Architecture in crisis. Experiments with more-than-human participation

CRATÈRA

micol rispoli

ARCHI-TECTURE IN CRISIS

EXPERIMENTS WITH MORE-THAN-HUMAN PARTICIPATION

TER-RA-FOR-MA-ZIONI

To all neglected humans and non-humans
in architecture.

To those who imagine and experiment with
more careful ways of living together,
so that plural and divergent worlds in this
world can thrive.

To Bruno Latour, who put this into practice.

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FOREWORD: THE UNCOMFORTABLE LEGACY OF THE MODERNS

Miguel Mesa del Castillo Clavel

This book originates from a discomfort, or a disagreement, that many architects, both men and women, have been affected by. We often share the discomfort produced by the white, male, heteronormative, Eurocentric, ableist, and colonial condition implicit in the architectures of the global North. A current of unease that consists, in broad strokes, of the difficulty of reconciling the work of architecture with the intellectual, ethical, and political commitments implied by moving away from *the ruins of modernity*.

The architecture we have inherited from the Modern Movement was consolidated thanks to the experience of some European architecture schools whose influence still strongly pervades the discipline, which in general has never abandoned the theoretical and ideological reference of objective science. A scenario that implies a way of understanding buildings and all technical objects as autonomous entities without political agency, situated outside, discussed only by communities of witnesses through *literary technologies* and languages inaccessible to non-experts. This conception has contributed to disconnecting architecture from the debates that have simultaneously taken place in other fields of culture.

One might wonder why architects have shown so much resistance to being observed in their *laboratories* and their practices, while they fabricate the facts that they have purported to be objective since the 1920s. In architecture, studies of science understood as social practice have not been relevant until very recently, and even today their impact on architectural theory and practice remains very marginal. It is worth remembering that the Bauhaus, as the epitome of modern laboratories for architectural pedagogy, consolidates its intellectual proposal centered on logical positivism and around the four guarantees that Bruno Latour grants to the modern Constitution: the transcendence of nature; the construction of society as something immanent; the separation between nature and society; and the impossibility of *translation* between both spheres.

In contrast to this perspective, the French philosopher advocates for a new parliament of things (*Dingpolitik*) that recognizes and guarantees the rights of non-humans, hybrids, and *Things*. Modernist architecture was thus an architecture of objects and imposed solutions, of smooth, resolute volumes devoid of conflict. This book proposes that we embark on a journey that frees us from the object (autonomous, delimited, stabilized, and depoliticized) and takes us back to things, to their political arenas, to their debates, their parliaments, and their agonisms.

A radical defense of the architecture of assemblages, of buildings composed not only of construction materials but of vibrant constellations of multiple entities with agency to act and affect the world. Micol Rispoli warns us, in the face of contexts, backdrops, or *genii loci*, that buildings are entangled in networks of actants, both living and inert, linked by unstable interactions. Leaving behind modernity means recognizing that we are surrounded by hybrids composed of humans and more-than-humans, and that the agency of buildings is conditioned by their relationships with other entities, often unpredictable and contingent, as the recent viral pandemic has eloquently demonstrated.

This text is also a laborious work of convergence between closely related but sometimes very delimited disciplinary fields. There is a good deal of research around architectural studies that have examined their procedures, technologies, archival methods, protocols, forms of dissemination and distribution of prestige, producing theoretical instruments that today would be very unreasonable not to consider. Borrowing many tools from Science and Technology Studies, the author invites us to face an epistemic challenge that helps architecture to break out of the deadlock of Modernity.

Instead of focusing on describing a specific scenario that needs architectural intervention (such as the restoration of a landscape, the revaluation of a neighborhood, the provision of material conditions for participation, or the domesticity of a social group), let us try to study its agencies, networks and chains of techno-material associations, processes of laboratization, interscalarity, translocality, to identify the collectives that inhabit it, the recognition of rights from non-anthropocentric perspectives, existing and potential forms of resistance, its resilient capacity, and the socio-material ecologies it mobilizes, and how all this may be relevant to our designs.

PRELUDE: CREATING "A SPACE FOR HESITATION"

This work stems from a complex path, at times distressing, in which I have tried to thoroughly question the reasons for my growing dissatisfaction with the architectural profession, or at least the one I was taught at university. In the Western world, the architect is generally attributed the role of an *expert*, a *genius* with special technical-aesthetic skills, capable of providing optimal solutions for improving the quality of life of human beings on this planet. Even though I have always had a controversial relationship with architecture, it would be unfair of me not to admit that I too, in my professional experience, have felt the fascination with a role that allowed me, by myself, to mould the ideas and solutions that I had generated and watch them taking shape. Many times I have felt enthusiastic while seeing them materialising and many times I have turned a blind eye when the illusory initial perfection started to crumble, giving way to the recalcitrance of the materials, to the clients' complaints, to the necessity for too costly maintenance. The creative and alleged solving power that architectural practice, as it has usually been taught, seems to offer is tempting. As well as its alleged goodwill and humanitarianism. However, a growing uneasiness with respect to the modern but still living presumption of being able to offer closed and all-embracing solutions from above and in the abstract, reducing and objectivising complex problems, without fully investigating the worlds they came from, motivated me to create what philosopher Isabelle Stengers would call "a space for hesitation" (2005). I started to become sceptical about a clear-cut understanding of what is good and right and to wonder about what is not said, what is not shown, and the different agencies, necessities, and circumstances that are too often neglected in architectural practice.

But there is more. My uneasiness also extended to the more general academic system in which I was trained. The same one in which I now find myself working. Paraphrasing the words of sociologist and art curator Alessandra Pomarico (2018), I am an educated white woman from the Global North of the world. I have always been curious and yearning for learning, as I believe that the role of culture is fundamental in a healthy society. In many respects, I consider myself lucky since so far I could keep asking myself questions and keep questioning. However, I have seen many suffer and I have suffered myself because of an academic system that is way too often inclined to oppress, mistreat, discourage, and deprive people of the ability or wish to imagine. Today academia is mainly conceived in terms of knowledge production: an economic enterprise inscribed in a capitalistic vision. In this way, students are de-politicised and the academic journey follows entrepreneurial dynamics, in which education is seen as a product, as goods. In the Western history of educational institutions, the principles that shape pedagogy imply an inhomogeneous and asymmetrical relationship between those who *know* and those who *do not know*. This often entails an intrinsically violent approach that, beyond apparently good intentions, is aimed at moulding, instructing, and training people. By insisting on abilities, skills, standardised study and evaluation programs, academic institutions frequently tend to instruct students pushing them to accept social roles uncritically and to direct their choices towards the market. Besides that, class, race, ability, and gender prejudice continue, although often silently, to deeply structure how certain ways of acting are internalized and repeated later on. What appears today as a global crisis scenario, which affects both us and the planet, turns into a crisis of imagination too: we seem to be incapable of thinking, or even dreaming, of the possibility of living differently, forced to *function* within a system that is incorporated into almost every aspect of our lives.

Creating a space for hesitation for me has not only meant enthusiastically exploring alternative design and pedagogical attempts; passionately interacting with others who shared my concerns and sensitivity; and looking for opportunities for further dialogue in fields other than architecture. Creating such a space also meant pushing the boundaries of that system and – as philosopher Michel Serres would say (1997) – exposing myself, questioning how I used to work and the tools with which I used to do that, unlearning what I had been taught up to that point, and learning to be affected by other ways of being in the world.

Chapter I of this book explores how, although the architect-author paradigm and the rationalist, centralised modernist *ethos* remain dominant, both in the practice of design professionals and most Western academic curricula, more and more approaches are being developed that oppose this scenario. Since the 1960s and 1970s, but increasingly over the last

two decades, such approaches have understood architecture as a tool for social transformation, foregrounding the democratisation of design practice. Some more recent reflections have expressed a more explicit stance against purely placatory forms of participatory design, i.e., arranged to obtain users' consent for actions already determined in advance by designers. The emphasis on the importance of including users' voices, desires, and needs has been further expanded through the influence of feminist thinking in architecture, which has inspired alternative practices to make visible what is excluded by dominant ideologies and practices. What avenues would open up for participatory design if, rather than understanding it as a consensus-making practice, the ways of dwelling and being in the world of usually neglected actors were taken seriously?

Chapter II attempts to carry out a more accurate analysis of the disciplinary scenario in which architects are trained and operate in the Western world, and against which the experiences mentioned in chapter I move. This analysis aims to show how the particular expertise of architects produces and is produced by normative models that constitute actual power technologies, or rather, – in Foucauldian terms – bio-power technologies. Foucault's analysis of the connection between knowledge and power is used as a lens to observe some stories of the Modern era: particularly, these stories are those that recur in the narratives underlying the pedagogical models adopted by most architecture schools of the Western world. Besides, the chapter highlights another much older question that is at the basis of such models, which concerns the binary oppositions specific to the tradition of Western thought, such as the nature/culture divide and other dualisms like thought/practice, design/construction, and architect/builder. In architects' education, certain pedagogical practices deploy procedures to ensure that students are absorbed in the dominating disciplinary paradigm. In this regard, a major role is played by architectural handbooks, which have contributed to the disciplinary construction of the architect as an expert technician, capable of operating on space through norms and standards. Furthermore, handbooks have conveyed a generic idea of the user, or universal body. This idea, in particular, even though it was shaped according to different forms of logic and visions – has characterised Western traditions of architectural design since ancient times.

Chapter III dwells on the contribution that Science and Technology Studies (STS) offers to reflect on issues concerning expert knowledge and participation in architecture. Actor-Network Theory (ANT), in particular, suggests a more-than-human perspective, significantly problematising the meaning of participation and what and how many parties are involved. Binomials such as nature/culture, human/non-human, subject/object, which belong to the modernist logic, are progressively questioned and treated as an effect, i.e. as a product of the purification of more complex relations. In contrast to conventional social science perspectives, ANT scholars extended the social to include multiple and more-than-human networks. Ethnographies conducted within architectural practices, in particular, reveal how design is a socio-material practice and, therefore, mediated, and which is carried out through very specific devices and techniques. By opening the black-boxes of scientific facts, technological artefacts, and design practice itself, STS scholars have made the experts' cultural authority questionable, showing a commitment towards the democratisation of technical knowledge. Notably, the influence of pragmatist philosophy on ANT spurred several scholars and designers to reframe participation through an issue-oriented and material perspective on its processes. Objects, devices and materials, not just human subjects, play a role in enacting particular ideals of citizenship and participation. Another aspect that takes on particular relevance, is Isabelle Stengers's invitation (2005) to continually foster situations that might destabilise the existing versions of the common world, to make new and unknown configurations possible. This turns out to be an ethical-political commitment to take into account all the heterogeneous parties that constitute the common world, without losing sight of potential victims. In this regard, María Puig de la Bellacasa (2017) emphasises the necessity of taking into account human and non-human parties which are usually neglected because they are unable to express, in conventional or normative ways, their concerns and needs.

Chapter IV aims to offer a partial and temporary overview of the several overlapping ways in which the more-than-human challenge is taken up by architects to explore different ideas of architectural practice and its political dimension. By questioning the modernist pact of social utility, according to which they are responsible for the creation of solutions for the *common good* by designing objects, technologies, and spaces, some architects have re-conceived and re-learned their practice in many different ways. From a STS perspective, design becomes an inherently participatory practice, in which

the architect is only one of the multiple and heterogeneous parties involved. Furthermore, an experimental agenda has unfolded in pedagogical spaces of architecture, whereby STS's anti-technocratic stance – their concern for the plurality of knowledge beyond those of experts, and the potential impact of neglected actors in the articulation of given socio-material assemblages – has particularly inspired relevant conceptual and practical explorations in design studio projects at some schools of architecture. Beyond architectural solutionism, these experimental briefs have revolved around particular more-than-human challenges, provoking a crisis in conventional methods and means of design and in how participation is usually understood.

Chapter V dwells on another experiment that is inscribed in this logic: together with anthropologist Tomás Sánchez Criado, from October 2019 to March 2020, I engaged in developing a joint auto-pedagogical programme to embrace the more-than-human challenge and experimentally re-learn my way of practicing architecture. The idea again revolved around working with actors who could put architectural practice's conventional contractual and collaborative/participatory ways of working in crisis. In our case, the encounter with Moritz, a neurodivergent person, prompted us to question the problematic relationship between participatory design and neurodiversity. Participatory design processes, in fact, besides being operations aimed at consensual closure, tend to rely too much on articulate language to explore needs and solutions, sidelining the more-than-verbal experiences and modes of expression specific to certain forms of neurodiversity. These concerns motivated us to embark in a series of explorations aimed at more-than-verbally coming into Moritz's proximity and learning to be affected by his ways of inhabiting in the world. As we came to realize, indeed, no participatory design practice could even start taking place without this un-learning and re-learning process.

These explorations are documented in the final section, a notebook titled *Learning to Be Affected by Moritz's Spatial Practice*. The attempts at coming into the proximity of Moritz gave me the chance to put my knowledge in crisis: I questioned the architectural culture through which I was educated, and the tools with which I used to work, experimentally learning to be affected by different ways of sensing and knowing. They not only made possible an articulate more-than-verbal relation with Moritz and his family, but also a possible avenue for designing together.

I. THE *WHO* AND *HOW* OF PARTICIPATION

For several decades now, there has been a growing awareness of the limitations and challenges posed by the legacy of the modernist approach in architecture. Many practitioners and scholars have noted how this paradigm, which regards architectural design as the domain of an expert individual capable of providing closed and comprehensive solutions from a distant and abstract perspective, has proven ineffective in addressing interconnected and urgent issues such as the climate crisis, resource depletion, and increasing global inequalities. Numerous voices advocate for moving away from an exclusive focus on efficiency and aesthetic qualities, instead calling for a reimagining of architecture as a tool for social transformation. This involves democratizing architectural practices and exploring new, thoughtful approaches to address planetary crises.

Concerns more or less felt, more or less linked to opportunistic market dynamics – often subtle and therefore not easily discernible –, have been gaining momentum in recent years, even through highly established institutional channels. To name but a few, in 2010 the *MoMA* exhibition *Small Scale, Big Change: New Architectures of Social Engagement* claimed a new form of architectural practice with social relevance, showcasing projects such as low-cost housing, school buildings, community facilities, public transportation access, and the renovation of existing social housing (Cupers, 2014). The same year, the 12th Exhibition of the Venice Architecture Biennale, curated by Kazuyo Sejima and titled *People meet in Architecture*, was conceived as a chance to explore the diverse potentials of architecture and to recognize its multitude of approaches. According to the curator: "[...] the twenty-first century has just started. Many radical changes are taking place. In such a rapid-changing context, can architecture clarify new values and a new lifestyle for the present?" (Cilento, 2010). At the 13th edition of the Biennale in 2012, the U.S. Pavilion *Spontaneous*

Interventions: Design Actions for the Common Good[1] presented a variety of collective, temporary and spontaneous initiatives. In the same edition, the Golden Lion was assigned to *Urban-Think Tank* (U TT) for a project documenting the squatter community of Torre David[2], in Caracas, Venezuela. In 2015, *Assemble*[3], a collective of architects based in London, was awarded the Turner Prize, a highly coveted recognition in the field of visual arts. Their achievement was attributed to their collaborative efforts with the residents of Liverpool in refurbishing the abandoned buildings on Cairns Street. The very same year, MoMA in New York promoted the exhibition *Uneven Growth. Tactical Urbanism for Expanding Megacities*[4], aimed to signal the potential changes in the roles of architects and urban designers towards the increasing inequality of current urban development. The idea of tactical urbanism surfaced as a comprehensive framework for grasping various innovative urban design experiments within today's megacities. Embracing participatory democracy, it aimed to offer an alternative to both traditional modernist-statist and neoliberal urban intervention paradigms (Brenner, 2016). In 2016, the Pritzker Prize was awarded to Alejandro Aravena for his housing project in Iquique, Chile. This project has gained widespread recognition and continues to be featured in numerous exhibitions and publications worldwide as an emblem of *engaged* architecture[5]. Aravena was also the curator of the 2016 Architecture Biennale, *Reporting from the Front*. Its central premise was that design practice, as a discipline naturally inclined toward a proactive engagement with reality, can provide effective solutions to the pressing issues of the contemporary age. The curators of the 16th Venice Architecture Biennale, Yvonne Farrell and Shelley McNamara, presented their theme – *Freespace* – as follows:

> Freespace can be a space for opportunity, a democratic space, un-programmed and free for uses not yet conceived. There is an exchange between people and buildings that happens, even if not intended or designed, so buildings themselves find ways of sharing and engaging with people over time, long after the architect has left the scene. (Farrell & Mcnamara, 2018)

Other publications, public events, and exhibitions have highlighted the increasing interest in redefining the role of architecture, particularly in addressing the pressing issues of the climate crisis (Graham, 2016; Harriss et al., 2021). In recent years, architects and urban planners have begun to formulate design proposals to address the era of the "broken planet", also known as *Anthropocene*, *Capitalocene*, *Plantationocene*, *Plasticocene*, *Chthulucene*, *Gynocene* (Fitz & Krasny, 2019, p. 11)[6]. *bioTallinn*, the Tallinn Architecture Biennale 2017, curated by Claudia Pasquero, was held under the idea of overcoming boundaries between natural and artificial realms:

> Rather than considering nature as a balanced system, that is perturbed and derailed by human action, *bioTallinn* assumes that there is no nature. [...] It explores the city as a territory of self-organization and co-evolution of multiple dynamical systems, including ecological systems, infrastructures and technological systems, social groups and political systems. (bioTallin, 2017)

In 2019, the XXII International Exhibition of La Triennale di Milano, curated by Paola Antonelli and titled *Broken Nature: Design Takes on Human Survival*, emphasized the significance of creative practices in examining and safeguarding our species' connections with the intricate systems of the world. The same year, the exhibition *Critical Care. Architecture for a Broken Planet*, curated by Angelika Fitz and Elke Krasny, was held as an appeal for a caring architecture and urbanism to "contribute to repairing the future and keeping the planet and its inhabitants alive" (2019). The 17th and 18th Venice Biennale also showed similar socio-ecological concerns. Hashim Sarkis, the curator of the first, stated that: "In the context of widening political divides and growing economic inequalities, we call on architects to imagine spaces in which we can generously live together", emphasizing the need for a new "spatial contract" (2020). The second, curated by architect, architecture lecturer, and writer Lesley Lokko, focused on issues such as decarbonisation and decolonisation (2023).

Such eco-socio-political concerns in the field of architecture and a certain scepticism towards centralised approaches and promises of modernist

1. http://www.spontaneousinterventions.org.
2. More information on this project is available at: http://u-tt.com/project/torre-david/.
3. https://assemblestudio.co.uk.
4. More information on this exhibition is available at: https://uneven-growth.moma.org.
5. Many scholars, particularly those rooted in critical urban studies, have raised doubts about the effectiveness of these interventions (Brenner, 2016; Boano & Vergara Perucich, 2016; Cupers, 2014; Schneider, 2018).
6. See also: Haraway, 2015; Demos, 2017; Boehnert, 2018.

culture have a more distant origin: as early as the 1960s and 1970s, professionals, scholars and collectives attempted to create more democratic alternatives. In more recent years, some scholars, in reflecting critically on the theme of participatory design, have expressed a more explicit stance against placatory forms, i.e., arranged by designers to obtain the consent of users on predetermined actions. Other reflections, from a feminist perspective, have inspired practices aimed at making visible and audible the parties that are usually neglected by dominant ideologies and practices. However, an interesting question would also be: what new challenges would open up for participatory design if the range of parties at stake were broadened, and if it re-learned its ways from traditionally neglected human and non-human entities?

EARLY COUNTERCULTURES

During the 1960s and 1970s some important experiences, which were critical of the dominant models of modernist design, drew attention to the themes of the relationship between (series) design-production and the user (as an individual), and the question of user participation in the design processes. Indeed, those years witnessed a resurfacing of different kinds of utopian architecture in Europe. Some of them took the form of megastructures – adaptable, flexible, extensible – in the atmosphere of a widespread trust in technology and in the unlimited availability of energy resources, which was suddenly contradicted by the 1970s oil crisis. Other kinds, such as Constant Nieuwenhuys's nomadic architecture, or Yona Friedman's mobile one – that is to say, available to the inhabitants' autoregulation – although they shared with the first ones some of their views on megastructures, they were presented, more specifically, as alternatives, as social change tools.

Regarding the Italian experience, certainly more familiar to me, *Archigram*'s work, which is linked to the first group of these utopias, influenced – by polemical opposition – some of the first radical expressions. *Archigram*, which was formed at the *Architectural Association* in London in 1961, through the use of different means, such as radical comics, poems, and statements, proposed the vision of a consumerist city, founded on resources that were considered unlimited. This vision pushed other groups to stand as antagonists to imagine a socially and politically committed architecture. The work by the Italian group *Archizoom* – whose name was a direct reference to the title of *Archigram*'s number 4, that is, *ZOOM! Amazing Archigram* – represented an ironic response to *Archigram*'s consumerist and separation logic between architecture and politics, and inaugurated the Italian *Anti-design* or *Radical Design* movement (Dellapiana & Pesando, 2018) with projects and essays that criticised modernism and explored flexible approaches to urban design. S*uperstudio* opposed mainstream architecture as well – accusing it to ignore and worsen environmental and social problems – and proposed polemic projects that imagined dystopian worlds. The *Strum* group saw in architecture a means to participate in social and political protests, which reached their highest expression in 1968, through the organisation of seminars, and by handing out copies of the group's photo stories. One of the most relevant contributions made by these radical groups was that of moving beyond a vision of architecture that consisted in a static building, favouring an image of architecture conceived in terms of cultural critique, and political and social practice. The exhibition *Italy: The New Domestic Landscape. Achievements and Problems of Italian Design* held at the *MoMA* in New York, celebrated the contribution of design to Italy's postwar economic development and success in the international market (Ambasz, 1972). However, the exhibition displayed, at the same time, luxury goods designed by important Italian architects who worked in the dominant consumerist context and provided the imagination of a young generation with an extraordinary showcase. Therefore, in the same exhibition, critical cultural expressions towards the consumer society and the architects' role within it were opposed to the design of consumer goods. Like many social utopias, such as those of Nieuwenhuys and Friedman, these radical types of experimentation were included in the framework of the critique of modernism, of its design practices and its educational paths. The relevance acquired by a renewed interest in forms of production that differed from industrial ones – based on standardisation – was not unimportant.

> *Gruppo 9999*'s environment was premised on nature's condition as a primitive and remote 'other' to technological modernity. [...] The turn to craft by Italy's countercultural architects in the early Seventies was informed by a wider surge of interest in the handmade. On the one hand, this period saw a growing popularity for do-it-yourself (DIY)[7]. (Rossi, 2014, pp. 149-151)

7. The do-it-yourself (DIY) culture is based on principles of self-management and self-production. It is an ethic born in reaction against a dominant society that considers culture in terms of a commercial enterprise (Rossi, 2014).

Craft production appeared as a possible way to recapture individuality in a world made homogeneous by series production. In 1974 Enzo Mari invited the public to build their own furniture by following a series of drawings published in a catalogue which was distributed for free (1974). By allowing the users themselves to produce their goods, he hoped that they would experiment with a non-alienated production method, freed from its fetishist connection with commodities. Also significant was the case of Riccardo Dalisi, the Neapolitan architect who, since 1971, led a series of experiences in one of the districts of Naples, Rione Traiano (1975). The interest of *Arte Povera* in the public's participation and the use of simple, common material, led Dalisi to encourage street kids to spontaneously produce furniture and structures with simple tools and material at hand.

