer to go deeper into the painting, to delve deeper into the landscape as in a unified and continuous movement from the foreground to the last. These ideas are clearly reflected in the chapter 'Surface and depth' of *Kunstgeschichtliche Grundbegriffe*, written by Wölfflin in 1915, who defined the new style as "distorted plane" [Wölfflin 2002, p. 91]. From the Baroque onwards, the flat and the deep will constitute a single element, superimposing themselves as relief and establishing new links towards the background.

Gradually, the old pictorial backgrounds, the 'far ones', took center stage until they swallowed up the foreground. Possibly due to the exaggerated flatness of its topography, Dutch artists were the first to begin to pay attention to environmental effects and the details of distance, encouraging the view to extend to a distant horizon. Dutch art enriched the representation of the effects of reality for scientific purposes, firstly, at the service of cartography in merely descriptive topographic visions –without interest in depth–; while landscape representations, more personal and interpretive, would be more affected by the particular conditions of lighting and setting, as Svetlana Alpers indicated in *The Art of Describing* (1983).



Fig. 9. Left: Hieronymus Bosch, central panel of the triptych of The Hay Wagon (1485); oil on panel (135 × 100 cm); Prado Museum, Madrid. Right: Joachim Patinir, Landscape with Saint Jerome (ca. 1516); oil on panel (91 × 74 cm); Prado Museum, Madrid.

In addition to the aforementioned Campin, Hieronymus Bosch (1453-1516) stood out for his sophisticated use of color in the distance, as shown in the central panel of the triptych of *The Hay Cart* (1485). The more vibrant colors in the foreground contrast with the softer tones in the distance to create the effect of depth, arranging an overlay of elements that guides the eye through the scene to the background. All shapes, whether close or far, are represented with a high level of detail, ensuring that distance does not diminish visual clarity, along with the use of unrealistic scales; a challenge to the coherence of Leonardo's perception.
Joachim Patinir (ca. 1485-1524) was another great builder of deep extensions [10]. Based on a progressive use of color ranges, very similar to the "stratification by layers" [Wölfflin 2002, p. 100] of Hieronymus Bosch, it would accentuate the feeling of distance over its large spaces. This chromatic perspective was characterized by the progressive 'cooling' of the tones: with a predominance of browns and browns in the foregrounds, in the lower part of his paintings; as he moved away, the landscape began to take on the color green; and, in the distant areas, it was the color blue that predominated and gained intensity –a quality already appreciated by Leonardo [11]–. The space follows one another in a calm and clear gradation.
Thus, in *Landscape with Saint Jerome* (ca. 1516), Joachim Patinir widened the veduta until it fit the dimensions of the painting, having difficulty integrating the characters into these deep and inhospitable landscapes. Its horizon line was located in the highest area of the painting, which allowed it to represent a wider and more distant space. Above this line, he used to paint part of the sky with a bright white that caused a spatial continuity, suggesting, intentionally or not, the curvature of the Earth. On the other hand, whatever the distance, the details were represented with the same thoroughness and the figures appeared to be artificially cut out and pasted on the background (fig. 9).
Painters such as Albrecht Altdorfer (ca. 1480-1538) in *The Battle between Alexander and Issus* (1529) also developed vast aerial panoramas, even following a color code similar to Patinir. Some, like Pieter Brueghel (1525-1569), whose landscape of *The Flight into Egypt* (1563) was already a perfect synthesis of the keys to Leonardo's depth, imitated the remoteness effect of Jacob Grimmer (ca. 1525-1590) and Herri Met de Bles (ca. 1500-1558). In *The Harvest* (1568), Brueghel raised



Fig. 10. Top left: Albrecht Altdorfer, detail from The Battle of Alexander and Issos (1529); oil on panel (158 × 120 cm); Alte Pinakothek, Munich. Top right: Pieter Brueghel, The Flight into Egypt (1563); oil on panel (55.6 × 31.1 cm); Courtauld Institute of Art, London. Bottom left: Pieter Brueghel, The Harvest (1568); oil on panel (161 × 118 cm); Metropolitan Museum of Art, New York. Bottom right: Hans Bolt, View over the River Scheldt (1578); oil and tempera (74.5 × 46.5 cm); Los Angeles Country of Art, California.

the point of view and drastically reduced the size of the figures; He no longer had a series of planes in front of him, but rather his perception of the distance became unique, fluid and homogeneous. Also under the influence of Brueghel, Hans Bol (1534-1593) brought the topographical view closer to painting, expanding the visuals with a great impact on depth, as can be seen in his *View over the River Scheldt* (1578) (fig. 10).
The Dutch made landscape a pictorial matter: "the most revolutionary genre" [Gombrich 2000, p. 108]. The careful lighting effects definitively distanced the landscape from the topography. An erudite landscape was created, with restricted tones and greater atmospheric treatment, heir to Adam Elsheimer's (1578-1610) views such as *The Aurora*, (ca. 1606): stormy skies, mists, sunsets…
In the case of Rembrandt (1606-1669), it was typical of many of his works illuminate –or rather dazzle– with a certain drama some area of the composition painted on a dark background, as in *Stone Bridge*, (ca. 1639), to give the sensation of the degree of distance [12]. This effect would be masterfully translated by Philips Koninck (ca. 1619-1688) in *River Landscape* (1664), who,



Fig. 11. Top left: Adam Elsheimer, The Dawn (ca. 1606); oil on copper (22.5 × 17 cm); Herzog Anton Ulrich-Museum, Brunswick. Top right: Rembrandt van Rijn, The Stone Bridge (ca. 1639); oil on panel (42.5 × 29.5 cm); Rijsmuseum, Amsterdam. Bottom left: Hercules Seghers, Landscape with Rocks (1633); oil (97 × 53 cm); Uffizi Gallery, Florence. Bottom left: Philips Koninck, River Landscape (1664); oil (121 × 95 cm); Museum Boijmans Van Beuningen, Rotterdam.

assimilating the lessons on distance from Hercules Seghers (*Landscape with Rocks*, 1633), brought the flat, vast and extensive panorama to perfection (fig. 11).
Flemish artists "replaced interest in the subject with representation as an end in itself" [Sutton 1994, p. 52] and overcame the control of distance –like the Italian Renaissance the perspective domain–. They realized that light had its own qualities. But to generate the relief they did not start from contrast –like the Caravaggists– but rather they modeled depth in an avant-garde attitude: representing the global appearance of a correctly illuminated scene, and thus generated landscapes that constantly varied depending on the different atmospheric conditions or the time of day, with special interest in the treatment of the skies.
Jacob van Ruisdael (1628-1682) in his *View of Haarlem with Bleaching Fields* (ca. 1665) arranged the landscape in unevenly illuminated horizontal bands; This does not mean that it will be a picture of the previous system of stratification by planes, since "the succession of stripes has more force than each one of them" [Wölfflin 2002, p. 92]. They are exalted clarities that reveal the influence of Rembrandt and cannot be understood unless integrated into the spatial totality of the landscape.



Fig. 12. Top left: Jacob van Ruisdael, View of Harlem with Bleaching Fields (ca. 1665); oil (62 × 55.5 cm); Royal Picture Gallery Mauritshuis, The Hague. Top right: Jacob van Ruysdael, Bentheim Castle (ca. 1650); oil (68 × 54 cm); Rijsmuseum, Amsterdam. Bottom: Meindert Hobbema, The Way of Middelharnis (1689); oil (141 × 103 cm); National Gallery, London.

The Baroque brought the point of view closer, shortening the perspective and increasing the dimensions of the objects in the foreground. This sudden approach caused an intentional sequence of depth. Ruisdael also used this excessive effect in *Bentheim Castle* (ca. 1650-1682), enlarging the stone forms of the foreground –the close– to emphasize, in a visual leap of immediate contrast, the hill in the background and its building –the far–. And when Meindert Hobbema (1638-1709) in *The Road to Middelharnis* (1689) turned the road into a projection of vertical poplars into the landscape, entering the painting, the progress of looking in depth occurred again. The matter itself was already a matter of depth (fig. 12).
As a master of lighting conditions and depth, Claude Gellé (1600-1682), called Lorrain, had the idea of

painting *Cleopatra's Landing in Tarsus* (1643) with all the sun and the effects of the misty shadow, projecting its luminous halo over the around. The light diffuses from the background of the painting and, when expanded, is enough on its own to create the sensation of depth, blurring the contours and degrading the colors to create the pictorial space. Generally, Lorrain arranged the composition in successive planes, where the shapes gradually blurred until they were lost in the ambient luminosity, producing a sensation of almost infinite distance where the gaze is lost. This masterful effect of natural light on the waters was highly appreciated, since this almost blinding front lighting acts as a focalizing element that brings the background closer to the foreground; culmination of the perceptive artifices of distance. The representation of the landscape "will never again be natural, but rather supernatural" [Roger 2007, p. 13].
Lorrain's treatment of depth would be imitated in the future by artists of the stature of William Turner (1775-1851), as seen in *Caernarvon Castle* (1799), who, as a final twist, dissolved the deepest spaces, ceasing to be even perceptible, accentuating its emotional meaning with color; the representation entering a completely indefinite and almost infinite luminous space; reflected in his masterful *Aosta Valley* (1837), which recalls Leonardo's tragic atmospheric effects (fig. 13).
The culmination of this atmospheric perspective would in the future be the impressionist paintings of Claude Monet (1840-1926), who in his views of the British Parliament blurs the contours of the building on the vaporousness of the fog, reflecting a cluster of spatial perceptual sensations at any time of the day, and which they manifest different degrees of remoteness depending on the different lighting and environmental conditions; In some the building appears closer and more defined, while in others it almost seems to dilute and move away from the viewer imbued by the density of the London fog (*London* series, *The Parliament*, 1900-1905).

Conclusions

Depth is an illusion, a harmonious appearance that allows the scene to be observed with a pleasant sensation of verisimilitude, from which some figures hide parts of others, and a decreasing effect of sizes and textures –of

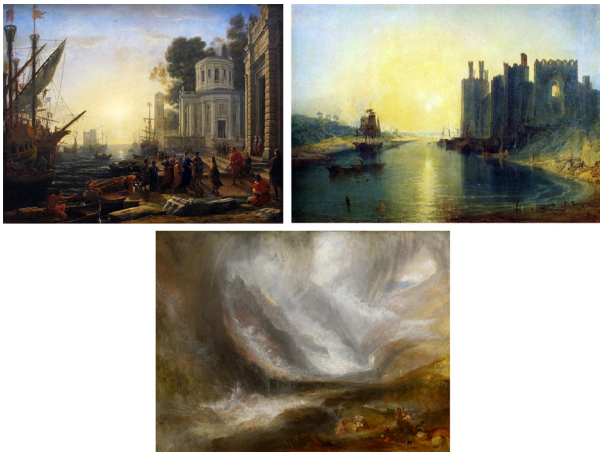

Fig. 13. Top left: Claude Lorrain, Cleopatra's Landing in Tarsus (1643); oil (147 × 117 cm); Louvre Museum, Paris. Top right: William Turner, Caernarvon Castle (1799); watercolor (82.5 × 57 cm); Yale University Art Gallery, New Haven, Connecticut. Bottom: William Turner, Aosta Valley: Snowstorm (1837); oil (122 × 91 cm); Art Institute, Chicago.

relationships– is produced towards the line of horizon. It is, therefore, an effective perception device [13], since it makes it easier to capture certain formal invariants in such a way that, if the perspective were poorly constructed, it would help us intuitively interpret its spatial arrangement; and also recognition, because, in a certain way, knowing is representing, and we see what we are capable of recognizing.
Conquering depth to create a full figurative space was not an easy task; it was founded on the "primacy of doing" [Montes 1992, p. 58]; it is the story of a "cultural acquisition" [Milani 2015, p. 56]: a slow assimilation of graphic conventions –formulas, schemes and techniques on the representation of distance– in which underlies that certain idea of progress described by Gombrich in *Art and Illusion*. We would have to overcome simple perspective vision and focus our attention on the scientific observation of looking into the distance to reach the true landscape.
Multiple experiments, hours of observation, advice, successive generations of artists and a great tradition were necessary to discover and perfect the realism of depth, always breaking the conventions established up

to that moment with other more effective resources, until replacing the medieval coplanar vision by the planes of different gradients and, later, by the concept of deep centrality.
In this evolution, we must highlight the importance of drawing manuals and treatises, such as Leonardo's, spread throughout Europe during the 16th and 17th centuries. Its success derives from the belief that correct visual perception had to be accompanied by some basic principles –tradition– since only when you have the formulas can you improve and adjust the results. This method of learning by confrontation between perception and technique has been in use for more than five centuries, and even today remains valid for the figurative representation of the landscape.
In this career, the control of lighting was clearly important, since until well into the 15th century, painters, when giving color to the figurative space, behaved as if light were everywhere and did not come from specific sources. Until artists, little by little, realized that if you controlled the light you controlled the depth. Lighting always helped to contrast environments, mark locations and distinguish volumes.
Leonardo's aerial perspective would be the greatest visual achievement in this search to capture remoteness in landscape representation. The sensation of distance or closeness, always under the guidelines, first of perspective during the Renaissance and, later, under the control of light and its atmospheric variations in the Baroque, provided relevant information about the scene and its figures. Said illusionistic artifice, therefore, must be graphically captured with precision through certain intonation and lighting effects that cause the interruption of the different tonal, textural or chromatic gradations in the elements of the landscape. In a way, it would be like the game of trying to "find the stain on the window that could be mistaken for a house in the distance if we look at it from a certain point" [Gombrich 1997, p. 255].
In summary, the search for the illusion of depth and its correct codification in the representation of the landscape was a struggle to subdue the schemes, habits or conventions that every artist uses in his task, that is: to subdue the "graphic invariants" [Montes 1992 , p. 39] to others of perception and interpretation –'recoding'– that are more credible and accurate, thus acquiring progress in their visual representation.
As Wölfflin stated: "every painting owes more to other paintings than to direct observation". Thus, all these advances would open the future path of the great landscape masters such as Pousin, Gainsborough, Constable, Corot, Turner, Friedrich, Bierstadt, Cezanne, Monet and many others [14].

Notes

[1] However, "perception ignores the concept of the infinite" [Panofsky 2003, p. 13].

[2] So pertinently related in the article by Montes: "Looking like the relief and leaving the wall what is not" [Montes 2008, pp. 483-512].

[3] For Leonardo there was another perspective, the so-called 'aerial', in reference to the environment of the scene and its influence on the representation of the landscape and the perception of distance: "because by the variety of the air the various distances can be known of various objects" [Da Vinci 1827, V., p 76]. To differentiate it from linear perspective, some authors also use the term 'atmospheric perspective', referring to the different light gradations and tonal contrasts of the landscape.

[4] Leonardo spoke about it in the *Codex Urbinas*, ending up giving little importance to the cast shadow.

[5] Leonardo's treatise is a compendium of writings recorded in his notebooks under the general title: "On painting". The manuscripts were begun in Milan while da Vinci was in the service of Ludovico Sforza –between 1482 and 1499– and were substantially worked on during the last 25 years of the artist's life. The first edition was published in France in 1632. It was printed in abbreviated form in French and Italian as *Trattato della pittura* by Raffaelo du Fresne, in 1651. After Melzi's version was rediscovered in the Vatican Library, the treatise was published already in its modern form in 1817.

[6] Although Leonardo does not directly mention Cennini, it is likely that the techniques described in the treatise were known by the workshops and art schools of his time, indirectly influencing his training.

[7] Distance in relation to perspective, which for Leonardo "has three main parts: the first deals with the decrease in the size of objects at various distances: the second deals with the decrease in their colors, and the third of the obscuration and confusion of contours that occurs to figures seen from various distances" [Da Vinci 1827, V., p. 158].

[8] Leonardo said that "concluded and defined objects must be close, and confused and undone objects must be very far away" [Da Vinci 1827, V., p. 34]. Ching verifies this postulate by stating that the sensation of depth requires "a well-marked contrast between limits and contours, scrupulously defined in the foreground, to move

on to more nebulous forms in the last terms, dissipating their edges or profiles, with a weak continuous line, discontinuous or dotted" [Ching 1982, p. 73].

[9] This reduction of the distant object would be for Ruskin like a "shadow abstraction" [Ruskin 2012, p. 109].

[10] According to Wölfflin, Patinir is the first in northern painting who, "with clarity and serenity unknown until then, makes the landscape extend into the background" [Wölfflin 2002, p. 100].

[11] Leonardo already in his treatise on painting relates the distance of the last planes in the landscape with the color blue through a kind of translation of the environment –air– that surrounds it: "the one that is most remote must be somewhat bluish; and whoever has to see further will be done with more blue" [Da Vinci 1827, V., p. 76].

[12] As happens in its interiors, such as *The Supper at Emmaus* (1628) or in *Monk Reading* (1661). For Rembrandt, distance is enveloping, not a relief carved into the darkness, as it would be for Caravaggio.

[13] In relation to perceiving something, what our mind tries to discover is "what that object is and where it is" [Montes 1992, p. 41].

[14] All images used in this article have been taken from *Wikimedia Commons* and are freely accessible.

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Urban Landscape in Circular Images: Panoramas and Cylindrical Anamorphosis

Fabrizio Agnello, Maria Isabella Grammauta

Abstract

The 'panoramas', painted canvases intended to be exhibited in cylindrical buildings named 'rotundas', were produced by the composition of images portrayed from the same point of view, rotating the direction of the visual axis. The privileged subjects of panoramas were urban areas, usually portrayed from an observation point placed at a high altitude, usually a tower, a bell tower, or the roofs of a building. In panoramas, the city cannot be seen at a glance, as the overall image can be formed only in the observer's memory, as a combination of the partial views of the cylindrical canvas. In order to remedy this difficulty, or simply to help visitors to recognise the depicted places, panoramas were also represented in a synthetic image, produced by the projection of the cylindrical canvas onto a horizontal plane; these images were called 'horizontal panoramas'.
This essay analyses the projective relationship between the cylindrical panorama and the horizontal panorama; unfortunately, as far as the authors know, the two images have been preserved only in two panoramas: the panorama of Constantinople, realised in 1801 by Henry Barker, and the panorama of Thun, realised in 1814 by Marquard Wocher. The analysis of the correspondences between the cylindrical and the horizontal panorama is anticipated by the survey of 17th century treatises that illustrate the problem of the relationship between a cylindrical image and its projection onto a plane. One hypothesis proposed in this study is that the hollow area in the centre of horizontal panoramas may be the base of a cylinder whose surface shows the image of the cylindrical panorama formed by reflection.

Keywords: 19th century panoramas, urban landscapes, catoptric anamorphosis, digital representation.

Cylindrical panoramas (1793-1880)

The term 'panorama' denotes an elongated painting, produced by the combination of several views (usually six or eight) in vertical perspective, that spanning the entire circle and are captured from the same point of view, through the rotation of the visual axis. The first panorama that accomplishes these features dates from 1559, according to the current state of research. It is a view of the city of Constantinople, presumably taken from the hill above the Haydarpasa promenade, looking towards the Bosforo and, beyond it, the oldest part of the city with the Topkapi, the church of St. Sophia and the Blue Mosque [1]; the view shows the painter at work (fig. 1).
The invention of the panorama as a form of mass entertainment [2] dates back to 1787 when the Scottish painter Robert Barker patented this type of pictorial representation and provided instructions for its exhibition in dedicated buildings named 'rotundas'.
Although the great part of them was executed by painters, Panoramas offered a training opportunity for young architects experts in perspective drawing, e.g., Jakob Ignaz Hittorff, designer of the Champs Elysées rotunda in Paris (no longer extant), and Friedrich Schinkel, author of a panorama of Palermo.
The panorama's history spans over a century: after the construction of the first rotunda in 1793, painted panoramas went through a period of success in the entire first half of the 19th century. The spread of photography from 1839 did not undermine panoramas success because, from

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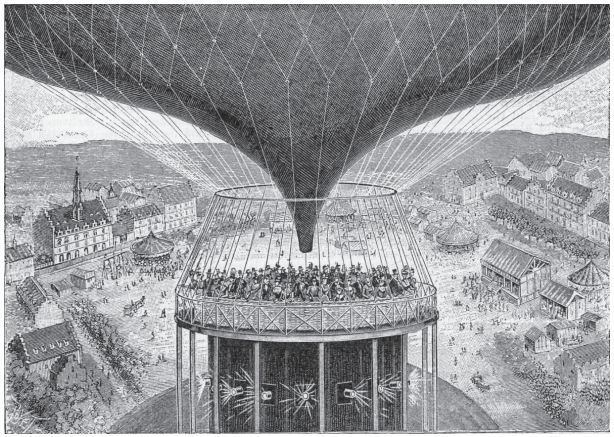


Fig. 1. M. Lorichs, Panorama of Constantinople, 1559. Up: detail of the Panorama of Constantinople. Down: The XI sheet of the Panorama of Constantinople shows the painter himself drawing the view [Solar 1979, p. 63].

Fig. 2. R. Grimoin Sanson, Cyneorama Ballon, 1900 [Bordini 1984, p. 312].

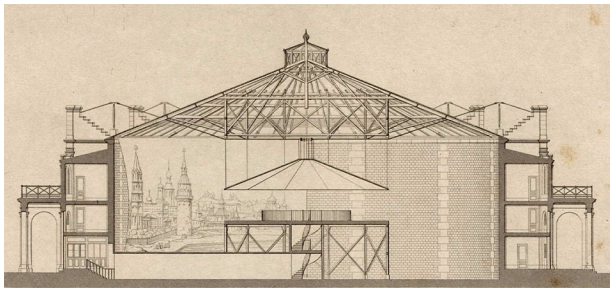


Fig. 3. Section of the Champs Elysées 'Panorama' [Hittorff 1842, Planche 2]

the very beginning, the new technique was also used to produce successful circular photographic panoramas (fig. 2). The very decline of panoramas and rotundas will be caused by the cinema that became the new form of mass entertainment; panoramas will be completely abandoned after the end of the century.

Rotundas were circular buildings, whose diameter ranged from 20 to 30 metres, covered by a conical roof; an elevated platform for the public took the centre of the cylindrical room [3]. The painted canvas was stretched along the inner walls of the building and the platform was placed at a height almost equal to half the height of the canvas, corresponding to the horizon line of the perspective views (fig. 3).

The crucial difference between *veduta* and panorama lies in the fact that the first one, as the term itself suggests, is captured by the eye at a single glance, while the overall image of a panorama can only be formed in the observer's memory; moreover, if in a *veduta* the observer distinguishes the depicted subject from the context in which it is exposed, when watching a panorama the observer finds himself 'inside' the painted landscape, in a condition that today we would call 'immersive'.

Together with panoramas, small images (approx. 40*40 cm) depicting a horizontal projection of the cylindrical panorama were produced; these images were named 'horizontal panoramas'. The aim of these images, where the name of depicted subjects or the description of historical events depicted were often given, was probably to support visitors' orientation in the panorama exhibitions and identify its context and theme; this is why horizontal panoramas were also called 'viewers' key'.

Although it is reasonable to assume that horizontal panoramas were always realised for the exhibitions in rotundas,

the two versions of the same panorama, the cylindrical and the horizontal one, have been preserved only in two cases: namely, the urban panorama of the city of Constantinople, painted in 1801 by Henry Barker, son of Robert, and the panorama of the small Swiss town of Thun, painted in 1814 by the painter Marquard Wocher (fig. 4).
Even if the number of horizontal panoramas that have come down to us is greater than that of cylindrical panoramas [4], the relationship between the two images has rarely been investigated.
The question of the projective relationship between cylindrical images and their projection onto a plane has been studied in numerous treatises of the 17th century on optics, perspective, and direct and catoptric anamorphosis. The analysis of the demonstrations presented in these treatises will provide the reference for the formulation of a hypothesis on the projective correspondence between the two versions of the same panorama.

Horizontal panoramas

Horizontal panoramas were usually offered to visitors together with a small pamphlet that provided information allowing a better understanding of the depicted subject. These images, were at the same time a vehicle for the dissemination and the promotion of the exhibited panorama. Horizontal panoramas are often the only source for the reconstruction of themes and subjects depicted in missing canvases [5].
The artistic characteristics and transformations of horizontal panoramas, and the related pamphlets, have been well summarised by the art historian Denise Oleksijczuk; she observes that, since the first exhibition in 1793 of the panorama *View of the Grand Fleet at Spithead* accompanied by a horizontal panorama: «the Barkers made changes to the pamphlets, experimenting with different pictorial techniques, narratives, and ways of representing space and time» [Oleksijczuk 2011, p. 130]. Oleksijczuk also discusses the evolution of horizontal panoramas, distinguishing the circular format – widespread until 1818 – produced by the projection of the cylindrical image onto a plane, from the later rectangular format, obtained by the development of the cylindrical image on a smaller scale. While the latter presents the extended panorama, often divided into two or more parts, the circular format offers a synthetic representation of the panorama, all at a glance.
The circular format, i.e. the horizontal panorama that is the subject of our study, depicts the ground line in the innermost circle and the horizon line on the outside; the innermost part of the circular image sometimes contains the title of the panorama.
Despite a huge literary production on panoramas, especially developed in the last thirty years of the last century, only a few authors, save Oleksijczuk, have focused their studies on horizontal panoramas and their projective relationship with cylindrical panoramas.
One of these scholars is Stephan Oettermann, probably the most prominent expert of panoramas. In his book on 19th century panoramas, an indispensable reference for anyone approaching the subject, Oettermann dedicates a short paragraph to horizontal panoramas, which he calls 'anamorphic' drawings. The author firmly states that these drawings played no role in the realisation of the panorama, and does not provide a clear explanation of the projective relationship between the two panoramas: «how the anamorphic drawing came to be connected with the panorama is a mystery» [Oettermann 1997, p. 60].
A second outstanding scholar of panoramas, Gustav Solar, focuses his book – dedicated to Hans Conrad Escher, painter of Alpine panoramas – on urban panoramas and on the description of their history and evolution. Solar mentions horizontal panoramas several times, showing many examples, including the Thun panorama analysed in this study. The author states that; «the horizontal or circular panorama […] is based on the vertical projection at a wide central angle. The landscape appears as a circular area, the horizon line as its edge» [Solar 1979, p. 36].
A hypothesis on the use of horizontal panoramas, proposed in this study, is that the hollow area in the centre of the circumference may be the base of a cylinder with a vertical axis, on whose surface the image of the cylindrical panorama is formed by reflection.

Catoptric cylindrical anamorphosis: from Jean Louis Vaulezard (1630) to Kaspar Schott (1657)

The examination of the scientific literature has been directed to the research for studies on the projective relationship between images on a cylindrical surface and their projection onto a plane orthogonal to the axis of the cylinder, i.e. the relationship between vertical cylindrical surfaces and their projection onto a horizontal plane.



Fig. 4. M. Wocher, «Panorama von Thun», 1814. Up: cylindrical panorama of Thun. Down: horizontal panorama of Thun.

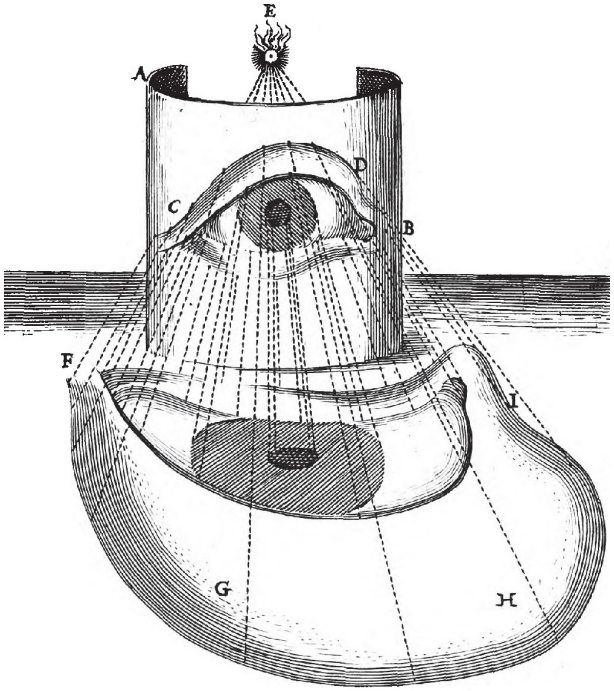


Fig. 5. Depiction of the anamorphosis of a cylindrical figure using a light source, 1642 [Bettini 1642, V, p. 7].

This relationship is analysed in many treatises published in the 17th century, according to two distinct methods:

1. the projection of the cylindrical image onto the plane with the aid of a candle placed inside the cylinder;
2. the projection of the image with geometric criteria, using the optical principles of reflection.

The first method is described in 1642 by the Jesuit mathematician Mario Bettini (fig. 5). In Chapter III of his treatise, Bettini illustrates a method to deform a cylindrical image in a horizontal one: *Imaginem in cylindrica superficiae rectè formatam in plano horizontali ritè deformare* [Bettini 1642, V, p. 7]. The author suggests to place the base of a wooden cylinder on the horizontal surface and to lay on its surface a canvas, or *papyrus*, where the figure to be projected is represented. The canvas is then perforated in correspondence with the lines of the drawing; the wooden cylinder is then removed, keeping the perforated canvas in place. At this point, a candle is placed behind the canvas, in the area previously occupied by the cylinder; the light rays will project the deformed figure, named *dissipata*, onto the horizontal plane. The last step is to place, in the area previously occupied by the wooden cylinder, another cylinder of the same size with reflective outer surfaces. The observer must stand at the same height as the candle but on the opposite side of the cylinder, at a distance from its surface that equals the distance of the candle [6], in order to see the deformed image in a corrected form, *reformata*, on the reflective surface of the cylinder.

The procedure presented by Bettini is extensively reported, recalling the source, by Kaspar Schott in his treatise of 1657. The only difference between Bettini and Schott lies in the judgement on the accuracy of the procedure that uses light rays: while Bettini states that the procedure is flawless, Schott notes that the projection with the candle is affected by imprecision and is not comparable to geometric constructions [7].

The second method, which uses the optical principles of reflection, is described in some 17th century treatises in the chapters dedicated to the phenomenon of 'catoptric anamorphosis', a part of the more general subject 'anamorphosis'. This is not the place for an even short resume of the vast contemporary literature on anamorphosis [8]. Here, it is simply reminded that the term states for a projective procedure that deforms an image so that it can be recognised only from a pre-established point of view. The most diffuse and known anamorphosis, based on the projection of rays onto a surface, is named 'optical' or 'direct', whereas those anamorphoses that use mirrors are named 'catoptric' or 'indirect'. We will limit our attention to catoptric anamorphoses, since they provide an effective reference to study the problem of the projective relationship between the cylindrical surface and its representation on the plane.

Jurgis Baltrušaitis identifies one of the earliest appearances of a catoptric anamorphosis in an engraving by Simon Vouet dated from 1625, (fig. 6) in which the effect produced by a cylindrical catoptric mechanism is depicted. According to Baltrušaitis, this engraving encouraged scholars to investigate this subject, dedicating part of their treatises to the analysis of the catoptric phenomenon.

The first treatise that focuses catoptric anamorphosis is *Perspectif cylindrique et conique* written by the French mathematician Jean Louis Vaulezard and published in 1630. Vaulezard's demonstration stands out among the others, both for its earliness and for the exactness and elegance

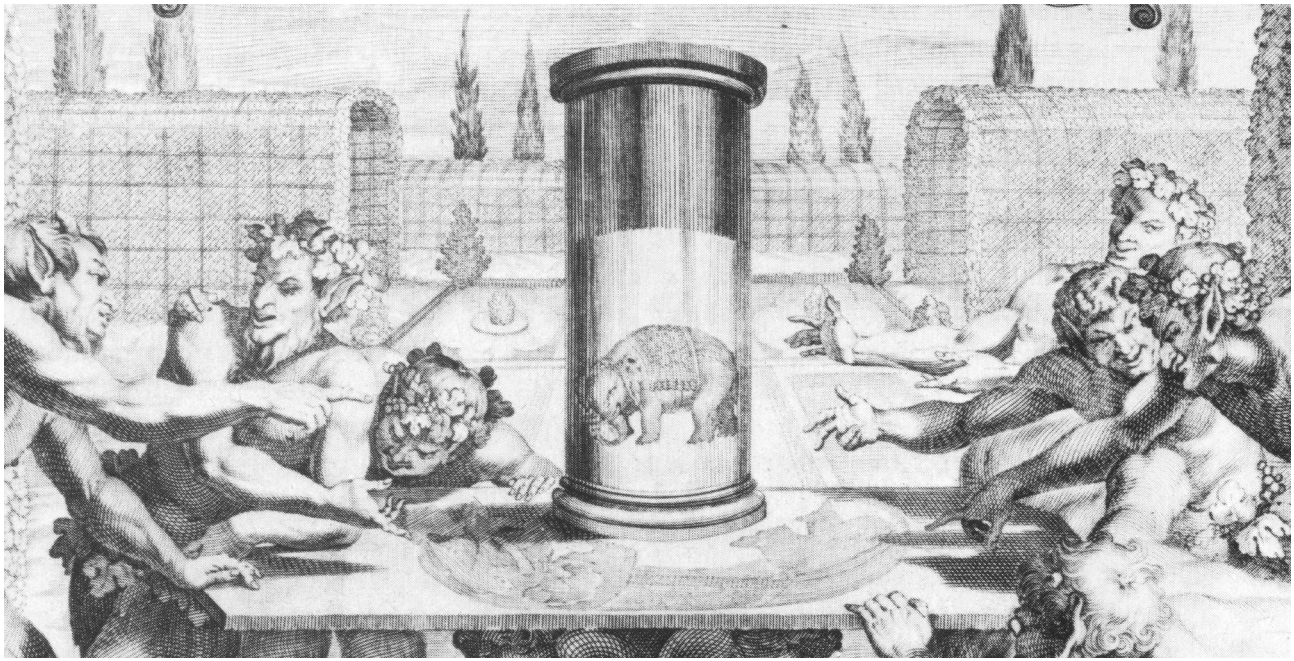


Fig. 6. S. Vouet, Eight satyrs looking at an anamorphic mirror with an elephant, 1625 ca (detail) [Baltrušaitis, 1990, p. 169].

of the demonstration. Later treatises on cylindrical projective catoptric mechanism report rough reproductions of Vaulezard's demonstration [9].

