

MAPPING THE LIMITS: A MULTIDIMENSIONAL JOURNEY

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A CARTESIAN FRAMEWORK

In 1882 the reverend and educationalist Edwin A. Abbott (London 1838-1926) anonymously published the first edition of *Flatland: A Romance of Many Dimensions*. The book is now considered a classic of fantasy literature that explores various themes such as mathematics, geometry, and social issues, it is also one of the first works to investigate the concept of the fourth dimension. The story aims to explain the theory of the three canonical dimensions (width, length and height) to prepare the reader for the possibility of the existence of a fourth. Through a straightforward and intuitive

procedure, the Reverend tells us of the adventures of a Pentagon, an inhabitant of a world where only two dimensions existed. Through his forays into the one and three-dimensional realms – which is obvious to the reader – he understands the difficulty of accepting a reality that is impossible to control through the senses and logic of the inhabitants of Flatland. The fantastical tale invites us to reflect on the extent to which citizens of the three-dimensional world may be prepared to recalibrate their perceptions by admitting the possibility of other way of understanding the reality that we are unable to verify through experience. As well as being a desecrating critique

of the society in which he lived, the book aims to ennoble the existence of doubt, of something that lies beyond acquired certainties.

The ability to rely on the indeterminacy of transformations and to understand the intimate relationship between soil, design, natural elements and atmospheric agents can be investigated by questioning the systems of architecture's representation that, through mapping, have the possibility of revealing and designing new scenarios. Mapping is a fundamental driving force for research and the overcoming of a deductive method that applies standards. Abbott's book explores the idea of interpreting and comprehending the world by abandoning certain reference systems and adopting new parameters and languages. Similarly, landscape design can be seen as an evolving discipline that allows for a multi-scalar, multi-disciplinary and multi-media approach. Through mapping, designers can discover new dimensions of knowledge and represent new possibilities for design. Starting from the Zenith view, which comes from a long geographic tradition, adopted by planners and urbanists, through the analysis of the section as a mandatory tool for mapping the landscape and rediscovering the profound relationship between the biosphere and the built environment.

The line that traces the boundary takes shape on the sheet of paper, meanders along the bank of a river, geometries the plains, and draws the territory. On the horizontal plane of the page, we read the traces of natural and man-made limits that make up the drawing of the land that we call a map. It serves us as a reference in orientation and directions of development: these limits build

the reference system within which we distribute and organize the earth's surface. They compose the intricate jumble of information that orients projects, arms the land and, often, defines the boundaries of our actions on it. The Zenith view has traditionally been the preferred angle for architects and planners to manage the project and transform the landscape. The value of the plan and, by extension, of territorial cartography is an expression of a culture that has made use of an external perspective, a distant, almost divine and creationist gaze that, by drawing, has established private property, infrastructures and engineering systems capable of governing the territory. A gaze, the Zenith one, capable of grasping quantities and potentials, of recapitulating them into a whole, and of proposing a global view: a way of looking at the inside of things as Abbott tells us through his protagonist's journey to explore the third dimension. In terms of landscape architecture, the existence of boundaries and the limitations they create force designers to define areas as either inside or outside, dammed or embanked, inaccessible or transitional. This stimulates a thought process that requires the recognition of barriers that transcend mere quantitative dimensions. That is strongly characterized by measurable quantities that configure the space that the limit itself occupies (or precludes) and by the vantage point one has or decides to place oneself. As the observer's viewpoint changes, so does their relationship with the environment and the various elements within it. This relationship is not limited to objective measurements but also includes subjective experiences and emotional responses to the space. These factors are essential



not only for understanding a place but also for designing it. Plotting maps allow, through changes in scale and definition of the picture, to reveal dormant relationships between distant elements, to connect the dots and to establish new interferences and interactions.

The abstraction of the flat restitution of the world around us is a powerful tool that has enabled us not only to represent but to construct the reality within which human life unfolds, giving rise to hierarchies, values, and relationships (F. Farinelli, 2007) that we can grasp in the distance, just as Flatland first presents itself to Pentagon's gaze when guided by the Sphere he leaves the plane to venture along the Z axis. Thanks to this unprecedented possibility of figuring out

his world, he understands its potentialities, weaknesses and opportunities.

