

From
Body

to
Space

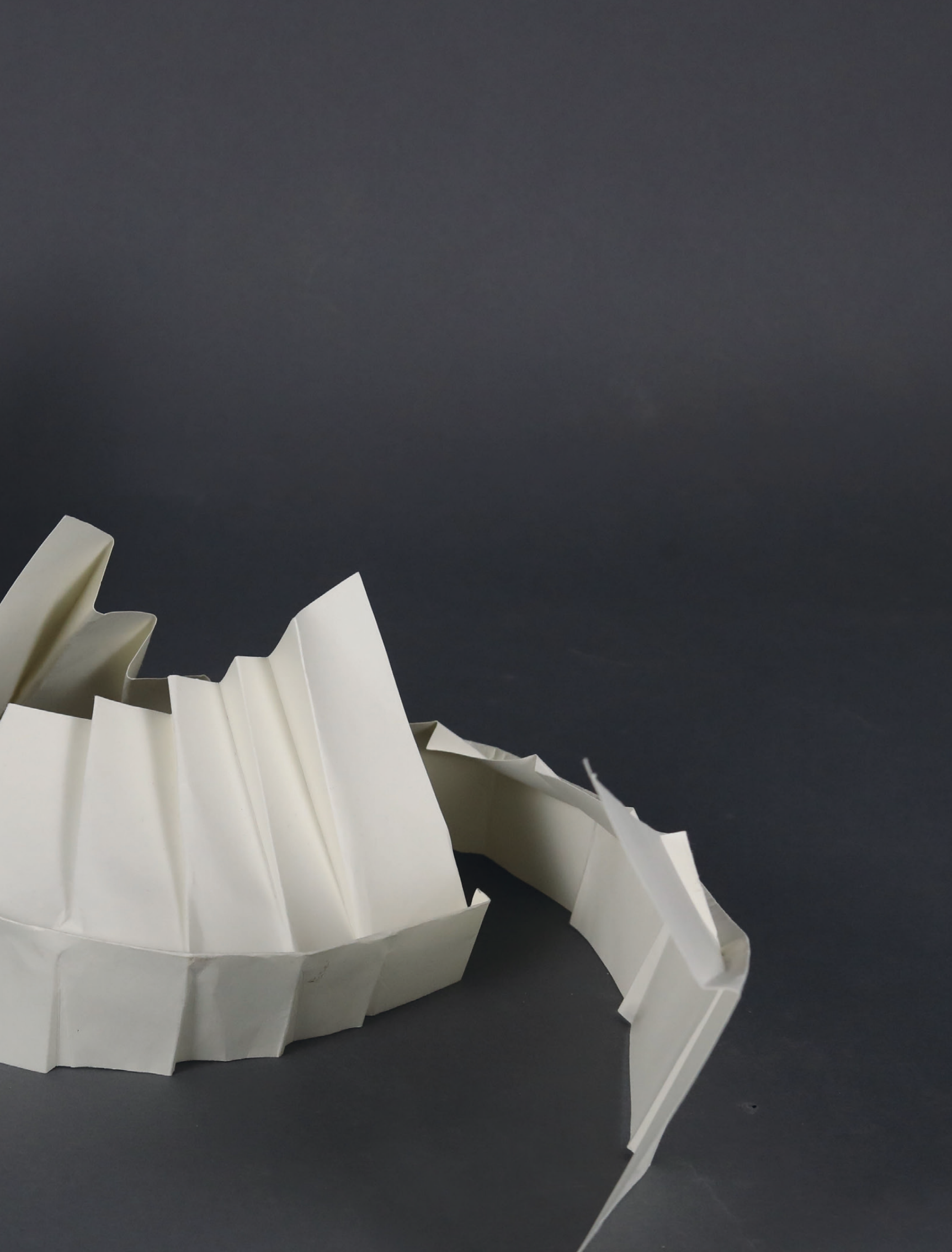
An Architectural Relation

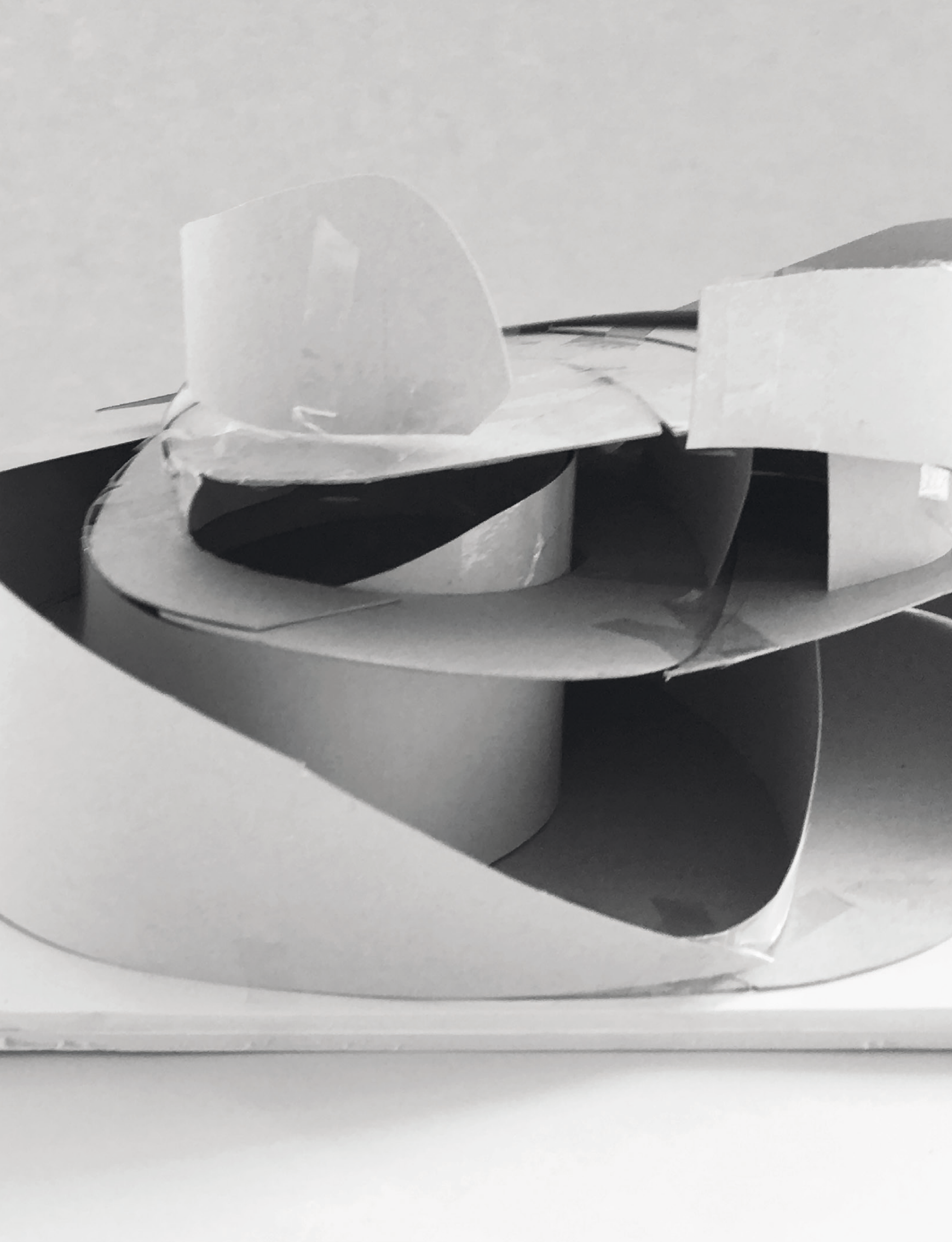


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An Architectural Relation

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Design Medium

Introduction

Matthias Ballestrem

The project of this book originates in one of the focal points of our architectural pedagogy at HafenCity University in Hamburg. “From Body to Space” is both the title of the last contribution to this book and our first-semester course; in the latter, we introduce students to architectural design. At the same time, the title also expresses a fundamental understanding of architecture that conceives of the body as the first point of reference for our living space. The understanding that manifests is that architecture is first and foremost a sensual discipline, and that we as living beings gain access to the space that surrounds us through our bodies—through perception, experience, and use.

This body-based concept of space originated in German aesthetics at the end of the nineteenth century through writers such as Robert Vischer, Heinrich Wölfflin, and August Schmarsow. Since then, it can be traced up to the present through phenomenology, embodiment theory and enactivism, and most recently neuroaesthetics. Drastic developments over recent years, including digitalization and the climate crisis, have lent new meaning to the sensual experience of space: it has become a locating force in the physical world, a transformative force that renders the basic living conditions and potentials of a place touchable and tangible.

Although there is a rich literature of body-based architectural theory and psychology, however, a body-based understanding of space has never exerted a substantial impact on design practice. This book aims to advance body-based design in the current debate by updating the significance of the body as an access point to the world, as well as presenting and describing exemplary projects and designs—originating both from our research and teaching at HCU, as well as from invited guests.

The book is divided into three chapters: “Body as Access,” “Body as Reference,” and “Body as Design Medium.” The contributions’ focus moves from the body as the first direct access point to space, to the interrelation between body and space, and finally to methods of design received and conceived from the body.

In the first contribution to the book, “Domestic Affairs,” Marta Fernández Guardado gives insight into her architectural practice and her design-based doctorate building upon it, which deals with the question of what role the things that surround us play in the construction of our home. In their subsequent contribution, Hannah Krufft and Corinna Kühnapfel take “A Neuropsychological Perspective on Architecture and the Body” and challenge the dominance of vision in architectural theory by referring to current research from the field of neuroaesthetics. Through an overview of current research topics and hypotheses from neuroscience and psychology, they offer an introduction to the significance of an embodied experience of space. Tim Simon-Meyer and João Quintela, in their contribution, use projects and brief descriptions from their office Atelier JQTS to articulate the concept of “Commonstructures,” by which they mean architectural structures that have an inherent potential for social appropriation and interaction through the way they are designed and constructed.

In the second chapter, “Body as Reference,” Tim Simon-Meyer picks up this thread again and introduces his concept of “The Bodily of a Tectonic Approach,” developed on the basis of the projects and designs in his design-based doctorate. Here, too, the focus is on recreating and interacting with architectural structures; his contribution explores the role of self-builders and their perception and experience while working with material and its assembly. In her subsequent contribution, “Perceiving Beauty,” Franziska Wittmann explores the feeling of beauty. In short paragraphs supplemented by a few select photographs, she adumbrates what beauty does to the perceiver. In doing so, she expands on her longstanding preoccupation with the perception of space and the body in space. The contribution “Primal Movements in Architectural Composition” brings together a series of hand sketches by Wiktor Halm Skrzypczak dedicated to concepts of movement that can also

be described as constellations of space and perception. They constitute a partial result of his doctoral research into the potential of dance and movement practices for architectural design. Under the title “Eppur si Muove,” Alberto Campo Baeza reports on his observations and handling of changing daylight in his architectural practice. Light, as he describes it, is also a form of building material that plays a special role in perception.

The third chapter of the book, “Body as Design Medium,” begins with “Big Dreams” by Anton Burdakov, who in some of his latest work employs his own body in the conception and construction of his objects—as a scale reference, but also as a tool of making and observing. Through pre-sensory and intuitive decisions, he explores the interplay between the readings of his works as models and their existence as concrete objects. Designing from one’s own point of view—in perspective—plays the central reference point in my contribution “Designing with and in Perspective,” which shows exemplary student works from experimental design studies. The final section, as described above, is made up of student work from our first semester, which is examined from the perspective of spatial qualities that can produce a design “From Body to Space.”

I would like to express our sincere and deep gratitude to the above-mentioned authors who were willing to invest their time and energy to share their expertise and contribute to this book. For clarifications and stylistic improvements, we thank Rob Madole, and for translating this diverse collection of contributions into an appropriate layout, our thanks go to Niklas Sagebiel. Last but not least, we thank HafenCity University for the financial support that made this publication possible.

Body as

Access

Learning from Thing-Body Relations in Home-Making to Transform Existing Dwelling

Marta Fernández Guardado

The following work was developed as part of the author's design-based dissertation "Home: Things & Bodies: A Thing-Based Exploration into Personal Space."



We live between, together, within, and through things. Building on this idea from a phenomenological perspective (which conceives the relationship of the body we inhabit with other bodies and things as defining and transforming the experience of home) and following new material approaches (based on the relationships between more-than-humans and their agencies), I aim to formulate a thing-based conceptual and methodological tool for the identification and consolidation of the personal experience of inhabitation, so it can be celebrated and shared.

I propose to start by looking at artist Csilla Klenyánszki's work "Pillars of Home" (self-published as a photobook in Amsterdam/Budapest in 2019), a series of ninety-eight photographs of balancing sculptures built during her son's naps. In sessions no longer than thirty to forty minutes, the artist temporarily transforms the different spaces of her house into a studio, and builds floor-to-ceiling pillars by stacking furniture and other objects that often include herself and which can collapse at any moment. As she explains, the instability of the construction endangers not only the capture of the photo but also the existence of her personal space, as the noise of the falling objects could wake her baby up and end the break from her parenting duties. With her sculptures, Klenyánszki seeks to explore the conditions of her changing identity as mother and artist, and to negotiate the balance between her priorities: responsibility, care, patience, and devotion; need, desire, transgression, and play.

The images draw us in with their humor and surrealism. The generic objects are presented as singular recognizable entities that, for an instant, form an arrangement together. The different parts of the body, marked by colorful items of clothing, are read in an equally objectual way: independent feet, hands, heads, or torsos, which have surprisingly managed to articulate themselves with other chairs, computers, brooms, and flowerpots, to create a clumsy body-column. This accumulation of things occupies the room from edge to edge, balancing and squeezing, making space for each other. The architecture remains in the background, although the objects indicate a different room in each image: kitchen, living room, bedroom, staircase. What matters is the more-than-human action that the architecture houses at the precise moment of the photo: on one hand, the awkward posture of the body and the balanced position of the objects transmit liveliness and transience; on the other, the role connotations and use conventionalisms associated with the items suggest misfits and alterations. Klenyánszki works quickly and dirtily, but carefully and systematically. She engages intimately with what she has at hand to react to her condition at the moment, and she does so each and every time that she has the chance.



For me, Csilla Klenyánszki's photo series serves to frame the kind of personal space with which I work. Time and space, things and bodies, functions and forms, roles and rooms combine for the time being to transform the home that she inhabits into her personal space. Results vary and evolve, offering unrepeatable object-based solutions to a universal spatial question: how does one inhabit among others? I am interested in generic dwelling with standardized qualities and rational tradition, occupied by living forms that do not necessarily comply with familiar norms. In such forms, one lives with other people, typological furniture, functional objects, and personal belongings, and negotiates relationships through them by creating personal spaces for temporary use in which one experiences what one is in order to live together. What can we learn from thing-body relations in home-making processes in order to transform and adapt existing housing?

To explore the agency of things and be able to answer this question, I have worked on a series of design cases that enable me to formulate the notion of "domestic repair," which I ultimately define as the arrangement, mending, or reconstruction of home, understood in relation to the notion of an "affair"—based on an intimate relationship between the things and bodies that inhabit it. For me, a "domestic affair" manages (with few resources and standard components) to accommodate a specific need or desire in a non-ideal but successful way, alluding to the specific dispositions and abilities of the human and non-human social and material entities involved and, at the same time, making the particular need or desire clearly manifest, so that it is shared with anyone or anything that enters the relationship.



"Pillars of Home," Csilla Klenyánszki,
p.8: Nr. 74, p.9: Nr. 65, p.10: Nr. 43, p.10: Nr. 23, p.11: Nr. 57, 2019

The first design case, “Defne, Christopher, and Ela,” is a commission for a family table that allows its members to share time and space while carrying out their personal activities without disturbing each other—a table for closeness without compactness. The table splits into three co-dependent parts that enable countless layouts. The layering of horizontal spaces inverts hierarchies, increasing instability through height. The new furniture piece explores the semiotics of the object by translating the typological big family table into an animated material setting that redefines familiar relations. It serves to investigate the ways in which the material world orders the social (Baudrillard 1968, 13–30), and suggests the agency of objects as material-social entities that can mediate and transform social relations (Latour 2000, 10–21) to enable alternative forms of co-living.

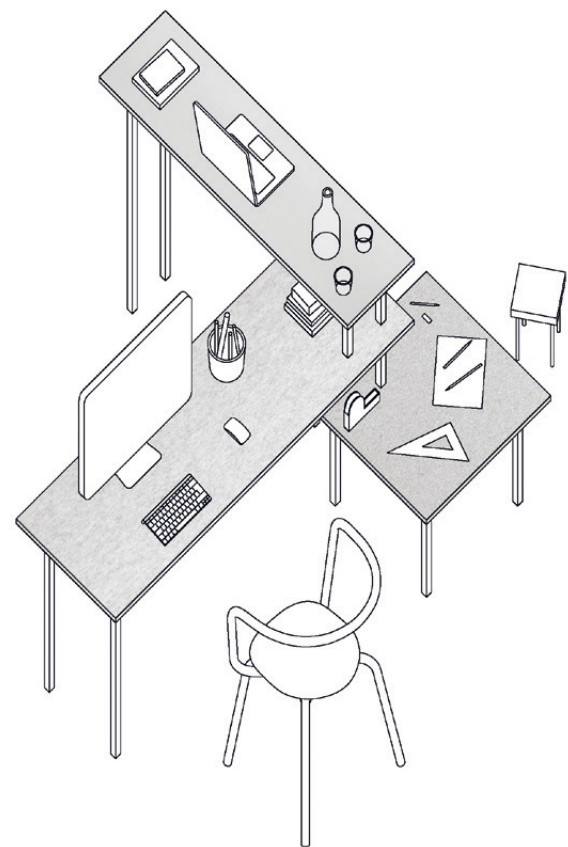
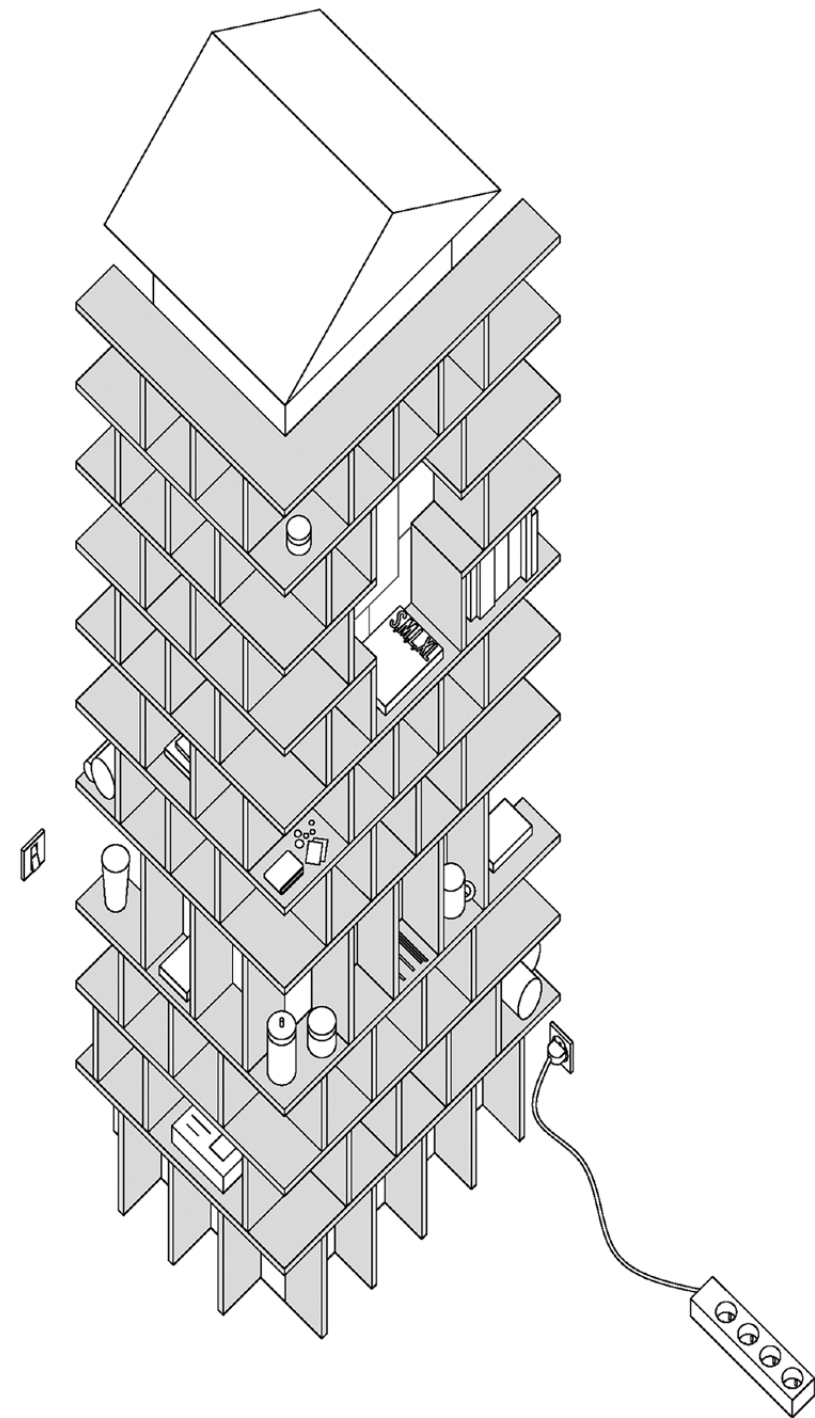


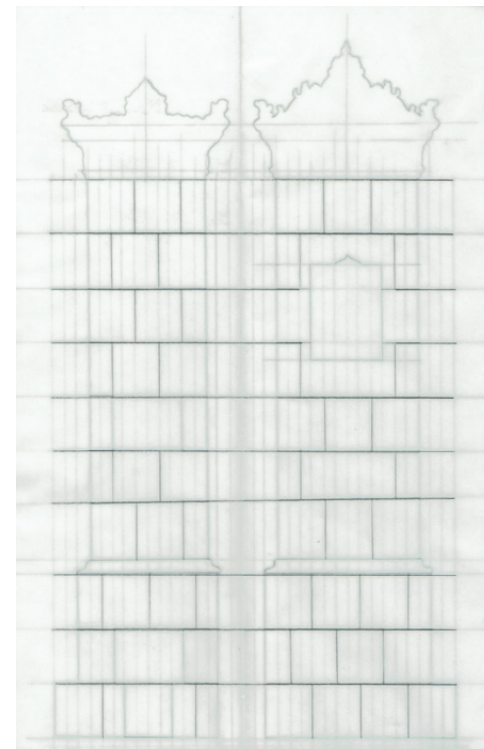
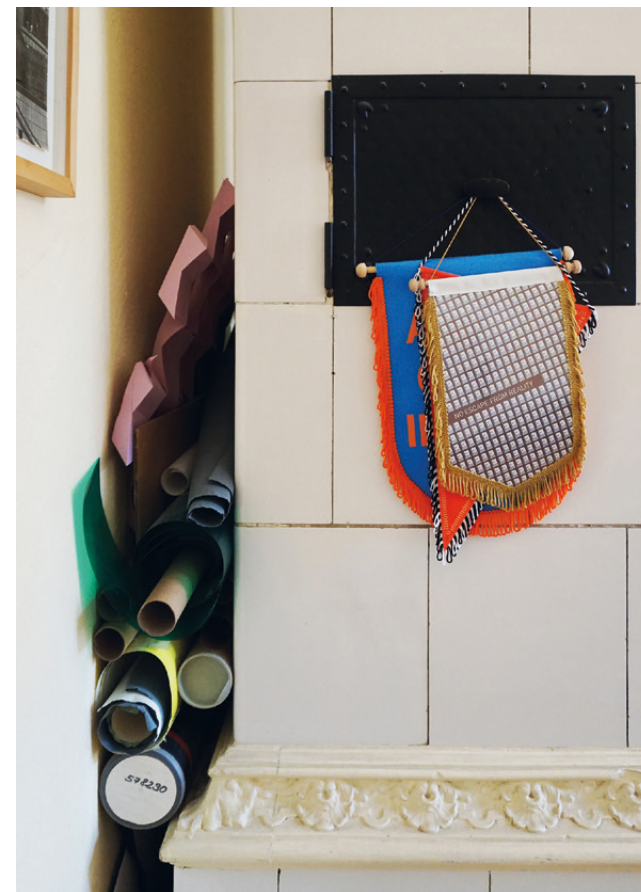
Table “Defne, Christoph and Ela,” Pretty Something (Marta Fernández Guardado and Diogo Passarinho)



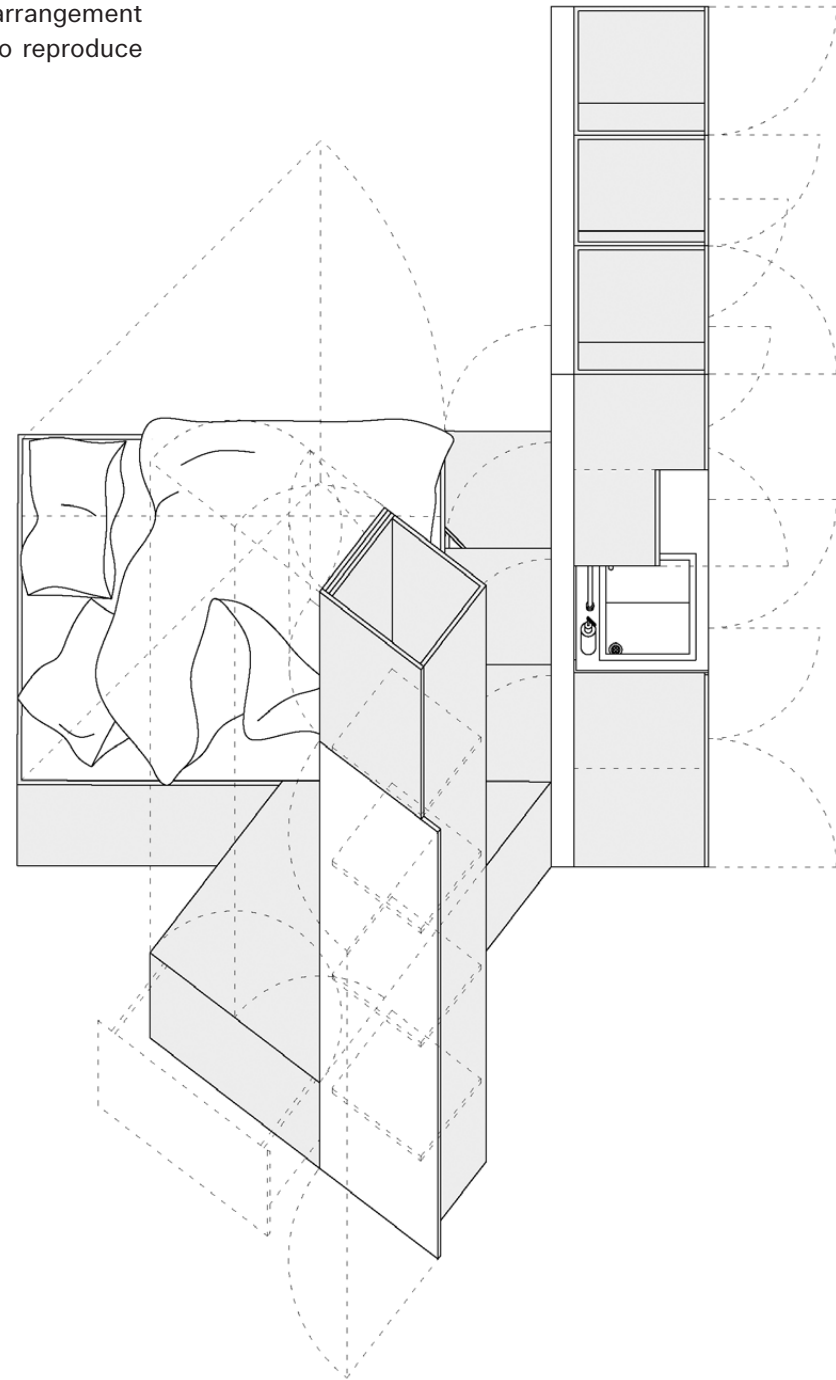
The second design case, "Matthias," is a commission for a shelf in a room where an obsolete oven already occupies the ideal position. It follows from a direct observation of the existing object being used as improvised display and storage, and translates it into a shelving skin that supports and transforms the ill-fitting practice. As discussed in *Thing Theory*, instead of designing an object that represents an idea, this design deals with what is encountered (Brown 2004, 1–21) to investigate the substance, making, and becoming of a new thing (Grosz 2001, 167–183). To do so, I use line drawing to trace the physical elements of the oven: the volume, the moldings, the openings, and the tiles, whose pattern I use to articulate a new "something" that extends toward the edges of the room and defines the compositional and structural logic for a new shelving system growing from the oven and becoming its excess (Brown 2004, 5). What was hitherto an idiosyncratic habit formed from necessity is established as a domestic practice finally fully enjoyed. The resulting artifact encourages the observed "inappropriate" behavior while embracing the found "useless" material, redefining the human-thing relationship and nourishing their mutual engagement.



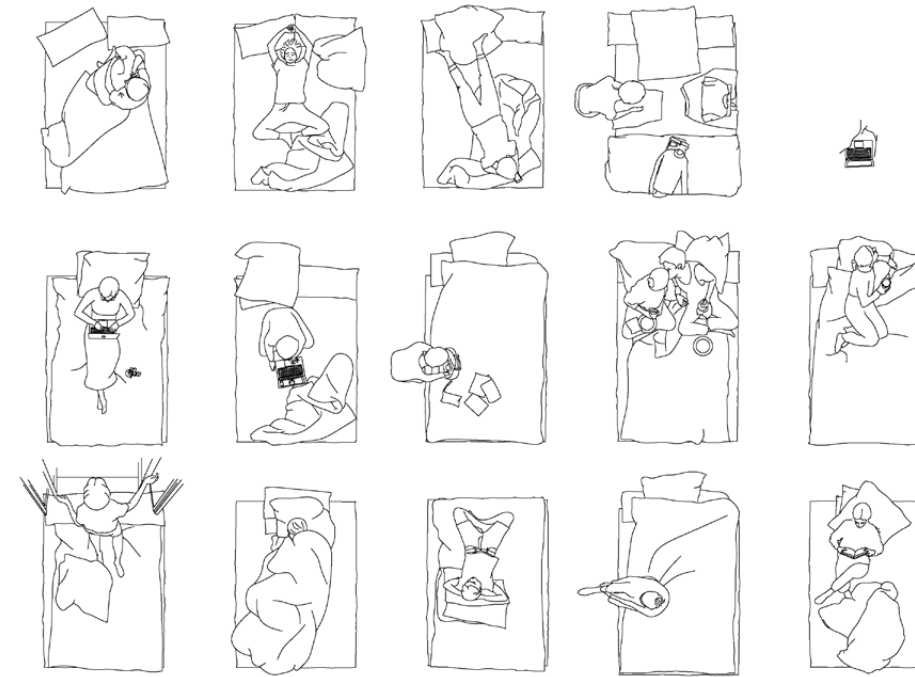
Shelf "Matthias," Marta Fernández Guardado



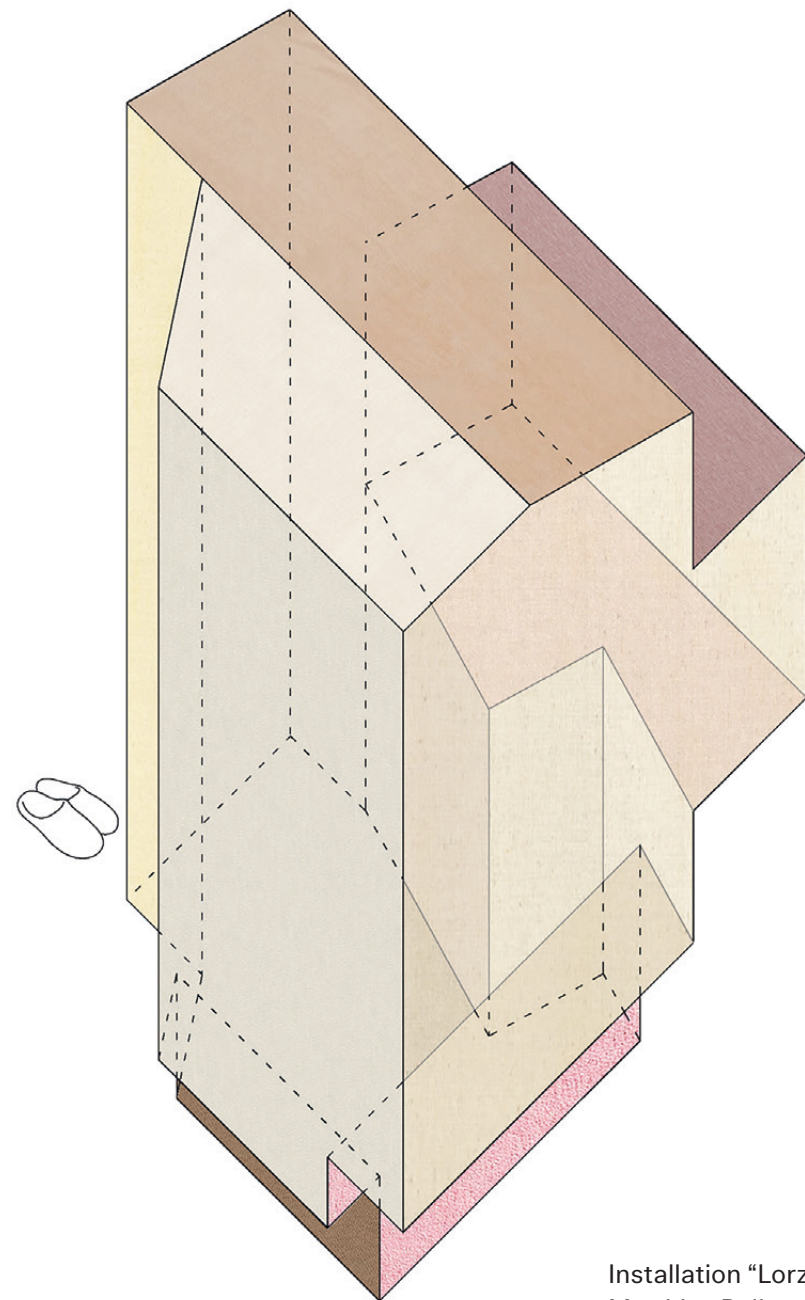
The third design case, "Marta," is a renovation of an apartment with no bedroom to reaccommodate my things and myself based on an exploration of my bed. According to Actor-Network-Theory (Latour 2007), together we form a material collective that assembles our social home, and, under the appropriate relational circumstances, can be reassembled and strengthened. My case employs line drawing to trace the movements from one association to the next, and get closer to the thingness of our current space (Latour and Yaneva 2017, 103–111). The bed presents itself as the center around which we mobilize, juxtapose, and associate; a thingly space for resting, but also contemplation, entertainment, work, socialization, intimacy, and preparing myself each time before leaving or upon arriving home. It marks the access to our collective network. Thus, I have placed the bedroom at the entrance of the new apartment, making those completely different notions of space cross-define each other and transfer qualities of privacy and exposure, overturning the traditional progression from public to private, intensifying social practices of solo living. The new arrangement of things reconstitutes our collaborative agency to reproduce and transform home.