Catoptric cylindrical anamorphosis according to Vaulezard's demonstration.

All the schemes for cylindrical catoptric anamorphosis, published during the 17th century, assume that the flat image to be deformed, named 'prototype', is inscribed in a vertical grid placed inside the cylinder. The prototype is then deformed through two steps: the first is a central projection of the plane grid onto the cylindrical surface; the second 'catoptric' one, uses the principles of reflection to project the cylindrical image onto the horizontal plane; this image, when reflected onto the cylinder, will restitute the correct perception of the initial vertical image. For the purposes of this study, the analysis of the first step has been rejected, and the investigation has been restricted to the second step, i.e. the catoptric demonstration.

Vaulezard illustrates his demonstration with the aid of two images: a double orthogonal projection, which follows a widely recurring scheme in various treatises on perspective, and a an axonometric drawing, which, although aiming to facilitate the comprehension of the demonstration, is quite puzzling (fig. 7).

Vaulezard places the observation point of the reflected image at a considerable distance from the cylinder, at a height from the horizontal plane roughly equal to its diameter.

Given a line *m* that passes through the observation point and intersects the cylindrical surface in *Pr*, Vaulezard illustrates the reconstruction of the reflected line *n* [10] and of the point of incidence *Po* between *n* and the horizontal plane at the base of the cylinder. From the observation point *V*, *Pr* will be the reflected image of *Po*.

It is known that the incident line and the reflected line form the same angle with the reflecting surface; to

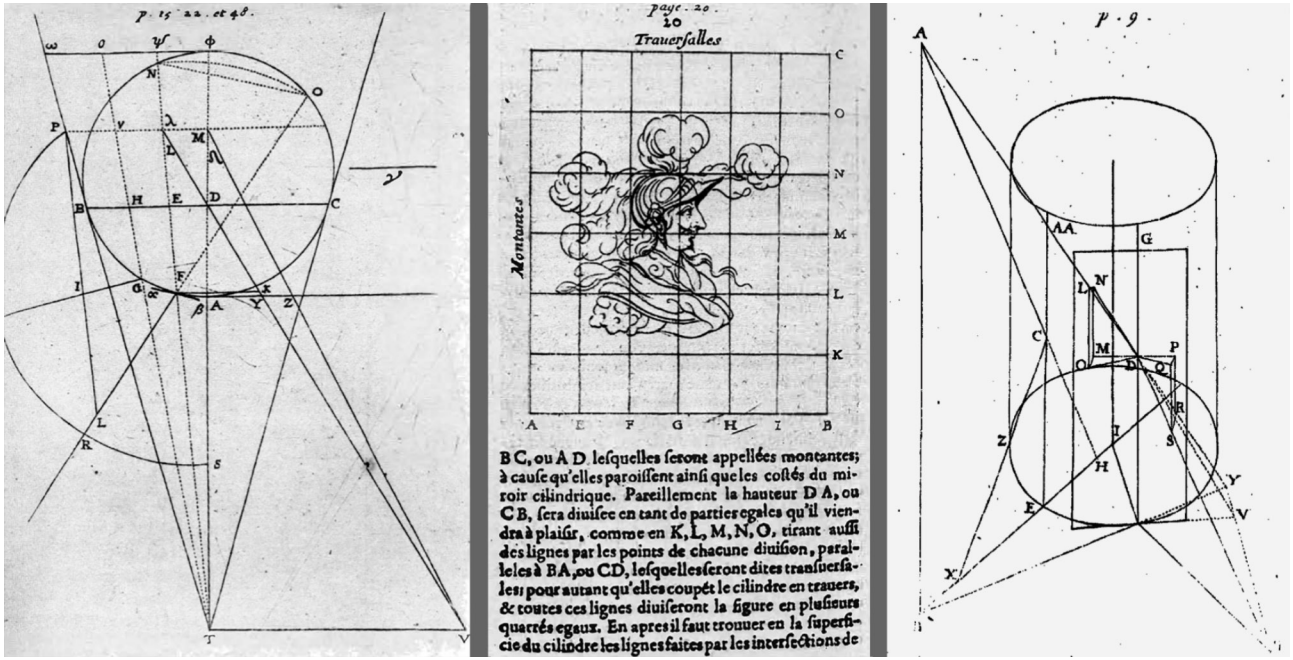
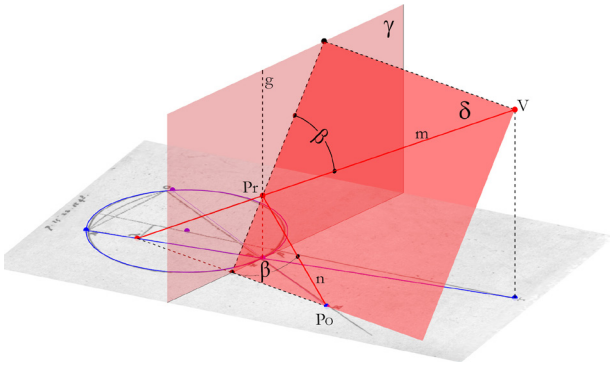


Fig. 7. a) Double orthogonal projection scheme [Vaulezard 1630, p. 20]; b) Prototype figure [Vaulezard 1630, p. 15]; c) Axonometric scheme [Vaulezard 1630, p. 9].

reconstruct this condition it is sufficient to place a vertical plane γ tangent to the cylinder along the generatrix *g* that passes through *Pr*, after that, the angle β that the line *m* forms with its orthogonal projection on γ is measured; δ is the plane that projects the line *m* onto γ. The reflected line *n* will form an equal angle β with the projection of *m* on γ (fig. 8). The construction proposed by Vaulezard correctly reconstructs the three-dimensional scheme of reflection.
Thus, given the observation point *V* and a chosen point *Pr* on the surface of the cylinder [11], produced by the projection from *V* of a point *P* of the starting grid plane, Vaulezard draws in plan the line corresponding to the vertical plane that passes through *V* and *P*. This line matches *m'*, the projection of the line that passes through *V* and *P*; *Pr'* is the plan projection of the intersection point between *m'* and the cylindrical surface. Vaulezard draws in elevation both the generatrix of the cylinder through the point *Pr*, named *g*, and the line *m* passing through *V*, *P* and *Pr*.

Vaulezard uses the plan drawing to reconstruct the vertical plane that will contain the reflected ray, simply drawing a straight line that forms with the circumference the same angle of incidence formed by *m'*. To do this, Vaulezard extends *m'* to the second intersection *M'* with the circumference, centres the compass at *Pr'* with radius *Pr'M'*; the arc, thus drawn, intersects the circumference at *N'*. The line *n'* will pass through *N'* and *Pr'*. The chord through *M'* and *N'*, as Vaulezard himself notes graphically, is parallel to the tangent to the circumference at *Pr'* [12]. The last step reconstructs the position of *Po* on the line *n'*; Vaulezard considers that the reflected ray must cover the same distance that separates the point *Pr* from the point *Q* where the line *m* intersects the plane of the cylinder: he therefore imposes the equivalence *PrQ*=*PrPo*. To find *Po*, Vaulezard represents the second projection of *Q*, i.e. *Q'*, and, from this, the point *Q* on *m'*; he then traces, in top view, an arc of circumference with centre at *Pr'* and radius *Pr'Q* (fig. 9). The point of intersection between the circle, thus drawn, and the line *n'* will be the point *Po* [13].



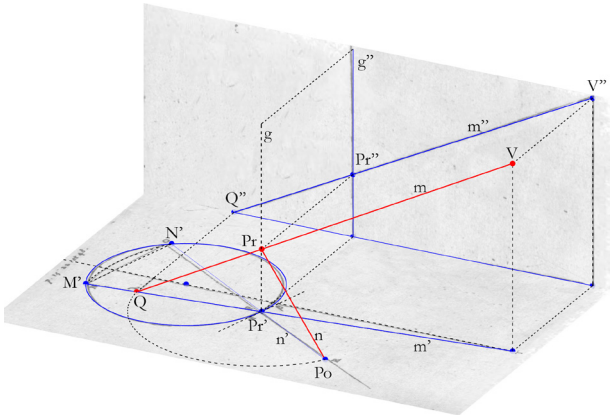


Fig. 8. Explanatory model of the construction proposed by Vaulezard (drawing by the authors).

Fig. 9. Illustration of the construction proposed by Vaulezard with the spatial reconstruction of the projection planes (drawing by the authors).

Digital tools for the photorealistic verification of projective correspondence

Digital representation and photorealistic rendering tools make it possible to verify the operations described by Bettini and Vaulezard and demonstrate the substantial differences in the produced effects.
Both verifications have been carried out by tracing, onto a cylindrical surface, a circumference at a pre-established height; afterwards, the circumference has been projected onto the horizontal plane according to the two mechanisms proposed by the two authors; finally, the correspondence between the starting circumference (our prototype) and its reflected image on a cylinder having the same dimensions has been verified.
The first studied mechanism uses projecting straight lines (light rays): given the cylinder and the circumference to be projected, a point on the axis of the cylinder is chosen, and this point assumes the role of the centre of projection, or light source; from this point the projecting straight lines are then drawn to intercept some points of the circumference, thus identifying their projection on the horizontal plane. As can easily be argued, the projection on the horizontal plane of the circumference onto the cylinder is once again a circumference, concentric to the first one. Following Bettini's instructions, in order to see, on the cylindrical surface, the match between the reflected and the drawn circumference the observer must be positioned at the same height as the centre of projection and at a distance from the cylinder equal to the radius of the cylinder.
Using a digital tool for photorealistic rendering [14], it is possible to assign a reflective texture to the cylinder and position a virtual camera on the previously defined observation point. It is thus verified that the circumference identified on the cylinder and its reflection are perfectly congruent only on the portion of the cylindrical surface closest to the generatrix, at the intersection between the cylinder and the vertical plane through the cylinder's axis and the observer's point. In fact, the digital model demonstrates that, moving away from this generatrix and approaching the apparent contour generators, the two circumferences show slight deviations (fig.10a).
The second verification was performed using Vaulezard's geometric method for catoptric anamorphosis. Given the circumference on the cylinder and the observation point, the incident rays through chosen points on the circumference and their reflections have been identified, thus

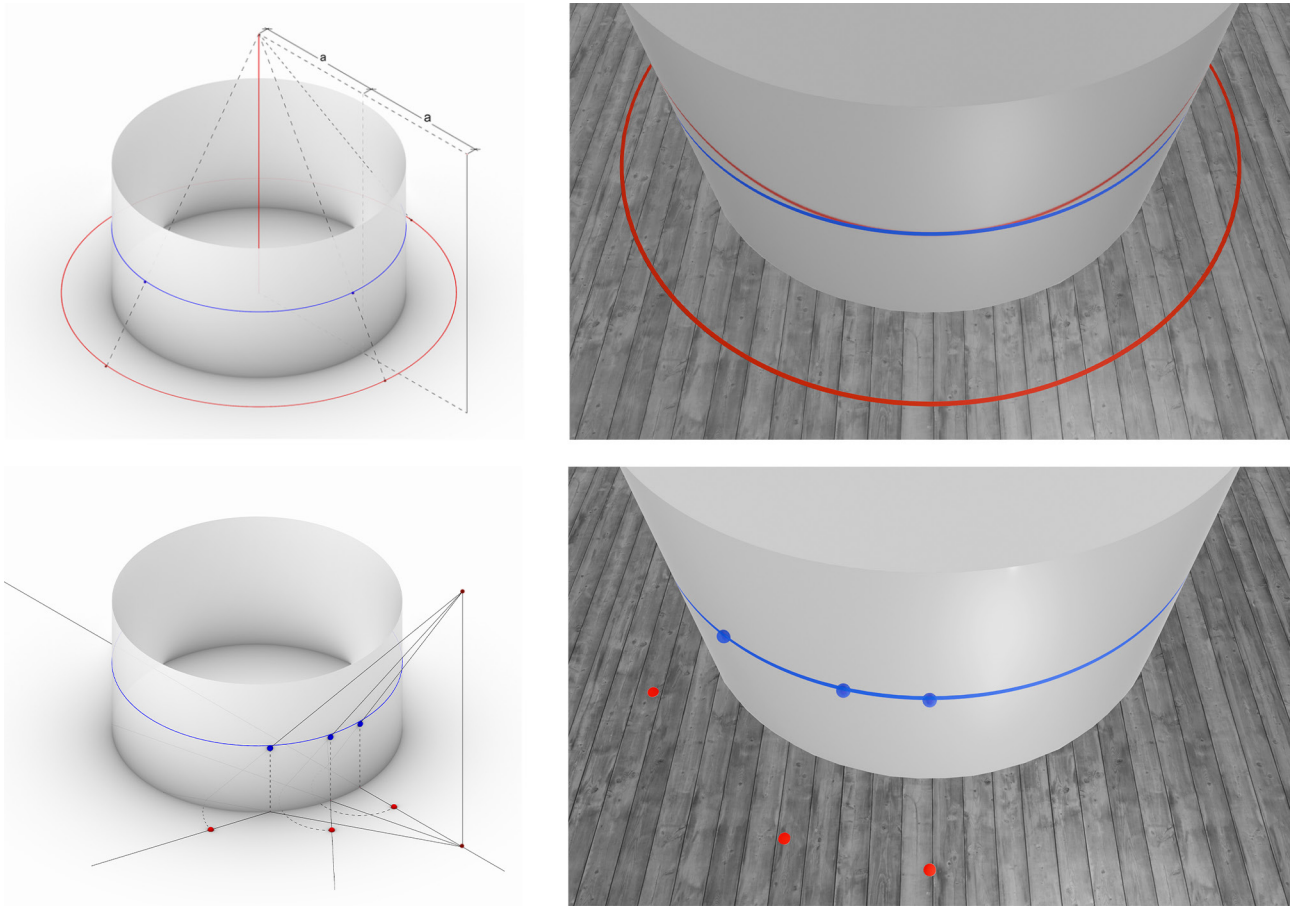


Fig. 10. a) Verification of the light-ray method; b) Verification of the Vaulezard method (drawing by the authors).

obtaining their projection on the horizontal plane according to Vaulezard's method. Assigning a reflective texture to the cylinder and placing a virtual camera on the observation point, it has been verified that the circumference drawn on the cylinder exactly matches its reflection (fig. 10b). It is thus confirmed that if the observer is positioned exactly at the predetermined viewpoint, the Vaulezard geometric mechanism has no error.
This test has revealed advantages and weaknesses of the two techniques: while the method proposed by Vaulezard is the most correct, it can be used only for the reflection on the cylinder of an image that takes only a limited area of the horizontal plane, that can be reflected on the portion of the cylinder that is visible from the observation point.
On the other hand, the method proposed by Bettini, which is affected by the deviations described above, allows the catoptric correspondence between plane and cylindrical image to be extended to the entire circumference; these deviations can be considered irrelevant, as Schott has already noted, for an observer who rotates around the mechanism composed of a horizontal plane and a cylinder, i.e. to observe the entire cylindrical panorama recreated by the reflection.

The Panoramas of Thun and Constantinople

As already noted, this study aims to answer two questions:
1. is there a projective relationship that explains how horizontal panoramas were drawn?
2. if this relationship exists, does it allow us to reconstruct, by reflection, the image of the panorama displayed in the rotundas starting from its horizontal panorama?

The previous considerations guided the analysis of the two chosen case studies [15].
The first test was dedicated to find a correspondence between the horizontal and cylindrical panorama. To this end, after mapping the cylindrical panorama onto a surface of corresponding shape, a vertical plane passing through the axis of the cylinder and a remarkable point of the cylindrical panorama was identified; the horizontal panorama was then mapped onto the plane at the base of the cylinder, ensuring that the hollow inner portion of the circumference corresponded to the base of the cylinder; the mapped image was then rotated until the remarkable point of the cylindrical panorama matched the corresponding point on the horizontal panorama.
At this point, the vertical plane passing through the axis of the cylinder was rotated in order to intercept other remarkable points of the cylindrical panorama, in order to verify whether the line of intersection between these points and the horizontal panorama passed through the corresponding point.
This test has revealed a good correspondence between the two images of the Thun panorama, while it showed clear inconsistencies for the Constantinople panorama; it was therefore decided to exclude the second panorama and perform further analysis only on the Thun panorama.
The next step was to verify whether there was a projective correspondence between the two versions of the Thun panorama based on the light ray mechanism.
For this purpose, straight lines passing through homologous points were drawn on the previously identified vertical planes. The research of a convergence towards a common point was successful and showed that, to a good approximation, the lines passing through homologous points intersect the axis of the cylinder (Fig. 11).
In addition, the verification showed that this point of convergence on the axis of the cylinder is placed at a distance from the base that equals the diameter of the cylinder.
The research for the projective correspondence between the cylindrical and horizontal panorama of Thun showed that it corresponds to the method proposed by Bettini.
As far as the second question is concerned, it can be observed that, based on what was observed in the previous paragraph, Thun's horizontal panorama made it possible to recreate the image of the panorama on the reflective surface of the cylinder with an acceptable approximation (fig. 12).

Conclusions

This study focuses a topic often eluded by the scientific literature on the subject: the relationship between cylindrical panoramas and their anamorphic transformation into horizontal panoramas. It has been proposed that a catoptric mechanism could be used to reconstruct the cylindrical panorama outside the rotunda, through the reflection of the horizontal panorama on a cylindrical surface located at the centre of the horizontal panorama. The examination of 17th century treatises focusing the relationship between cylindrical images and their flat anamorphosis has made it possible to verify two different projective workflows that use light rays and reflection

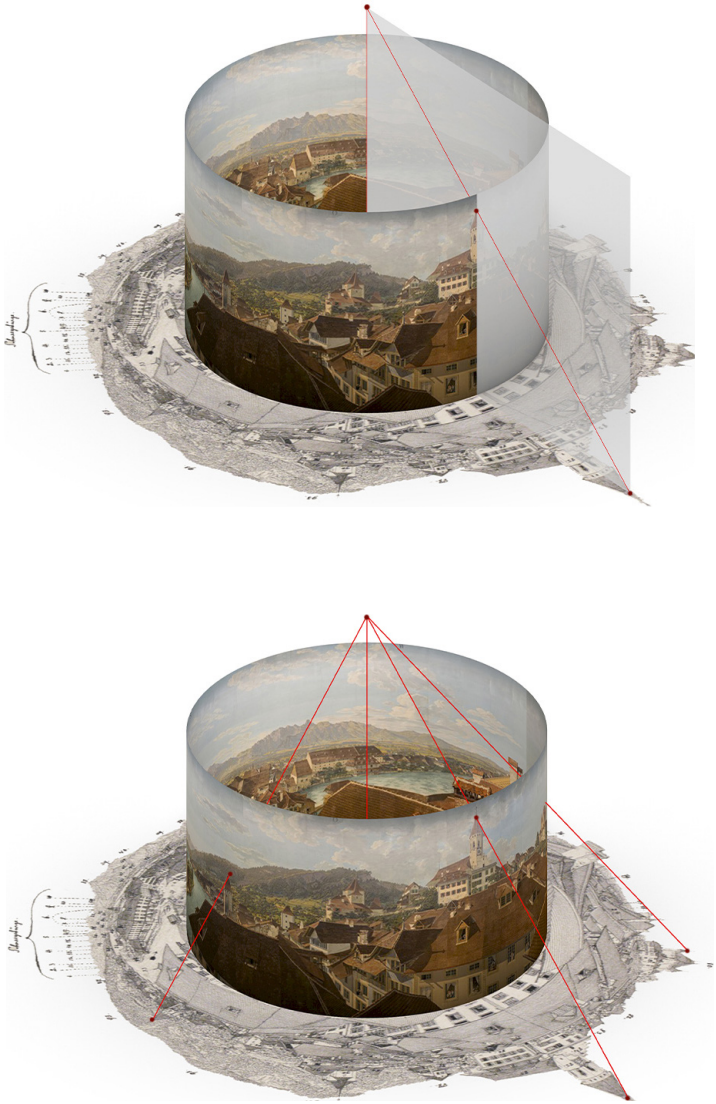


Fig. 11. Steps for finding the projective correspondence between the cylindrical panorama and the horizontal panorama of the city of Thun (drawing by the authors).

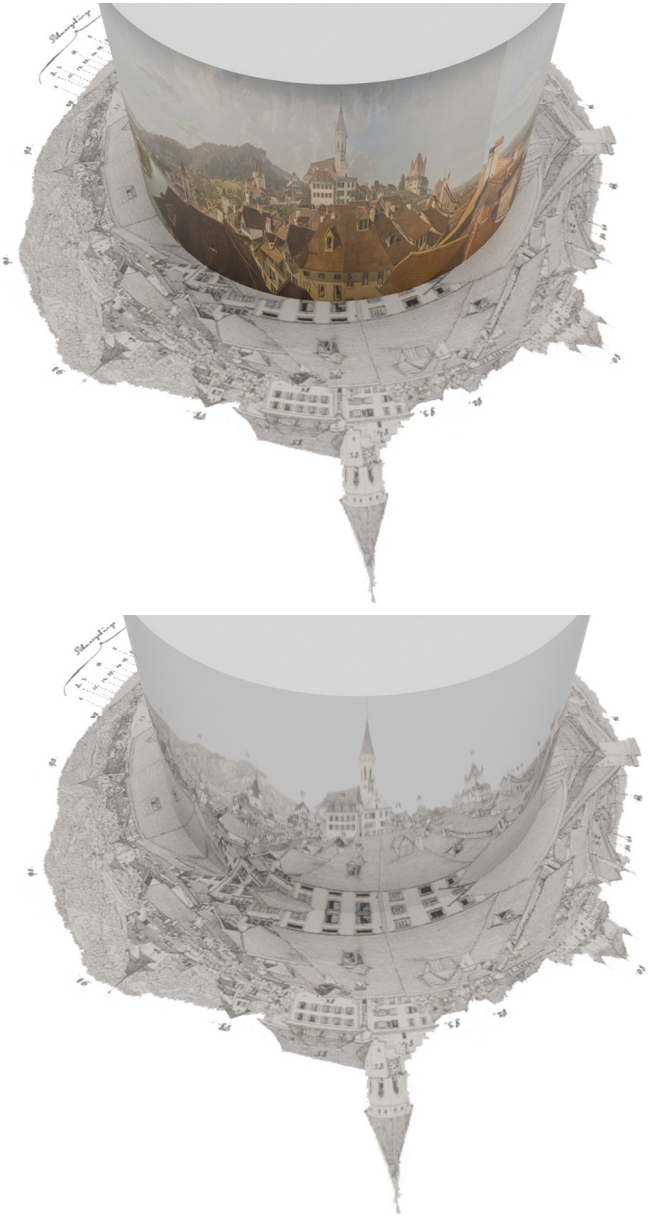


Fig. 12. Comparison between the cylindrical panorama of the city of Thun and the one produced by the reflection of the horizontal panorama (drawing by the authors).

respectively. The analysis, also developed with the aid of digital tools for photorealistic visualization, has made it possible to confirm the hypothesis of a relationship based on projecting lines (light rays) converging at a point on the axis of the cylinder, whose distance from the base equals the size of the diameter. The proposed considerations must be intended as simply hypothetic, because, although many horizontal panoramas and a good number of cylindrical panoramas have come down to us, the double version of the same panorama has been retrieved only in two cases, one of which turned out to be inaccurate; the field of investigation was therefore restricted to a single case study, the panorama of the small Swiss town of Thun.

Notes

[1] The panorama of Constantinople, now kept in the Leiden library, has never been exhibited to the public.

[2] The definition of the panorama as a mass medium was introduced by Stephan Oettermann in his famous monograph on the 19th-century panorama [Oettermann 1997].

[3] In Barker's patent, the rotunda was described as: «a circular building […] lighted entirely from the top, either by a glazed dome […] inside this building there must be a circular stage […] there must be over it […] a shade or roof […] to prevent an observer seeing above the drawing or painting, when looking up; and there must be […] another interception […] so as effectually to prevent the observer from seeing below the bottom of the drawing» [Bordini 1980, p. 13].

[4] The small format of the horizontal panoramas allowed their quick and cheap reproduction, facilitating their preservation even by enthusiasts; on the other hand, most of the cylindrical panoramas made during the 19th century have been lost due to the degradation induced by the repeated transport and assembly operations to which they were subjected.

[5] A proposal for the reconstruction of a lost cylindrical panorama starting from its horizontal panorama was carried out for Schinkel's panorama of Palermo; the study was conducted by Fabrizio Ferro, architect and PhD in Survey and Representation at the University of Palermo, as part of his degree thesis in Architecture, discussed in 1993 [Ferro 1996]. Ferro proposes a graphic procedure that applies Galli Bibiena's method to project a three-dimensional object on double-curved surfaces. Given the considerations set out in the text, the authors state that they cannot agree with the assumptions and procedure adopted by Ferro.

[6] «*Advertendum tamen est (ut exactissimè omnia fiant) lumen, quod collocandum est post cavam papyrum, tantum dem ab ea, et in eadem altitudine distare opporrere, quanta est distantia, et altitudo oculi visentis emendatam imaginem depictam in convexo papyri cylindricè incurvatae*» [Bettini 1642, V, p. 8].

[7] Bettini states that light, as a natural phenomenon, is without error: «*Atque hic prefectissimus deformationis modus est, cui rite facto nullus error subesse poterit, cum naturam magistram in proiectione, ac traiectione luminis sequatur*» [Bettini 1642, V, p. 8]. On the other hand, Schott notes that the accuracy of geometric reconstruction of the reflection phenomenon is superior to projection using light rays: «*Hic obiter observo, lumen non tam accuratè praestare dictum officium designandi in plano figuram*» [Schott 1657, III, p. 162]. A little further on, however, the author states that the margin of error is acceptable, as it does not affect the perceptual experience: «*Sed in similibus praxibus non requiritur scrupolositas geometrica*» [Schott 1657, III, p. 162].

[8] The text that rekindled the scientific community's attention to the projective phenomenon of anamorphosis in contemporary times is *Anamorphosis o Thaumaturgus opticus* by Jurgis Baltrušaitis. Numerous studies on the subject have been conducted in subsequent years by Riccardo Migliari and the academic school that draws on his teachings; two volumes collect the results of a PRIN project in which numerous scholars from different universities participated [Valenti 2014], while a more recent text offers a compendium of theories above perspective and its applications [Migliari, Fasolo 2022]. An important recent exhibition on the anamorphosis of Nicéron and Maignan, curated by Agostino De Rosa, author of numerous studies on the subject [De Rosa 2013], has to be mentioned. A valuable compendium of treatises on anamorphosis is offered by Chiara Capocefalo's PhD thesis [Capocefalo 2014], which deals with optical and catoptrical anamorphosis through the demonstrations set out by de Caus, Vaulezard, Hérigone, Nicéron, Dubreuil, Bettini, Kircher and Schott. In the plates attached to the text, the 17th-century schemes are redrawn by the author to aid understanding and highlight certain approximations.

[9] Demonstrations of the catoptric phenomenon, after Vaulezard, adopt an intuitive approach to bring them closer to the artists' practices. Jean François Nicéron, for example, in the book III of his treatise, published in 1638 and entitled *Perspective Curieuse ou Magie Artificielle des Effets Merveilleux*, proposes an admittedly approximate method, including corrections to be made by observing the image reflected on the mirror. Nicéron does not consider the relationship between the incident and reflected rays and, above all, the position of the point of view for the correct view of the reflected image. Later, in the same volume, Nicéron proposes a scheme based on that of Vaulezard, proposing some simplifications. Subsequent works describing the construction of anamorphic images, starting with Dubreuil's 1642, collect and graphically rework previously published schemes, adopting a practical and intuitive approach.

[10] «*Et il faut décrire en ce plan une ligne, de laquelle l'apparence tombe sur le côté du miroir cylindrique*» [Vaulezard, 1630, Problème I, p. 14].

[11] For ease of reading, the description, while remaining faithful to the scheme proposed by Vaulezard, adopts the annotation of points and lines proposed in the text; in addition, it uses the current conventions on the indication of double orthogonal projections.

[12] «*Du point T, soit menée la ligne droite TF, prolongée jusqu'à la circonférence concave du cercle, coupant icelle au point N; puis du point F,*

comme centre, & intervalle FN, soit décrit l'arc de cercle NO, coupant la circonférence du cercle de la base au point O, duquel par le point F, tirant OFR, icelle FR, sera la ligne requise. Car, si on tire la ligne αβ touchant le cercle ABC, au point F, l'angle OFβ sera égal à l'angle ONF» [Vaulezard, 1630, Problème I, p. 14].

[13] «*En après soit faite la ligne Fκ, parallèle a TV […]; puis tirant la ligne droite Vκλ, coupante la ligne TFλ, au point λ, si on fait FR, égale à Fλ, le point requis sera le point R*» [Vaulezard, 1630, Problème 2, p. 17].

[14] The drawings and models designed by the authors to illustrate the essay were made with Rhinoceros; photorealistic simulations were calculated with Blender.

[15] The first case study is the panorama realised by Henry Aston Barker and exhibited at the rotunda in Leicester Square, London, between 1801 and 1802, called *View of Constantinople from the Town of Galatea*; the panorama shows part of the city and port of Constantinople from the tower of the historical quarter of Galata. The original canvas has been lost but its dimensions are known, and a scale aquatint made by Charles Tomkins in 1813 has been preserved [Hyde 1988]. The aquatint, divided into eight sheets, and the viewer's *key* of the panorama are preserved in the Prints and Drawings Department of the British Museum. The second case study is the *Panorama von Thun*, created by Marquard Fidelis Wocher and exhibited since 1814 in a small rotunda in Basel, Switzerland. This panorama, depicting the mountain landscape of the small town of Thun, is 7,5 m high and 38 m long [Steiger-Bay, H. A. 1950]. The panorama is now displayed in Thun inside a new rotunda, designed in the 1960s by architect Karl Keller.

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Landscape Drawing in Contemporary Design

Landscape Design as the Representation of Relationships with Nature, Ecologies and other Living Species

Lucina Caravaggi

Landscape design has always been considered an open reference, an available space of interpretation, but this is not equivalent to considering it a field of indeterminate images and concepts [Caravaggi 2021].
The hypothesis I will attempt to argue in this article is that landscape design can be coherently interpreted as a representation of the infinite relationships between human societies and the natural world and, more recently, between humans and other living species.
I would like to be able use other terms rather than 'nature' and 'natural', in taking up Bruno Latour's recommendation [Latour 2018]. Dismantling the dualistic nature-culture construct allows us to reveal that it is, in fact, a single and highly-cohesive concept which in many contemporary landscape design projects has been traced back to the ecological sphere and more recently to the broader dimension of 'living' [Caravaggi 2018; 2020; 2022]. The challenge to conventional binary thinking appears, in other words, inevitable, if one wants to interpret landscapes having undergone fierce contemporary transformations.
Many landscape architects, even though they belong to different cultural and historical contexts, have a common vision capable of seeing living species as traveling companions on the path to the project and not as trivial 'tools', as is also evidenced by their drawings, aimed at highlighting relationships rather than objects. Landscape has always been, since its modern foundation with Alexander Von Humbold (1769-1859), a system of relationships [Caravaggi 2023a].

This article was written upon invitation to frame the topic, not submitted to anonymous review, published under the editorial director's responsibility.

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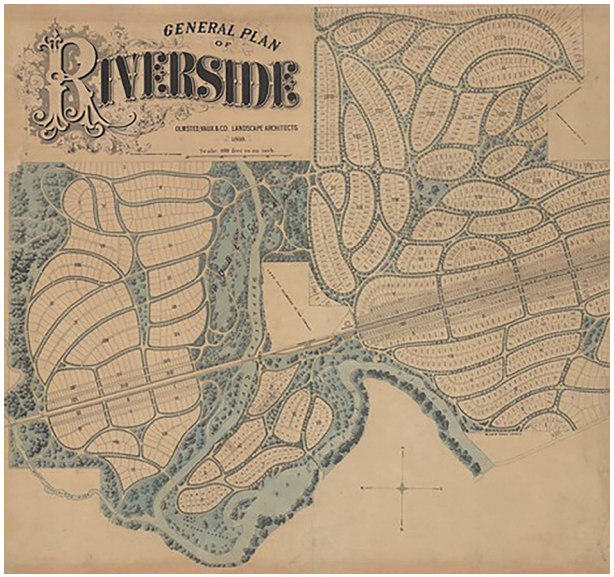


Fig. 1. F.L. Olmsted, General Plan of Riverside, Chicago, 1868 (Olmsted archives litho 00607).

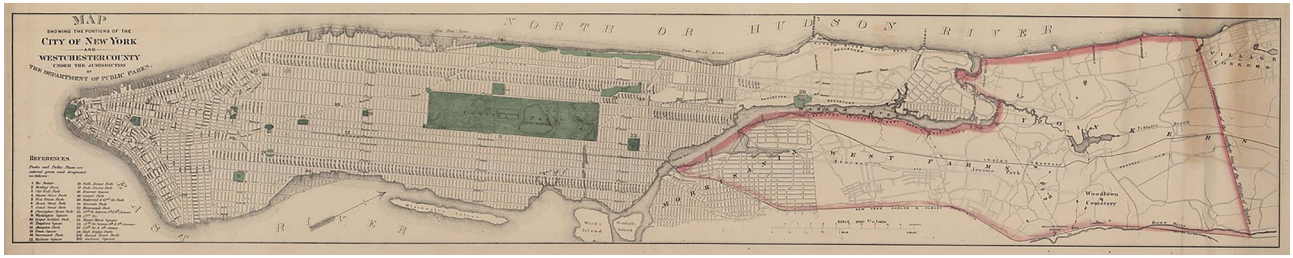
The selection of images that follows is intended to precisely highlight the relational character of landscape design, but also the trust in design understood as a possibility of action in the face of phenomena that seem impossible to control, such as the worsening ecological crisis and climate change, the loss of biodiversity and the growth of social inequalities.
In this sense, the reference to Frederick Law Olmsted (1822-1903) is an almost obligatory starting point. A firm believer in the possibility of profoundly influencing the construction of the city through large-scale green interventions intended to condition its future expansions and functionings, Olmsted also upheld the need for a close relationship between projects and new demands for social equality and urban democracy [Caravaggi 2023b]. Indeed, for Olmsted, the mediation of the landscape architect's work constitutes the means by which to foster democratic development and guarantee every citizen's enjoyment of nature [1], understood not as irreducible wilderness, but as domesticated, healthy, beneficial space, accessible to all [Imbroglini 2003; 2019].