He noted a higher degree of creativity among "the children of the lumpenproletariat" compared to his architecture students. He attributed their uninhibited nature to their freedom from the constraining effects of Italy's education system and the rigid routines of the assembly line. As part of the project, Dalisi kept a diary and took photographs to document the behavior of the children (Rossi, 2014, p. 152). Another relevant experience was that of *Global Tools*[8], which proposed to teach craftsmanship to stimulate and restore the atrophied creative abilities in contemporary society. In the second part of the 1970s the members of *Superstudio*, in their research course and project, *Extra-Urban Material Culture*, at the Department of Architecture of Florence, made use of anthropological techniques to examine and document the material and tools that belonged to Tuscan rural culture. Their open, militant opposition to the forms of modernist, standardised, consumerist and commercial design, proposed the return to a simpler and more spontaneous craftsmanship. (Natalini et al., 1983)

Giancarlo De Carlo: *An Architecture of Participation*

In Italy, De Carlo's name is linked like no other to the theme of participation. A resumption of discussion on his contribution can be found in the recent re-editions of *L'architettura della partecipazione* (2013)[9] and *La piramide rovesciata*[10] (2018). De Carlo's contribution[11] has developed since the second half of the 1950s and represents an actively committed critique of some positions, or rather, the drift of modern design. In particular, he elaborated on key themes concerning the social role of architecture and the education of architects, which, during that period, primarily consisted of predetermined solutions, standards, models, and other modernist conventions. His ideas had a significant international influence and made a noteworthy contribution to *Team-X*[12]. His critique focused on those conditions that, on the one hand, have led to the exclusion of the very addressees of the project – society, and citizens – and, on the other hand, have led architects to limit themselves – in an neutral vision of technique – within specialised, aesthetic and self-referential positions. According to De Carlo, specialisation is a dangerously degenerative phenomenon because it severs

8. *Global Tools* was founded in 1973. It was made up of leading architects of the Italian radical counterculture – including Dalisi himself, Andrea Branzi, Michele de Lucchi, Alessandro Mendini, Sottsass, *Superstudio* and *Gruppo 9999*.

9. De Carlo's essay *An Architecture of Participation* was published in 1972 by the Royal Australian Institute of Architects and collected the reflections presented in a conference in Melbourne, the third in a cycle dedicated to the future of architecture and urbanism. The conference was opened by Jim M. Richards with *A Critic's View*, followed by Peter Blake with *The New Forces*. The three essays are collected and translated into Italian (Richards et al. 1973).

10. This work represented a sharp criticism of the hegemonic structure of the Italian university, devoid of tension and demands from below and sustained by the principle of authority (De Pieri, 2018). The book includes, in addition to the reprint of De Carlo, G. (1968) *La Piramide rovesciata*, Bari, De Donato, also that of two other essays: *Perché costruire edifici scolastici* – originally published as Id. (1969) Why/How to Build School Buildings. *Harvard Educational Review* 39(4), 12-35 – in which De Carlo also questions the spatial organisation and the necessity itself of school buildings – and Id. (1970) *Il pubblico dell'architettura* – published in Italian/English –,*Parametro* 5, 4-13. To give an account of its relevance it is enough to quote the titles of some chapters: *The revolt and frustration of the school of architecture*; *The ambiguity of the architect's role*; *The Modern Movement: Betweeen commitment and uncommitment*; *Faith in "how" and ignorance about "why"*; *Good reasons for the non credibility of architecture*; *Participation and scientific method; The discovery of the users' needs*.

11. Although De Carlo's contribution has been particularly relevant in the Italian context, this book consciously excludes a much broader range of experiences on participation in those years. We need only think of Alison and Peter Smithson, Cedric Price and Takis Zenetos, to name but a few. For a brief overview of their contributions and others sharing a similar perspective, see: Ratti & Claudel, 2015.

12. In 1953, a group of young architects were given the task of organising the tenth CIAM (*Congrès Internationaux d'Architecture Moderne*) in Dubrovnik in 1956 – hence the number X (10) in the name. Numerous architects were part of the team. A more stable group included Jacob B. Bakema, Giancarlo De Carlo, Georges Candilis, Aldo van Eyck, Peter and Alison Smithson, Shadrach Woods. In addition to them, also José A. Coderch, Ralph Erskine, Herman Hertzberger, Gulliermo Jullian de la Fuente, Reima Pietilä were present on several occasions. Other architects were present at some of the meetings, including Christopher Alexander, Fumihiko Maki, Jean Prouvé, Kenzō Tange and James Stirling. Some of the points shared by the group were the need for greater consideration of people's actual social needs and the search for a relationship with the specific and historical conditions of different contexts, which is opposed to modernist ideology of erasure and *tabula rasa*.

the connection between the architects' field of activity and the external world. In the industrial age, specialisation hasn't just become a means to rationalise production, but also a tool of social control. Particularly relevant is his seminal text *An Architecture of Participation, which* collects some of his most important reflections. De Carlo explicitly went against the trend of the dominant culture, and developed, since the beginning of the 1950s, a series of trials that represented an important critical rethinking of the architecture and the architectural practice of the Modern Movement[13]. In particular, he developed a severe critique of rationalist thought starting from the role of the designer and the necessity for "translating design into a process, into an open work, capable of welcoming, listening and connecting with the city and the citizens' tensions" (Marini, 2013, p. 13). The Modern Movement has made extremely scarce contributions, different from the expected ones,

> because the scientific content of the first approaches to the issue of the organisation of the physical space was rapidly absorbed by the labyrinths of schematizations and trapped by models that apparently grasped reality, but that, in effect, distorted it deeply [...by using)] the same criteria that one would adopt when planning the production of a commodity. [...] The Modern Movement has lost touch with, and even cognition of, the context in which it had meant to work. [This] required the direct participation of the protagonists, while the applied method imposed to exclude them and ignore their voice. [...] There remained no other way except to take refuge either in art's fiery arrogance or in technique's cold neutrality; to surrender to the excitement of aesthetic research or to the tranquillity of professional practice. (De Carlo, 2013, pp. 56-57)

People do not simply use architecture with a logic that can be codified and uniformed, but also follow their desire for connections. De Carlo insists on the misunderstanding of the users' desire, and especially on the clichés created by the Modern Movement about it, revealing what lies behind the simplifications that almost reduce man to an automaton that can be measured and standardized: a cog in a *machine-city*. Therefore, De Carlo never followed given rules: the rule is to listen to the city, that is to say, to understand how the city is experienced. He felt the necessity of taking a chance on his design work, to contribute to society's cultural growth, in an architectural sense, so that society can be able to manage its own space of existence and co-existence, developing communal sharing[14]. After all, this tension in the international scene also drove other members of the *Team X* who, in their work, aimed at a collective methodology with a more complex approach to the built environment reality.

BEYOND TOKEN PARTICIPATION

In more recent years, some architects and scholars have attempted to map past and more recent international experiences of socially and politically engaged architecture, in order to keep track of this evolving and constantly expanding scenario. An example of such efforts is *Spatial Agency*[15], a project by Nishat Awan, Tatjana Schneider and Jeremy Till. Originally conceived as an online database[16] and later evolving into a publication (Awan et al., 2013), *Spatial Agency* collects several rather heterogeneous international collaborative practices. These practices, the authors argue, pertain to "a second history of architecture, one that moves sharply away from the figure of the architect as an individual hero, and replaces it with a much more collaborative approach in which agents act with, and on behalf of, others" (*Spatial Agency*, 2020,). Notably, the concept of *agency* in social and political theory contrasts with *structure*, which refers to the organization of society. Agency denotes an

13. In the texts mentioned here Modern Movement is always written in capital letters, and so it was reported in this chapter. We know that nowadays capital letters aren't just being dropped, but also that what seemed to be a unique, monolithic history has revealed itself – in the historiographical contributions that have been made over the years – to be made by many, different stories.

14. De Carlo's design process was emblematic for the Matteotti neighbourhood in Terni (1969-1975). In that case, being the real users unknown in advance – indeed, the subsidised allocation of housing units, to this day, only occurs at the end of the construction – he addressed all the potential users, about 1800 workers. Therefore, De Carlo organised an exhibition of projects that had already been completed in various countries, in order to immediately offer alternative models, that differed from the usual ones. This triggered – at times fierce – debates and discussions. In this way, little by little, both the real overall needs, which allowed to formulate hypotheses on the general configuration of the neighbourhood, and the specific needs, which fed the design of individual units, were defined jointly. However, being the actual addresses still unknown, these projects could only meet the needs that could be deduced exclusively by typifying those expressed by all of the potential tenants.

15. The notion of agency has also been used in other works. See, for instance: Cupers & Doucet, 2009; Kossak et al., 2009.

16. The database is available at: http://www.spatialagency.net/.

individual's capacity to act independently of the constraining structures of society. Additionally, the authors deliberately avoided using the term architecture, as they felt it was too closely associated with the abstract notion of isolated buildings. Instead, they employed the term *spatial*. Here they took the French marxist philosopher Henri Lefebvre and his book *The Production of Space* (1991) as a reference. According to Awan, Schneider, and Till, the most significant aspect of Lefebvre's contribution is his removal of the production of space from the exclusive domain of specialists, particularly architects and planners, and situating it within a broader social context. The authors signal that assuming that only architects are involved in the creative production of the built environment is one of the main limits of traditional architectural culture. The standard and commonly told histories of architecture focus almost exclusively on the guiding hand of the individual author, but in doing this they exclude the multiple voices and actions of others. In this sense, the way architects study and look at the contemporary city requires a profound reorientation: the production of space always belongs to a much wider range of actors, with a wide and diverse range of skills and intents (*Spatial Agency*, 2020). The choice to use the term *spatial* has also been made by Melanie Dodd in a book published in 2020. Following a similar logic, Dodd explores

> forms of positive spatial action that can envisage and present alternatives of everyday life. These are not necessarily the built and architectural alternatives of twentieth-century modernism, but rather [...] practices that [...] involve actors from various backgrounds who don't always fit categories or align to professional disciplines, but who support action and engagement through forms of situated 'spatial' practice. (Dodd, 2020, p. 1)

However, particularly interesting critical reflections on the topic of participation have been made by Peter Blundell Jones, Jeremy Till and Doina Petrescu in their *Architecture and Participation* (2005). A participatory approach is seen by the authors "as a means of making architectural practice more relevant to, and more engaged with, the everyday world" (Blundell et al., 2005, p. xvi). One of the results is the notable diminishing of architects' roles and expertise, recognized as just one aspect among many upon which "architecture depends", as later pointed out by Till (2009). "Modernization", the authors argue,

> has meant the removal of people from decisions, as layers of bureaucracy and specialist procedures compel the experts to intervene between the user and the building. [...] A gap thus opens up between the world as built and the world as needed and desired. (Blundell et al., 2005, p. xiv)

To clarify the impact of this gap, the authors cite the mass housing projects of the mid-twentieth century. During this era, a standardized version of living and abstract notions of community were imposed by what was perceived as a well-intentioned bureaucracy. However, individuals had little chance to express their actual wishes and needs. Participation, instead, is meant to address this gap through involving the user from the early stages of the design process. Anyway, what is most interesting in this work is the authors' willingness to re-valuate the meaning of participation, "given a European political context in which [it] had become a buzzword, but with little thought given to what the word actually meant" (Blundell et al., 2005, p. xiii). Jeremy Till, for instance, highlights that participatory design frequently operates more as a form of "placation" serving as a method to secure the assumed approval of citizen users for actions that have already been decided by professional agents: the authority of the state is replaced by one of the architects, who "sneak their expert values through the back door" and increase their acceptability by a sceptical public by "creating a 'feeling' of participation" (Blundell et al., 2005, pp. 21-23). The architect's expertise and the participant user's tacit knowledge often reside on different levels, resulting in a power dynamic between them. Professionals typically dominate the process, initiating communication on their terms and constraining it through the use of specialized drawings and language, "which for the architect may be pregnant with possibilities, [but which] remain mute to the outsider" (Blundell et al., 2005, p. 35). Till suggests that what is required is a form of participation that acknowledges the inherent imbalances of power and knowledge, yet actively works with these imbalances to reshape the expectations and futures of all participants. This cannot be accomplished by either disregarding expert knowledge or simply granting non-experts easier access to the expert's domain. Instead, this move demands a reformulation of expert knowledge in another mode: by challenging the very limits and constrains of specialist knowledge, that seeks to abstract and control users' lives, architects should be open to "expose themselves to the uncertainty of what others may know" (Blundell et al., 2005, p. 28) and provide channels through which their knowledge might be articulated[17].

17. This appeal to remain vigilant against merely placatory forms of participa-

NEGLECTED PARTIES IN ARCHITECTURE

The emphasis on the democratisation of design is also central to the reflections and experiences that embrace the contribution of feminist thought in architecture, and its interest in identifying power relations and neglected actors. Broadly speaking, we can consider that the beginnings of the influence of this current of thought in architecture date back to the 1970s. As architectural historian Jane Rendell notes (2012), during those years, Marxist feminist architects began to develop gendered critiques of architecture, exposing the limits of its inherently patriarchal system. At its inception, this movement drew inspiration from an activist, political atmosphere focused on breaking down barriers for women in the profession. Simultaneously, it sought to confront and mitigate gender discrimination within what was commonly viewed as a predominantly male-built environment (Little et al., 1988; Roberts, 1991). American feminist planner and historian Dolores Hayden, for instance, in her seminal book *The Grand Domestic Revolution: A History of Feminist Designs for American Homes, Neighborhoods, and Cities* (1982), outlined the visionary approaches of a cohort of nineteenth-century American feminists. They viewed women's confinement within the domestic sphere as the central factor contributing to their unequal status in society. In the pursuit of economic independence and social equality, these women developed what Hayden termed "material feminism" (Hayden, 1982, p. 6). Their suggestions, such as housewives' cooperatives, innovative building designs, and communal kitchens, posed a challenge to two fundamental tenets of industrial capitalism: the rigid physical segregation of household and public spaces, and the economic division separating the domestic sphere from the political economy. In her work *Redesigning the American Dream* (1986), Hayden highlighted how the built environment favored men over women, evident in aspects like unwelcoming streets and gender-biased imagery in advertising. She advocated for the replacement of such discriminatory features with more equitable alternatives, such as childcare facilities, safe shelters, and improved public transportation (Rendell, 2012, p. 87).

Matrix Feminist Design Co-operative, a London-based practice established in London in 1980[18], delved into both the issues concerning women and the built environment, as well as the dynamics between women and the architectural profession. According to them, as buildings and cities have been created by a dominant male gender, they are not neutral but expressive of social values and relations. Therefore, they were concerned with the "making of space" by women, arguing that "precisely because women are brought up differently in our society [they] have different experiences and needs in relation to the built environment which are rarely expressed" (Matrix, 1984, p. 7). *Matrix*, in particular, championed a design process that prioritized direct involvement of users. Architects, instead of imposing their ideas, served as facilitators, aiding users in realizing their spatial desires and needs (Dwyer & Thorne, 2007).

Works by Lynne Walker (1984) in the United Kingdom and Doris Cole (1973), Susana Torre (1977) and Gwendolyn Wright (1977) in the United States criticized the accepted and gendered architectural historiography of the time and contributed to the visibility of women's historic participation in the built environment. Alongside *Matrix*, other feminists advocated for the recognition of the historical significance of everyday housing, modest buildings, domestic environments, interior design, textile design, and other spaces or practices traditionally associated with women. This was in contrast to the prevailing male-centric urban landscapes. American critic Karen Franck[19] advocated for an architectural approach grounded in "women's ways of knowing" (Franck, 1989), which embody a distinct value system emphasizing traits such as interconnectedness, inclusivity, emotional resonance, complexity, adaptability, and an ethics of care (Rendell, 2012, pp. 87-88). As Rendell notes (2012, pp. 86-89), these

tory design seems to have been somewhat taken up by the authors of *Design as Democracy: Techniques for Collective Creativity* (de la Pena et al., 2018), a comprehensive book gathering a series of methodologies revolving around a particular theme or issue, covering aspects such as project inception, community engagement, and strategic political intervention. The book offers detailed instructions and showcases case studies from diverse contexts to provide practical insights and guidance. The techniques themselves have a less token and more experimental nature, as they remain open to improvisation, adaptation, and being created anew.

18. In the late 1970s and early 1980s in the UK, political discussions and actions, especially carried out by the New Architecture Movement (NAM), resulted in the creation of several feminist organisations operating within the field of architecture, such as the *Feminist Design Collective* (1978). It was the first time in Britain that a politically charged word such as *feminist* was used to name an architectural practice. *Matrix Feminist Design Co-operative* was set up after the split of the *Collective* in 1980.

19. Franck referenced the contributions of women architects such as Eileen Gray and Lilly Reich, as well as projects like Susana Torre's *House of Meaning* http://www.susanatorre.net/architecture-and-design/the-individual-and-the-collective/the-house-of-meanings/ and *Space as Matrix* as exemplary of this approach (Rendell, 2012, p. 87).

concerns for exploring the relationship between architecture and gender also inspired several works in the 1990s, which expanded the field to include issues related to sex, desire, space, and masculinity (Colomina, 1992; Agrest et al., 1996; Coleman et al., 1996; McCorquodale et al., 1996; Hughes, 1996; Sanders, 1996). Certain authors formulated extensive feminist critiques of the conventional male canon (Agrest, 1993), centering not just on gender[20] but also on issues of race and ethnicity within the architectural practices of male figures like Adolf Loos and Le Corbusier (Colomina, 1994; Wilson, 1996; Çelik, 1996).

Other interesting reflections are those collected in *Altering Practices. Feminist Politics and Poetics of Space* (2007), a book edited by Doina Petrescu[21]. This work focuses on spatial practices intended to provoke, change, transform, or alter, much like those embraced by other groups such as *Taking Place*[22], *muf* (2001) and *atelier d'architecture autogérée*[23]. As Petrescu and her colleagues point out, they "were no longer speaking of 'woman' and her spatial practice within a theory of dichotomy and a dream of unity, but more within a heterogeneous spectrum of the 'feminine' coming under a theory of 'alterity'" (Petrescu, 2007, p. xvii). Indeed,

> The *Altering practices* based their meaning on *Alterities*[24]. They both refer to alter – the Latin word for "other" – more as a verb than a noun. They speak about making or becoming different, about change. [...It] could mean "undermining", "subverting" received identities and authoritative rules, norms and tools and working out other shared meanings throughout their transformation. (Petrescu, 2007, p. 3)

20. A much wider range of works have emerged and continue to emerge, bringing together reflections on the relationship between architecture and gender (Henderson, 1996; Rendell et al. 2000; Brown, 2011; Stratigakos, 2016; Dellapiana & Pesando, 2018).
21. See also: Schalk et al., 2017; Schalk & Reisinger, 2017; Reisinger & Schalk, 2017; Frichot et al., 2017.
22. For a description of the work of *Taking Place*, see for example: Stratford et al., 2002; Hoskyns & Petrescu, 2007; Dwyer, 2012; Hoskyns & Stratford, 2017.
23. See, for instance: Hoskyns & Petrescu, 2007; *atelier d'architecture autogérée*'s website is available at: https://www.urbantactics.org.
24. The book was born out of a conference, *Altérités: Interdisciplinarité et Pratiques "Féminines" de L'Espace*, held in Paris in 1999. The event was co-organised by l'*École d'Architecture Paris Villemin* and l'*École Nationale Supérieure des Beaux-Arts* and intended to unite various genealogical threads within the feminist approach to architecture in the late 1990s (Petrescu, 2007, p. xv).

Other interesting and more recent reflections and experiments have drawn on the feminist notion of care[25], which has been taken as a politically and morally charged vocabulary to engage with emerging issues of social and environmental concern[26]. In particular, many of them are inspired by the version of care proposed by political theorist Joan Tronto, who has given it a distinctly political character (Tronto & Fisher, 1990; Tronto, 1993)[27]. In Tronto's view, this concept, and the ethics associated with it, are capable of providing an alternative to traditional modes of ethical and political reflection.

Recent initiatives and publications, such as the exhibition *Critical Care: Architecture for a Broken Planet* and its related book (Fitz & Krasny, 2019), the 2019 edition of the *URBANBATfest* in Spain[28], and the book *Urbanismo Feminista* by *Col·lectiu Punt 6* (2019), are rooted in this perspective. They gather critical reflections and situated architectural practices aimed at challenging normative, ableist, sexist, and exploitative models of capital-market-oriented economies that have contributed to the current crisis. Particularly, the last two initiatives emphasise the need to produce urban spaces capable of ensuring conditions of liveability for multiple and different actors, challenging generic assumptions about how, for whom and for what architects design. *Col·lectiu Punt 6*, for instance, argue that "feminism is the revolution we need because it embodies real equality, recognising

25. Since the 1970s, various strands of feminist theory have placed significant emphasis on the concept of care, though they often diverge in their perspectives and interpretations. This includes Silvia Federici's Marxist perspective on reproductive labor, Carol Gilligan's feminist moral evaluations, and Nel Noddings and Sara Ruddick's concepts of maternalism (Federici, 1975; Gilligan, 1982; Noddings, 1986; Ruddick, 1990).
26. The notion of care or maintenance has also been a source of inspiration in the field of art. In the 1970s, Mierle Laderman Ukeles pioneered *Maintenance Art*, which highlighted and brought visibility to everyday maintenance tasks, bringing attention to their role and significance in the public sphere (Mattern, 2018; Ponzio, 2020).
27. In *Toward a Feminist Theory of Caring* (1990, p. 40), together with Berenice Fisher, Tronto defined care as follows: "On the most general level, we suggest that caring be viewed as a species activity that includes everything we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web". Beyond focusing on individuals often perceived as vulnerable, the concept extends to encompass the entire spectrum of activities that facilitate and enhance livability and the sustainability of life. The responsibility linked to care therefore consists in the recognition of the social interdependence and substantial vulnerability of individuals.
28. http://8festival.urbanbat.org.

and assuming diversity; because it values care, recognising us as part of a species in a complex ecological system" (Col·lectiu Punt 6, 2019, p. 12)[29]. In this sense, a feminist urbanism involves a change of values so as

> to put life at the centre and, for this, to recognise the diversity of the people and realities of which we are a part, incorporating the different needs and capacities to respond to real situations and people, and not too cold, universalising statistics [...]. All bodies are considered, without standardising any model. (Col·lectiu Punt 6, 2019, p. 14)[30]

These reflections, therefore, help to highlight that architecture and urban design have traditionally operated according to a predefined and standardised idea of subject and community. In a far from neutral way, they respond to special interests, and render the diversity of experiences and needs invisible. By emphasising values such as efficiency and productivity, and by basing themselves on essentialist views of gender and Eurocentric, classist, ableist interpretations of reality, they tend to privilege the interests – and favour the profit – of a restricted group of actors. In this way, they have historically contributed to great social inequalities and to the harming of certain population groups, i.e. the many other bodies that do not fit into these models, such as – to name but a few sociological variables – women, black people, the LGBT population, ethnic minorities, indigenous people, the elderly and disabled people.

In addition to historical contributions by the likes of Jane Jacobs (1961), this concern to explore how the interests of minority groups have traditionally been excluded from architectural and urban design is expressed in recent works, such as *Race and Modern Architecture* (2020), edited by Irene Cheng, Charles L. Davis II, Mabel O. Wilson, in which the authors reflect on the close link between race and modernism. Architecture, they argue, has historically been grounded in the hierarchies of racial difference[31], that have permeated modernism's narrative of universalism and

29. Author's translation.
30. Author's translation.
31. Other interesting perspectives on the subject are offered by the BIPOC Centered design history courses, facilitated by *Polymode*. Introduced in January 2021, this series of classes re-examines and reshapes the trajectory of design history by placing previously marginalized designers and cultural figures at the forefront, with particular emphasis on Black, Indigenous, and People of Color (BIPOC) as well as Queer, Trans, People of Color (QTPOC). The classes are available at: https://bipocdesignhistory.com.

progress since the Enlightenment. Other authors such as Aimie Hamraie (2017), Bess Williamson (2019) and Rob Imrie (1996; 1999; 2003), reflect on how disabled bodies have also been traditionally excluded from both architectural practice and historiography, and how "disability narratives [...] provide the missing fragments of an architectural history usually told from the perspectives of architects" (Williamson, 2019, p. 7).