Bedroom "Marta," Marta Fernández Guardado



The fourth design case, "Lorza," is a spatial installation that connects worn-out domestic textiles with personal memories, in order to investigate spatial inhabitation through thing-body intimacy in a material and phenomenological way. The question of intimacy between human and non-human materials leads to an exploration of personal space through encounters between bodies and other things, which connect through their material vitality (Bennet 2004, 347–372) and define experience together. The installation captures and displays the intimate ways we relate to objects in space, delving into the thingly structures of spatial experience in which subjectivity appears as another material layer.

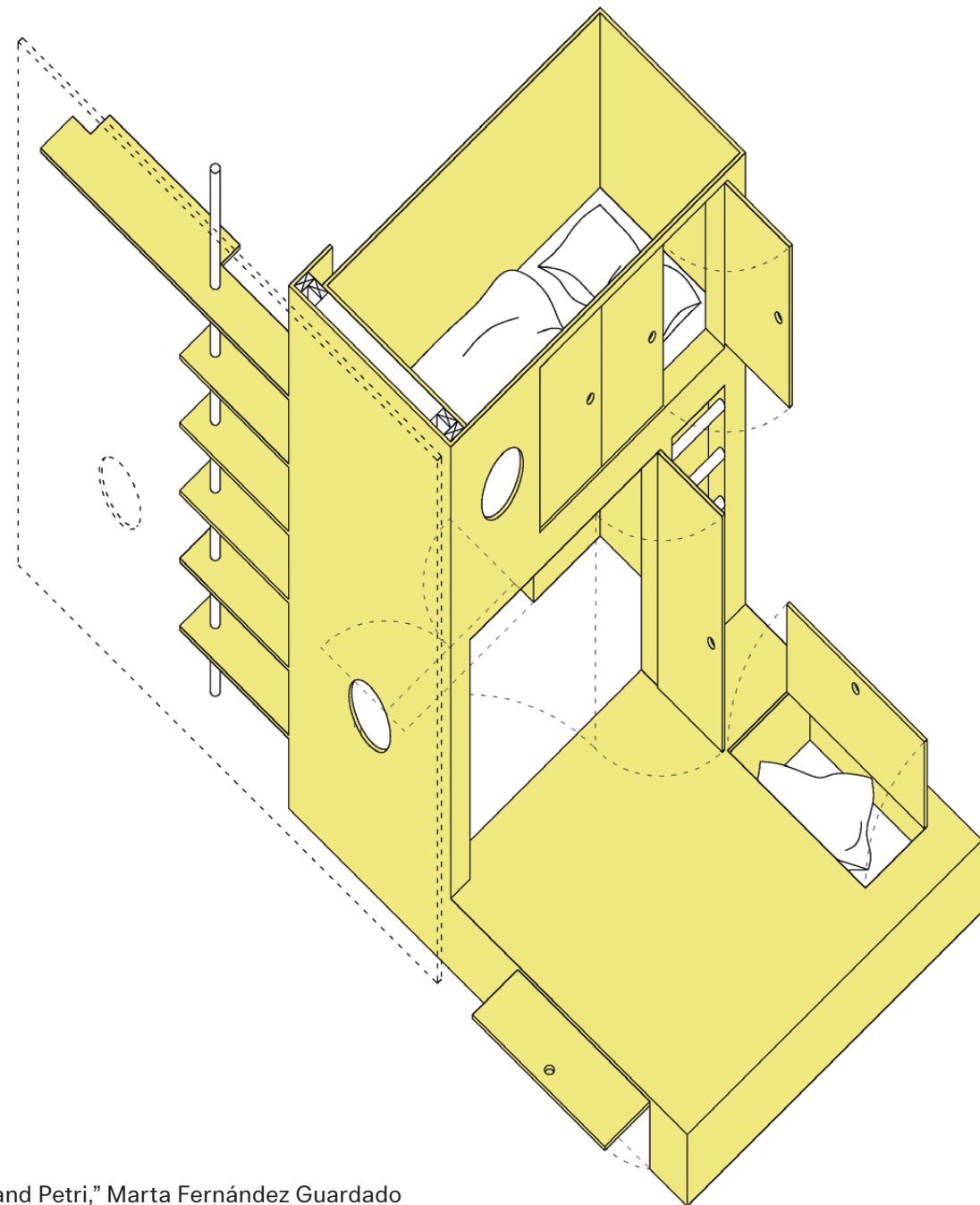


Installation "Lorza," Marta Fernández Guardado, Matthias Ballestrem



The fifth design case, "Inga and Petri," is an apartment renovation to create an extra room for a child who periodically lives with her dad in a new one-bedroom home. The process begins by documenting their shared parenting routines, in which the remote work and difficulty of communicating with Inga (the child) defines her as vital material and Petri (the father) as a subjective material layer of their experience. For three months, I recorded and transcribed all my conversations with Petri, collecting snaps of Inga at home as well as encounters between him, her, and their material context. The verbal and visual material is selected, combined, connected, evaluated, reselected, reconnected, and translated into parameters for a new design, employed to design a new "some-thing" that registers, rearranges, and redefines the detected relations. The arrived-at proposal is to enlarge the existing entrance wardrobe to fit Inga's bed, adding one opening to the back that transforms it into a small, doubly oriented, two-floor niche, connected to a platform with several swinging openings that

lift the ground. This makes the window accessible to her, while a sliding door that opens to the living room, wrapping it around the corner with a shared shelf, closes or opens the entrances. Over the following three months, once the construction began and until Inga (and Petri) fully appropriate the design, the process was repeated. Again, the verbal and visual material is selected, combined, connected, evaluated, reselected, reconnected, and translated into a series of inhabiting design qualities that serve as a final evaluation of the project. I analyze the new phenomena through material, spatial, temporal, and social relations to understand the transformation of their feelings and actions at home. Hindered moments of Inga and Petri's domesticity are used for the design of a new "some-thing" that supports and manifests their particular life-at-home, defined by their needs of independence and care, and their continuous negotiation of responsibilities and wants for themselves together in a house where they don't really fit.



Room "Inga and Petri," Marta Fernández Guardado



The progressive design, execution, and evaluation of these five design cases structured my studies and enabled the formulation of the sought-after tool of “domestic repair,” which aims to open a relational research path on the contribution of the material world of objects to the human experience of inhabiting through thing-based production of personal space. By working with objects, things, bodies, encounters, associations, matters, flows, and all kinds of stuff, “domestic repairs” strengthen the inhabitants’ engagement with space and activate their agency to transform home—in a time when it has become clear that there are less reasons to build and more reasons to make better use and enjoyment of what we already have.

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A Neuropsychological Perspective on Architecture and the Body

Corinna Kühnapfel and Hannah Krufft

The two authors contributed equally to the text.

Abstract

Neuroarchitecture is the study of how the architecture of the built environment affects the brain and behavior. In this chapter, we begin with a review of neuroaesthetics-informed neuroimaging studies, which aim to reveal what brain processes are engaged when we perceive and evaluate architecture. Tying this to discussions on ocularcentrism in architectural theory and practice, we argue that the operationalization of architectural stimuli in the vein of neuroaesthetics practice lacks the embodied and enactive experience that architecture offers. Following from this, we point out ways in which the body is crucial for architectural experience, something that has begun to be proven through empirical studies using so-called ecologically valid settings (e.g., virtual reality, mobile brain imaging). More specifically, we show how our experience is influenced by opportunities for skilled interaction and movement, the kind of body we have, our environment, and the ways in which meaning- and memory-making is enacted by engaging with architecture. Altogether, we hope to provide contextualization of the bodily-sensory access to space within the current discourse of neuroaesthetics and psychology, as well as ideas on how neuroarchitecture can contribute to understanding and improving our being-in-the-world.

Neuroarchitecture is a relatively new interdisciplinary field of research that draws on neuroscience, psychology, and architectural design. It studies how the architecture of the built environment affects our brain and behavior and seeks to yield conclusions on how architecture can promote human flourishing and well-being. Studies have shown that architecture has an impact on our mood, cognition, and mental health (e.g., sleep quality, stress reduction) (Coburn, Vartanian, and Chatterjee 2017; Coburn et al. 2020; Karakas and Yildiz 2020; Norwood et al. 2019). The mechanisms through which it accomplishes this, however, still need to be elucidated (Bower, Tucker, and Enticott 2019).

A significant body of studies in neuroarchitecture are based on neuroaesthetics, which is the study of the neurobiological underpinnings of aesthetic experience using neuroscientific methods (Chatterjee and Vartanian 2016). Some studies have focused on how architectural stimuli are visually processed. For example, it was found that the apprehension of color, form, and shape is integrated into higher order processing areas such as the parahippocampal place area, which was found to be associated with the recognition of environmental scenes (e.g., landscapes, buildings, interiors) (Choo et al. 2017) and scene-specific information (e.g., spatial expanse and naturalness) (Harel et al. 2016). Other studies have examined how those visual features relate to our psychological responses to architecture. For example, Vartanian and colleagues (2013) asked subjects to rate photos of different architectural interiors with curved or rectilinear forms in terms of beauty while they lay in a magnetic resonance imaging (MRI) scanner, which allows for the non-invasive production of anatomical brain images by using the magnetic properties of hydrogen contained in body tissue. They found that beauty ratings were higher for curvilinear rooms compared to rectilinear rooms. Moreover, the beauty ratings for curvilinear spaces were accompanied by activity in brain areas responsive to emotional value and rewarding properties (i.e., the anterior cingulate cortex). In a further study, the authors demonstrated the involvement of the same brain area when viewing images of open rooms compared to enclosed rooms (Vartanian et al. 2015). Open rooms were also judged to be more beautiful and approachable than enclosed rooms (i.e., subjects said they would like to enter the space), and activated brain regions with strong connections to the amygdala—an area of the brain associated with threat processing—suggesting that enclosed spaces evoke stress or threat in the viewer. Rooms with higher ceilings were also preferred over rooms with lower ceilings and elicited more activation in brain areas related to visuospatial processing (e.g., precuneus and middle frontal gyrus), which indicates that we might prefer rooms with higher ceilings because they facilitate attention, exploration, and navigation. This suggests that how we aesthetically experience architectural spaces is not only influenced by our senses and emotional reactions, but also the kind of behavior those spaces invite us to perform. Additionally, our architectural experience is informed by personal background and knowledge. For instance, the beauty judgments in the study by Vartanian and colleagues (2013) varied in brain activity within regions involved in memory retrieval (e.g., the parahippocampus) indicating that what we find beautiful is also influenced by our memory or education. Indeed, an earlier study showed that brain activation during aesthetic judgments of architectural spaces varied with expertise. Architects, compared to non-architects, evinced not only increased activity in areas related to reward-processing (e.g., the orbitofrontal cortex) but also showed increased hippocampus activity, which likely reflects integration of past experience with what is being perceived (Kirk et al. 2009; for further examples of studies on individual differences see Markovic et al. 2016; Shemesh et al. 2017; Vartanian et al. 2019).

The various findings in neuroarchitecture have been structured alongside the aesthetic triad according to which aesthetic experience of the built environment is mediated by three large-scale neural systems: the *sensory-motor*, *knowledge-meaning*, and *emotional-valuation* systems (Coburn, Vartanian, and Chatterjee 2017). Nevertheless, the lion's share of the above-mentioned studies have focused on our aesthetic experience of *images* of architectural spaces, and as such strongly align with the operationalization of visual art in neuroaesthetics (Bower, Tucker, and Enticott 2019). Paradigms focusing on neural activity, however, and generic/aesthetic responses in the lab using visual representations of architecture, lack the *in situ* and embodied

experience architecture offers: we actively move and interact with space, and sense our own body as we are doing so. Thus, a crucial part of our experience with architecture arises from our active bodily engagement, and certain aesthetic qualities become available only once one's body is engaged in order to move and interact with spaces. It has even been argued that the feeling of our body while moving through architecture is a crucial part of appreciation in its own right (Robinson 2012). This disregard of the body in neuroarchitecture research has been recognized by various scholars (e.g., Jelić et al. 2016; Mallgrave 2020; Wang et al. 2022), and parallels discourse both in architecture theory that argues against the primacy of vision in architectural culture while advocating toward an experiential and phenomenological approach that acknowledges the role of the body in perception and experience (e.g., Pallasmaa 1996; Robinson 2012; Robinson 2021a), as well as a paradigmatic shift in cognitive science and philosophy of mind. Ecological psychology (e.g., Gibson 1986) and *embodied, extended, embedded, and enactive* approaches to cognition (4E Cognition, e.g., Newen, De Bruin, and Gallagher 2018; Varela, Thompson, and Rosch 1991) turn away from a conceptualization of cognition as processing of neural representations of the external world and instead ground it on embodied experience arising from our active engagement with the environment.

Yet considerable advances in mobile applications of brain imaging techniques, which allow for the monitoring of brain activity as participants move freely through space, meet the challenge of studying architecture in so-called ecologically valid settings (Wang et al. 2022). In what follows, we will present results from recent empirical work within the ecological psychology and enactive tradition that suggest that the body is crucial for architectural experience in several ways, and therefore encourage taking a more enactive-ecological approach. A group of researchers in Rome applied a mobile electroencephalogram (EEG), which records voltage fluctuations of neural activity at the scalp, while participants sat on a chair and visually explored three virtual reality (VR) environments, one consisting of an empty room, the other two of furnished rooms with different designs (Vecchiato et al. 2015a; see also 2015b). In order to assess the realism of the virtual environments, participants were asked to rate how physically present they felt in each of the rooms. EEG recordings revealed that reports of high presence were underpinned by activity patterns associated with sensorimotor integration, proprioception (perception of body position and movement), and self-localization in space, which suggests that our motor system plays a crucial role in real-life architectural experiences (Vecchiato et al. 2015a). During the exploration of rooms rated as highly pleasant, EEG recordings revealed activation of sensory and frontal regions as well as increased activity over brain areas related to action planning, which supports the previously presented aesthetic triad suggesting an integration of *sensory-motor, knowledge-meaning, and emotion-evaluation* systems underlying our aesthetic experience. Since ratings of pleasantness were higher for furnished rooms, regardless of furniture style, the authors further assume that motor activity might be generated by opportunities to move and interact with objects in space, which, accordingly, results in higher pleasantness ratings as participants “felt free to ‘live’ those spaces” (Vecchiato et al. 2015a, 14). Furthermore, the authors found that ratings of pleasantness were associated with increased visuospatial processes in the brain, supporting the aforementioned assumption that we prefer rooms with higher ceilings because they offer more room to move and explore space (Vartanian et al. 2015).

Possibilities for action within a given environment are also known as “affordances”—a term that is widely used in architectural and design theory and that was coined by ecological psychologist James J. Gibson (1986). Importantly, for Gibson, affordances are to be understood as relational properties determined by both the environment's physical structure and the perceiving organisms' bodily constitution and potential to interact with the environment. Whether a tree affords climbing is, for instance, related to the diameter of its stem and the range of its branches, but also to the bodily height, strength, and past climbing experience of the perceiver (see Warren 1984 for an example of body-environment relation with the climbability of stairs). As such, one could even argue that the “body itself [can act] as a measure of architectural quality” (Jelić et al. 2016, 3).

Researchers at the Berlin Mobile Brain/Body Imaging Laboratory (BeMoBIL) of Technische Universität Berlin investigated the neural underpinnings of architectural experience by specifically manipulating architectural affordances (Djebbarra et al. 2019). In contrast to the aforementioned study, EEG recordings were made while participants actually moved through a virtual space that consisted of rooms with varying door width—that is, varying transition affordances (easily passable, passable, and impassable). After entering the virtual space, participants were instructed to wait until the door changed its color and then either move through the door (green door) or remain in their position (red door). Results revealed that early sensory brain activity measured over motor and visual areas differed depending on whether the door was passable or impassable. Importantly, at the point in time in which participants did not know yet whether they were required to move or stay, the activity observed in the motor system did not reflect any action intentions. Moreover, the EEG recordings revealed that passable trials were characterized by the allocation of more attentional resources than impassable trials. The study has since been confirmed by further results (see Tosoni et al. 2021) and indicates that our brain activity in response to a given environment is influenced by an environment's affordances from early on. Thus, what we see cannot be separated from the kind of bodily interactions a space enables or denies. We perceive space as action space and, as such, always in relation to the kind of body we have. There is no disembodied perception of space to begin with.

Vision, however, is not only informed by action, but, as scholars of ecological psychology in particular stress (e.g., Gibson 1986), is an act itself. Because our eyes are attached to a head, which sits on a body that actively moves through and explores space, our perception changes as we move through space. That is, what we perceive is actively brought forth by our movements. Unsurprisingly, this is also reflected in brain activity, which was found to vary while walking naturally allowing different perspectives on the same room (Banaei et al. 2017), when experiencing a sudden change of ambience in a street while walking along different routes in a city (Karandinou and Turner 2017), as well as during passive observation and interaction. While some activity patterns reflect a space's immediate affordances (e.g., passable vs. impassable), others change dynamically in accordance with our movement (Djebbarra, Fich, and Gramann 2021). Thus, “by designing our environments, architects design cortical activity” (Djebbarra, Fich, and Gramann 2021, 12). And as we have seen, this is so because, crucially, architects design possibilities for bodily interaction with space.

Further studies show that the body is crucial for our experience of architecture in yet another sense, as our sensing and feeling body is, in and of itself, a fundamental part of the experience.

Architecture is first of all something we touch—not only with our gaze, but with the skin of our hands and feet (Pallasmaa 1996; Robinson 2021a). Touching wood, for instance, has been found to induce physiological relaxation in comparison to other surface materials (e.g., marble) as indicated by both self-report ratings, heart rate, and neural activity (Ikei, Song, and Miyazaki 2017). Given that there are already more than 200,000 nerve endings only in the soles of our feet (Robinson 2021a), our experience of architectural space is likely to be colored by haptic sensations, too.

Moreover, VR studies suggest that being enclosed in space is something that we do not only see but actually feel when it intrudes in our peripersonal space, i.e., the space immediately surrounding the body. Pasqualini and colleagues (2013) filmed participants from behind while they stood in either a large or narrow room and watched the virtual online version of their own body over a head-mounted display. When standing in the narrow room, participants reported feelings of room retraction and illusory touch with the sidewalls, which illustrates how architecture can modulate our bodily self-consciousness and how our self-identification can extend not only to objects but also to built structures in close proximity to our body.

Furthermore, our experience of architecture is likely to be mediated by the kinds of postures and movements specific spaces afford, considering that how we move or position ourselves has been found to be characteristic of certain emotional or affective states, as well as influence how we feel, think, and behave (Robinson

2012; Robinson 2021b). The enclosure of a room, for instance, was shown to alter how free we feel to move, which was in turn related to the ease of revealing personal information in an interview—i.e., participants showed more self-disclosive behavior when the room was perceived to be more spacious (Okken, van Rompay, and Pruyn 2013). Another study showed that room size influences individuals' current perceived body state (i.e., a high ceiling height correlates to feelings of being relatively free vs. confined in low ceiling height) and the manner in which individuals process information (i.e., awareness of the high ceiling relates to feature-specific processing and a low ceiling to abstract ideation) (Meyers-Levy and Zhu 2007). Furthermore, looking up at tall buildings and immense ceilings has been suggested to evoke feelings of awe (Joye and Dewitte 2016; Negami and Ellard 2021), which is thought to be associated with feelings of a small self (Pfiff et al. 2015). In the aforementioned study by Djebbarra and colleagues (2019; 2021), it was found that wider door widths were experienced as more arousing and positive than narrow door widths when actively moving through spaces, which shows that it is also important to empirically capture how it feels to occupy and move through spaces. Robinson (2012) argues that such emotional reactions help tell us something about the building itself, informing appreciation and evaluation. Taken together, these findings clearly demonstrate that our experience of architecture is affected by our bodily being-in-space, which partly results from being situated in, surrounded by, and interacting with space that affords certain movements and postures. What is more, it has been argued, although not empirically tested yet, that affordances and interaction make us more aware of our own body, which on the one hand can create an experience of our embodied presence and being-in-the-world to strengthen our sense of self (Pallasmaa 2018), and on the other hand can itself function as a trigger to make ourselves more receptive and make the whole experience more profound (Robinson 2012; Robinson 2021b). For example, the design of Carlo Scarpa's peculiar stairs at the Brion Cemetery in San Vito d'Altivole, Italy, affords each step to be performed with either the left or right foot, which "ruptures" one's usual stair-walking behavior and thus allocates an attentional switch to the conscious experience of one's body while climbing these stairs (Jelić et al. 2016).

In the last part of this chapter, we will take a closer look at the role of bodily interaction in architectural spaces for meaning- and memory-making, which has not yet been submitted to direct empirical examination, but represents an important topic for both architects and neuroscientists (Robinson & Pallasmaa 2015; Robinson 2021a; Jelić and Staničić 2021).

From an ecological-enactivist approach, a space becomes meaningful for us through the kind of bodily experiences it affords (Robinson & Pallasmaa 2015), and these bodily experiences are brought forth through our own active engagement with space (Robinson 2021a; Jelić and Staničić 2021). Thus, meaning is created and always re-created anew as we interact with space (Jelić and Staničić 2021) and becomes more and more skillful in responding to its affordances. For example, extending one's repertoire of possible movements by learning how to skateboard lets one perceive a city in a different way: a bench which afforded sitting may turn into an obstacle on which to practice a new trick (Robinson 2021a). Importantly, we not only generate new meaning by changing our way of interacting with space, but also by designing space itself so that it offers certain bodily experiences (Robinson 2012; Robinson 2021a; 2021b), such as in the previous example of Scarpa's stairs. Another illustrative example is traditional Japanese garden design, in which the scattered placement of stepping stones is meant to slow the visitor's movements to encourage paying attention to the body as well as subtly changing one's view of the garden (Saito 2017). The way we move in such gardens, then, engenders certain emotive and affective states as the garden is revealed step by step. Hence, in being shaped by and shaping our bodily experiences, architectural spaces reflect and engender what is meaningful to us—that is, they embody and enable a certain mode of living and being-in-the-world (Jelić and Staničić 2021; Robinson 2012; Pallasmaa 1996). When we interact, therefore, with our constructed and continuously-being-reconstructed settings, "we know and remember who we are as historical beings" (Johnson 2015, 52).

From an ecological-enactive stance, remembering is something that emerges as we actively engage with our environment, just as meaning-making is something that we do. Architectural space can therefore be seen as providing a scaffold for a "remembering-in-the-now" (Jelić and Staničić 2021, 198). One could assume that this might in part be reflected in the activity of the brain's memory system during architectural experience (as was the case, for example, in Vartanian et al. 2013). It would moreover explain that the *method of loci* or *memory palace* technique works so well because it reflects the "natural human proclivity to use spatial context . . . to learn and recall information" (Maguire et al. 2003, 94; see also Peeters and Segundo-Ortin 2019 for an enactive account). Another contributing factor to the memorability of spaces likely lies in the inherent affectiveness of architectural experience, since it was found that emotionally arousing experiences are remembered best (Eberhard 2009; Brosch et al. 2013).

Lastly, since we do not only move through space but inhabit space, there is yet another aspect of "embodiment" to consider. Not only do we form architectural spaces according to our needs—for sheltering, for engaging in social situations—but our constructed habitats also form us, by influencing our movement and perceptions over a long period of time (Robinson 2021a). The brain's capacity to change as we learn and make experiences in the world is called *neural plasticity* (Eberhard 2009), and various neuroscientific evidence shows that the environment we inhabit plays an important role in facilitating action and cognition. In a manner of speaking, our nervous system "is very concretely configured by our environment" (Robinson 2021a, 173). For example, where we grow up has been shown to shape our attention style (Miyamoto, Nisbett, and Masuda 2006), brain structure (Kühn et al. 2020), and motor capacities (Robinson 2015). Furthermore, compared to Americans, Europeans for instance were found to lose their balance more slowly, as they are accustomed to walking on cobblestones (Robinson 2015)—which shows how our memory of spaces can also be considered to consist in our bodily attunement and skillful engagement with the places we inhabit. In addition to that, we can navigate our homes in the dark because we have integrated the locations of our furniture into our movement repertoire (Robinson 2021a), which demonstrates that our homes are not after all "a set of closely associated images" but something that we in some way have in our legs (Merleau-Ponty 1962, 130).

In this short chapter, we have presented the current state of neuroaesthetics research and the psychology of architecture with a focus on an ecological-enactive understanding of architectural experience, stressing that how we perceive, experience, and engage with space depends on having a particular kind of body that skillfully interacts with the environment. We have reviewed studies that have shown that architecture has meaningful impacts on our brains and behavior. Furthermore, we have illustrated that by acknowledging architectural experience as encountered through the lived body, neuropsychological research on architecture that makes use of mobile brain-imaging approaches can teach architects, designers, and city planners about the corporeal dimensions of architecture as well as its affordances and the affective experience it generates, while helping to realize spaces that facilitate peoples' flourishing in individual life quality, psycho-emotional behavior, health, and well-being (see for example Tvedebrink, Jelić, and Robinson 2022 for practical considerations) and, ultimately, our being-in-the world.

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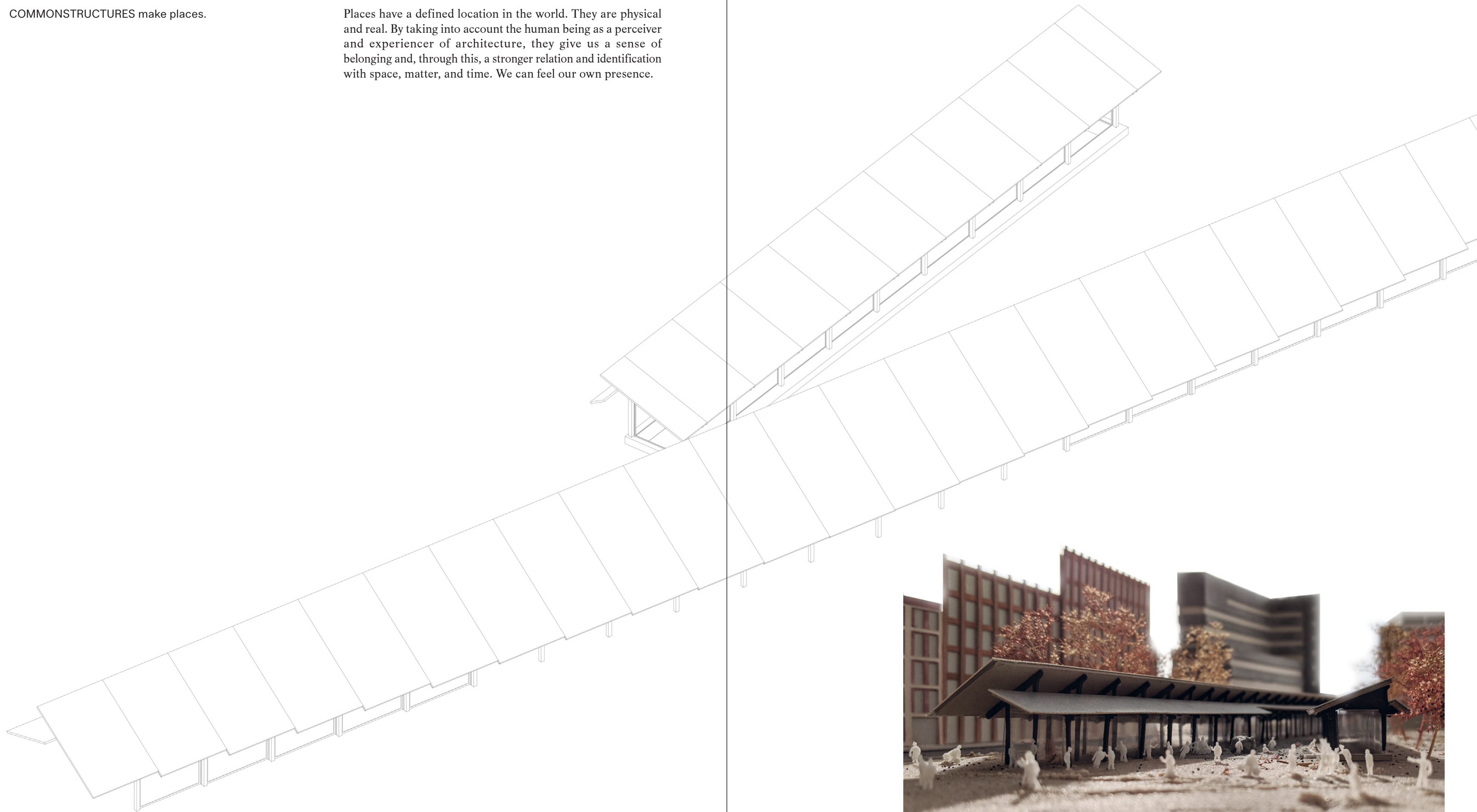
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João Quintela & Tim Simon-Meyer

Engaging Society through Architecture

COMMONSTRUCTURES make places.

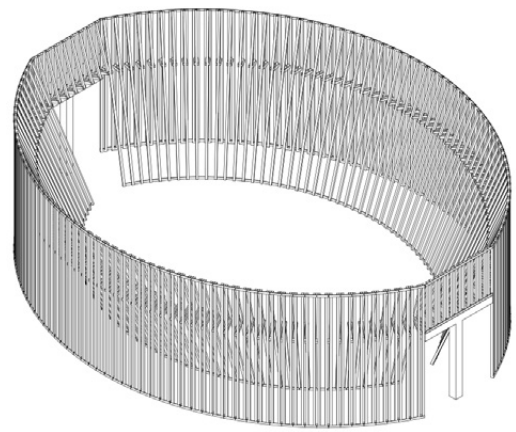
Places have a defined location in the world. They are physical and real. By taking into account the human being as a perceiver and experiencer of architecture, they give us a sense of belonging and, through this, a stronger relation and identification with space, matter, and time. We can feel our own presence.



HOPFEN, Atelier JQTS, B.W.Knitter, Henrik Becker Architekt, 2022

COMMONSTRUCTURES are useless.

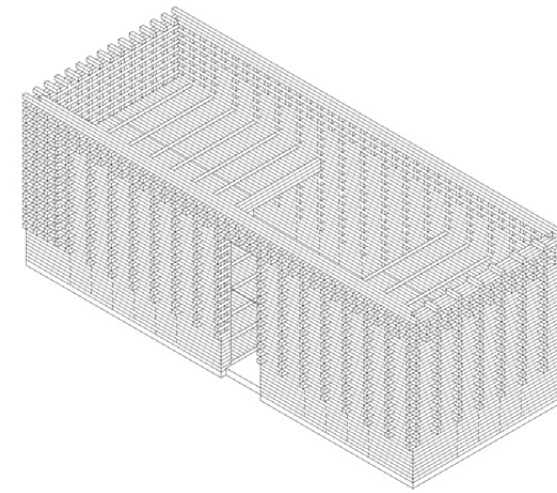
The architecture does not follow functional requirements. Instead, the architecture generates an open field for diverse uses and appropriations. Primarily, it creates the frame for our movements and activities.



POVERA, Atelier JQTS, students of the UAL Lisboa, 2015

COMMONSTRUCTURES are inspiring.

In their structural appearance, they're open for individual associations and interpretations. They address our creative drive to acquire individually what is there and make use of it.



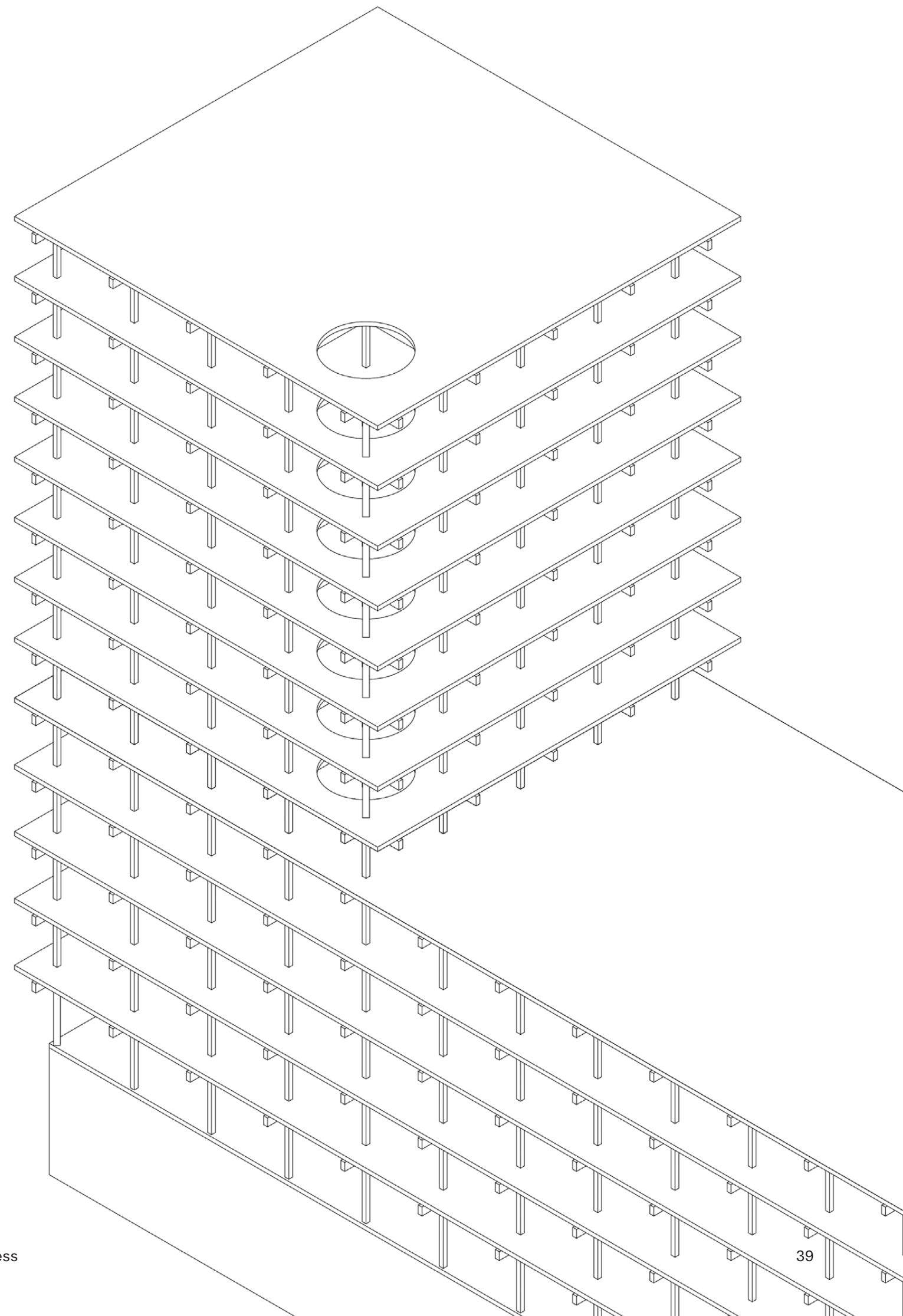
VERTIGO, Atelier JQTS, 2014

COMMONSTRUCTURES engage society.