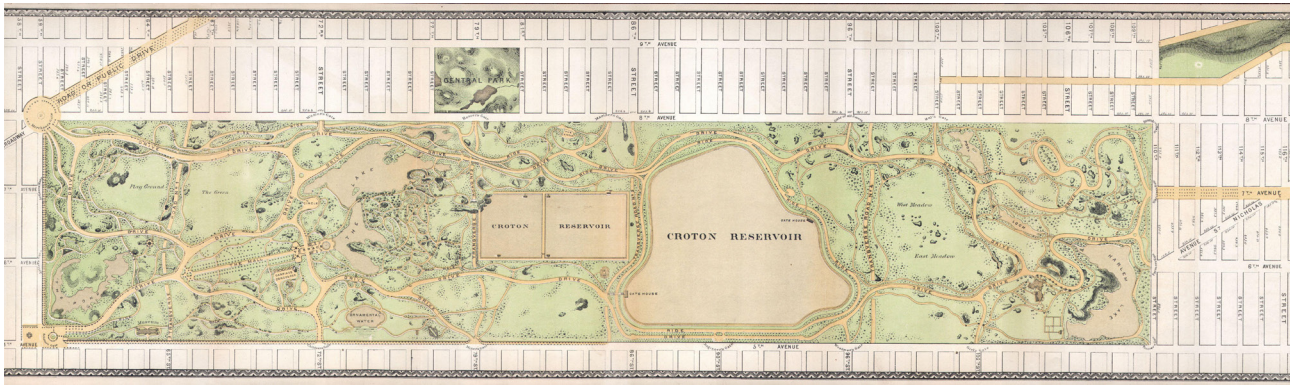
Interrelationships and 'open' landscapes

The emergence of a new historical-environmental awareness based on the discovery of the physical-biological limits of natural systems fueled, between the 1960s and 1980s, new design experiments characterized by the affirmation of positions of a 'relational' nature that opposed the objective nature of classical geography. In the post-World War II period, the affirmation of the relational and systemic character of the landscape also found full expression in our country [Italy].
Vittoria Calzolari outlines the 'structure' of the landscape as the outcome of "correlations between morphological, biophysical and climatic factors, components of an ecological system regulated by mechanisms of action and retroaction, but also by the historical evolution of geo-political, juridical, economic, technological and other similar structures, hence the term 'anthropogeographical structure'" [Calzolari 1974, p. 82].
As in Calzolari's drawings, "Lands, waters, woods, countryside, parks, historical buildings and places, paths, tend to be seen in their interrelation and integration as parts of a single structure and of a unitary design project: this concept is valid for the project for conservation of the historical landscape, as well as the project for creating new landscapes" [Calzolari 1999, p. 61]. The idea of 'system' sanctions not only the inexorably relational nature of every action aimed at the landscape, initiating a harsh critique of sectorial actions, but also the need for strategic thinking capable of leading individual design experiments back to the same general purpose. This attitude courageously introduces a trans-scalar dimension into the project, in a period still dominated by cascading planning and design (from large to small).
In addition to historical dynamics and the rearticulation of spatial scales of representation, the temporal dimension also officially enters landscape design, being understood as the possibility of 'natural evolution' in space and time, as is evident in the work of a number of landscape architects, including, in France, Michel Corajoud. In the Parc de Sausset, the realization of the patterns of the countryside relies on a geometric reading of the context, to make evident the relationship with the new public spaces, but also the evolution of natural forms over time: "It is a very refined work that interprets and exploits the potential of the place, without subjecting it to a radical and arbitrary transformation. This respect for the soil has nothing conservative about it; it is the condition of the future […]. In

Fig. 2. F.L. Olmsted, Central Park (Olmsted archives 00502-5).

Fig. 3. F.L. Olmsted _Map_of_Central_Park,_New_York_City, 1869 (Olmsted archives 00502-8).





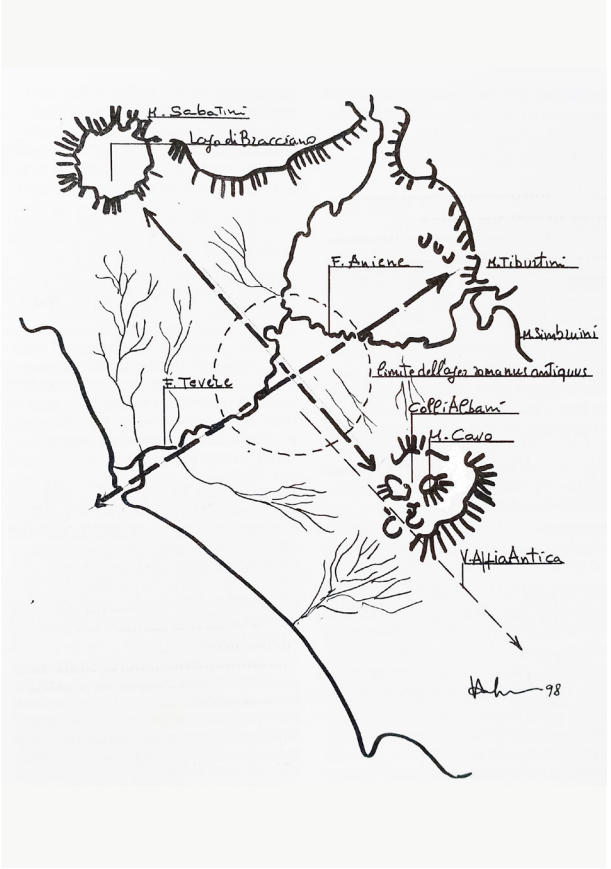


Fig. 4. V. Calzolari, Trame insediative e trame ambientali. Corridoi verdi e linee d'acqua. Quattro generazioni di oggetti sull'affaccio di Monte Mario [from Calzolari 1999, p. 246].

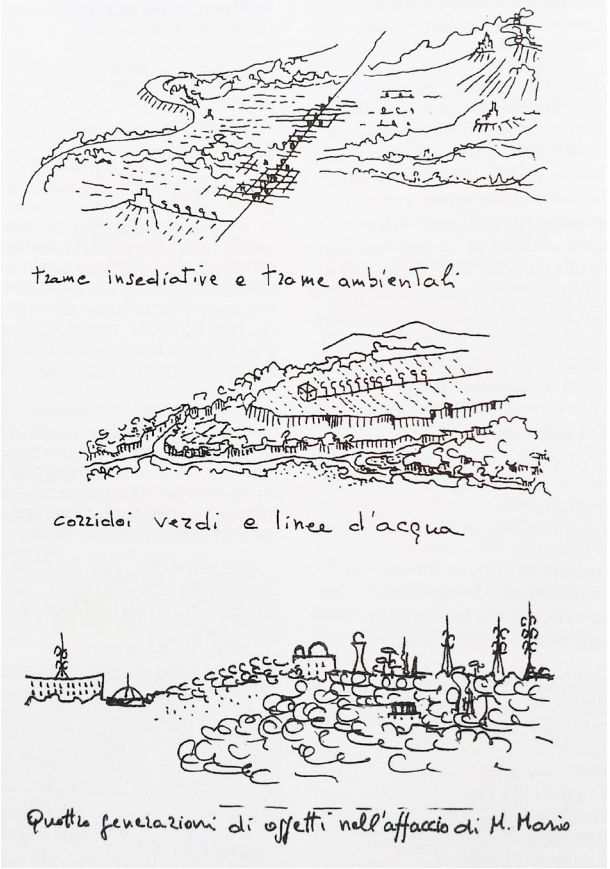


Fig. 5. V. Calzolari, Tracciati ordinatori della struttura storico-morfologica dell'area romana. [from Calzolari 1999, p. 50].

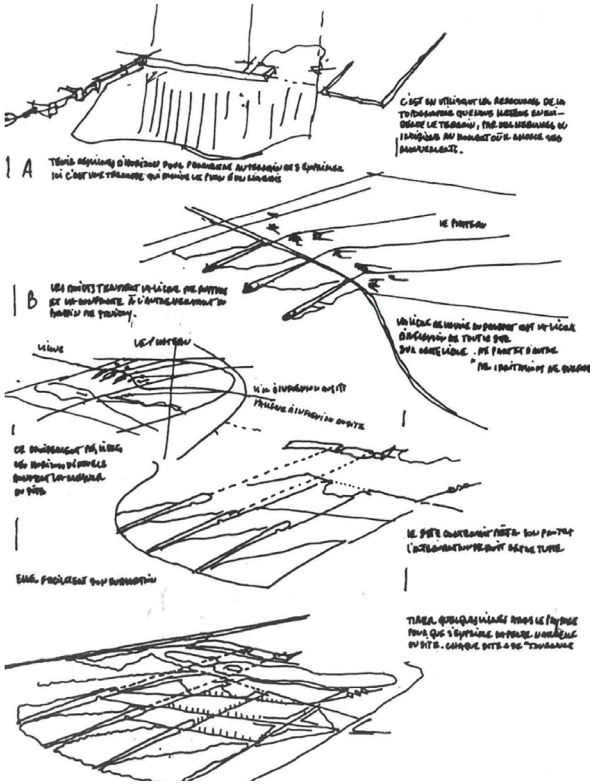


Fig. 6. M. Corajoud, explanatory diagram of the functioning of the Parc du Sausset], 1989 (from Nourrisson 2000].



Fig. 7. M. Corajoud, diagram of the geometric pattern of the Parc du Sausset, 1980 [from Nourrisson 2000].

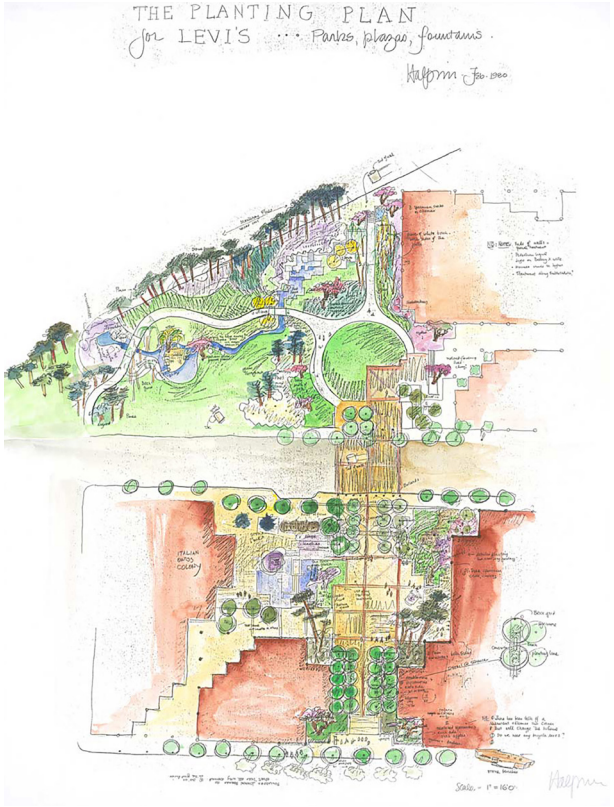


Fig. 8. L. Halprin, Levi's plaza site plan in San Francisco, 1979-82 (<http://www.tclf.org/sites/default/files/microsites/halprinlegacy/levis-plaza.html>).

this, the landscape architect, with other means and other finalities, takes up the farmer's baton. Michel Corajoud finds in traditional agriculture a model and a source of inspiration" [Collot 1998-1999, pp. 164-165] [2].
In those same years, landscape design was transformed into an 'open process' [3], also with respect to the people who wanted to take part in it, starting with the founding experiences of Lawrence Halprin. The new relationships between man and the environment, between different (and often distant) disciplines, led Halprin to define landscape design as an art of collective creativity, and cities as a place where people can realize their creative potential [Gangemi 2019].
The 'open' landscape is not a given (fixed) space attributable to clear demands on the part of well-defined subjects, but also to a system of interactions between different, heterogeneous, often conflicting components. And Halprin's highly animated drawings bear full witness to its historical relevance and extraordinary topicality.

Dynamic ecologies

A second stage, relevant from the point of view of the affirmation of relational thinking and trust in design is connected to the worsening ecological crisis. Ecology, which stands precisely as the science of relationships between living organisms and their living contexts, has, since the 1990s, assumed a prominent role in the interpretation of many contemporary landscapes. The reference to dynamic patterns, understood as a set of actions and retroactions, emphasizing the relevance of the temporal dimension and its uncertainty, also entails a profound transformation in the way design is considered.
The new interpretations of contemporary urbanized territories take their cue from the positions of important contemporary sociologists and geographers, such as David Harvey and Edward Soja, who invite us to read the structural transformations of metropolitan regions starting from the economic mechanisms that determine their increases, crises and spatial mutations, aspects that are irremediably different from the modern city. They are the exponents of Landscape Urbanism who, interpreting the dynamics of contemporary urbanization from patterns of exchange and flows of people, vehicles, materials and information, propose a new 'radical' relationship between the science of ecology and design culture. The intention is to free ecology from the objective limits of the ecological



Fig. 9. L. Halprin, Sketch of Jerusalem, 1987(<https://www.tclf.org/sites/default/files/microsites/halprinlegacy/haas-promenade.html>).

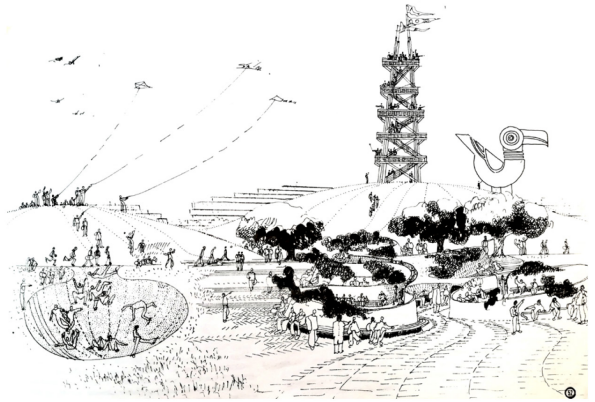


Fig. 10. J. Simon, Schizzo di un parco, Aménagement des espaces libres. Plans, Croquis, perspectives de projets, n° 23, 1988.

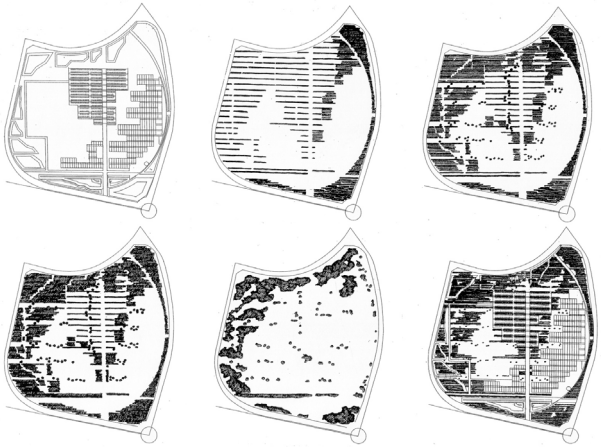


Fig. 11. M. Desvigne, 30 year planting development, Thomas Plant, Guyancourt, 1989 (<https://micheldesvignepaysagiste.com/en/michel-desvigne-0>).

paradigm, contrasting and reinterpreting it starting from new cultural, professional, historical and geographical perspectives: "Our intention was to bring science out of ecology and bring it into design, and to take art out of design and bring it into ecology" [Corner 2011, p. 23]. The focus thus shifts towards building a direct dialogue with the processes, whether environmental, economic or social.

OMA's plans for the Parc de la Villette competition constitute a shared reference; the idea of 'programmatic indeterminacy' asserts itself within landscape design [Waldheim 2006; 2016; Corner 1997], and encourages the widespread use of maps and diagrams as tools for a representation capable of communicating the different evolutionary possibilities of a given structure.

For James Corner, it is necessary to develop new creative ways to shape process design: "In this sense, landscape exceeds typical architectural concerns with formal and stylistic appearance and demands a more focused attention to the design of method, process and configuration of emergence" [Corner 2007, p. 150].

A significant example of planning in this sense is the well-known *Lifescape Project* for the rehabilitation of the Fresh Kills Landfill in New York. Here, Corner proposes a new form of public-ecological landscape guided by time and processes, where the logic of natural systems and the self-adaptive ecological dynamics are used to define multi-scalar and multi-temporal strategies. Corner defines the new identity of this nature reserve as 'nature sprawl', imagining it as supporting a spontaneous process of the diffusion of plant and animal species that, over the course of twenty years, will recompose a synthetic nature which, although governed by technology and by a project, will become a place of emerging colonizations, both natural and artificial.

In James Corner's works, ecology is taken as the engine of figurability: "In these early experiments with radical ecological indeterminacy, urban form is given not from planning, policy, or precedent, but through the self-regulation of emergent ecologies as curated by a landscape urbanist" [Waldheim 2016, p. 45].

In Europe, too, ecology proves to be a matrix of spatial ordering with respect to different scales and themes. Projects testify to a growing attention toward aspects of environmental functioning, initiating a long season of regenerations and renaturalizations. The form comes from the knowledge of morphological, hydraulic and ecological dynamics, whether real or potential, as in the case of many projects by Michel Desvigne and George Descombes, which at times, however, seem to become too complacent with such a powerful formal matrix.



Fig. 12. J. Corner, Field Operation, Freshkills, growing a park over time, 2001 (<https://www.fieldoperations.net/project-details/project/freshkills-park.html>).

The point of view of the subjects is introduced into the new landscape designs in new forms. In Europe, it is especially Jacques Simon who reaffirms the landscape as a public asset, an asset of the earth offered to the community, at the service of a creativity and inventiveness that is always imagined 'for' and 'in function of' someone [Colafranceschi, Galì-Izard 2018]. Simon's garden has very broad boundaries, to the point of coinciding with vast agricultural and natural spaces, in which the landscape architect's sign is only a signal, an acknowledgement and a tribute. In this framework, his project for the Parc de la Deûle in Lille appears significant [4]. The proposal envisions the restoration of natural conditions in a vast territory exploited and polluted by mining, through the reclamation of contaminated sites, the ecological restoration of water lines and green spaces, and the reconstitution of an agricultural land plot that infiltrates into Lille's urbanized suburban territories and transforms itself into a local environmental network, the largest regional *trame verte et bleue* [5].
The project testifies to the emergence of a new aesthetic perception based on the right of natural components to evolve freely, winning back run-down, abandoned spaces; this perception finds its full affirmation in Gilles Clément's *Manifesto del Terzo paesaggio* [*Manifeste pour le Tiers paysage* /*Manifesto of the Third Landscape* 2004] [Lei 2023].

The climate crisis and relations with "other" living species

Concerns about the loss of biodiversity and new challenges related to climate change underlie a further evolution of landscape design characterized by an increasing attention to other living species, not only plants, but also animals [Imbroglini, Lei 2023].
The theme of the common fate binding humans and non-humans becomes central.
Rather than the holistic slogan of 'everything is connected to everything else', which is perhaps no longer helpful, along with Donna Haraway we might say that "everything is connected to something that in turn is connected to something else" [Haraway 2019, p. 60]. In other words, what matters is the specificity and proximity of connections, that is, who we are connected to and in what way.
The crisis of the antinomy between human and natural is accompanied by many other disconnections, involving established oppositions within the design culture of architecture and landscape, beginning with that which for almost two centuries has rigidly confined science and creativity, and in more recent years has exacerbated the opposition between the scientific determinism of ecology and the aestheticizing drifts of urban and landscape design [Lentini 2019].

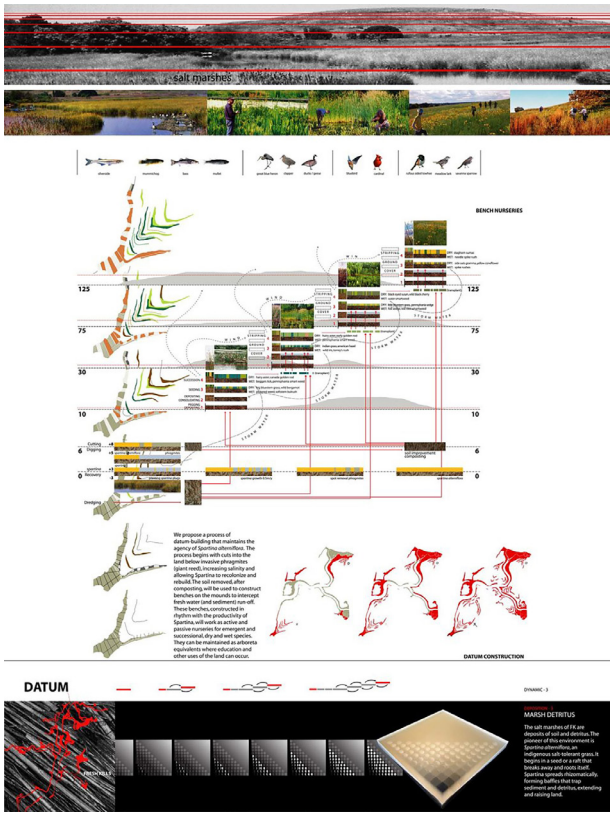


Fig. 13. Mathur da Cunha with Tom Leader Studio, Dynamic coalition. Fresh Kills landfill, 2001 (<https://www.mathurdacunha.com/dynamic-coalition>).

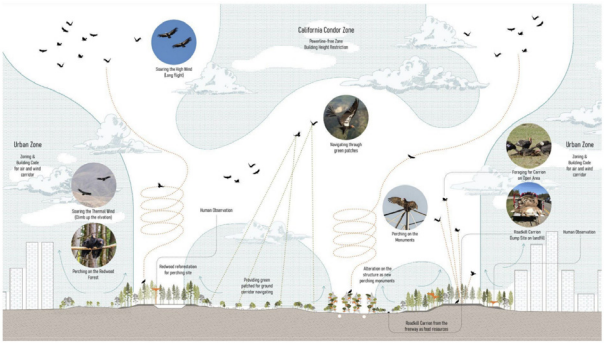


Fig. 14. C. Reed, 2022, Wild Ways: A Fifth Ecology for Metropolitan Los Angeles. California Condor Zone with building height and powerline restrictions (<https://issuu.com/gsdharvard/docs/wild_ways>).

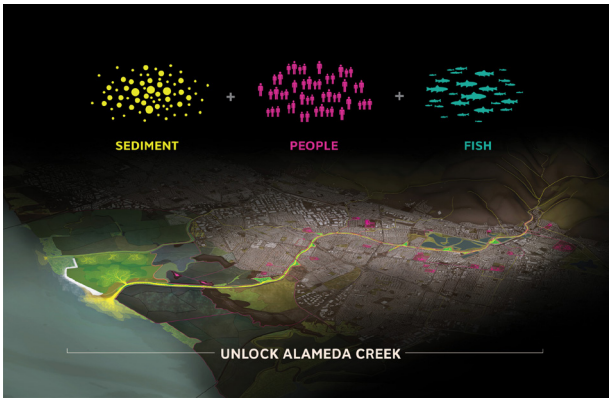


Fig. 15. K. Orff, Scape, Public Sediment for Alameda Creek (<https://www.scapestudio.com/projects/public-sediment/>).

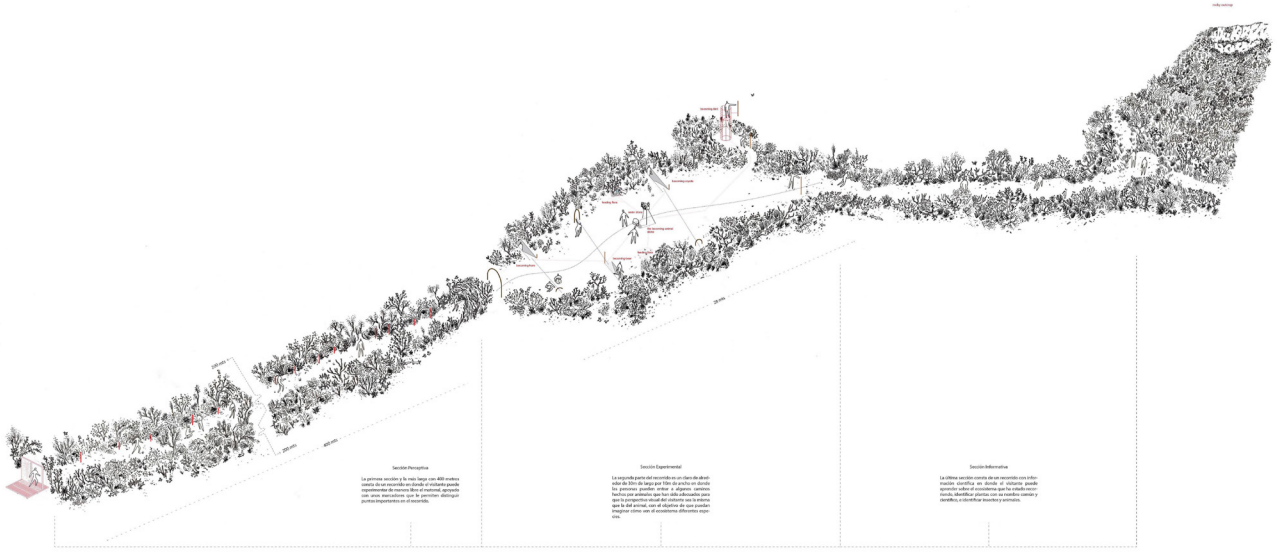
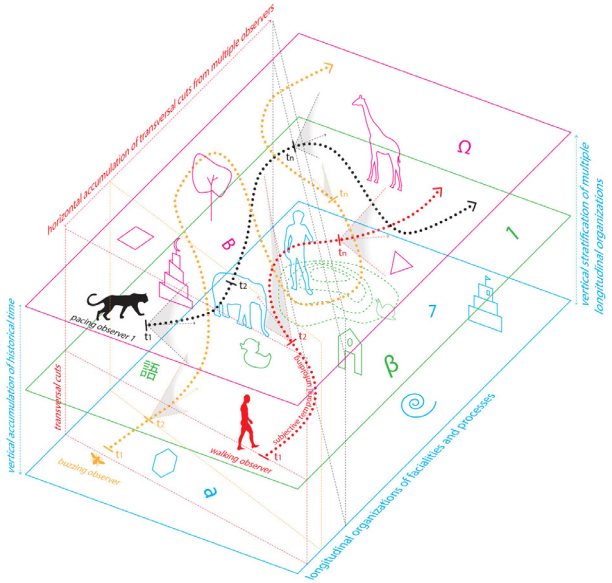


Fig. 16. Pasini Garza Ramos Rosas, Symbiotic Matorral, temporal phases, 2020 (<https://landezine.com/the-symbiotic-matorral-by-pasini-garza-ramos-rosas/>).



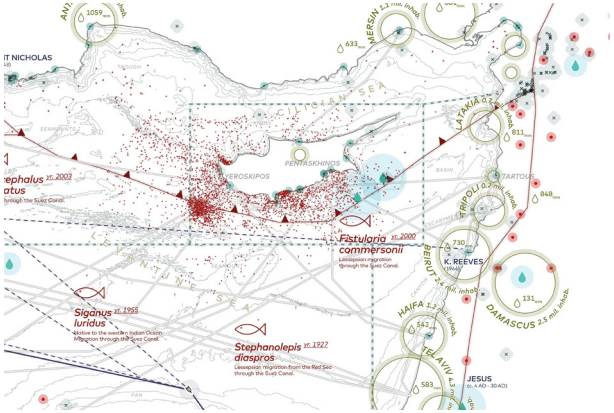


Fig. 17. Pasini Garza Ramos Rosas, Symbiotic Matorral (<https://landezine.com/the-symbiotic-matorral-by-pasini-garza-ramos-rosas/>).

Fig. 18. Openfabric, Migrating Mediterranean, 2023 (<https://www.openfabric.eu/projects/migrating-mediterranean/>).

Therefore, the 'scientific' components enter as constituent elements in the creative and participatory process, by means of refined and innovative methods, not merely 'lending' concepts of an ecological matrix for the construction of compositional metaphors. It is a new species of ecology –simultaneously scientific, social and cultural– that pursues osmosis between architects, citizens and scientists, and that considers participation a generative (not ritual or instrumental) way of working. It is a creative ecology and an ecological creativity [Krasny, Tidball 2015].
From a new inhabiting science can come a new eco-revelatory design [Hester 2006]. These positions have been developed by landscape architects such as Chris Reed and Nina Marie Lister [2014], or Kate Orff [2016], also through the use of new mapping tools and crowd-sourced techniques.
The dynamism of the 'processes' is metabolized definitively in the design project, as in the curated ecologies through which Chris Reed proposes a mode of work in which the designer seeks to support the development of dynamics over time, intervening intermittently to follow the new and ever-changing ecological conditions of the site [Reed 2010; Monacella, Douglas 2016].
Contemporary open ecological models, which are no longer linear, lead to a definitive abandonment of the idea of a return to a previous state (bounce-back, restoration, or rehabilitation) [Lister 2010], an idea that is particularly widespread, especially in the case of the violent transformations related to climate change.
The new maps of global and local problems are synthetic representations of heterogeneous elements with high symbolic value, as in the case of *Migrating Mediterranean* (2022), where Openfabric explores the limits of growth by mapping the geographic implications generated by Western standards of consumption and well-being in terms of movement of goods and people, consumption of primary resources, and ongoing ecosystem transformations in the 'Mediterranean continent'.
Projects experiment with new statutes of co-evolution and climate adaptation through flexible and responsive interventions. Communities become an integral part of urban ecosystems; landscape design is transformed into a dialogic process, based on continuous learning processes [Lister 2010].
The relational genetic imprint of landscape design is further strengthened, thanks to the multiple subjects taken into consideration and a renewed empathy with other living species, as well as by the confidence in design, a stubborn challenge to the massive transformations caused by our own species.

Notes

[1] "The enjoyment of the choicest natural scenes in the country and the means of recreation connected with them is thus a monopoly, in a very peculiar manner, of a very few very rich people. The great mass of society, including those to whom it would be of the greatest benefit, is excluded from it. In the nature of the case private parks can never be used by the mass of the people in any country nor by any considerable number even of the rich, except by the favor of a few, and in dependence on them" [Olmsted 1865, p. 7].

[2] See also: Di Carlo 2015, p. 73.

[3] The term 'open work' used by Umberto Eco comes from the rereading of Roland Barthes and Jacques Derrida's post-structuralism and emphasizes the role of the subjects who interpret the work itself, interpretations that are also profoundly different in relation to the characters and expectations of the subject.

[4] With his project for the Parc de la Deûle, Jaques Simon won the 2006 Grand Prix national du Paysage.

[5] See <http://www.trameverteetbleue.fr/> (accessed 29 November 2024).

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Contemporary Representations for Landscape Design

Sara Colaceci

Abstract

This paper addresses the issues related to contemporary representation for landscape design through significant experiences developed from the 1990s to today, born from the collaboration of architects, landscape designers, and artists such as Yves Brunier, Enric Miralles, Inside Outside (studio founded by Petra Blaisse), Mark Smout, Laura Allen, Teresa Moller Landscape Studio (studio founded by Teresa Moller), Openfabric (studio founded by Francesco Garofalo), 08014 arquitectura (studio founded by Adrià Guardiet and Sandra Torres), Mir (studio founded by Mats Andersen and Trond Greve Andersen). Contemporary trends in landscape design representation include hybridizations aimed at integrating the communicative power of the concept with photography through the expressive value of manual experience; schematic drawings of project management systems; detailed analytical representations of the multiple areas involving the landscape; botanical investigation representations; communicative images to narrate atmospheres, materials, and colors. The analysis of the methods, forms, and language in use allows for probing the expressive potential of representation. Over this time, the methods and tools have changed, but it is possible to trace a common denominator, namely the role of representation in relation to the type of narrative objective. Representation does not manifest itself simply as a product/image but as a process of construction of form and of the design and figurative content.

Keywords: representation, landscape, project, graphic languages, hybridizations.

Introduction

The current cultural debate surrounding the broad theme of landscape design – nd, more specifically, the design, recovery, and reuse of open spaces, whether they are public spaces or large urban parks, historical heritage sites, or post-industrial areas with an agricultural vocation– cannot overlook the dialectical relationship that landscape design establishes with representation. For these reasons, this paper aims to address issues related to contemporary representation in landscape design. The goal is to examine landscape design as a mode of representation, as a form of communication, and as an expressive language, through an analysis of some contemporary projects born from collaborations among architects, landscape architects, and artists, including Yves Brunier, Enric Miralles, Inside Outside (a studio founded by Petra Blaisse), Mark Smout, Laura Allen, Teresa Moller Landscape Studio (founded by Teresa Moller), Openfabric (founded by Francesco Garofalo), 08014 arquitectura (founded by Adrià Guardiet and Sandra Torres), and Mir (founded by Mats Andersen and Trond Greve Andersen).

Amid the diversity of contexts and dimensional scales, and the variety of space types and materials present in the contemporary landscape, the changes that the project assumes entail images of the before and after, as well as transformative strategies to be implemented, including the time variable. The communication of the idea and the description of the geometrically defined space are two aspects that are inevitably embedded in

https://doi.org/10.26375/disegno.15.2024.24

diségno ISSN 2533-2899
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the representation of contemporary landscape design. In particular, they are not simply products/images, but rather a process of constructing both the form and the project's conceptual and figurative content, making the relationship between drawing and project inseparable [Pierluisi 2014]. The critical significance of the figurative investigation emerges from the different approaches of the designers, where the correlation between landscape design and representation is crucial for understanding how contemporary trends unfold in this area: "Representation travels along the line of the 'visible', of the distinguishable, and simultaneously of the immaterial; for this reason, we cannot speak of the representation of the landscape without a clear understanding of its role in contemporary expressionism" [Cianci 2008, p. 22].