Beyond a mere inclusion, which leads them to be considered as legitimate users – with particular interests and needs – several neglected parties imply new challenges for architecture. Each of them, in questioning a given normative order, might require specific ways of designing and co-designing.

FROM "COMMONING" TO "UNCOMMONING"

The concern with extending the design process to users, as opposed to modernist centralised approaches, has been a recurring theme in architecture for decades. More recent positions invite reflection on how participation often runs the risk of being a tokenistic operation led by experts in search of consensual closure, and urge architects to question how they approach their tasks. The influence of feminist perspectives in architecture has also inspired critical inquiries aimed at highlighting asymmetries and usually neglected parties.

Grounded in a specific worldview, and still affected by the generalizing tendencies of modernism, "commoning" practices frequently face the risk of excluding differences and minorities. To put in anthropologists Mario Blaser and Marisol de la Cadena's words,

> commoning comes at the cost of subordinating one set of practices to the other through "same-ing" – that is, an equivalence is proclaimed (and accepted) where a divergence is actually operative. The consequence is that dominant practices can eventually operate as if the subordinate ones were irrelevant to the constitution of the commons. (Blaser & de la Cadena, 2017, p. 190)

What would happen if participation were rethought in a more-than-human perspective? What if we slowed down the construction of the *community*, or the "'good common world'", and "a space of hesitation" was created "regarding what it means to say 'good'" and for whom? (Stengers,

2005, p. 2) What if, rather than aiming for a consensual closure, the ways of being in the world of usually neglected human and non-human parties were taken seriously? How would this affect architecture and participatory design?

Rather than understanding participation as a "commoning" practice, what seems interesting is to question the supposed common ground on which it is based, and rethink it as an "uncommoning" practice. As the two anthropologists suggest:

> uncommoning runs counter to this possibility [of subordinating one set of practices to the other], not simply by emphasising that practices taken as common are *different* (that is, the contrary of the same) but rather by stressing that they are *divergent*, [...]. [This is a] positive divergence as they symbiotically come together – like in an ecological system – while also remaining distinct: what brings them together is an interest in common that is not the same interest. The point of uncommoning, then, is not to preclude the possibility of commoning but rather, whenever possible, to seek ways to base the latter on the more solid grounds of recognised productive divergences. (Blaser & de la Cadena, 2017, pp. 190-191)

In this perspective, in contrast to the idea that giving voice, or that taking part itself, is something simple, pursuable through procedures and tools are already given, participatory design becomes a far more complex challenge. It requires architects to reflect on their modes of designing and the tools they use, as well as their effects, and to open themselves up to other ways of knowing and inhabiting the world.

II. THE WAY IN WHICH ARCHITECTS ARE TRAINED

Architects' expertise both shapes and is shaped by normative models that function as actual power technologies, or rather, – in Foucauldian terms – bio-power technologies. Here, Foucault's insights into the intersection of knowledge and power are employed as a framework to examine narratives prevalent in the Modern era. Specifically, these narratives are foundational to the pedagogical models adopted by many architecture schools in the Western world. Moreover, this perspective brings to the forefront longstanding issues rooted in the binaries inherent to Western philosophical traditions. One of them is the nature/culture divide, which determined the traditional *tabula-rasa* approach of modernist urban planning. Additionally, from the Renaissance onward, dualisms like thought/practice, design/construction, architect/builder form the ideological basis on which the specialised role of architects is founded.

Architects' education may be viewed as an essential part of the creation of the "architect-subject" (Imrie & Street, 2011, p. 107)[1]: certain pedagogical practices "deploy 'micro technologies of power' or mechanisms to ensure that individuals are absorbed into 'the dominant disciplinary paradigm'" (Imrie & Street, 2011, p. 106).

In these practices, architectural handbooks play a significant role by offering architecture students and professional designers a systematic and comprehensive framework of normative architectural knowledge. These devices have historically contributed and continue to contribute to shaping architects as expert technicians adept at manipulating space according to norms and standards. Their approach implies that the standardization of the built environment can be based on the dimensional

1. See also: Webster, 2006.

rationalisation of the human activities it accommodates, thereby assuming an inherent dimensional likeness among human beings (Emmons & Mihalache, 2013; Hamraie, 2017; Williamson, 2019).

Architecture and urban design have historically adhered to a standardized concept of subject and community, often marginalizing those who do not conform to these models. A sort of *universal body*, albeit shaped by diverse logics and perspectives, has persisted in Western architectural traditions since ancient times.

THE KNOWLEDGE-POWER NEXUS

The Enlightenment, the industrial revolution and the corresponding technical-scientific progress set the conditions for the link between knowledge and power to spread as never before. Indeed, this link has strengthened along with confidence in the methods of the physical sciences, which were considered valid for solving social problems too. The role of experts, therefore, which placed these methods at the basis of planning, programming, control and regulatory practices, has increasingly asserted itself, in a potentially technocratic perspective.

The link between knowledge and power underlies the notion of *expertise*, which produces and is in turn produced by normative models. Between the eighteenth and nineteenth centuries, there was a significant inclusion of experts in the machinery of political government. Governing increasingly came to mean using knowledge to shape, guide, and direct the conduct of others, such as groups of farmers or the crew of a ship, the employees of an office or a factory, the members of a household, the inhabitants of a territory, etc. The idea which took hold stated that, in order to govern, it is necessary to know the particular characteristics of the area over which the government is to be exercised: for example, in agriculture, geography, fertility, climate; in navigation, the rules of navigation and possible routes; in demography, the data relating to births, illnesses and deaths; in sociology, the classes, interests and conflicts; in economics, the laws of the market, supply and demand; in architecture and urban planning, the forms and techniques of construction and the models of settlement of populations in the territory.

This knowledge, although only possessed by certain people – the experts – was to be considered *universally valid*. In all these cases "government has both fostered and depended upon the vocation of 'experts of truth' and the functioning of their concepts of normality and pathology, danger and risk, social order and social control, and the judgements and devices which such concepts have inhabited" (Rose, 1999, p. 30). The norm, in this context, is what is "socially worthy, statistically average, scientifically healthy *and* personally desirable" (Rose, 1999, p. 76). In this framework, knowledge determines the power to establish *normality* as the correspondence to norms that experts develop and, through government practices, translate into laws. Experts can decide which of our behaviours are permissible: "The notion of normality, the invention of the norm, is the linchpin of this mechanism" (Rose, 1999, p. 75), in which free individuals become governable – in different forms and with different effects – as *normal* subjects[2].

In order to explain this background more precisely, some aspects of Michel Foucault's fundamental contribution, developed in his reflections on biopower and its capacity, through the knowledge-power nexus, to act upon human life, are reported below. The theoretical framework conceived by the French philosopher – or at least some of its most crucial aspects – is useful to read critically the design practices and pedagogical approaches that are still dominant in architectural schools of the Western world, and their emphasis on the figure of the architect as expert author.

Biopower

Biopower according to Foucault is the *power over life*. This power evolved into two fundamental forms:

2. However, the expert *status* does not derive purely and simply from the possession of certain knowledge. Indeed, knowledge is sometimes acquired *socially* through one's belonging to groups of experts. This can lead to particularly problematic situations, both in the sense that these groups make themselves *a priori* guarantors of the expertise of their members (an example might be the belonging to a professional association), and in the sense that, together, they can impose political programmes disguised as technical-scientific solutions. Collins and Evans present a repertoire of various forms of expertise in the contemporary world (2017). Beyond these risks, in order to grasp the complexity of the implications that underlie the knowledge-power nexus, it is also necessary to take into account the different ways and procedures in which knowledge is formed and developed. There is not one science – and, in this case, one idea of architecture – but different "epistemic cultures" (Knorr-Cetina, 1999). Sociologist Karin Knorr-Cetina's analysis focuses on the practices that contribute to the fabrication of scientific knowledge and the cultures to which these practices belong.

> One of these poles [...] centered on the body as a machine: its disciplining, the optimization of its capabilities, the extortion of its forces, the parallel increase of its usefulness and its docility, its integration into systems of efficient and economic controls, all this was ensured by the procedures of power that characterized the "disciplines": an "anatomo-politics of the human body". The second [...] focused on the species body, the body imbued with the mechanics of life and serving as the basis of the biological processes: propagation, births and mortality, the level of health, life expectancy and longevity, with all the conditions that can cause these to vary. Their supervision was effected through an entire series of interventions and "regulatory controls: a biopolitics of the population". (Foucault, 1978, p. 139)

The organisation of power over life has developed around these two poles. Unlike in the past, its "highest function was perhaps no longer to kill but to invest life through and through" (Foucault, 1978, p. 183). Based upon the knowledge-power nexus, technocracy operates through the norm, which is one (perhaps the principal) of these ways in which power invests life. In one of his lectures, referring to a book by Georges Canguilhem (1966), Foucault states:

> In [...this] text [...] the norm is not at all defined as a natural law but rather by the exacting and coercive role it can perform in the domains in which it is applied. The norm consequently lays claim to power. The norm is not simply and not even a principle of intelligibility; it is an element on the basis of which a certain exercise of power is founded and legitimized. [...] it is always linked to a positive technique of intervention and transformation, to a sort of normative project. (Foucault, 2003, p. 50)

Every form of social control rests on a form of knowledge, a regime of truth – an assumption that is taken for granted and shared while instead it is imposed – that makes it possible. Biopower makes power-knowledge an agent of transformation of human life, one of the indispensable elements in the development of capitalism. Rationalisation and quantification are indeed central to the logic of capitalism.

An anatomo-politics of the human body

In this technocratic view, according to Foucault, all disciplines aim at imposing a *code of conduct*, at making the individual body *docile*, at training it to make it productive, stronger, or simply obedient. Therefore, it is necessary to consider individuals as mere objects, on which automatisms can be inscribed, which are useful to achieve the maximum control and the best possible order. Exercise is the main mode of application of disciplinary power. Bodies are continually solicited to obtain maximum useful force and minimum political resistance.

Disciplinary power cuts out space and marks time, and this is done in terms of *microphysics of power*: through small portions of space and short fractions of time, in order to deeply affect every detail of the human body. The techniques applied, inherited from the monastic tradition, are – first of all – seclusion, the space of a cell and a reticulum constituted by basic localisations, cut out within the cell. In addition to being divided in a physical space, individuals are also divided – to be differentiated – in an ideal space that establishes a hierarchy. Disciplinary time, split in the duration of individual operations, presides over production cycles. There mustn't be any downtime, there must only be "a totally useful time" (Foucault, 1995, p. 150). The body is broken down into single acts. Each of its operations is classified to isolate its most useful parts, capable of summoning up the maximum strength in the shortest time. The aim is to maximise the efficiency of the process.

Foucault's philosophy of power is a *philosophy of devices*. A device[3] represents the fundamental theoretical connection that can explain the actual practices of power from the point of view of their real functioning. A device constitutes the configuration of power that can connect elements located on different levels: regulations, practices, surveillance systems, etc. (Foucault, 1980). According to Foucault, discipline attempts to train individuals to become the cogs of a machine, able to ensure the stability of power relations. Disciplinary power is a sort of mechanics of power aimed at extracting from the body the most of its useful force. Evidently, Foucault had one more text on his mind, the one by Canguilhem:

3. The device, or *dispositif*, is a key concept in Foucault's mode of analysis. Here is how he himself describes its meaning: "What I'm trying to pick out with this term [*dispositif*] is [...] a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions – in short, the said as much as the unsaid. Such are the elements of the apparatus. The apparatus itself is the system of relations that can be established between these elements" (Foucault, 1980, p. 194).

> with Frederick Taylor[4] and the first technicians to make scientific studies of work-task movements, the human body was measured as if it functioned like a machine. If we see their aim as the elimination of all unnecessary movement and their view of output as being expressed only in terms of a certain number of mathematically determined factors, then rationalization was, for all intents and purposes, a mechanization of the body. (Canguilhem, 1992, p. 63)

A bio-politics of population

The political and economic necessity to control great masses of individuals, starting from the eighteenth century, has been conceived as the real objective of the government's action. It is in this way that the political problem of population management arises. A notable advancement in the techniques of power during the eighteenth century was:

> [the] emergence of "population" as an economic and political problem: population as wealth, population as manpower or labor capacity, population balanced between its own growth and the resources it commanded. Governments perceived that they were not dealing simply with subjects, or even with a "people", but with a "population", with its specific phenomena and its peculiar variables: birth and death rates, life expectancy, fertility, state of health, frequency of illnesses, patterns of diet and habitation. (Foucault, 1978, p. 25)

This is directly linked with the development of statistic. Adolphe Quetelet (1796-1874), a Belgian statistician, introduced the concept of social physics, wherein he introduced the notion of *l'homme moyen*, the average man. This average individual was envisioned not only in terms of typical physical traits like height, weight, education, and lifespan, but also in terms of average tendencies regarding marriage, suicide, or participation in criminal activities (Gigerenzer et al. 1989). As Quetelet himself stated:

> The man I am considering is, in society, the analogue of the center of gravity within a body; he is the mean around which various social elements move. He is a fictional being for whom all things occur in accordance with the average expectations for the society in question [...]. This determination of the average man is not merely an idle pursuit; knowledge of social averages can serve an important purpose for the human and social sciences. The study of averages is a necessary precursor to any research into social physics, for it serves as the foundation of such study [...]. Only by taking [the average man] into account can we truly appreciate the phenomena of social equilibrium and movement. (Quetelet, 1835, quoted in Ewald, 1990, p. 145)

Therefore, as François Ewald also notes, the *average man* "is not an individual whose place in society is indeterminate or uncertain; rather, he is society itself as it sees itself objectified in the mirror of probability and statistic" (Ewald, 1990, pp. 145-146). These are the premises on which modern urban planning was founded and its procedures developed. The objective of power is not constituted by single cases, but by the statistical average, the overall effects of a population that lives in a certain territory. The image of a *risk society* takes shape, dotted with regulation devices that operate through the establishment of a regime of truth and the configuration of spaces that are suitable to a well-ordered civilian life. By imposing a regime of truth, the power-knowledge operates in a way that renders individuals able to recognise themselves as acting subjects, as keepers of freedom that is institutionally granted: it is the very knowledge-power regime established by liberalism. So, this regime presents itself as a body of government knowledge and practices, based on the creation of risk as the government's objective, controlled by a broad range of different kinds of knowledge (medicine, geography, psychology, sociology, urbanism, etc.), capable of predicting – through statistical calculation – the occurrence of different circumstances that could reduce life expectancy in various places and times. In this government mode, based on the creation of these technologies to prevent risk, freedom does not turn into previous data, but rather "is produced from one moment to the next, at every point" (Foucault, 1978, p. 93), based on a series of very specific security assumptions, such as the principle of risk assessment.

Normation and normalisation

If on the one hand anatomo-politics produces and shapes subjectivity through its dealing with various disciplinary devices (or apparatuses), with notions, like that of the normal body, and criteria, to connect

4. Frederick Winslow Taylor (1856-1915), an American engineer and entrepreneur, was the initiator of research into methods of improving efficiency in production. Hence the term Taylorism, which refers to the theory he developed (Taylor, 1911; Relph, 1987, p. 94).

different activity spheres or spaces, on the other hand, biopolitics, through security devices (such as hygienist urban planning[5]) tries to regulate *milieus* or environments of different living populations. Both technologies that constitute biopower refer to the norm, applying it, however, in very different ways. Under disciplinary power, Foucault writes, "there is an originally prescriptive character of the norm" (Foucault, 2007, p. 57), emphasizing that the norm dictates what is considered normal. Subjects both shape and are shaped by power mechanisms that hinge on this normative ideal, often depicted as an "optimal model" (Foucault, 2007, p. 57). In biopower, the norm is shaped by various *normals*, illustrated specifically through curves of normality. Foucault asserts that statistical analysis serves as a pivotal method for regulating and managing populations:

> Foucault has marked a distinction between normalization, which he now attributes solely to biopower and describes as the process of establishing the norm from different normal curves, and the disciplinary process of bringing subjects into conformity with a pre-determined norm which he now refers to as "normation". (Taylor, 2009, p. 50)[6]

The planned city as the regulator of modern society

Many authors followed the footsteps of Foucault in exploring the links between modern society and the rationalities of rule. According to Paul Rabinow (1995), these rationalities operate on the:

> fields of knowledge (hygienic, statistical, biological, geographic, and social); forms (architectural and urbanistic); social technologies of pacification (disciplinary and welfare); cities as social laboratories (royal, industrial, colonial, and socialist); new social spaces (liberal disciplinary spaces, agglomerations, and new towns). (Rabinow, 1995, p. 9)

In each of these domains Rabinow describes the different constructions of norms and the search for appropriate forms to regulate what came to be known as modern society. Modern urbanism was born "at the end of the [nineteenth] century, when a form was invented that combined the normalization of the population with a regularization of spaces" (Rabinow, 1995, p. 82) – that is when planning produced not only spatial schemes but "normative projects for the ordering of the social milieu" (Rabinow, 1995, pp. 76-77). Social thinkers, reformers, architects, engineers, and governors embarked on considering ways to unite norms and forms within a shared framework to foster a healthy, efficient, and productive social order. Not by coincidence, Rabinow characterizes these individuals as the "technicians of general ideas", whose endeavors reside in "the middle ground between high culture or science and ordinary life" (Rabinow, 1995, p. 9)[7].

The methods of modern urban planning were rooted in many events, such as the new scientific advancements, the great technical achievements, and the measures invoked by hygienists to cope with the health deficiencies caused by industrial development. This, in particular, had caused the profound transformation of the distribution of population on the territory and the consequent exponential growth of cities, which brought unprecedented problems of congestion and healthiness to the fore. It became increasingly necessary for the conduct of each individual to conform to established patterns. The health of the individual was no longer a private matter, because the disease could be spread to the wider community. Since an epidemic in one area could quickly infect the whole city, regardless of social class, remedies had to be decided by the public authority. In a short time, the first sanitary laws evolved into increasingly complex regulations that affected every aspect of the city.

In 1850, in France, a law authorised municipalities to appoint commissions – consisting of a doctor and an architect – whose task was to establish the measures that were necessary to repair unhealthy buildings. Some measures also included a series of expropriations for the rehabilitation of residential districts. The latter, in particular, took on the character of a true general urban planning instrument through which the public authority directly managed the transformation process of the city. In such a scenario, for instance, Haussmann, under the authority of Napoleon III, carried out the project of the reconstruction of Paris in the 1850s

5. See, for instance: Zucconi, 1992.

6. Numerous insights for writing this section on Foucault's thought have been drawn from this interesting work: Domenicali, F. (2009), *Biopolitica e libertà in Michel Foucault*, PhD dissertation, Modelli, Linguaggi e Tradizioni nella Cultura Occidentale [Università degli Studi di Ferrara].

7. In his book, Rabinow delves into the particular forms of rationality embodied and articulated by these individuals. He describes their endeavors to create new realms of knowledge and technologies for social control, alongside the development of novel urban configurations and social arenas.

and 1860s, laying out its avenues, boulevards and major urban parks[8]. The construction of the avenues sliced through the densely packed medieval Latin Quarter, forcing many of its poor residents to relocate. While these developments significantly enhanced traffic flow and sanitation within the city, they also facilitated the swift mobilization of soldiers to repress potential uprisings[9].

As the Welfare State emerged, city planning increasingly became a tool of "the scientific administration of modern life as a whole" (Rabinow, 1995, p. 343). Its objective shifted towards molding the environment according to functional criteria and standardized sociological categories. "The challenge was to invent new forms for society" (Rabinow, 1995, p. 116) and establishing norms to guide the implementation and regulation of these structures. This opened the era of technocratic planning: space began to be seen as an abstract "socio-technical environment [regulated] by committed specialists dedicated to the public good" (Rabinow, 1995, p. 320). Architects, urbanists, and social scientists collaborated to create and oversee an "optimum social environment" (Rabinow, 1995, p. 321), driven by ideals of efficiency, scientific advancement, progress, and welfare. This endeavor led to the emergence of "the planned city as a regulator of modern society" (Rabinow, 1995, p. 12), embodying new methods of analysis and intervention.

> The most general value in the name of which modern normalizing efforts have been justified is the welfare of the population. The project of understanding and regulating population has a long history, but it received a new impetus in the Nineteenth century when the control of population was linked with the modern understanding of society. This link was provided by the new science of biology. The metaphoric transfer of concepts from a newly emergent physiology – function, hierarchy, and norm – to the social realm presented many conceptual and practical challenges for those seeking to intervene in and improve society. The search for a spatial localization of functions in society, similar to that found in the body, was a particularly bedevilling, if fertile, problem. (Rabinow, 1995, p. 10)

8. Haussmann's experience soon crossed the borders of Paris and France. It would be impossible to list all the cities that took it as a model. Among the Italian examples there are the *Firenze Capitale* scheme of 1864 and the *Risanamento* (Restoration) of Naples, an urban intervention – which radically changed the face of numerous historic districts of the city – carried out after the cholera outbreak of 1884. This intervention was aimed at restoring and solving hygiene and health problems especially in areas that had been considered most responsible for the spread of cholera.

9. See also: Winner, 1980, p. 124.

As Robert Imrie and Emma Street (2011) note, referring extensively to Rabinow's reflections, the proliferation of building instruments and regulations from the late nineteenth century in Western countries was intertwined with the evolution of building and design programs. These programs were not only geared towards architectural advancements but also influenced by political agendas aimed at job creation:

> The actions of architects and other building professionals were, and remain, closely intertwined with broader social and economic goals (of government) that placed a value on the commodification of the built environment. By the early part of the twenty century [...] the belief in planning for social and economic outcomes, and predicting and controlling the course of events, was part of the justification for the intensification of statist controls. Such controls were particularly to the fore in relation to spatial development and [...] the actions of architects were entwined in [...] standards and codes that virtually dictate all aspects of urban development. (Imrie & Street, 2011, pp. 51-56)

Great stories* and *Great Manifestos

Between the two wars, in particular, a series of experiences have had such a profound impact on architectural practice that they have come to be regarded as true paradigms of the so-called Modern Project[10], which has often even been identified with them. These experiences have been conveyed over time by certain narratives that are still among the most dominant ones in the schools of architecture in the Western world. Told as historical experiences of *great schools* and *great masters*, they have

10. I am aware of the many ways and versions in which what is commonly known as Modernity can be told, and of the plurality of stories that lie behind this term. An interesting reflection on this can be found in the book titled *Modernités Plurielles 1905-1970* (Grenier, 2013), the catalogue of the exhibition *Modernités Plurielles 1905-1970* (Multiple Modernities), held from 2013 to 2015 at the *Musée National d'Art Moderne* (*Centre Georges Pompidou*). The exhibition's expressed goal was to shift away from linear historical narratives and instead chart "a cartography of connections, of transfers, but also of resistance" that lie beneath the conventional understanding of Modernity.

played and continue to play a real epistemic role in architects' approach to design practice. Below are just a few particularly emblematic ones, although the scenario is much richer and more complex.