They're done for everyone, independent of cultural background, social context, or age. They bring people together that would otherwise not necessarily meet. Through them, we find places of diverse community and activity.

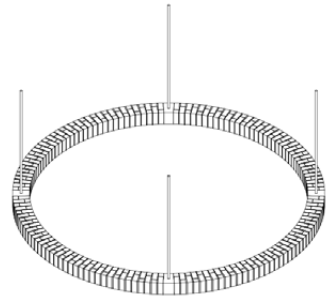


COMUN, Atelier JQTS, Atelier 17, 2019



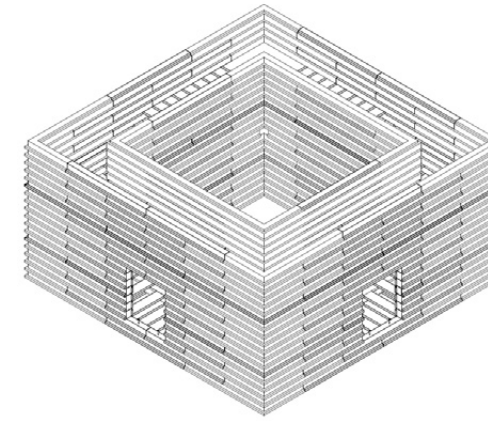
COMMONSTRUCTURES do not depend on scale.

It's not a matter of the scale of the architecture, but of how the human scale is reflected in the architectural space. If we can put our own body in relation to the architectural body, the architecture can engage us on different levels, whether it's furniture or a stadium.



COMMONSTRUCTURES are based on construction.

The construction defines the architecture. Elaborated with a formal intention, the construction solves the structural needs in mutual dependence, creating the spatial character and determining the architectural expression. Through this, the construction is able to generate tectonic qualities and transform structural needs into an engaging *Gestalt* that we can perceive empathically.



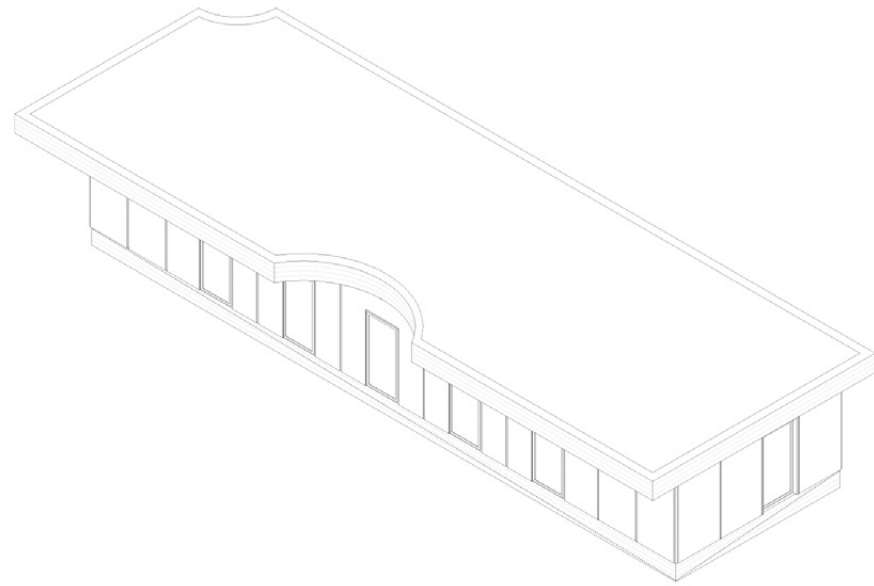
HEARTH, Atelier JQTS, students of the University of Antwerp, 2020



KAIROS, Atelier JQTS, 2012

COMMONSTRUCTURES address political issues.

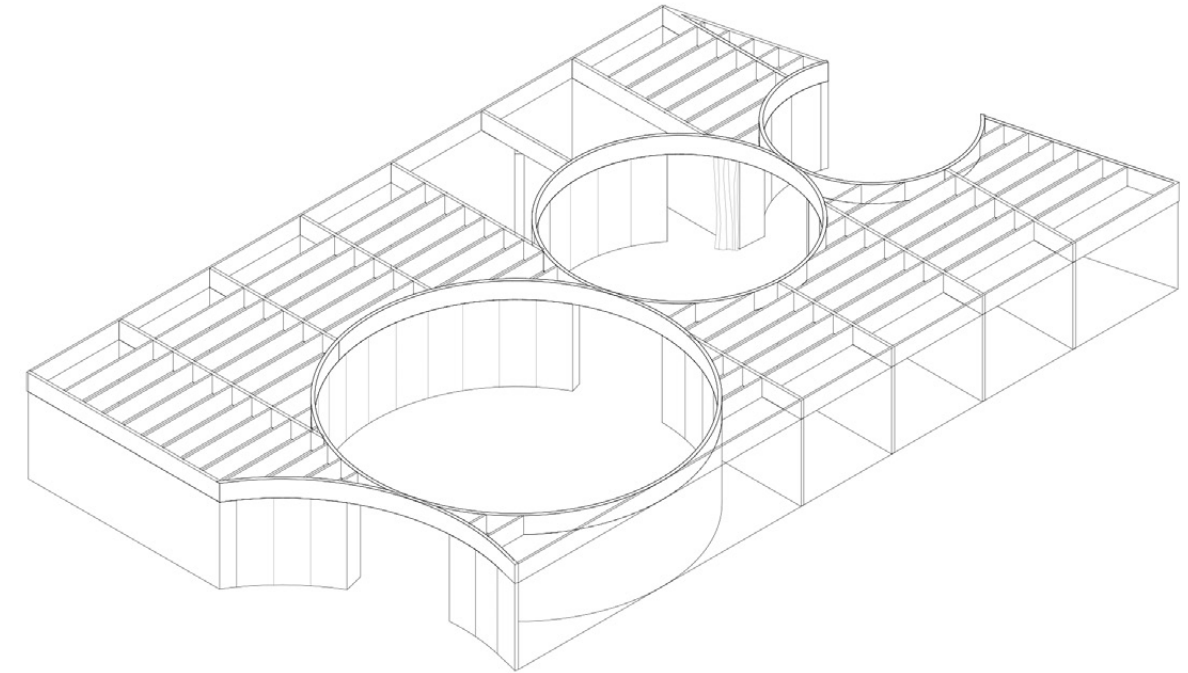
They create places where no feeling of place exists. They promote social activities where social life doesn't have space. They extend the public toward where it's possible to reduce the private. They support our interpersonal relations.



NOVERCA, Atelier JQTS, 2017

COMMONSTRUCTURES are inclusive.

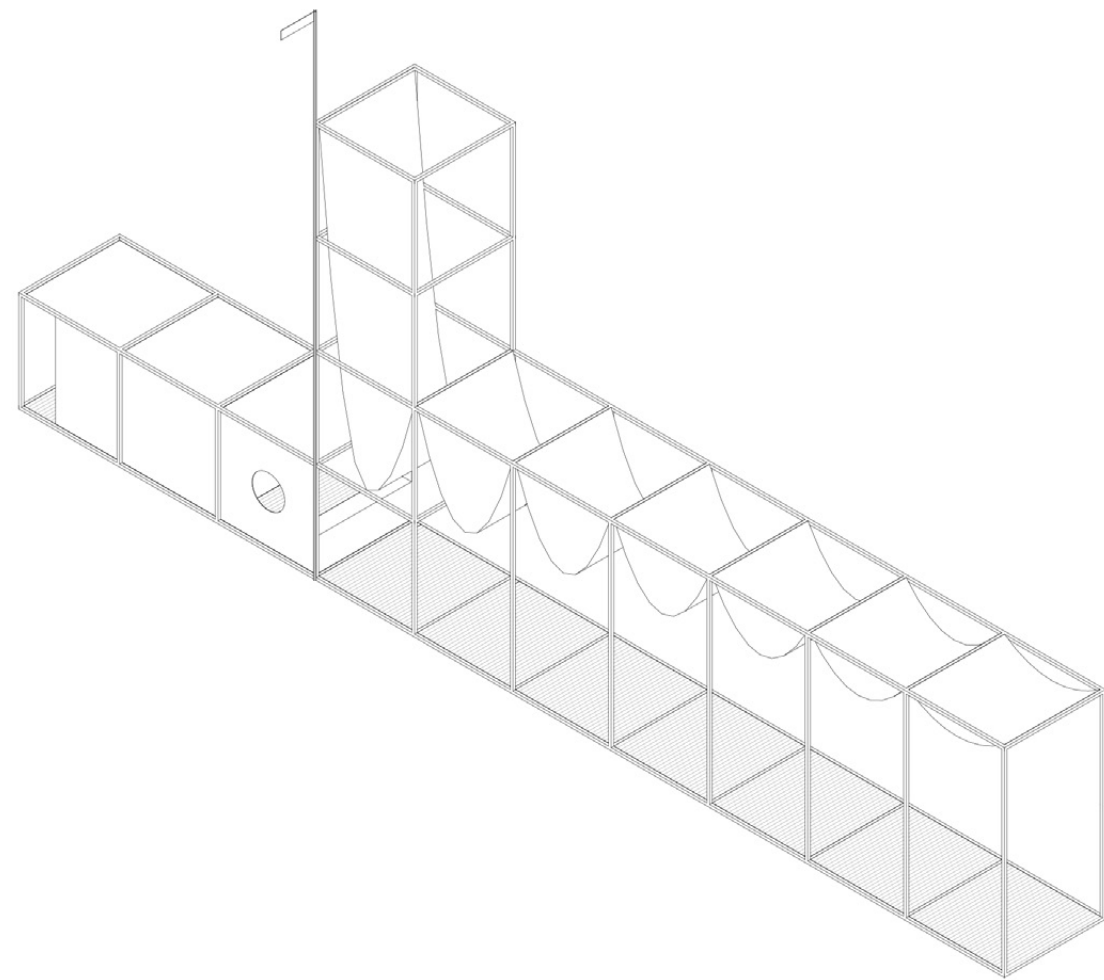
Their open appearance is not only a matter of expression, but of actual accessibility, both physical and mental. By using common and familiar materials, constructions, and forms, the architecture communicates in a legible way. We can understand its meaning without needing any special knowledge or background information.



ULISSEIA, Atelier JQTS, 2019

COMMONSTRUCTURES have symbolic character.

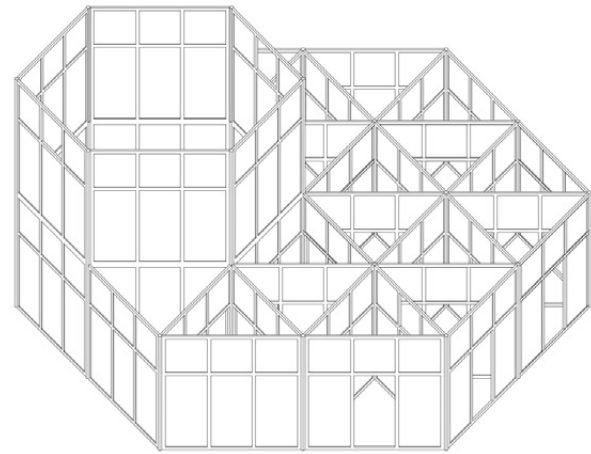
Buildings can become part of a cultural context once they establish a dialogue with the city and its people. When a certain structure is considered part of each one of us, suddenly there arises a sense of belonging. It has the capacity to represent us in a meaningful way and on a symbolic level.



VIATICUS, Atelier JQTS, 2018

COMMONSTRUCTURES have haptic qualities.

The architecture expresses its physical nature. Exposed materiality enriches the experience of space and reveals how it is made. It expands visual perception through haptic experience and facilitates a deeper understanding of the architecture.



There's undoubtedly an interconnection between social life and architecture. Social structures, therefore, can promote architectural structures, and vice versa. Whereas social life can only develop from architecture if the architecture is able to create an engaging framework for people.

Over the last few years, we have been developing the concept of COMMONSTRUCTURES through our practical work as architects and with an interest as researchers. From our point of view, the concept can be applied to every architectural structure that has the capacity to generate public life and thereby impact society.

The above thoughts represent a personal collection of characteristics of COMMONSTRUCTURES. They are complemented by documentations of our projects as illustrations. Each project was selected to underline one aspect, even if it cannot solely be reduced to it and might simultaneously apply to others. The project itself is always represented with an isometric drawing emphasizing the architecture in its constitution as a whole, isolated from the context. This drawing is accompanied by an atmospheric image catching a specific moment of appropriation by people.



GALLERY, Atelier JQTS, 2017

Body as

Refer-
ence

The Bodily of a Tectonic Approach

Tim Simon-Meyer

In a world that's changing more and more rapidly and unpredictably, physical places, both natural and constructed, take on new meanings. They create concrete moments of sensory experience where our senses receive stimuli—we smell, taste, or feel—and our bodies are invited to act—we climb, dance, or relax. These places have a strong presence that makes us feel *our own* presence, in the here and now, located in time and space.

The Tectonic Approach describes a design methodology that focuses on the specific physical presence of architecture as a counterpart to the physical presence of the human body. Here, a special role is played by aspects of materiality and construction. Their interplay is intended to bring about an expressive potential in architecture that appeals to the human body and its senses. Construction, both as a process and a constitution, is understood as an act of design that can give constructive conditions a sensually and physically perceptible appearance. This unification of the “seemingly contradictory pairs of technology and art, construction and appearance” (Kollhoff 1993, 17) is reflected in the concept of tectonics and forms the theoretical basis for the study of the Tectonic Approach.

The central question pursued by the Tectonic Approach is: How can tectonic qualities be created that make the architectural artifact a sensual and physical experience?

This contribution begins with a brief examination of the concept of tectonics, establishing a theoretical basis and personal classification. This is followed by a description of the Tectonic Approach that focuses on physical interaction with building materials during the process of design and construction. Selected design-build projects that we, the Professorship of Architecture and Experimental Design at HCU Hamburg, have realized together with our students serve as case studies and are presented in a series of photos.

The concept of tectonics experienced a renaissance toward the end of the twentieth century thanks to the work of Kenneth Frampton. Based on the theories of Bötticher, Semper, Sekler, and others, Frampton defined tectonics as the “poetics of construction” (Frampton 1995, 2) pointing to the sensual, expressive potential of constructive elements. But construction can only become meaningful in connection with a formal intention. In this context, Perret underlines: “*Technik, dichterisch gesprochen, führt uns zur Architektur*” (“Technology, poetically speaking, leads us to architecture,” Perret 1986). The terms “poetics” and “poetical” here are borrowed from literature, where they denote the handling of commonly known words and their meanings in a way that goes beyond the mere communication of information. The creative use of language, and the associative and emotional effect on the reader this engenders, plays an especial role here. Transferred to the field of architecture, tectonics can thus be understood as an attempt to use the means of construction—i.e., building materials and their assembly—in a way that goes beyond the fulfillment of structural necessities and can evoke (physical) emotions through their expression. How architecture is used and how people react to it is determined by this emotional relationship between people and architecture.

With the intention of creating architecture as a counterpart to people's movements and actions, Aldo van Eyck introduced the concept of “counterform” (Van Eyck 1962, 471), based on his research into human behavior vis-a-vis the built environment. In relation to Van Eyck's architecture and in particular his playground projects, Sarah Robinson in turn developed a theory of “generative affordances,” which is about an invitational character of the built environment that “can be performative but not deterministic” (Robinson 2020, 31).

If we take a closer look at Van Eyck's playground projects, it becomes clear that neither counterform nor generative affordances refer to forms and architectural gestures that trace actions or movements. Rather, Van Eyck uses simple geometric shapes such as circles or squares, common materials such as steel and concrete, and comprehensible construction methods that express gravitational forces. Accordingly, the interplay of form, material, and construction determines the shape and expression of the objects. This approach corresponds to the understanding of tectonics presented here, as it employs construction to communicate with the counterpart, the human being, and to make offers for physical interaction.

The Tectonic Approach

Following these ideas, the Tectonic Approach tries to integrate physical interaction with the materials and construction into the design process from the very beginning, and to lay a central focus on it. Materials—which are often not freely chosen—require an intensive exploration as a first step. This is not primarily a matter of physical or already known (sensual) properties. Rather, it's a matter of actively engaging with materials with our own hands and bodies, in a way that allows sensual and structural properties to become physical experiences. We touch the materials with our hands to feel their surface and temperature. We lift them and feel their weight. We step on them to experience their stability. And we intuitively join them together to test constructive possibilities and limits.

In doing so, our aim is always to transform constructive conditions into aesthetic expression. The tool to achieve this is our own body. It selects feasible elements and, through the act of construction, places them in a relationship that builds space and structure. Through this interaction between our body and the materials, questions relevant to design are negotiated, decisions are made. Some examples of the questions that characterize this process might be: How can an old wooden beam and a reused concrete block be combined meaningfully so that their material-specific properties are translated into an engaging *Gestalt*? How can former industrial shelving be layered to create a water-repellent surface that simultaneously expresses the roof as a playful and lively relief? How can ordinary steel profiles become load-bearing supports that convey their creation process while boasting an elegant appearance?

In this way, we question the material in the sense evoked by Louis Kahn when he asks, “What do you want, brick?” (Kahn 1971, minute 47:01). However, we do it with our hands and our bodies, finding out which method of handling best corresponds to the peculiarity of the material. Crucially, this is not about striving for an unconventional handling of the material; rather, we search for a simplicity of assembly that corresponds to the materials and their properties, in order to create an understandable expression of the construction. The aim is both to enable the participation of many in the process of designing and building, and to present this process in the artifact itself in a legible and comprehensible way. Constructive conditions are not bypassed or negated, but are explicitly given a visibility that determines the expression of the architecture and shows “how things are made” (Deplazes 2005, 17).

The design-build projects shown here all began with the question of available building materials. While, in the first projects, it was a question of low budget, in the more recent projects it also became a question of sustainability. Taking the climate crisis into consideration, we sought to use discarded materials. Stressing the importance of reusing, repurposing, and upcycling, the Tectonic Approach has great potential because it focuses on the properties of materials, irrespective of whether they are old or new. In this sense, it’s not about what material we *want* to use, but what material we *can* use—followed by how its expressive and poetic potential can be unlocked.

Accordingly, the projects explore different materials based on different contexts and possibilities. Residence BÄÄM explores the creative potential of drywall construction materials such as plasterboard and metal profiles. Built as a temporary workspace for student volunteers at the Kampnagel Summer Festival 2018 in Hamburg, the drywall elements were reused for various constructions after the festival, and some profiles even found their way into the roof construction of our latest project ZINNERGIE.

For the ENVILAGO project, speed was key, so we relied on standard wood profiles as an easy-to-use material. The project was developed as an adaptable structure for the New Hamburg Festival 2018, and was subsequently used for various types of festivals and urban activation projects.

In the ALBERTO project, the decisive considerations were the low budget and the condition of a structure that allows for numerous configurations and can be easily assembled and disassembled. Steel profiles and plywood panels were chosen as inexpensive, durable, and easily procured off-the-shelf materials. Together with students from Hamburg and Lisbon, it was realized in 2019 as a temporary event center for the contemporary art festival “Materiais Diversos” in Portugal’s small town of Minde.

In the ZINNERGIE project, on the other hand, we were driven by the concept of a circular building process, which led to our determination to work exclusively with discarded and reused materials. The structure forms a spatial framework for the infrastructure of an urban biogas plant in Hamburg-Wilhelmsburg. It was built in 2021 with an interdisciplinary and international group of students and lecturers from various disciplines, as well as schoolchildren and residents from the district.

In the course of all of these projects, a recurring methodology crystallized, forming the basis for the Tectonic Approach. According to that methodology, we always begin from a stock of materials that become building elements and that are brought into a meaningful context through the act of assembly. In this way, a constructive and spatial structure is created, which receives its specific form through the interaction with the place and program.

That is how, in the Tectonic Approach, the design process leads from the small to the large, from the parts to the whole. Constructive testing and intuitive building are part of the process from the beginning. What is usually a sequential process of designing and building is replaced by a reciprocal process that sees construction as an act of design and as a way of creating places for sensory experience. The human body, as the perceptual counterpart of architecture, takes on the role of a design tool within the process.

Deplazes, Andrea. 2005. “The Importance of the Material.” In *Constructing Architecture: Materials, Processes, Structures*, edited by Andrea Deplazes. 17. Basel: Birkhäuser.

Frampton, Kenneth. 1995. *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*, edited by John Cava. 2. Cambridge, Massachusetts: MIT Press.

Kahn, Louis. 2003. Master Class 1971, University of Pennsylvania. In *My Architect*, film directed by Nathaniel Kahn, minute 47:01.

Kollhoff, Hans. 1993. *Über Tektonik in der Baukunst*, edited by Hans Kollhoff, 17. Wiesbaden: Vieweg Verlagsgesellschaft.

Perret, Auguste. 1986. *Zu einer Theorie der Architektur*. Berlin: Verlag der Beeken.

Robinson, Sara. 2020. “Articulating Affordances: Towards a New Theory of Design.” In *Affordances and the Potential for Architecture*, edited by Bob Condia, 31–37. Manhattan: New Prairie Press.

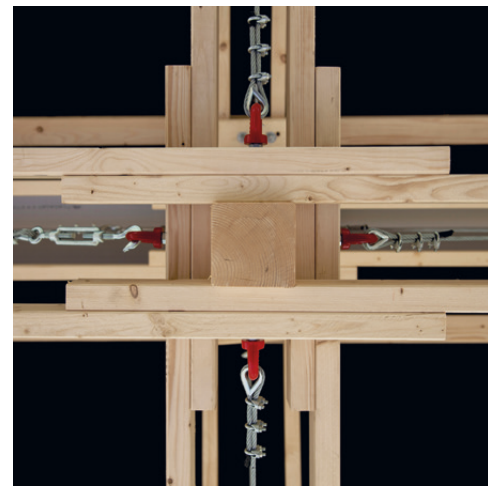
Van Eyck, Aldo. 2008 (first published in 1962). “Place and Occasion.” In *Aldo Van Eyck: Writings*, edited by Vincent Ligtelijn and Francis Strauven, 471. Amsterdam: Sun Publisher.

Residence BÄÄM, design-build project with students
of the HafenCity University Hamburg

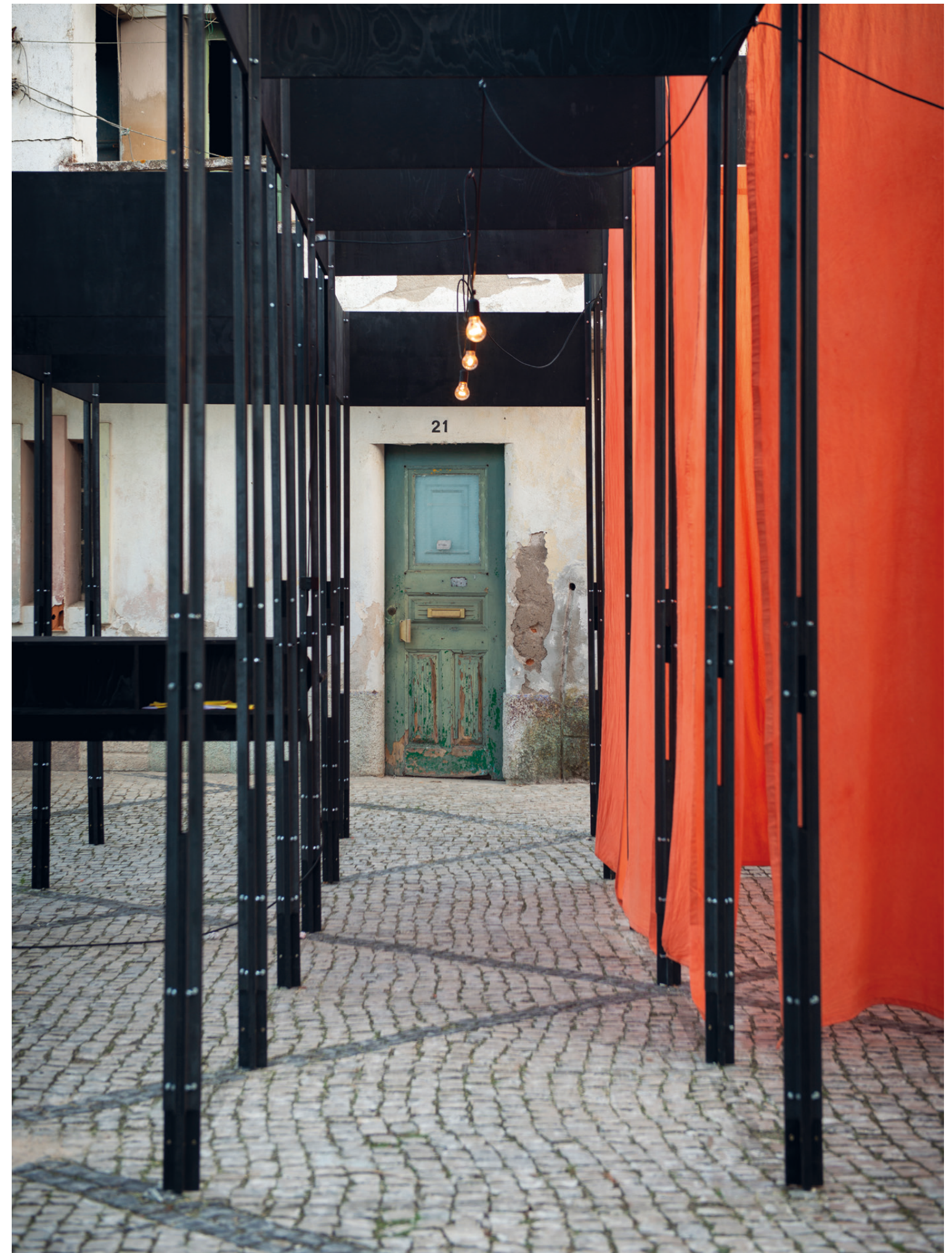




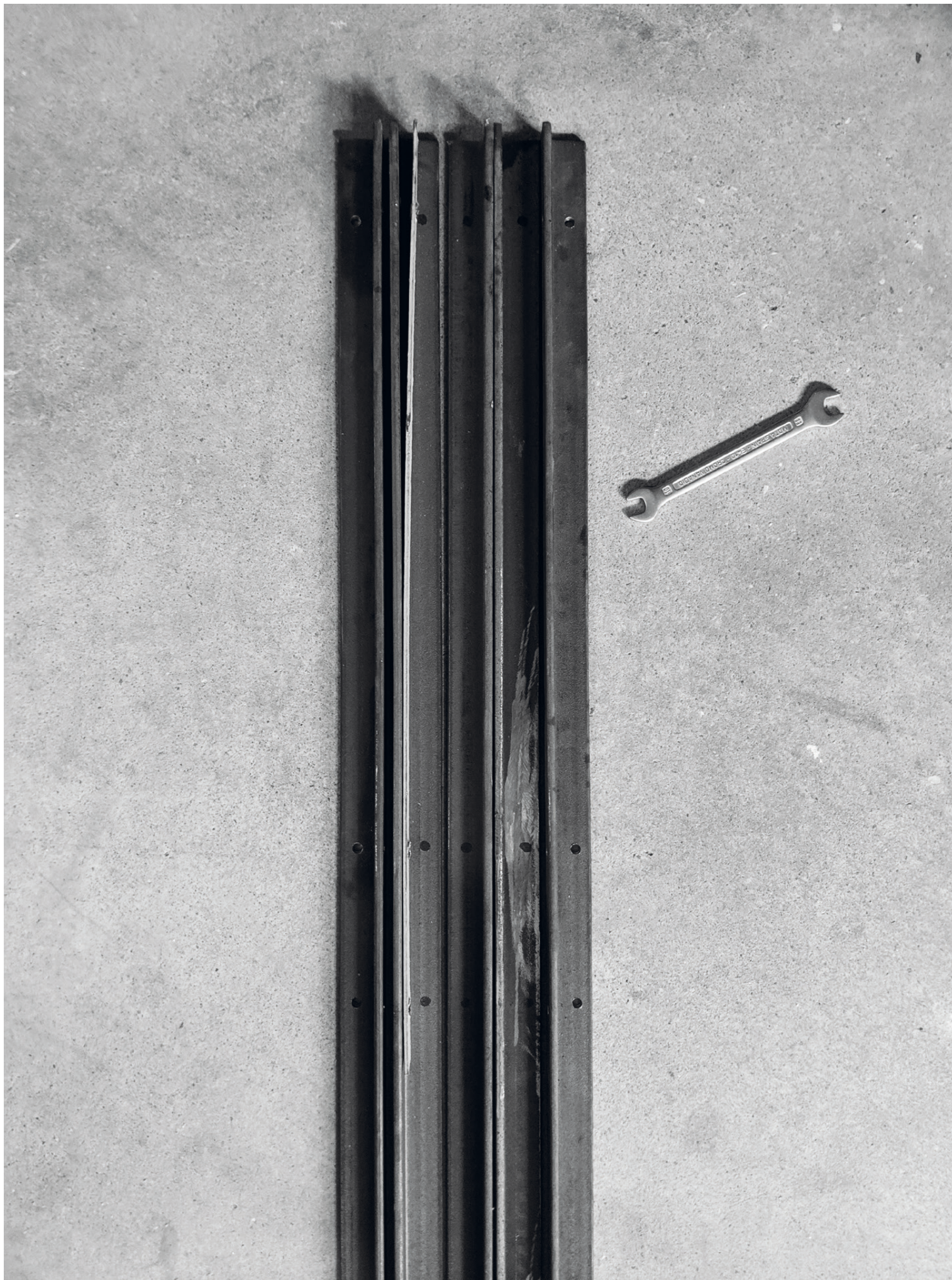




ALBERTO, design-build project with students
of the HafenCity University Hamburg and UAL Lisboa









ZINNERGIE, design-build project with participants
of the Summerschool Ex_Kurs



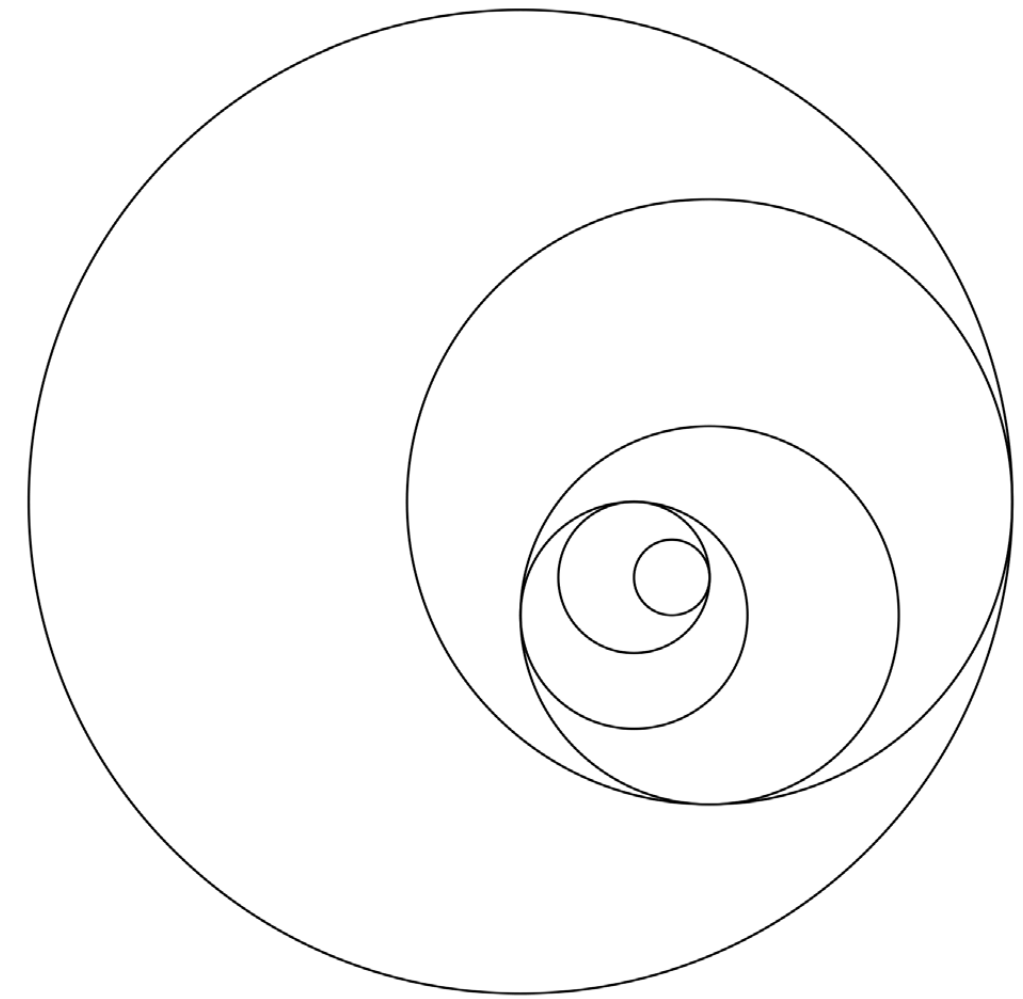




Beauty

Franziska Wittmann

We perceive both enduring and changing moments in spaces. The perception of architecture is synesthetic, and its aesthetic impact is a conscious feeling of the present in a place. Our body, our senses always relate to the environment. Phenomena unfold in the forms and materials of architecture, and the resulting spatial conditions impact us. I want to trace their beauty. The search for beauty arises from a desire—for an ideal existence, for a harmonious order, for a pleasing resonance. Beauty creates a sense of oneness with the world, and of freedom. The experience of beauty assumes an engagement with a moment, imparting an intensity that carries and liberates us.



Beauty reveals itself as an ideal—as an aesthetic moment in which we do not want to change anything. This can be a spatially static moment as well as a dynamic play, of sounds or light reflections, of warmth or air movement. We find ourselves in an aesthetic abundance. Reality becomes a truth that leaves no aesthetic potential unrealized

Beauty does not explore boundaries. Beauty arises out of harmony. A form appears clear and in balance. The inherent mathematics contain geometries that are expressed in proportions. The golden ratio, symmetry, or the Fibonacci numbers have the ability to harmoniously relate forms to one another in an aesthetic order.