Hybridizations

In landscape design, the manipulation of images through the blending of techniques, tools, representation methods, and analog, photographic, and digital modes has a dual significance: on the one hand, to communicate the design concept, and on the other, to serve as a means and method for generating design inputs.
As Falbel, Pousin, and Urlberger note [Falbel, Pousin, Urlberger 2023], photomontage, which was already present in 19th-century photography [Koetz 2023] and employed by the avant-garde movements of the 20th century as a radical cultural and formal break –allowing for the questioning of the singular perspective of linear vision– enables work with the eidetic image. This type of image can conceive ideas, prompt design intentions, and play an active role in the design process [Corner 1999].
In this regard, the experiences of Yves Brunier and Enric Miralles are particularly significant, albeit with differences. In Yves Brunier's collages for *Trois jardins particuliers à Brasschaat* created in 1991 [1], the project's prefiguration takes place through the hybridization of analog, photographic, and collage techniques. The representation is a composition derived from the digital plan representation of the existing homes, to which heterogeneous fragments of photographic images and analog patches in yellow, green, blue, and white are added to communicate lawns, trees, plant species, materials, and colors. The composition conveys the design idea of organizing outdoor space and the relationship between the garden and the house (fig. 1).



Fig. 1. Y, Brunier, photomontages of the three private gardens in Brasschaat, Antwerp, Belgium, 1991 [Jacques 1996, pp. 78-79].

"Graphic with harsh colors, brutal forms wrapped in sheets of aluminum, raw paints, supports borrowed from industry, raw materials, foam, rubber, plastic. To represent the landscape and the building, cotton swabs, electrical wires, pieces of cloth, screws... Everything, as if hastily thrown, in anguish" [2] [Blaisse 1996, p. 19]. The project's prefiguration is achieved through montages to gather inputs and images that then become unexpected suggestions, facilitating the emergence of new spatial interactions and new figurations. The use of diverse materials, textures, and forms assembled together is a means to generate new figures and, consequently, new prefigurative imaginary spaces. Through collage, Brunier disrupts traditional representation methods by overlaying heterogeneous portions to suggest textures, materials, colors, and atmospheres of the project.
As Freytag highlighted, Yves Brunier's representation functions like a microtopography, featuring multiple overlapping layers and textures, thanks to the effective depth of materials and techniques used [Freytag 2014, p. 107].
"In landscape design, the drawing must convey mutability, seasonality, evolution, and even the pliability of vegetation. The centrality of space gives way to an environmental representation capable of narrating, either directly or with synesthetic devices, those chromatic, olfactory, and



Fig. 2. E. Miralles, collage for the Maretas Museum of Lanzarote project, Spain, 1999 (Benedetta Tagliabue – EMBT Architects and Fundació Enric Miralles).

atmospheric factors that substantiate the perception of a place" [Consalez, Rocca 2013, p. 52]. Morabito, drawing from Benjamin's concept of the originality of the artwork –unique because it maintains a recognizable aura over time and space– asserts that: "Brunier's contemporary landscape drawings retain their originality, surviving their projects, whether realized or not" [Morabito 2020, p. 52]. These images are based on a strong evocative power and the narrative capacity of representation [Auricoste 1996; 1997]. Yves Brunier's work demonstrates his pursuit of an expressive and communicative vocabulary between design and narration, between representation and manual experience [Rocca 2017].

Enric Miralles uses photomontage for documentation, experimentation, and to initiate the project development process. Influenced by David Hockney, Miralles developed a way to transform reality. By reassembling photographic images in a different manner, he created a system that allowed him to generate new suggestions, enriching his spatial vision [3]. The partial and fragmented shots, subsequently recomposed while maintaining overall perspective integrity (sometimes accompanied by additional overlaid textures), allowed him to expand figurative possibilities (fig. 2). Photomontage and collage became integral to the design and communication process, capable of generating meaning. They serve as an initial step in the design process that enhances spatial prefiguration.

The integrated use of painting, photography, and collage techniques relates to a craft-based dimension of representation and, at the same time, to a material dimension of landscape design. The craft and gestural aspects of cutting and reassembling disparate fragments, originally belonging



Fig. 3. Inside Outside, Parco del Polcevera, Genoa, Italy, 2019 (<https://www.insideoutside.nl/>; accessed 15 December 2024).

to other images, guide the design concept and create an evocative image that accompanies the creative act, which is an intellectual act [Miralles, Tagliabue 2006; Spellman, Miralles 2017].

Transformative strategies

The landscape project aims to develop representations that best describe the transformative strategies under consideration. Often, these representations do not focus on depicting a defined geometric space but rather on communicating the transformative strategy over time. Contemporary trends are oriented toward multiple graphic and linguistic forms and different methods of representation depending on the objective: analytical-descriptive, informative, communicative, expressive, or as a specific investigation into certain aspects of the project.
For the *Polcevera Park* project in Genoa in 2019, the Dutch studio Inside Outside, founded by Petra Blaisse, developed a park consisting of a series of parallel linear fields of varying widths, each intended for a different type of garden to promote biodiversity. The rich variety of botanical species is well expressed through abstract graphic geometrizations of the plant elements. Each plant species is represented through a synthesis of the arboreal element in which, however, its shape and color value are clearly recognizable. This allows for an effective and immediate communication of the richness and diversity of the plant life, a key strength of the project's concept. This approach is complemented by a more descriptive representation of the botanical species through a chart that highlights the abstract graphic element, realistic image, and name for each species (fig. 3).
Mark Smout and Laura Allen, in collaboration with Geoff Manaugh, presented the *Rescue Lines* project at the *17. Biennale di Architettura di Venezia* in 2021, focusing on the restoration and expansion of forests in the United Kingdom. The map displays vast green areas intersecting with the urban fabric and the road network. In the image, these green spaces have the greatest visual weight compared to the lighter territorial background and the built environment, depicted in white, as they represent the strengthening of connections between British forests. The project involves graphic additions and subtractions in the map image to identify the nature that should be reinforced and supported within the contemporary city. The representation highlights a structuring framework for the territory

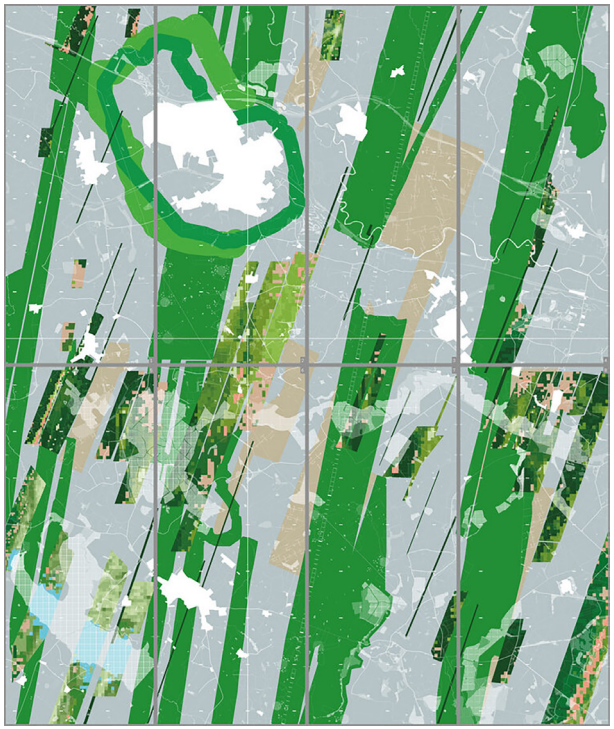
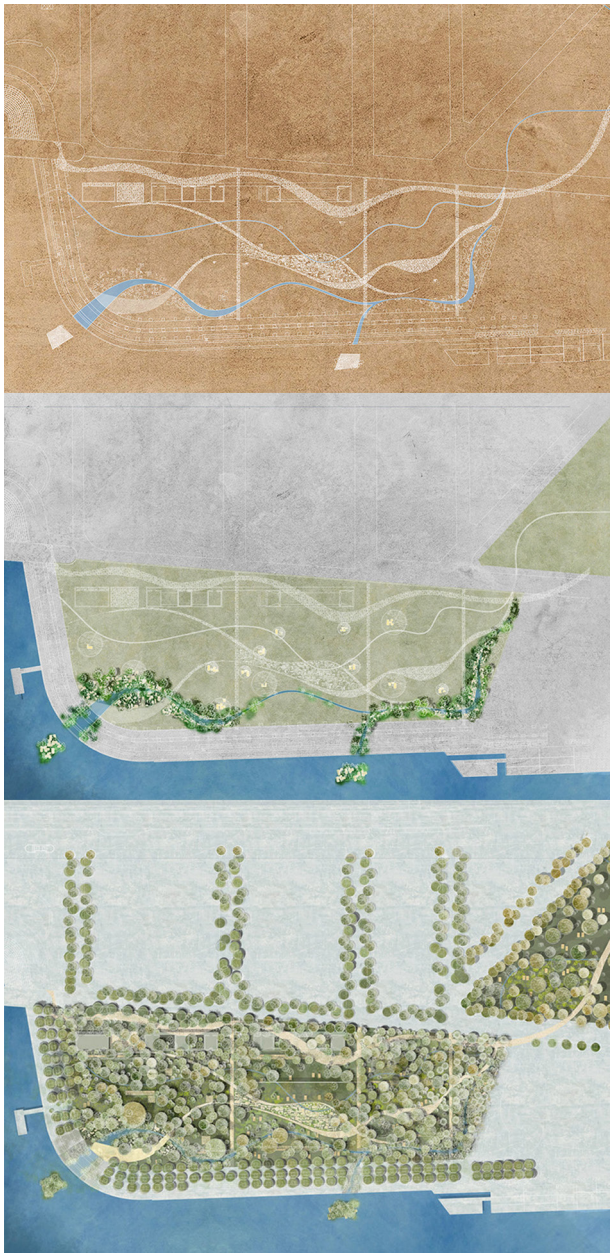


Fig. 4. M. Smout, L. Allen, G. Manaugh, R. Lines. Project exhibited at the 17. Biennale di Architettura di Venezia, 2021 (<https://www.smoutallen.com/>; accessed 15 December 2024).



Fig. 5. M. Smout, L. Allen, G. Manaugh, R. Lines, 2021. Transparent base with integrated digital and analog representations in acrylic and wood, 280×320×70 cm (<https://www.smoutallen.com/; accessed 15 December 2024).

that needs to be emphasized and consolidated for design purposes (fig. 4). The project, presented on a transparent base with acrylic representations and 3D wooden models, emphasizes the need to integrate digital and analog techniques for a tactile and artisanal communication of the landscape project (fig. 5).
For the *Harbour Park* project in Sydney, Australia, in 2023, *Teresa Moller Landscape Studio* designed a park in an area reclaimed from the harbor, on the waterfront near Central Barangaroo. The awareness of being above water, the presence of the built city, and the need for a prevailing natural environment shaped the development of the concept. The mapping representation that illustrates these choices is developed across three plans, each describing different systems through an expressive graphic language. The first plan emphasizes the linear elements that structure the spatial organization, namely the water lines (in blue) and the pathway lines (in white), set against a material background with ochre/earth tones. The second plan indicates, in addition to the structuring lines, the vegetation along the water channels and grassy areas. The third plan, finally, describes the entirety of the project's defining elements, including the masses of trees and shrubs that integrate with the city (fig. 6).
For the *Saline di Molentargius* project in Cagliari in 2023, the Italo-Dutch studio Openfabric, founded by Francesco Garofalo, conceived the site –now decommissioned and undergoing a process of rewilding– as a park connected to the nearby urban areas through pathways crossing the dams, with recreational activities that preserve botanical and wildlife biodiversity. The planimetric representation of the area primarily aims to highlight the complex system of dams connected to the Molentargius lagoon through the network of paths and numerous integrated activities. Some graphic



choices are particularly notable for making the project's concept instantly comprehensible: the semicircular cut of the urban settlement area surrounding Cagliari's hinterland, the descriptive information on activities, access points, architectural and infrastructural features, and the overall composition based on a circle, from which the park system stands out. Simplified diagrams focusing on individual systems accompany the project's narrative, facilitating more immediate communication: the natural and artificial water systems, the pathways and accessibility, and the program and activities. The system-based approach helps to understand their internal functioning and their interrelationships (fig. 7).

In landscape design, various types of representation come into play, each created with different methods, techniques, and tools depending on their purpose, which may be descriptive, communicative, or emotional. For example, Openfabric uses photographic images of the salt flats to digitally integrate the project, aiming to convey the atmosphere (fig. 8). The expressive power lies in the atmospheric, chromatic, and material aspects of the area, where natural elements and wildlife are predominant. The compositional choice aims to emphasize the natural character of the site in contrast to the human interventions, which focus on pathways for traversal and enjoyment.

For the landscape regeneration project of the *Camí de Cabrianes* in Sallent, Spain, carried out between 2017 and 2019, the Spanish studio 08014 arquitectura, founded by Adrià Guardiet and Sandra Torres, intervened on the path connecting Sallent to Cabrianes. The intervention included the demolition of the railing that sharply delineated the boundary between road and landscape, redefining the path by reconstructing its edges with local resources, and opening up spaces along the trail. These interventions are well illustrated in the choice to depict the section in two temporal moments: the first (in gray tones) represents the existing condition, while the second includes some ochre parts to illustrate the *post operam*. The section shows the terrain's profile, the tree and shrub vegetation, and the type of human activity through raster images. Additionally, attention is given to the depiction of the root system, to show that the tree develops as much above as below ground (fig. 9). The representation, although lacking real RGB data, effectively conveys the transformative strategy of the landscape regeneration project.

Fig. 6. Teresa Moller Landscape Studio, Harbour Park, Sydney, Australia, 2023 (<https://teresamoller.cl/en/; accessed 15 December 2024).

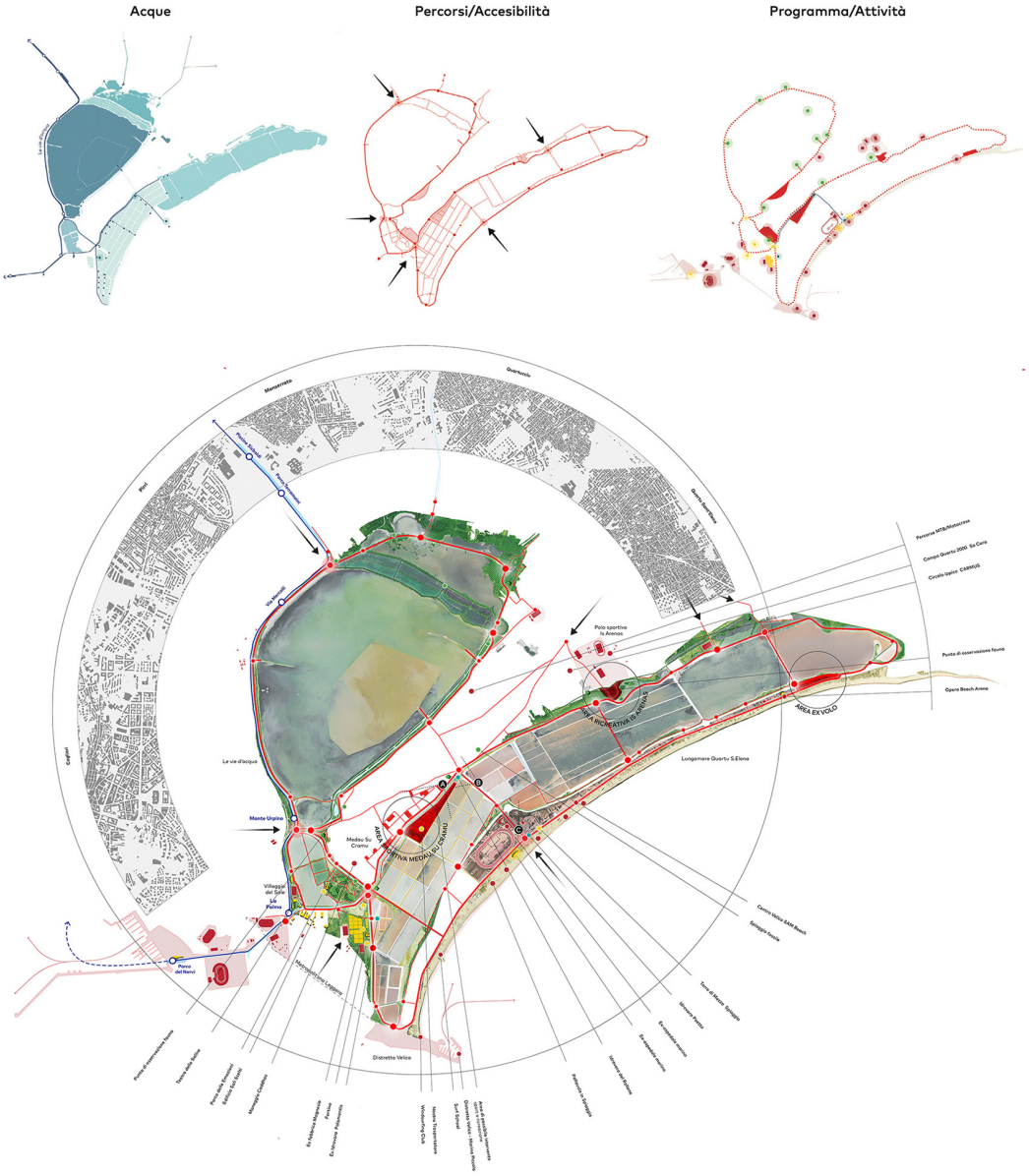


Fig. 7. Openfabric, Saline di Molentargius, Cagliari, Italy, 2023 (<https://www.openfabric.eu/>; accessed 15 December 2024).

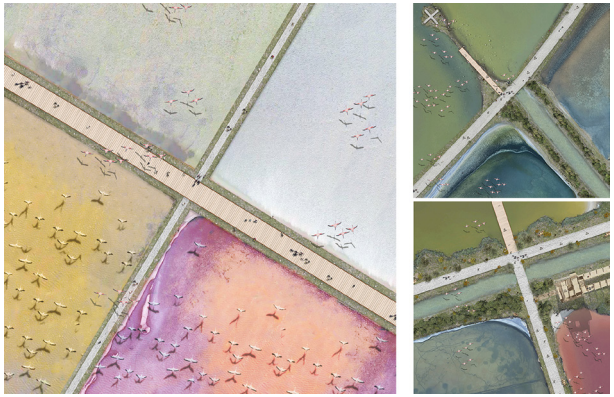




Fig. 8. Openfabric, Saline di Molentargius, Cagliari, Italy, 2023 (<https://www.openfabric.eu/>; accessed 15 December 2024).

Fig. 9. 08014 arquitectura, Landscape regeneration project of Camí de Cabrianes, Sallent, Spain, 2017-2019. (<https://www.estudi08014.com/>; accessed 15 December 2024).

Multiple information

In recent years, the representation of landscape projects has seen an increase in the production of illustrations containing multiple layers of information, not limited to depicting geometrically defined space. This development likely stems from the need to create representations that are as descriptive and comprehensive as possible, covering the various aspects of landscape design. This trend is particularly evident in the representation of detailed sections.
In the 2023 proposal for the *Park of the Oil Refinery Factory* in Hangzhou by Openfabric, the representation of open space is enriched with graphic and textual information on the various aspects related to the landscape project.
The section, in fact, illustrates not only the morphological layout, the relationship between vegetative masses and empty spaces, and the diversity of plant life, but it also graphically and textually indicates air pollutants, root systems, soil composition, tree and shrub species, human activities, fauna, and dimensional annotations (fig. 10). This is a raster image obtained through photomontage with realistic rendering, depicting topographic variations, shrub species, different types of trees with varying saturation between those in the foreground and background, the extent of root systems, and the stratification of the subsoil, though in a simplified form.
Various informational layers have been added to the section. The first layer relates to human use, incorporating human figures to illustrate how the space can be utilized.
The second informational layer involves photographs of the flora and fauna: detailed images of tree species at the top, which convey the density, color, and texture of the foliage; detailed images of shrubs at the bottom, showing texture and color; and images of animals that inhabit the area in the center.
The third informational layer includes graphic codes: arrows to indicate movement, chemical symbols, figures to document atmospheric temperature variations, and elevation markers expressed numerically and with horizontal lines every five meters.
The fourth informational layer is textual, consisting of captions and brief explanatory notes.
This type of representation shows that the project has considered all the listed issues and has sought to find strategic solutions. Similarly, the representation has been directed towards a descriptive enrichment through graphic languages, symbolic codes, representation methods, and

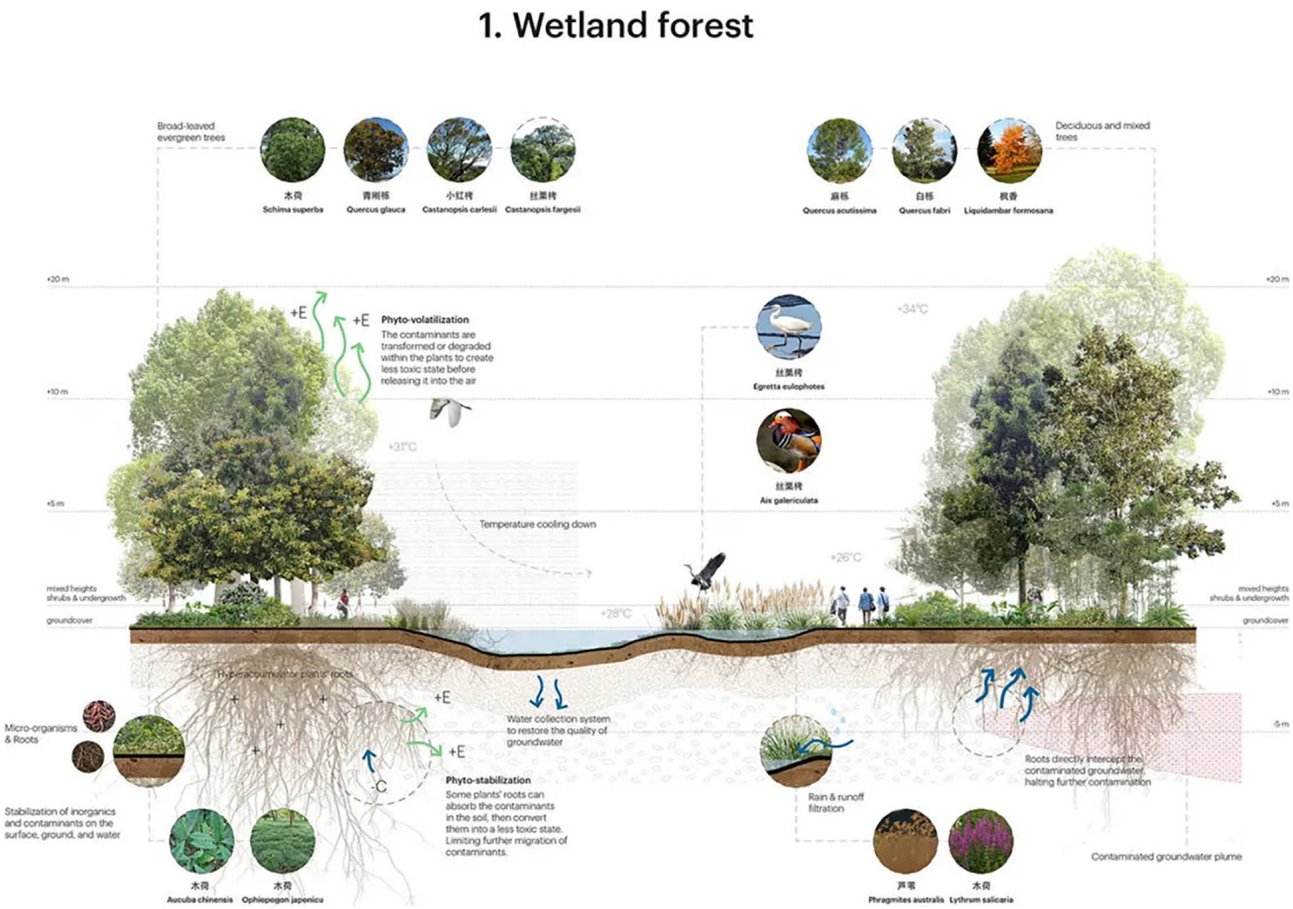


Fig. 10. Openfabric, Oil Refinery Factory Park, Hangzhou, China, 2023 (<https://www.openfabric.eu/>; accessed 15 December 2024).

texts that support the project's objectives: "The perspective of landscape design works with the particular ability to grasp or establish 'relationships' between elements of various kinds, both material and immaterial, rather than between defined objects in themselves" [Zagari 2006, p. 25].

Visualizations

In the representation of contemporary design, three-e-dimensional visualization is essential, in fact in recent years architectural visualization (archviz) has undergone exponential development, also thanks to the technological progress of IT tools. In particular, landscape design has been the object of interest of archviz for application experiments, for the verification of the expressive potential of IT and digital, for communicative contents [Farinella 2020].
In the visualization proposal of the *Nunavut Inuit Heritage Centre* in Iqaluit, Canada, in 2023, the Norwegian studio Mir (founded by Mats Andersen and Trond Greve Andersen) has created, on behalf of the Danish studio Dorte Mandrup, some documents that attest to the attention to the theme.
The design concept of the cultural center for the promotion of Inuit culture derives from the movement of snow and wind, therefore its sinuous and organic shape is established in continuity with the morphological structure. The roof, covered in rock and peat, rises from the ground, leaving only the vertical wall visible like a cut in the topography.
Mir's communication strategy highlights the camouflage of the architecture, enhancing and exalting the natural and atmospheric components of the landscape. Figure 11 is a digital image, expertly constructed, in which the first and second floors are occupied exclusively by the ground, that is, by the natural topographical arrangement made up of rocks and vegetation. Only in a small central portion is the presence of the constructed architectural object noted. It is revealed by the strip of land/covering that rises, determining the curvature that reveals the vertical glass wall. The top floor also tells the story of the surrounding environmental context. Two human figures on the covering restore the scalar dimension, simulating the type of use and the type of perception that could be had, while the background of the image denotes a totally leaden sky. It is clear that the communicative choice does not want to show only the built architecture, but also the landscape context in which it is inserted and the relationship between architecture and landscape, therefore the natural morphological, vegetal, atmospheric, material and chromatic components assume a predominance in the image. Similarly, in the visualization proposal of the *Norrøna Lodge*, in Senja, Norway, created by Mir in 2024 (construction planned for 2026) on behalf of Dorte Mandrup we find the same design and communicative intentions. Dorte Mandrup states that the project is a hotel conceived: "as individual lodges connected by a large stone roof that continues the formations of the surrounding landscape, almost dissolving the boundaries between architecture and landscape to create an engaging experience of being in nature" [4]. If the landscape assumes a substantial role in determining the concept of the project, it is not possible to omit this role in the representations. It is revealed and is valorized to the maximum terms. In fact, figure 12 highlights the sea and the rocks of the coast in the foreground, the hotel in the background and a rocky spur in the top floor. The background of the image is occupied by the sky, the sun, the clouds. Finally, a further natural element, namely snow, characterizes the composition.



Fig. 11. Mir, Nunavut Inuit Heritage Centre, Iqaluit, Canada, 2023 (<https://www.mir.no/>; accessed 15 December 2024).

The built architecture is never exhibited in its entirety, but is revealed partially as an integration of the landscape, which in turn is represented in all its components: geo-morphological with precise atmospheric and light conditions linked to a particular moment of the day and season.

Conclusions

The critical analysis of methods, forms, and language used in contemporary landscape design allows for an exploration of the expressive potential of representation. The references presented provide an overview of significant graphic experiences developed from the 1990s to 2024. During this period, methods and tools have evolved, but a common thread can be identified: the role of representation in relation to the intended narrative goal. Contemporary trends highlight the aspects toward which representation is directed: overall project representations, in axonometry or plan view, to convey the concept; representations aimed at illustrating the transformative strategy; schematic drawings of individual systems for project management; detailed representations for describing the various aspects that make up the landscape project; in-depth illustrations on botanical issues; expressive images to narrate atmospheres, materials, and colors.
In the cases of Brunier and Miralles, the focus is on initiating the project development process to enhance its spatial vision through representation. These hybrid approaches aim to combine the communicative strength of the design idea with the descriptive capacity of pre-intervention photographic images, enriched by the expressive value of manual techniques.
In more recent cases, such as those of Inside Outside, Mark Smout and Laura Allen, Teresa Moller Landscape Studio, Openfabric, and 08014 arquitectura, we observe drawings that, while employing different methodological and graphic language solutions, effectively describe the systems and the overall design framework. The dual approach, intended to convey both the general functioning and the diverse thematic areas (vegetation, fauna, human use, subsoil stratification, atmospheric qualities), is evident in the works of Inside Outside, Openfabric, and 08014 arquitectura. The representations by Openfabric and Mir demonstrate a focus on atmospheric and material phenomena specific to natural components, which enhance the expressive quality of the representation.



Fig. 12. Mir, Norrøna Lodge, Senja, Norway, 2024 (expected 2026). (<https://www.mir.no/>; accessed 15 December 2024).

Thus, representation serves a narrative function, capable of fully describing the lexicon, content, and form of the landscape project, both in analytical and expressive terms. The emphasis on diverse figurative forms reflects the ongoing relationship between architecture, landscape, and representation, arising from a process of form-building rather than being merely a graphic product.
Additionally, drawing a landscape project (a garden, a park, or a landscape configuration) is a complex and multifaceted task, as it requires not only graphic and expressive skills but also knowledge of the discipline of landscape architecture: "One cannot look at the landscape without understanding the landscape itself; this understanding implies attention to all its components and, above all, respect for its meanings" [Cianci 2002, p. 34].

Credits and Acknowledgements

The author thanks Birkhauser Architecture, Benedetta Tagliabue – EMBT Architects, Fundació Enric Miralles, Inside Outside, Mark Smout, Laura Allen, Teresa Moller Landscape Studio, Openfabric, 08014 arquitectura, Mir, Dorte Mandrup for kindly granting the images.

Notes

[1] Three private gardens in Brasschaat, Antwerp, Belgium, 1991. Realized project. Architects: Willem Jan Neutelings (*maison N.*), Stephan Beel (maison B.), Xaveer de Geyter (*maison SN.*). Landscape architect: Yves Brunier. Project manager: Jérôme Boutterin.

[2] "Des graphismes aux couleurs grinçante, des formes brutales emballées de papier alu, des peintures crues, des supports empruntés à l'industrie, des matériaux bruts, mousse, caoutchouc, plastique. Pour figurer le paysage et le bâti, des coton-tige, des fils électriques, des morceaux de tissus, des vis. Le tout, comme jeté à la hâte, dans l'angoisse; talles étainent les maquettes / projects d'Yves Brunier" [Blaisse 1996, p. 19].

[3] <https://www.artribune.com/progettazione/architettura/2021/05/enric-miralles-benedetta-tagliabue/> (accessed 15 June 2024).

[4] <https://dortemandrup.dk/news/dorte-mandrup-and-norrona-create-unique-nature-hotel-above-arctic-circle> (accessed 30 June 2024).

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Graphic Mimesis. Representation of the Landscape in Dimitris Pikionis' Xenia Hotel and Alberto Ponis' Casa Hartley

Ana Muñoz-López, Lara Redondo González

Abstract

One of the most challenging aspects of the architectural project is the representation of the landscape, particularly when dealing with the graphic representation of abrupt natural enclaves. In the field of contemporary architecture, technical documentation often employs abstractions to illustrate the relationship between construction and landscape in a synthetic way. The terrain is conceptualized using contour lines, and the vegetation, paths while other elements of the site are simplified to highlight the position of the intervention. Notwithstanding the aforementioned general tendency, the figures of Dimitris Pikionis (Athens, 1887-1968) and Alberto Ponis (Genoa, 1933-) stand out as two architects who have distanced themselves from these conventional tendencies of representation by virtue of their faithful definition of the landscape. Their projects, situated in the Mediterranean basin, are characterized by the topographical complexity to which they adapt. It is therefore crucial to understand their particular graphic approach in order to fully comprehend the development and subsequent understanding of their interventions. In this context, the landscape representations used by Pikionis and Ponis in the Xenia Hotel (Delphi, 1951-56) and Casa Hartley (Costa Paradiso, 1977) projects are analyzed as paradigmatic models, demonstrating, through their graphics an exceptional approach, to safeguard the landscape through the harmonious integration of natural and man-made elements.

Keywords: topography, in-situ drawing, Mediterranean basin, Mediterranean architecture, landscape.

Introduction

The interpretation of the landscape in the architectural project, and more specifically the representation of its forms, necessitates a reflexive effort to effectively communicate the relationships between its different elements. It is frequently observed that this information is simplified in order to reflect the architecture in greater detail, resulting in documentation that fails to convey the potential of certain landscapes and the necessity for a sensitive approach to their management. Nevertheless, it is of the utmost importance to ascertain the characteristics of these landscapes during the project development phase, particularly when working in areas of abrupt enclaves where the topographical features dictate the optimal implantation strategy. In this regard, several contemporary architects, including the Greek Dimitris Pikionis (Athens, 1887-1968) and the Italian Alberto Ponis (Genoa, 1933), have distinguished themselves through their unique approach and profound interest in comprehending, unravelling, and encapsulating the landscape element within their projects. Both architects concentrate on meticulously mapping the existing natural elements, including rocks and soil formations, as well as the diverse array of vegetation. The graphical representation of architecture and the environment is characterized by a similar level of detail, with the two elements being balanced to the extent that they become indistinguishable from one another.