A 90-DEGREE ROTATION

Through the action of delimiting, of constructing fences and barriers, of establishing an inside and an outside where different activities take place, lines can acquire depth and become infrastructures: railway networks, roads and motorways innervate the ground, they are the scars that carve the territory and also become the points of observation, edges that we occupy as we pass through.

It is in these circumstances that it becomes essential to make a 90-degree turn and observe

the landscape from the direct experience of it: in fact, the system of surfaces that one traces in the plane acts in space differently. If one abandons the cartographic gaze and plunges into the three dimensions, it is the sensitive datum of height that becomes the protagonist, and the point of observation practiced is a crucial factor.

For instance, if we consider a primarily flat terrain, such as the one that stretches along the via Emilia route, it becomes difficult to recognize large-scale relationships by looking at the horizon that runs parallel to the ground. Rather, it is essential to identify a series of proximity relationships that directly influence our experiences and can either encourage or discourage certain behaviours.

The via Emilia acts as a line that connects two antithetical and complementary viewpoints. Along its longitudinal direction, the axis both divides and shortens the distance between Piacenza and the sea. On the other hand, regarding the transversal direction, the infrastructure serves as the contact margin where two opposing versions of the same edge coexist. Here, the two sides of the road mirror each other, healing the fracture in a broken landscape.

By examining the cross-section along the axis's development, we can perceive the landscape as a sequence of transects along the SS9. The via Emilia takes on the role of a hinge that brings the landscape's two edges closer together. Suppose the landscape is the result of the interrelationship between nature and culture (M. Jakob, 2009), where the emotional and sensitive component plays a central role (J.M. Besse, 2020), it is also the outcome of the dense network of proximity relations that can be experienced in the landscape

and that depend on the spatial conformation of the boundary, on the volume it occupies, projects or draws in the three dimensions.

Flat cartography, as pointed out, allows us to correctly represent certain landscape features through the use of conventional symbology. In this reference system, the section is the privileged tool for verifying the presence or absence of barriers, or impediments that may create an interruption on the earth's surface, or edges by transforming which it is possible to control flows in the management of atmospheric or migratory phenomena. The dimensional question is indeed central in the orientation of behavior that may involve different types of users, animate or inanimate, and all of these together participate in a condition that the boundary sanctions modify the modes of interaction between a given surface and the agents that come into contact with it. It is possible to consider the section as the privileged tool for understanding and designing the landscape, since it is capable of working at the different scales of the project, making relations or autonomies evident at the territorial scale, but above all since it is capable of revealing the intimate bond between soil, the built environment and atmospheric factors. The thickness of the soil also alludes to the concept of Palimpsest (A. Corboz 1983) and to the implications it generates in terms of the passage of time, the stratification of events and histories, composing a new system of reference, of measurement of space. The palimpsest is composed of traces, suspensions, and erasures referring to an allusive and reticent unit of measurement that incorporates the unfinished, doubt, compromise, and negotiation.



HYPERBOLE

The revelation of the third dimension, to which Pentagon in Abbott's fantasy bears witness, echoes the need in landscape architecture design to consider the map as a field of action in which dimensions, plural and unforeseen, can be regenerated, invented, and repositioned. Through the mapping operation, an attempt is made to describe reality with new tools, probing in particular the transversal relationship between what lies above and what lies beneath. This operation, now famous thanks to the research of James Corner, a pioneer of this discipline, has allowed landscape architecture to leave behind procedures such as zoning or territorial planning

by areas. These practices have proved unable to overcome certain limits, relying on an excessively rigid and Cartesian system that no longer responds to current needs (and emergencies). Today, the importance of mapping is recognized as a stratified instrument of knowledge but above all of interpretation – as James Corner emphasises on more than one occasion – of the landscape phenomenon; new research methodologies are being experimented by integrating different reference and representation systems in order to grasp its complexity.