Beauty is a sensual perception. We do not feel the same way, but we share a sense of beauty. Perceptions of beauty are individual as well as collective. The awareness of beauty is something that connects us.

Beauty connects us with people as well as with the world. In relation to something, beauty allows our senses to come to rest. The eye does not jump any further, but can stay still. Even beyond the visual, no sense leads us on to another place. We have found a place in the world with pleasant resonance. Carried by space, time recedes into the background. In such a moment of stillness and connectedness, we feel spatially at ease.



The perception of beauty is a deeply human sensation. Our awareness of beauty is an ability to perceive a counterpart in its essence. Our sense of aesthetics is also a sense of an existence that shows itself in a wholeness and truth. Something rests in itself; it is free and shines.

Beauty is rare, hidden. It appears and disappears. Its magic envelops us and leaves us affected and longing. It could be the search for beauty that has the power to move us and that sustains the longing for a wonderful condition of world. Beauty touches us all; it is a promise of happiness.



Architectural Composition

Wiktor Halm Skrzypczak

From my perspective as an architect and dancer, the fields of spatial design and physical movement are strongly interrelated. Several years ago, I began having a recurring experience of intensive spatial immersion during dance events or while exercising. It aroused my interest in pursuing a doctoral thesis on the intersections of embodiment theory and architecture theory. By analyzing relevant source texts, I identified a number of movements that create distinct spatial phenomena.

The movement of grounding. It is a compositional relation of the *ground* itself to the structure standing on it, releasing its *weight* into it. Grounding is the compositional relationship of the upper regions of a composition yielding into lower, supporting regions. And while it might appear rather static, it can be imagined as the subtle flow of a weight released into the ground. The moment the ground shifts, the composition also rearranges its weight on the ground accordingly. In balancing, a composition (or its parts) has a clear *center of mass*, a *standpoint*, and a *vertical midline*, which allows it to maintain its *mass center* above its *standpoint*—that is, to balance. Balancing is a compositional relation of counterparts balancing each other. In toning, the *force lines*—the lines along which weight flows into the ground—determine the form of a composition. The form binds to the force line, as in the case of an arch. This allows some areas to transmit higher *force quantities* and display higher *strength*. Then, in articulating the composition differentiates into *members*, which dissociate from the mass, these members optimize their quantity and develop specialized *joins*. Closing is, essentially, the compositional relation of a *perimeter* circumscribing a *void*, and it creates both an *enclosure* and a *free space* within it. Opening, on the other hand, is an aperture-like movement regulating the interchange and separation between the *self* and the *world*, a compositional relation between inside and outside. In facing, the elements of a composition orient themselves toward things. Such movement creates spatial *direction* but also the *kinesphere* (the tactile space), the *front space*, and the *backspace*. In tracing, the locomotion of a subject (its forward movement) creates the *depth dimension* and the *trace*—the path one leaves behind. Tracing differentiates between the *foreground* and the *background*. The movement of positioning reveals how one’s presence can occupy a space, how an architectural form can emanate or host human *presence*. And then the movement of timing underlines the *duration* of a composition, how the parts of a composition (*a*)*rhythmically* coordinate themselves. In focusing, the attention of the observer moves through space—between the *focus* and the *periphery*, and it may emphasize a single element of the composition or relate all the elements to each other at once.

Some of the authors of the texts I evaluated and compared to construct the categories outlined above—Schmarsow, Wölfflin, and Vischer—write about space in terms of movement. They often observe movement phenomena that are quite similar to those described by movement and dance theorists—Laban, Bartenieff, Hanna, Bainbridge Cohen, Paxton, Stark Smith. Apparently, at their cores, these two disciplines have something in common. What distinguishes them is the fact that, while the space theorists mainly write about movement and space in rather abstract terms, movement theorists discuss movement also in its practical dimension, in relation to movement pedagogy or dance practice. Thus, to perform a systematic cross-reading of their theories, I examined the texts through an analytical process involving minute sampling to filter out the fragments that describe movement. This allowed me to look at movement as a relatively simple primal phenomenon consisting of patterns that reappear between authors and disciplines. I call these “primal movements.” Every time I noticed concepts reappearing between two or more texts, I created a cluster—a category around a unique primal movement. During this process, asking specific, in-depth questions helped me to understand how one primary movement differs from another: To what unique abstract concepts does the movement refer? What unique compositional relations does it establish? Does a distinct subject perform it?

This part of the research is theoretical and not artistic. However, while reading the texts, I could not help but recall my personal movement experiences and witness images of movement in my imagination. I present some of these images here. And although by the word “image” I mean the living and changing content of one’s imagination, here you see only static pictures. They are arranged in short sequences, and, thus, hopefully represent the imagined movement better than a single image would. Such a method of illustration aims to counteract the static rationalist understanding of architectural form and to depict simple architectural compositions in their duration—as subtle movements. Although what I attempt to highlight here is the importance of human movement, I also want to stay as close as possible to the scale and forms of the built environment. For this reason, the drawings depict only a few actual human bodies. Nevertheless, they strive to underline how the expression of such simple architectural forms is grounded in our intuition of how our bodies behave and feel, or how objects with weight in general behave and feel.

Cohen, Bonnie Bainbridge, Margaret Guay, Rodrigo Arraya, and Michael Ridge. 2018. *Basic Neurocellular Patterns: Exploring Developmental Movement*. El Sobrante, CA: Burchfield Rose Publishers.

Dell, Cecily. 1991. *A Primer for Movement Description Using Effort-Shape and Supplementary Concepts*. New York: Dance Notation Bureau Press.

Friedrich, Thomas and Jörg Gleiter. 2007. *Einführung und phänomenologische Reduktion: Grundlagentexte zu Architektur, Design und Kunst*. Berlin: Lit-Verl.

Hanna, Thomas. 1976. "The Field of Somatics." In *Somatics: Magazine-Journal of the Bodily Arts and Sciences I* (1): 30-34. <https://somatics.org/library/biblio/html-fieldofsomatics>.

Ikonomou, Eleftherios and Harry Francis Mallgrave. 1994. *Empathy, Form, and Space: Problems in German Aesthetics, 1873-1893*. Santa Monica: The Getty Center for the History of Art and the Humanities.

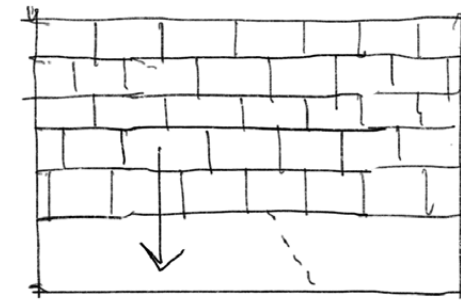
Koteen, David, Nancy Stark Smith, and Steve Paxton. 2008. *Caught Falling: The Confluence of Contact Improvisation, Nancy Stark Smith, and Other Moving Ideas*. Northampton, MA: Contact Editions.

Paxton, Steve. 2018. *Gravity*. Brussels: Contredanse Editions.

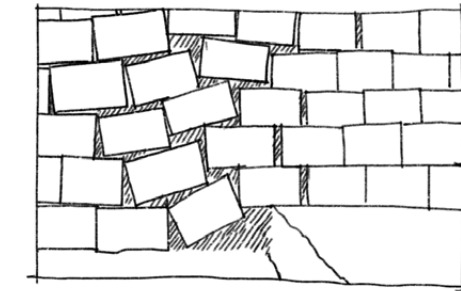
Schmarsow, August. 1893. "The Essence of Architectural Creation." In *Empathy, Form, and Space*, edited by Ikonomou and Mallgrave.

Vischer, Robert. 1927. "Über das optische Formgefühl." In *Einführung und phänomenologische Reduktion*, edited by Friedrich and Gleiter.

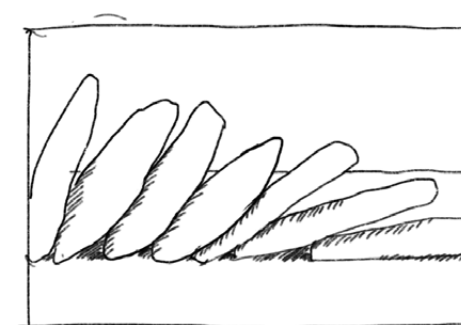
Wölfflin, Heinrich. 1886. "Prolegomena zu einer Psychologie der Architektur." In *Einführung und phänomenologische Reduktion*, edited by Friedrich and Gleiter.



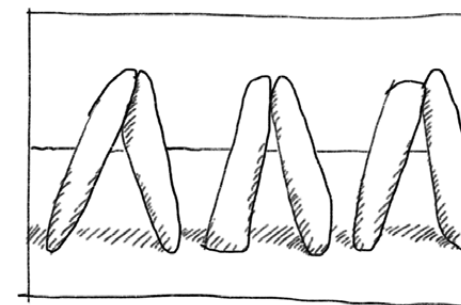
GROUNDING
resting,
weighing on
the ground



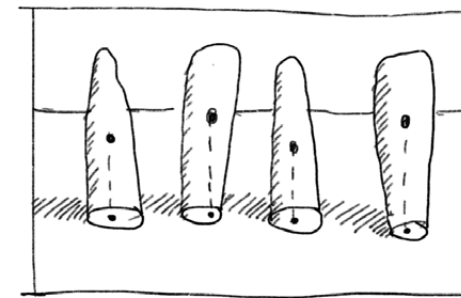
Structural
Settlement



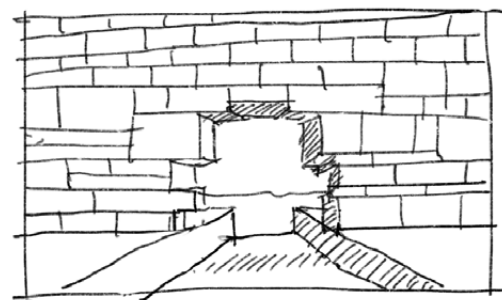
BALANCING
imbalanced
form



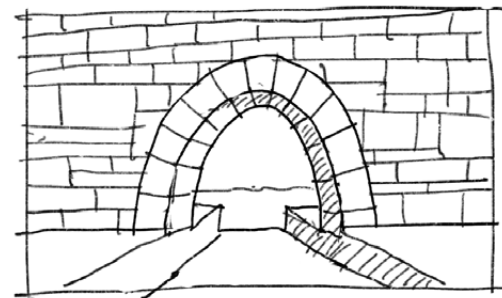
balanced,
symmetric
form



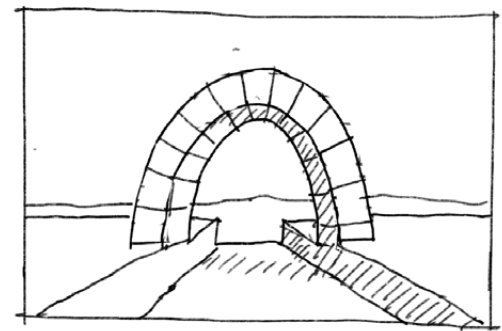
Standpoint



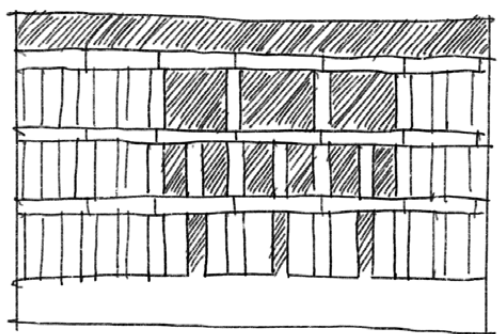
TONING
Stützgewölbe



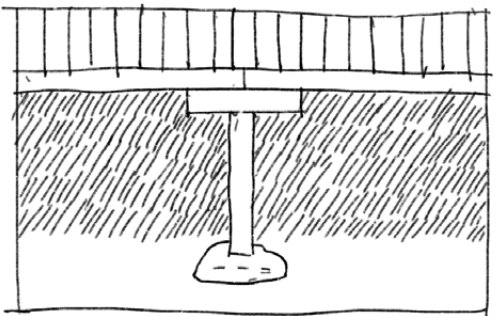
bounding to
the force line
form finding



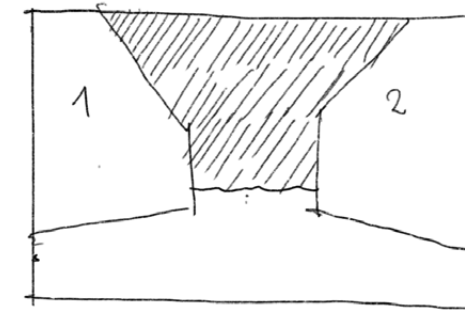
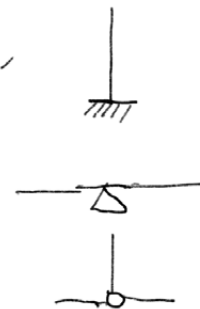
(articulating,
dissociating from
the mass)



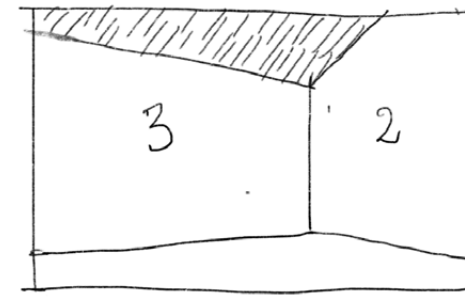
ARTICULATING
articulated
floors and
openings
optimised in size and
quantity



specialised
members
and
joints

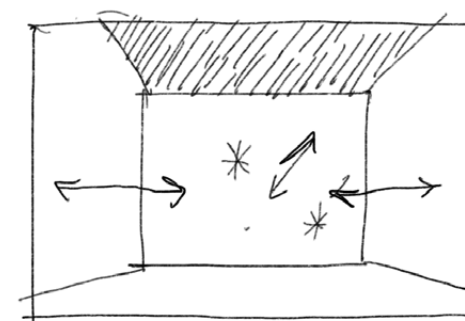


CLOSING
closing:
two walls

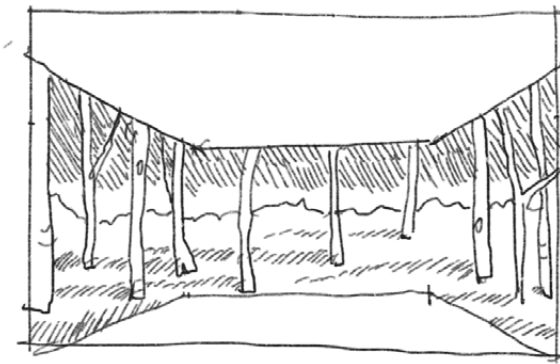


closing:
a corner

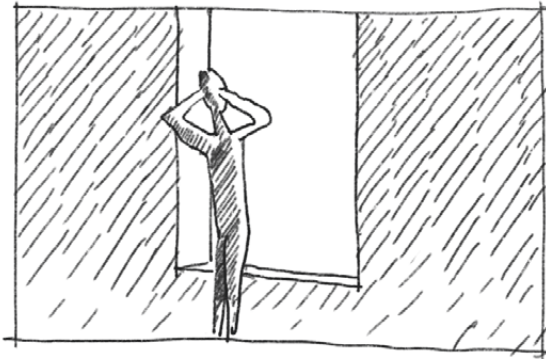
how to depict
the in-between-space



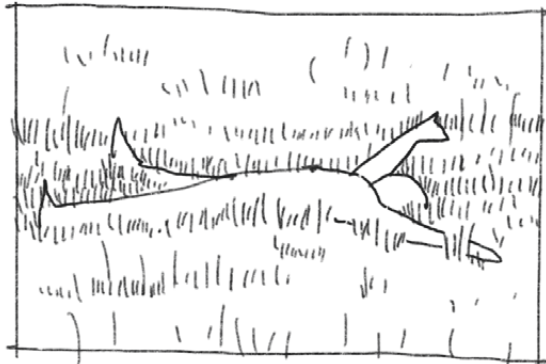
closing and
condensing, resp.
closing and
expanding
(an alternating
movement)



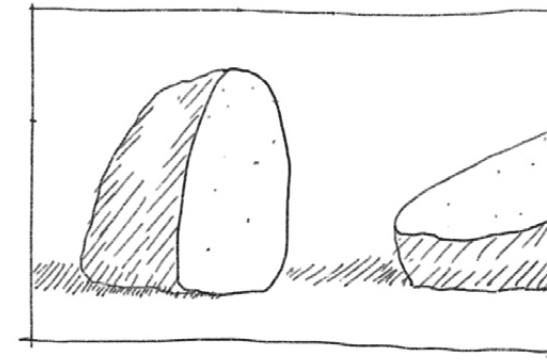
OPENING
the inside to
the outside



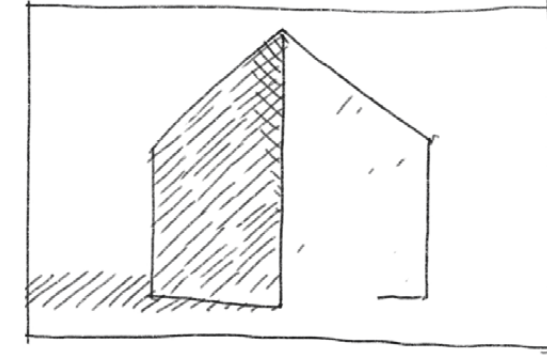
taking the
world in
receiving the
sun



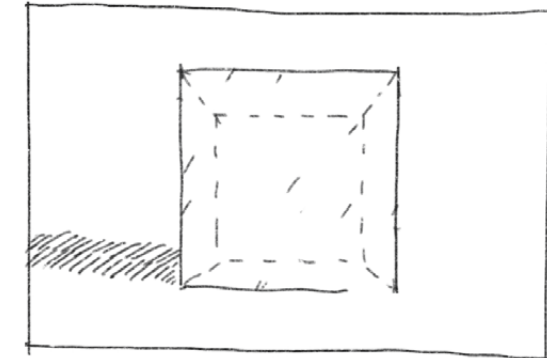
receiving
the ground
and vegetation



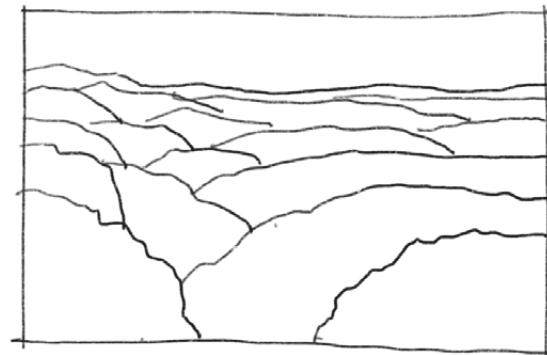
FACING,
REACHING
face, front side



reaching

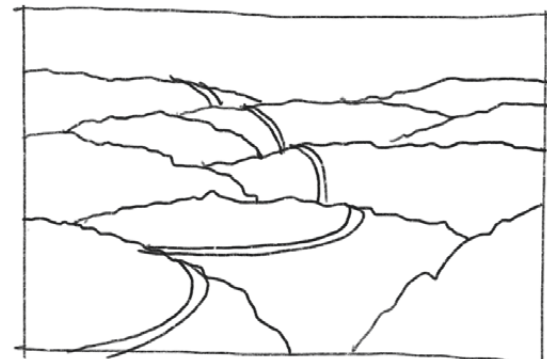


facing



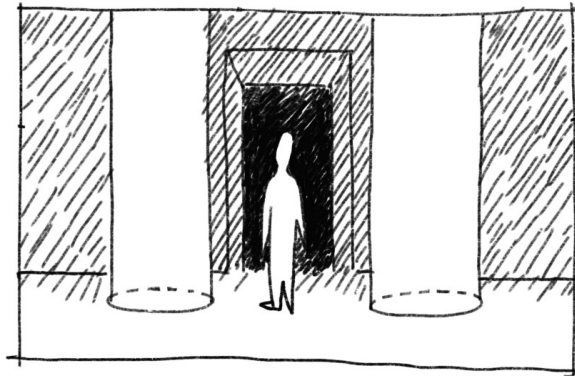
TRACING,
WANDERING

foreground
backgrounds

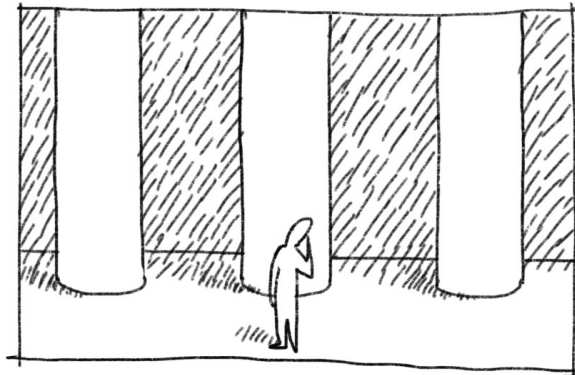


path wandering
through the
layers of depth

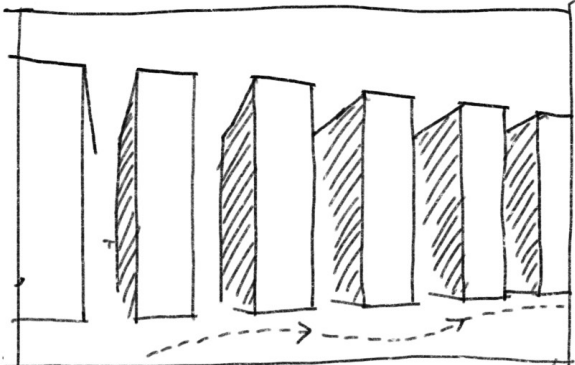
POSITIONING,
OCCUPYING



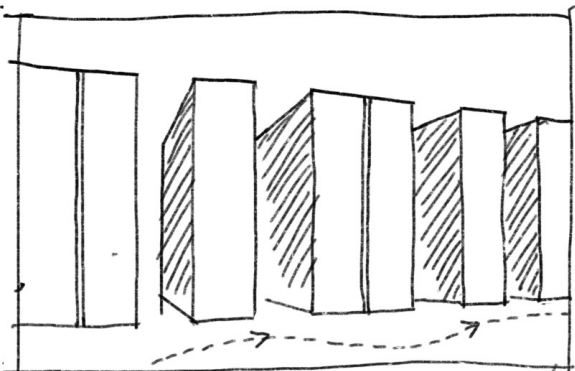
hosting
and



emanating
presence



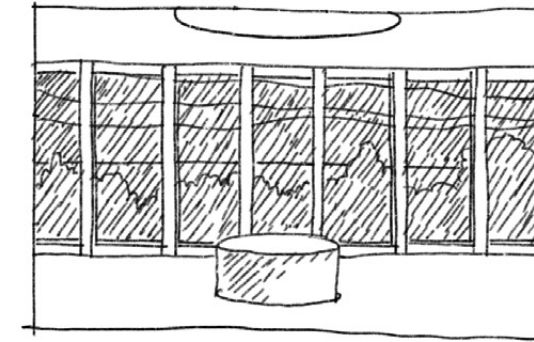
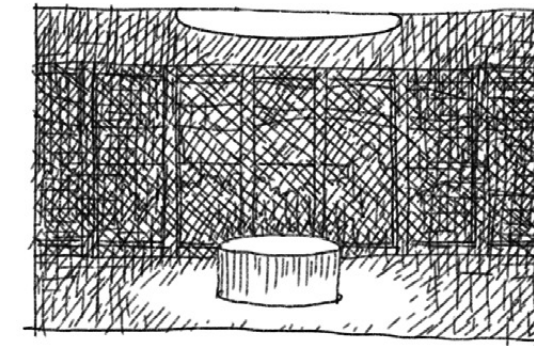
TIMING
rhythmic
form



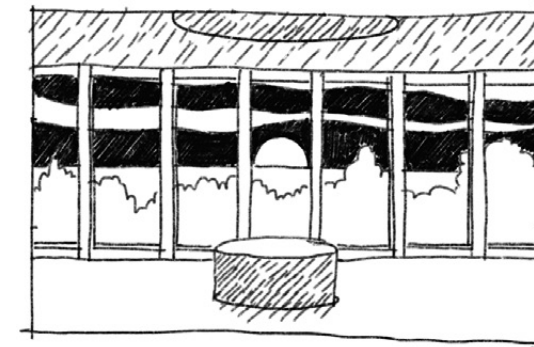
arrhythmic
form

FOCUSING

eye catcher



overall
atmosphere



cosmic
perspective

On the Movement of Light, because Light Is Never Still

Alberto Campo Baeza

*First published in: Palimpsesto
Architectonico. Ed. Asimétricas.
Madrid, 2018*

Galileo claimed that the earth moves around the sun, and history summarizes this in *eppur si muove*. And, with or without Galileo, we all see the movement of light in our lives.

Guided by Galileo, I have decided to entitle this reflection on the movement of light, *eppur si muove*. For our topic here is the movement of light and when we architects work with light, we are dealing with a material in constant and predictable movement, like the sun from which it emanates, crossing the spaces that we create, if we provide the appropriate devices.

Time and time again I have drawn the comparison between light in its relationship with architecture and air in its relationship with music. But I have never written that, while the air passing through a musical instrument is docile and music is air tempered by the performer of that music via the musical instrument, the light that crosses the architectural space is not so docile; it is in continuous, constant and unstoppable but foreseeable movement. As a result, the fixed images that we have of that architecture are false, or better still, incomplete. Only a film or a video, now within the reach of all, has the ability to adequately translate that movement. In a sense this is what I am trying to explain here.

Light is material, as material as stone, whether we opt for Newton and his corpuscular theory or Huygens and his wave theory. I stated more than once that light is the most luxurious, the most wonderful material with which we architects work and as it is given to us for free we do not value it sufficiently. Here, however, I would like to reflect on that other special quality of light –its inescapable movement in and about architecture.

An architect from Granada, Elisa Valero, wrote a book about light that she aptly entitled *The Intangible Material*. And in my unpublished prologue, I wrote: “With its title alone this book is already a success. Writing about light, the most luxurious material that we architects work with, is not easy but necessary. Writing about light and declaring from the outset that it is matter, that it is material, is more than thought-provoking. And to qualify it as intangible is most appropriate because we are not the ones who touch light: it is light that touches us and our architecture, allowing the miracle to happen.”

A Simple Experiment

In some of my projects I have tried to make this movement of light visible. When I designed and built the Pavilion for Pibamarmi at the Verona fair in 2009, I called it: “Catching Light in Motion.”

The exterior was a black 6x6x6m cube on which were placed reproductions of classic sculptures, as if it were a Roman Antiquarium. And the inside of the cube, all in white, was done in Pibamarmi Carrara marble. And on one of the inner corners, a trihedron, we made equidistant circular perforations to allow the light pass through. To simulate the natural light of the moving sun, we invented a contraption, like a little choo-choo train carrying the source of artificial light. Obviously, its speed was slow, but greater than that of natural light. In this way, as can be seen in a video, the movement of the splashes of light on the Carrara marble walls was visible, they moved. The effect was amazing; the movement of the light became visible and credible.

A Magical Space

And also in 2009, in a joint project with Paulo Duraó for Milan Airport, which we called Porta Milano, we proposed an exercise of light in motion. The large box that would lodge the lobby of the Malpensa Airport had a double skin of translucent glass, with many equidistant circular holes, the geometry of which was identical in both skins. Thus, when the rays of sunlight passed through and coincided, the sun would enter as if through a sieve, and immediately stop, and after the briefest pause pass through again and so on, making visible this natural movement of light emanating from the sun.

The central focus, once again, was to catch, to make visible, the movement of sunlight. The projected space was wonderful, as some would say: a magical space.

Light in an Isotrope Space

In geometry, isotropy is the property of invariance in a differentiable variety. It occurs when certain measurable vector magnitudes give identical results, regardless of the chosen direction of measurement.

I applied this isotropic quality with conviction to a cubic space project, constituting one of the many solutions for the MIA, a project for a museum in New York. And now, sitting on my desk is another project, already under construction, for a small mausoleum in Venice, which we will call “heaven on earth.”

In this small piece of Venice, measuring 3x3x3m, at each corner of each of the six faces of the concrete cube, in a simple isotropic operation, I have opened a small square gap of 0.60m, without touching any of those small squares, including the floor. In this way sunlight will successively penetrate into the interior. With this tomb project currently under construction, I have made slight variations to control the quantity and quality of the incoming light with greater precision. I will include a mirror on the square floor.

Making the movement of light visible is the central focus in both of these projects, museum and tomb. In both, the intended isotropic space is nuanced by gravity. I'd like to imagine myself— –vain whim!— – as a bird flying within those isotropic spaces, or better still, as an astronaut who, having overcome the law of gravity, moves with equal ability in all three directions.

The Rosy-Fingered Dawn

The window of my little apartment in Madrid is large and illegal. And it has stunning views of all the roofs and rooftops and stainless steel chimneys that reach the tallest buildings in the Plaza de España. As the window faces west, every day it receives the direct rays of the evening sun, providing welcome heat in winter, but less welcome in summer. In the mornings, however, all the chimneys adorning this landscape of Madrid

rooftops, almost all made of shiny stainless steel, are stained by the pinkish light of the rising sun at dawn. And because of the movement of light, this marvel only lasts a short time. My head and my heart are touched by the rosy-fingered dawn that Homer speaks of in his *Odyssey*. I can assure you that it is a spectacle of enormous beauty. And that is why I mention it here, because it makes the movement of light visible, it accounts for the passage of time and confirms my reiterated affirmation that light builds time. From dawn to sunset.

Refining Light in Granada

Of course, some time ago I had already worked with light in movement in Caja Granada. Can you work with light and at the same time ignore that it is a material in constant movement? One cannot and should not.

The Caja Granada building in Granada is the consequence of giving due consideration to that movement of sunlight. Initially, the project proposed a grid of skylights, the same concrete structure in a 3×3m grid with 3m depth and all the recesses open. Then I discovered that, as the NS cube was oriented according to its diagonal, light would only enter through the southern quadrant and that with its 3×3×3 proportions, light would only enter at noon when the sun was very vertical. Two suitable corrections were then introduced to move the grid to 6×6×3 in the 64 existing boxes, and only open 12, in groups of 3 linked to each of the 4 large columns, and in the right direction.

The day that the skylights were revealed and the sun came streaming in is simply unforgettable.

A Round of Applause for the Sun in Cádiz

I do not know how to tell you what happens every day in Cádiz, because it scarcely seems credible.

Last summer, at dusk, after a walk through Cádiz with my sisters, I was told in hushed whispers that we were going to see something very special. And they took me to San Sebastian Castle, which is linked to the city by a narrow isthmus where the lighthouse stands.

The landscape before us was just as it used to be when we were children and living in Campo de las Balas. There, in the tower where the old lighthouse was located, it is said that the Oracle announced to Caesar Augustus that he would be emperor. And when he became emperor, he issued a decree whereby all those born in Cádiz became Roman citizens.

One of the most beautiful design projects I have ever made is for the castle of San Sebastian, which I wanted to make the flagship of the City of Cádiz. I still have the secret hope of one day bringing it to fruition.

There, at the castle, we encountered quite a number of people sitting on the wide parapets of the edges, waiting. They were waiting for the sun, the red evening sun, to descend into the sea and disappear over the horizon. When this happened, everyone burst into applause; we all did. Thrilling. Here was light in motion, disappearing.

Damned Apollodorus of Damascus!

And what can we say about the light in the Pantheon? Although I have written extensively and on many occasions about it, here I will limit myself to merely proclaiming my admiration for the wisdom of its architect, Apollodorus of Damascus. Both the 43m diameter of the air sphere contained within and the 9m diameter of the lofty oculus are designed with implacable precision. The amount of light entering through the oculus is perfectly controlled, and the movement, the dance of the golden disc on the curved or flat surfaces inside, is amazing. The movement of light here attains untold heights. Of course, there are those who say that the Pantheon, after all, with its all its precision, is nothing more than a sundial.

Federico's Sphere

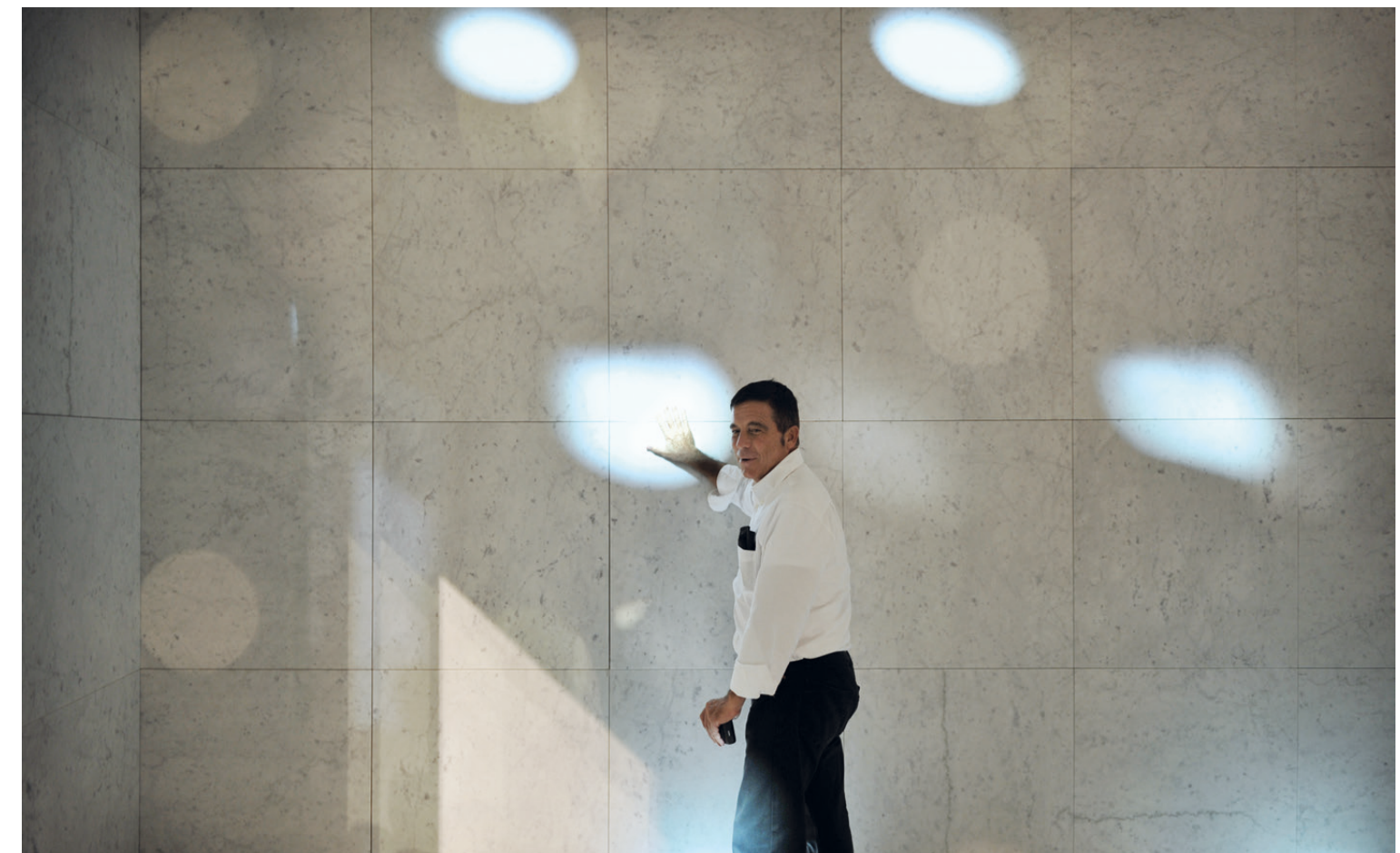
There is a well-known photograph of Federico García Lorca in New York in 1930, sitting on a marble podium, under a large black onyx sphere in the center of the campus of Columbia University. This was a curious sundial that marked the hour by means of the shadow thrown from the sphere onto the podium on which the hours were marked with bronze numbers. And an inscription also in bronze lettering that read: HORAM EXPECTA VENIET, await the hour, it will come.