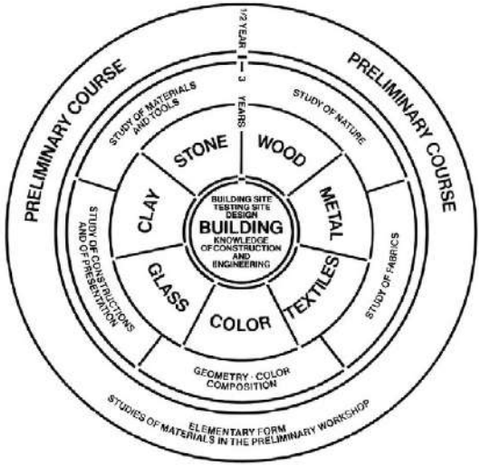
The Bauhaus

Among the narratives that have contributed and still contribute most to the way architects are trained are those relating to the Bauhaus, which since the 1920s drew on all the strands of thought about modern design for mass production that had developed in the previous thirty years, and wove them together to produce one of the prevailing approaches to design of the twentieth century. The appearance of buildings, chairs, fabrics, light fixtures, kitchens, desks, city skylines of angular skyscrapers, indeed almost anything that we might refer to as *modern*, probably owes something to the Bauhaus and its legacy. In his *Bauhaus Manifesto and Program* (1919), Walter Gropius declared:

> Let us create a *new guild of craftsmen*, without the class distinctions which raise an arrogant barrier between craftsman and artist. Together let us conceive and create the new building of the future, which will embrace architecture *and* sculpture *and* painting in one unity and which will rise one day toward heaven from the hands of a million workers like the crystal symbol of a new faith. (Bayer et al., 1938, p. 18) **[1]**

Gropius' passionate manifesto proposed a new conception of design and a new pedagogical program: students were to produce prototypical designs suitable for machines and mass-produced goods. The simpler the lines and forms were, the better they were held to symbolise the modern machine world (Relph, 1987, pp. 106-107). This pedagogical model, which combined thought and practice, craftsmanship and industry, design and construction, was one of the most important aspects of the Bauhaus approach. However, this approach has gradually disappeared in almost all pedagogical practices. In architectural design, an attitude to uncritical replication of the typologies developed by the Bauhaus protagonists has prevailed. Gradually, these typologies became purely formal schemes to which the constructive aspects could be adapted at a later stage. The Bauhaus set the standard – understood as a model to which mass production could be conformed – and determined the main course of architectural design for the years to come. According to its original intentions, however, the school aimed at reducing architecture to a functional social

[1] A reproduction of Gropius' original diagram of the Bauhaus curriculum (1920 ca). Source: uxplanet.org



service. As regards housing and its implications in terms of urban planning, the starting point is the dimensioning of the housing unit. Its value:

> is not in proportion to the surface of the housing anymore, but to the number of beds which it contains, where a bed stands for the unit of measurement of all the housing needs (the space aliquot of the living/dining room, of the kitchen and of the bathroom) of a person. Once this dimensional aliquot is established, a distributive conformation is studied to guarantee optimal standards of sunshine hours, aeration, ventilation, etc. This distribution results in different building types: townhouses [...]; multi-storey buildings; and council flats [...] which will be the most used type because, although it is more expensive than multi-storey house type, given the greater number of stairs, it offers the advantage of units that have two opposite sides which are completely free and oriented, lit and ventilated in the best way. Once organised the housing units into a typological unit, the rationalist "technique" conforms to a building; more buildings, arranged in a way that guarantees a good orientation, optimal distances, the relationship with access roads and the other necessary infrastructures, form a neighbourhood; more neighbourhoods from the city. (De Fusco, 1974, pp. 253-254)[11]

It is, therefore, a strict application of the principles of industrial production. Design is functional to production and consumption for a

11. Author's translation.

generic, abstract user. In this approach, the specificities and differences of users are disregarded. A theme closely linked to the dimensioning is the *Existenzminimum*. The most renowned architects connected to the Bauhaus essentially reduced each house part to a dimensioning that was suitable for the main housing functions, which are "supposed to be the same for all men, theoretically overlooking their social class, but it was done because of the necessity of answering in the best way to the most urgent requests of social housing" (De Fusco, 1974, p. 254)[12]. In this way they started a "process of building unification, standardisation and industrialization that was supposed to be the outlet of all the rationalist 'technique', that is, that of being the maximum social result obtained with the least economic effort" (De Fusco, 1974, p. 254)[13]. This maximum social result was achieved by excluding any difference in housing functions, since these were programmatically assumed to be *the same for all men*. In this way,

> "Minimum house" was outlined by the *Congrès Internationaux d'Architecture Moderne* (CIAM) in Frankfurt in 1929 to describe the possibilities of producing functional living spaces derived from standard measures relating to human biological and psychological needs. Bodily performance was translated into technical (design) criteria, or the minimum spaces required to facilitate efficient (bodily) functions [...]. Henceforth, the design was to "yield to what is common to all" by the application of technical standards and the rational disposition of physical layout and function in dwellings. (Imrie & Street, 2011, p. 57)

Maximum functionality and economy thus became the determinants of the norm in architectural design. There are at least three closely interconnected features of this perspective that should be highlighted: a reductionist idea of design that develops through abstract functional standards; the claim to know *what is common to everyone*; and the exclusion of all differences, starting with the bodily ones. If what is common to everyone can only be known through generalization, it means that the *common* is represented by the prevailing, most recurrent needs: to put it another way, the needs of the typical user. Gropius (1955) didn't fail to notice that, although the problem of minimum housing was the elemental minimum one of space, air, light, and warmth necessary to man, that is to say, "a *minimum modus vivendi* in place of a *modus non moriendi*",

> The actual *minimum* varies according to local conditions of city and country, landscape and climate; a given quantity of air space in the dwelling has different meanings in a narrow city street and in a sparsely settled suburb. (Gropius, 1955, p. 113)

However, despite this awareness, Bauhaus methods held on to a trade apparatus which later developed their potential in a taylorist way – especially in the production of expensive objects of use, though in series, maybe branded by famous designers. These methods were adopted by the capitalist economy to extract surplus value and have moved very far away from the original social concerns.

Le Corbusier

Not one architect or architecture student in the Western world is unfamiliar with Le Corbusier's work and theoretical perspectives. Generally considered to be one of the great architects of the twentieth century, he continues to appear in countless books, conferences, and publications, whether they deal with urban, architectural or interior design. The principles underlying his early work were not unlike those which inspired Gropius, and he stated them in what is often presented as the most emblematic manifesto of the modern architect, namely *Vers une architecture*:

> If we eliminate from our hearts and minds all dead concepts in regard to the houses, and look at the question from a critical and objective point of view, we shall arrive at the "House-Machine", the mass-production house, healthy (and morally so too) and beautiful in the same way that the working tools and instruments which accompany our existence are beautiful. (Le Corbusier, 1986, pp. 6-7)

The new architecture was, he argued, for a *machine age*[14], and its

12. Author's translation.
13. Author's translation.
14. Anyway, not only have relatively few Le Corbusier-style machine-houses been built but even his prototype of development of modernist workers' houses at Pessac has undergone many changes and modifications. The free facades have been altered, awnings have been added, porches put over the doors, and windows have been blocked in. As a style far detached houses modernism, whether Le Corbusier's

elements could already be recognised in industrial products. The engineer's aesthetic, devoid of any style or custom in its search for efficient design solutions, was the preeminent one. Accordingly, his references included aircraft, automobiles and ocean-going liners, all engineered to serve specific purposes.

In the early 1920s, Le Corbusier envisioned the creation of a completely modernized city, meticulously designed in every aspect. For much of his career, he continued to draft plans for large-scale imaginary cities or propose radical reconstructions of existing ones. One notable example is his 1925 *Voisin Plan* for Paris, which aimed to address the issue of city center congestion by demolishing pre-existing structures and replacing them with a combination of low-rise terrace apartments and 60-story towers. The underlying principles of these ambitious designs were elaborated in his 1920s manifestos dedicated to the *Ville Radieuse* (Radiant City). This utopian city concept involved replacing all older buildings with skyscrapers designated for offices and residences, blocks of terrace apartments, and an extensive transportation hub featuring roads, highways, railways, and an airport[15]. *Broadacre*, the dream city of another *great master*, namely Frank Lloyd Wright, was conceived, unlike the high-rise, machine-dominated *Radiant* city, as a low-density, mostly low-rise development city. However, the starting assumptions were the same: like Le Corbusier's city, *Broadacre* would replace the existing urban settings. Urban design, therefore, was understood as a practice aimed at producing a new state of the world, treating the pre-existence as a mere blank slate, or *tabula rasa*, on which to impose new ideas and forms (Relph, 1987, pp. 70-74). Both architects envisioned a world devoid of any historical, social, and political constraints, in which their urban forms would magically solve the problems of modern urban civilization. In this sense, their projects were emblematic of a clearly technocratic approach. Their utopias, despite their relative differences, shared a vision that is linked to the exclusive expertise of the architect, capable of designing the city of the future.

Le Corbusier had an Enlightenment-like faith in the fact that everything depends on a rational formulation of problems and that,

or anybody else's, has not received popular acclaim, and the machine-house has never been mass-produced.

15. Not surprisingly, Le Corbusier found Haussmann approach enchanting: "My respect and admiration for Haussmann" – he declared – "A titanic achievement - hats off!" (Relph, 1987, p. 51). These ideas of Le Corbusier were transposed in a charter adopted in 1933 by CIAM, which proclaimed that "housing should consist of high, widely spaced apartment blocks which would liberate the necessary land surfaces for recreation, community and parking purposes" (Relph, 1987, p. 71).

therefore, architecture can solve many of society's problems on its own. In this way, as regards the theme of minimum housing, even if he starts from the German rationalists' social demands, Le Corbusier's reference decidedly highlights a phenomenon that is already common in industrial production, which is the standard.

> We must aim at the fixing of standards in order to face the problem of perfection [...]. Architecture operates in accordance with standards. Standards are a matter of logic, analysis and minute study; they are based on a problem which has been well "stated". A standard is definitely established by experiment [...]. The business of Architecture is to establish emotional relationships by means of raw materials. Architecture goes beyond utilitarian needs. Architecture is a plastic thing. The spirit of order, a unity of intention. The sense of relationships; architecture deals with quantities. Passion can create drama out of inert stone. (Le Corbusier, 1986, pp. 4-5)

Indeed, the premises of his position on this matter were made even more explicit in this other statement:

> All men have the same organism, the same functions. All men have the same needs. The social contract which has evolved through the ages fixes standardized classes, functions and needs producing standardized products. The house is a thing essential to man. Painting is a thing essential to man since it responds to needs of a spiritual order, determined by the standards of emotion. (Le Corbusier, 1986, p. 136)

As he says, standards are the basis not only of function but also of emotional homologation. That is to say, there is no room for whatever difference. "We must aim at the fixing of standards to face the problem of perfection" (Le Corbusier, 1986, p. 4): this statement was not put there by chance. The entire system of proportions (regulatory plans) and measurement (the *Modulor*) referred to an ideal of perfection, or harmony, that has been conveyed since classical antiquity by the *Golden Ratio*. The *Modulor*, in particular, did not only provide dimensional standards, proportionate to human body parts. Le Corbusier believed that within this model, those parts, in turn, were also proportioned themselves through the *Golden Ratio*. In other words, the anthropometric system offered itself as the most capable one when it came to producing a harmonious architecture.

Although a more extensive discussion on the *Modulor* will follow,

suffice it to say here that it was best applied in the *Unité d'Habitation* of Marseille. This building – which hosted an entire neighbourhood and basic equipment for 1600 inhabitants – was thought of as a prototype of *grandeur conforme* in a serial development process: more neighbourhoods, and therefore more standard buildings were to form the city. From a dimensional point of view, the housing was rigorously dimensioned following the *Modulor*: their usable height between the floor and ceiling amounted to 226 cm exactly, that is, the height of a (male) human being with a lifted arm, as it is shown by his famous figure.

THE ARCHITECT IN WESTERN BINARY THOUGHT

The figure of the architect has also been shaped and stabilised by much older divides specific to the tradition of Western thought. As Elke Krasny (2019) points out, among these divides we find the one established between nature and culture. Vitruvius, in an early chapter of his *The Ten Books of Architecture*, written in 30 BC, first mentions imitation and learning from nature for the construction of shelters. Nature is portrayed as providing the materials and knowledge necessary for humankind:

> The men of old were born like the wild beasts, in woods, caves, and groves, and lived on savage fare. As time went on, the thickly crowded trees in a certain place, tossed by storms and winds, and rubbing their branches against one another, caught fire, and so the inhabitants of the place were put to flight, being terrified by the furious flame [...]. It was the discovery of fire that originally gave rise to the coming together of men, to the deliberative assembly, and to social intercourse [...]. They began [...] to construct shelters. Some made them of green boughs, others dug caves on mountain sides, and some, in imitation of the nests of swallows and the way they built, made places of refuge out of mud and twigs. (Vitruvius, 1960, pp. 98-99)

In the book's section titled *The Education of the Architect*, Vitruvius points out the difference between such shelters and true architecture. The architect should have been "skillful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of medicine, know the opinions of the jurists, and be acquainted with astronomy and the theory of the heavens" (Vitruvius, 1960, pp. 30-31). By shifting the art of building towards *culture*, the idea that dwelling is part of *nature* is abandoned. This historical fracture has led to modern architecture being built through the logic of *tabula rasa*, which, as already seen, was a mechanism geared towards the destruction of all pre-existence and the imposition of certain forms that can be inhabited by humankind.

Another historical divide, which shaped the idea of the architect as the sole holder of the knowledge necessary for the design and production of the built environment is the one between architecture and construction and between the architect and the builder. As noted by several scholars (Roth, 1993; Habraken, 2005; Imrie & Street, 2011; Ingold, 2012; Krasny, 2019), the separation between architecture as an art form focused on the aesthetic aspects of the built environment and the construction of buildings as the creation of their physical structure originated during the Renaissance. Before then, things were different.

Vitruvius, for instance, described the architect as a figure who merged technical skills with artistic ones, and architectural practice could not be separated from a deep understanding of building materials and construction techniques. He stressed the importance of architecture students becoming proficient in both the theoretical and technical aspects of construction. For Vitruvius, architects' knowledge "is the child of practice and theory. Practice is the continuous and regular exercise of employment where manual work is done according to the design of a drawing". He suggested that "architects who have aimed at acquiring manual skill without scholarship have never been able to reach a position of authority to correspond to their pains, while those who relied only upon theories and scholarship were obviously hunting the shadow, not the substance". Thus, for Vitruvius, educational experiences needed to be rooted in both the theory and practice of design. As he wrote, "those who have a thorough knowledge of both, like men armed at all points, have the sooner attained their object and carried authority with them". (Vitruvius, 1960, pp. 29-30).

From the early fifteenth century the modern architect, or the "artist-architect" (Roth, 1993, p. 111), began to appear, claiming the superiority of architecture over building or construction. Leon Battista Alberti, in particular, in his treatise *De re aedificatoria. On the Art of Building in Ten Books*, published for the first time in 1485, was one of the first authors to make a clear distinction between craftsmanship and architecture. This automatically resulted in binary oppositions such as learned skill/creative genius and dependence/autonomy. At the beginning of his treatise, Alberti introduces the autonomous architect-genius as follows:

> For it is not a Carpenter or a Joiner that I thus rank with the greatest Masters [...] the manual Operator being no more than an Instrument to the Architect. Him I call an Architect, who, by sure and wonderful Art and Method, is able, both with Thought and Invention, to devise, and, with Execution, to complete all those Works, which [...] can, with the greatest Beauty, be adapted to the Uses of Mankind: Such must be the Architect. (Alberti, 1755, p. 3)

The schism between thought and practice, architecture and building, as British anthropologist Tim Ingold notes, contributed to the improvement of an understanding of design in hylomorphic terms, where shapes are designed in an abstract space, as "mind's work", and only after that they are imposed on matter, as "hands work" (Ingold, 2012, pp. 20-22)[16]. Besides Alberti, as Habraken notes (2005, p. 9, cited in Imrie & Street, 2011, p. 10) other highly influential architects such as Andrea Palladio, contributed to the emergence of the tradition that came to represent buildings as abstract models separated from their context. Palladio's drawings, while beautiful artistic creations, were symptomatic of architects' growing detachment from the broader social, institutional, and political contexts of design and construction processes. The emphasis on form rather than place and context contributed to strengthening the idea of the architect as someone with superior artistic and creative skills. Along these lines, as Imrie and Street also point out (2011, pp. 9-12), later generations of architects began to depict their buildings as "'stand-alone' objects", emphasizing form and style. The representation of architecture was increasingly reduced to Cartesian coordinates or geometric points, abstracting the relationships between different parts of a building. Even today, architects tend to focus on form and style, thus severing ties with "contingency" (Till, 2009). This approach fosters a perception of their work as being largely unbounded by constraints or control on their design activities (Imrie & Street, 2011, p. 15).

The establishment of this autonomous realm[17] and of the emphasis on aesthetic-formal aspects in architectural education can be traced back to the *Académie Royale d'Architecture*, founded in 1671 in France, which, later on, in 1793, became the *École des Beaux Arts*. Rabinow notes that the *École* framed the issue of producing good design "in terms of solving a compositional problem harmoniously. This meant applying the given principles to a specific building; social, cultural, and geographic considerations were by definition beyond the scope of the problem" (1995, p. 53, quoted in Imrie & Street, 2011, p. 109). According to him, trainee architects were modelled on their masters or tutors.

The reinforcement of the division between artist-architect and craftsman-builder, initiated by the *École*, was a pivotal aspect of the professionalization of architecture in the nineteenth century, coinciding with the establishment of much of the institutional framework governing the education and training of architects. Other important institutions, such as the RIBA, founded in 1834, the Architectural Association of London in 1847, and the AIA, founded in 1857, followed suit (Imrie & Street, 2011, p. 109). With a few exceptions, such as the *Bauhaus*, which, as discussed earlier, ultimately deviated from its founding principles, this approach has persisted and continues to define the majority of architecture schools in the Western world today. As Till argues:

> The constitution and aesthetics of the manners, mannerisms, and taste may have changed over the ages, but they still define a particular set of internalized customs in the architecture studio [...]. The cult of genius, the unquestioned authority of the *patron*, the emphasis on form, the prescriptive pedagogy, the absurd rituals, the particular socialization, and the internal mores are all alive and kicking in architecture schools [...]. While the product might have moved from classical plans to algorithmic-driven blobs, the underlying principles remain unscathed, most of all the overriding autonomy of the process [...]. While the École des Beaux-Arts promoted a single version of truth under the rule of Enlightenment reason, today's ateliers are more plural but nonetheless retain the principle that the tutor in some way holds the keys to success, and in order to obtain them the student must follow the rules. (Till, 2009, pp. 12-14)[18]

16. As he states, "in the literature, the theory is known as hylomorphism, from the Greek *hyle* (matter) and *morphe* (form). Whenever we read that in the making of artefacts, practitioners impose forms internal to the mind upon a material world 'out there', hylomorphism is at work" (Ingold, 2012, pp. 20-21).

17. This attitude, as also noted by Till (2009), was also reported by architectural critic Reyner Banham. In his famous article *A Black Box: The Secret Profession of Architecture* Banham criticised the profession for its retreat into a rarefied and self-referential world (Banham, 1999).

18. Le Corbusier himself, as Till notes (2009, p. 13), strongly criticised the logic behind the *École des Beaux Arts*, particularly in *When the Cathedrals Were White*, an account of his trip to the United States in 1935. According to him, the *École* "is the seat of a most disconcerting paradox, since under the ferule of extremely conservative

THE CREATION OF THE "ARCHITECT-SUBJECT"

As Imrie and Street (2011) note, following Webster (2006), architects' education can be understood as part of the creation of the "architect-subject", in which pedagogical practices deploy what Foucault termed "micro-technologies of power" (Imrie & Street, 2011, pp. 107-109), to control and train individuals towards dominant disciplinary paradigms. Till, for his part, compares the architects to a tribe, which, like others:

> assume[s] particular rituals and certain codes, both visual and linguistic. [The architects] often dress according to type and use a specific language [...]. The undertaking of socialization into the tribe starts in the school studio [...]. By the end of the course, the students are fully assimilated into the social mores of the architectural world. (Till, 2009, pp. 17-18)

Together with the dominant narratives mentioned above, which are focused on *great examples*, also the architecture studio has evolved into a significant instrument for normalising trainees, aiming to regulate and ensure their adherence to the established norms within the architectural profession. Its focus often centers on the creation of buildings as artistic entities, often divorced from their social or environmental contexts.

> Briefs for buildings are set in the "real" world on "real" sites, empirical data are collected, engineers are sometimes spoken to, and famous architects are brought in to review the work. But these activities really do nothing to disturb the artificiality of the whole process. A linear route from problem to solution is instigated, unaffected by external forces. (Till, 2009, p. 14)

According to many authors (Anthony, 1991; Moore, 2001; Webster, 2006; Webster, 2007), the design jury stands out as a notable micro-technology of power. It emerged as a practice where experts would collectively assess students' abilities and admit them into the architectural community (Imrie & Street, 2011, p. 110). Till, again, provides an interesting description of the dynamics at work within these situations. As he notes, it

> is a strange act of tribal initiation that is played out in schools around the world. [...] The word alone, crit, is a stab of negativity. The crit places into a pressure cooker a combination of potentially explosive ingredients: students catatonic with tiredness and fear, tutors (mainly male) charged on power and adrenaline, and an adversarial arena in which actions are as much about showing of as they are about education. (Till, 2009, p. 8)

The role of architectural handbooks

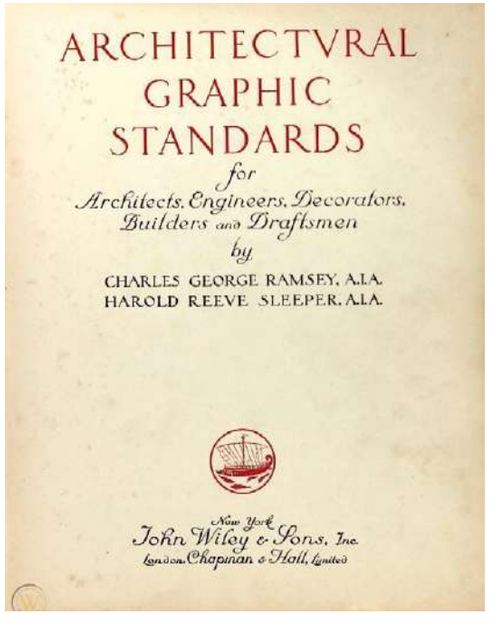
Among other numerous micro-technologies, or devices, that contribute to the *subjectification* of architects, an important role is played by architectural handbooks, which over the twentieth century played a crucial role in centralizing and homogenizing the production of architectural knowledge. Although in some schools or countries handbooks are less used today than in the past, it is important to recognise how they have anticipated and thus contributed to the rapid assimilation of digital design and its many software applications such as *Computer-Aided Design* (CAD), *Building-Information Modelling* (BIM), and others alike, which reduce the architectural drawing to a series of algorithmic protocols. Handbooks have contributed to the disciplinary construction of the architect as a technical expert, providing students and professionals with a systematic and encyclopedic framework of normative architectural knowledge. As Paul Emmons and Andreea Mihalache (2013) note, architectural handbooks appeared for the first time in the 1930s and 1940s, under the influence of scientific management's ideology, whose separation of planning from production, as we have seen, was naturally appealing to architecture. **[2, 3, 4, 5]**

Ernst Neufert's *Bauentwurfslehre*, initially published in 1936, remains in circulation with thirty-eight editions and translations into multiple languages, including English under the title *Architects' Data*[19]; additionally, Charles Ramsey and Harold Sleeper's *Architectural Graphic Standards* (AGS) from 1932 reportedly sold over one million copies by the close of the twentieth century; *Time-Saver Standards* (TSS) was published in its first edition in

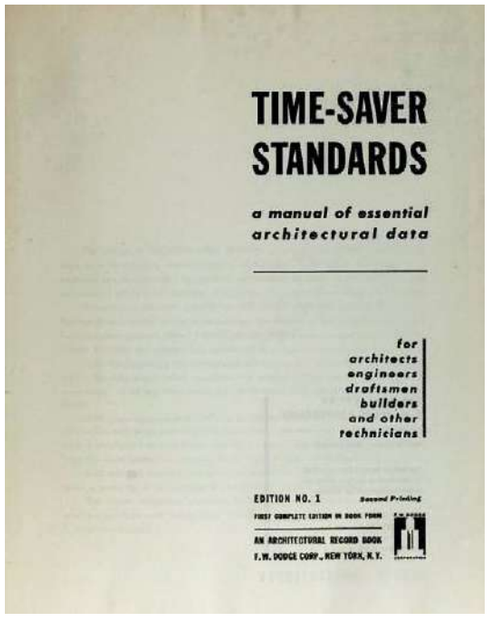
methods, everything is good will, hard work, faith" (Le Corbusier, 1947).