An exhaustive analysis that demonstrates a desire to understand the details of the place through constant work

https://doi.org/10.26375/disegno.15.2024.25

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in the enclave itself, while simultaneously allowing for the sensitive adaptation of projects to the inherent complexity of the landscape. This concept is especially pertinent in the case of the Xenia Hotel (1951-56) in Delphi and the Casa Hartley (1970) in Costa Paradiso, as designed by Pikionis and Ponis, respectively. These projects demonstrate the significance that architects ascribe to the representation of the landscape. This is evidenced by the fact that the development of both projects was informed by an in-depth analysis of the surrounding area.
This article studies the conception process of these examples through their distinctive graphic representation, with the objective of understanding the role of the landscape and its elements in the conceiving of these interventions. In order to gain insight into the conception process of these examples, the archives of both architects were consulted. The archive of Dimitris Pikionis was accessed virtually through the digital platform provided by the Benaki Museum [1], while the archive of Alberto Ponis was accessed in person by visiting his studio in Palau, Sardinia. In order to complete the information and gain a deeper understanding of the projects, we consulted the available published works on both architects, as well as conducting personal interviews with Alberto Ponis during visits to the Sardinian island.

Xenia Hotel by Dimitris Pikionis

A comprehensive analysis of the relationship between the built environment and the surrounding landscape is a recurring theme in the history of Greek architecture. Since classical times, construction has been based on the concept of natural values, which posits that buildings should not dominate their surroundings, but rather be in harmony with them. The objective is to achieve a landscape perfection that transcends mere perception and incorporates the existing connections with the elements of the territory itself, thereby expressing its *genius loci* [Jellicoe 1995, p. 117]. Pikionis upholds these classical principles of connection with the landscape and maintains them in a dogmatic manner throughout his professional career, both in the configuration of the buildings and in the determination of the visual angles.
From an early age, Pikionis showed a profound interest in painting, particularly the work of Konstantinos Parthenis (1878-1967), whom he considered to be his first pupil and to whom he mainly owed the opportunity to study drawing and painting in Munich [Pikionis 1987, p. 27] [1]. This fascination and training in the plastic arts would have a notable influence on his work, in which he would pour all his artistic baggage and knowledge of the conception of space, composition, rhythm and aesthetic sensitivity. These aspects are a constant in all his architectural production, situated at a point between construction and painting. The result of this approach to the design process is the extensive collection of drawings that has been preserved, in which a common thread can be seen to condition his interventions: namely, the desire to understand and enhance the Greek landscape and the elements that make it unique. Along these lines, his project for the Xenia Hotel, located in the western part of Delphi, a small-town clinging to the steep slope of Mount Parnassus, is particularly noteworthy. The plot where the project is located is at its lowest point and connects with the main road that leads, just a few meters away, to the old Sanctuary. Its landscape is characterized, firstly, by its topographical complexity; a deep valley cleft by winding roads that connect the few inhabited units, whose architectures practically hang from the terrain and sometimes look out over the Gulf of Corinth. Secondly, because of the physical and symbolic presence of the Sanctuary, which significantly conditions the landscape image (fig. 1). In this context, Pikionis designed the hotel with the objective of responding to the nascent increase in tourism that was occurring in the 1950s [2]. Two decades after his unrealized project for the Delphic Centre (1934),

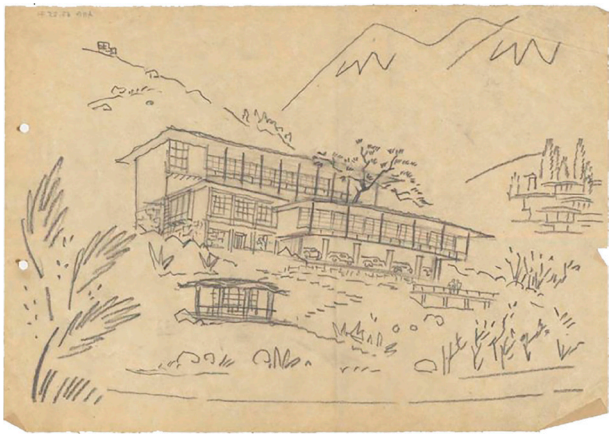


Fig. 1. Delfos' Sanctuary in relation with the landscape (Photography by Lara Redondo González 2019).

the architect was presented with the opportunity to apply his knowledge of this site, considering the landscape elements as determining factors in the rules of composition. The pre-existences are regarded as elements linked to the person passing through the site, connected with it aesthetically and emotionally, giving importance to the individual in the landscape. It is for this reason that they constitute the primary object of study in terms of their potential relations with the future incorporation, with a view to establishing a harmonious connection between the project (artifice) and the surrounding landscape (nature).

A review of the numerous drawings produced for this project reveals that Pikionis prioritizes the pre-existences over the architectural materiality itself. Konstantinidis, who was his assistant for a time around 1949, states that Pikionis considered elevations to be of particular importance in his way of composing [Tsiambaos 2018, p. 144]. In this regard, the elevation and perspective drawings for the Xenia Hotel consistently contextualize the project within the landscape, irrespective of the level of definition. From the initial sketches, which depicted the architecture in simple geometrical forms and swift strokes, the mountainous profile of Parnassus, the complex shapes of the terrain and its vegetation were depicted in detail (fig. 2). However, in the case of the present project and subsequently in his intervention in the area around the Acropolis (1951-58), Pikionis came to understand the ground plan as the primary element of the project. A plan designed: "as an elevation, in a painterly mode" [Tsiambaos 2018, p. 144] [3], connecting with Konstantinidis' initial assessment. In this instance, the emphasis is not on typology or the organization of spaces, but on achieving a specific visual form that is: "clear and pure, readable in photographic fidelity" [Tsiambaos 2018, p. 144]. For this reason, the floor plan is significantly influenced by the pre-existing structures and the various points of view from which to observe them.

In some of the initial sketches of this project, the architectural form is absent and instead represented as a trace on the ground (fig. 3). In the initial plan representations of the complex, the construction is shown as a void, while the vegetation, paths, rocks and even the ground are analyzed and depicted with great precision. In contrast to the abstract representation of the architectural elements, the artist employed a realistic technique in his depiction of the site, utilizing shading to accentuate the effects of perspective. This graphic dichotomy, where the artifice is blurred in order to show exhaustively the particularities of the site,



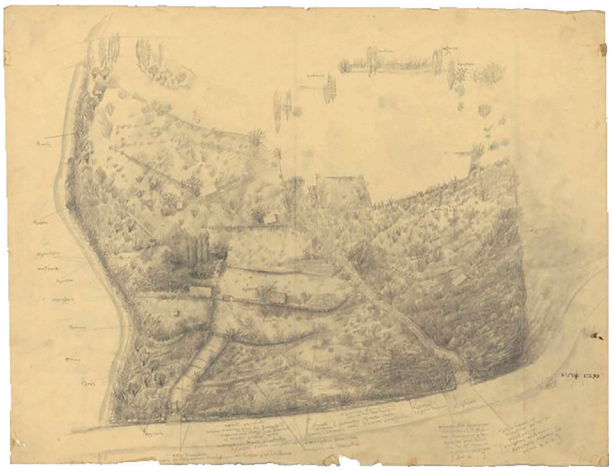


Fig. 2. D. Pikionis, first sketches of Xenia Hotel with the silhouette of Mount Parnassus in the background (Benaki Museum, ANA_67_25_71 1951-55).

Fig. 3. D. Pikionis, detailed site plan with the silhouette of Xenia Hotel (Benaki Museum, ANA_67_25_03 1951-55).

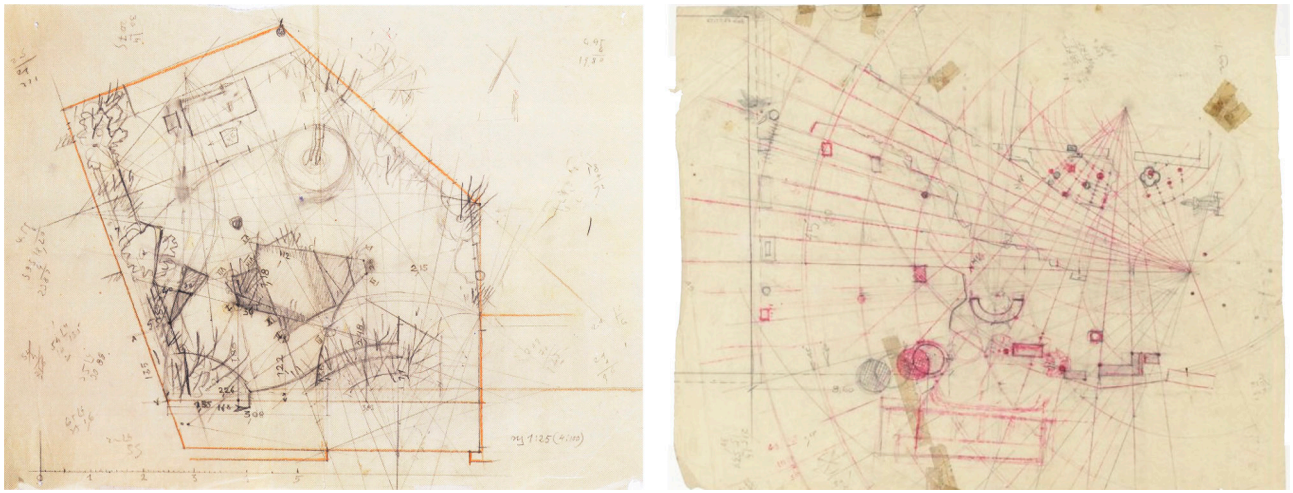
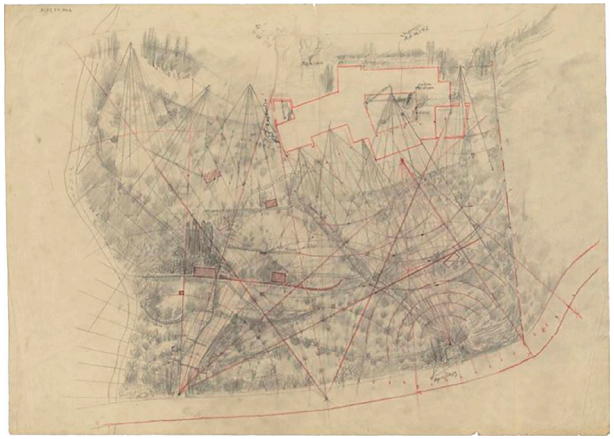


Fig. 4. Left: D. Pikionis, geometric diagram of the interior space of Efthymiadou House in Athens (Benaki Museum, ANA_67_24_01 1948-49). Right: D. Pikionis, geometric diagram of St. Dimitrios Loumbardiaris' area in Athens (Benaki Museum, ANA_67_55_37 1954).

is aligned with the architect's idea of the way of understanding the landscape. A process of reconnaissance of the enclave *in situ* to discover sequences of points of view, meticulously selected to establish a dialogue with the most relevant elements of the surrounding area. This technique had already been initiated a few years earlier in the project for the house of the sculptor Efthymiadou (1948-49), which he subsequently employed to its fullest extent in his aforementioned intervention on the Acropolis (fig. 4).
The documentation outlining this process would serve Pikionis as a graphic base, designed on the site designed on the site: "like a Borgia map" [Ferlenga 2023, p. 77] [5]. On it he notes the existing elements and vegetation such as the olive trees (ελιές) and sketches a first exterior proposal. In his subsequent drawings, he completes this base with a series of red lines that correspond to different project elements and compositional tools (fig. 5).
On the one hand, the architect delineates the perimeter of the hotel's ground plan, which is still undetailed, but with annotations indicating the type of planting, such as: "a vine, ivy, or invisible thyme" [García-Sánchez 2011, p. 116]. In addition, the silhouette and the remainder of the plot feature a number of focal points, with red lines emanating from each to indicate the visual cones. These angles: "serve to verify every possible relationship between the building and the landscape, framing the main emerging elements of a microcosm comprising trees, paths, housing, access and rock, which are subtly modelled by the architect's hand" [Ferlenga 1999, p. 112]. These points indicate directions and suggest concentric arcs that establish a web of visual connections, influencing the position of both the main building and the various auxiliary constructions.
This particular way of designing is based on the application of mathematical models and compositional systems identified in the research of the architect Konstantinos A. Doxiadis (1913-1975), to whom he had the opportunity to transmit his knowledge and ideas as a professor at the National Polytechnic University of Athens (NTUA). These studies are finally collected in his book, *Architectural Space in Ancient Greece* (1937) [Doxiadis 1972, p. 2] [6], and are based on the layout of the enclosures of the classical temples and their geometrical organization. Pikionis studies and defines these parameters of visual space organization not using Cartesian coordinates, but by considering the speed of human movement and the hypothetical movements of the observer. This demonstrates that each of the lines and directions observed in his drawings is indicative of a sophisticated control of movement and points of view, with the objective of creating an oriented perception of the landscape.

As a result of this singular way of composing, the volume of the Xenia Hotel is fragmented into different parts to adapt to the topography, a strategy already employed by Pikionis in other earlier projects such as the Pefkakia School (1931-1932) or the aforementioned Efthymiadou House. In its original version, the hotel is organized in four blocks of rooms other blocks for the lobby, restaurant, and lounge, arranged at different levels following the slope of the land [Ferlenga 1999, p. 112] [7]. Each of them is situated on the ground and rotated to orientate the perspectives according to the angles of vision represented (fig. 6). All these blocks are configured around two courtyards whose proportions and dimensions also respond to the analysis of the site. The first of these acts as an access atrium and is completely open to the surrounding landscape, whereas the second is enclosed by the restaurant wing, which is situated on a lower level. This configuration allows the block of rooms situated behind it to still enjoy the views. This concern for visual connections is also transferred to the private spaces where Pikionis incorporates wooden benches in the loggias of the rooms as: "a place where this visual relationship is privately consummated, which becomes a choral experience from the large openings of the collective spaces" [Ferlenga 1999, p. 112].

Fig. 5. D. Pikionis, application of Doxiadis' method in Xenia Hotel plan (Benaki Museum, ANA_67_25_04).



Casa Hartley by Alberto Ponis

Alberto Ponis relocated to the island of Sardinia after working in London between 1960-1964 (Ponis 2003, p.14). His approach to the cultural and physical environment was based on a total ignorance of the Sardinian imaginary, a lack of knowledge that he addressed through a detailed, investigation travelling through the landscapes of the island [8]. Upon his arrival on the island, Ponis promptly set out to explore the territory in order to gain a comprehensive understanding of Sardinian culture, its diverse landscape and the distinctive characteristics of its vernacular architecture [9]. During his trips, he documented the vegetation, rocks, and regional constructions through graphic and photographic procedures. This approach to understanding the local context informed a distinctive ideation process based on on-site work, which was subsequently applied in the design of his holiday houses. Many of these are situated within the rocky topographies of Costa Paradiso and Punta Sardegna tourist resorts.
The initial moments of each commission were characterised by constant visits to the site. During these excursions, Ponis carried out an in-depth analysis, which was used in all phases of the project as a basis for adapting the holiday homes to the abrupt topography in which he was intervening. Throughout the expeditions, he analysed the

Fig. 6. Exterior view of Xenia Hotel in relation with Delphi landscape [Ferlenga 1999, p. 113].



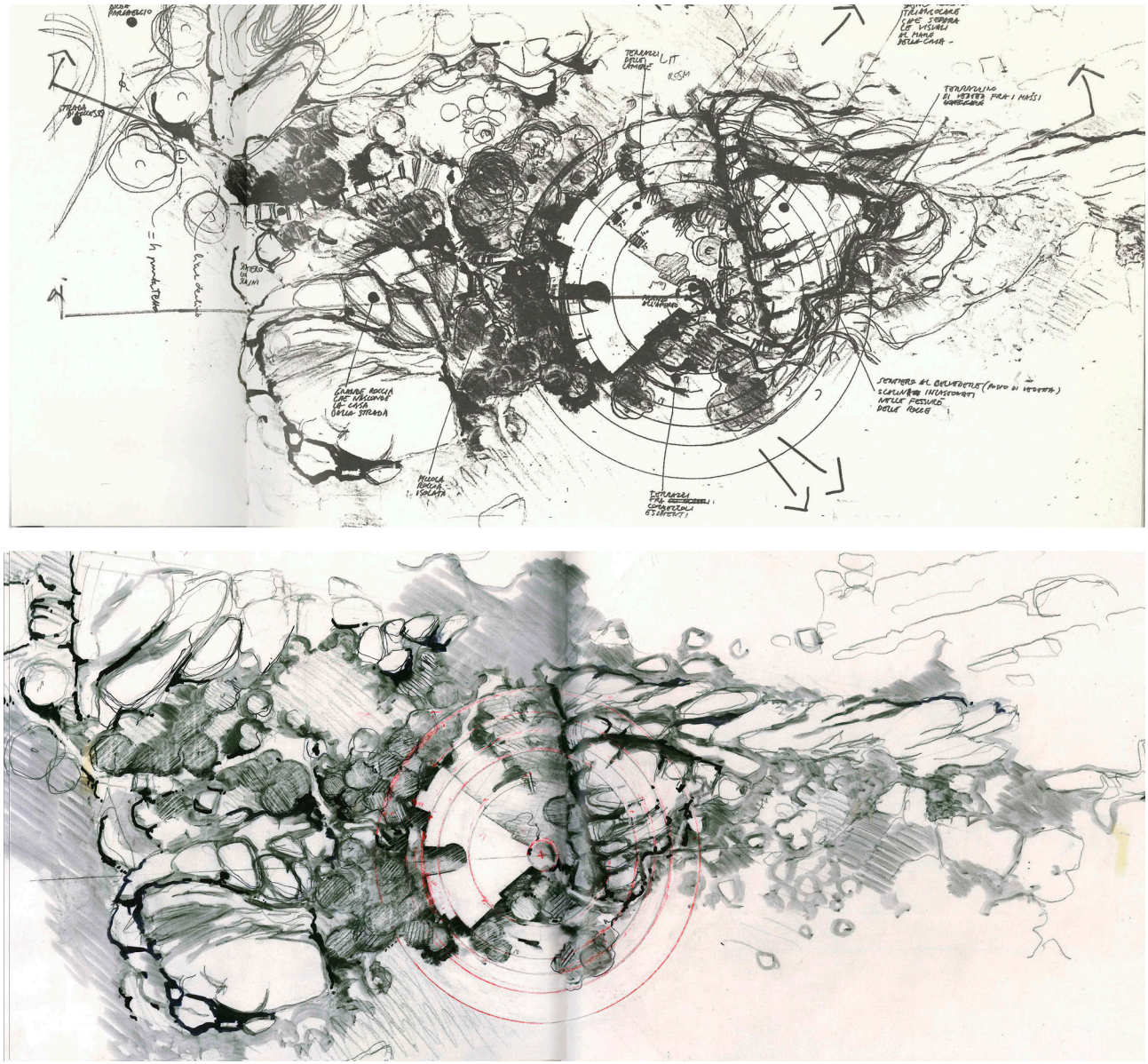


Fig. 7. Initial sketches of Casa Hartley. Top [Brandolini 2003, pp.60-61], bottom [Brandolini 2014, pp. 128, 129].

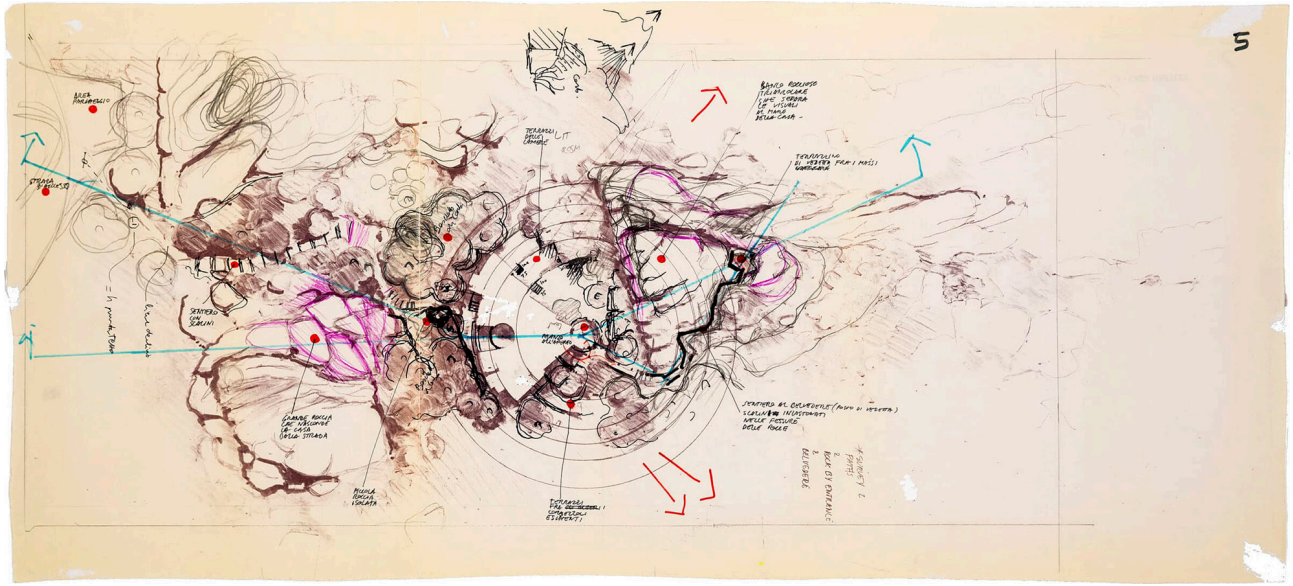
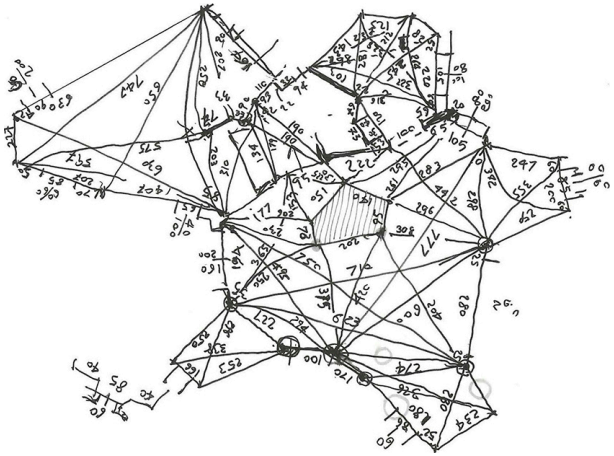


Fig. 8. Analysis site plan and sketch of the project [Brandolini 2021].

small Mediterranean vegetation –or *macchia*– identifying the unique elements while mapping, formally and dimensionally, the closest rocks to the site. The identification of each site was compiled in sketches as well as indicated on the site by marking the references and areas to be worked with stakes, ropes, and stones [Ponis 2023, p. 2]. The documents that make up the data collection, usually consist of a few sketches on folded paper and brief notes in the margins of the sheets, have not survived for the vast majority of his projects. As a result, some of the projects present unlinked information which hardens the understatement of the ideation of the project. For this reason, other projects where the documentation has been correctly preserved, such as Casa Hartley, commissioned to the architect around 1970 by an American consul and his wife, are of great value.
Among the documents that have survived, there are three very similar plans that convey an apparently similar information differing in their nuances (fig. 7). Despite the fact that they seem to be drawn up after the completion of the house, or at least during its construction, they all succeed to communicate the project details developed during its various stages. However, the one that could be considered the first, due to the dubitative graphics of the proposal and the number of annotations describing the peculiarities of the enclave, is the one that brings together the most representative characteristics of the intervention. Its superimposed lines condense the details of the project, the character of the environment and the subjective vision of the architect (fig. 8).
This first planimetry shows the architecture embedded between three granite monoliths of Costa Paradiso, a tourist resort in the municipality of Trinità d'Agultu [10]. The site is characterised by an abrupt soil with continuous irregularities, forming valleys, ridges and cliffs that complicate visual orientation when immersed in it while providing, at the same time, the necessary privacy [Brandolini 2014, p.124]. In the plot where the Casa Hartley is located, the: "bizarre, sharply pointed rock pinnacles, set close together, look as if they had once been the nests of prehistoric animals or the unidentifiable fossils remains of some creature that once lived there" [Brandolini 2014, p.124]. As a consequence of the irregular orography, the development of the project requires constant work on



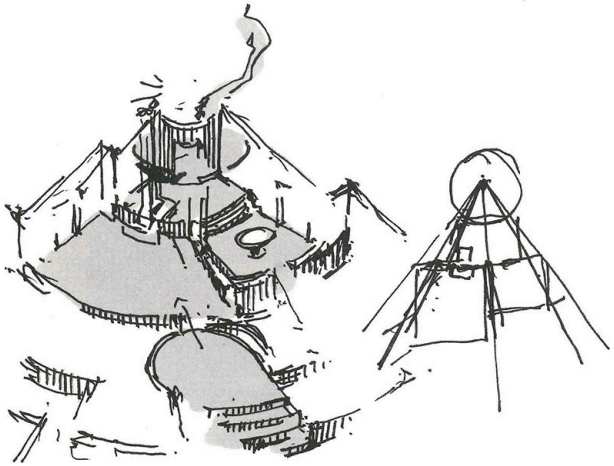


Fig. 9. Triangulation plan in Casa Ivan (1994) [Brandolini 2014, p. 181].

Fig. 10. Radial composition diagram of Casa Hartley [Brandolini 2014, p. 131].

site, especially in the first phases when the elements of the landscape are recognised.
The document describing the conception of the house shows a landscape drawn figuratively and realistically. The base documentation use for its realisation might have been similar to the one used in other projects such as the Yacht Club (1964-1965) [11] where the landscape was represented using the photos of military flights as reference. The first planimetries: "put down on paper the necessary details for the mental construction of the project, in the need to imagine the building before touching the ground" [Mura 2020]. These sketches reveal a closeness to the artistic world that begins in the early stages of the architect's life. From a young age, Ponis stabilised contact with renowned designers, sculptors and painters such as Lanza, Sironi, Depero and Arturo Martini, who produced their designs at M.I.T.A., the textile factory founded by his father Mario Alberto Ponis [Fochessati, Franzone 2016]. This artistic side of Ponis continued throughout his life, being more evident in some stages were he distanced himself from the architecture world. Ponis was interested, like Pikionis, in the work of Cézanne, as well as other artists such as Constant Permeke and Gino Rossi. His artistic career culminated in the exhibition of his paintings in renowned art galleries of Genoa and Florence [Ponis 2003, pp. 12, 13].
In the planimetry of Casa Hartley, he uses a mixed technique of ink and graphite more typical of artists than architects, to detail the nearby granite silhouettes and their shadows, creating a sense of three-dimensionality. The gradations of colour help us to understand the heights of the rock, which are normally identified by contour lines. Denser patches, outlined by a line of ink, define the mass of trees. Both vegetation and rock, whose contours are accentuated by pink tones referencing to the local granite, define the landscape void where the house emerges.
On this precise representation of the landscape we find handwritten annotations which refer to the most characteristic elements of the place which, at the same, will condition physically the project. These are mixed with others, drawn in a similar way, describing the interior and exterior spaces of the dwelling. In addition, the arrows and dots, drawn in different colours, indicate the most peculiar sides of the enclave and the building, as well as the visual relationships that the house establishes with its surroundings.



Fig. 11. Casa Hartley merged with the landscape of Costa Paradiso [Brandolini 2014, p. 132].

Centred in the plan we can find the silhouette of the Casa Hartley, wedged between the rocks. Its position is not accidental, as Ponis: "made a scientific study of the morphology of the land on which the house was to settle down" [Brandolini 2014, p.125]. Its profile is outlined on a structure of concentric arcs that regulate the fan-shaped composition. This configuration stands out from the generative elevation used by Ponis in other projects a few metres away, such as the Ivan House (1994). The sketches of the latter show how its organic profile, common to Ponis houses, designed in the void of the landscape by means of triangulations (fig. 9).
The decisive geometry of the arches that generate the plan of Casa Hartley contrasts with the organicity of the silhouettes of the site [Vogt 2023]. These design base extends from the interior to the exterior defining the ground-level platforms that continue the slope of the land. Furthermore, the guiding curves are used to mark the position of the structural walls, constructed in concrete blocks, that organize the inner spaces while supporting the weight of the gabled roof [Ponis 1971]. The curvilinear and discontinuous layout organises the activities inside the house, while at the same time allows visual connections to be made between them (fig.10).
Casa Hartley constantly searches shelter using the shape of the rock as a protection from adverse weather. This intention might be subtly references in the similarity of the representation between the building and nature (fig. 11). Its sloping roof seems to visually complete the missing volume of the granite monolith where it apparently rests. At the same time, its inclined roof is followed by the 'interior landscape', a succession of terraces that descends with the terrain, allowing the continuation of the project from construction to nature [Brandolini 2006, p.11]. Following the radical layout of curves, the house separates from the rock by a circular courtyard that finds its analogue at the other end, where the main entrance is located. Unfortunately, the necessity of protection from the aggressiveness of the climate of the island forces a disposition of the houses that impedes the establishment of direct visual relationship with the sea that we find in other houses, such as the Casa Scalesciani (1977), located in the same resort at a lower level. In the Casa Hartley, the link with the sea horizon made either through lateral voids in the house or through the belvedere that emerges from the rock-covered courtyard and crosses the landscape, dodging the large emerging monoliths.

Conclusions

Along the professional career of both architects we can notice a constant need to solve the issue of the integration of architecture in the complex landscapes. Pikionis, as well as Ponis, shows a deep interest in understanding the place and its culture. In order to understand and enhance the local image, they travel to different locations of Sardinia and Greece respectively, drawing their vernacular architecture, vegetation and traditional symbols. By sketching they analyse and domesticate the site, it's their particular way of dealing with the complexity of the abrupt topographies in which their interventions are inserted. It is an attitude that is probably encouraged by the artistic facet and the pictorial training of the two architects. For both of them, the active and constant recognition of the features of the enclave is fundamental, walking through it and capturing it in detail in order to 'own' it and decipher its possible relationships with the architecture. An atypical, meticulous and artisanal method, which Pikionis himself describes as the only one capable of offering: "a practical knowledge, a feeling for matter and its fashioning, things that no theory is able to teach us" [Condaratos 1990, p.56]. The fidelity and detail of his representation of the context testify to a constant analysis and work *in situ*, in line with the scarcity of cartographic resources available at the middle and end of the last century. This is probably why we find similar representations in the contemporary works of other architects, such as Raili and Reima Pietilä or Álvaro Siza, in which we can see a similar eagerness to understand and capture the landscape in order to link their projects to their surroundings [12].
In the architectural plans studied in the Pikionis and Ponis projects, the architectural form itself is no longer the primary focus, but rather becomes integrated into the surrounding landscape, and in some instances, even disappears entirely, thereby visually representing the significant influence of the natural environment. The aspiration to comprehend the context of the new project is encapsulated in compositions that, beyond their intrinsic aesthetic value, serve as invaluable working material for their creators. It is therefore important that the figurative character of these representations does not distract from their primary function, which is purely functional and subordinate to the correct development of the project. The architectural projects of the Xenia Hotel and Casa Hartley illustrate the significant influence of the design process on the construction process. Both architects employ geometric compositional systems to determine the location

of their projects, with superimposed lines indicating a continuous integration of the construction elements, taking into account the complexity and visual potential of the site. This approach reflects their intention to adapt the architectural design to the specific characteristics of the site, including its topography and the elements that shape its landscape.
The result of this meticulous work process is the creation of interventions that engage with both interior and exterior spaces in a continuous dialogue with the surrounding environment. The routes that are articulated in these interventions are based on sequences of perspectives and volumetric views that synthesise the entire network of relationships that have been meditated upon. Both projects exemplify the value of the cultural landscape through an architectural approach that is closely connected with all its benefits and challenges. In contrast to the anonymous and repetitive constructions that characterise tourism-related complexes, which often appear disconnected from their surroundings, the projects for the Xenia Hotel and the Casa Hartley represent a model of good practice. This is evidenced by the fact that both architects have opted for the enhancement of the landscape identity from the initial phases of approaching the site.

Notes

[1] Dimitris Pikionis Archive (1887-1968). Benaki Museum is available at: <https://www.benaki.org/index.php?option=com_collections&view=creator&id=126&collectionId=57&lang=en> (accessed 5 July 2024).

[2] "I showed him some of my works, which he praised (...) chronologically, I was his first pupil. It was Yannopoulos [Pericles] and Parthenis who persuaded my father to let me study painting" [Pikionis 1987, p. 27].

[3] Unprecedented growth in quantitative terms [Ferlenga 1999, p. 112].

[4] In the words of architect Zissis Kotionis, this is particularly visible in the floors of the Garaganis House (1939) and the Rigas School (1939), both in Zagora [Tsiambaos 2018, p. 144].

[5] Ferlenga refers with this comparison and a 'great Byzantine fresco' to Pikionis' plan drawings for the Acropolis intervention. This reference can also be used in the case of the plan drawings for the Xenia Hotel [Ferlenga 2023, p. 77].

[6] This is the publication of his doctoral thesis, originally entitled *Raumordnung im griechischen Städtebau*, written at the Technical School of Charlottenburg (Berlin). This version was translated into English in 1972 [Doxiadis 1972, p. 2].

[7] Initially, the hotel had a capacity for 88 beds distributed on a single floor. In 1961 an additional floor was added , Alberto. [Ferlenga 1999, p. 112].

[8] Alberto Ponis barely knew Sardinia before relocating to the island [Ponis 2003, p. 15].

[9] Alberto Ponis studied architecture in the University of Florence. Once concluded, he made the decision to emigrate to London where he collaborated eith the firm of Ernö Goldfinger and Denys Lasdun [Darley 2023].

[10] The resort was promoted by Pierino Tizzoni, who, in the late 60's, bought great extensions of land in the coast of a location previously known by locals as Sarra Niedda (*Selva Negra*). [Piccardo 2023, p. 124].

[11] The Yacht Club is one of Poni's first projects in Sardinia. The commission consisted in the transformation of an old Napoleonic bunker in modest nautical facilities which Ponis himself completed with a pathway that goes across Punta Stropello connecting the military construction with a nearby inlet, Cala Inglese. The analyse sketches show the *genius loci* of the site. [Brandolini 2014, pp. 92-105].