With the passage of time the sphere broke and was taken away. The podium is still there today with the inscription that, without the sphere, leaves those reading it somewhat perplexed. And this is where I am in the habit of having my photograph taken with friends when we go to Columbia. And it is that very light in movement, with the precision of sunlight, that gives rise to the building of sundials. Not without cause do I repeat again and again that in architecture, light builds time.

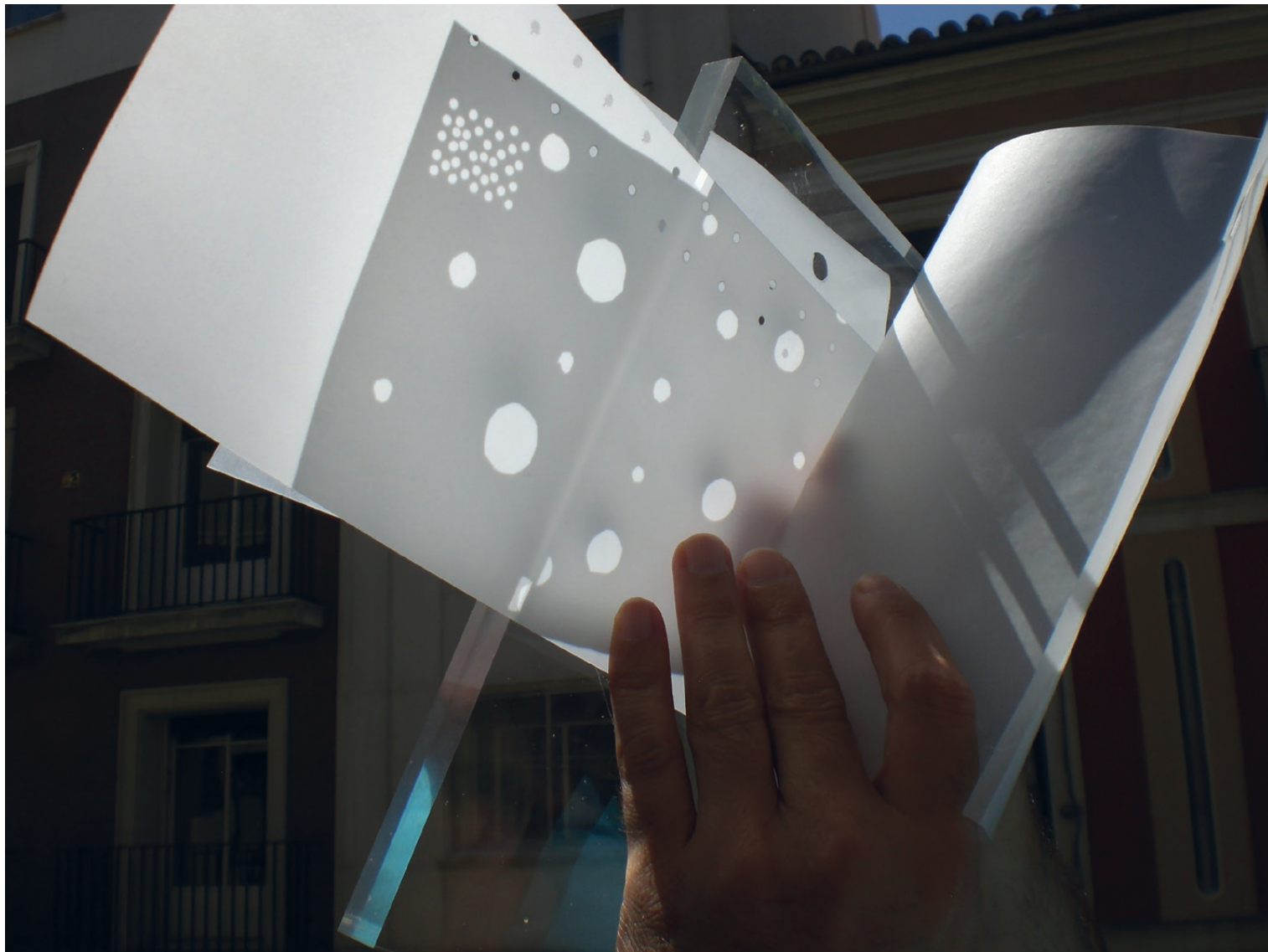
Finale

Some time ago, I invented the existence of tables of light, mathematical tables to accurately calculate the quantity and quality of light, like tables for calculating structures. What was an invention then has become reality today. Now there are computer programs designed to quantitatively and qualitatively control light in movement with absolute precision.

Light! The primary material of architecture, always in constant movement.



Pibamarmi Pavilion, Alberto Campo Baeza



Porta Milano. Study of the façade, Alberto Campo Baeza, Paulo Durao.

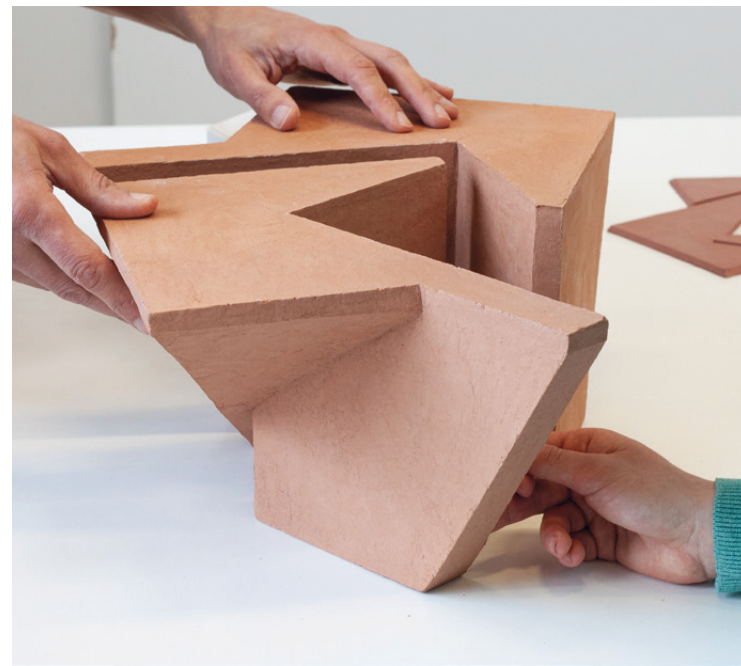


Caja Granada, Alberto Campo Baeza

Body as

Design
Medium

Big Dreams



Anton Burdakov

“What you see is all there is” describes a cognitive bias outlined by the psychologist Daniel Kahneman. The information in front of us—“what you see”—heavily biases our decisions even when we know that other considerations should be equally important.

I think about this often when I work on my art projects, which revolve around making places. My recent focus has been a series of ceramic sculptures through which I try to create convincing worlds. Although viewers often refer to these objects as “models,” they are not intended to be built on a larger scale.

Each medium, each format, has its own rules. A rule is something that works: makes an impression, on someone, sometime. You hope for many people to be impressed, time and again. An encounter with a material three-dimensional thing on the scale of the body is one format. A two-dimensional rendering on a computer screen is another. A pencil sketch, a walk through a building. If one works, the other may not.

In my process, I aim to make the most out of a specific size, specific materiality, specific moment. Focusing on what is in front of me and using my own body as the measure, even when working in a small format, helps me to make encounters with the architectural fictions that I create more convincing.

Thinking about planning actual buildings, I see a similar visceral exchange happening between the architect and conventional representations of spaces such as models, photographs, or renderings. Because of the bias toward what lies in front of us, we judge these artifacts on their own terms over what they aim to represent, much more than we admit. At the same time, due to the same bias, they become a way to dream through our bodies about things much larger than us.

As I create, the key body connection for me is in repeated encounters with the work. Stepping back, circling, squinting, pacing. Although it is important to know the process intimately, I am reluctant to become too much of a maker. Whenever I get help, and do not make the works with my own hands, some encounters become fresher and some judgments better.

If my works lean toward representation and a clear sense of scale, I notice that something is often lost. They work best when they exist on different planes at the same time, neither representation nor an autonomous object. One duality is representation versus the thing itself, but there are other such dualities. In general, I hope that my works can become triggers, seeds that grow in people’s minds. In my mind, I never work with shapes and materials. My building blocks are yearning and embodied memory, hopes and personal beliefs.

Something staggeringly big is out there, locked in our inner worlds. The program is to create, invent, discover keys that work. With glimpses they grant, and flexibility to change the destination, the aims can grow.



Design Medium











Perspective

Matthias Ballestrem

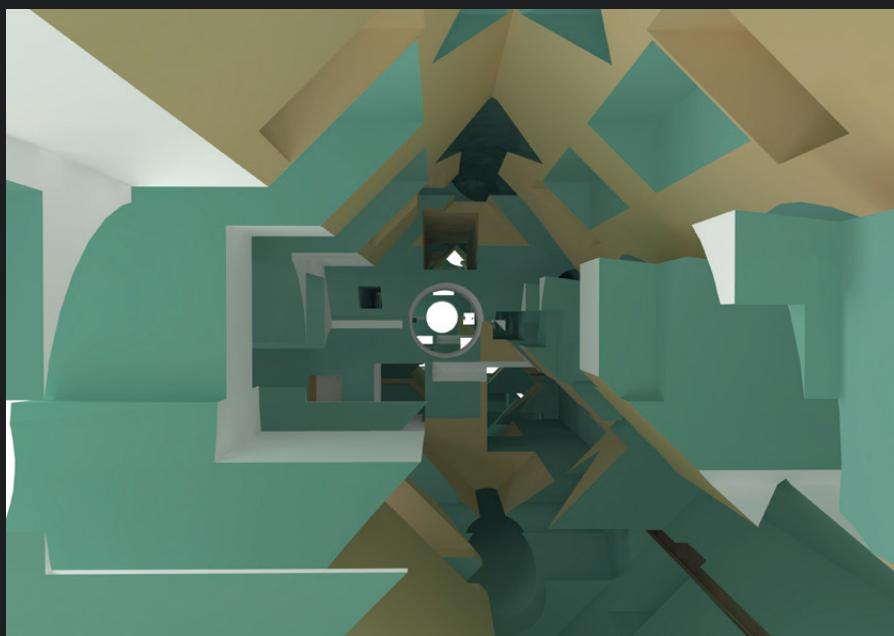
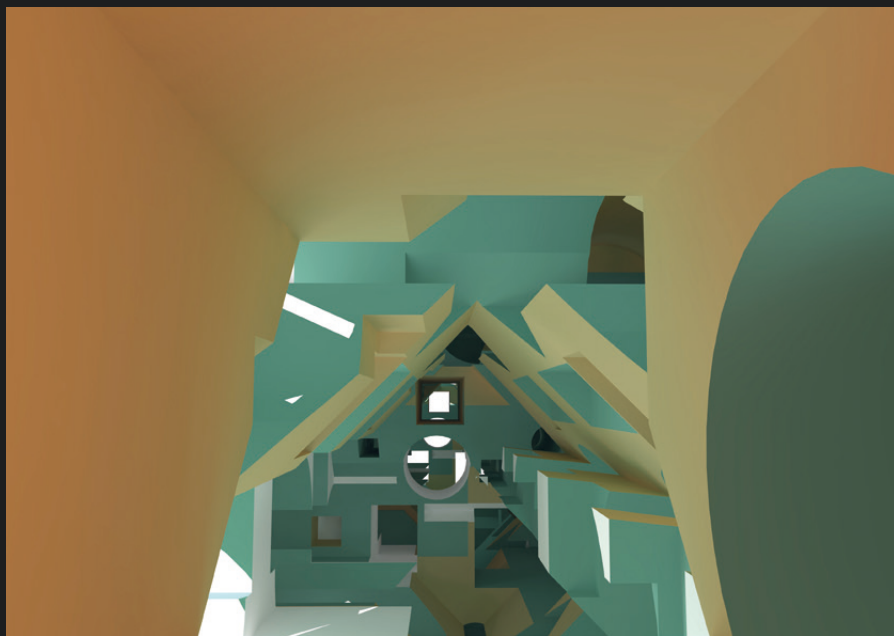
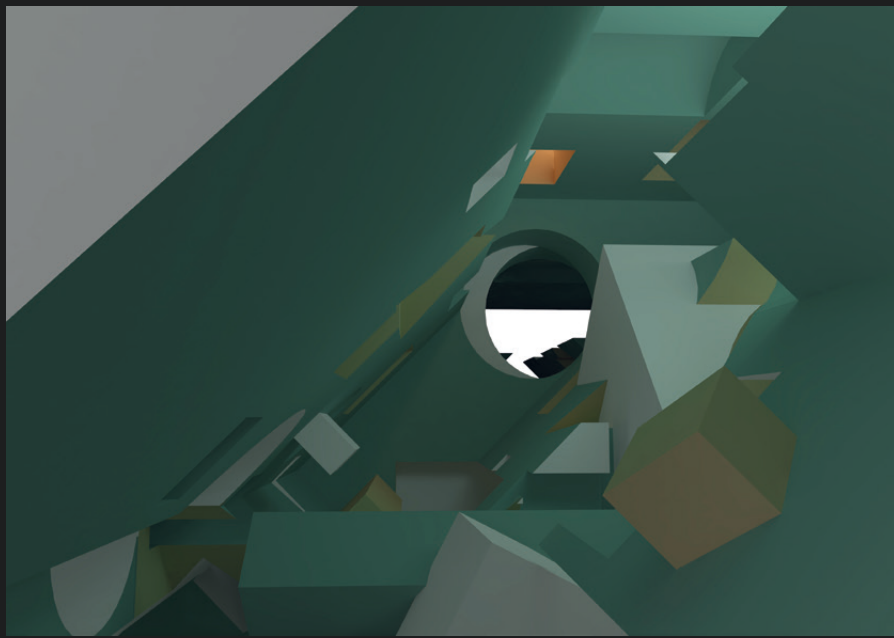
I first learned about designing with and in perspective as an exchange student at SCI-Arc with Coy Howard. He regularly taught design studios in which the first half of the semester was spent working on just a single image. A room was designed in detail in one singular perspective drawn from the eye level of an assumed observer. Through the intensive pictorial formulation of spatiality, surface, light quality, reflections, and layering, it was thought that a powerfully atmospheric idea of an interior would emerge, which would be strong enough to guide and determine the further elaboration of a multi-roomed residential building in plan and model in the second half of the semester.

I never actually studied with Coy, but his design method fascinated me and stayed in my head until I used it myself teaching smaller design methodology classes in Hamburg. I do not consider designing in a single perspectival drawing to be a complete independent architectural design method. It leaves out too many essential parameters such as program, context, and construction. I conceive of it more as a design-study exercise. In its focus on a single view, it bears a relation to stage design, and therefore highlights certain spatial qualities that often only emerge—especially in the university design studio—as the results of other parameters in the course of a design process and are polished, at best, for the final presentation renderings.

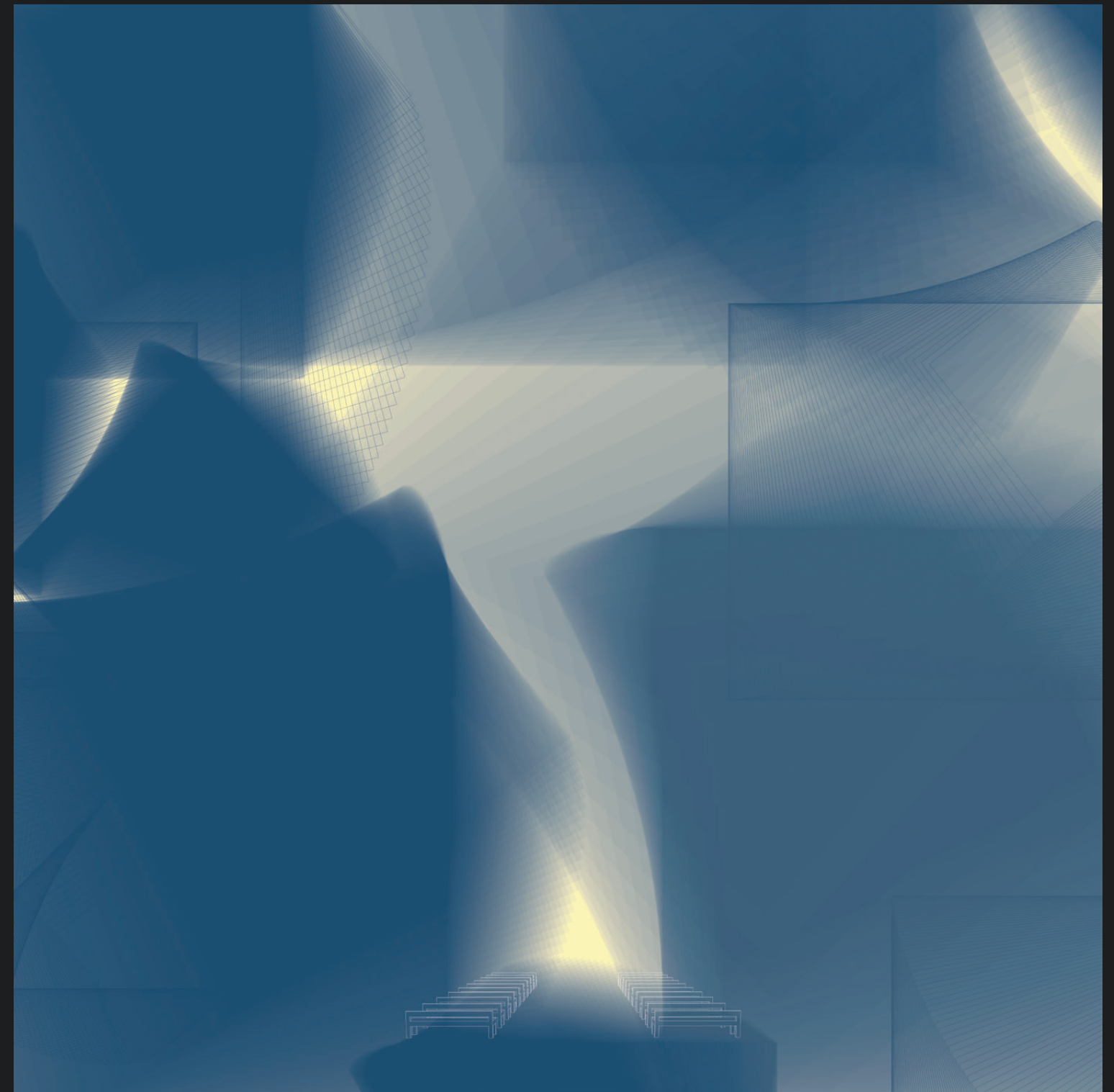
In perspectival design studies, however, the perceptual qualities of spaces are the only thing that matter, and they can therefore develop a specific and radical intensity. These qualities can be articulated in various ways. Density, for example, which we see playing an important role in the debate on sustainable cities, can either be stimulating or constrictive, depending on the articulation and composition of masses. Spatial complexity, as another example, can be perceived as overwhelming or as inviting a variety of affordances.

In a series of experimental design methodology seminars, students designed interiors of high complexity, depth, and density. In the design process, students used a variety of media and techniques, according to our assignments—from two-dimensional analogue collages to CAD models, isometrics, virtual hubs, and VR environments. The design process was exclusively evaluated, however, through perspectival drawings. Students and critics automatically projected themselves bodily into the drawn spaces and evaluated them accordingly. In doing so, and in the absence of a clear programmatic dedication of the designed spaces, their attention was automatically directed to perceptual atmospheric visual qualities: materiality, color, surface, form, spatiality, composition, depth, and structure move into focus.

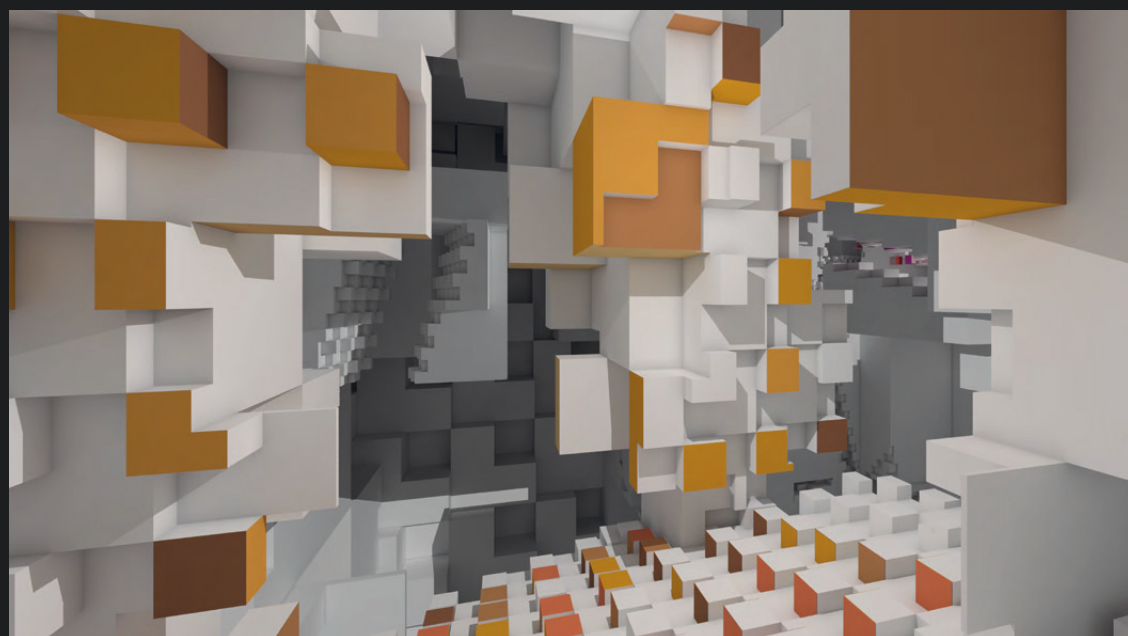
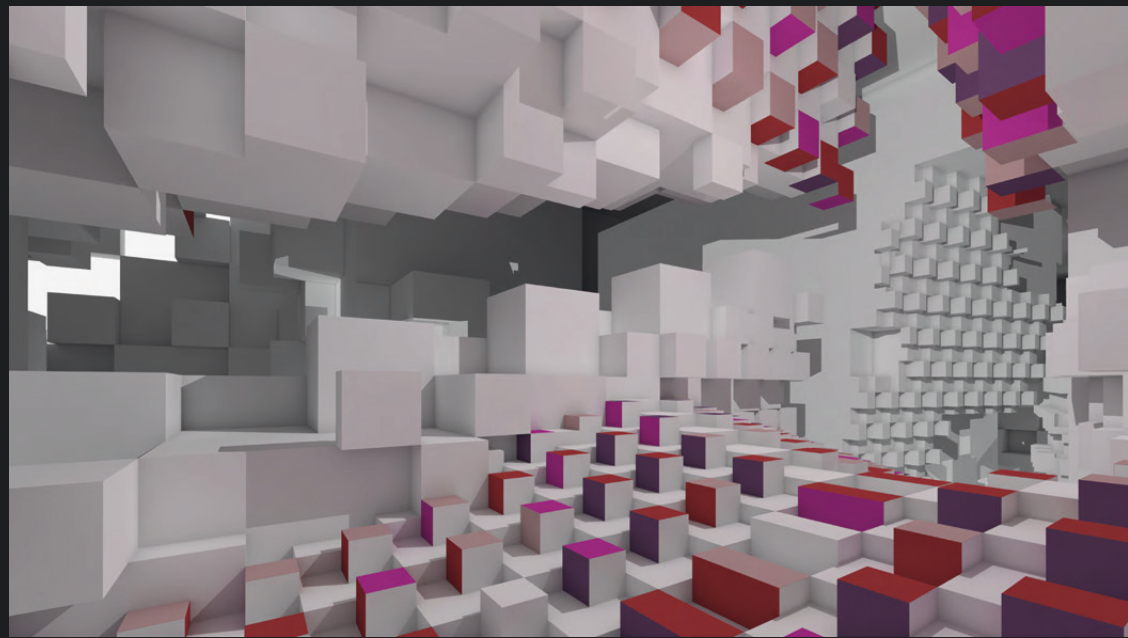
On the following pages, the selection of results from the exercises show how students used the class to explore their own fascinations and preferences toward certain spatial phenomena in experimental freedom, and to deepen their own design skills along the way.



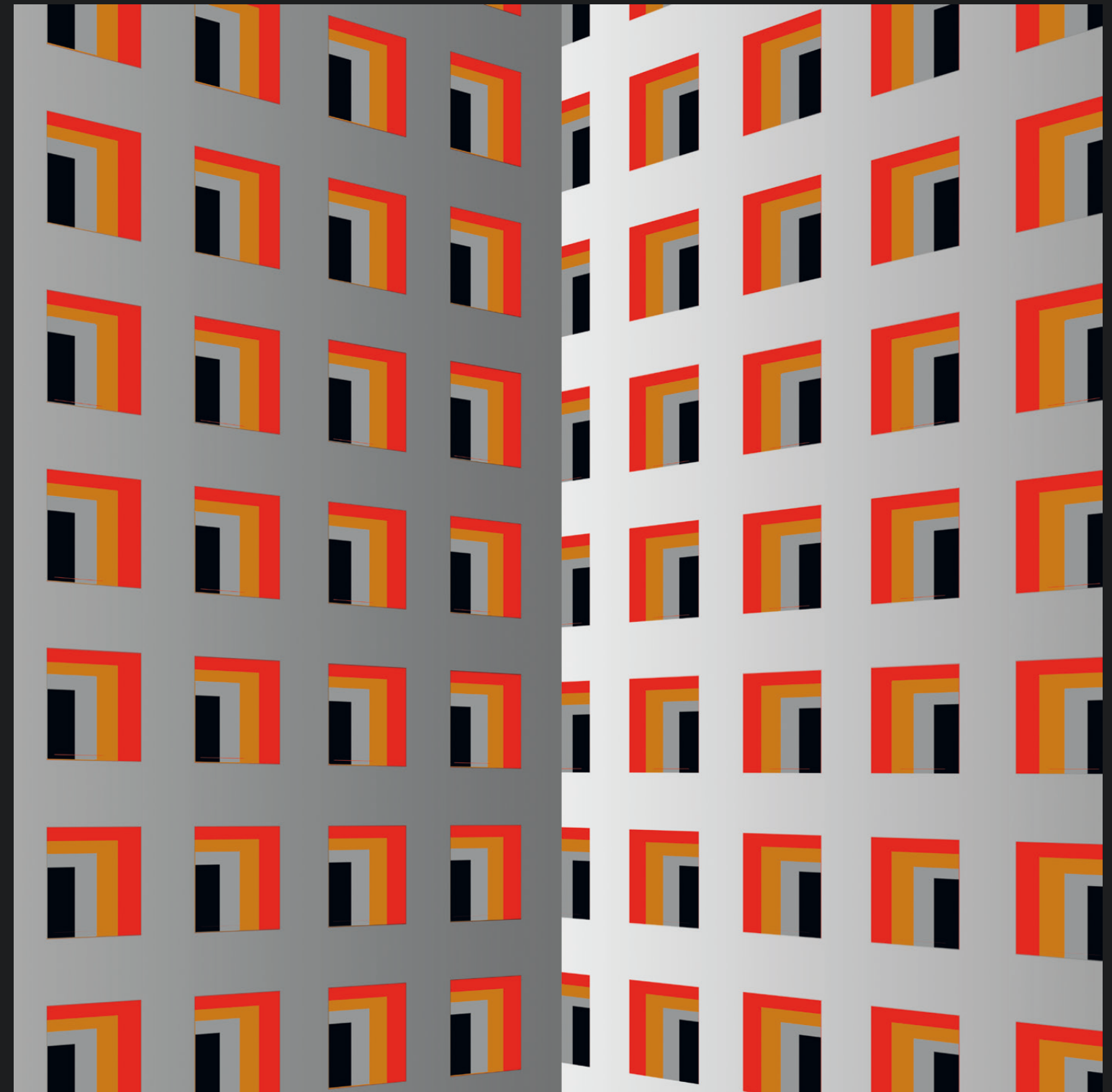
Own Privat Density, Mehmet Deniz, 2021



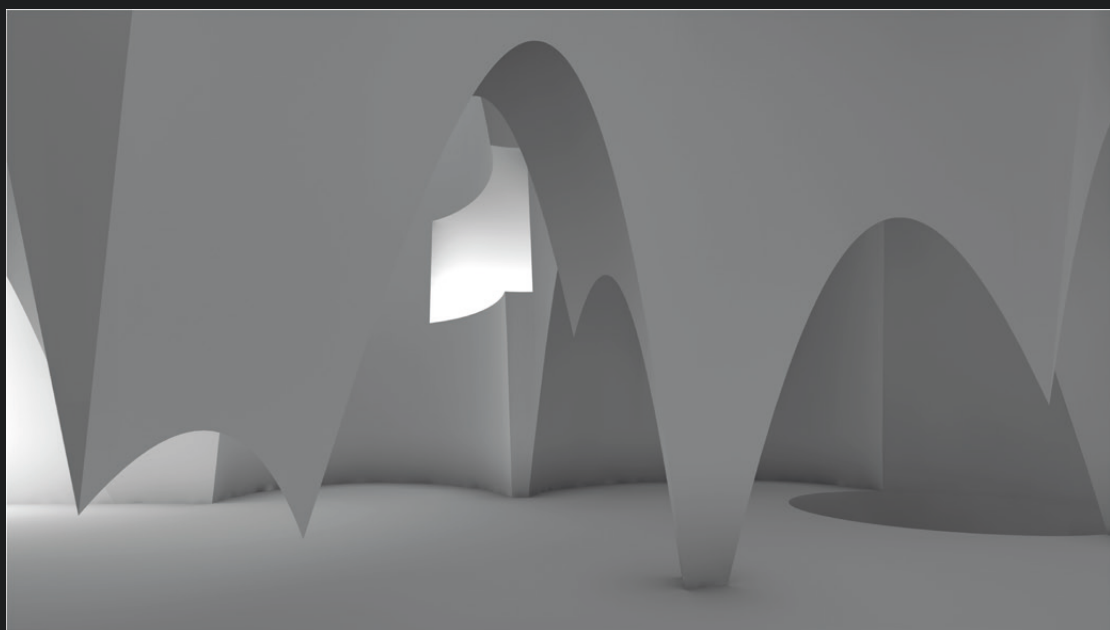
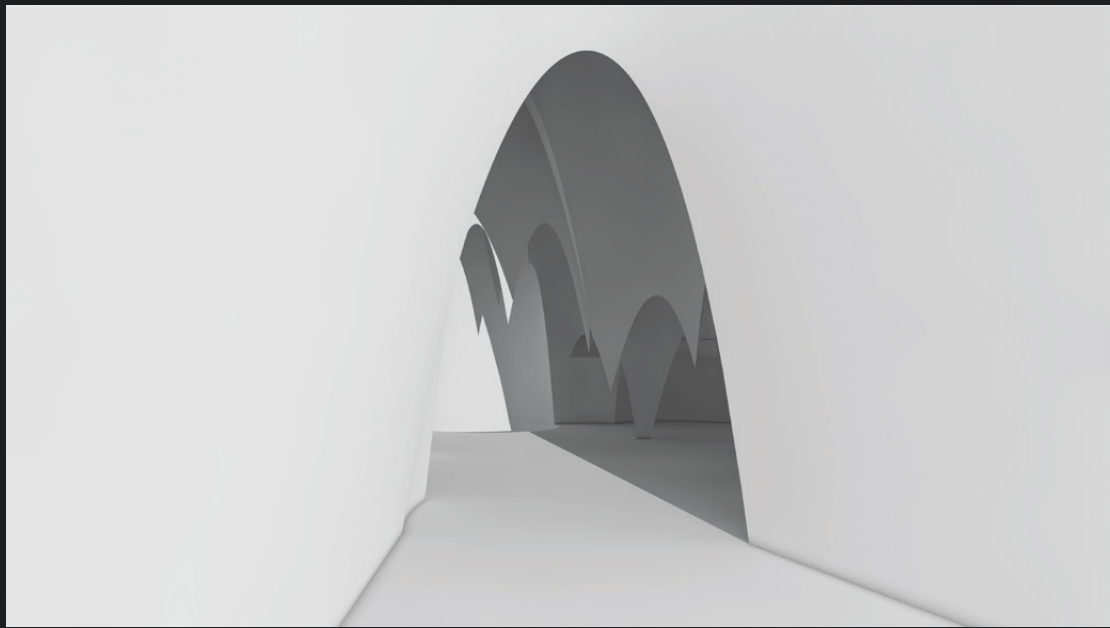
Erik Rønneberg, 2018