19. In Italy, after World War II, Neufert's handbook – published under the title *Enciclopedia Pratica per Progettare e Costruire* – acquired great relevance, paving the way for *Il Manuale dell'Architetto* (1946) edited by Mario Ridolfi and published by the CNR. *Il Manuale dell'Architetto* contains a wealth of information – together with graphic and numerical tables – on building elements, economic management and safety of construction sites, and different architectural styles. At the end of the twentieth century, Bruno Zevi edited the *Nuovo manuale dell'architetto* (1996). Zevi's son Luca published the *Nuovissimo manuale dell'architetto* in 2003.

[2] Neufert, E. (1936) Bauentwurfslehre. Berlin: Bauwelt-Verlag. Source: Vossoughian, N. (Winter 2014) Standardization Reconsidered



[3] Ramsey, C. G., Sleeper, H. R. (1932) *Architectural Graphic Standards*, 1st ed. New York: John Wiley & Sons. Source: worthpoint.com



[4] Architectural Record (1946) *Time-Saver Standards*. New York: F. E. Dodge. Source: openlibrary.org

[5] Ridolfi, M. (1946) *Il Manuale dell'Architetto*. Published by CNR

1946 and went into several re-issues. In line with Taylorist logic, handbooks were informed by principles such as standardization, productivity and efficiency. The centrality of standardization is also made explicit in their titles: *Graphic Standards*, *Time-Saver Standards* and in the subtitle of *Bauentwurfslehere*: *Grundlagen*, *Normen und Vorschriften* (Fundamentals, Standards and Requirements). The internal organisation of the books reflects this logic too. *Time-Saver Standards*, for instance, "described its material as 'carefully edited reference data' and its presentation with 'a minimum of verbiage' where 'diagrams, drawings or tables will give condensed, accurate information'", eliciting feelings of rationality and efficiency (Emmons & Mihalache, 2013, pp. 36-39). Neufert, who studied at the Bauhaus in 1919, emphasized the similarity between his handbook and the building process and:

> organized all building types to parallel user's lives from birth to death, beginning with the house (where births took place), then schools, and ending with the crematorium. All the interiors were bookended between two kinds of exteriors: the garden at the outset (perhaps the Garden of Eden as the origin of humanity?) and finally the cemetery. In this way, the handbooks demonstrate that the entirety of human life can be functionalized and standardized. (Emmons & Mihalache, 2013, p. 38)

As architectural historian Nader Vossoughian highlights (2014), Ernst Neufert held a teaching position at the Staatliche Bauhochschule in Weimar, established in 1926. The institution shared a similar mission to that of the Dessau Bauhaus, striving to integrate the arts with industry (Vossoughian, 2015). Neufert termed his own course "*Schnellentwerfen* ('rapid design')", which focused on training students to quickly and efficiently visualize and solve various architectural problems (Vossoughian, 2014, p. 680). Furthermore, from 1938 to 1941, Neufert led the Neufert Department (*Abteilung Neufert*) within the General Construction Management Department (*Generalbauleitung*) of Albert Speer's office, who was Hitler's *Generalbauinspektor für die Reichshauptstadt* (GBI). During this period, Hitler sought to reshape Berlin into a global capital and a symbol of Nazi power. Speer was in charge of coordinating this effort and saw in Neufert a useful ally who could contribute to a quick and efficient renovation of the city (Vossoughian, 2014, pp. 676-685)[20]. **[6]**

Notably, the initial set of standards presented in the first edition of the *Bauentwurfslehre* were paper standards, which Neufert identifies as essential and practical knowledge for architects: "standard [paper] formats constitute the basis for the dimensions of furniture used for writing and record keeping. These are also constitutive of the dimensions of spaces [...]. Exact knowledge of standard [paper] formats (=DIN formats) is [...] important for the builder" (Neufert, 1936, p. 12). Later in the book, Neufert suggests that the principles used for standard-format paper could be adapted for use in the construction industry, theorizing what Vossoughian terms the "standard-format brick": **[7, 8, 9]**

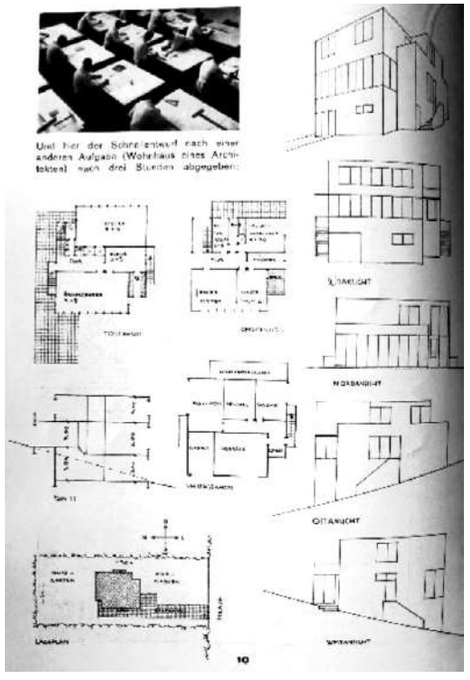
> the A0 paper format is one square meter in area. Similarly, Neufert takes as his departure point the idea that all bricks ought to have dimensions that are multiples of one meter – they needed to conform to what he calls the "Octametric System". As Jean-Louis Cohen notes, this system suggests "a complete world based on norms derived from the subdivision of the meter into eight basic modules of 12.5 centimeters, whence the notion of the 'octametric' norm". Neufert's bricks have a length of twenty-four centimeters and a width of eleven-and-one-half centimeters (with one centimeter allotted for joint thickness along each axis). (Vossoughian, 2014, pp. 46-47)[21]

The Octametric System had multiple functions, ranging from the reduction of fabrication costs to the acceleration of the design and construction process. Speed and efficiency were stressed in every detail of the *Bauentwurfslehre*:

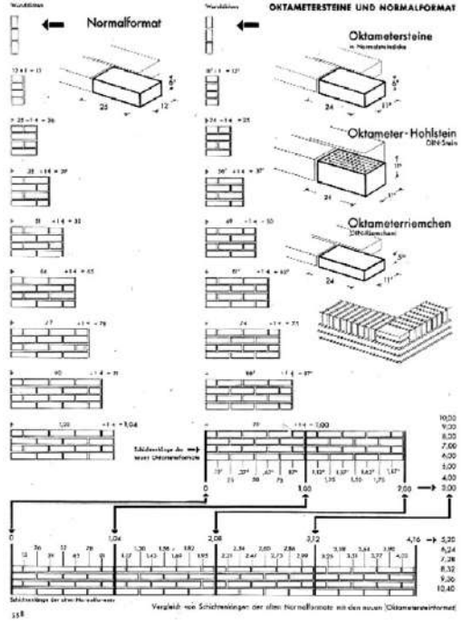
> Headings are arranged asymmetrically and in boldface print to facilitate quick referencing. Abbreviations and acronyms are included wherever possible to economize the use of space. Individual drawings are numbered sequentially in the interest of guiding the reader's eye, as well as assuring narrative coherence [...]. Illustrations resemble comic book – style caricatures, probably to make reading less taxing. Plans and elevations are of uniform dimensions [...], which facilitates comparative analysis. Column widths are short, which minimizes eye movement [...]. The entire text appears in a sans serif font, which, according to the prevailing wisdom of the

20. Vossoughian's articles (2014; 2015) offer an interesting and detailed analysis of Neufert's teaching philosophy and his connection with the *Third Reich*.

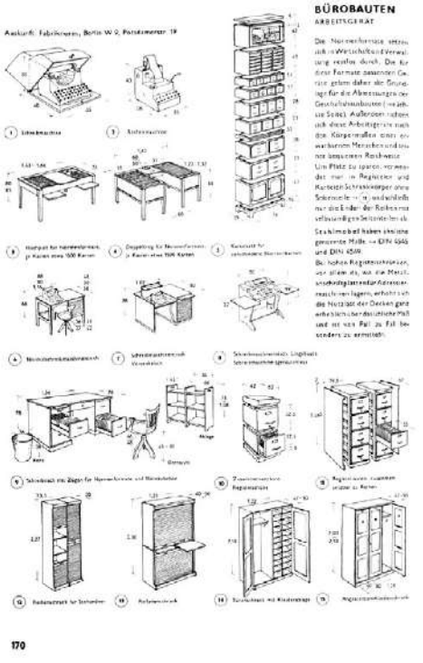
21. Here Vossoughian quotes Jean-Louis Cohen, 2001, p. 310.



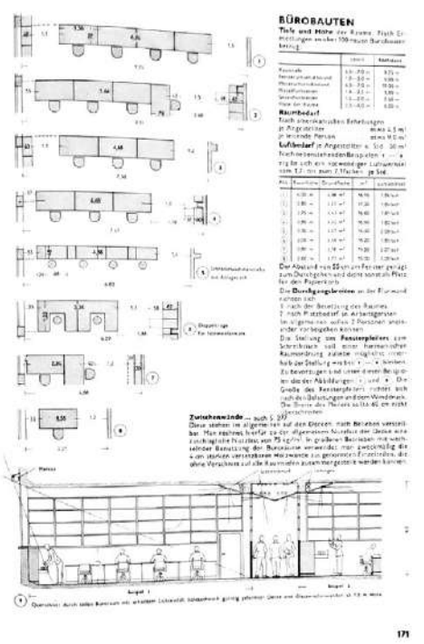
[6] Werner Gräff, ed. *Staatliche Bauhochschule Weimar*, 1929. Example of student work from Neufert's Schnellentwerfen course; on the upper-left corner of the page, students at work. Photo and caption: Vossoughian, N. (Winter 2014) Standardization Reconsidered



[7] Ernst Neufert. *Bauordnungslehre*, 1943. "Octametric Bricks [Oktametersteine] and Standard Format." Photo and caption: Vossoughian, N. (Winter 2014) Standardization Reconsidered



[8] Standard-dimensioned furnishings by *Fabriknorm*, as presented in the pages of Neufert's *Bauentwurfslehre*. Photo and caption: Vossoughian, N. (2015) From A4 Paper to the Octametric Brick



[9] From standard-dimensioned furnishings to standard-dimensioned spaces. Neufert's *Bauentwurfslehre*. Photo and caption: Vossoughian, N. (2015) From A4 Paper to the Octametric Brick

> time, was supposed to improve legibility [...]. Its coverage of building types is encyclopedic, which simplifies the research process [...]. Its contents are classified typologically, which eases the task of translating program into form [...]. It advises use of the Golden Section, which eases determination of a building's proper scale and proportion. It offers dimensional standards for organic and inorganic matter alike – for people as well as for vacuum cleaners – which permits the architect to design multiple buildings for many people simultaneously. (Vossoughian, 2014, pp. 42-43)

Notably, even rooms were organized according to binary categories, such as private/public, female/male[22], domestic/professional, so as to simplify the task of programming space. From a disciplinary perspective, therefore, handbooks perform the task of providing information to standardise and optimise the building process, characterising design as a problem-solving practice.

"NORMATE TEMPLATES"

A number of authors suggest that the user has been often reduced to a generic type or even ignored in Western architectural theories and practices (Marble, 1988; Tschumi, 1996; Hamraie, 2017). As Imrie (2003) points out, a series of studies indicate that schools of architecture devote little or no time to issues concerning the human body. The drawings themselves, a fundamental tool for architecture, often do not represent it at all[23]. According to Tschumi (1996), this absence could be attributable to a desire to preserve the nature of the project as a purely aesthetic endeavour. The highly stylized figures that architects place in their drawings are often stripped of features that are expressive of anything but a very general human shape. The human body is primarily used to indicate the scale of buildings or to provide clients with a sense of spatial proportion (Frascari, 1987)[24]. For most architects, this body is presocial, fixed, and beyond culture. It is characterised by a corporeality that revolves around a singular sex, and generally fails to acknowledge ethnic, gender, or physical differences (Imrie, 2003, p. 62). If we pay attention to the best-known representations of the architectural user, we cannot help but notice this. Bodily diversity has been hardly taken into account, while there is a widespread tendency among architects to design according to technical and dimensional standards that revolve around what Hamraie calls a "normate template" (Hamraie, 2017)[25]. In general, a generic and universal representation of the body has been part – even though it was shaped according to different logics and visions – of Western traditions of architectural design since ancient times.

In the first century BC, referring to Protagoras' dictum that "man is the measure of all things", Vitruvius (1960) outlined an ideal body as a reference for a certain idea of beauty in architecture (de Solà-Morales, 1997; Hamraie, 2017). As Imrie points out, "the scale and proportion of this ideal were the embodiment of God" (Imrie, 2003, p. 49). Hence, it was conceived as "a perfect microcosm" (Imrie, 2003, p. 49) inside a circle, with his head, arms and legs creating a perfect square, canonizing a template for the measure of the built world (Hamraie, 2017, pp. 20-21). For Vitruvius, the human body was important only insofar that it provided the dimensions for deriving architectural style and form (Imrie, 2003, p. 49)[26]. Anyway, this generated a twofold process: its proportions materialized a certain kind of architecture and "buildings likewise materialized the existence of certain *bodies* – presumably white, masculine, nondisabled citizens – as the most likely inhabitant of public space" (Hamraie, 2017, p. 21).

Vitruvius' ideas reappeared in the Renaissance. Leon Battista Alberti, for instance, noted that: "beauty is that reasoned harmony of all the parts within the body, so that nothing can be added, taken away or altered, but for the worse" (Alberti, 1988, p. 3). In 1490, Leonardo Da Vinci, while

22. Vossoughian notes how Neufert casts the *Frankfurt Kitchen* as an exemplary cooking space, thus reproducing the sexual bias at the core of the *New Frankfurt*'s agendas. "Both privilege patriarchy by actively desocializing, mechanizing, and ultimately isolating female labor. They also cast the family as the atomic 'unit' of the domestic sphere, with the mother cast as the invisible 'engine' of the interior and the father as the face of its exterior" (Vossoughian, 2014, p. 44). The sexual politics of the *Bauentwurfslehre* is also discussed in: Dörhöfer, 1999.

23. This also applies to photographs of buildings. See, for instance, Jeremy Till's chapter *Out of Time* (pp. 77-92) in Id. (2009) *Architecture Depends*. Or, in the case of renders, there are online databases from which it is possible to download a number of generic or ready-made people devoid of context and representative of a set of social behaviours.

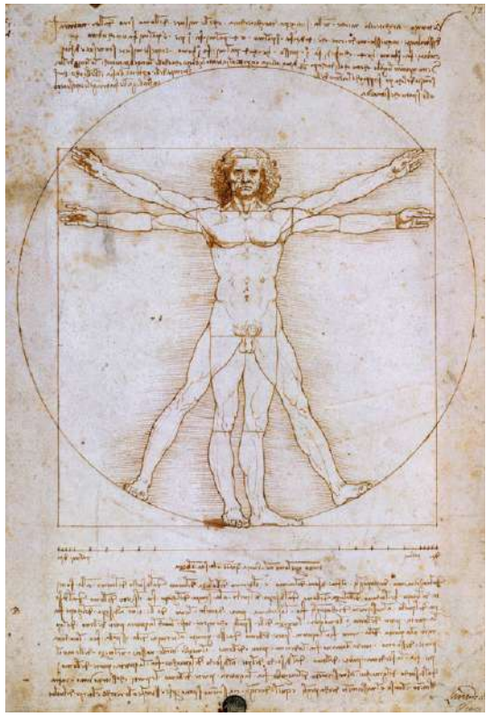
24. Particularly, Frascari refers to Robert Venturi's scale figures as "biped balloons with pointed feet and floating heads" (p. 124). See also: Bloomer, 1977; Borden, 1998; Vidler, 1999.

25. See also: Grosz, 1992; Grosz, 1994; Irigaray, 1993; Scott, 1914; Vidler, 1999.

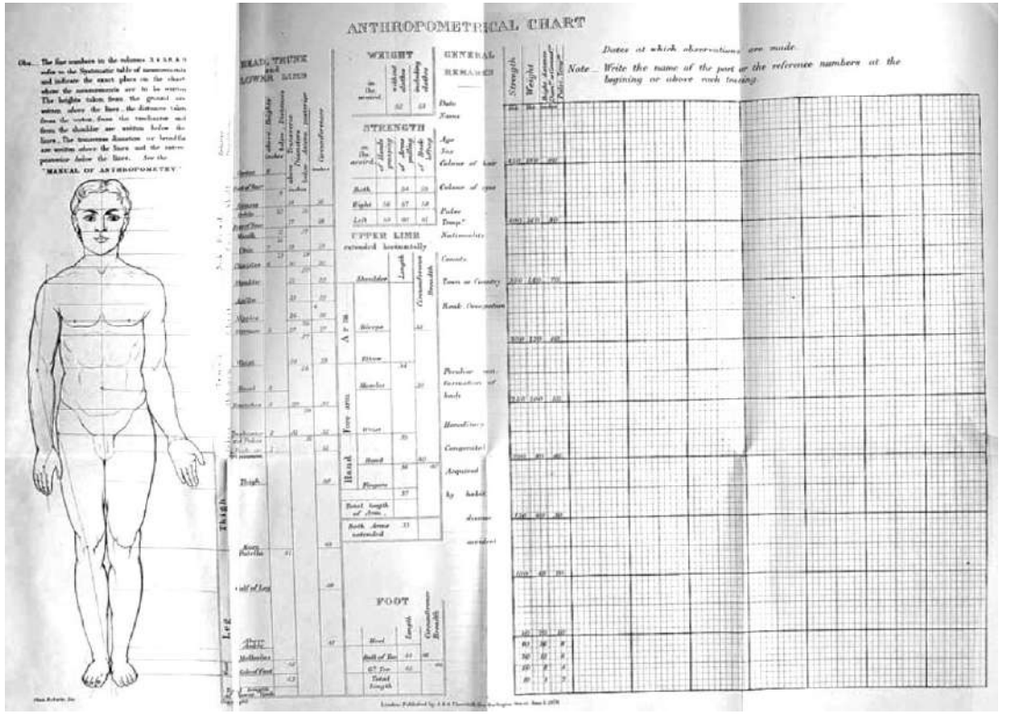
26. Imrie draws here on Ellis & Cuff, 1989.

maintaining Vitruvius's interest in the body as an instrument of measurement, gave it a transcendent appearance[27]. His depiction of the Vitruvian Man, as a white, masculine, young, muscular figure with outstretched limbs and long hair, quickly became a shared symbol in both medicine and architecture (Hamraie, 2017, p. 21). **[10]**

In the nineteenth century, however, in the wake of positivist perspectives and with the birth of statistics, the scientific value of da Vinci's *Vitruvian Man* was questioned and his mathematical proportions were criticized as mere myth and abstraction (Hamraie, 2017, p. 21)[28]. Statistical data, as seen at the beginning of this chapter, began to be commonly regarded as guarantors of validity and reliability within the domain of architecture. Nevertheless, these ideal representations were reproduced by statisticians, physical anthropologists and eugenicists in the new material culture of anthropometry, in the attempt to collect population data for statistical calculation. **[11]**



[10] Leonardo da Vinci, *Vitruvian man* (1490 ca). Photo: © Scala, Firenze – courtesy of Ministero Beni e Attività Culturali e del Turismo



[11] Roberts, C., anthropometrical chart, *Manual of Anthropometry* (1878). Source: Hamraie, A. (2017) Building Access

Originally conceived as a burgeoning field within racial science, anthropometry facilitated the determination of averages – or norms – as well as deviations from them. Its primary objective was to present comparative evidence of the perceived *abnormality* of individuals who were non-white, disabled, or economically disadvantaged. The *Vitruvian Man* was, in short, rendered "calculable, legible, a standard against which difference could be measured, and [...] [an] evidence of the supposed moral and aesthetic truths of normate bodies" (Hamraie, 2017, p. 23)[29].

In the twentieth century, Modernist architects reintroduced classical principles of geometric harmony and beauty, within the context of positivism. They emphasized an objective understanding of good design, which was rooted in the standardization of production methods (Hamraie, 2017, p. 25). Notably, behind Modernist standards, as disability theorist Tobin Siebers highlights, lied the "ideology of ability", which he defines as the societal "preference for able-bodiedness" (2008, p. 8). For Le Corbusier, as already seen, the standard was

> necessary for order in human effort [...]. [It] is established on sure bases, not capriciously but with the surety of something intentional and of a logic controlled by analysis and experiment. All men have the same organism, the same functions. All men have the same needs. (Le Corbusier, 1986, pp. 135-136)

According to Colomina, Le Corbusier conceptualized the body as a "surrogate machine in an industrial age" (1994, p. 136). Indeed, the architect's own words reveal that the body was considered as a type reducible to specific, mechanical parts:

27. Hamraie refers here to Lester, 2012.
28. Hamraie refers here to McEwen, 2003; Wetmore Story, 1864.
29. See also: Hammonds & Herzig, 2008; Kevles, 1985; Gould, 1981; Sekula, 1986.

> If our spirits vary, our skeletons are alike, our muscles are in the same places and perform the same functions: dimensions and mechanism are thus fixed [...] human limb objects are in accord with our sense of harmony in that they are in accord with our bodies. (Le Corbusier, 1925, p. 76)

According to his perspective, all human needs were alike, or, as he observed: "these needs are type, that is to say they are the same for all of us [...] since nature is indifferent, inhuman (extra human), and inclement, we are all born natural and with insufficient armour" (Le Corbusier, 1925, p. 72).