[12] Specifically, the building of Dipoli in the Otaniemi Campus (Espoo) designed by Raili y Reima Pietilä and Das Marés swimming pools (Matosinhos, Porto) projected by Álvaro Siza [Connah, Pietilä 1989, p. 254], [CCA, ARCH281835 and ARCH282004].

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Representing the Invisible. The Integral Plan for the Architectural and Cultural Landscape of Maní, Yucatán

Laura María Lázaro San José

Abstract

For a place to be identified as a landscape, there is first a personal decision to differentiate it as an element of value; then there is a necessary process of transversal argumentation of its landscape intensity, and finally, it is disseminated in a clear and accessible way. However, on many occasions, what is really necessary is a method of visibility, of representation of blurred or unnoticed landscapes, which does not consist so much in contemplating the physical environment, but in understanding the cultural and collective memory that they hold. In this direction, the case of the Integral Plan for the enhancement of the landscape of Maní in Yucatán (Mexico) is presented as an example in which its graphic interpretation is a key tool for rescuing and conserving its cultural heritage. The ancient colonial city, and former Mayan ceremonial center, has come down to us today as a confused space of overlapping and unintelligible memories. The Plan –elaborated at intercontinental distance, without previous graphic documentation and affected by the restrictions of the COVID-19 pandemic– proposes to define the city from a personal vision and by means of different systems of representation and scales to offer a synthetic and comprehensible reading of the whole. Therefore, in this case, the choice of an eloquent method of graphic interpretation of the architecture, landscape and territory becomes the most effective instrument for the dissemination of heritage that is now culturally accessible.

Keywords: Colony landscape, Mayan landscape, Cultural memory, Maní, General Plan.

Introduction

The so-called *Tomba del Tuffatore* (480-470 B.C.), discovered in 1968 at the archaeological site of Paestum (Capaccio-Paestum), shows a famous fresco on the inner face of the limestone slab that closes the upper part of the tomb. There is no record of the genuine meaning of the scene, and not even the experts agree on a single hypothesis. It represents a solitary man throwing himself into the waters –the waters of death or the entrance to Hades, depending on the context– immersed in a landscape. Any supposition is the fruit of personal imagination, although figurative elements are recognizable: two trees, the rippling waters of a river or rough sea, a rigged architecture as an elevated platform. This is the image that the deceased would perceive after waking from a deep sleep.

A landscape has just been described without being a landscape by consensus, the result of an inalienable concept of the meaning of place: the personal notion. Subjectivity of each individual, also inherent, professes an affective gaze on the landscape that allows us to perceive its aesthetic and sensorial values through emotion [Prada 2012]. Thus, part of what we contemplate is determined by the psyche of the observer and intimately related to

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our own experience and memories. Conception of landscape evolves beyond the physical environment towards a "convergence of the natural and the cultural in the same formal expression" [Ballester 2017, p. 105].
The 'state of mind', as enunciated by Amiel or Byron, conditions the perception of a place and shapes its mental representation. Along the same lines, for Unamuno 'the landscape becomes soul' from the mere action of describing it through contemplation and knowledge. By extrapolating one's own cultural baggage to new places, these make sense as complex systems of value that need to be made known.
For this reason, interdisciplinary work, and especially architecture, is used to deepen the methods of representing the landscape. The architect, far from assuming a categorical system of drawing, knows that each place demands intrinsic research in the development and transmission of its own image or, at least, a sensitive gesture that makes visible the features that differentiate it from other landscapes. Thus, the "physiognomies of the landscape" [Aníbarro 2017] constitute in the first place a subjective interpretation that is then translated through graphic systems.
This article delves into the personal decision of how to draw a landscape, becoming at once the beginning, the vehicle and the end of the process of recognizing it as such. Its representation constitutes a powerful tool for making visible those values veiled by the passage of time, by routine or by oblivion. Specifically, the Integral *Plan for the Architectural and Cultural Landscape of Maní*, in Yucatán (Mexico), is presented, which goes beyond the graphic interpretation of the place to practically address the definition of the project. Methodologically, we will now explain the particular starting point of the commission, which has undoubtedly conditioned its representation. In short, it is necessary to reflect on the choice of graphic methods according to the scales of the landscape and the proposal in a complex architectural and heritage space. All of this in order to tell the image and history of a city hitherto unrepresented, where representation is fundamental for its recovery and enhancement.

Project constraints

The ancient administrative province of Maní [Gerhard 1991], of great importance in Mayan and Colonial times, is a little-known or at least little-explored landscape. In contrast to coastal tourist towns such as Cancún or Playa del Carmen, Maní does not open onto the sea, but is immersed in the jungle. It is located in the western half of the Yucatan Peninsula, 16 km geographically from Tikul (the city on which it currently depends administratively) and 100 km from Mérida. It is a small municipality of more than 5000 inhabitants [Secretaría de Fomento Económico y Trabajo (SEFOET) 2023] who, perhaps without knowing it, inhabit a city of great historical and territorial importance.
Since 2012, Fomento Cultural Banamex [1] has been promoting socioeconomic measures aimed at rescuing and enhancing the value of Maní through cultural

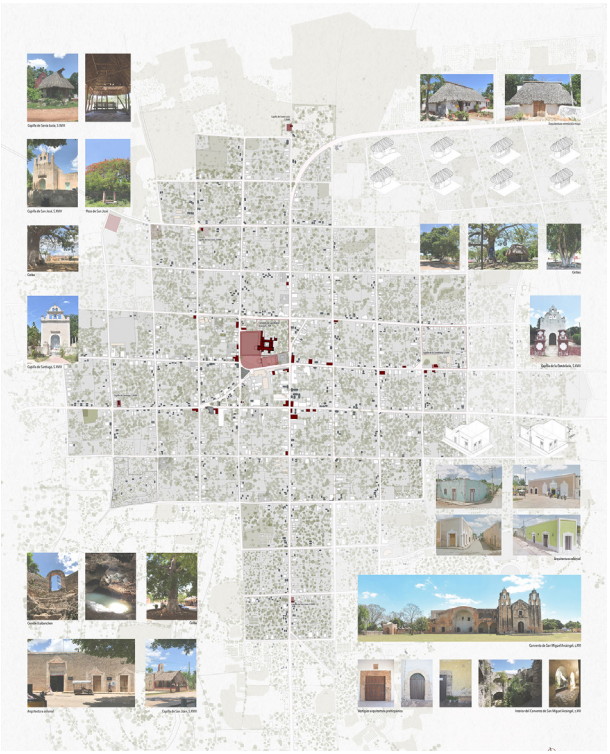

Fig. 1. Planta general de Maní con elementos de interés cultural. Plan Integral de Maní (elaboración gráfica de LABPAP 2022).

tourism [Fomento Cultural Banamex 2023]. Within this framework, the Laboratorio de Paisaje Arquitectónico, Patrimonial y Cultural (LABPAP) [2] has been commissioned to draw up an Integral Plan (completed in 2022) whose architectural proposals aim to bring together the great wealth of tangible and intangible heritage examples (fig. 1). The aim is to make the sequence of historical and cultural strata that make up the current image of the city legible, decoding an overall landscape for its population and potential visitors. To this end, it is essential to recognize the memory that links civilizations over time. From the Plan's philosophy, the identification of this memory allows the past to be rescued in order to build a present that shapes the future landscape of the city and its inhabitants.
The commission, carried out over an intercontinental distance, posed two unique challenges from the outset. First, the graphic elaboration of the city is developed from scratch due to the lack of previous documentation on its current state. The lack of a general representation led to the creation of a completely new image of a place that had never before been drawn as a whole. We began by carrying out the architectural survey, using aerial photography, in a detailed manner by urban blocks. Secondly, the situation of global immobility during the COVID-19 pandemic significantly affects the work. The possibility of travelling and taking data in situ is discouraged; the use of powerful technological tools, such as 3D scanners or drone flights, usually employed in urban and territorial scale projects, is impossible.
In these circumstances, landscape drawing becomes a fundamental tool for understanding and valuing historical, natural and cultural heritage. Thus, contemporary design is based on the graphic definition that accompanies the investigation of the different landscapes of the city, establishing levels of knowledge and representation. The distance design process requires an innovative approach that uses graphics as the main means of knowing and transmitting the qualities of the environment, making up for the lack of prior information and the limitations imposed by the pandemic. Therefore, the commission becomes a model of work and study with a broadly experimental sense. Maní is understood as an architectural, urban and landscape laboratory; a space for research, very disparate in terms of the professional trajectory of the drafting team, but which nourishes, continues and expands its experience.

Centrality in Time: San Miguel Convent and Cenote

Semantically, Maní alludes to the concept of 'place where everything happened' according to the Mayan language. However, its current image is that of an old Colonial city superimposed on the traces of an important Mayan city, with express documentary and historical references for being an important place before and during the Spanish colonization [3]. It represents a valuable documentary base in the territory that begins as a result of witnessing the first Auto de Fe of the Peninsula in 1564 [4].
In particular, the nucleus configures a landscape with enough reminiscences of colonial times to be recognizable. The urban grid, systematically reiterated by the Spaniards in the conquered cities as an imposition of order and jurisdictional control [Kubler et al. 2014], makes it possible



Fig. 2. Axonometría frontal del área del Convento de San Miguel. Plan Integral de Maní (elaboración gráfica de LABPAP 2022).



Fig. 3. Estudio de color. Alzados Calle 27, estado actual y propuesta. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

to define central blocks that represent the core of the population from a cultural and architectural point of view. The Convent of San Miguel Arcángel (1549) presides over this large public area [Suárez 2014]. Building opens to the exterior with the great vault on its main façade where an ephemeral construction would enter to constitute the so-called 'chapel of the Indians'. It also coexists with one of the four 'capillas posas' that flanked the platform for processions [Chico 2000, p. 665].

These permanences make up the present-day colonial landscape, although it is presumably superimposed on a previous landscape: the Maya. The Convent stands on a prominently elevated platform, and can be identified with the occupation of the corresponding ceremonial center and Mayan temple of the indigenous city, now disappeared [Gendrop, Villalobos 2012]. The Colonial grid would also have been imposed on the Maya grid, originally governed by planning rules related to cosmology. Adjacent to the Convent, several centennial ceiba trees frame the access to the urban center. This venerated tree appears in the sacred book Popol Vuh, playing an important role in the conception of the universe according to Mayan culture [5]. Likewise, the cenote of XCabachen was considered a sacred formation, symbolically constituting the gateway to the underworld.

For all these reasons, the nucleus of Maní condenses a very intense heritage area, full of inter-temporal culture, which must be enhanced. The Integral Plan seeks to reflect this agglutinating centrality as a focus from which the different itineraries for getting to know the city as a whole radiate. However, the urban heart must be understood beyond the architectural fact that is the Convent, currently the only protagonist in the tourist visit. The project proposes extending the heritage area by integrating, on the one hand, the interior of the Convent as an autonomous landscape that recovers the traces of its orchards and monastic gardens and, on the other hand, the extraordinary exterior as if it were a great architectural ensemble under the open sky.

The representation also covers the south side of the building, presided over by the Town Hall with the remains of the disappeared dwelling of the last cacique Tutul-Xiu in Maní. In addition, leisure and sports spaces are sequenced, designed without a preconceived order, without forgetting the cultural heritage of this area where there are archaeological traces of the famous Auto de Fe of the 16th century. The new design reorganizes and regenerates the area, based on the current layout and existing elements, to reinforce the centralizing character of the area. Street is blurred to become a road of coexistence that controls the passage of vehicles and very specific parking areas, leaving the pedestrian space as free as possible. Thus, the new texture sutures the two fronts of the area and integrates the ordered succession of spaces (fig. 2).

The residential architecture, with a clear Colonial expression, outlines and differentiates the monumental space. Colors on the facades of houses are studied in the Plan to highlight the chromatic connection of the architecture with the land and natural elements, maintaining the existing harmony at all times (fig. 3) [6]. From the graphic design,

the redevelopment gives meaning to everything that exists: it recovers and emphasizes layouts, dilutes others, reorganizes elements, eliminates superfluous paths and adds elements that reinforce this character, such as the area of palm trees on the side of the Convent in continuity with the geometry of the public space.
In addition, the area of influence descends through the street, like a great tentacle, until it joins the surroundings of the Xcabanchen Cenote, currently unlinked. Space is adapted and reconfigured in order to establish a small area for access to the cenote, equipped with an information pavilion. Minimal elements such as paving, benches and planting provide the site with an entity to make it visible and recognizable as a differentiating element. All of this defines the central void of Maní as a unique and expanded whole (fig. 4), where flows and perspectives converge, constructing one of the most significant images of the architectural and cultural landscape of the city.

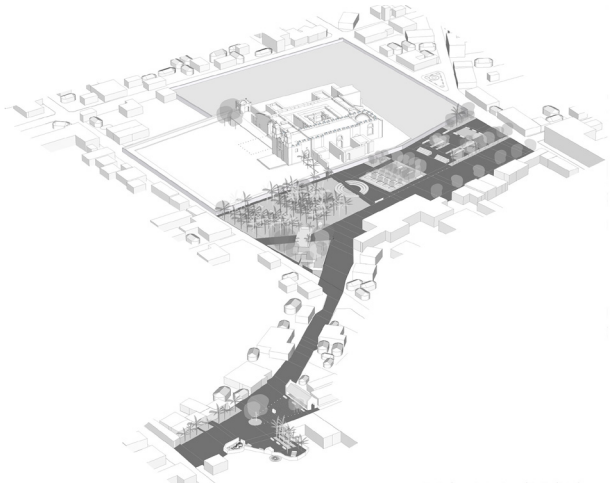

Fig. 4. Vista aérea de propuesta en el entorno del Convento de San Miguel y el Cenote. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

Urban Strategy: Heritage Focuses

Far from the current vision of Maní, the city constitutes a landscape of mixed times which encompasses much more than its cultural core and expands, progressively, towards the territory.
Around the central void, other heritage centers of interest appear, presided over by eighteenth-century chapels that take on the character of new satellite centers. The five religious constructions –Chapels of Santa Lucía, Candelaria, San Juan, Santiago and San José– have their origins in the movements of indigenous peoples 'appropriated' by the Spanish [Kubler et al. 2014] in order to have greater control over administration and evangelization. Thus, they are the trace of the demographic and territorial reconfiguration carried out by the colonists, grouping pre-existing populations into head towns. In this way, Maní became an agglutinating space where each chapel corresponds to the nucleus of aggregation of the immigrant communities from neighboring villages. For this reason, the chapels distinguish areas within the homogeneity of the layout and are more than just elements of cultural or religious value.
Chapels organize the city's current neighborhoods, with reminiscences and identities specific to the founding collective that still survive today. In this sense, the Plan covers the drawing and redesign of these spaces in continuity with the system of representation shown in the central area of the Convent. Different levels of graphics are established in the approach to each area where, inevitably, the drawing carries implicitly the idea of the project. Thus, the strategy is based on the definition of a series of minimal and reiterative design mechanisms that are based on the character of some existing elements in order to reinforce or complete them with new ones.
For each area, a graphic ground plan survey is carried out as a state of the question to understand morphologies, dimensions and relationships between elements (fig. 5). It is also the first step towards the search for a system of representation of the city that allows us to convey its sensorial meaning. The results are drawings of textured plants at different scales to represent the great presence of the jungle vegetation flooding everything, the stone masonry that forms the boundaries of the blocks, the size of the buildings and their arrangement on the plots, the earthy sensation of the roads or the compactness or dispersion according to zones. These textures are intended to evoke sensitive perceptions through graphics, which involves an important work of abstraction. Through colors, textures and strokes, the team draws what is essential to transmit this sensation, but without reaching the precision of detail. Otherwise, the representation would become a graphic



Fig. 5. Axonometría frontal del área de la Capilla de La Candelaria. Estado actual. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).



Fig. 6. Axonometría frontal del área de la Capilla de Santiago. Propuesta. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

incongruity; a useless planimetry, of impossible scale and reading which, taken to the extreme as in Borges' story, the accuracy of detail would mean that the "map of a single province would occupy an entire city and the map of the empire, an entire province" [Borges 1992, p. 443].
The new graphic information is based on plans that need to provide more information at the propositional moment, thus giving rise to axonometries. In particular, the frontal axonometries constitute an evolution of the contrasted representation in the plans that allows the sensation of volume to be introduced. They propose the placement of newly designed umbraculums, the rearrangement of street furniture, the planting of new native trees or the development of different levels of signage in relation to the chapels, as outstanding architectures in the image of this landscape. In addition, its scale allows us to provide greater detail of the proposal where, for example, new garden systems are defined that homogenize the existing spaces, extending and specifying the uses (leisure, recreational, sports or walking); new children's playground areas are designed and the type of trees planned is specified (fig. 6).
Furthermore, different types of axonometric representation are used, reiterated systematically in the proposal for each area. All of them are preceded by a preliminary, highly conceptual drawing, which in greyscale synthesizes the spatial and architectural approach (fig. 7). The new paving is defined in negative, highlighting the sense of crossroads that each chapel generates. Intersection of part of the streets leading to the chapels, linked to open public areas, generates recognizable forms of confluence. It is defined by a system of soft paving with geometric breaks, essentially designed for pedestrian use, although compatible with road traffic by means of specific elements of separation and protection from traffic.
From this point on, graphic design progresses, adopting increasingly more environmental features and closer to a possible real image. The final aerial views give an overall view of the project that corresponds to the final steps in the Plan's cognitive and representational scales (fig. 8). This allows to complete the proposal and to show the character of a differentiated, dynamic and attractive crossroads space. In this way, they are represented and projected as real heritage and social focal points of interest, both for the inhabitants of Maní and for visitors. Finally, the graphic process leads to an image of each area which, close to the rendering, presents the proposal as fully accessible and realistic (fig. 9).

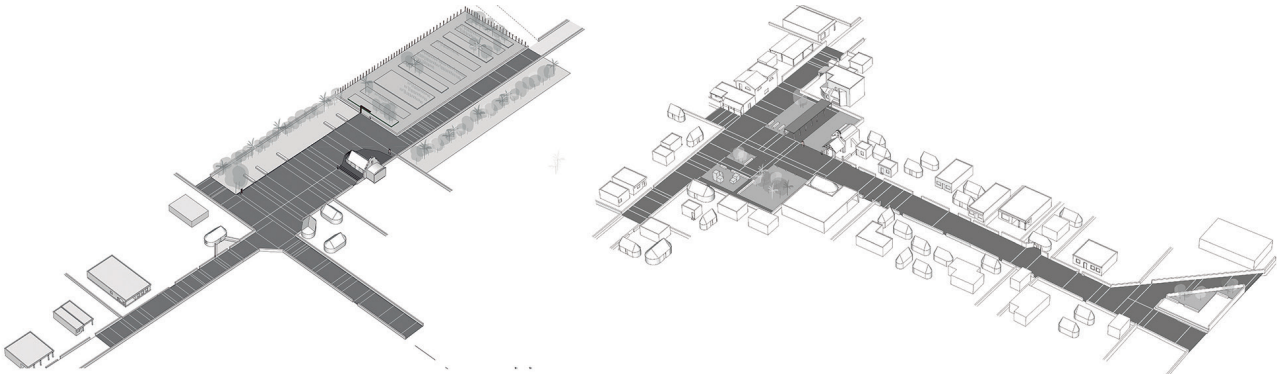

Fig. 7. Concepto espacial-arquitectónico del área de la Capilla de Santa Lucía y San Juan. Propuesta. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022)

Overall strategy: network system

The Integral Plan is proposed as an overall strategy, although in its development the redesign of some singular spaces will be tackled in order to give them a new, more integrating character. The five focal points, together with the central one of the Convent, function as nodes of time and memory within a fully regulated urban structure. In this way, the areas that concentrate the highest density of cultural memory are identified in order to convert them into significant tools of the Plan. They constitute the support points for generating the network system that organizes the new architectural landscape of the city (fig. 10). All the intervention procedures are based on an abundant and precise planimetric representation which, at this point, covers the urban scale as a whole.

To this end, it is necessary to recognize the traces of the different layers of memory, the traces that allow an identification from the material to the environmental. In the general plan, as the urban grid advances towards the territory, there is an architectural dissolution of the blocks. Buildings diminish and other landscapes frozen in time emerge, such as the so-called 'Mayan plots', blending in with the increasingly natural surroundings. This is an ancestral system of land organization and lotification that fragments the block grid into elongated plots, with narrow stone fronts, to configure family units for self-consumption [Baños 2003; Ávila 2009]. The Mayan plot of land is the protagonist of the image of the border landscape, constituting the fusion between the urban space and the thick forest. Identifying these elements –Colonial, religious, ephemeral, vernacular, environmental or historical– leads to the redefinition of the urban grid that organizes the population, understood as a fact of identity in itself (fig. 11). In this way, the layout becomes an argument for the conception of the architectural landscape itself. It establishes a system of networks made up of itineraries, crossroads and connections to definitively imprint the character of the whole. In contrast to the idea of the Convent as the only piece of heritage that can be visited, the definition of cultural routes allows other elements of interest to be interconnected, promoting their conservation and enhancement. Specifically, different themed itineraries radiate from the urban center in the form of a cluster to link this area with those of the chapels.

These routes, both architectural and cultural, allow successive narratives within Maní, enriching the palimpsest [Lázaro 2023].

In addition, the overall strategy is based on the introduction of a comprehensive signage model to identify the elements of interest and define the itineraries. The scale of the new structure in the city is very broad and with different casuistry along the routes, so a system of signs is designed according to function –plaque, lectern, totem or information pavilion. It should be noted that all the satellite chapels are strategically located on the





Fig. 8. Vista aérea de propuesta del entorno de la Capilla de San José. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

Fig. 9. Vista del entorno del Convento de San Miguel Arcángel. Propuesta. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

entrance roads to the city, forming, at the same time, real access areas. Their historical creation is intended, on the one hand, to reverberate on a more contained scale the symbolic charge of the Convent area and, on the other, to project the regulated morphology into the organic landscape. For all these reasons, the layout of the chapels accompanies the idea of jurisdictional and religious conquest in expansion, from the center of the city towards the territory. Analysis of the aerial images shows traces of past times and uncovers new territorial planning relationships.
The new drawing recovers these geometric configurations closely linked to Mayan cosmology (fig. 12). Routes departing from Maní are identified with the axes and diagonals of its urban grid, directly linked to the axes of the cities they connect. In this way, graphic coincidences emerge, clearly intentional, of orthogonal expressions, triangles and circles of relationship in the territory. Guidelines, of Mayan origin, show man's will to impose his order through the transformation of the territory as a means of control. An example of this is the documented triangle constituted by the cities or *batabilob* of Maní, Ticul and Oxkutzcab [Loveland Roys 1957], which configures an interior area where the four lordships resided headed by the Xiu rulers [Okoshi Harada 2012], the main Maya power in the 16th century. This will give rise to another even larger triangle of power, as a strategy of socio-political advancement in the territory, with Mayapán as the vertex, in which Maní would continue to be the 'core of dominion' of the Xiu jurisdiction. Likewise, the representation of the territory reveals Maní as the epicenter of a possible system of concentric circles, relating the cities around it and other environmental elements (cenotes, haciendas, lagoons, etc.), of great importance for the creators of this system of territorial relations.

Conclusions

Each landscape is the story of everything that has happened in this place, on a material and cultural level, and acquires different meanings according to the interpretation of the abstract that resides in it. Furthermore, from this research it is considered that the landscape also speaks of spatial and temporal extension: origin, transitions, current state and imminent near future, but never

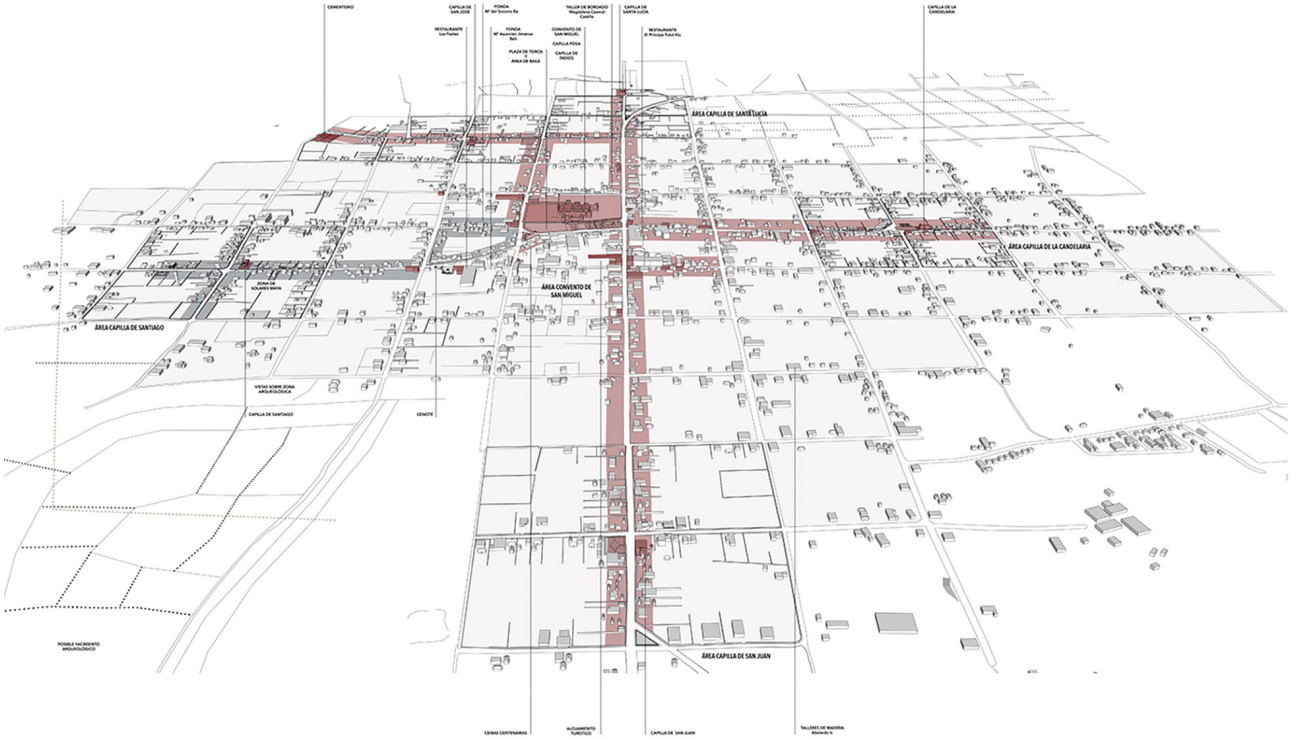

Fig. 10. Levantamiento volumétrico y análisis de la ciudad. Propuesta. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

of an end. For this reason, the Integral Plan is understood as an instrument for the future that allows for the reconstruction of a community's past and the reinforcement of its collective identity. Consequently, it is not only an exercise in the graphic survey of Maní, but each drawing carries an important propositional meaning. In this case, the representation of the city functions as a project tool in itself; even in the plans and frontal axonometries of the current state, a strategy is already implicit.

From the perspective of landscape as an individual feeling, its graphic design constitutes a very broad field of research that takes on different forms depending on the specific case. As the results show, although the planimetry draws on the representation and experience of other projects, Maní requires a specific and certainly innovative drawing system for two reasons. On the one hand, the Plan defines the image of a town lacking global representation; until now there was no overall image as a reflection of a territory transformed over time. On the other hand, the environmental and architectural landscape of the city is identified with a textured, sensitive system of representation; far from a solid, flat drawing, the new design aims to transmit the material perception of the land, the vegetation or the buildings.

The resulting representation of the city is a personal perception of the Plan's drafting team, developed through its own process of interpretation. It is considered to present a particular way of making visible a very large but unnoticed heritage landscape [7]. Drawing becomes a plea for the way in which the population of Maní is understood and the projective intention at the landscape level in it. In this sense, the exposed results show how a method of

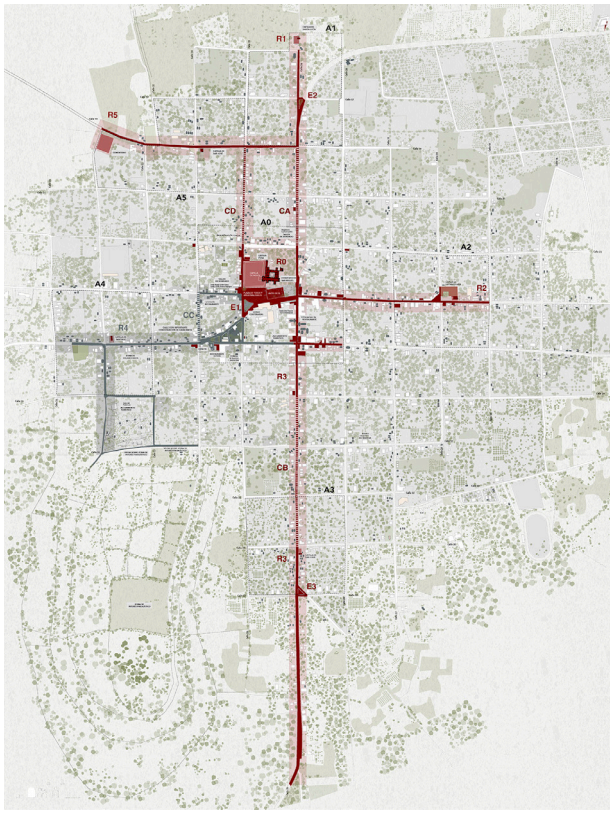

Fig. 11. Planta general. Análisis de la ciudad; redes itinerarios y áreas de propuesta. Plan Integral de Maní (elaboración gráfica de LABPAP, 2022).

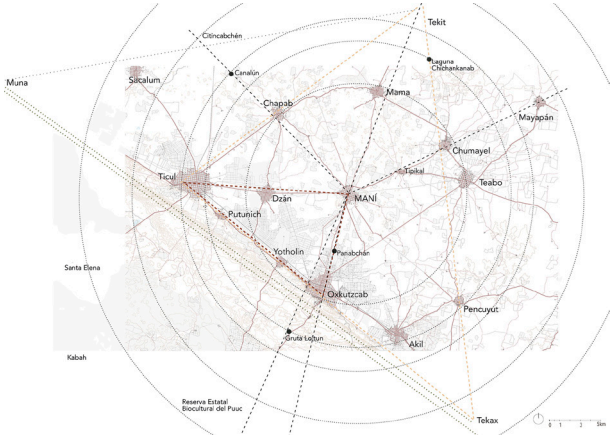

Fig. 12. Planta territorial. Esquema de relaciones geométricas de la trama urbana de Maní en el territorio (elaboración gráfica de autora sobre documentación del LABPAP, 2022).

representation at different scales has been chosen in order to show the integral vision of the city. The approach route employs various types of drawing, from the ground plan, axonometries and, finally, the rendered approach as the last step of setting the scene. At the same time, the different systems of scale and graphics serve to emphasize the elements of interest implicit in the project strategy. Thus, in the regular checkerboard layout, where it is difficult to single out urban spaces, the plan focuses on the presence of the chapel-satellites to support the grid system and build a recognizable architectural landscape.
In conclusion, in the representation of the landscape of Maní, a dual design process takes place, referring to the generation of the Plan and, inherently, of the intervention project in the city. This shows a new perspective which, although personal to the Drafting Team, has previously identified and interpreted the historical and cultural values it presents. The architectural drawing is the language that allows them to be translated and revealed, from the scientific research, in order to direct attention to them [Lapayese 2008]. The result constitutes the formal, spatial and functional definition of the town, knowledge of which determines its perception, or not, as a heritage landscape.

Notes

[1] Non-profit organization promoted by the National Bank of Mexico.

[2] The Architectural, Heritage and Cultural Landscape Laboratory is a recognized Research Group of the School of Architecture of the University of Valladolid, Spain, formed by professors and architectural researchers, coordinated by Darío Álvarez Álvarez and Miguel Ángel de la Iglesia Santamaría, with Sagrario Fernández Raga, Carlos Rodríguez Fernández, Flavia Zelli, Laura Lázaro San José, Lara Redondo González and Ana Muñoz López. It also has scholarship holders and collaborating researchers from different European universities.

[3] This refers to the compilation of facts and descriptions of the daily life of the city that the first bishop of Yucatán, the Toledo-born Fray Diego de Landa, compiled in the form of a logbook during his stay in Maní.

[4] Thus began the "most notorious case of persecution in Yucatán", [Quezada 2001, p. 288] where the burning of codices and symbolism of Mayan gods took place, as well as the exhumation of corpses that had been buried according to the Mayan rite, considering that "they contained nothing more than the lies of the Devil" [De Landa 2001, p. 39].

[5] "And the Great Mother Ceiba arose, amidst the memory of the destruction of the earth. [...] It sat upright and raised its crown, asking for everlasting leaves. And with its branches and its roots it called out to its Lord. There was no light on the earth. There was no sun, no night, no moon. They woke up when the earth was waking up. And then the earth awoke, at this moment the earth awoke. Infinite steps of time and seven more moons were counted since the earth awoke, and then it dawned for them." [Médiz 1985, p. 89].

[6] Color study based on the color theories of M. Eugène Chevreul, published in his work *Principios de Armonía y Contraste de Colores* (Principles of Harmony and Contrast of Colours) in 1859. Plan pursues a minimum chromatic adequacy, moving away from cold colors and highly saturated reds, towards colors with a predominance of yellow, reminiscent of sand and land.

[7] From the expressionist painter Paul Klee's quote "art does not reproduce the visible, but makes it visible" [Klee 2013, p. 1], it can be said that, in these cases of vast heritage landscapes, it is essential to make the invisible visible in order to make its knowledge accessible.