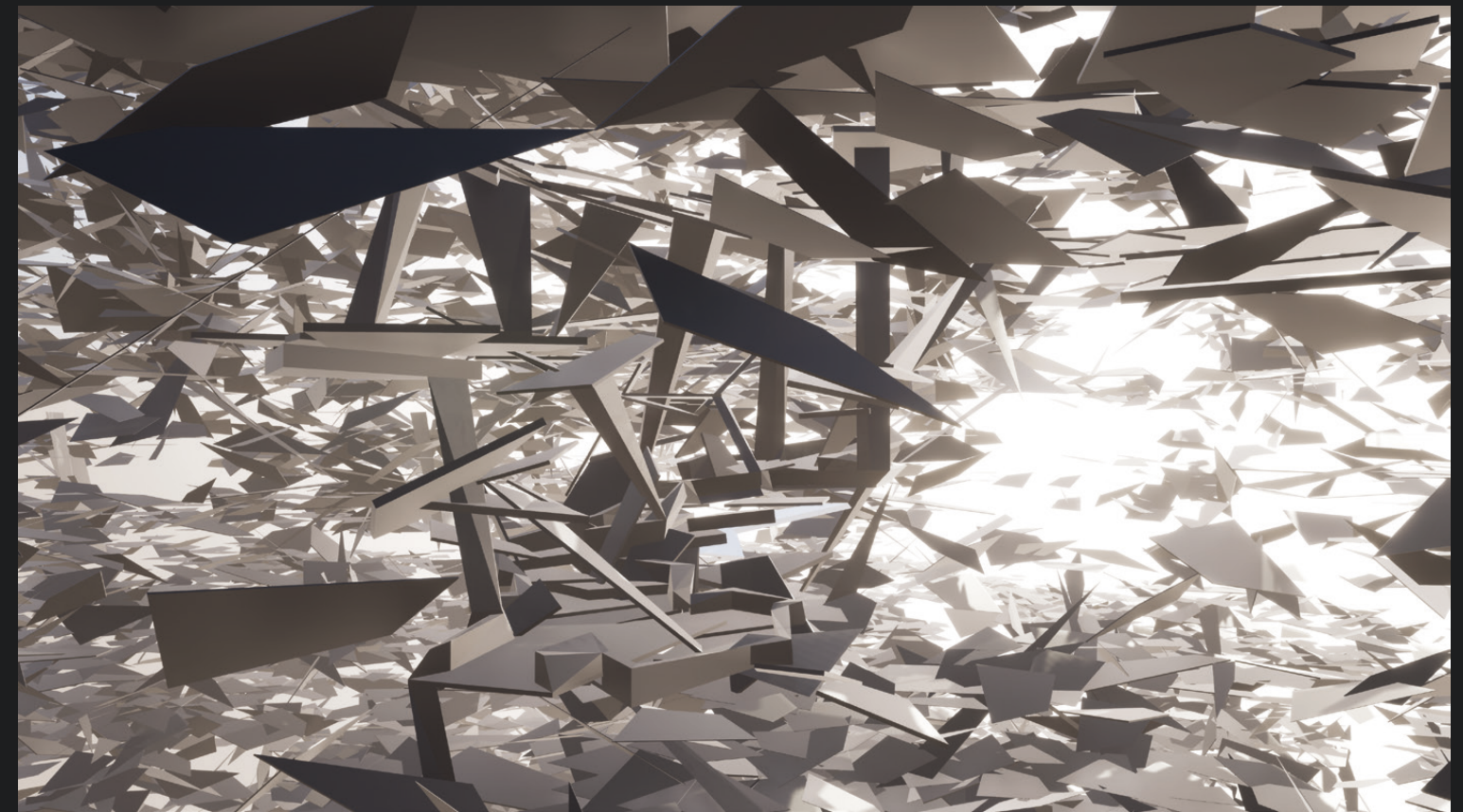
Naim Jelinek, 2021



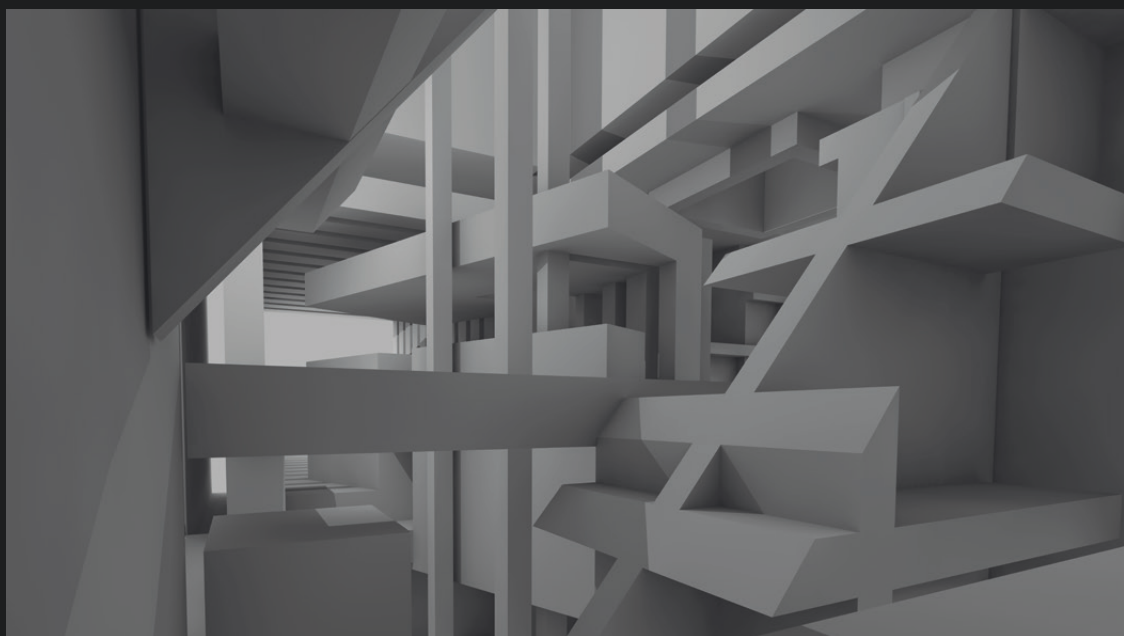
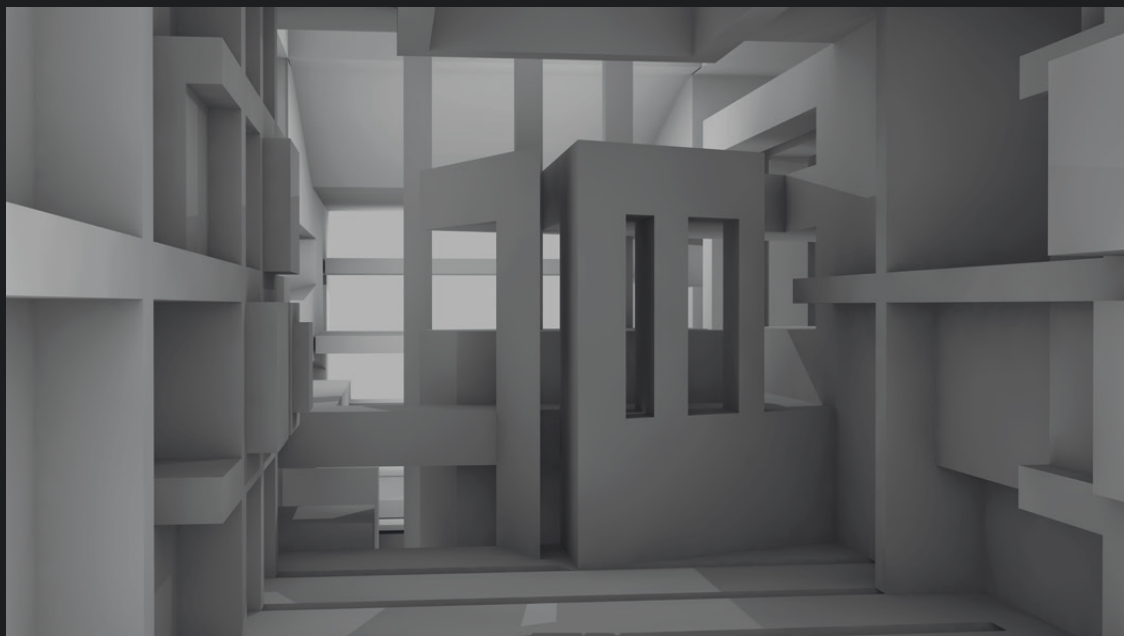
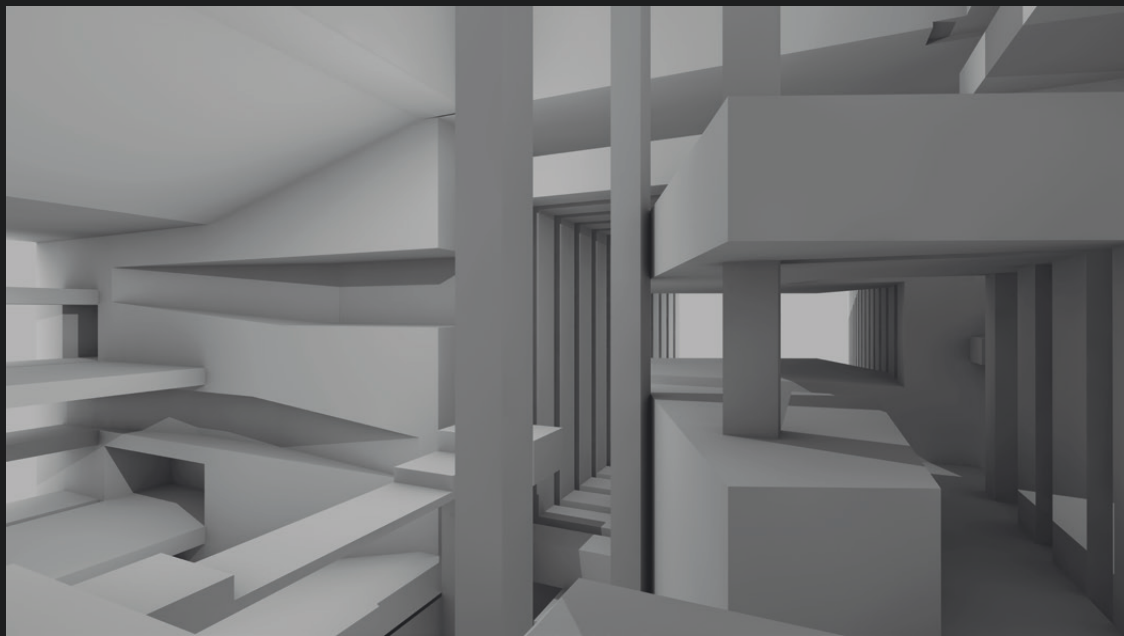
Milan Pribnow, 2018



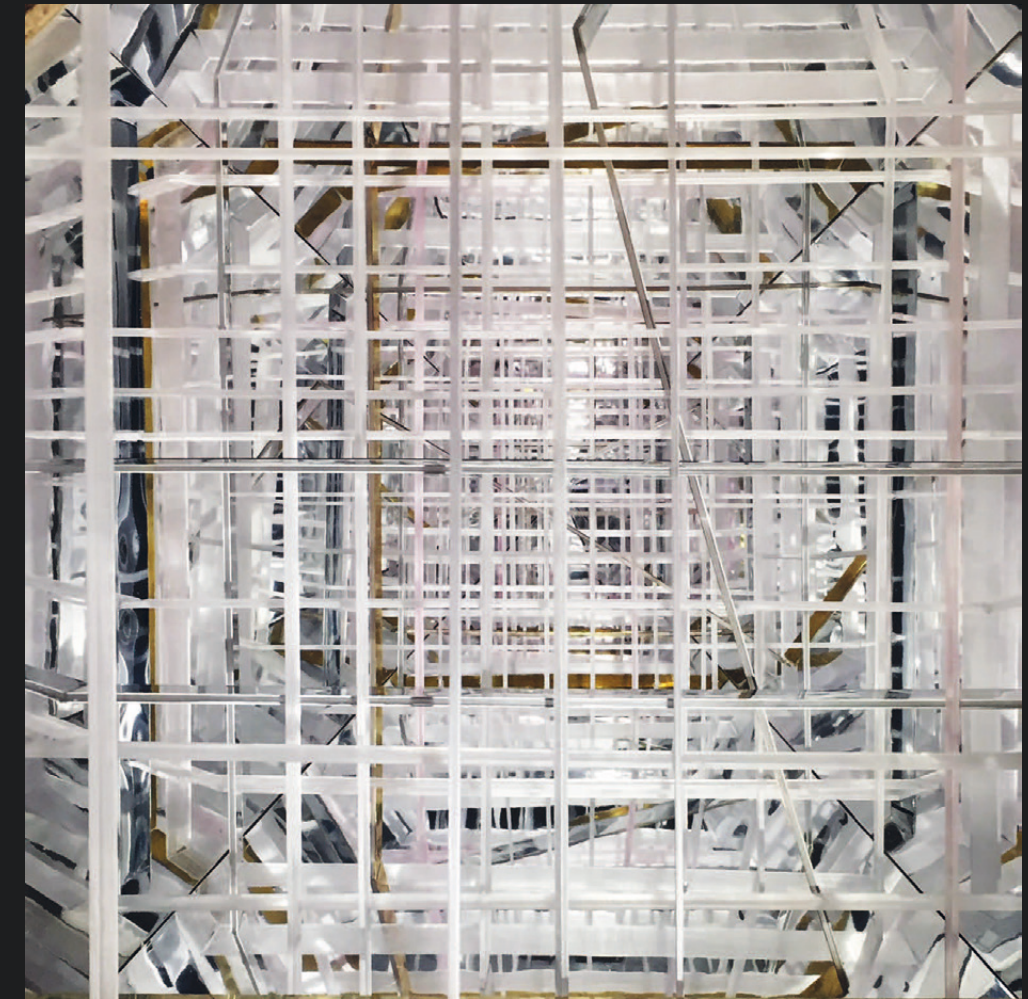
Alma Claußen, Jan Bosscher, 2021



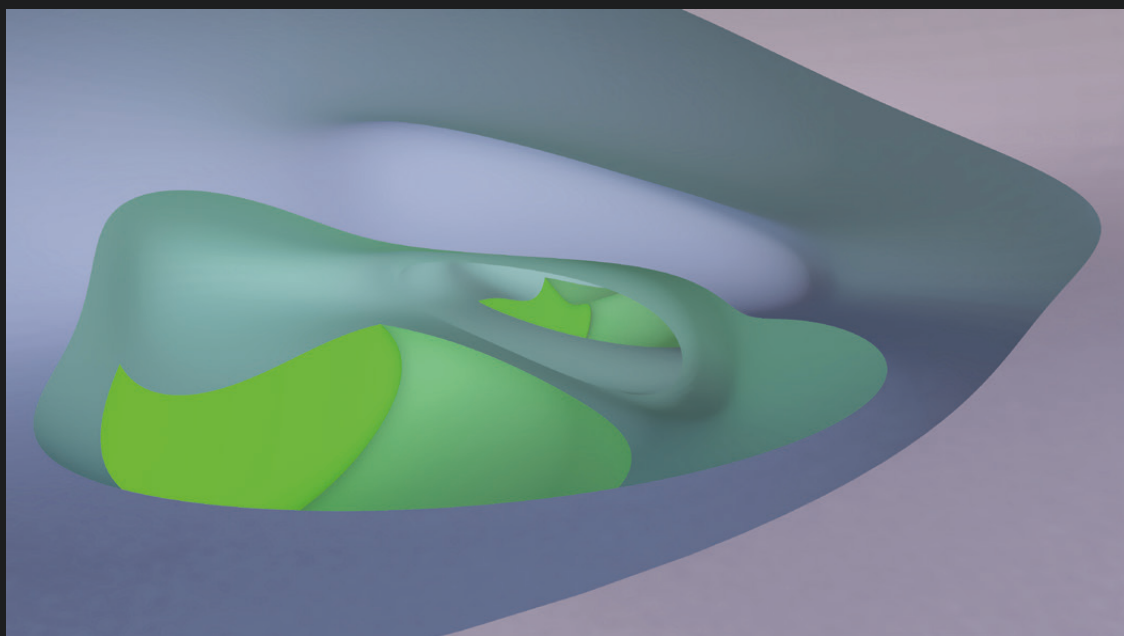
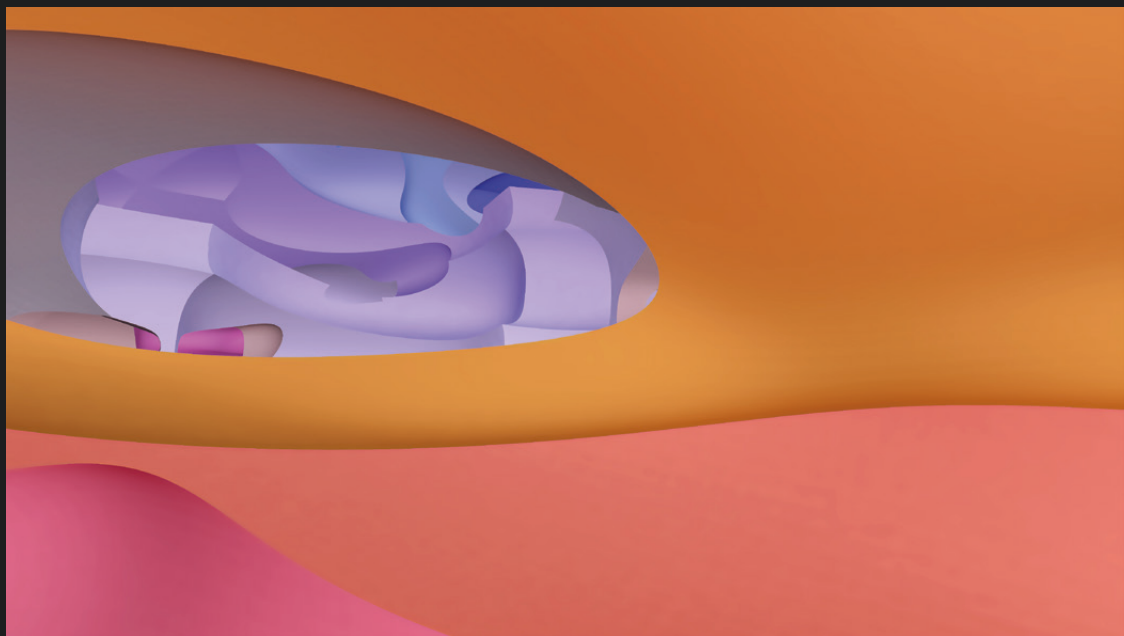
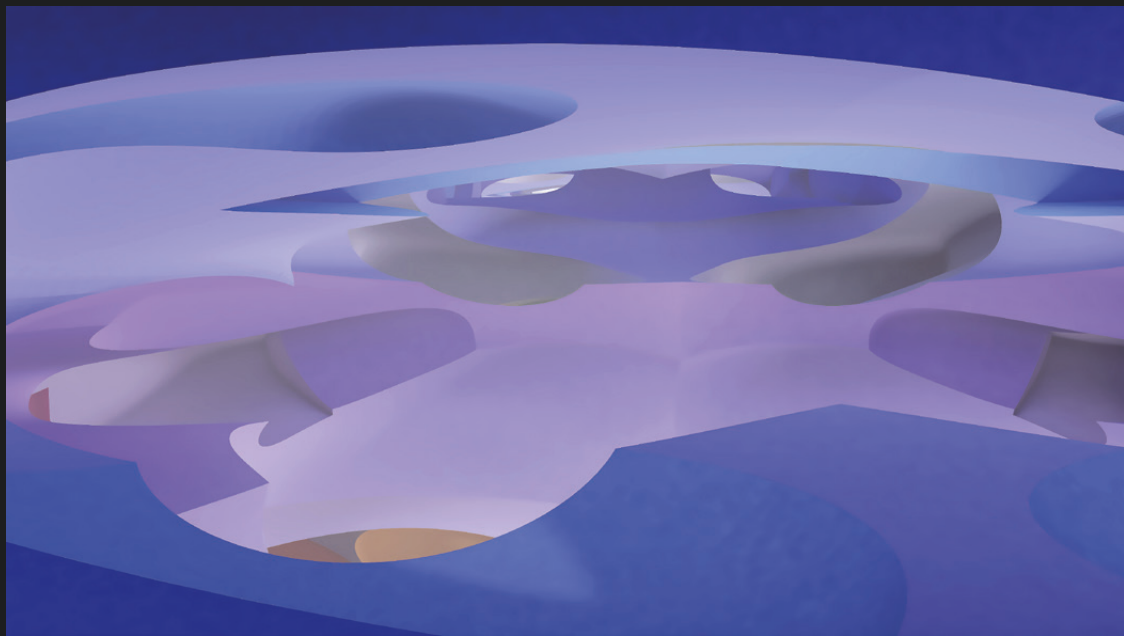
Aylin Güney, Alessandra Dieseldorff, 2020



Exdensity, Samuel Pahlke, 2021



Laura Kneiss, 2018



Sina Richter, 2021



Martin Tikvic, 2018

From Body to Space:

An Introduction to Architectural Design

Matthias Ballestrem and Tim Simon-Meyer

Do you have a ritual that you always perform in a certain place? How does your body move during this ritual, and what role does the space in which it takes place play? Does the space frame your movement, or is it an interactive partner? How can you represent and document this relationship?

Use your own body as a measuring tool for the space you are in. The units for your tool can be your shoulder width, eye height, step length, forearm length, or finger width.

Develop an apparatus as an extension of your body. Use it to help you interact with the surrounding space.

How does your apparatus structure your body's movement in space? What can you perceive through the apparatus?

These exercises are where our first-year course in design begins, one's own body becoming the point of departure for designing space. For the vast majority of students, the beginning of their studies is the first point of contact with design—their first attempt to appropriate space as a language and form of expression in its own right. Unlike other academic subjects, architecture doesn't usually overlap with high school subjects. Therefore, first-year teaching needs to confront the question of how one shapes access to design.

Defining one's own body as the first point of departure and reference for architecture is not entirely new. Since the late nineteenth century, a body-centered concept of space has influenced architectural theory, up to the present day. Its origins lie in Semper's theory of clothing, as well as in German aesthetics, empathy theory, and phenomenology in particular. In the years since, body-centered approaches have entered architectural education, from Oskar Schlemmer's Bauhaus courses to Black Mountain College and Ciudad Abierta in Ritoque. A further lens was provided by analysis and design exercises centered on the "utilitarian object," which probably originated at Cooper Union and which we borrow from by considering the apparatus as an extension of the body.

Both the research approaches of embodiment theory and perception psychology in recent decades have strengthened our understanding of the importance of the body as our first and most immediate mode of access to the living world. Ultimately, the change of focus from an object-centered to a relational understanding of architecture over the last years of so-called "spatial turn" suggests that a sensual interaction between body and built space should be given primacy in any approach to design.

We will only briefly refer to these topics here, favoring instead a description of design methods and a presentation of resulting spatial qualities by means of practical examples. In recent years, we have built up a basic architectural pedagogy on this basis, which will be illuminated in the chapter that follows. The design exercises outlined here aim to make students aware of the implicit processes underlying their spatial perception as well as the automated fashion with which they interact with the environment, enabling them to consciously shape the sensual qualities of their designs and create places that allow for physical location and familiarity. Beyond its contemporary relevance, our teaching method is a commitment to a basic attitude that sees the architectural discipline's greatest effective power in a physical-sensual dimension.

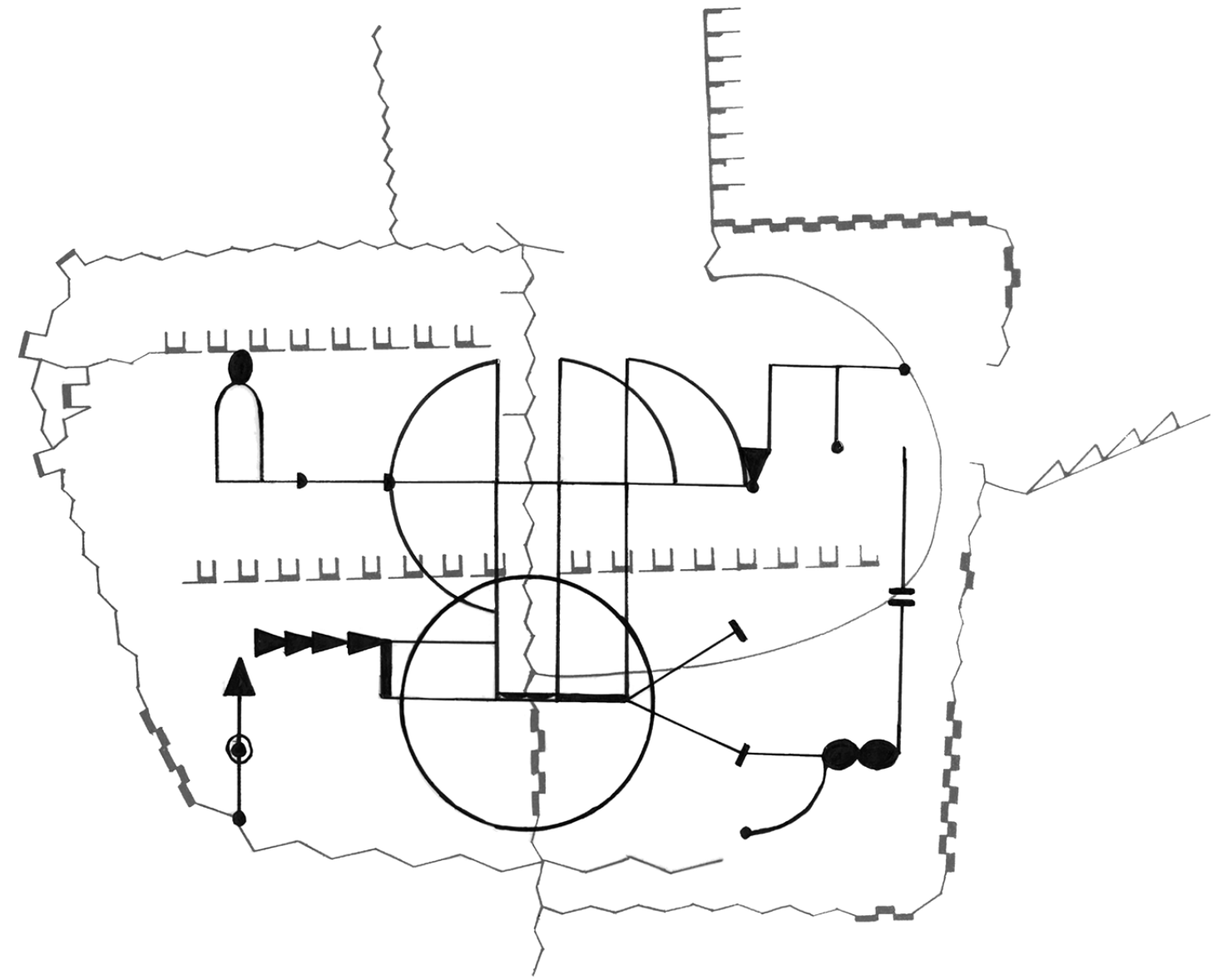
1: "Das Geheimnis der Rituale besteht darin, dass sie Ausdruck des impliziten Wissens sind. Dieses Wissen bezieht sich auf unser Können und auf unsere Handlungen, ohne dass wir dafür Worte haben. Es ist das Wissen, mit dem wir etwas ausüben können, ohne dass direkt das Bewusstsein hinzugeschaltet wird." Ernst Pöppel in: Wagner 2011.



"Schwere und Leichte" (Heaviness and Lightness), Mira Gross, Lucia Adler, Marguerite Gerhardt, Thomas Schächtel, 2022



“Apparat” (Apparatus), Camilla Hoening O’Carroll, 2021



“Maßstab” (Scale), Simon Stock, 2021



“Apparat” (Apparatus), Simon Stock, 2021

In his book *Flesh and Stone*, Richard Sennett describes the interrelationship between the body and the built environment over the centuries. He therefore directs his attention away from the society-forming and society-nurturing functions of ritual toward the mutual conditionality between ritual actions and the architecture that modulates and frames them. In this way, the Athenian rituals of *Thesmophoria* and *Adonia* are also described in terms of the specific spatial situations—the hut, the roof terrace, the courtyard, and the stable—that they depend on for their performance (Sennett 1997, 87–101).

Ernst Pöppel describes rituals as expressions of implicit knowledge.¹ This is even truer when it comes to our individual habits, which, although not always necessarily ceremonial, nevertheless exert a meaningful and ordering significance in our lives. The coffee you brew in the morning while half-asleep follows the same sequence of movements day after day, a sequence in which your body interacts with your rooms and the things within them inside a fixed choreography.

When we ask students about their routines, we use the concept of ritual to sensitize them to the implicit processes inherent in their spatialization. In this “dance,” one’s own movements are of central significance. As August Schmarsow writes: “I can pace and scan the distance, I can cover the space in front of me piece by piece. After my forward-looking eyes have already surveyed the space in advance, it is only as I walk through it that the details arrange themselves in their actual distance from one another, only now proving their full reality after the mere appearance, precisely as a body in space like myself.”² Schmarsow defines the depth dimension of architecture as an artistic field of creation, in which movement through space forms the determining modality of perception. Our body’s own rhythms, such as our “throbbing heart” or “pendulum-like walk,” structure our perception and are reflected in the rhythms of architecture—the sequence of its elements of openings, supports, fields, and steps.³

Analyzing and documenting these automatisms engenders an awareness in students for the interplay between space and body. Architecture reveals itself as a dialogue partner making an offer of interaction. When students use their own bodies as measuring tools for distances, sizes, proportions, circumferences, and spaces, they realize the affordances of architecture; they sit down in niches, stretch out in spaces, test the stability of a wall. They turn, cross, walk through distances and intervals. In doing so, they appropriate space for themselves, making it familiar and creating places through specific, body-centered relationships and memories.

The apparatus that the students go on to design not only changes how they interact with space, but also their sense of their own bodies. Everyone knows the phenomenon when, as soon as one takes a stick in one’s hand, one’s sense of touch expands from the fingertips to the tip of the stick, making it, in a way, part of one’s body. Rebecca Horn makes impressive use of this phenomenon in her “Berlin Exercises” from 1974, when she strives to touch opposite walls with both hands at the same time. The phrase “a nut makes me all round”⁴—attributed by Gaston Bachelard to La Fontaine—comes immediately to mind when we see the bulbous costumes in Oskar Schlemmer’s triadic ballet. The way inanimate extensions of our bodies become animated has already been the subject of intensive research in experimental psychology (Longo and Lourenco 2006). So what’s it like to change one’s corporeal spatiality while exploring architectural space in a different way?

Such exercises take up the first four weeks of our course. They do not, as one might expect, segue into design methods that directly use the body as a medium. Our attempts to design space alone through “bodily imagination” (Ballestrem and Skrzypczak 2021) have repeatedly shown that the imagined spatial concept lacks the geometric determinacy necessary for a precise development of built space.

Consequently, we understand our introductory exercises as a process of sensitization and imprinting, which we retain vividly in our memory through the rest of the semester. Again and again with the students, we focus our attention on the perceptual qualities of their designs, asking them to physically empathize with

2: Original quote in German: “Die Entfernung kann ich abschreiten und abtasten, den Raum vor mir kann ich Stück für Stück zurücklegen. Nachdem ihn meine vorwärts blickenden Augen schon im Voraus überschaut haben, ordnen sich nun erst beim Durchwandeln die Einzelheiten in ihrem tatsächlichen Abstand zueinander, bewähren nach dem bloßen Augenschein nun erst ihre volle Realität, eben als Körper im Raum wie ich selber.” Translation with deepl.com. Schmarsow 1903, 104.

3: “Die Ortsbewegung in der dritten Dimension erst bringt uns die Ausdehnung zum unmittelbaren Erleben.” And: “Wie unser pochendes Herz in schnellem Tempo, unser Ein- und Ausathmen schon in regulierbarem [sic] Wechsel innerhalb fühlbarer Grenzen, so hilft auch unser pendelnder Gang, das mehr oder minder schnelle Sichablösen der beiden Beine, bei unsrer Kontrolle des Nacheinander in Raum und Zeit.” Schmarsow 1896, 55.

4: Original quote in German: “Eine Nuß macht mich ganz rund.” Translation with deepl.com. Bachelard 2011, 229.

their designed spaces, to visit and walk through them in their imagination—picturing views, light and materiality, haptics, reverberation, and temperature.

In our pedagogical approach, the first step from one's own body to designing its surrounding architecture is to design an inhabiting shell, meant to serve as an interaction and dialogue partner for one's own movement in space together with one's own designed and built apparatus. Classical media such as line drawings and models are used; indeed, they're introduced here for the first time. Through this approach, we zoom outward from our own experience toward a projection and measurement of the body in motion, a body desiring to be housed. This alternation—between the physical empathy of one's own design and intuitive design methods in projections, drawing, and models—structures the sequence of design steps in the subsequent course, which results in a sequence of spaces at the end of the first semester that are programmatically undefined, but spatially attuned to precise spatial perceptions.



“Apparat” (Apparatus), Kaja Goebel, 2021





“Apparat” (Apparatus), Kaja Goebel, 2021

Spatial Qualities

Our process gives rise to associated architectural qualities that can be identified in the student works shown here, and which have been repeated and consolidated in new and individual ways over the years in the results of the first design semester. In what follows, these qualities will be characterized briefly, and will serve as a possible answer to the question of what the essence of architecture conceived and designed from the body can be.

A primal space for lingering and retreat, before we begin walking, is found in a motif we call “Primal Cave” (rather than a Primal Hut). Primal Caves are round, mostly introverted rooms with few openings. They enable a being-inside and establish a dialectic of inside-outside. Directly connected to this and significant for it are Intermediate Spaces, in which the body is framed by walls, ceilings, and floors. In their book *Metaphors We Live By*, George Lakoff and Mark Johnson attribute a fundamental importance to bodily experiences such as being-in-between or being-above for the development of metaphorical concepts: “The structure of our spatial concepts emerges from our constant spatial experience, that is, our interaction with the physical environment. Concepts that emerge in this way are concepts that we live by in the most fundamental way” (Lakoff and Johnson 1980, 56–57). For the designer, what matters is the diversity of the in-between spaces we experience.⁵ Between the location of a particular position in space for a framed view of the landscape, and the proportion of a corridor that tempts us to walk quickly through it, lies an infinite variety of Intermediate Spaces in architecture: sometimes narrow, then expanding fluidly; sometimes gradual or abrupt.

When bodies and architectural elements come very close together, the building material begins to display its Haptic Properties. These define whether I want to touch the architecture, whether I want to feel what it’s like to walk on the floor, how the sounds and reverberations change when the space narrows—or whether sounds are completely swallowed up by a particularly fluffy or soft surface. We only experience

5: “Inzwischen gilt es als gesichert, daß das Gehirn höherer Tiere und insbesondere des Menschen seine vielfältigen Leistungen nur im Wechselspiel mit der Umwelt voll entwickeln und entfalten kann.” Singer 1987, 186.

the fullness of this sequence of loud and quiet, of proximity and expanse, when we move. And as described above in the words of Schmarsow, a steady Rhythm is usually created when we walk, something that finds its counterpart in many student works in sequences of similar space-defining elements. Like a companion and a clock, architecture comments on the rhythmic movement of the body. This regularity lends space a structural stability, while the variation of elements alters space with every step (Husserl 1966).

In contrast, there are works that play with Dynamic Balance, a term used by Rudolf Arnheim to describe a central quality of artistic composition in which the force and counterforce of the various elements keep each other in a sensitive balance (Arnheim 1978, 69–75). Here, too, a pendulum-like walk can be understood as a reference to the body. Swinging back and forth around one’s own center of gravity without stumbling corresponds in architecture, for example, to a vertical block of stone that is askew and just not yet threatening to topple over. Like the tilting Oberhafen canteen near our university in Hamburg, such spaces challenge the body in its vertical axis and result in a constant balancing movement.