Le Corbusier's *Modulor* replaced the *Vitruvian Man* in merging classical and scientific notions of the body, establishing the measurements and attributes of the architectural user. He believed the standard to be based upon "sure truths and emotions of a superior mathematical order" (Le Corbusier, 1986, p. 221): on the one hand, the expression "superior mathematical order" could imply a assertion of scientific rationality, while on the other hand, it was also an ideal and poetic form of beauty and harmony (Imrie, 1999; Hamraie, 2017). In deterministic terms, Le Corbusier thought that the abstraction of bodily essence was crucial in establishing standardized systems of measurements to be used in the design of the built environment. As Imrie notes,

> In rejecting the individual sentient-object, Le Corbusier conceived of a world where the (standardised) measurements of the body would be critical in giving shape to the objects, decorations, and materials of everyday (human) use. For Le Corbusier, everything external to the body is but an extension of the body, or what he termed human-limb objects[30]. (Imrie, 1999, p. 33)

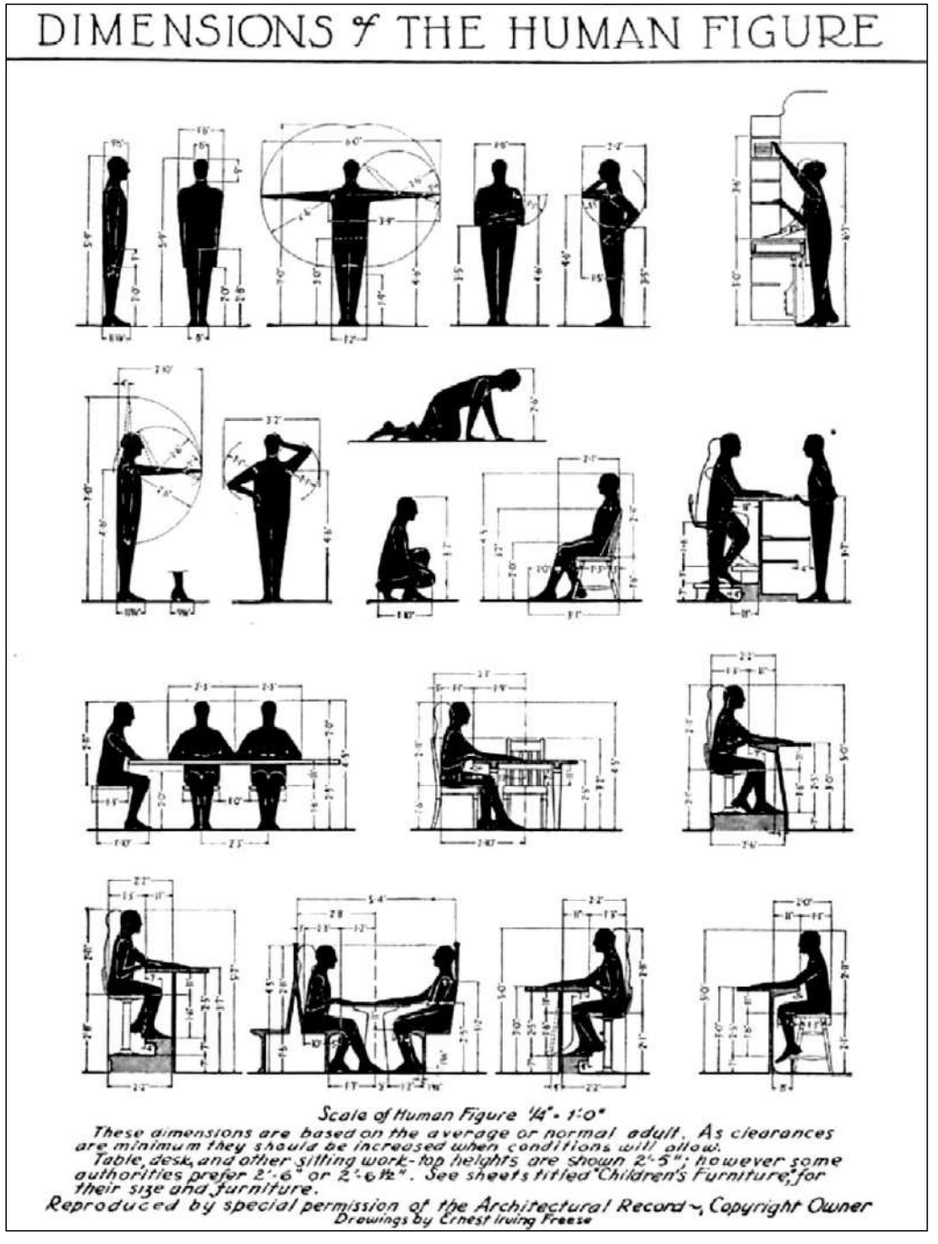
To establish their authority and validate their social, aesthetic, and industrial endeavors, modernist architects relied on the scientificity of the normate template. As noted by Hamraie, echoing Foucault's concept of "games of truth" (1997), this was a part of the reasoning where labeling something as scientific conferred upon it the power and credibility of presumed truth and objectivity (Hamraie, 2017, pp. 25-26). The portrayal of a universal white, male, non-disabled body has persisted as the standard, concealing any form of deviation from it[31]. A crucial role in rendering normate bodies legible to architects was played precisely by architectural handbooks. Indeed, "orthographic drawings [in these books] both defined and prescribed the typical features of built environments. Alongside standard doorways or roofs, depictions of the standard inhabitant, decorated with notations of measurement and size, staged the legibility of normate spatial users" (Hamraie, 2017, p. 27). In line with the modernist perspective, the representation of normate bodies has been generated by the merging together of classical canons with contemporary scientific standards. From the third edition of *Architectural Graphic Standards* (Ramsey & Sleeper, 1941), a series of black-and-white drawings realized by artist Ernest Irving Freese and titled *The Dimensions of the Human Figure* were included in the final part of the handbook. Showing numerical dimensions, these figures had the aim to provide a useful reference to average spatial dimensions to architects, adding a "hint of scientificity" (Hamraie, 2017, p. 27) to da Vinci's unmarked *Vitruvian Man*.

Anyway, scientificity here was essentially fictional – indeed, these numerical values did not align with any anthropometric data available at the time[32]. Rather, they served as an aesthetic element with a persuasive function, creating an impression of standardization and order in architecture (Hamraie, 2017, p. 27). Freese's depictions of human figures, with their neutral appearance, echoed harmonious and idealized

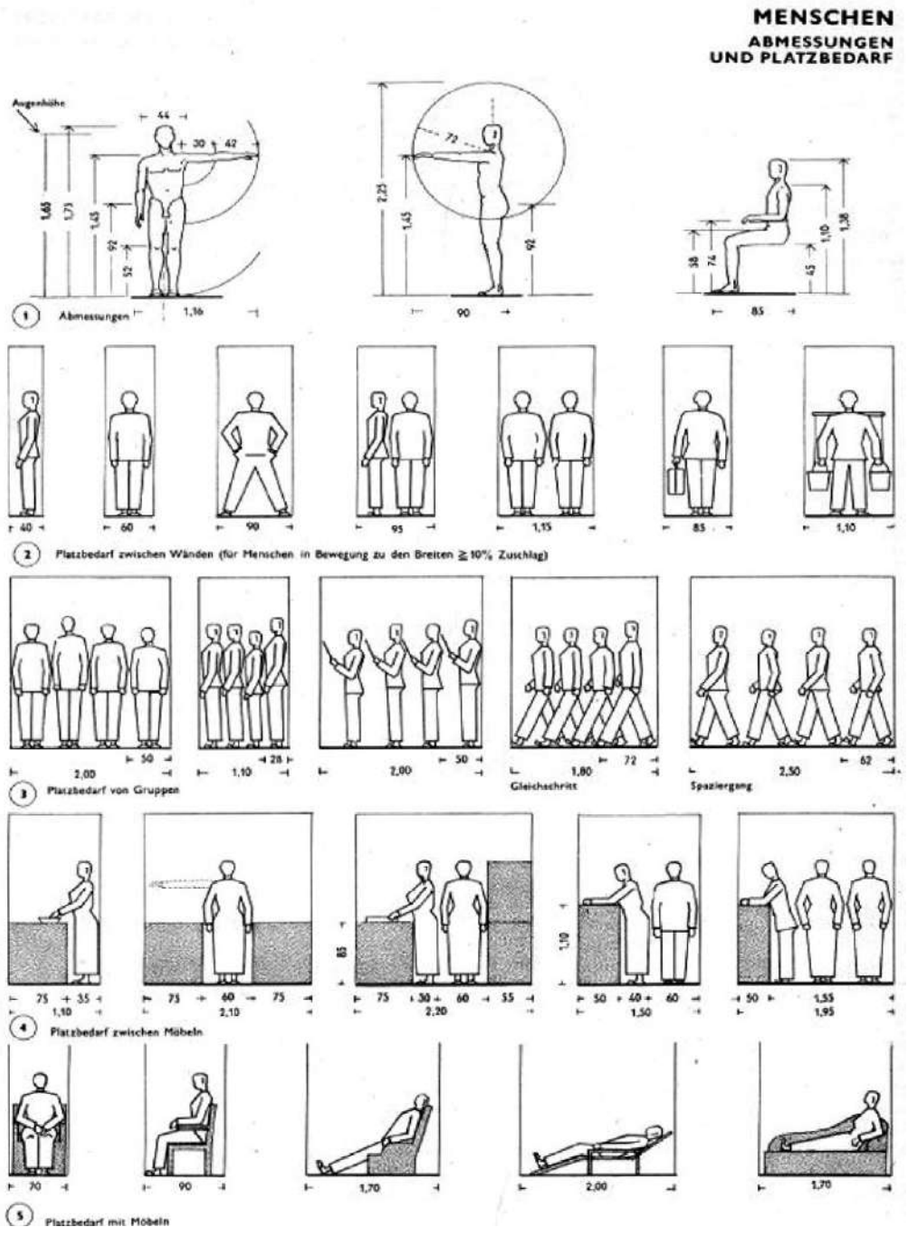
30. Indeed, Le Corbusier also used medical metaphors linked to the body to signal problematic issues of contemporary urbanism. Early twentieth-century urban planning had been responsible for cities' deformed appearance, which was analogous to a broken and maimed body. Modern architects, according to him, had the task of overturning the socio-environmental decay of the city, and providing it with health, youth, cleanliness and vigour. Such an imperative to provide the city with a good and healthy body implicitly discredited the elderly or disabled (Imrie, 1999, pp. 34-35. Here Imrie cites: Le Corbusier, 1967, pp. 92-94).

31. A number of disability design historians have reported how the social project of eugenics, whose purpose was to eliminate what were considered defective bodies, affected the nature of spatial inhabitation (Hamraie, 2017, p. 26). Christina Cogdell notes that eugenicists' goals of facilitating and accelerating human evolution were in many ways metaphorically comparable to industrial processes of assembly-line manufacture (2010; 2013). In the early twentieth century in US, non-normate bodies were segregated from public space by "ugly laws", and "feeble-mindedness" was assessed based on an individual's capacity to navigate urban environments. (Hamraie, 2017, p. 26). See also: Schweik, 2010; Mitchell & Snyder, 2006.

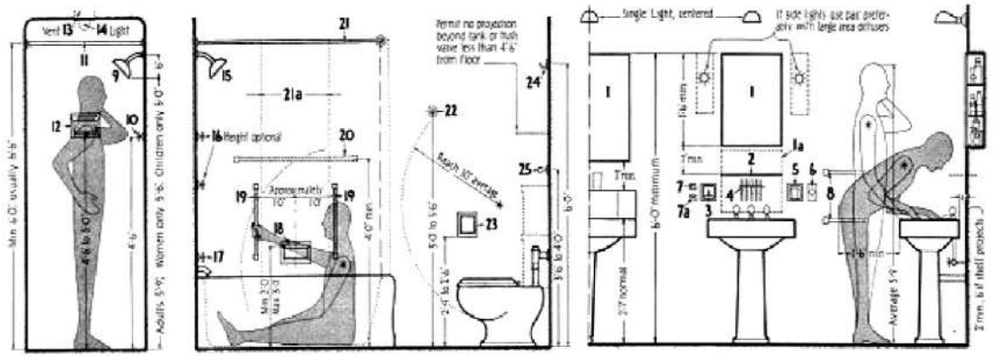
32. This has been signaled by architectural historians such as Hyungmin Pai (2002). See also: Emmons & Mihalache, 2013.

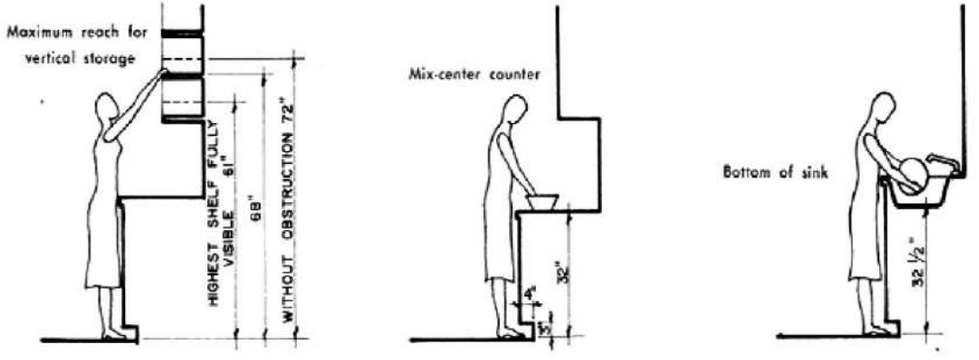


[12] Freese, E. I., *The Dimensions of the Human Figure, American Architect and Architecture* 145 (July 1934): 57–60. Source: Hamraie, A. (2017) *Building Access*



[13] "Man: dimensions and space needs", in Neufert's *Bauentwurfslehre*. Source: Emmons, P. and A. Mihalache, A. (2013) *Architectural handbooks and the user experience*





representations. Resembling the industrial products they would interact with, these figures were highly abstracted, depicted with straight lines, arcs, and dimensions from centerlines (Emmons & Mihalache, 2013, p. 45) [33]. They "stand, sit, and crawl using two arms and two legs; their dark shade does not appear legible as a racial category; their gender is largely unannounced" (Hamraie, 2017, p. 30). Interestingly, to make the female inhabitant legible, a single, high-heeled shoe was depicted next to a normate figure. Architectural critic Lance Hosey (2006, p. 105, cited in Hamraie, 2017, p. 30) observes that what seems like a benign act of differentiation ultimately resulted in a marginal increase in diversity that only served to uphold the existing standards. **[12, 13, 14, 15]**

One exception to the generalization and normalization processes of Modernism arose from the field of ergonomics. Here, evidence-based research on human factors, derived from military contexts, was melded with the aesthetic and functional principles of industrial design. This evolution within industrial design soon influenced architecture as well. At the beginning of the twentieth century, the U.S. military enlisted industrial designers to create machinery, vehicles, and uniforms, furnishing them with extensive collections of anthropometric data concerning male soldiers' bodies. Even after World War II, esteemed American industrial designer Henry Dreyfuss persisted in this role, emphasizing the significance of human body statistics as a vital tool for crafting both aesthetically pleasing and functional products (Hamraie, 2017, p. 33). By using the terms human factors and human engineering, Dreyfuss outlined a philosophy of "fitting the machine to the man rather than the man to the machine" (Lupton et al., 2014). **[16]** In *Designing for People* (Dreyfuss, 1955), he also included charts depicting Joe and Josephine, two anthropometric drawings of a man and a woman. In contrast to Le Corbusier's *Modulor* and other systems that relied on a single set of measurements, the dimensional data associated with these figures included both upper and lower percentiles, in addition to the average. This approach gained widespread acceptance, leading to the publication of life-size wall charts in *The Measure of Man* (Dreyfuss, 1960), a portfolio-style packet featuring dimensional drawings (Hamraie, 2017, p. 34). Compared to the modernist, standardization-oriented approach, Dreyfuss' human engineering, forming the foundation of user-centered design, emphasized the dynamic and different nature of design users. Joe and Josephine, he wrote,

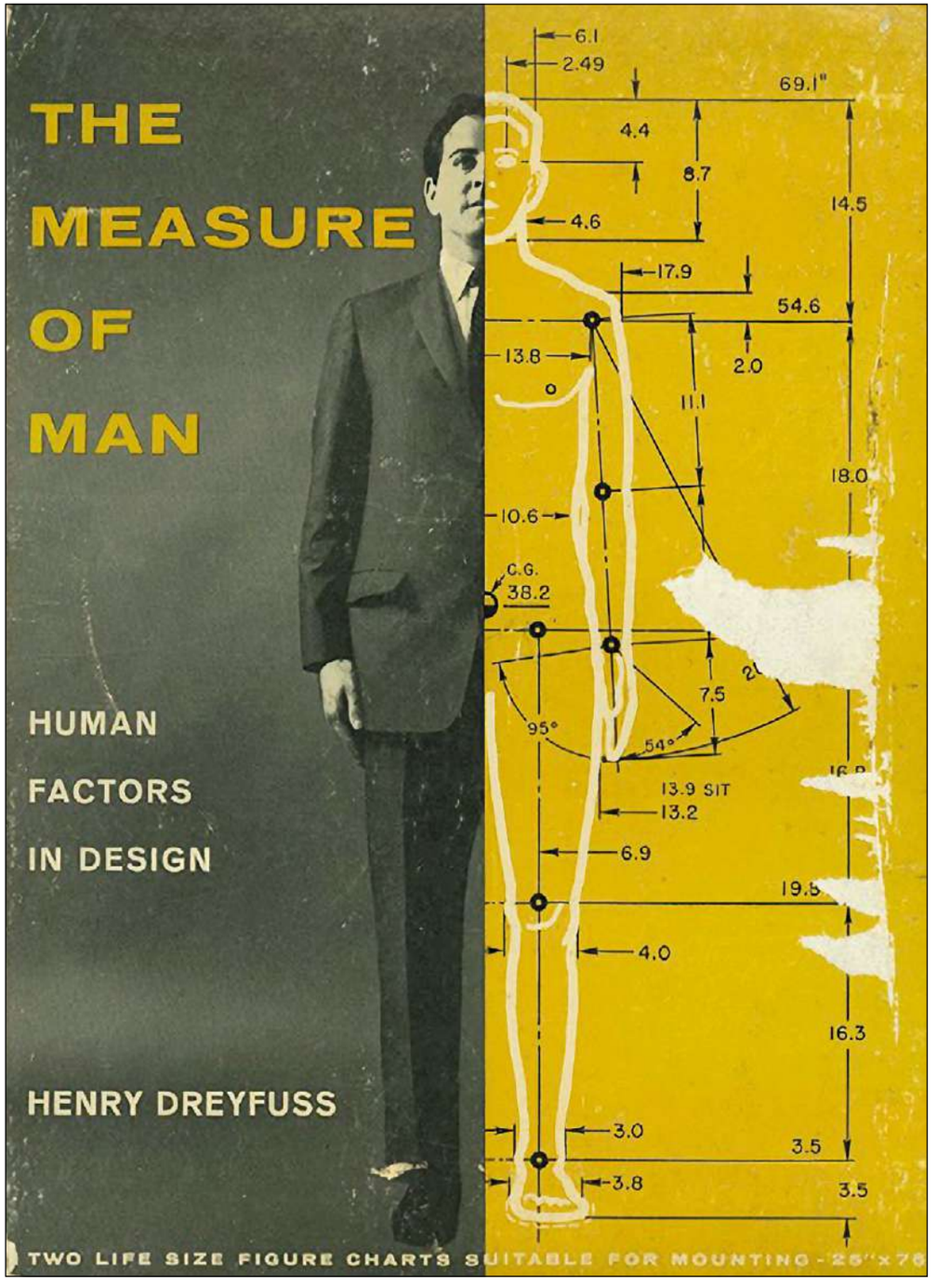
> are not very romantic-looking, staring coldly at the world, with figures and measurements buzzing around them like flies, but they are very dear to us. They remind us that everything we design is used by people, and that people come in many sizes and have varying physical attributes. (Dreyfuss, 1955, p. 45)

Although in his day some cognitive differences had not yet been biomedically categorized, he also pointed out that Joe and Josephine had

[14] (a) "Bathroom Planning, Shower and Bathtub" (September, 1935), 191; (b) "Bathroom Planning, Lavatory" (September, 1935), 190. Architectural Record, *Time-Saver Standards*, 2nd edition (New York: F. W. Dodge, 1950). Photo and caption: Emmons, P. and A. Mihalache, A. (2013) *Architectural handbooks and the user experience*

[15] "Kitchens, Critical dimensions, Comfortable working heights," in John Hancock Callender, editor-in-chief, *Time-Saver Standards*, 4th edition (New York: Mc- Graw-Hill, 1966), 968. Photo and caption: Emmons, P. and A. Mihalache, A. (2013) *Architectural handbooks and the user experience*

33. Emmons and Mihalache (2013) note that these figures, or silhouettes, remind of Viennese sociologist Otto Neurath's *ISOTYPE* symbol for man, which were intentionally minimal, flat and devoid of any inner life or individual character to emphasize factuality. Neurath explained that "the sign man has not to give the idea of a special person with the name XY, but to be representative of the animal *man*" (1973, p. 217).



[16] Dreyfuss, H. (1960) *The Measure of Man*. 1st ed. New York: Whitney Library of Design. Book cover. Source: modernism101.com

"numerous allergies, inhibitions, and obsessions. They react strongly to touch that is uncomfortable or unnatural; they are disturbed by glaring or insufficient light and by offensive coloring; they are sensitive to noise, and they shrink from disagreeable odor" (Dreyfuss, 1955, p. 37, quoted in Hamraie, 2017, p. 37).

Between mid-1970s and the 1980s, a new wave of designers inspired by Dreyfuss started to explore innovative approaches to designing for the diverse range of human variations, moving away from the Modernist trend of standardized abstractions. Starting from 1974, Niels Diffrient, Alvin Tilley e Joan Bardagjy from the Henry Dreyfuss Associates published a revision and expansion of Dreyfuss' *The Measure of Man*, which included a series of portfolios titled *Humanscale* (Diffrient et al., 1974) displaying anthropometric data on a range of newly legible figures, such as women, children, elders, wheelchair users and a person using crutches (Hamraie, 2017, p. 38). Although they were initially conceived for industrial designers, these new charts began to cross into the realm of architecture.

In the early 1980s, in particular, legal mandates for accessible architectural design began to emerge, intensifying the need for architects to possess a more comprehensive knowledge base that prioritized inclusivity. Consequently, an updated edition of *Humanscale* (Diffrient et al., 1981) was incorporated into the seventh edition of *Architectural Graphic Standards* (Ramsey & Sleeper, 1981), replacing Freese's dimensional figures of the universal man and feminine shoe. Additionally, certain texts featured in the charts provided loose recommendations for designing with consideration for blind, deaf, and hard-of-hearing individuals. These examples thus hinted at the existence of a more diverse array of bodies than the conventional, standardized depictions of the architectural user. In essence, templates appeared to take on a greater degree of flexibility (Hamraie, 2017, pp. 30-33).

Another designer, Victor Papanek, moved in a similar direction. In his famous book *Design for the Real World* (1972) Papanek advocated for a design approach that transcended commercial motivations, "emphasizing those overlooked by commercial marketing: the poor, the developing world, and 'the retarded, the handicapped, the disabled, and the disadvantaged'" (Williamson, 2019, p. 170). In *Design for Human Scale* (Papanek, 1983), he even included calculations of the number of users who would find objects like counters, cabinets, and shelves inaccessible, revealing how mainstream designers tended to have narrow perceptions of their

target users as affluent, able-bodied, Western consumers (Williamson, 2019, p. 170). However, despite these efforts displaying a heightened awareness of differences among users, they often stayed at a generalized and abstract level, neglecting to consider the specificity and unique characteristics of individual bodies. For instance, according to design historian Bess Williamson, *Humanscale* replicated "some of the contradictions of the Dreyfuss originals, which embraced a diversity of human bodies while also summarizing them through a visual presentation of a normative figure of a single, seemingly unblemished male body" (Williamson, 2019, p. 159). As also Ellen Lupton points out:

> The authors [...] acknowledged that the diagrams account for variations in height but not weight: in their "leshy areas", populations feature broader individual differences than they exhibit in their height. The limb dimensions are averages; actual measurements vary from individual to individual. The goal in creating a standard system of measure – even an inclusive one like *Humanscale* – constantly comes up against human particularity. (Lupton, 2014, p. 29)

EXPERT HARBINGERS OF THE *GOOD*

Some persistent issues in architectural education and practice, characteristic of a still largely dominant disciplinary paradigm, include historical dichotomies such as nature/culture and architecture/construction, the glorification of past and present *great myths*, an emphasis on efficiency and aesthetics, and reliance on standard templates. Despite numerous attempts to oppose this paradigm, for the most part architects are still framed as expert harbingers of the *good*, providing technological fixes from above and in the abstract, while generally little attention is paid to their effects. As Giovanna Borasi and Mirko Zardini point out in their *Imperfect Health: The Medicalization of Architecture* (2012) architectural design still adheres to a purely medical rhetoric, in line with the hygienic paradigm of nineteenth century urban planning and the centralised, rationalist logic behind modernist design. Modern architecture is a discipline – characterised by a high legal component – linked to the question of social medicine, which, for Foucault (2001), represents the paradigm of liberal governmentality invented in the nineteenth century. In most cases, when approaching, for example, questions of climate urgency and more generally the health of the population, "design disciplines prefer to rely on an abstracted, scientific notion of health, and very literally adopt concepts such as 'population', 'community', 'citizen', 'nature', 'green', 'development', 'city' and 'body' into a professionalized, disciplinary discourse" (Borasi & Zardini, 2012, p. 16). Nature itself is seen as an external element to be manipulated to heal or repair the human-made environment. What still prevails is "an absolute confidence in the ability to provide perfect solutions" (Borasi & Zardini, 2012, p. 17) and an attitude towards generalisation, simplification, abstraction and the elimination of differences and specificities. In this perspective, the *common good* is identified as a technical issue and objective, without asking who is part of this *common* and what *good* means and for whom, with all the technocratic risks that this entails.