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RUBRICS

Readings/Rereadings

Readings/Rereadings

A Reading of Alexander von Humboldt's *Kosmos* between Scientific Observation and Images of Nature

Rossella Salerno

Kosmos [1] by Alexander von Humboldt (1769-1859) –the geographer born in Berlin to whom we owe the modern concept of landscape– evokes a 'doctoral passion' in me: it was, in fact, during the years in which I was working on my thesis for the doctoral program in Survey and Representation of the Built Environment that, driven by a growing interest in the complex issues present in the concept of landscape, I came across this fundamental text.
From Rosario Assunto to Franco Farinelli [Assunto 1973; Farinelli 1992], references to the work of the scientist Humboldt were recurrent and manifold, and I searched out his original works in the University of Padua Library and the Marciana Library: leafing through those large-format books, often translated into French or Italian and accompanied by extraordinary iconographic apparatuses, opened up long-cultivated perspectives of study to me.
But what was the reason for so much interest in Humboldt's works on the part of Italian landscape scholars in the period between the late 1980s and the following decade?
The key to interpretation suggested on several occasions by Franco Farinelli furthers the scope of *Kosmos* beyond geography, in turning to an approach to landscape that ranges from science to

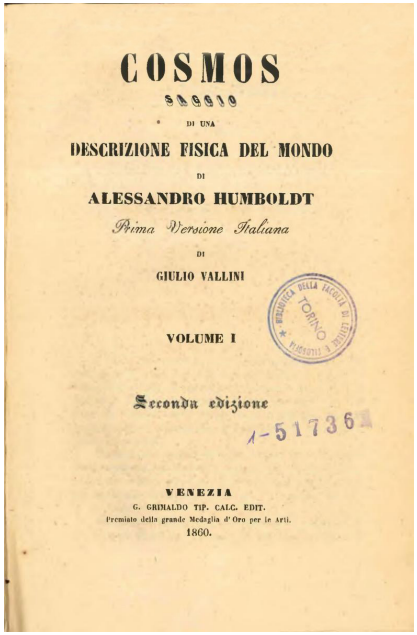
COSMOS
SAGGIO
DI UNA
DESCRIZIONE FISICA DEL MONDO
DI
ALESSANDRO HUMBOLDT
Prima Versione Italiana
DI
GIULIO VALLINI
VOLUME I
Seconda edizione
VENEZIA
G. GRIMALDO TIP. CALC. EDIT.
Premiato della grande Medaglia d'Oro per le Arti.
1860.

Fig. 1. Frontispiece of the first italian edition, Vol. I, 1860.

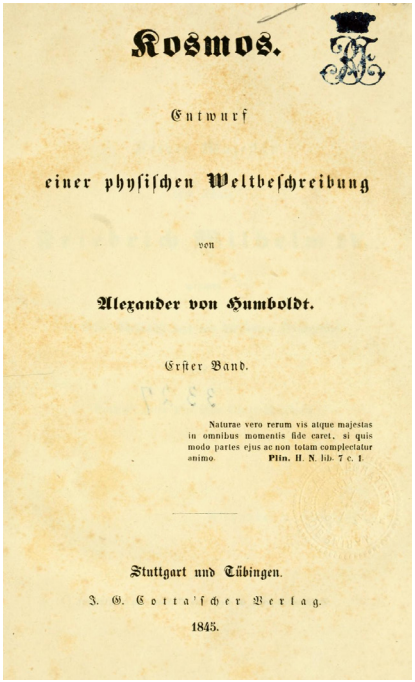
Kosmos.
Entwurf
einer physischen Weltbeschreibung
von
Alexander von Humboldt.
Erster Band.
Naturae vero rerum vis atque majestas in omnibus momentis fide caret, si quis modo partes ejus ac non totam complectatur animo. Plin. H. N. lib. 7 c. 1.
Stuttgart und Tübingen.
J. G. Cotta'scher Verlag.
1845.

Fig. 2. Frontispiece of the first German edition, Vol. I, 1845.

https://doi.org/10.26375/disegno.15.2024.27

diségno ISSN 2533-2899
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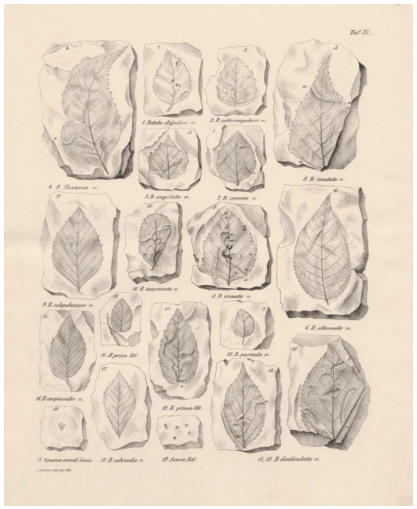

Fig. 3. Heinrich Göppert, Alexander von Humboldt, Lithographien nach versteinerter Flora mit aufgeklebter Humboldt-Notiz , o.D. (da: https://digital.staatsbibliothek-berlin.de/werkansicht?PPN=PPN832956058&PHYSID=PHYS_0005&DMDID=DMDLOG_0001).

aesthetics, a holistic approach that includes both firmly connected material components and immaterial aspects. In Alexander von Humboldt's monumental scientific production –of which *Kosmos* represents the conclusion, the scientific and theoretical epilogue of a vision at once of nature and culture– the engine of inquiry finds its spark in the incessant and meticulous observation of environmental phenomena.
The scientific description of nature, far from being exclusively concerned with the "objective" analysis of the earth's crust, requires the correlation between all events through the use of a "geognosy" (descriptive geology) capable of connecting phenomena and tracing them back to environmental contexts endowed with autonomous characteristics. Man is a fundamental part of any environment, since his action can modify its elements; therefore, the analytical tools needed to know, interpret, and construct "views of nature" –the geographical contexts– must pertain to both natural and human sciences.
"In order to depict nature in its exalted sublimity," Humboldt writes, "we must not dwell exclusively on its external manifestations, but we must trace its image, reflected in the mind of man, at one time filling the dreamy land of physical myths with forms of grace and beauty, and at another developing the noble germ of artistic creations." [Humboldt 1849, Vol. II, p. 371] The aspects of nature that thus define environmental contexts –the just-mentioned "views,"– appear so interrelated as to require the contribution of both the sciences and art, as well as the historical awareness of the different ways in which mankind has related to physical space. The result is an idea of landscape having multiple dimensions, not all of which can be easily measured, not all of which can be traced to an objective metric, of mathematical, geometric, cartographic order.
In the preface to *Kosmos*, Humboldt writes, "This general picture of nature, which embraces within its wide scope the remotest nebulous spots, and the revolving double stars in the regions of space, no less than the telluric phenomena included under the department of the geography of organic forms (such as plants, animals, and races of men), comprises all that I deem most specially important" [Humboldt 1849, Vol. I, p. xii].
At this point, it should be noted that Humboldt's multidisciplinary investigation of nature, conducted through an observation ranging from botany to mineralogy, and from astronomy to

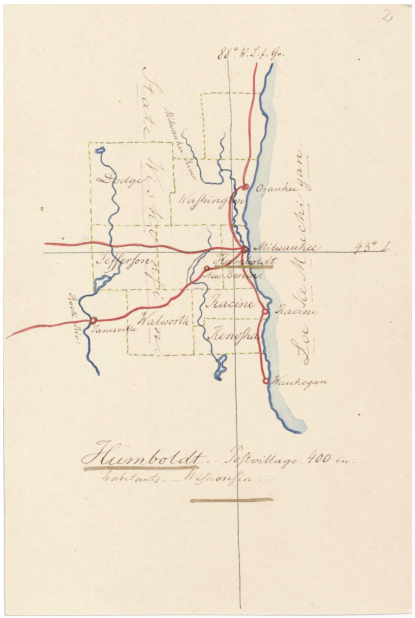

Fig. 4. Album der Humboldt-Lokalitäten in der neuen Welt , o.D. (da: https://digital.staatsbibliothek-berlin.de/werkansicht?PPN=PPN825685826&PHYSID=PHYS_0005&DMDID=DMDLOG_0001).

anthropology, is always supported by written descriptions and supplemented by improbable amounts of graphic annotations, drawings, sketches, interpretive schemes, views, maps... up to the invention of the famous "cutaways" –orographic cross-sections/profiles– capable of combining measurable parameters and visual synthesis.
One might say that *Kosmos*, in its 'almost' five volumes –the fifth was to remain incomplete– has no images, unless one were to consider as such the synoptic charts of the plates; in any case, the presence of images is evoked by the centrality that the conceptual, and at the same time visual tool of the

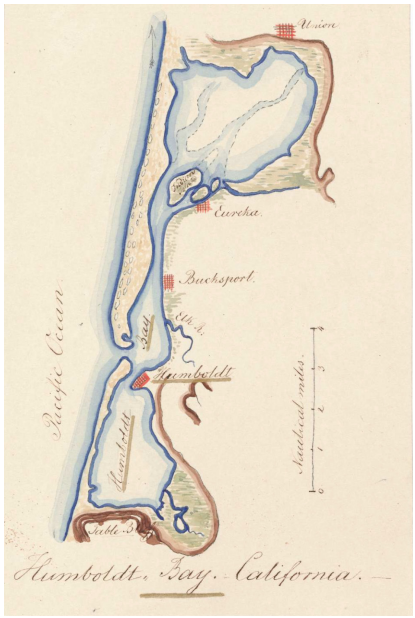

Fig. 5. Album der Humboldt-Lokalitäten in der neuen Welt , o.D. (da: https://digital.staatsbibliothek-berlin.de/werkansicht?PPN=PPN825685826&PHYSID=PHYS_0011&DMDID=DMDLOG_0001).

Views of Nature (*Ansicthen der Natur*/ *Tableaux de la Nature*) [von Humboldt 1808 (1858; 1998)] holds in the German geographer's entire scientific career. "In the work on the *Cosmos* on which I am now engaged," –these are again the words of the Berlin-born scientist– "I have endeavoured to show, as in that intitled *Ansichten der Natur*, that a certain degree of scientific completeness in the treatment of individual facts, is not wholly incompatible with a picturesque animation of style" [Humboldt 1849, Vol. I, p. xi].
Such a 'visual' and 'pictorial' approach to the description of natural phenomena constitutes a constant method of investigation throughout the entire Humboldtian oeuvre: in all interdisciplinary areas of his research, nature –the object of scientific observation– cannot be described only through the writing of a rigorous text, but also needs to be 'shown', that is, illustrated, made visible 'pictorially' in such a way that aspects and correlations can be discerned.
This program of theoretical and applied research –as we would say today– was perfected by Humboldt during his many voyages of exploration, first and foremost, in the one that took him to the "Equinoctial Regions" (Central America) [von Humboldt 1910; 1814-1834 (1986)]: indeed, I believe that one cannot understand *Kosmos* without keeping in mind the wealth of illustrations documenting the survey, at once both accurate and concise, realized while traveling through those exotic lands [2].
Humboldt's 'picturesque' travels include accounts, written narratives, as well as the graphic or pictorial 'translation' of what he had observed, or, in other words, the vivid images of landscape painting: in the descriptions of the lands of the Mediterranean basin and the Near East, as in those ever more distant and exotic, a unique figurative language acts as a link between the different features of the observed cultures, allowing the homologation of artificial and natural objects thanks to a consolidated style and a well-established compositional technique [Salerno 2020].
It is perhaps for this reason that, after developing a method of inquiry –which as I recall consisted of both scientific and aesthetic presuppositions– in *Kosmos* it appears unnecessary to include illustrations, but only to 'methodologically' refer to the need



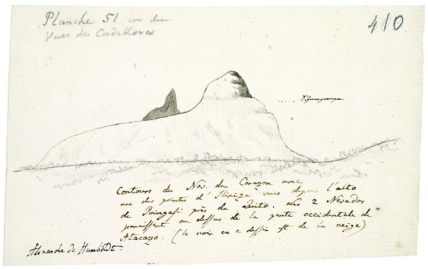

Fig. 4. Album der Humboldt-Lokalitäten in der neuen Welt , o.D. (da: https://digital.staatsbibliothek-berlin.de/werkansicht?PPN=PPN825685826&PHYSID=PHYS_0015&DMDID=DMDLOG_0001).

Fig. 5. Alexander von Humboldt, Vues des Cordillères, pl. 51, autograph sketch (da: https://www.faz.net/aktuell/feuilleton/jahrhundertkauf-stiftung-preussischer-kulturbesitz-erwirbt-humboldts-tagebuecher-12694469.html).

for landscape painting, as, moreover, is well explained in the second volume [3]: "Landscape painting, and fresh and vivid descriptions of nature alike conduce to heighten the charm emanating from a study of the external world, which is shown us in all its diversity of form by both, while both are alike capable in a greater or lesser degree, according to the success of the attempt, to combine the visible and invisible in our contemplation of nature" [Humboldt 1849, Vol. II, p. 440].
And a few pages later, again in the second volume, Humboldt adds: "Landscape painting, though not simply an imitative art, has a more

material origin, and a more earthly limitation. It requires for its development a large number of various and direct impressions which, when received from external contemplation, must be fertilized by the powers of the mind, in order to be given back to the senses of others as a free work of art. The grander style of heroic landscape painting is the combined result of a profound appreciation of nature, and of this inward process of the mind" [Humboldt 1849, Vol. II, p. 453].
Therefore, he continues: "The conception of the natural unity, and the feeling of the harmonious accord pervading the universe, cannot fail to increase in vividness amongst men, in proportion as the means are multiplied, by which the phenomena of nature may be more characteristically and visibly manifested" [Humboldt 1849, Vol. II, p. 457].
Perhaps it is because landscape, even today, continues to seem to us such a multifaceted concept that it can be likened to a "bat" concept [Farinelli 1991], that the Humboldtian lesson, so attentive to multiple interpretive registers, seems so relevant to us, and all the more so because of its ability to synthesize material and immaterial components into images.

Notes

[1] In the text I will refer to the Italian edition of the work: von Humboldt 1961. The entire publication of *Kosmos. Entwurf einer physischen Weltbeschreibung* in German was published between 1845 and 1862.

[2] See the recent digitization of the Berlin-born geographer's diaries which can be consulted at the *StaBi Digitalisierte Sammlungen* of the Berlin State Library, *Alexander von Humboldt's travel diaries*, from which the images accompanying this contribution are taken: <https://digital.staatsbibliothekberlin.de/suche?queryString=categories:%22Alexander%20von%20Humboldt%22%20tageb%C3%BCcher&fulltext=&junction=&feature=humboldt> (accessed 29 November 2024).

[3] *Pitture di paesaggi. Applicazione delle arti del disegno alla fisionomia delle piante* e *varia forma di queste nelle zone diverse*: von Humboldt 1861, Vol. II, pp. 60 and following.

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Events

Events

VL. International Conference on Visualizing Landscape

Alexandra Fusinetti

The Alghero Campus of the Department of Architecture, Design and Urban Planning of the University of Sassari hosted the first *International Conference on Landscape Visualisation 'VL2024'* on 11th and 12th July.
As a pioneering edition on a topic of growing interest in both the scientific and design fields, the response from the academic community was very strong, with 61 contributions from numerous faculties, both Italian and foreign. All the authors offered new and interesting insights into the understanding and visualisation of contemporary landscapes through innovative approaches that integrate digital tools and traditional methods.
Due to the large number of participants, the conference was organised in parallel sessions over the two days, with five main thematic sections, defined by the curators as 'Research Rooms' (*Concepts and Theories, Communication and Images*, *Heritage*, *Perception* and *Information Systems*), according to which the volume containing all the contributions was also divided. These 'Rooms' cover a wide range of topics, from the conceptual definition of landscape to its practical implications in spatial planning and the management of cultural and natural heritage.
The two days opened with institutional greetings from the Director of the Department of Architectural Design and Urban Planning at the University of Sassari, Professor Emilio Turco, and from the two coordinators of the degree courses in Architecture and Urban Planning, Professors Enrico Cicalò and Paola Rizzi. The floor was then given to UID President Francesca Fatta and the Chairman of this first edition, Professor Michele Valentino, who introduced the first keynote speaker, Rossella Salerno. In her paper *Visualizing/Narrativing/Mapping Landscape*, Professor Salerno set out to explore the relationship between landscape and vision in Western culture. By analysing different forms of representation, from paintings to maps, she highlighted how visual perception and graphic representation have contributed to building our understanding of territory and its values, in which 'mapping' has played a fundamental role.
Following this contribution, the three parallel sessions began, which in the first morning focused mainly on two thematic areas: the one on *Heritage*, which examined research focused on the management of natural and cultural heritage and proposed innovative practices related to its valorisation and conservation; the one on *Communication and Images*, which focused instead on the different media declinations in which the landscape is presented, whether traditional or digital; here the role of technology in the elaboration of new visual outputs and how these influence the perception of the landscape was highlighted.
The second parallel session in the afternoon introduced the 'Research Room' on *Information Systems*, where the proposed research illustrated the different applications of GIS and other technologies for the collection, analysis, visualisation and management of landscape data in support of planning strategies.
The first day ended with a presentation by the organisers of the first edition of the conference –Michele Valentino, Amedeo Ganciu and Alexandra Fusinetti– who illustrated the state of the art of 'landscape research' on landscape visualisation, analysing both the topics proposed in the call and those addressed in the papers submitted by the authors.
The analysis attempted to synthesise and summarise the variety of research proposed, using visual analysis techniques with the representation of networks and nodes. By associating each article with a metadata file –containing name, affiliation and keywords– different types of networks were presented, which made it possible to map both the topics of

https://doi.org/10.26375/disegno.15.2024.28

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Fig. 1. Event poster

greatest interest and the various collaborations between researchers and universities. The analysis, carried out in successive steps in which certain terms were merged and others silenced (such as the word 'landscape', which for obvious reasons was present in most of the keywords) in order to obtain a more visually ordered and readable network, made it possible to identify macro-categories that finally allowed the creation of the different 'research spaces'. On the other hand, a second data analysis linked the different research topics to the universities to which the authors belong, in order to highlight the degree of collaboration within the design discipline, which turned out to be very high.

At the end of the speech, a round table was opened to discuss the topics raised during the first day of work, with the presence of the chairpersons of the various parallel sessions, namely Professor Francesca Fatta, Professor Rossella Salerno, Professor Carlo Bianchini, Professor Roberta Spallone, Professor Ornella Zerlenga, Professor Elena Ippoliti and Professor Sandro Parrinello.

On the second day, the two remaining themes were proposed in parallel sessions: the *Concepts and Theories* Room, where the proposed contributions deepened the concepts and theoretical foundations underlying landscape interpretation, exploring different perspectives and offering an indispensable conceptual framework for future studies on the subject. The *Perception* section, on the other hand, analysed how people see and interact with the





Fig. 2. Chairmans round table.

Fig. 3. Picture of one of the parallel session.

landscape, taking into account psychological, cultural and environmental factors and highlighting the importance of these aspects in landscape design and management.

The keynote speaker of the second day, photographer Davide Virdis, spoke with the paper *La linea d'ombra. Photographic narratives on the landscape*, in which he illustrated his many years of research in the field of architectural and landscape photography, exploring the complex relationship between the contemporary landscape and the changing dynamics linked to the processes of development and evolution of the territory.

In conclusion, the first edition of *Visualizing Landscape* has been an important reference point for all scholars interested in the study of landscape and its representation. By providing a comprehensive and up-to-date overview of the latest research, it has stimulated numerous critical reflections on the complexity of landscape and the challenges it poses to contemporary society. The interdisciplinary approach and the use of innovative tools have certainly made a valuable contribution to the scientific and planning debate.

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Events

45th UID Conference

Gabriella Liva

The 45th International Conference of Representation Disciplines Teachers, Congress of Unione Italiana per il Disegno (UID), promoted the close collaboration between the University of Padua and the Iuav University of Venice in promoting the dialogue, the sharing, and the planning linked to the science of drawing. In three intense days of study, the two cities hosted more than 350 scholars (including professors, researchers, PhDs, designers and drafters), from Italy and as well as from other countries. They exchanged views, reflecting on the notion of measurement and/or unmeasurement related to the discipline of drawing.

The Call for Papers invited in-depth exploration of the wide range of declinations of the proposed topic, based on the assumption that knowledge of the dimensions of what has to be represented is a necessary, but not sufficient, condition for establishing a scientific relationship between an artifact and the phenomenal world, both in the operations of investigation and analysis of the existing as well as in the stages of conception, design and prototyping of artifacts.

The units of measurement, which we currently employ today, reflect epistemological and cultural patterns informed by the scientific progress of research, as well as the outcomes of its discoveries. Since antiquity it has often been man and the human body that have fulfilled the role of model and module for the proportioning of architecture. The same concept can be extended as far as the works of celebrated masters, such as Le Corbusier and Terragni, for example, in a kind of yearning for perpetuable harmony over time. However, measurement is not the exclusive prerogative of architecture, for numerical and proportional features also invest other fields, such as music, mathematics, geometry and poetry.

Today, design representation is increasingly linked to the development of generative parameterization algorithms, with applications that allow one or more numerical values to be modified to verify the formal effect produced by new measurements. In parallel, the obsession with data control, coupled with the crisis of anthropocentrism, produces an excess of measurements that are often ungovernable: a 'disproportion of measurements', a proliferation of numerical data that address physical dimensions, but which the human intellect increasingly struggles to understand and qualify as a whole. The design of planetary-scale infrastructures and the many discoveries of intelligences, collective and non-human (animal, plant and artificial), force reckoning with measurement excess and new challenges to represent and understand what previously appeared as unmeasurable.

Whether the act of measuring requires traditional human action or relies on the presence of algorithmic tools with which to interact, the drift of unmeasurement can reach into immensity in design practices ranging from architecture to engineering, product design, communication and fashion design, and even break free in the visual and performing arts.

The numerous contributions selected by the organizing committee were distributed in three focuses: *Ideating: prefiguration and configuration* (34 contributions, 28 Italian and 6 foreign); *Knowing: observation and deduction* (78 contributions, 70 Italian and 8 foreign); and *Narrating: description and interpretation* (86 contributions, 73 Italian, 13 foreign). The proposals of the UID conference participants were all collected in the volume published by Franco Angeli of the conference proceedings. The result is a tome of almost four thousand pages, edited by Francesco Bergamo (coordinator), Antonio Calandriello, Massimiliano Ciammaichella, Isabella Friso, Fabrizio Gay, Gabriella Liva and Cosimo Monteleone [Bergamo et al. 2024].

https://doi.org/10.26375/disegno.15.2024.28

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Fig. 1. Event banner

The conference opened in the prestigious Bo palace in Padua, welcoming first in the hall dei Quaranta, then in the main hall, the guests. The institutional greetings included the participation of the rector of the University of Padua, Daniela Mapelli, and the rector of the Iuav University of Venice, Benno Albrecht, sealing the fruitful collaboration between the two universities in Veneto and between the two cities whose cultural relations are rooted in centuries. To underscore the close collaboration between the two universities, after institutional greetings, Andrea Giordano, director of the Department of Civil, Building and Environmental Engineering at the University of Padua, and Giuseppe D'Acunto, pro-rector of education at Iuav University, both promoters and organizers of the conference, spoke at the same time. The plenary session was closed by UID honorary president Mario Docci and UID president Francesca Fatta, who was just this year concluding her three-year term. Massimiliano Ciammaichella, Cosimo Monteleone and Fabrizio Gay then interbenched, who presented the three focuses. From *Devising* focus, themes emerged that extended from the measure or disproportion of the conceptual prefiguration of the creative act to the physical and digital survey of natural and anthropic space, without neglecting timely insights related to the extent and potential of artificial intelligence, the fleetingness of sound, the rule and boundlessness of the clothed body.

The focus *Knowing* raised the issue of the concept of measure or unmeasure from the scale of detail in artifacts to the cosmic dimension of astronomical models, tracing examples of illusory or immersive space, probing archival heritage, and addressing visual and human body disability as a tool for measuring the geometry of visual and nonvisual space.

The third focus, *Narrating*, was introduced by Fabrizio Gay, who highlighted its issues related to the measurement of scopic narratives that reveal morphometric errors, the relationships between the aesthetic and the inesthetic, as well as many other aspects related to drawing practices.

The conference, therefore, crystallized the state of the art of the specificities of drawing act to measure the measurable as well as the abnormal and the unmeasurable, including through new methodologies and novel tools. Simultaneously from the results of the conference, possible contradictions emerged, framing questions and challenges to which we are called to act with increasing urgency, collaborating with other disciplinary fields in setting strictly measured or unmeasurable goals, but relevant to the knowledge and to the safeguarding of the world that surrounds us.

Moving from the Bo, right in the center of Padua and historical heart of its university, to the monastic complex of Santa Caterina, current headquarters of the Department of Statistical Sciences, the selected papers were distributed over the two days in five parallel sessions, each moderated by two chairs, who introduced the topics and took questions addressed to the speakers. At the end, the outcomes of 198 research papers by scholars from Italian, European and intercontinental universities were presented.

The opening talk of the session, *Ideating: prefiguration and configuration*, was given by Marco Beltramini, director of the Centre for the Study of Perception and Art (CArPe), who with lucidity, expertise and irony, addressed the topic of vision and illusory images. Manuela Rossi, director of the Museum of the

City of Carpi, Palazzo dei Pio, introduced the session *Knowing: observation and deduction* by emphasizing the intense collaboration, active since 2010, with the University of Padua for the reconstruction of the urban and architectural transformations of the city of Carpi by means of VR and AR physical 3D modeling. Finally, for *Narrating: description and interpretation*, Toto Bergamo Rossi reviewed some highlights of *Venetian Heritage*, the *nonprofit* organization he founded that has become an international foundation dedicated to the preservation, restoration and promotion of Venetian historical and artistic heritage in the lagoon and mainland domains, in collaboration with local superintendencies and the UNESCO-International Private Committees for the Preservation of Venice program. Bergamo Rossi's talk shifted the attention to Venice, thus anticipating the third and final day, which took place in the lagoon city at the Tolentini Convent, the historic headquarters of Iuav University.

During the last day, alongside the institutional greetings of vice rector Anna Saetta, the main hall welcomed Marco Tirelli's *lectio magistralis*, introduced by Angela Vettese. The Roman artist recounted his work, emphasizing how his works arise, first and foremost, from mental places traversed and made evident by light. Dwelling on the most important installations and exhibitions, numerous images were projected in sequence to document the artist's intense activity, appreciated by the public and critics nationally and internationally. With passion and emotional involvement, Tirelli dwelt on graphic and sculptural techniques that physically translate a wholly personal flow of thoughts and concepts. His painting rests on the connection between light, shadow and memory. Light reveals images, fragments of reality that the artist captures and rereads in essential forms that slowly emerge from the dark backgrounds of the canvases. The painted figures are not pure and simple abstract geometric forms, rather mental architectures, places in which the artist translates the real. The images of the visible, exhibited in their essentiality, whether objects or architectural interiors, appear in the light endowed with volume, a physicality defined by *chiaroscuro* and perspective vision. Admiration and devotion to the artist resulted in the awarding of the UID 2024 gold plaque.

The other UID 2024 gold plaque was assigned to Andrea Giordano, with reasons read by president Francesca Fatta. In the general commotion, also increased by Francesca Fatta's end-of-term greetings and thanks, the day ended while the president awarded the best paper prizes to the speakers of the individual sessions: for the session *Devising* Daniele Colistra was awarded with the contribution *Measuring the sign. Symbols and Signs for Contemporary Music Notation*; for *Knowing*, the tied papers of Alessio Buonacucina, Prokopios Kantas, Graziano Mario Valenti, *Conjugate Geometries: hyperboloidal core gears*, and Marta Salvatore, *Around the Volute. Just and Easiest Measure of Diminishing Pitch*; for the *Narrating* session, two best papers were awarded to Paolo Belardi, *Measures and Disparity: the Street Soccer Field as a Place of Regeneration* and Matteo Flavio Mancini, *Measuring the Infinite. Space and perspective between Piero della Francesca and Andrea Pozzo*.

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Events

Lizori: Segni e Dialoghi

Michela Meschini, Chiara Mommi

Hosted in the evocative Rotonda Talucchi of the Accademia Albertina di Belle Arti di Torino, from September 24th to October 29th, 2024, the exhibition *Lizori. Segni e Dialoghi* offers an experience of artistic and cultural reflection dedicated to the regeneration of Italy's historic burgs. Focusing on Lizori, a medieval Umbrian burg located in the municipality of Campello sul Clitunno in the province of Perugia, the exhibition explores the possibilities of restoring and enhancing historical and cultural roots, reflecting on the deep bond that links architecture to the landscape and collective memory. The burg of Lizori, with cobbled streets, stone houses, and perimeter walls that preserve its ancient defensive character, becomes a symbol of a heritage that is capable of speaking to both the present and the future with a vibrant, layered cultural identity.

The exhibition originates from the project and educational experience of the workshop with the same name, *Lizori. Segni e Dialoghi* carried out in 2023 and designed to involve artists, architects, and researchers in an active dialogue with the village itself. This workshop marked a fundamental starting point, offering a context of interdisciplinary exchange where visual, architectural, and cultural languages intertwined to create a collective reflection on the place. Numerous works emerged from this initiative, now forming the core of the exhibition, enabling new interpretations of Lizori.

After the success of the first exhibition hosted in the burg at Palazzo Trinci, the exhibition arrives at its second stage, this time in Turin, confirming the growing interest around the theme of regenerating historic burgs. The exhibition has been supported by the Antonio Meneghetti Scientific and Humanistic Research Foundation, the event's sponsor, in collaboration with the Accademia Albertina di Belle Arti di Torino and with the support of numerous institutional and academic bodies, including the Region of Piemonte, the Province of Perugia, the Department of Civil and Environmental Engineering of the University of Perugia, the UID (Unione Italiana per il Disegno), and the orders of Architects and Engineers of Turin and Perugia, as well as LAB-LANDSCAPE (International Laboratory for Landscape Research) and AICA Italy (Associazione Internazionale dei Critici d'Arte Sezione Ufficiale Italiana). The exhibition *Lizori. Segni e Dialoghi* offers to the visitors a rich *corpus* of works, bridging tradition and innovation, permanence, and transformation. The curators, Fabio Bianconi, Marco Filippucci from the University of Perugia, and Diego Repetto from AICA Italy have created a path that encourages the public to reflect on the value of historical heritage and the importance of preserving the authenticity of burgs.

The works exhibited in the rotunda are arranged according to a precise radial layout, which reflects and enhances the intrinsic geometry of the space itself. The entrance opens directly onto the central hall, the conceptual and structural core of the entire installation, where a three-dimensional reproduction of Lizori burg dominates the scene, centrally located and immersed in suggestive circular lighting that amplifies its symbolic centrality. The radial design is further accentuated by a series of white markings arranged like rays on the floor, each bearing the name of the artist to whom each room is dedicated, a curatorial choice that guides visitors along a symbolic path of knowledge and rediscovery.

Particularly striking is the room aligned radially with the entrance, housing the works of Antonio Meneghetti. In it, the piece *Il Disco Solare*, crafted from Murano glass, lights illuminating up in a play of light and shadow that enhances the density and transparency of the material, creating a tension between physical presence and immateriality.

https://doi.org/10.26375/disegno.15.2024.30

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Fig. 1. Exhibition Lizori. Segni e Dialoghi.

The arrangement of the rooms follows a fluid interconnection, revealing perspectival glimpses, each offering new details and viewpoints on the burg and the artistic narrative celebrating it. The work of Maria Grazia Cianci and Sara Colaceci introduces visitors to the urban space of Lizori through a careful study of the burg's layout, elevations, and sections, providing an analytical framework that reveals it not only as a lived space but as tangible memory. In dialogue with this representation, Stefano Bertocci's works explore the dialectical relationship between interior and exterior, between ancient walls and surrounding landscapes, illustrating the contrast between the enclosures of medieval structures and the openness they establish with the outside world.

Sandro Parrinello's series *Tactus* evokes the unique temporal suspension experienced when walking through Lizori's alleys, unfolding it in visual narrative capable of immersing the viewer in a suspended time.

Following this is the work of Fabrizio Ciappina, whose watercolors depict the sometimes-conflicting dialogue between artifice and nature. This dialogue, marked by historical layers and the ceaseless transformation of the landscape, embodies constant metamorphosis, a blend uniting past signs and present tensions. Gian Piero Frassinelli, with his photomontages, reinterprets the concept of the Monumento Continuo, integrating it with Lizori's morphology, where the rhythm of architectural solids and voids anchors the burg in the embrace of the olive-covered hillside. Alongside, Ruggero Lenci's *Torre Silla* offers a musical transfiguration of the burg, materializing in a bronze fusion specially crafted for the exhibition, a solemn yet dynamic presence that reinterprets architecture as rhythm and cadence.

Continuing along the path, Franco Purini presents a series of site studies, comprising ink sketches, drawings on tracing paper, and digital representations that span from the detail of stone walls to the horizon of the landscape. In his vision of the *Piazza del Cielo* e *dell'Acqua*, Lizori appears as an enclosure of absence, avoid that generates collective memory in its absence, a place that exists in the visitor's reminiscence and imagination.

Claudio Patanè continues the reinterpretation of Lizori, envisioning the village towers as hands reaching toward the sky, like figures emerging from the landscape; his sensitivity is expressed in a booklet that synthesizes the principal landscape features of the Umbrian hills, translating the environment into essential signs.

Fausta d'Ubaldo appropriates the structure of the medieval polyptych but replaces sacred images with seven watercolors in which landscape fragments alternate with traditional religious icons. Taking a different approach, Emanuela Chiavoni uses black ink to highlight contrasts between light and shadow, between day and night, in an almost metaphysical exploration of the burg's structure. Rounding out this dialogue, Elisabetta Silvestri presents a study of musical and dimensional matrices, culminating in the oil painting *Come in Cielo, così in terra*, which translates the burg into a synthesis of form and transcendence.

The exhibition further features works that interpret Lizori in a more abstract way: Valerio Morabito imagines the burg walls as protective guardians, *Giganti delle Porte* that watch over and move within the landscape; Raffaele Federici uses charcoal and oil on canvas to revisit Lizori in a language of dense shadows and vibrant colors, while Elisa De Santis, with a vivid color palette, endows the village with an atmosphere of dynamism and vitality, a tribute to the landscape's continuous transformation.