When, as designers, we think in terms of a sequence of spaces, imagining movement through them, this gives rise to designs that follow a Choreography. Here, the arc of increase, climax, and decrease usually corresponds to the entering, remaining, and exiting of a sequence of spaces. Spatial language and movement may correspond to one another in the Flowing Movements that take place through fluidly shaped spaces. Means of staging such as the proportion of rooms, their directionality, and their lighting support the formulation of pathways and lounges. At the same time, a high degree of Complexity and Density, as well as spatial Depth, often goes hand in hand with a choreographic condensation of spatial elements. Such spatial characteristics offer a wealth of possibilities for reading and interpretation. The body can relate to different elements and thus, also, to spaces. Complex depth creates a simultaneity of immediate surroundings, as well as larger and wider spatial contexts offering themselves to the perceptual apparatus as points of localization. This quality of perception also characterizes so-called Ephemeral Spaces: spaces that remain incomplete due to overlaps with other spaces, only hinting at their missing wholes. Through their overlaps, such spaces also appear to belong to several volumes at the same time, offering this simultaneity to spatial perception as a both-and-also (Ballestrem 2014, 159). Although we cannot perceive several possible references at the same moment—as the widely known tilting images impressively demonstrate—the ambiguity of such spaces offers a rich fund of interpretation for the perceptual system, allowing it to switch constantly between the reference systems on offer (Zeki 2004).

The spatial characteristics named here and exemplified in the design artifacts on the following pages do not constitute a conclusive categorization. They do, however, indicate how architecture can be thought of in terms of direct interrelationships between body and space, while suggesting an idea of how the body establishes a unique relationship to a specific space by interacting with it.

“As I walked slowly up to Baptiste’s resting place, I placed my sandals in the footprints of the past year, and the land recalled me.”⁶ Marcel Pagnol articulates the recognition that takes place between body and place by describing land familiar to him as a friend who has been awaiting him. This gives rise to the idea that body and the place enter into a relationship, one refreshed with each visit, one that becomes more familiar through every interaction. The recognition between a space and a body is not a thought, not conscious, but something implicit, sensual, and experienced. It requires touching, looking, smelling, as well as familiar colors, patinas, sequences of impressions, anticipations, and memories of the place where one sits.

In the creation of places, such physical-sensual qualities and affordances form the specific peculiarities of architecture. And such measures provide an important counterweight to our increasingly digitalized and virtual world of the mind. It is about the interweaving of a space with the body—facilitating the emergence of a localization, a place, a feeling of being housed. Through our approach to architectural pedagogy, we hope to support architectural production that is designed from the body, for bodies. Through such an approach can places be created that remember us, and that we remember. Places that, through their spatial-material qualities, can become permanently—and thus sustainably—significant for our own situatedness in the world.

6: Pagnol 1983, 286. German edition. Original quote in German translation by Pamela Wedekind: “*Während ich langsam zu Baptistes Ruheplatz hinaufging, setzte ich meine Sandalen in die Fußspuren des vergangenen Jahres, und das Land erkannte mich wieder.*” English translation by M. Ballestrem.

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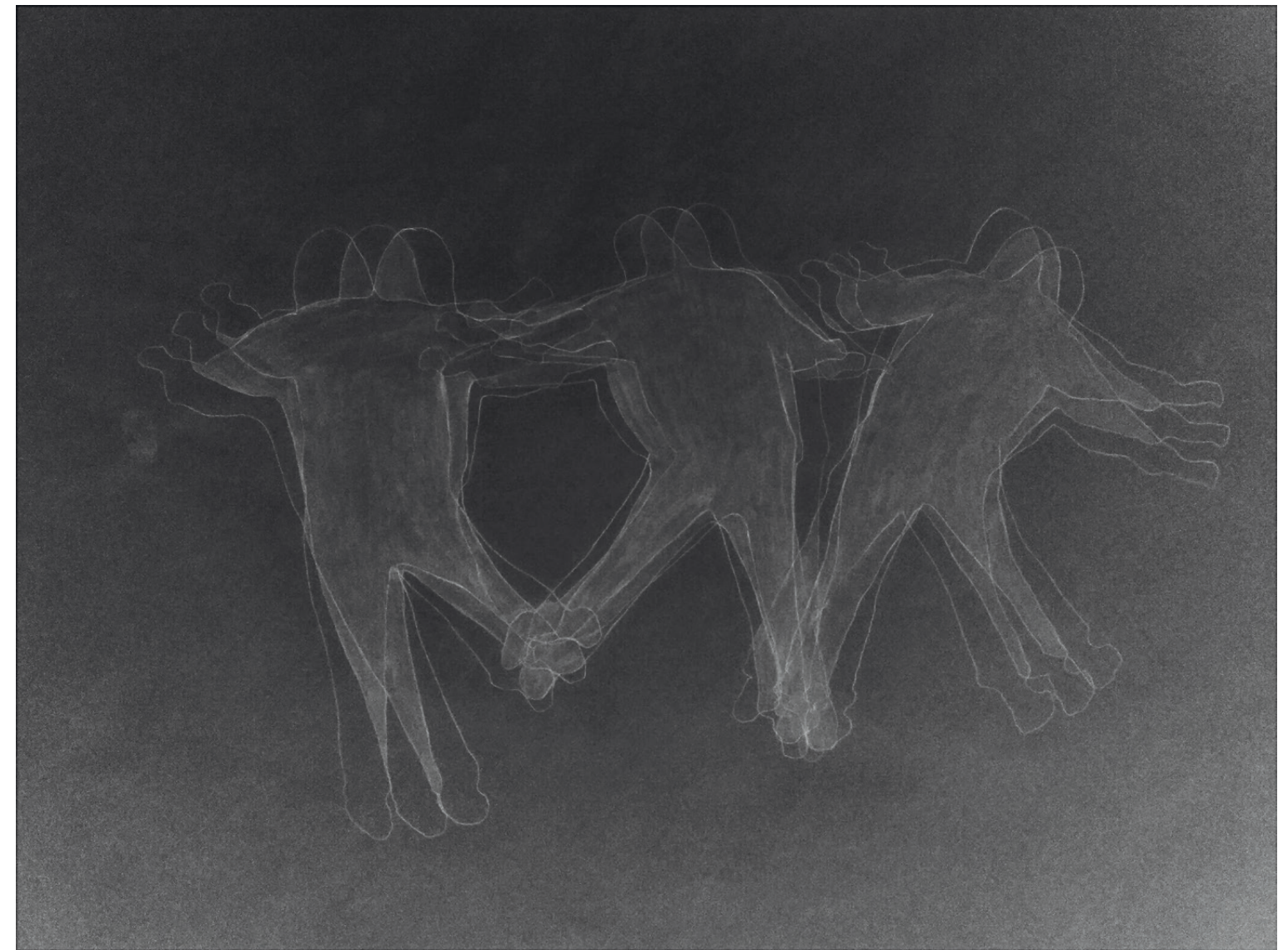
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“Hülle” (Shell), Finn Britze, 2021



“Raumgefüge” (Spatial Structure), Hannah Grapentin, 2019

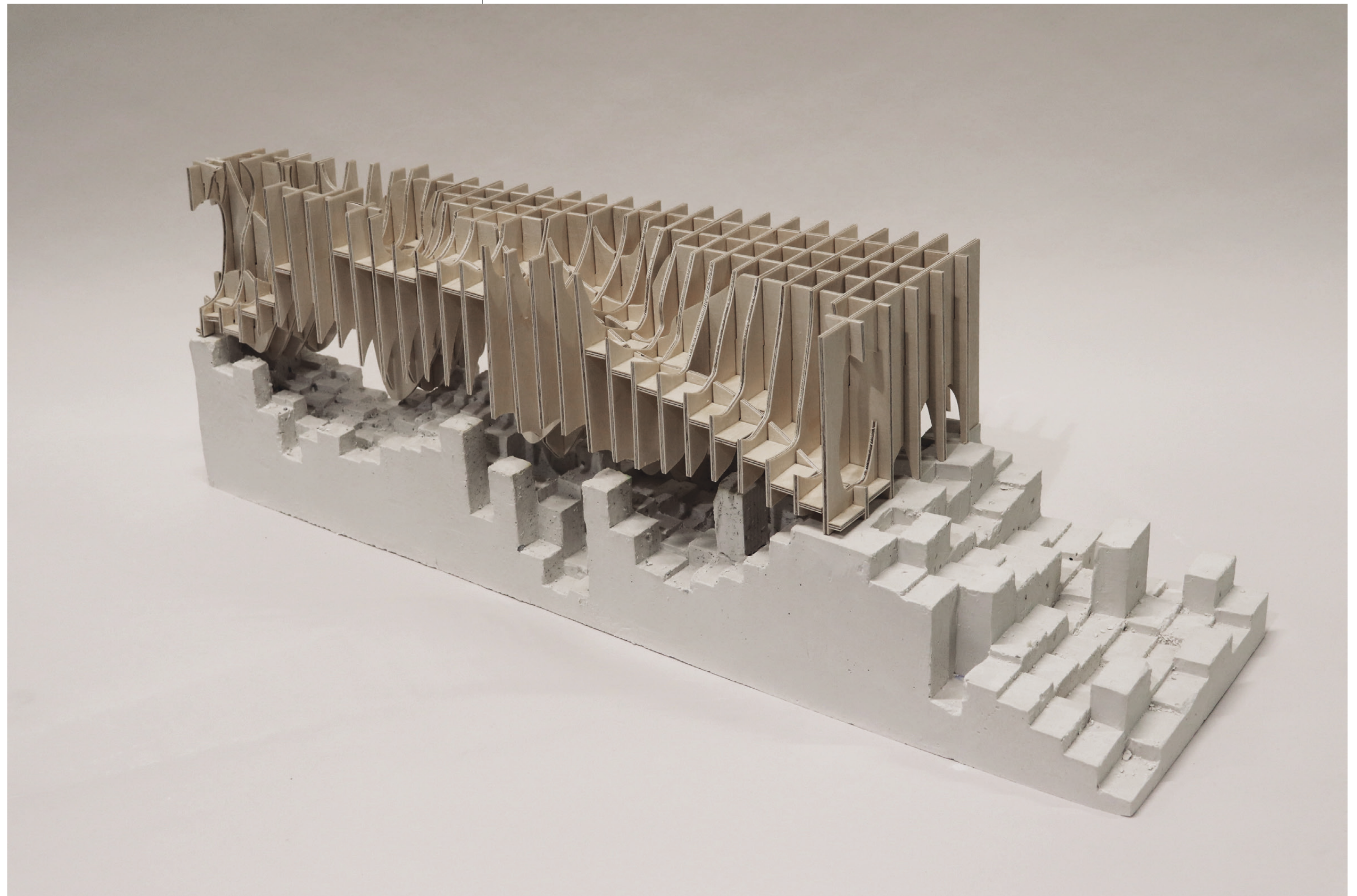


“Vertikal” (Vertical), Hannah Grapentin, 2019



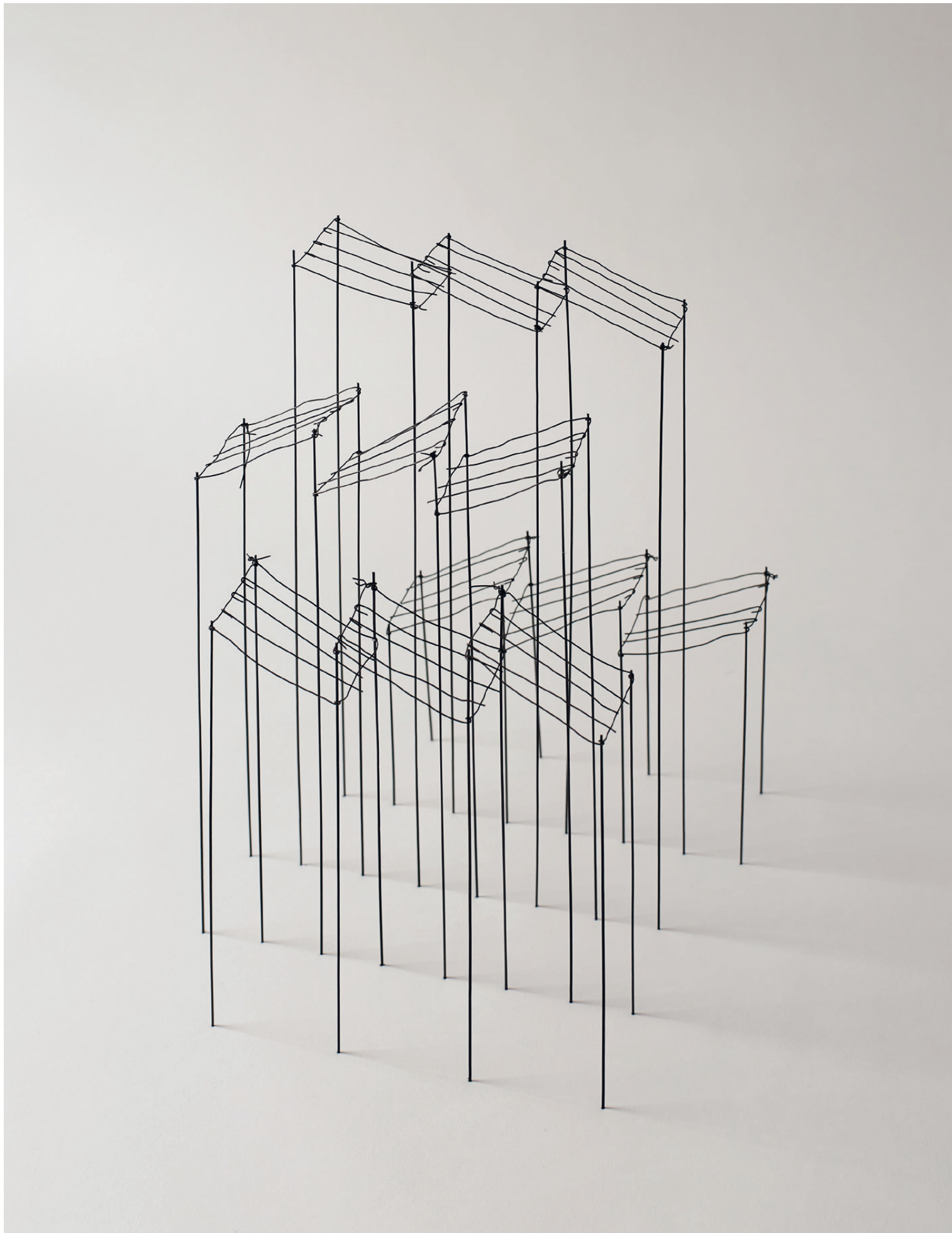
“Raumgefüge” (Spatial Structure), Lea Jeß, 2020





"Raumgefüge" (Spatial Structure), Greta Ghanem, 2020

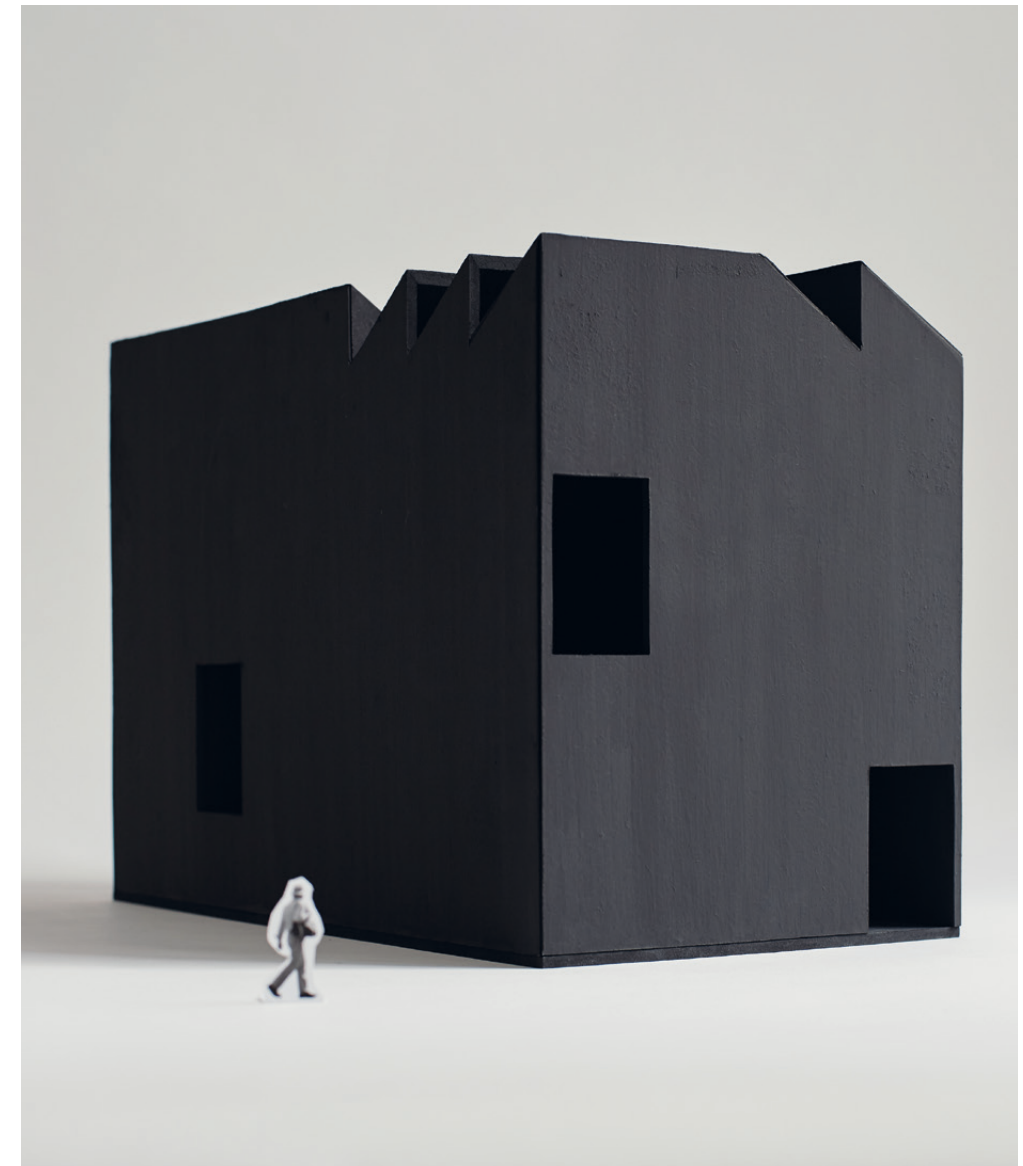
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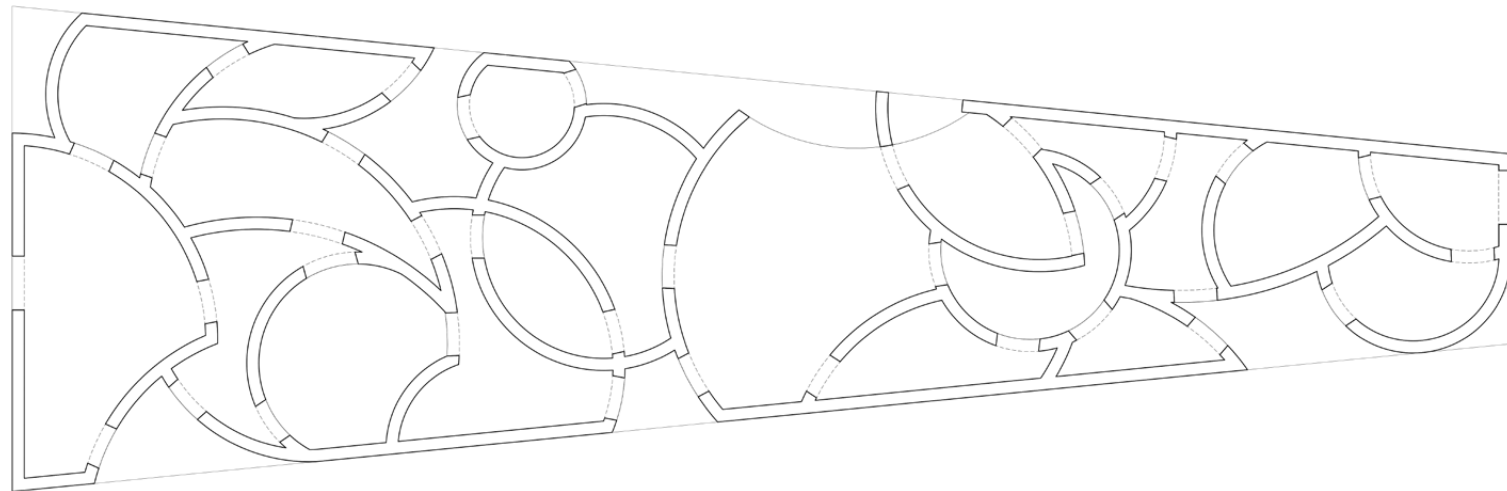
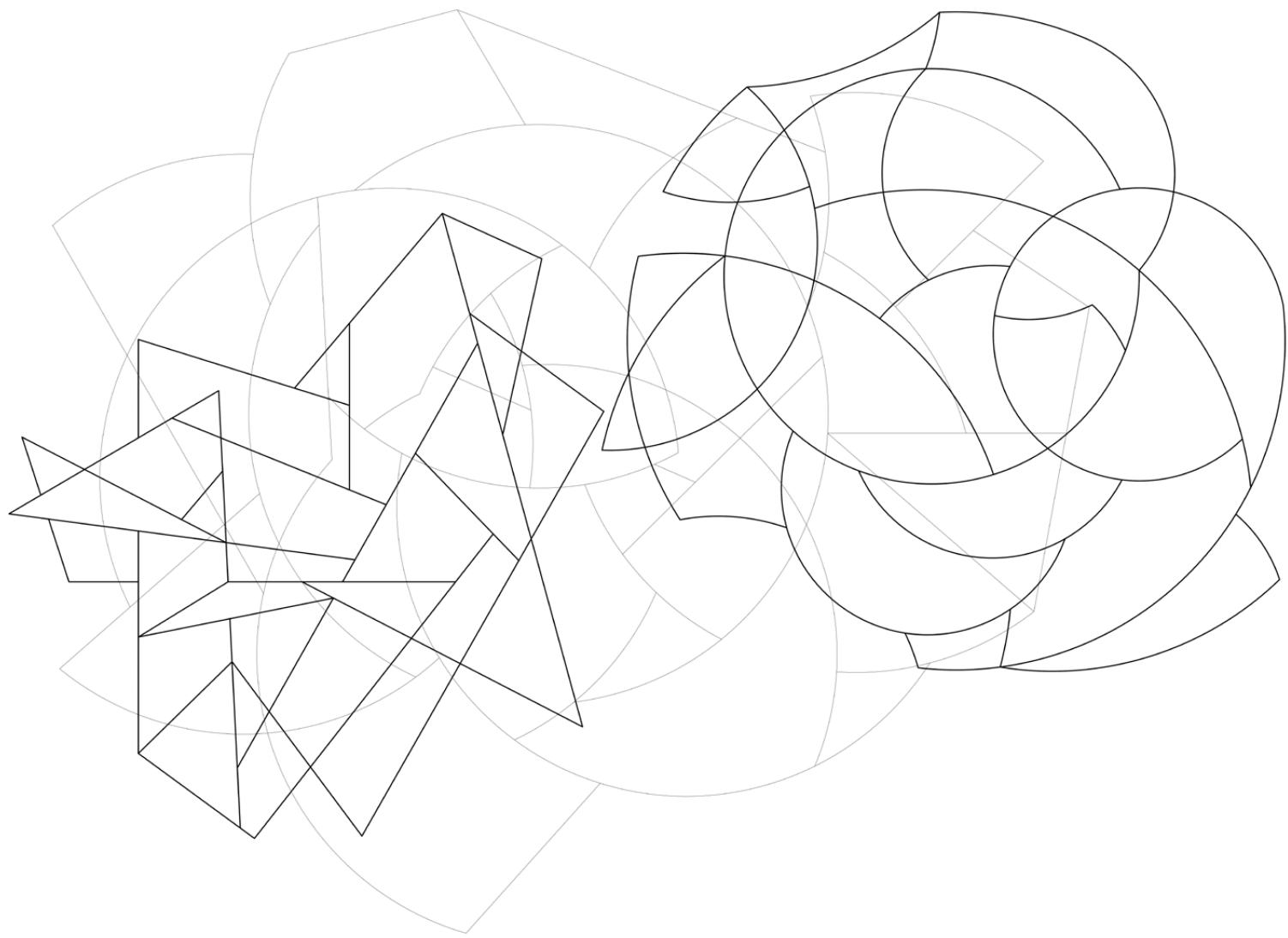


“Wiederholung und Transformation” (Repetition and Transformation), Simon Stock, 2021



“Raumgefüge” (Spatial Structure), Simon Stock, 2021

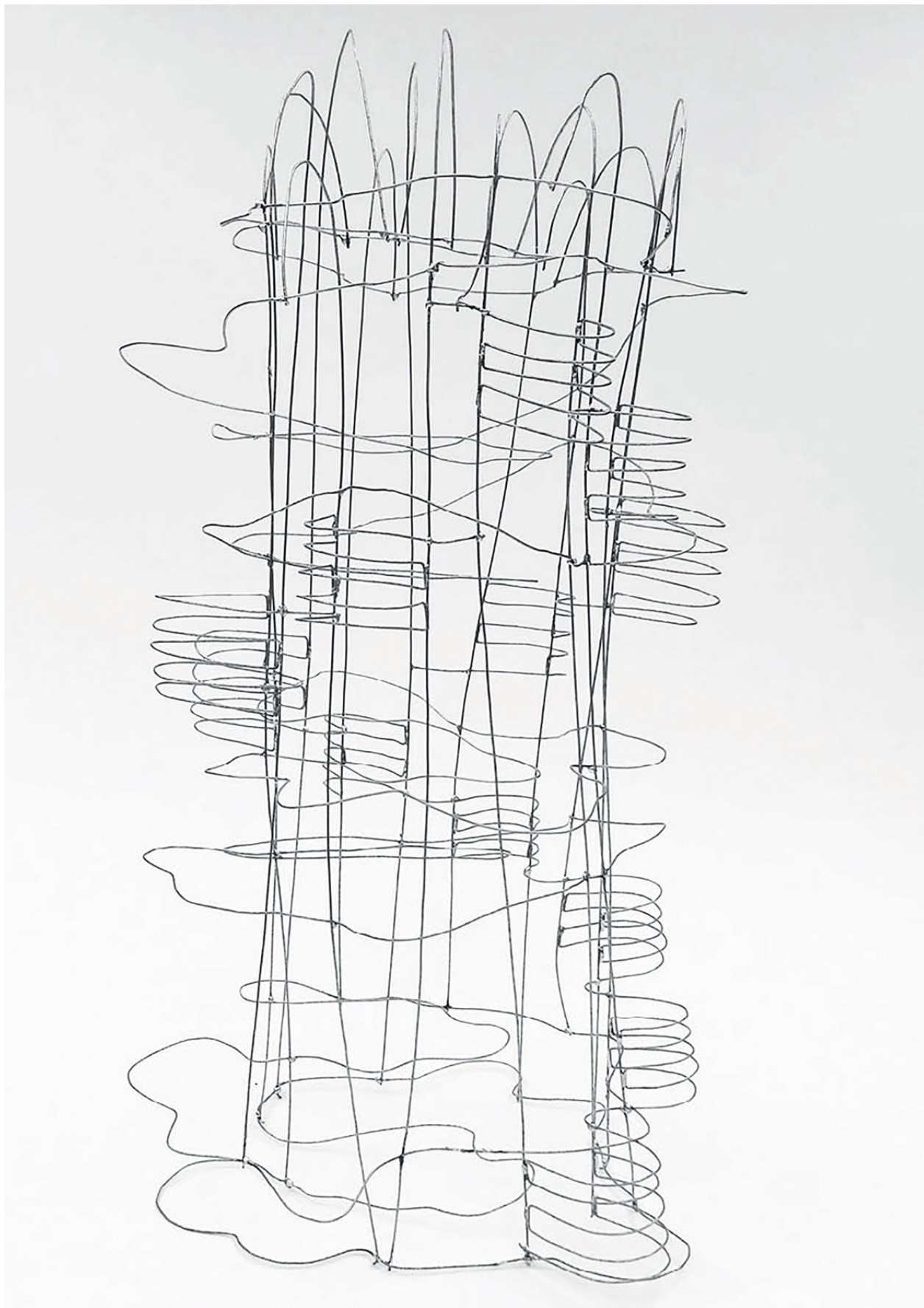




“Wiederholung und Transformation” (Repetition and Transformation), Levin Wagner, 2020



“Raumgefüge” (Spatial Structure), Levin Wagner, 2020



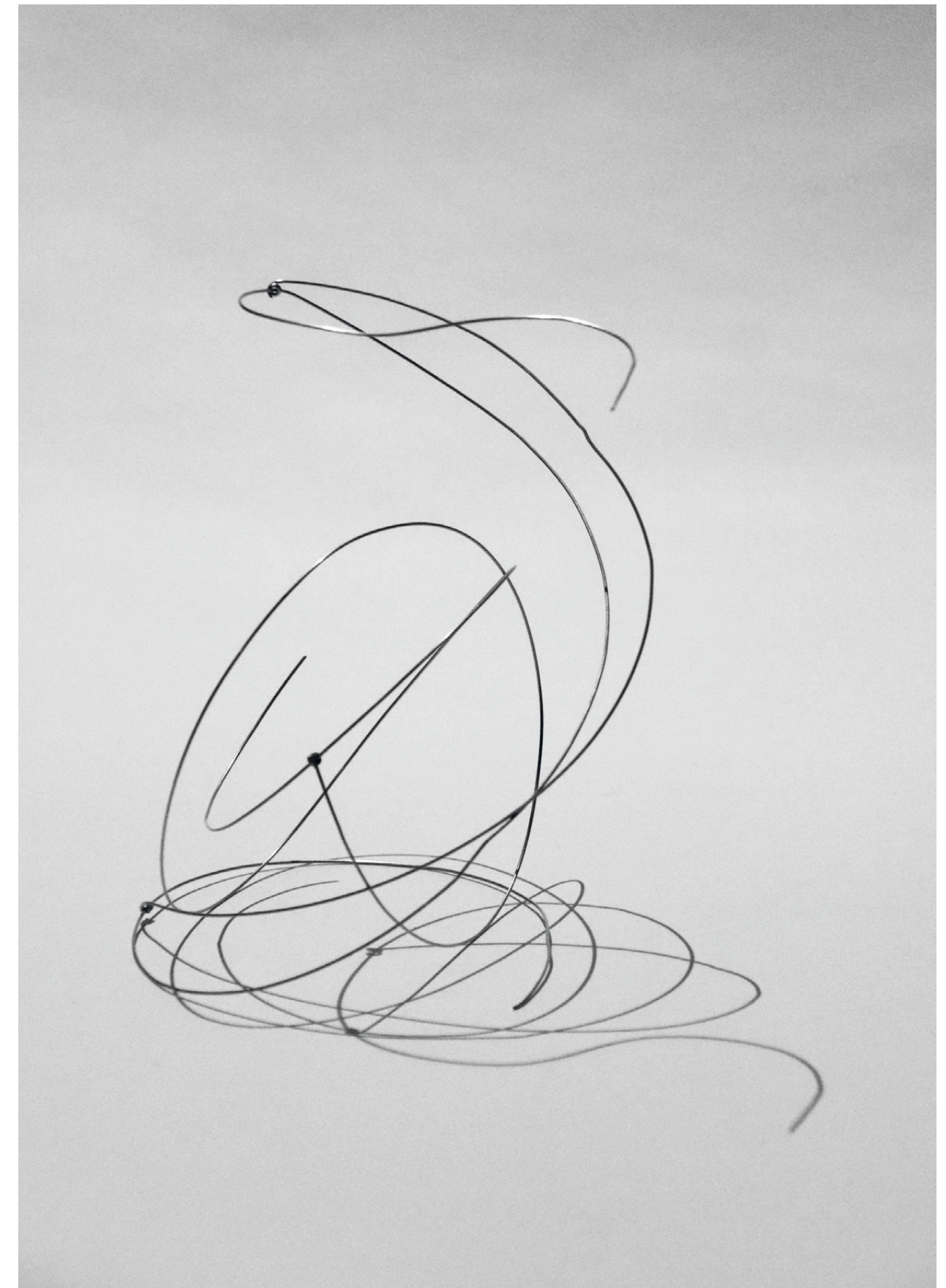
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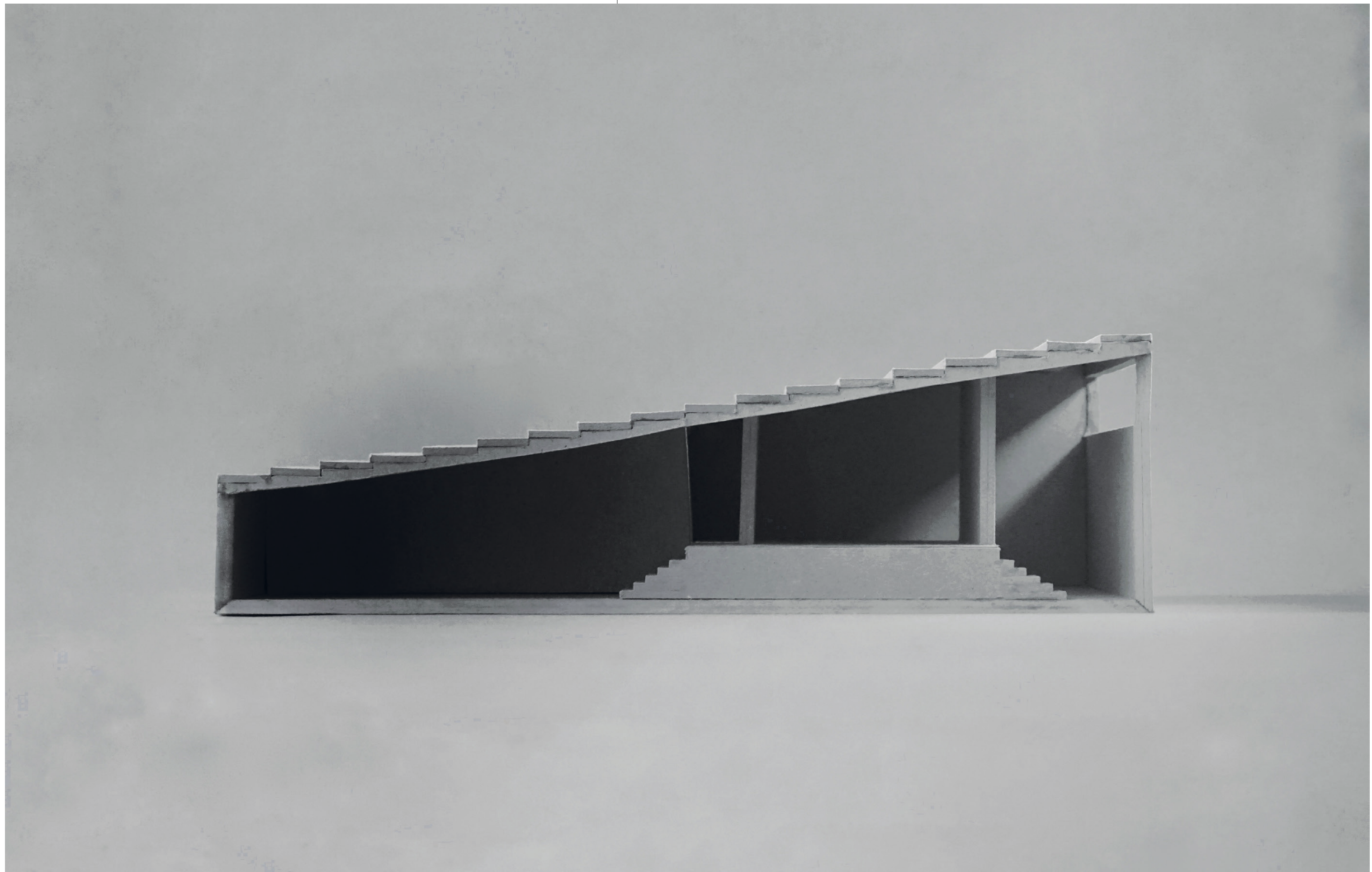
“Hülle” (Shell), Leonie Schleyer, 2020