III. THE "THINGS" OF ARCHITECTURE

A particularly interesting contribution to reflecting on the problems related to expert knowledge and the question of participation in architecture is offered by Science and Technology Studies (STS). The field of STS emerged in the 1970s to investigate the close link between scientific knowledge and power. By analysing the work of scientists in their laboratories, social scientists and ethnographers sought to demonstrate how scientific facts take shape and how expert authority is constructed. One of the most relevant issues introduced by these studies, and by Actor-Network Theory (ANT) in particular, is the political agency of non-humans, seen as active participants in social reality. Modern binomials such as nature/culture, human/non-human, and subject/object have been progressively questioned and treated as an effect of the purification of more complex and heterogeneous relations. In contrast to conventional social science perspectives, ANT scholars extended the social to include more-than-human networks, and began to describe the operations that can bring together and discipline ideas, materials, procedures, tools, technologies, and humans.

Some scholars, in particular, have focused their attention on the field of architecture, analysing not only the artefacts, but also the practices of designers, and the way they construct social worlds. Just like the work of scientists, design is seen as the "heterogeneous engineering" (Law, 1987) of the networks in which people and things perform through a series of mediators, such as particular devices and techniques. By opening the black boxes of scientific facts, technological artefacts, and design practice itself, STS scholars have called into question the cultural authority of experts, showing a commitment towards the democratization of technical knowledge, particularly in response to the growing uncertainties and controversies that have emerged around scientific and technological issues.

The influence of pragmatist philosophy on ANT spurred several scholars and designers to reformulate the idea of participation by shifting the focus from procedural methods to others that are inherently more experimental and processual, based on engagement with publics on specific, controversial issues. In particular, great emphasis is placed on material perspectives on participatory processes, i.e., how objects, devices, and materials play a role in these processes, enacting specific versions of subjectivity, agency, and the issues at hand.

Another crucial aspect is Isabelle Stengers' (2005) call to continually foster situations that might disrupt existing versions of the common world, allowing for new and unknown configurations to emerge. This approach embodies an ethical-political commitment to consider all parties involved, ensuring that potential victims are not overlooked. In this regard, María Puig de la Bellacasa's concept of "matters of care" (2017), further articulating the feminist perspectives mentioned in chapter I, stresses the importance of taking into account neglected human and non-human actors, whose diverse capacities may prevent them from articulating their concerns and needs in conventional or normative ways.

THE POLITICAL AGENCY OF NON-HUMANS

Together with others, Foucault's reflections have strongly contributed to the development of an interest in the social sciences for the study of science, where a close association was found between scientific knowledge and power. The field of study known as Science and Technology Studies (STS) was born precisely to inquire the vast power of science and technology in today's society. In a nutshell, the field investigates how scientific facts are socially constructed and black-boxed (Latour, 1987), thus making the cultural authority of techno-science contestable. In an attempt to understand how the power of science works, a group of ethnographers and social scientists in the 1970s entered the laboratories to directly observe the practical, day-to-day activities of scientists. As sociologist Jonathan Murdoch put it: "within the ethnographies, scientists are shown to be using a variety of means to bring nature 'into being' in the laboratory just as Foucault had shown the human sciences bringing particular conceptions of 'man' into being within prisons and asylums" (Murdoch, 2006, p. 59). Bruno Latour, himself a pioneer in the so-called

laboratory studies[1], together with Steve Woolgar announced their intention to study scientists as follows:

> Since the turn of the century, scores of men and women have penetrated deep forests, lived in hostile climates, and weathered hostility, boredom, and disease in order to gather the remnants of so-called primitive societies. By contrast to the frequency of these anthropological excursions, relatively few attempts have been made to penetrate the intimacy of life among tribes which are much nearer at hand. This is perhaps surprising in view of the reception and importance attached to their product in modern civilised societies: we refer, of course, to tribes of scientists and to their production of science. (Latour & Woolgar 1986, p. 17)

These studies legitimized scientific knowledge as a subject of sociological investigation (Murdoch 2006, p. 59). The aim of these scholars was to reveal, through their ethnographic analyses, how the shaping of data, along with the phenomena themselves, is intricately linked to particular skills, cultural practices, and the everyday negotiations occurring within laboratory settings (Sismondo 2007, p. 15). In their endeavors, they have aimed to reveal the contingent and uncertain nature of science, which is frequently obscured – whether intentionally or unintentionally – when scientific facts and theories are deployed and disseminated.

An interesting methodological perspective in STS[2] is known as Actor-Network Theory (ANT), developed by Latour together with Michel Callon and John Law[3] with the will to extend their research beyond the confined space of the laboratory to its implications on the world at large. Latour, Callon, and Law started to pay attention to material aspects, and to analyse how science exerts its power by controlling and manipulating heterogeneous elements, thereby enabling the construction of scientific facts and their dissemination beyond the boundaries of scientific

1. See also: Knorr-Cetina, 1981; Lynch, 1985; Collins, 1985; Traweek, 1988.
2. It is no easy to account for the numerous research programmes in STS. Anyway, a full-blown survey of this multidisciplinary field – that has so strongly contributed to shaping new perspectives in sociology, philosophy, science and technology – is beyond the scope of this book. For useful accounts of STS see: Yearley, 2005; Sismondo, 2004.
3. This group of sociologists was working at the *Centre de Sociologie de l'Innovation* of the *École Nationale Superieure des Mines* of Paris. Among their earlies works are: Callon, 1986a; Latour, 1988; Law, 1987.

laboratories (Murdoch, 2006). ANT therefore offers an original reinterpretation of agency involving non-humans[4], challenging the sovereignty of human action. Since then, not only will human social dynamics play a role in narratives of knowledge production and dissemination, but also genes, particles, scientific equipment, and research documents. Furthermore, these scholars suggested that the divide between science and society is one aspect of a larger modernist rift between nature and society, objects and subjects, science and politics. According to them, this separation or purification was always fictitious: a few years later, in fact, Latour (1993) argued that "we have never been modern" **[BOX 1]**.

Heterogeneous engineering

One of the pillars of ANT is the consideration of knowledge as a social product – consisting of a network of heterogeneous components – rather than the product of a scientific method. In the analysis of the relationship between the laboratory and its external environment attention was given to the ways and "means whereby laboratories draw entities in from the outside, subject them to various processes of transformation, and then export them to the rest of the world in the form of scientific facts and artefacts" (Murdoch, 2006, p. 57). In the following, I will attempt to give an incomplete account of some of the reflections within STS – particularly by ANT scholars –, with a focus on how they have proved relevant to the field of architecture, for both the study of material products and artefacts and design practices.

In his famous book *Science in Action* (1987) – and then in *The Pasteurization of France* (1988) – Latour undertook the task of explaining how laboratories gain their influence and power in the world by using a case study, which was scientist Louis Pasteur's work in his laboratory in the *École Normale Supérieure* in Paris in 1881. Here Latour shows that power

4. Notably, the term non-human is used to replace the term object and to broaden its scope. Some years after his first contribution to ANT, Latour defined it as a "concept that has meaning only in the difference between the pair 'human-nonhuman' and the subject-object dichotomy [...]. The pair human-nonhuman is not a way to 'overcome' the subject-object distinction, but a way to bypass it entirely" (Latour, 1999a, p. 308). In using these two terms, in fact, Latour aims to move beyond the conventional understanding of the roles of subjects and objects, which often depict objects as passive tools at the disposal of human subjects. Instead, he seeks to acknowledge the active agency of non-human entities, an aspect frequently neglected or denied.

BOX 1 > WE HAVE NEVER BEEN MODERN. In *We Have Never Been Modern* (1993) Latour starts an investigation that he will develop more fully in the 2000s. He starts to question why people persist in separating reality into distinct domains, human-society-politics and non-human-nature-science, when everything we observe and read reveals their inseparable connection. Even a glance at the newspaper reveals that "all of culture and all of nature get churned up again every day" (p. 2). Indeed:

> On page four of my daily newspaper, I learn that the measurements taken above the Antarctic are not good this year: the hole in the ozone layer is growing ominously larger. Reading on, I turn from upper-atmosphere chemists to Chief Executive Officers of Atochem and Monsanto, companies that are modifying their assembly lines in order to replace the innocent chlorofluorocarbons, accused of crimes against the ecosphere. A few paragraphs later, I come across heads of state of major industrialized countries who are getting involved with chemistry, refrigerators, aerosols and inert gases. But at the end of the article, I discover that the meteorologists don't agree with the chemists; they're talking about cyclical fluctuations unrelated to human activity. So now the industrialists don't know what to do. The heads of state are also holding back. Should we wait? Is it already too late? Toward the bottom of the page, Third World countries and ecologists add their grain of salt and talk about international treaties, moratoriums, the rights of future generations, and the right to development. [...] On page eight, there is a story about computers and chips controlled by the Japanese; on page nine, about the right to keep frozen embryos; on page ten, about a forest burning, its columns of smoke carrying off rare species that some naturalists would like to protect; on page eleven, there are whales wearing collars fitted with radio tracking devices; also on page eleven, there is a slag heap in northern France, a symbol of the exploitation of workers, that has just been classified an ecological preserve because of the rare flora it has been fostering! On page twelve, the Pope, French bishops, Monsanto, the Fallopian tubes, and Texas fundamentalists gather in a strange cohort around a single contraceptive. (pp. 1-2)

As evident as this proliferation of hybrids or "quasi-objects" (p. 51) is, the separation of nature from science, and knowledge of things from human society and politics, stubbornly continues. And yet,

> the smallest AIDS virus takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco, but the analysts, thinkers, journalists and decision-makers will slice the delicate network traced by the virus for you into tidy compartments where you will find only science, only economy, only social phenomena, only local news, only sentiment, only sex. (p. 2)

Indeed, the "modern Constitution" (p. 29) – the silently acknowledged separations between humans and non-humans, politics and science, power and knowledge – shapes our collective imagination. Latour argues that we've effectively engaged in one action while professing the opposite: separating a set of activities that by "translation, creates mixtures between entirely new types of beings, hybrids of nature and culture" from another set that, "by 'purification', creates two entirely

distinct ontological zones: that of human beings on the one hand; that of nonhumans on the other" (pp. 10-11). According to him, it's our unwavering commitment to separation that has facilitated the unchecked proliferation of such divisions. "Without the first set, the practices of purification would be fruitless or pointless. Without the second, the work of translation would be slowed down, limited, or even ruled out" (p. 11). Indeed, "the modern Constitution allows the expanded proliferation of the hybrids whose existence, whose very possibility, it denies" (p. 34) by refusing to acknowledge them as such. According to Latour, the time has come to welcome what ANT has discovered and "stop having been modern" and become "retrospectively aware that the two sets of practices have always already been at work in the historical period that is ending" (p. 11). He also highlights how this proliferation of hybrids has unfolded without a public sphere capable of monitoring and addressing our socio-technical complexities. For that, we need a new, "nonmodern Constitution" (p. 139), to handle the proliferation of hybrids in a more accountable and traceable manner: "we are going to have to slow down, reorient and regulate the proliferation of monsters by representing their existence officially. Will a different democracy become necessary? A democracy extended to things?" (p. 12). At this point, he introduces his renowned conceptual metaphor of a "Parliament of Things" (p. 144), wherein hybrids become public things: "We want the meticulous sorting of quasi-objects to become possible – no longer unofficially and under the table, but officially and in broad daylight. In this desire to bring to light, to incorporate into language, to make public, we continue to identify with the intuition of the Enlightenment" (p. 142).

consists in the "ability to tie together actors situated beyond the laboratory into networks that enable scientific facts and artefacts to travel far and wide" (Murdoch, 2006, p. 61). Scientists like Pasteur, to be successful, must be able to build networks and enroll heterogeneous allies. In this process, non-humans play a crucial role, for they "become 'delegates', able to carry 'rationalities of rule' generated by the centre out to all the localities enrolled in the network" (Murdoch, 2006, p. 65).

In other words, to deal with the world outside the laboratory, scientists create several "inscriptions", which are "the photos, maps, graphs, diagrams, films, acoustic or electric recordings, direct visual observations noted in a laboratory logbook, illustrations, 3-D models, sound spectrums, ultrasound pictures, or X-rays as arranged and filtered by means of geometric techniques" (Callon, 2001a, p. 62). Their work consists in "setting up experiments so that the entities they are studying can be made 'to write' in the form of these inscriptions, and then of combining, comparing, and interpreting them. Through these successive *translations* researchers end up able to make statements about the entities under experimentation" (Callon, 2001a, p. 62). As Latour declares:

> I was struck, in a study of a biology laboratory, by the way in which many aspects of laboratory practice could be ordered by looking not at the scientists' brains (I was forbidden access!), at the cognitive structures (nothing special), nor at the paradigms (the same for thirty years), but at the transformation of rats and chemicals into paper [...]. Their end result, no matter the field, was always a small window through which one could read a very few signs from a rather poor repertoire (diagrams, blots, bands, columns). (Latour, 1990, p. 22)

To produce inscriptions scientists use instruments, or "inscription devices", which are the interface between them and the real world, or, in Latour and Woolgar's words, "any item of apparatus or particular configuration of such items which can transform a material substance into a figure or a diagram which is directly usable by one of the members of the office space" (Latour, 1986, p. 51). Inscriptions, therefore, constitute particular versions of knowledge, being all the types of transformations through which entities outside the laboratory are materialized into something legible and amenable for scientists to use. Also called "immutable mobiles" by Latour (1987), they have to keep their form intact – and thus be immutable – despite being in motion – that's why mobiles –, allowing the compilation and recombination of results. Their work consists of making what is complex and mutable stable and fixed, thereby circulating it through formulas or visual representations. Thinking about a map, as Latour (1990) explains, helps us to understand this process: the map is an inscription that translates space into diagrammatic form, thus reducing spatial relations to a single – and, therefore, legible and governable – sheet of paper (Murdoch, 2006, p. 134). Unlike the land, the map is mobile, and at the same time is immutable, whereas, to take Latour's example, the drawing in the sand of a native person is not. By drawing a map on paper, it is possible to carry the remote land back to the center – i.e. the laboratory – even if the real one remains in its place[5].

5. Latour also uses other examples. For instance, recalling William Mills Ivins's words, he mentions linear perspective, "because of its logical recognition of internal invariances through all the transformations produced by changes in spatial location" (Ivins, 1973, p. 9). In perspective, Latour writes, "no matter from what distance and angle an object is seen, it is always possible to transfer it – to translate it – and to obtain the same object at a different size as seen from another position". In this sense, it "creates 'optical consistency,' or, in simpler terms, a regular avenue through space" (Latour, 1990, p. 27).

ANT scholars were interested in tracing the circulation of such inscriptions, which are created by and at the same time shape a particular version of knowledge (to say in other words, scientists produce them and, at the same time, are conditioned by their world-making effects). An example of the complexity of such a tracing process **[BOX 2]** is offered by Callon:

> The map drawn up by a geologist, based on readings in the field; the photos used to follow the trajectories identified by detectors in a particle accelerator; the multicolored strips stacked on a chromatograph; the tables of social mobility drawn up by sociologists; the articles and books written by researchers: all these circulate from one laboratory to the next, from the research center to the production unit, and from the laboratory to the expert committee which passes it on to a policy maker. When a researcher receives an article written by a colleague, it is the genes, particles, and proteins manipulated by that colleague in her or his own laboratory that are present on the researcher's desk in the form of tables, diagrams, and statements based on the inscriptions provided by instruments. Similarly, when political decision makers read a report that asserts that diesel exhaust fumes are responsible for urban pollution and global warming, they have before them the vehicles and atmospheric layers that cause that warming. (Callon, 2001a, pp. 62-63)

This descriptive attention is also central to ANT's accounts of technology. In his account of the process of development of an electric vehicle in France in the 1970s, Callon used the expression "engineer-sociologists" (1987), showing that engineers were simultaneously addressing social and technical issues. To put it in his words, "engineers construct hypotheses and forms of argument that pull these participants in the field of sociological analysis. Whether they want or not, they are transformed into sociologists, or what I call engineer-sociologists" (Callon, 1987, p. 84). John Law, for his part, called this process "heterogeneous engineering" (1987), and suggested that large-scale technological innovations like the electric vehicle "can be seen as [...] *network[s]* of juxtaposed components" (Law, 1987, p. 113). To give another example, Law mentioned the empirical case of the Portuguese expansion in the sixteenth century, and, more precisely, the reconstruction of the navigational context undertaken by them to secure the mobility and durability of their vessels. In this endeavour, he writes, the Portuguese had to construct "a network of artifacts and skills

BOX 2 > SPATIAL METAPHORS AND THE DISTRIBUTION OF AGENCY IN ACTOR-NETWORK THEORY

The peculiar interest of ANT in following the various entities that participate in the production of facts mobilises, in turn, a spatial vocabulary: in fact, it reveals that space itself is produced by different associations. It is therefore topological and not unique, absolute – as it is in the Euclidean conception. In particular, in early ANT studies, inscriptions are seen to circulate in space and time in stable networks. These networks have a "socio-technical" character (Callon, 1986b), since the inscriptions connect humans with the non-humans their statements refer to – such as cells, particles, animals and so on – and with those that make them possible – such as microscopes, computers and other scientific equipment. Actions always take place within networks.

Notably, the spatial analysis proposed by ANT scholars focuses on how knowledge is distributed among the different actors. What interests them, and pushes them to use the conceptual tools of topological-spatial analysis, is not so much a characterisation of space, as a reflection on the spatiality – or spatial distribution – of knowledge. Anyway, the spatial metaphor of the network has been criticized by many scholars – mostly feminist thinkers – for tending to colonize all domains in a way that no space remains outside the network itself. Also, these authors have complained that actor-network theory has focused too much of its attention on the network builder rather than on other entities potentially excluded from network relations. To put it in Haraway's words:

> How is visibility possible? For whom, by whom, and of whom? What remains invisible, to whom, and why? For those peoples who are excluded from the visualizing apparatuses of the disciplinary regimes of modern power-knowledge networks, the *averted gaze* can be as deadly as the all-seeing panopticon that surveys the subjects of the biopolitical state. (Haraway, 1997, p. 202)[a]

Moreover, another interesting criticism was made by Strathern, who pointed out that these scholars had not taken into account the role of procedures, such as legal ones, that prevent the propagation of networks (as in the case of patents or intellectual property). Indeed, Strathern notes how the circulation of knowledge is also regulated by many legal forms that prevent such expansions, or diffusions, and/or allow the rich proliferation of others. In other words, the circulation of knowledge can be – through legal procedures – limited or prevented, as, for instance, in the case of reserved know-how, copyrights, and patents (Strathern, 1996), or be liberalised too much (obviously not without specific economic interests) as in the case of many websites' cookies.

In response to such criticisms, other understandings of space have been introduced besides the network one. Notably, a particularly relevant contribution in connecting the developments in ANT to spatial metaphors has been offered by STS scholars Annemarie Mol and John Law (2001).

Regions and networks: Euclidean space and network space

STS and particularly ANT have localised science and technology, which were previously seen as universal, in specific places – laboratories – and in networks that connect them. This, as we have

seen, "led to the notion of the immutable mobile: that which moves through regional space while holding its shape. In this way, then, 'the global' was understood as a network for transporting invariant shapes: information, scientific findings, technological artefacts" (Mol & Law, 2001, p. 10). In this network space – a second spatial metaphor coexisting with the first, that is the Euclidean one – the focus is on building an ever-widening network to let immutable mobiles circulate. As seen above, this topology has been accused of being panoptical, and technocratic, for it draws attention to the centrality of the network builder.

Fluid space

A third metaphor, related to a fluid form of spatiality, is the case of the *Zimbabwe bush pump*, which in an earlier text written by Mol together with Marianne de Laet was used to signal a distribution of agency in which the centrality of an author is substituted by a more fluid, a-centric and democratic arrangement. The *Zimbabwe bush pump*

> spreads far and wide in Zimbabwe. [...] It is a *mutable mobile* [...] that moves to so many places in rural Zimbabwe and that moves (...) precisely because it is not an invariant shape either in network or in Euclidean space. [...] It is a way of encouraging collective action by village dwellers. And then again, it is active in constituting Zimbabwe as a nation to which the villages and the villagers belong. (Mol & Law, 2001, pp. 613-615)

Notably,

> the "inventor" of the bush pump [...] has not sought to impose the rigidities of a patent. He is not bothered when those who install and use the pump introduce alterations. [...] The pump, he says, does not belong to him. His idea is that it was invented by many, and in many different locations. This means that it goes on growing, changing, adapting, and working in places where it would never work if its relations were held stable, as in a network. (Mol & Law, 2001, pp. 613-615)[b]

Fire space

A fourth metaphor is that of fire.

> Topologically [...] in fire space a shape achieves constancy in a relation between presence and absence [...]. Thus fire becomes a spatial formation alongside (and in interference with) Euclidean, network, and fluid spaces. To say that there is a fire topology is to say that *there are stable shapes created in patterns of relations of conjoined alterity*. (Law & Mol, 2001, p. 616)

Mol and Law give the example of a physical and mathematical formula. Such a formula is generally the result of a whole series of interactions and conditions that determine it and which no longer appear after it has been developed: its validity depends on what is no longer present. In this sense, it is a "*mutable immobile*" (Law & Mol, 2001, p. 620). Notably, the authors use the example of their paper to summarize and bring together these different topological conceptions and spatializations of knowledge:

> [...] this text is local. As we write it, it is in this personal computer. It is just here and nowhere else. *Immutably immobile*. But if you are reading it then it has moved to another location. [...] If the words you are reading are more or less the same then it has been transported through a network as an *immutable mobile*. [...] But then again, maybe, at the same time, it has become fluid. Some words have changed. It has been edited. While the circumstances in which it is read in which you are reading it, also mean that it has been, however subtly, reconfigured in that reading.
> The same but also different. Which means that it is, in addition, a *mutable mobile*. And finally? [...] All of these and heaven knows what else are included in a paper like this, are present in it, but also absent from it. A paper, then, this paper, exists within the space of fire – the space of conjoined alterity [on which it depends]. Which means, finally, that it is also a *mutable immobile*. It is four things, located in four spaces: region, network, fluid, and fire. (Law & Mol, 2001, pp. 616-620)[c]

Notes

a. See also: Lee & Brown (1994); Star (1991).
b. See also: de Laet & Mol (2000); Mol & Law (1994); Law & Hetherington (1998); Mol & Law (2002).
c. A further interesting use of ANT spatial metaphors can be found in: Moreira (2004, February).

for converting the stars from irrelevant points of light in the night sky into formidable allies in the struggle to master the Atlantic" (Law, 1987, p. 124).

As per these accounts, then, techno-science is a matter of different elements acting "in concert" (Murdoch, 2006, p. 67)[6]. Scientific facts arise from heterogeneous networks where components are arranged to act as if they align, whereas technological artifacts are networks in which components are organized to work together and produce specific effects. From this perspective, the idea of human society is replaced by multiple and heterogeneous associations.

6. Another interesting example is Latour's semi-fictional account of *Aramis* (1996), a failed technological project of an innovative public transportation system developed in France between 1972 and 1987. Here Latour reveals the complex universe of cooperating human and non-human actors that lie behind the development of a transportation system: at the same time relations between materials and definitions of users are composed.