The exhibition's opening, held on September 27th, was accompanied by the presentation of the catalog, a record encapsulating the perspectives and interpretations of the participating artists. On October 25th, at the conclusion of the exhibition, the Study Seminar *Prospettive. Lizori Segni e Dialoghi* was held, dedicated to discussing the relationship between architecture, art, and landscape in the context of historic burg restoration –a topic of profound relevance for cultural heritage regeneration. The seminar, introduced by official greetings from the Accademia Albertina di Belle Arti di Torino, the Antonio Meneghetti Scientific and Humanistic



Fig. 2. Franco Purini's works within the exhibition.

Research Foundation, and the UID, included significant contributions from academics and experts in the field, each contributing to a multifaceted vision of the central theme.
Among the speakers, prominent figures such as Roberta Spallone, Fabio Marcelli, Massimiliano Marinelli, Anna Osello, Giulia Pellegri, Michela Scaglione, Massimiliano Lo Turco, and Anna Maria Rufino offered diverse perspectives, ranging from the preservation and enhancement of architectural heritage to the role of visual arts as a medium for dialogue and cultural regeneration. Their contributions were enriched by testimonies from some of the participating artists, Emanuela Chiavoni, Sandro Parrinello, Raffaele Federici, Ruggero Lenci, Claudio Patanè, Fausta d'Ubaldo, and Elisabetta Silvestri, who shared their experiences and insights regarding the relationship between artistic creation and the memory of places. The exhibition curators, Fabio Bianconi, Marco Filippucci, and Diego Repetto, concluded the event by summarizing the key ideas emerging from the discussion, highlighting how a synergic approach across disciplines can offer a new way to the preservation of historic villages, combining innovation with tradition.
The exhibition *Lizori. Segni e Dialoghi* is thus an aesthetic and cultural experience that goes far beyond a mere display. Lizori, from an ancient medieval settlement, transforms into a place of experimentation and reflection, where art and architecture engage in dialogue with history in a process of renewal that reveals the evocative power of small historic centers. The exhibition invites reflection on how the enhancement and preservation of burgs should not be seen as freezing the past but rather as an ongoing rediscovery that, through new expressive languages, enables a vibrant interaction between historical legacy and contemporary visions. Lizori thus presents itself not only as a burg to be preserved but as a place where safeguarding the past becomes an inspiration for envisioning the future.

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Events

Digital & Documentation 2024. Otherness

Giuseppe Nicastro

On September 16, the 2024 edition of the *Digital & Documentation conference* took place. Now in its 7th edition, the event brings together professors, researchers, and scholars in the field of Representation to discuss the topic related to documentation practices: in this scenario, particular attention is given to digital technologies applied to historical buildings. The aim is to highlight contributions and research experiences that, starting from a critical analysis of documentary sources, exploit digital tools to produce information systems that increasingly prioritize usability and clarity. As is well known, the advantage of digitizing historical heritage, thanks to the interoperability inherent in digital data, allows us to design valorization experiences suitable to various types of audiences. Thus, the same data, when processed and contextualized appropriately, can serve as support tools for industry experts (such as architects, engineers, and administrative officials); at the same time, it can offer innovative storytelling opportunities to communities and cultural heritage users.

This year's edition, titled *Otherness,* was held in the venues of the Società di Mutuo Soccorso Porta Palio in Verona. The conference was opened by Alessandro Luigini, scientific director of D&D for the 2024 edition, Michelangelo Pivetta, president of SMS Porta Palio, Francesca Fatta, president of UID and Sandro Parrinello, representing the Founding Committee of D&D.

The morning program featured three international keynote speakers. In a presentation titled *A South African Perspective on Measuring: Architecture & Design*, Jacques Laubscher and Marinda Bolt (Tshwane University of Technology) and Victoria Ferraris (University of Córdoba) presented three case studies on documenting South African cultural heritage. This research is the result of collaboration between the Department of Civil Engineering at the University of Salerno, the Faculty of Architecture at the University of Córdoba, and the Department of Architecture and Industrial Design at Tshwane University of Technology in Pretoria. Focusing on the importance of measurement accuracy in historical contexts, the speakers illustrated effective photogrammetric acquisition methods ranging from landscape to urban environments.

In the morning panel, Michela Cerachi (Free University of Bozen-Bolzano) reflected on the opportunities that digital technologies offers in the field of descriptive geometry, particularly in exploring spatial forms. In her presentation, *Il "modello fisico aumentato" per esplorare le forme nello spazio. Nuovi dispositivi per un teatro didattico multimediale di Geometri descrittiva Costruzioni geometriche complesse* [The "Augmented Physical Model" for Exploring Forms in Space. New Devices for a Multimedia Educational Theater of Descriptive Geometry Complex geometric constructions], Dr. Ceracchi proposed a "multimedia educational theater" that uses technologies like augmented reality to enhance physical models and renew the teaching of descriptive geometry.

In *Le radici latine dell'arte stereotomica: metodologie digitali di indagine e ricostruzione per l'analisi dei monumenti antichi* [The Latin Roots of Stereotomic Art: Digital Investigation and Reconstruction Methodologies for Analyzing Ancient Monuments], Giulia Piccini (Università Iuav di Venezia) sought to identify stereotomic parameters in pre-renaissance buildings (the historical period traditionally associated with this technique's origins). By analyzing case studies primarily from classical and pre-classical periods, her research employs digital surveying tools to verify the technologies and construction methods at the time.

The importance of measurement accuracy, as highlighted by Andrea Pasquali (University of Florence) in

https://doi.org/10.26375/disegno.15.2024.31

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Fig. 1. Flyer of the event.

his presentation *La documentazione di dettaglio nella digitalizzazione del mosaico del battistero di Firenze* [Detailed Documentation in Digitizing the Mosaic of the Florence Baptistery], is essential even in cases of close-range studies. Collaboration between the Opera del Duomo Museum in Florence and the Department of Architecture provided Dr. Pasquali with a suitable case study: the mosaic on the inner dome of the Florence Baptistery. The close-range digital survey of the mosaic surface offered a significant opportunity to experiment with operational proposals aimed at achieving the highest level of detail in three-dimensional restitution.

Focusing on the 3D reconstruction of complex historical buildings, Roberto Barni (Sapienza Università di Roma), in his presentation *Dall'acquisizione dei dati alla segmentazione semantica delle nuvole di punti per la classificazione del patrimonio culturale: i casi delle abbazie di Fossanova e Casamari. Segmentazione di nuvole attraverso intelligenza artificiale* [From Data Acquisition to Semantic Segmentation of Point Clouds for Cultural Heritage Classification: The Cases of Fossanova and Casamari Abbeys. Cloud segmentation through artificial intelligence], explored the opportunities offered by point cloud segmentation practices, aided by Machine Learning and Artificial Intelligence. Historical architectures, such as the case studies of Fossanova and Casamari Abbeys, are characterized by a high variability of elements, making their translation into Digital Twins a time-consuming operation. Semantic segmentation of collected data can thus improve historical heritage documentation processes.

Concluding the morning presentations, Martina Suppa addressed the important issue of surveying buildings affected by seismic events, such as the 2012 earthquake in Emilia-Romagna. In her presentation *Optimization of survey procedures and application of integrated digital tools for seismic risk mitigation of cultural heritage: The Emilia-Romagna damaged theatres*, the project outlined a workflow specifically designed for seismic damage to historical theaters. Using a case study on the Teatro Sociale di Novi (Modena), the research focused on the most significant volumetric and spatial aspects of these buildings, integrating these analyses into the digitization workflow. This approach defines three complementary information levels determined by visual surveys, 3D acquisitions, and subsequent implementation into an HBIM model.

The afternoon session began with a keynote speech by Massimiliano Ciammaichella and Barbara Pasa (Università Iuav di Venezia) titled *Diritto all'immagine. Pratiche di progetto e digitalizzazione negli archivi di moda* [Right to Image: Project Practices and Digitization in Fashion Archives]. The themes of documenting and digitizing historical documents and archives were explored in the context of fashion: drawings, photos, sketches, etc., which constitute a valuable partially explored and inaccessible documentary heritage. The archive serves a dual purpose: as a catalog of a brand's historical documentation and as a useful tool to guide and support the creative process. Due attention was also given to the issue of copyright, addressing accessibility from a perspective that ensures consultation while preserving copyright.

Fig. 2. Venue: Società di Mutuo Soccorso Porta Palio, Verona.



Andrea Tomalini (Politecnico di Torino) opened the afternoon panel with his presentation *Modellazione geometrico informativa: verso il digital-twin per il patrimonio museale* [Geometric-Informative Modeling: Toward the Digital Twin for Museum Heritage]. Starting from the definition of the museum environment as a stage (container) for interactions between users (visitors) and content (exhibited works), the research highlighted the potential of the digital twin as a tool to support the daily activities of a museum context. The parametric modeling of the container leads to managing complex systems, such as digital collection management or analyzing visitor flows and behaviors.
The valorization of historical-architectural heritage, specifically lighthouses, was the focus of Sonia Mollica's presentation (Università degli Studi Mediterranea di Reggio Calabria) *La conoscenza del patrimonio storico: modellazione parametrica tra semantica e ontologia. La rete dei fari del Maditerraneo* [Knowledge of Historical Heritage: Parametric Modeling Between Semantics and Ontology. The Network of Mediterranean Lighthouses]. The focus was on reconnecting digital data to make it accessible to communities that identify with their heritage values. This action combined HBIM parametric tools with the Web Ontology Language approach: the semantic definition of all elements constituting the investigated objects creates an "Atlas of Italian Lighthouses."
The fortified system of Bergamo was the subject of the presentation by Pietro Azzola (University of Bergamo) *Rilievo 3D, ricostruzione digitale e restauro virtuale: il caso studio della cannoniera di San Michele della Fortezza di Bergamo* [3D Survey, Digital Reconstruction, and Virtual Restoration: The Case Study of the San Michele Cannon Room in the Bergamo Fortress]. The Bergamo fortress is characterized by its bastions and towers, which form its identity. Equally important but less known, due to their specific nature, are the underground spaces, particularly the cannon house defending the city's access points. Starting from an analysis of the current state, the research employed modern 3D surveying techniques to digitize these underground environments. The use of the Unreal Engine rendering engine allowed for a narrative that faithfully restores the original appearance of these underground spaces.
The landscape, no less then cultural heritage, represents a resource to protect and enhance becoming a valid application area for digitization and documentation processes usually employed at architectural or urban scales. Marco Vedoà (University of Barcelona) deals with this topic in his presentation *Qualitative GIS for Decision-Making Processes: From Landscape Digitization and Documentation to Defining Territorial Strategies*. The presentation illustrated three research contexts: a doctoral thesis, a *Horizon* project, and a *PRIN* project. These contexts employ GIS systems in multiple ways, such as analyzing the digitization processes of cultural landscapes to define territorial development strategies or documenting social and participatory initiatives related to food sharing. The examples confirm that Qualitative GIS can become an integral part of knowledge and decision-making processes.
Also dedicated to GIS was the final presentation of the afternoon panel by Dina Jovanovic (Politecnico di Milano), titled *Methodology of using historical cartography in planning widespread historical center.* The study of territory began with the fascinating perspective provided by historical maps and cadastral archives. Historical maps transcend their role as mere representations of specific territorial configurations at a specific point of time; instead, they document the evolution of the environments they depict, effectively becoming valuable archives. Through a case study in Desio, Lombardy, the research proposed a methodology characterized by two distinctive approaches: the Deconstructive approach, focusing on the detailed analysis of elements within the historical map, and the Constructive approach, aimed at integrating historical documentation with the most recent territorial data. By defining guidelines for the use of historical data, the research results become an integrated part of all territorial planning practices.

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Events

Symposium REAACH 2024

Roberta Spallone

REAACH 2024 is the fifth edition of the *REAACH Symposium* (fig. 1), an event that, over the two days of study on October 8 and 9, 2024, featured contributions from international scholars on the topic of the challenges of the discipline of Representation in light of the disruptive and interconnected phenomena of Artificial Intelligence (AI) and eXtended Reality (XR).
The symposium, first held in 2020, was born online because of the pandemic, after some postponements in the hope of keeping it in-person. The organizational simplicity, the possibility of reaching scholars in every part of the world, the modularity of the program, and the cost containment have, over the years, consolidated this mode of holding, coordinated by the three Chairs, Andrea Giordano, Michele Russo, and Roberta Spallone, at the DICEA (Civil, Environmental and Architectural Engineering) of the University of Padua. Following a call for extended abstracts, the proposals are selected for oral or video presentation at the symposium. The next phase involves the development of the research according to the directions of the Scientific Committee, up to the production of an extended contribution that, if accepted by the reviewers, is collected as a chapter in a collective volume, published in the 'Digital Innovations in Architecture, Engineering and Construction series' of Springer Nature.
While the annual holding of the symposium imposes a tight cyclicality in its organization and subsequent publication is the outcome of the discussion and directions of the Scientific Committee, it has the advantage of reading and interpreting the trends imposed by technologies and the ability of scholars to govern them, establishing a stringent link between the proposals of previous years and the new ones.
The survey of keywords – AI and/or XR are mandatory to target contributions appropriately; others should be drawn from a 'galaxy' of terms conceptually related and referring to the different declinations of the discipline of Representation – and the comparison between them in the successive editions of the symposium, allow for the identification of established and new trends in the studies presented.
In the inaugural presentation of the *REAACH Symposium 2024*, a brief *excursus* was made between themes and directions of the different editions in light of the previous considerations.
The first *REAACH-ID Symposium 2020* aimed to carry out a recognition, a fundamental one, of the research carried out by Representation scholars in Italy that explored new interests and intersections in the field of Artificial Intelligence and Augmented Reality (AR), outlining possible interdisciplinary collaborations and transdisciplinarity. The acronym *REAACH-ID*, conceived for the event, revealed the meaning of the initiative ('Representation for Enhancement and management through Augmented reality and Artificial intelligence: Cultural Heritage and Innovative Design').
The second step of the 2021 debate set the ambitious goal of exploring the new boundaries that, after just one year, AR and AI marked in Cultural Heritage and Innovative Design, opening up to international studies. That goal was achieved and surprisingly exceeded, thanks to the lymph provided by new proposals and scholars.
In the third *REAACH-ID Symposium* of 2022, it was observed that many of the topics addressed in the research corresponded to those listed in the Final Report 'Study on quality in 3D digitization of tangible cultural heritage: mapping parameters, formats, standards, benchmarks, methodologies, and guidelines', published in April 2022. In the last paragraph of the report devoted to 'Forecast Impact of Future Technological Advances', single points of attention in convergence

https://doi.org/10.26375/disegno.15.2024.32

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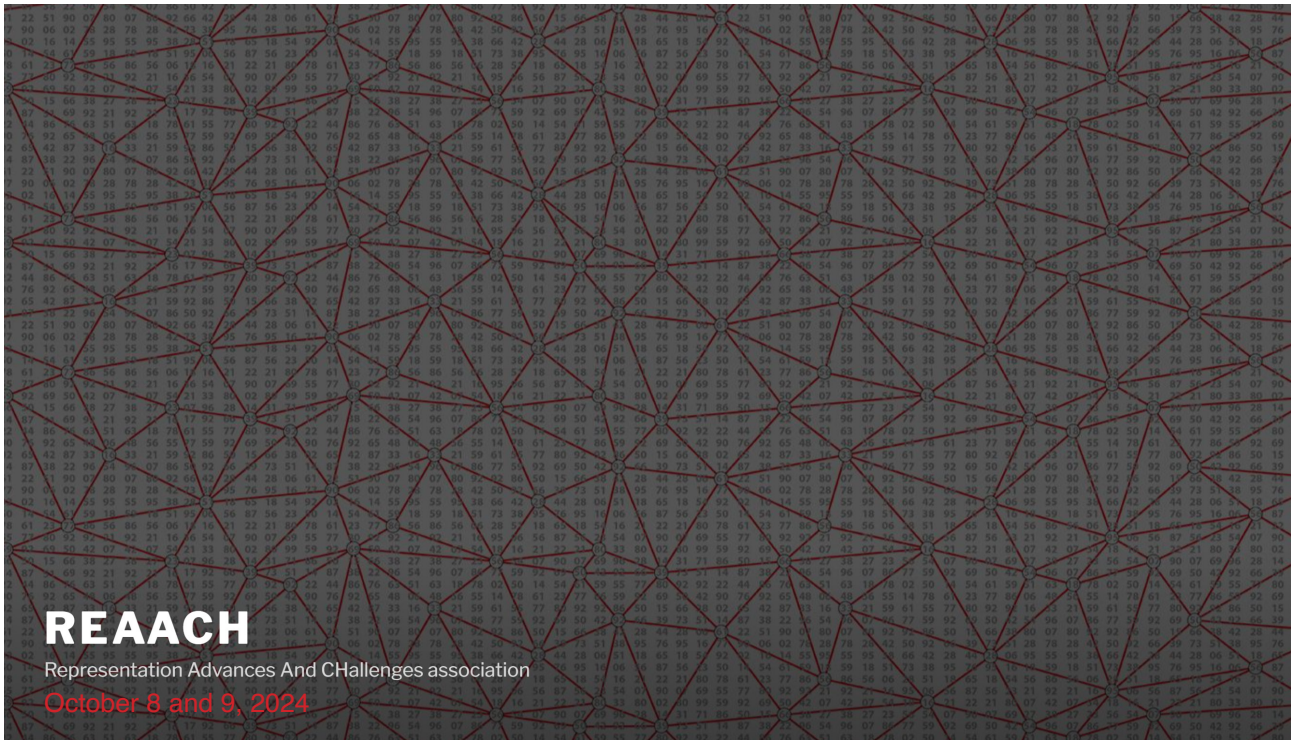

Fig. 1. Banner of the event.

with *REAACH-ID Symposium* topics were, among others, Extended Reality (AR, VR, MR), Metaverse, 5G, and the Continued Advancement of Mobile Technologies, BIM, HBIM, HHBIM, and the Digital Twin, Artificial Intelligence/ Machine Learning, Blockchain Technologies. In some studies, it also opened the big game of Generative Artificial Intelligence.

In 2023, the Symposium reconfigured its title to *REAACH* (REpresentation Advances And CHallenges), taking over the name of the REAACH Social Promotion Association (https://www.reaach.eu/) which had just been founded to direct its goals. The focus of the Symposium expanded to include the relationships of Representation with Artificial Intelligence and Extended Reality and a keywords scheme, the one discussed above, was structured to guide the construction of proposals. The rise of generative Artificial Intelligence was evident in both Cultural Heritage and Innovative Design.

The current *REAACH 2024* (https://www.reaach.eu/symposium-2024/) featured 63 selected contributions: 42 in oral form and 19 in video. In total, the contributions involved 194 scholars from five continents.

Two keynote lectures characterized the study days, broadening the perspectives of AI and XR. The first, given by Francesco Carota and Gustavo Garcia do Amaral, both professors at the School of Architecture and Design at the University of Kansas, was titled 'Revealing and Interpreting Complex Urban Patterns from Location Based Social Network Data. An Investigation into Chinese Stadiums in the Global South' the second, by Lauren S. Ferro, from CSIRO's Data61 research institute in Melbourne, 'XR's challenges and solutions for cybersecurity'.

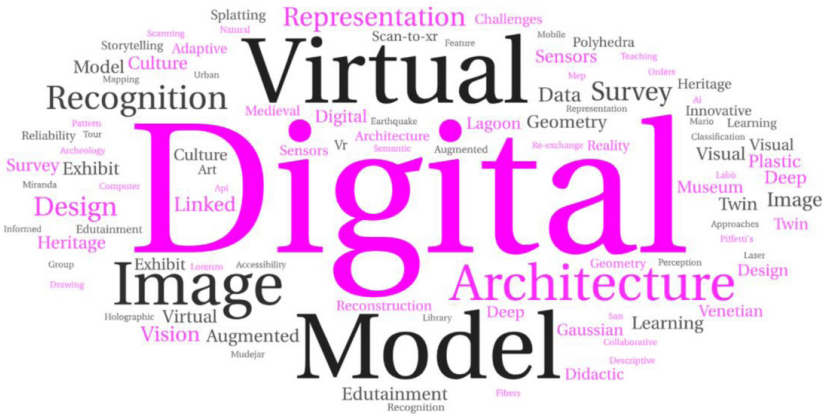

Fig. 2. Word cloud of the event.

Eight sessions punctuated the two days, organized according to the call's macro-themes: AI&XR and Historical Sources, AI&XR and Heritage Routes, AI&XR and Museum Heritage, AI&XR and Classification/3D Analysis, AI&XR and Building Information Modeling, AI&XR and Building Monitoring, AI&XR and Shape Representation, and AI&XR and Education. Thirty-one contributions identified the keyword AI as characterizing among the mandatory ones, twenty-eight the keyword XR, and three the pair AI&XR. Among the other keywords, as noted by the word cloud in the figure 2, terms related to the world of digital representation and the fields of its current application emerge.

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Events

UIDSS2024_UID_Summer School 2024, Drawing for the Gods: Selinunte, Temple F

Ornella Zerlenga

This year too, UID promoted a new doctoral workshop which, as usual, focused on a specific theme, that is, an intensive training activity carried out over the course of a week, and in which doctoral students from various parts of Italy participated and were guided during the study days by various professors.
For the year 2024, the CTS of UID organized a Summer School (fig. 1) [1] with the collaboration of the Department of Architecture of the University of Palermo and the Archaeological Park of Selinunte (TP) [2]. The Director of the Archaeological Park of Selinunte, Dr. Felice Crescente, immediately expressed the willingness of the Park to host the study and research activities, signing a Memorandum of Understanding with UID to establish the desire to develop joint activities aimed at the knowledge and enhancement of the archaeological heritage, also contributing to cover part of the expenses for the realization of the workshop. The UID paid for the registration, food and accommodation expenses of the working group, made up of PhD students enrolled in doctoral courses in the disciplines of Drawing. Furthermore, the participation of two PhD students from the École Nationale d'Architecture et d'Urbanisme (ENAU) of the University of Tunis, whose expenses were fully covered by the UID [3], contributed to creating an international climate and restored the Sicilian context as a center of gravity and meeting place for multiple Mediterranean cultures.
The theme of the advanced training course, which took place from 17 to 21 June 2024, focused on learning advanced technologies for the knowledge and representation of ancient architecture, well exemplified by the typology of the Greek temple. Among the remains of the ancient Siceliot city, Temple F was identified as the field of application of the training activities. Located on the eastern hill of the Park together with two other temples (E and G) (fig. 2), it is not only the oldest and smallest of the three but also the one that has suffered the most looting.
Starting from classroom lessons, the students were reminded of how Greek temples established direct relationships with the surrounding landscape and, at the same time, how the blocks of which they are made still retain visible traces of processing, albeit of a few millimeters.
Specifically, the field phase and the analysis of the ruined Temple F became opportunities not only to imagine the complexity of the factory and its relationships with the environmental context but also to propose a conjectural reconstruction. In this sense, equipped with their own laptop suitable for the processing of digital models, resulting from laser scanner and photogrammetric surveys, the participants had the opportunity to compare different technologies and methodologies for the survey, arriving at several proposals for reconstructive models and the development of critically evaluated solutions for their visualization and dissemination.
The workshop opened on the afternoon of June 17, 2024 with institutional greetings from the Deputy Pro-Rector (Enrico Napoli) and the Director of the Department of Architecture of the University of Palermo (Francesco Lo Piccolo), the Director of the Archaeological Park of Selinunte, Pantelleria and Cave di Cusa (Felice Crescente), the President of the Italian Union for Drawing (Francesca Fatta) and the member of the CTS UID (Francesco Maggio), who illustrated the purposes and motivations that guided the scientific and organizational committee in setting up the activities.
The workshop was divided into several focuses: Archaeological Studies, with essential contributions to contextualize both the more general theme of study (edited by Martine Fourmont, CNRS)

https://doi.org/10.26375/disegno.15.2024.33

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Fig. 1. Banner of the event.

and the construction techniques of the Greek world (edited by Carlo Zoppi, University of Eastern Piedmont); Historical and design dimension of the archaeological landscape, with contributions from Marcella Aprile and Maria Sofia Di Fede (University of Palermo); Survey/Reconstruction/Visualization, with practical lessons by the company MicroGeo, with whose contribution a day was organized dedicated to technological experimentation and 3D acquisition with integrated digital technologies, using both the static Faro Focus scanner and the dynamic Faro Orbis scanner.
At the end of the first two days of preparation for the design phase, in which theoretical studies and practical experiments were addressed, the doctoral students were divided into five working groups, each dedicated to a specific topic (rapid prototyping; augmented reality; equirectangular images; motion tracking; serious game). At the end of the days of work, the results of the conjectural reconstruction of Temple F highlighted a renewed ability of the participants to tackle complex problems, adopt scientifically recognized solutions, experimenting with new analysis and representation tools. Specifically, the group: 'rapid prototyping' explored the use of 3D printing technologies for the reproduction of archaeological models, highlighting the critical issues and potential of these tools in research and dissemination contexts; 'augmented reality' developed an interactive application to superimpose digital information on real finds, improving knowledge of the historical-cultural context; 'equirectangular images' produced high-resolution immersive paths, useful for the documentation and enhancement of archaeological sites; 'motion tracking' experimented with motion tracking techniques to develop a video on the conjectural reconstruction of a corner of Temple F; 'serious game' scientifically designed a game with educational purposes to raise public awareness of the fundamental construction elements of a Greek temple.
The seminar concluded on the morning of June 21, 2024 with a presentation by the students of the works produced. Retracing the thematic division of work, each of the five groups presented the first results of the experience conducted, demonstrating a rigorous and innovative methodological approach, enhanced both by the use of advanced technologies and by critical reflections on their applications in their respective thematic areas. At the end of the session and regardless of the specific outcomes, Francesco Maggio thanked and greeted the participants and members of the organizing committee, underlining how the interaction between different knowledge and skills represented the added value of the initiative and, at the same time, how from the verification of the results it clearly emerged that the experience of the Summer School 2024, promoted by UID on the theme Drawing for the Gods: Selinunte, Tempio F, favored the integration between theoretical knowledge and practical skills, contributing significantly to the disciplinary training of the participants. The results of the doctoral workshop, Drawing for the Gods: Selinunte, Tempio F, were then presented during the UID 2024 conference in Padua/Venice (13 September) by Francesco Maggio with the participation of the doctoral students.



Fig. 2. The Selinunte Archaeological Park.

Notes

[1] Coordinating Committee: F. Fatta, E. Ippoliti, F. Maggio, A. Sdegno, O. Zerlenga.

[2] Organizing Committee: F. Agnello, F. Avella, M. Cannella, F. Di Paola, V. Garofalo, A. Garozzo, G. Girgenti, F. Maggio, M. Milone, S. Morena.

[3] PhD Students: Davide G. Abbate (University of Palermo); Pietro Azzola (University of Bergamo); Gianluca Barile (University of Naples Federico II); Caterina Borrelli (University of Salerno); Emanuela Borsci (University of Basilicata); Alessandra Coppola (University of Naples Federico II); Stefano Costantini (Sapienza University of Rome); Angelo De Cicco (University of Campania Luigi Vanvitelli); Barbara De Nitto (Roma Tre University); Virginia Droghetti (University of Parma); Marco R. Geraci (University of Palermo); M. Isabella Grammauta (University of Palermo); Rosina Iaderosa (University of Campania Luigi Vanvitelli); Ali Yaser Jafari (University of Basilicata); Stella Lolli (University G. D'Annunzio Chieti-Pescara); Olfa Mellouli (ENAU Tunis); Federica Miconi (University of Molise); Lorella Pizzonia ('Mediterranea' University of Reggio Calabria); Nicola Rimella (Polytechnic of Turin); Nicola Rossi (Polytechnic of Bari); Andrea Sias (University of Sassari); Francesco Stilo ('Mediterranea' University of Reggio Calabria); Giorgia Strano (Sapienza University of Rome); Alim Wiem (ENAU Tunis).

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The UID Library

The UID Library

2024

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UID Awards 2024

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Golden award to Marco Tirelli

The UID 2024 Golden award is assigned to Maestro Marco Tirelli for his profound aptitude for studying the symbolic power of images and for creating extraordinary drawings, paintings, sculptures, and installations that always place the observer in front of an experiential act. Born in 1956 in Rome, where he lives and works, he began exhibiting in the second half of the Seventies. His first participation in the Venice Biennale was in 1982, in the *Aperto 82* section with a personal room. Numerous group exhibitions in Italy and abroad followed in the Eighties, in important international museums and exhibition institutions. The exhibition at the American Academy in Rome dates back to the Nineties, where Tirelli's drawings 'dialogue' with Sol LeWitt's *Wall Drawings*, which was followed by his participation in the XLIV Venice Biennale with a personal room. Among the many exhibitions to follow, noteworthy are the anthologies at the Palazzo Fortuny Museum in Venice (2010) and at the MACRO in Rome (2012). In 2018 he created the work *Proteo* commissioned by the MAXXI, exhibited in the collection since 2019, the year in which numerous collective exhibitions follow one another. His works are part of the collections of some of the most important national and international museums and institutions. A distinctive sign of his poetics is being increasingly close, by practice, to a meditative exercise: his works often represent the border between light and shadow. Tirelli's painting is first and foremost the result of an extraordinary ontological dialectic, on the part of the author, between the awareness of the failure of vision and the obstinacy, almost ritual, in wanting to represent what is recognized as partial and limited. The visual scenario offered to us by his paintings is the result of a subjective reworking of his gaze focused on the world: Tirelli's art is perspective like few others nowadays, and this sense of depth, of 'seeing through', is exercised also as President of the Accademia di San Luca, through the organization of cultural events and exhibitions of contemporary artists aimed at exploring the problem of vision and perception without ideological and/or critical superstructures.

Golden award to Andrea Giordano

The UID 2023 golden award is assigned to Andrea Giordano, a scholar who since his graduation, and then from the Doctorate (VI Cycle), has carried out research focused on the geometric-configurative interpretation of architecture, first as a brilliant student of the Neapolitan school of Anna Sgrosso, and then as a professor at the Department of Civil, Environmental and Architectural Engineering (DICEA) of the University of Padua.
Former Coordinator of the Master's Degree Course in Building-Architecture Engineering, Coordinator and member of the Scientific Committee for Civil Engineering and Architecture, today he holds the role of Director of the ICEA Department, Head of the 'Drawing and Representation' and 'Information Modeling' laboratories.

His critical and elaborative capacity in the field of Representation is not limited to the measurement of reality but shows the aptitude to interpret the qualities and complex aspects of architectural artefacts and cultural heritage, using new 'tools' for visualization, multimedia representation and communication of historical architectural and urban transformations.
He has written several essays on the theory and history of representation methods, dealing, more recently, with the use of ICT for research in the field of interoperable and semantic representation. Equally important is the contribution that he has been making for several years to teaching at an international level, as an appreciated visiting professor at Gwangju University (China) and Duke University (USA).

Silver awards "Gaspare De Fiore"

Michele Buldo, Scan-to-BIM for the enhancement and conservation of Architectural Heritage. Cutting-edge techniques and advanced automation processes; supervisors: prof. Cesare Verdoscia, prof. Luis Agustín-Hernández; co-supervisors: prof. Elena Cabrera-Revuelta, prof. Riccardo Tavolare
For having researched the well-known critics of the Scan-to-BIM process for architectural heritage with the aim of proposing a new protocol for its digitalization, in light of the latest developments in technologies, including artificial intelligence. Numerous case studies, in Italy and Spain allow experimental verification of the hypotheses of the thesis.

Michela Ceracchi, The 'augmented physical model' to explore shapes in space. New devices for a multimedia educational theater of Descriptive Geometry; supervisors: prof. Marco Fasolo, prof. Leonardo Baglioni; co-supervisor: prof. Giovanna Spadafora
For having researched innovative teaching methods for the teaching of Descriptive Geometry using the disciplinary tools of physical modeling in connection with the most recent methodologies of digital modeling and communication through augmented reality devices. The rich iconographic apparatus developed by the scholar enriches the work conducted with rigor and graphic scientific quality.

Mara Gallo, Digitalization and visualization systems for the virtual fruition of the Architectural Heritage; supervisor: prof. Antonella di Luggo, co-supervisor: prof. Luigi Fregonese
For having investigated with an integrated scientific approach the advanced methodologies for the conservation and enhancement of the architectural heritage, addressing the issues of perspective illusionism and vaulted systems. The rigorous structure of the thesis, the level of in-depth analysis of the case study of Andrea Mantegna's *Camera degli Sposi*, its possible virtual fruition and communication in AR and VR environments provides a considerable contribution to the scientific community.

Special mentions "Gaspare De Fiore"

Irene Cazzaro, Digital 3D reconstruction as a research environment in art and architecture history: Uncertainty classification and visualization: supervisor: prof. Fabrizio Ivan Apollonio, co-supervisor: prof. Piotr Kuroczyński
For having researched a scientific and methodological approach for the classification of uncertainty in the visualization of 3D digital reconstruction of unrealized or lost heritages. A theme on which the interests of scholars of Digital Humanities and Digital Heritage Studies converge, with scientific rigor, the hypotheses of the thesis are experimentally verified through the case study of the Speyer Synagogue.

Francesco Stilo, The underground as a place of worship. From Christianization to Byzantine hermit caves, supervisor: prof. Gaetano Ginex, co-supervisors: prof. Philippe Pergola, prof. Gabriele Castiglia

For having carried out a broad review of underground places of worship in the world with a large census and surveys of case studies in Calabria, in an interdisciplinary dialogue oriented towards documentation for knowledge and virtual communication of the hypogea analyzed.

Marco Vedoà, Cultural Landscape Digitisation in Fragile Areas: Data and Storytelling to Shape Strategies, supervisors: prof. Rossella Salerno, prof. Francesco Muñoz
For having investigated in a multidisciplinary manner the theme of cultural landscapes in fragile territories, tackling with methodological rigor the analysis of case studies in Italy and Catalonia and proposing in an experimental manner the construction of a webgis platform to confirm the potential for future development of the research.