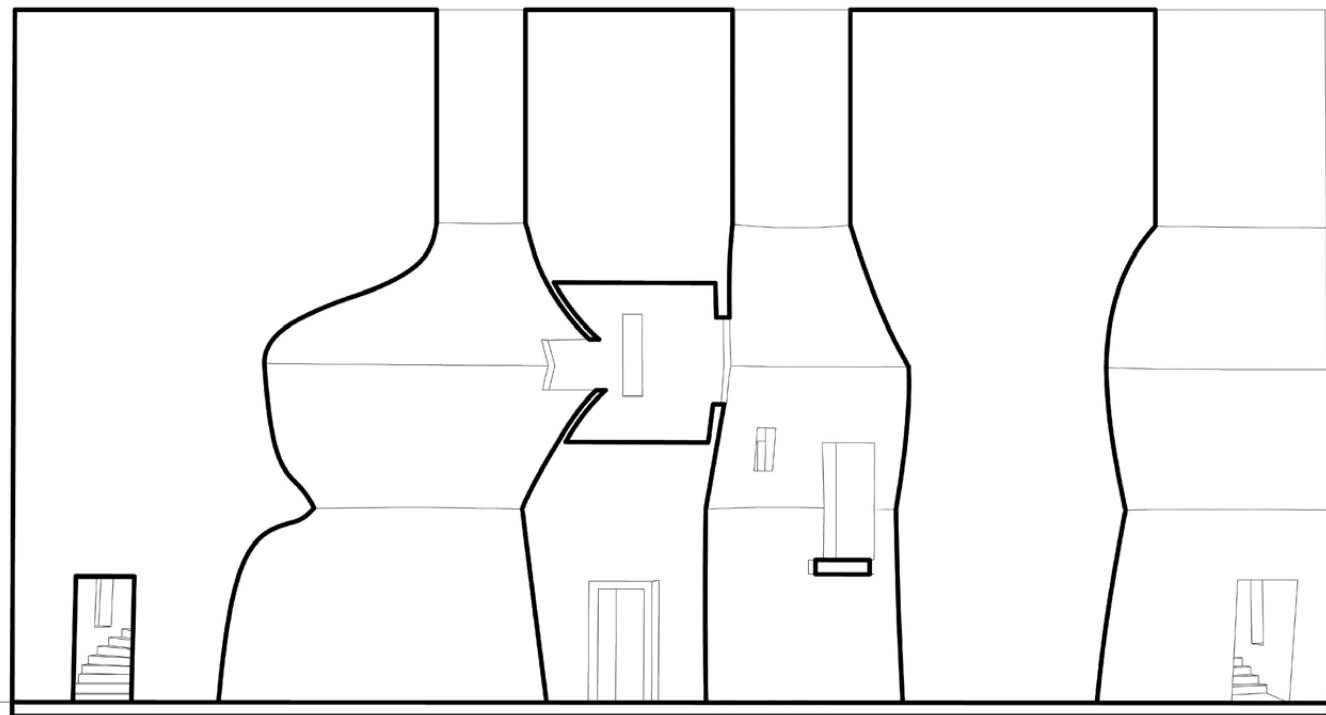
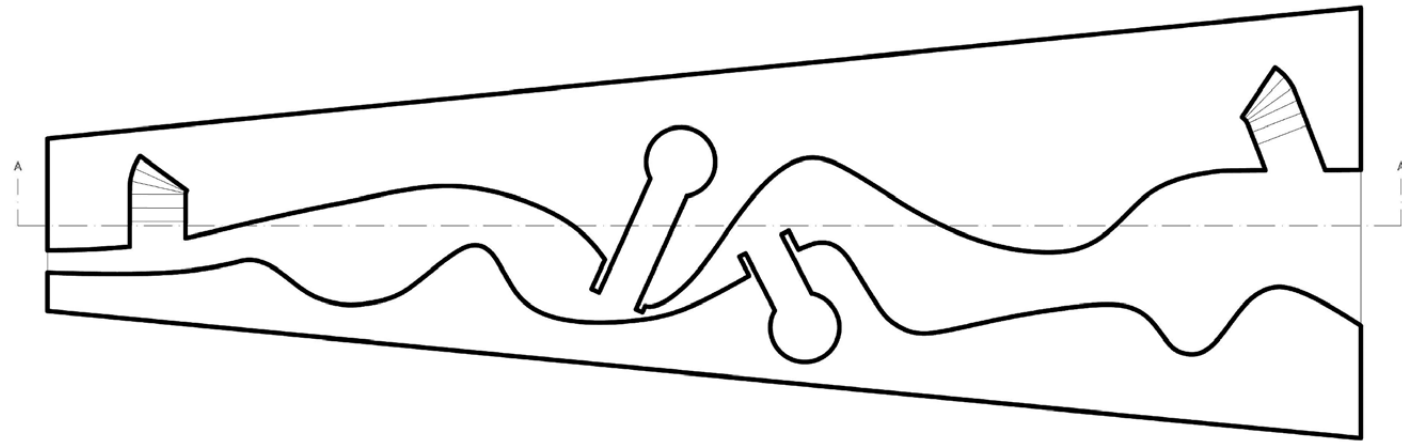
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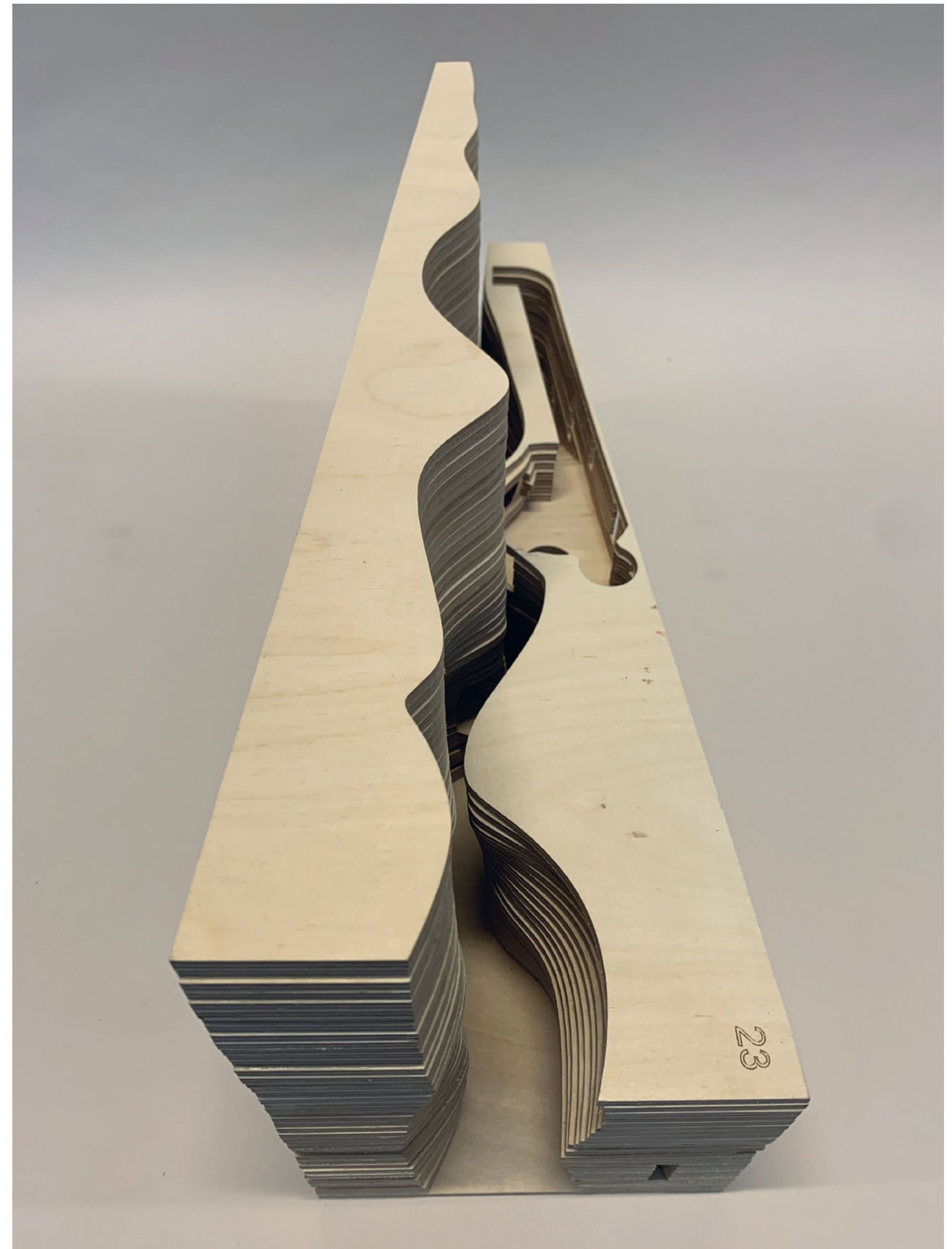
“Wiederholung und Transformation” (Repetition and Transformation), Camilla Hoenning O'Carroll, 2021

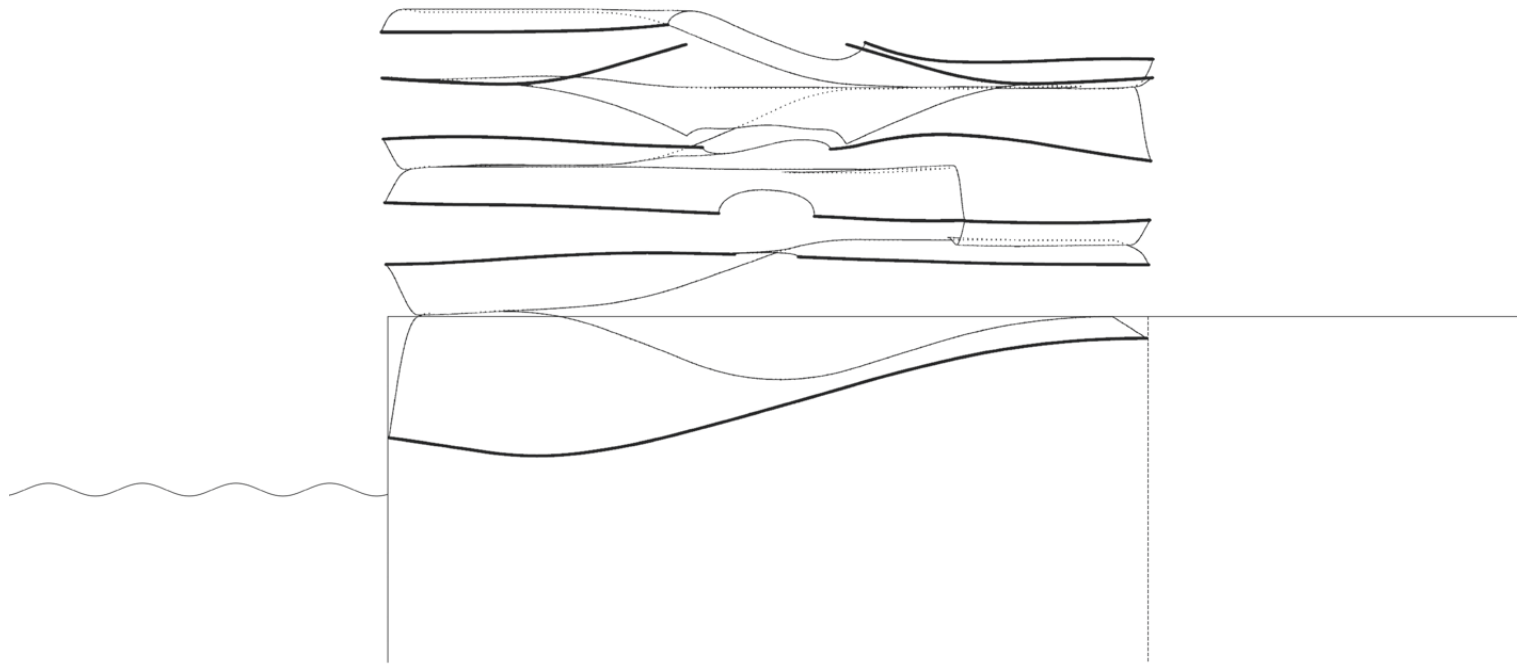


“Raumgefüge” (Spatial Structure), Finn Britze, 2021



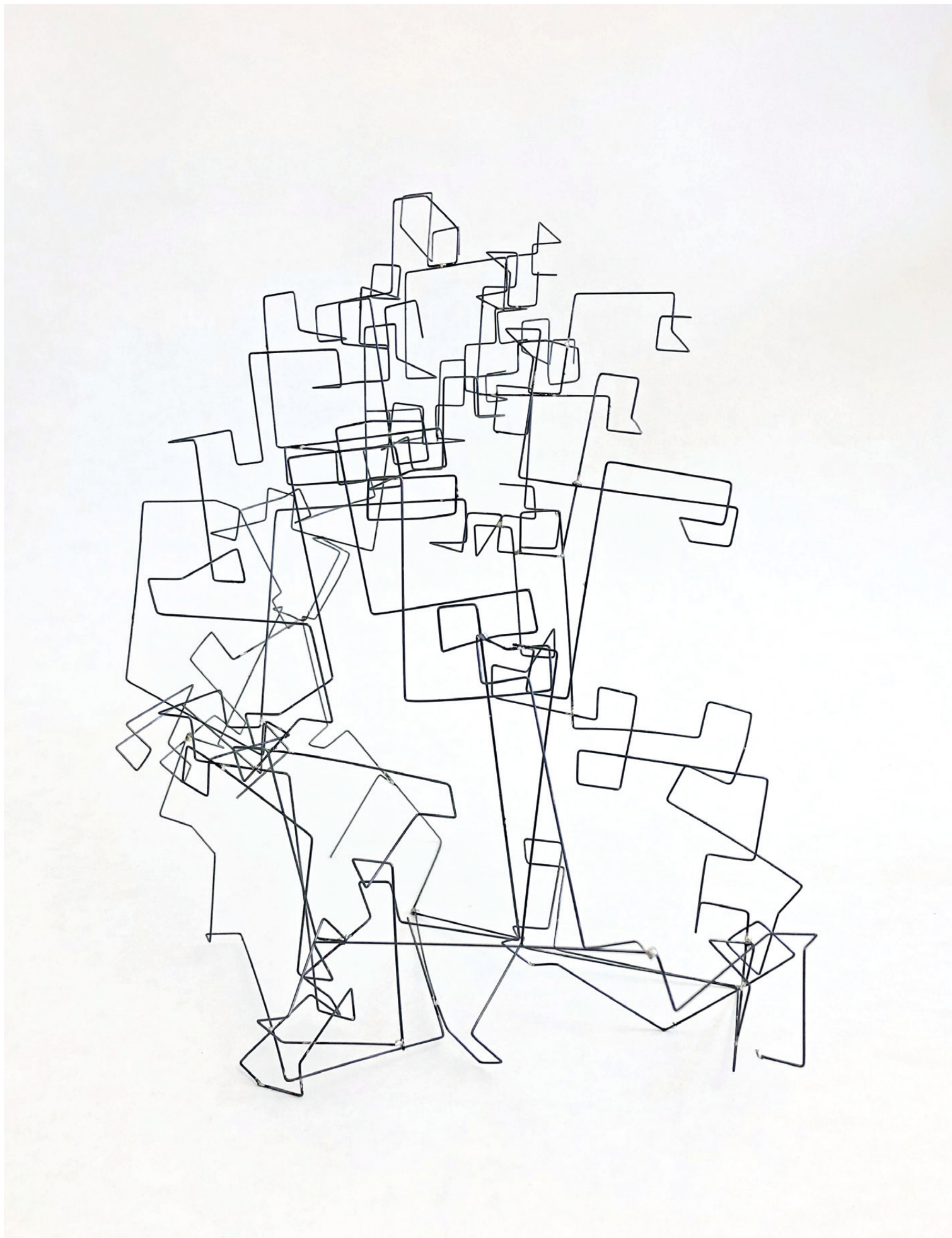
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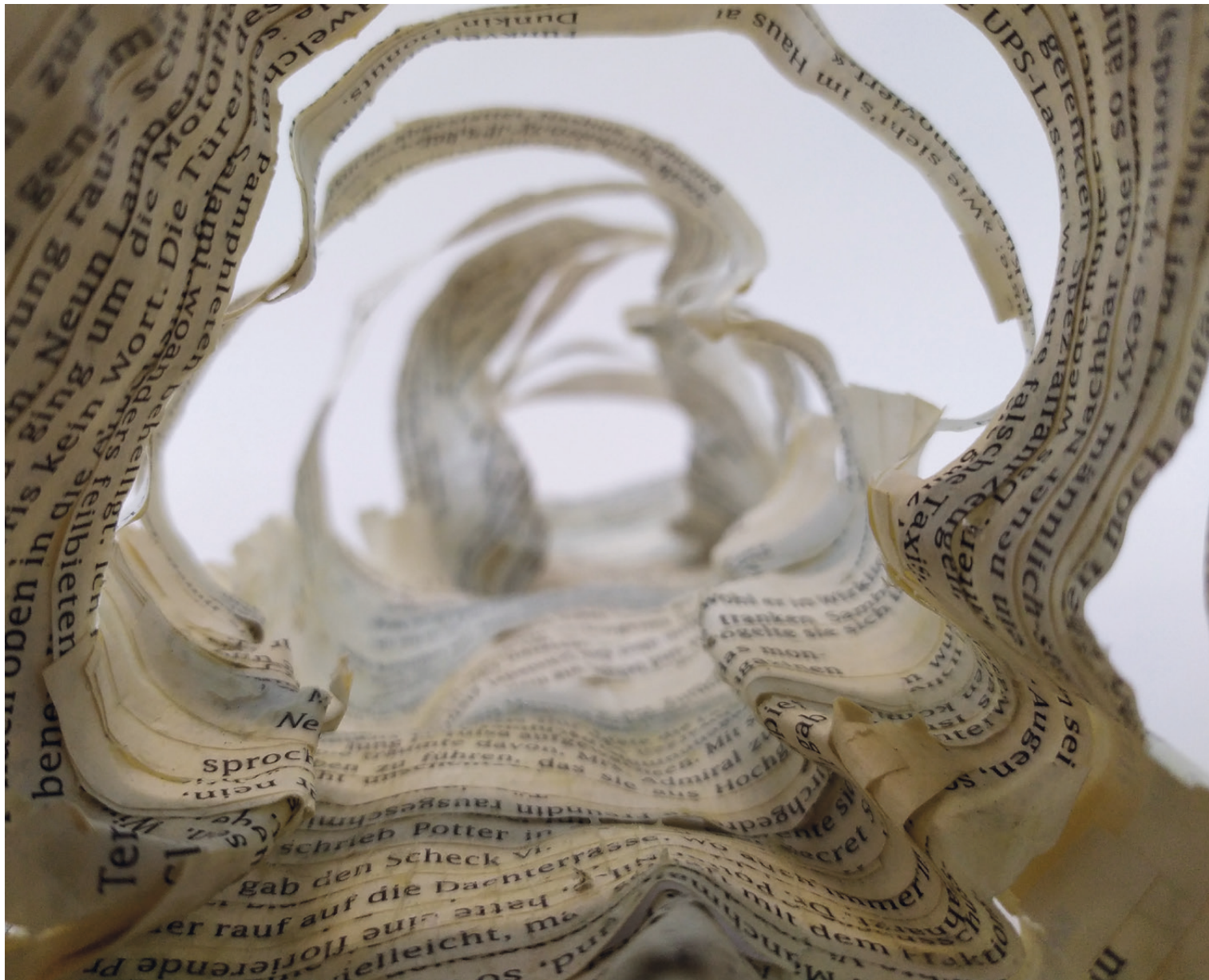




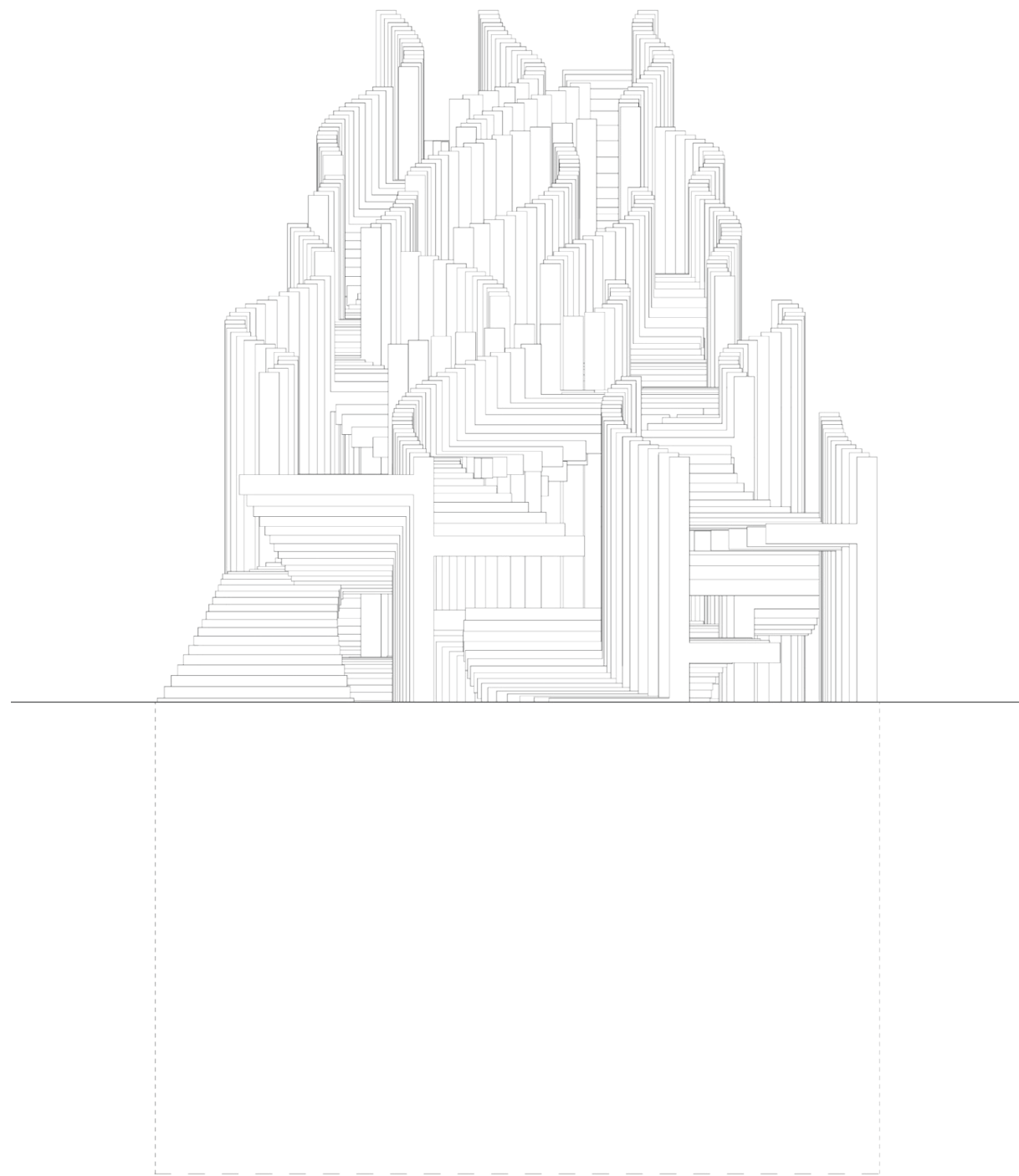
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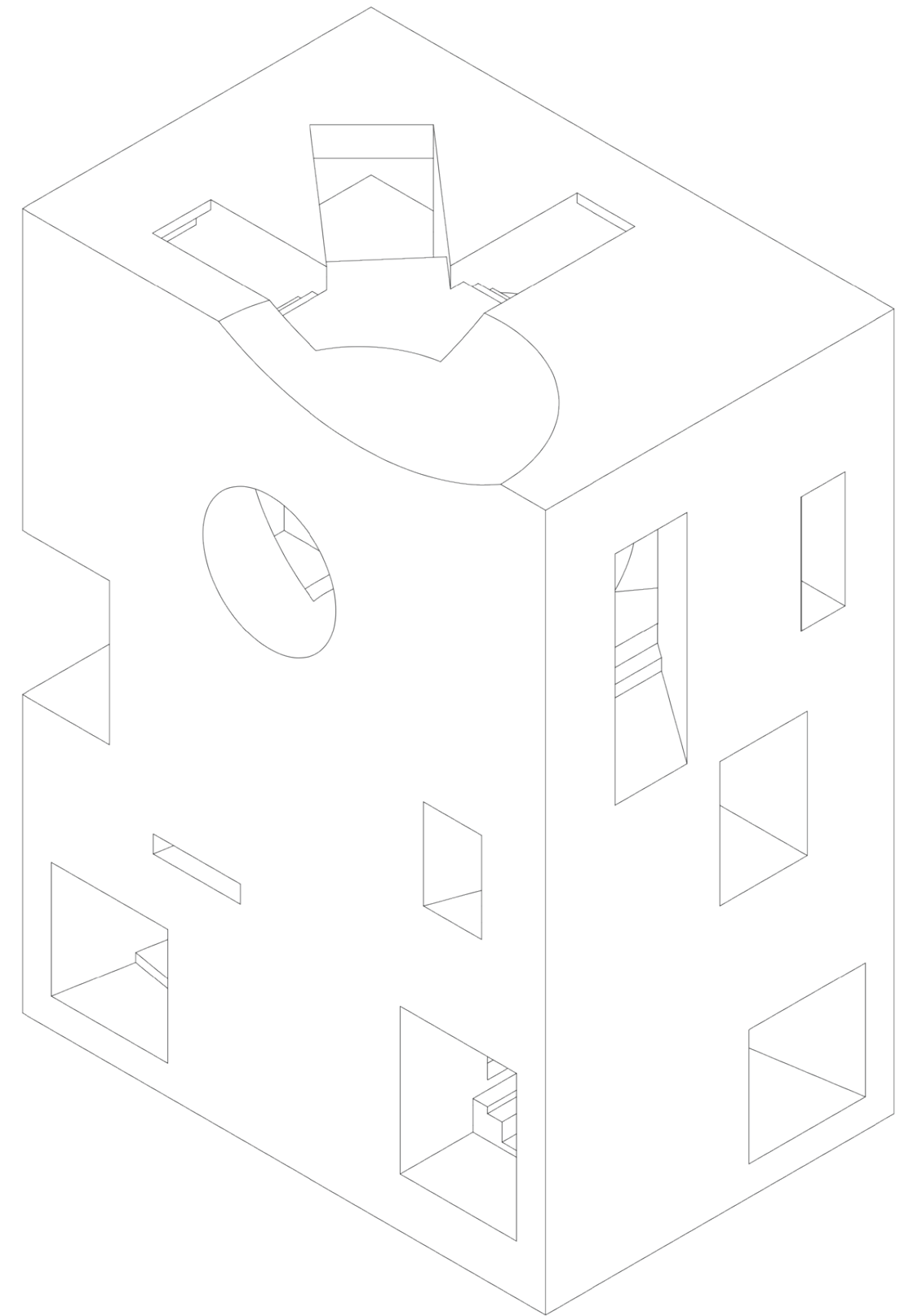


"Hülle" (Shell), Greta Ghanem, 2020



“Raumgefüge” (Spatial Structure), Leonie Schleyer, 2020





“Raumgefüge” (Spatial Structure), Jan Lehmann, 2019

Notes on Contributors

Alberto Campo Baeza was born in Valladolid; he saw the light in Cádiz. He has been a professor in the School of Architecture of Madrid, ETSAM since 1986. He has taught at ETH Zurich and EPFL in Lausanne, as well as the University of Pennsylvania in Philadelphia, Kansas State University, CUA University in Washington, the University at Buffalo, and many other schools of architecture. Since 2021, he has been a professor at NYIT. His works are widely recognized, from the houses Turégano, Gaspar, de Blas, or the House of the Infinite, to buildings like Caja Granada, the Offices in Zamora, or the Sports Pavilion for the University Francisco de Vitoria in Madrid. He has exhibited his work in the Crown Hall of IIT Chicago, the Urban Center in New York, the Palladio Basilica in Vicenza, the Tempietto S. Pietro in Montorio, the MAXXI in Rome, the MA Gallery of Tokyo, and the American Academy of Arts and Letters of New York. He has been a full member of the Royal Academy of Fine Arts of San Fernando of Spain since 2014. He has been awarded the Heinrich Tessenow Gold Medal, the Arnold W. Brunner Memorial Prize of the American Academy of Arts and Letters of New York, the Attolini Lack Medal of the Anahuac University of Mexico, the Piranesi Prix di Roma, and the RIBA International Fellowship. In 2019, he was named an honorary fellow of the American Institute of Architects of New York and was awarded a Gold Medal for Spanish Architecture, and, in 2021, he received the National Prize for Architecture in Spain.

Matthias Ballestrem is an architect and a professor of architecture and experimental design at HafenCity University in Hamburg. He has taught architectural design at various institutions, including Cornell University, the CIEE GAD Berlin program, and TU Berlin as a visiting professor of building design and construction. In 2011, he was a scholar at the German Academy Villa Massimo in Rome. He is co-founder of the “Programm Entwurfsbasierte Promotion” (PEP, or the Program for Design-Based Doctorates) and an active member of the European CA2RE network on design-driven doctoral research. He is also a member of the Research Academy of the EAAE and the Interdisciplinary Forum Neurourbanism. His main research interests include design-based research, experimental design, spatial perception, spatial complexity, and the architectural typologies of interiors.

Anton Burdakov is a visual artist based in London and Berlin. Born in Kiev, Burdakov grew up in Ukraine and the UK. He studied neuroscience at the University of Cambridge and sculpture at the Royal College of Art in London. Focusing on the relationship between people and built environments, he works across sculpture, installations, and projects in public space. Beyond the practical purpose of place-making, he sees it as a way to access and re-order unconscious processes and fictions. Through approaches borrowed from architecture, Burdakov seeks to connect specific circumstances to wider themes of memory, alternative timelines, and the possibility of change.

Marta Fernández Guardado is a Spanish architectural designer, researcher, and educator based in Berlin. For seven years, she worked as a project architect at June14 Meyer-Grohbrügge & Chermayeff and Sam Chermayeff Office, developing furniture, interiors, and buildings such as the residential building Kurfürstenstrasse 142 in Berlin. She has taught at the DIA Dessau, ETH Zürich, and TU Berlin, where she currently works as a lecturer and research employee. Since 2019, Marta has been a doctoral candidate at HafenCity University Hamburg, a participant in the Program for Design-Based Doctorates PEP at TU Berlin, and a member of the Community for Artistic and Architectural Research CA2RE, where she has been conducting a design-based research project “Home: Things & Bodies,” a thing-based exploration into personal space and the core of her current independent practice.

Corinna Kühnapfel is a PhD candidate in the EU H2020 ARTIS project (Art and Research on Transformations of Individuals and Society) at the University of Vienna. She has a background in cognitive science and embodied cognition with a focus on empirical aesthetics and neuroaesthetics. Her dissertation deals with the role of the body in art experiences by specifically considering installation art as a form noted for its ability to evoke and require use of the body, bodily movement in front of visual art, and the role of individual differences in body awareness for emotional experiences of art. She is also a co-founder of EDGE e.V., a non-profit organization dedicated to neuroscience communication and bridging art and neuroscience through workshops and exhibitions.

Hannah Krufft is a master’s student at the Berlin School of Mind and Brain of Humboldt-Universität. She has a background in psychology, neuroscience, cognitive science, and philosophy of mind, with a focus on embodied cognition and human-environment interaction. She works as a student researcher in a project investigating stress and well-being in the city affiliated with the Interdisciplinary Forum Neurourbanism e.V. and the EU H2020 ARTIS project (Art and Research on Transformations of Individuals and Society).

Tim Simon-Meyer is an architect, lecturer, and researcher based in Schleswig-Holstein, Germany. He has a particular interest in the relation between structural expression in architecture and its potential for affordances and appropriation in use. He studied at UdK Berlin and the UAL Lisboa and gained practical experience at the firms of Pezo von Ellrichshausen in Concepción, Chile, and Max Dudler in Berlin, Germany. From 2015 to 2017 he taught at TU Munich, and since 2017 at HafenCity University Hamburg, where he is also working on his doctorate, “The Potential of a Tectonic Approach for the Experiential Qualities of Architecture.” Together with the Portuguese architect João Quintela, he founded the architectural office Atelier JQTS.

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Franziska Wittmann is an architect and research assistant at the Department of Architecture of ETH Zurich. She studied architecture in Munich and Zurich following her training in dance and choreography in Salzburg. Her publications show a subtle handling of energy in architecture and the effect of architectural conditions on people. In the background is the assumption that architecture as a whole can be enriched with qualities through a conscious handling of physical natural laws and physiological themes. *Leistungen der Architektur / Effects of Architecture*, Quart Publishers Lucerne 2017 / 2021. *Körper in Räumen / Bodies in Spaces*, Quart Publishers Lucerne 2019.

Imprint

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2022

ISBN (print): 978-3-947972-51-7
ISBN (Ebook): 978-3-947972-52-4

DOI: 10.34712/142.32

Editors: Matthias Ballestrem,
Tim Simon-Meyer

Graphic Design: Niklas Sagebiel

Copyediting: Rob Madole

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Edited by
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ISBN 978-3-947972-52-4