The need to open the doors wide to the inclusion of other parameters, of factors that react according to other coordinates, is therefore manifest. Contemporary technology is making giant strides

through the provision of increasingly high-performance tools, richer and richer databases, and more accurate detection systems: this makes it possible to practice several languages to read contemporary phenomena and interpret them through sensitive design, overcoming the short-sighted Euclidean practice, which is narrow for today's environmental and social challenges. In many design approaches, the fourth dimension that contributes to the design of the project is the temporal one, not to be understood as a nostalgic revision of History, but as the set of effects produced by climatic, anthropic, animal and botanical transformations that, acting on the territory, have modified its substance and appearance. Time is not a univocal parameter, it can run out or stop, it can have different speeds, there can be moments and geological eras, epochal transformations and erosions. It acts in synergy with movement, contributing to quantifying distance and describing a displacement: crossing or stopping at a barrier is also measured in terms of distance, of the capacity or possibility of establishing a relationship between the edge and the agent that touches it, crosses it, stands in continuity or fracture with it. This implies the recognition of a direction, the conventional imposition of a reference system and the creation of tools to calculate it. It resembles in a strict sense a dimension as commonly understood but is not exhausted in its reduction to a unit of measurement, becoming instead a design component, a construction material, as demonstrated for example by the project realized by Atelier Descombes Rampini in Geneva where the iconic design of the river is placed alongside

the bed of the canal without overlapping it and without erasing it. The redesigning of the river route is destined to be reduced to a sub-track system, distinguishable even if changed by the force of flowing water and atmospheric, animal and anthropic agents.

Other design frameworks attempt to explore different extensions, that of the infinitely small for example. Biology, the knowledge of the soil as a living factor inhabited by entire universes of micro-organisms and particles, becomes in Catherine Mosbach's landscape project a generative element of unprecedented design forms, which interpret the soil as a primordial soup that already contains principles of distribution, shape and composition. Mosbach's approach goes beyond the limits of the visible to transform the microscopic into the morphological. She interprets the properties of organisms, understands their genetics and recomposes them through a creative effort that redesigns the living space, anticipating a holistic, post-anthropocentric vision. There are also attempts at mapping that intend to include the sound as a determining factor in the spatial definition of the project. For example in the research conducted by Gunther Vogt of particular interest is Sound Mapping for the SCI-arc Exhibition. In the design research on three-dimensional space, the focus is on sonic components as a condition for the existence of space on a par with extension or depth. The project does not aim to protect against noise, to create sound barriers or, on the contrary, to encourage the propagation of sound to guarantee optimum acoustic performance. It becomes a way to visualize the space, redesign it and in this



way understand certain characters and aspects that would otherwise be difficult to identify. As described on the website by the architect: “An auditory visualization of movement and flow through a cacophony of sounds and an interplay at the thresholds between the analogue and the digital”. The aim of contemporary research is thus to push the boundaries of the interpretation of phenomena further and further afield, the research moves towards post-human post-anthropocentric (D. Haraway, 2019) and extra-territorial perspectives such as those protagonists of Morton’s theories that identify hyper objects as new elements of the construction of reality so massively distributed in time and space as to transcend localization, such as climate change.

Mapping is a powerful and constantly evolving tool, malleable according to different needs and trends. It does not aim to provide finite solutions or unambiguous interpretations but, on the contrary, to admit and incorporate a reality made up of n-dimensions. It proves to be a useful device in understanding a territory such as the lowlands, threatened by land consumption, climatic, economic and social emergencies. Etched by limits and crossed by infrastructural corridors, shaped by dams and large energy production plants, the exploration of new tracks and the development of unprecedented coordinates is the key to coping with a landscape that has never found constraints in its limits.

Images:

p. 55 | Via Emilia Outbound. Image created by overlaying several frames captured from a video recorded while traveling outbound on the Via Emilia from the city of Piacenza. The purpose of combining different frames of the landscape is to symbolically represent a Palimpsest that is rooted in time and space, creating a layered and complex visual composition. Image by the author.

p. 57, 59 | Via Emilia Inbound. Image created by overlaying several frames captured from a video recorded while traveling inbound on the Via Emilia. The purpose of combining different frames of the landscape is to symbolically represent a Palimpsest that is rooted in time and space, creating a layered and complex visual composition. Image by the author.