THE SUB-POLITICS OF DESIGN

During the 1980s and until the end of the 1990s, ANT scholars were engaged in analysing the ways agency is distributed among any entity partaking in different processes. According to them, where the social sciences have dwelled too long on the disciplinary fabrication of docile and therefore manageable human bodies, engineers and designers have been able to understand, more than others, the socio-material dimension of the social. In a very influential text, Madeleine Akrich (1992) pointed out how designers, in defining the characteristics of their objects, produce a sort of prediction of the world inside which they will be placed, and of the users themselves who will use them:

> From some time sociologists of technology have argued that when technologists define the characteristics of their objects, they necessarily make hypotheses about the entities that make up the world into which the object is to be inserted. Designers thus define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways. A large part of the work of innovators is that of "inscribing" this vision of (or prediction about) the world in the technical content of the new object. I will call the end product of this work a "script" or a "scenario". (Akrich, 1992, pp. 207-208)

In other words, objects make subjects. Once the artefact is put into use, she argues, the user begins the work of "*de-scription*" (Akrich, 1992, p. 209), i.e. the recovery of a coherent programme of action from the object. Similarly, in analysing several technical objects – such as seat belts, door hinges, and keys –, Latour explored "how artifacts can be deliberately designed to both replace human action and constrain and shape the actions of other humans" and how "technologies that are so commonplace that we don't even think about them can shape the decisions we make, the effects our actions have, and the way we move through the world" (Latour, 1992, p. 151)[7]. One of his best-known examples on the subject concerns speed bumps (Latour, 1999a). According to Latour, these objects came into existence due to the impracticality of depending solely on drivers' individual will to regulate their speed around areas of potential risk, such as schools. Speed bumps solve this problem by allowing the "translation" of a shared ethical imperative, such as "slow down so as not to endanger students", into a demand driven by self-interest, like "I should slow down and protect my car's suspension" (Latour, 1999a, p. 186). In other words, "a specific version of 'civility' and the 'public good'" are materially inscribed "into asphalt" (Domínguez Rubio & Fogué, 2015, p. 145). As Latour writes, "the driver modifies his behavior through the mediation of the speed bump: he falls back from morality to force" (Latour, 1999a, p. 186).

In short, these scholars aimed to demonstrate that material artefacts exert profound influence in shaping human interactions, extending their impact to prescribe principles of morality, ethics, and politics. As Latour pointed out:

> Society itself is to be rethought from top to bottom once we add to it the facts and the artifacts that make up large sections of our social ties. What appears in the place of the two ghosts – society and technology –is not simply a hybrid object, a little bit of efficiency and a little bit of sociologizing, but a sui generis object: the collective thing, the trajectory of the front line between programs and anti-programs. It is too full of humans to look like the technology of old, but it is too full of nonhumans to look like the social theory of the past. The missing masses are in our traditional social theories, not in the supposedly cold, efficient, and inhuman technologies. (Latour, 1992, pp. 174-175)

STS-trained anthropologist Albena Yaneva – whose relevant contribution in applying an ANT perspective to architecture will be further explored below – in one of her texts offered other useful examples for understanding "how the way [technical objects] are shaped and designed is related to specific ways of enacting the social" (Yaneva 2009a, p. 277). Referring for instance to the staircase and the lift inside her university building in Manchester, Yaneva (2009a) highlighted that these objects hold different scripts, or visions, of the world: the staircase and the elevator provide alternative means of reaching the university auditorium, at different speeds; they both have particular features or elements – such as a handrail or the elevator's buttons or floor indicators – which afford particular actions; the wide surface of the staircase makes her lean upon it in conversation with colleagues, while the elevator makes her anxious or bothered by the presence of other people.

7. See also: Latour, 2000.

> We cannot understand how a society works without appreciating how design shapes, conditions, facilitates and makes possible everyday sociality. [...] The objects from my university mornings (my key, the door lock of the resource room, the elevator buttons, the staircase handle, the conference room arrangement) do not stand for social forces and divisions, nor do they symbolically represent the university's order, hierarchy or divisions of labor; rather, they *perform the social* as we use them, and connect us in a new way with fellow colleagues, students and university administrators. We remain linked by using the same objects, by facing the same functional problems, by committing the same ergonomic mistakes. (Yaneva, 2009a, p. 280)

However, although the concepts of heterogeneous engineering and script have been extremely generative within the STS literature, they also became the subject of rather strong criticism. Indeed, despite their attention to the contingencies of design and use, they were mostly methodological tools within the framework of semiotics extended to non-humans. As Latour stated: "in order to understand domination we have to turn away from an exclusive concern with social relations and weave them into a fabric that includes non-human actants, actants that offer the possibility of holding society together as a durable whole" (Latour, 1991, p. 103). Anyway, based on the assumption that technology can make society enduring, these accounts left in place an over-rationalized figure of the designer as a powerful creator. Precisely for this reason, some scholars have begun to criticise the notion of heterogeneous engineering, for its emphasis on the network constructor – such as Pasteur in his laboratory – and his ability to control and govern multiple heterogeneous entities [see **BOX 2**]. In this way, these accounts appeared uncritical towards the "sub-politics" of design (Marres & Lezaun, 2011, p. 494), or what, as we shall see below, STS-informed sociologist Fernando Domínguez Rubio and architect Miguel Foguè called the "enfolding" (2015) capacity of design. That is, the way design materially contributes to the construction of certain hegemonies. Furthermore, they overestimated the ways and extent to which definitions of users and use can be previously defined and inscribed into an artefact. STS-trained anthropologist Lucy Suchman, for instance, opposing Akrich's argument that "like a film script, technical objects define a framework of action together with the actors and the space in which they are supposed to act" (Akrich, 1992, p. 209), noted that "there is no stable designer/user 'point of view' nor are imaginaries of the user or settings of use inscribed in anything like a complete or coherent form in the object. [...] The 'user' is, in other words, more vaguely figured, the object more deeply ambiguous" (Suchman, 2006, pp. 192-193).

In response to such criticism, some scholars begun to go beyond the analysis of technical objects and the political programmes inscribed in them and to speculate on ways to make such politics public and contestable.

THE POLITICS OF "THINGS"

From the 2000s onwards, Latour came to formulate a different and peculiar version of politics, which shifted his interest from the analysis of scripts to the conceptualisation of things.

In previous ANT agendas, he acknowledges, the debunking of science had been pursued by extending

> the *same* habits of thought that had been developed in parliaments and on streets to each and every one of those far fetched new sites [i.e. laboratories]. The [...] solution was to say "everything is political" but without explaining how the checks and balances of democracy could be extended and made efficient in those exotic domains – hence the accusation of having ended up in some forms of depolitization. (Latour, 2007b, p. 813)

In particular, Latour explicitly refers to the accusation of political theorist Langdon Winner, who had declared that "although the social constructivists have opened the black box and shown a colorful array of social actors, processes, and images therein, the box they reveal is still a remarkably hollow one" (Winner, 1993, pp. 374-375). More precisely, Winner had criticized STS scholars for pursuing academic objectives that were "carefully sanitized of any critical standpoint" regarding technology's inherent political implications. Unlike Marxists, Heideggerians and other figures such as political sociologists Jacque Ellul or Lewis Mumford, they did "not explore or in any way call into question the basic commitments and projects of modern technological society" (Winner, 1993, p. 375), showing "total disregard [...] for the social consequences of technical choice", i.e. "for the texture of human communities, for qualities of everyday living, and for the broader distribution of power in society" (Winner, 1993, p. 368).

Also in response to such criticism, Latour wondered: "what if the definition of politics were to be reshaped as deeply as the definition of science has been by STS? Not simply expanded or shrunk but entirely *re-distributed*?" (Latour, 2007b, p. 814). Notably, his contribution to political thought in the 2000s has been greatly informed by the work of the early twentieth century American philosopher John Dewey, whose reflections were introduced to him by Noortje Marres (2005; 2007). Marres drew upon Dewey's perspectives regarding the formation of publics in democratic societies (Dewey, 1927) to argue that political action always revolves around particular issues. As she observes: "to articulate a public affair is to demonstrate for a given issue that, first, existing institutions are not sufficiently equipped to deal with it, and, second, that it requires the involvement of political outsiders for adequately defining and addressing it" (Marres, 2007, p. 772). Latour warmly welcomed Marres' contribution (Latour, 2004a; Latour, 2004c; Latour, 2005a; Latour, 2007b), although her influence became more evident and was more explicitly declared from the introduction to the *Making Things Public* exhibition catalogue (discussed further below) onwards. Following her insights, Latour began to insist on the importance of focusing on how objects have the ability to gather concerned publics around them. As he noted: "objects – taken as so many issues – bind all of us in ways that map out a public space profoundly different from what is usually recognized under the label of 'the political'" (Latour, 2005a, p. 5). And then he added: "whatever the term one wishes to use – object, thing, gathering, concern [...] the key move is to make all definitions of politics turn around the issues instead of having the issues enter into a ready-made political sphere to be dealt with. First, define how things turn the public into a problem, and only then try to render more precise what is political, which procedures should be put into place, how the various assemblies can reach closure, and so on" (Latour, 2007b, p. 815).

This perspective departs radically from earlier ANT scholarship, according to which the mediation of non-human actors has a stabilising effect on society. The influence of Dewey's thought has largely modified this vision, emphasising instead things as agents that put society into motion. The public is not a pre-existing group of individuals with fixed opinions and interests that can be simply documented and tracked. Instead, it is diverse and plural, with the characteristics of each public shaped by the specific issues or objects that bring them together.

Latour not only suggests shifting the narrative of things from stabilisers to destabilisers of society and politics, but also focusing on the uncertainties surrounding the things themselves. Indeed, he stated: "for too long objects have been wrongly portrayed as matters-of-fact. This is unfair to them, unfair to science, unfair to objectivity, unfair to experience. They are much more interesting, variegated, uncertain, complicated, far reaching, heterogeneous, risky, historical, local, material and network than the pathetic version offered for too long by philosophers" (Latour, 2005a, pp. 9-10). Hence his expression "matters of concern" (Latour, 2004a[8]; Latour, 2005b; Latour, 2007a; Latour, 2018), which came exactly as an alternative to modern matters of fact. In particular, Latour here draws on the work of Alfred North Whitehead, another early twentieth century philosopher, and in particular on his critique of what he called the "bifurcation of nature" (1920) – on which, in short, the subject/object distinction is based –, that has permeated the philosophical tradition[9]. According to Whitehead, natural phenomena cannot be seen as objects, but rather as processes. As Latour remarks, Whitehead "considered matters of fact to be a very poor rendering of what is given in experience and something that muddles entirely the question, What is there? with the question, How do we know it?" It is precisely this processual idea of reality that inspired Latour's idea "to get *closer* to [matters of fact] or, more exactly, to see through them" (Latour, 2004b, p. 244) into the multiple relations of matters of concern.

This turn towards things as matters of concern is part of Latour's broader attempt to deconstructing the basic categories of modern thought, a project begun with *We Have Never Been Modern* [see **BOX 1**], resumed in *Pandora's hope* (1999a) and greatly emphasised in *Politics of Nature* (2004a), a book primarily designed to engage with current discussions on the ecological crisis. According to Latour, pressing and urgent issues that have come to the fore have revealed the connections we have not taken into account. By posing the question "how many are we?" (Latour, 2004a, p. 8), he urged to dissolve the distinction between nature and culture entirely and to extend the realm of democracy from humans to non-humans, which are inextricably linked to them into ever-changing collectives. More precisely, Latour constructs the metaphor of a new Constitution – completely different from the modern one, which was based on the division of beings, knowledge, cultures, etc. –, founded on the coexistence of humans and non-humans in

8. This work was originally published in French in 1999 (see: Latour, 1999b).
9. See also: Stengers, 2002.

a single large collective. This collective is constantly evolving, always open to new requests for entry from other beings.

Matters of concern provide a conceptual tool for revealing the complexity that constitutes the world: we live in heterogeneous and conflictive gatherings, or things, a concept that Latour develops by referencing Heidegger's understanding of the word *Ding* (Heidegger, 1967). The ancient etymology of *Ding* comes from the governing assemblies of ancient Nordic and Saxon societies, where people and non-humans would gather to discuss issues and concerns. From these very reflections, he formulated the notion of "*Dingpolitik*", namely the *politics of things*, and suggested it to be the principle of an "*object-oriented* democracy": a form of participation which – in contrast to the human-centered *Realpolitik* – revolves around things. Notably, the notion first appeared in Latour's introduction to *Making Things Public: Atmospheres of Democracy* (2005a, p. 4), the catalogue of an exhibition with the same title – which he co-curated with Peter Weibel – that sought to redefine politics as operating in the realm of things[10]. The main idea was that politics is not just an arena, a profession, or a system, but a concern for things, issues that draw the attention of the public, seen as fluid and plural. In a nutshell, Latour's suggestion is that we learn to focus on what agitates, troubles, and "provokes speech" (Latour, 2004a, p. 103), in contrast to what the modernist attitude has always urged us to do, namely to cut out complexity and dissenting voices[11].

Particularly, the main challenge *Dingpolitik* faces is what Isabelle Stengers has called "cosmopolitics" (2005), which literally means the *politics of the cosmos*[12]. In Stengers' words: "in cosmopolitics, cosmos refers to the unknown constituted by these multiple divergent worlds and to the articulation of which they could eventually be capable" (2005, p. 995). Or, as Latour points out speaking for her, "the presence of *cosmos* in *cosmopolitics* resists the tendency of politics to mean the give-and-take in an exclusive human club. The presence of *politics* in *cosmopolitics* resists the tendency of *cosmos* to mean a finite list of entities that must be taken into account. *Cosmos* protects against the premature closure of *politics*, and *politics* against the premature closure of *cosmos*" (Latour, 2004c, p. 454). Cosmopolitics, therefore, is a continuous negotiation, a practice of coexistence in which all the living beings and non-living entities – to which we usually refer as *resources* – participate. Rather than figuring the common world as already given, the project of cosmopolitics reformulates it in its possible result and thus invites to "slow down reasoning and create an opportunity to arouse a slightly different awareness of the problems and situations mobilizing us" (Stengers, 2005, p. 994). Particularly, Stengers invites to take asymmetries into account, and thus not to lose sight of potential victims, i.e. actors who are systematically misrepresented by others or who might remain hidden due to their different conditions.

The transfer of the reformulation of politics which took place in STS to the field of architecture offers an important contribution to deepening reflection on the problems underlying modernist design practices. Modern architecture, in fact, is pretty much based on the notion of matter of fact. Its main features are purification, simplification, generalization, and standardization. Architectural practice is mainly understood as an expert human task aimed at producing indisputable solutions. Complexity, disagreements, different needs, and multiple – more-than-human – ontologies, are hardly taken into account. A reconsideration of architecture through the lens of ANT, instead, entails seeing it as an inherently participatory practice, in which the architect is only one of the multiple and heterogeneous parties involved; and taking into account the multiple, ever-emerging relations, mediations, dependencies, imbalances and controversies it enacts and by which it is enacted.

10. In the exhibition *Making Things Public: Atmospheres of Democracy* (Latour, 2005a) more than a hundred writers, artists, researchers, architects, and philosophers participated in the exhibition, rethinking what it means to make and render things public. What emerged is that multiple assemblies gather a public around things: workshops, assembly lines, courts, bureaucratic institutions, supermarkets, shopping malls, churches, and natural resources such as rivers and climates. Democracy is now being pursued not within the traditional realm of professional politics, but in the realms of technologies, interfaces, platforms, networks, and mediations.

11. Numerous insights for writing this section, as well as for the section *The political agency of non-humans*, have been drawn from this valuable work: Undurraga, B. (2016), *Amor Mundi: Politics, Democracy, and TechoScience*, UCLA Electronic Theses and Dissertations.

12. The notion of cosmopolitics brings together some important insights from ANT, feminist studies, Amerindian anthropology (Viveiros de Castro, 1998; Viveiros de Castro, 2004), and post-Deleuzian philosophy (DeLanda, 2006), to list a few, all differently challenging the nature-culture distinction.

"ARCHITECTURE IN THE MAKING"

In the past decades STS, and in particular ANT, gained critical acclaim among scholars in the fields of design and architecture studies. This interest was triggered by a programmatic article written by Michel Callon (1996), who first argued for the importance of ANT as a methodological perspective to deepen our understanding of architecture by emphasizing the materiality of design, viewed as a realm of negotiations, tools, and visualization strategies. Callon's work was crucial in originating a new strand of pragmatist-inspired studies on the practice of heterogeneous engineering conducted in architects' studios and the role of non-human participants in the process, such as: models (Yaneva, 2005a; Yaneva, 2009c), renderings (Houdart, 2008; Houdart & Minato, 2009; Houdart, 2016), city plans (Zitouni, 2010), urban artefacts (Doucet, 2012; Doucet, 2015), computer simulations (Loukissas, 2012), or maps (Nadaï & Labussière, 2013).

All these studies shared a renewed attention to architecture as an ongoing process of composing collectives of humans and non-humans, rather than an accomplishment of human doing and mastery over inert matter[13]. Hence, several scholars engaged in a pathbreaking search aimed at unpacking the different material registers and flows of non-human entities involved in the making of buildings, cities and urban infrastructures.

The starting assumption was that architecture cannot be reduced to a static frame of symbolic meaning, to be addressed by theories and ideologies. To put it in Yaneva's words:

> ANT allows reporting what architects, designers, engineers, and dwellers *do* – their daily routines, individual moves and collective groupings – in spite of their interests and theories, thus constantly prioritizing the pragmatic content of actions, not of discourses [...] because they make possible the existence of numerous objects, buildings and artefacts, instruments and theories that constitute architecture and the built environment. (Yaneva, 2017, p. 8)

13. To better understand the distinction between the ANT's work on science and that in the designers' studio, it is necessary to underline that while scientific laboratories are considered centers of calculation, what is at stake in the studio is synthesis. Since the 1990s, the ANT has begun to shift its focus towards other practices and dynamics, which have forced it to adapt or transform its narrative. In particular, wherein the laboratory focus is on truth, what is at stake in architecture is the composition of a socio-material form (Wilkie & Mike, 2015).

In this sense, traditional topographical – or Euclidian – representations of space were considered insufficient to account for the complexity of architectural processes. As Yaneva and Latour write in their essay *Give Me a Gun and I Will Make All Buildings Move* (2008), these representations are our own way of knowing and manipulating buildings – which render them "desperately static" (Yaneva & Latour, 2008 p. 80), impeding grasping their movements, flights, and transformations. In short, Euclidean space is a poor medium for capturing the way humans and things inhabit the world. "Where do you place the angry clients and their sometimes conflicting demands? Where do you insert the legal and city planning constraints? Where do you locate the budgeting and the different budget options? Where do you put the logistics of the many successive trades? Where do you situate the subtle evaluation of skilled versus unskilled practitioners?" (Yaneva & Latour, 2008, p. 81). Considering that geometrical patterns are grounded in the physical attributes of the city rather than its social aspects, fluxes, movements and social interactions are simply not taken into account and removed from view.

These ethnographic studies shared an interest in the ecology of design practice. By ecology is meant, in this context, an alternative to what Latour describes as modernization, to account for all the entities of human and non-human collective life. Drawing on ANT as a mode of overcoming dichotomies such as nature/culture, subject/object, materiality/meaning, describing the "ecology of practice" here means tracing the socio-material context of architectural practice, which means tracing the roles, routines, and actions and mediations of all participants in the design, such as skills, habits, designers' equipment, clients, regulations, models, images, buildings, and urban landscapes (Yaneva, 2017, p. 33). ANT's notion of translation, or delegation, allows us to understand what is at stake here: humans – in this case more precisely designers, or architects – delegate, or translate, their work to non-humans – design objects, environments, and devices. Designers' actions are thus bounded by technologies that affect how and what they do and shape particular ways of understanding space.

This trend, which could be termed an "ethnographic turn in architecture", is the outcome of a series of related processes, such as "the growing realization of architecture as a social practice and the social nature of outcomes of architectural production" and "the tendency to acknowledge the collective nature of design" (Yaneva, 2017, p. 45). Although the use of ethnographic methods in architecture is hardly a new topic in itself, by re-describing the practices of design from a socio-material perspective, this ANT-inspired method helps circumvent: a) a social constructivist agenda

that treats architectural form as a social and cultural symbol (society is a separate domain of reality that explains architecture) (Yaneva, 2012)[14]; b) traditional sociological approaches that rely solely on social contextualization of the working environment of architectural firms (Blau, 1984); and c) anthropology-informed approaches that treat all products of architectural design as socially constructed through negotiations among all – human – participants in design processes (Cuff, 1992). ANT-inspired architectural ethnographies, which Yaneva terms "new ethnographies" (2017, p. 45), follow the "the symmetric anthropology" advocated by Latour (1993, p. 92): rather than focusing on a particular agent, they account for the performances of all human and non-human collectives, "undivided attention to words and the gestural and non-verbal language" (Yaneva, 2017, p. 45). Below are some emblematic examples:

Inside OMA

Since 2002, Yaneva engaged in a two-year participant observation in Rem Koolhaas's studio, namely the *Office for Metropolitan Architecture* in Rotterdam (OMA). In line with ANT-inspired analysis and critique of modern scientific practice, she carried out a pragmatist re-description of the socio-material dimensions of design in Koolhaas's practice. Just like Latour in the 1970s followed scientists at work to understand the production of scientific facts, she decided to follow architects' daily routines. Her interest lied precisely in studying their activities and beliefs, "their cultures, their exoticism, their strange obsession with time, novelty and innovation; their enigmatic attachments to models, sketches and drawing software; and the extraordinary inconsistency in how they define themselves and their practices" (Yaneva, 2017, p. 41). To fully understand OMA's architectural approach, Yaneva put aside existing official interpretations in the architectural scholarship, which tend to rely on abstract notions such as society, culture and creativity, and focused on following the designers in the studio, watching their daily actions, their mistakes and the way they make sense of their world-building activities. Rather than referring back to wider frameworks such as "Surrealism or the Modernist Movement", she sought to provide an insider's perspective on the architectural office, highlighting the heterogeneous elements that architecture connects. This led her to state, for instance, that "design is a trivial, banal, mundane experience" (Yaneva, 2009c, p. 25) revolving around many minor gestures such as retouching images, scaling and rescaling models, visiting a building site, negotiating with other professionals and clients, dealing with urban regulations and so on. Or that, unlike what happens in other offices, where the design process revolves around a conceptual sketch or drawing made by the master architect – such as Zaha Hadid or Frank Gehry – "at the oma [it] often begins with collective experimentation at the table of models" and the design of a building or urban concepts emerges "as a relational effect of a whole network" (Yaneva, 2009c, p. 11).

In Yaneva's account, foam models play a crucial role at OMA. Far from reflecting visions, ideas, and imaginaries of human minds, they are things, contested sites, gatherings of human and non-human concerns that ultimately confer a particular shape to the building. Architects' actions and movements are inextricably linked to the emergence of a certain shape, as well as their thoughts to the visual and tactile experience of making the model. As seen with scientists at work in their laboratories, designers delegate to the foam the power to enfold, and the material in turn responds and starts dominating the model-maker, so that "the 'knowing architect' loses mastery over the building he is striving to understand" (Yaneva, 2009c, p. 58). Every action and movement they make with their instrumental and technical equipment – Autocad, the foam-cutter, the drawing board, and so on – "shapes the perceptive matter of a building-to-be, as a movement, as a new disposition" (Yaneva, 2009c, p. 59).

Yaneva observed how "architects think of the building by modelling, by cutting foam and paper and using various scoping techniques" (Yaneva, 2005a, p. 872). In her account of the work of the Whitney team – a group of OMA architects engaged in the design of the extension of the Whitney Museum of American Art in New York – the *NEWhitney* –, she noted how a distinctive trait of architectural practice is "knowing through scaling" for "the tiny material operations of 'scaling up', 'jumping the scale', 'rescaling' and 'going down in scale' enable architects to think of the building and to gain new knowledge about it" (Yaneva, 2005a, p. 870). Models are described as important tools for shared cognition: "architects discuss concerns about scoping and rescaling the models; they 'lend' their bodies to many visual instruments, which enable them to see and experience the internal space, 'guided' by the inner logic of the foam constructions, and 'influenced' by many previous choices" (Yaneva, 2005a, p. 871).

14. In chapter 3 of her book *Mapping Controversies in Architecture*, Yaneva criticises both Pierre Bourdieu and his analysis of the Berber house of Kabyle in Algeria, and Anthony King and his study of the bungalow in India. Both authors, according to her, treat society and architecture as two separate words (Bourdieu, 1971; King, 1984).

Models, renderings, images, and all the objects that architects fabricate to visualize and give shape to their works, fabricate them back, as they acquire autonomy. They talk back to their creators and transcend them. At the same time, other issues such as client demands, site specificity, city politics, technical requirements, regulations, and users' expectations constrain architects and thus determine the shape of models and the nature of a certain design solution. Here is why, in Yaneva's words, if one traces how models are fabricated and negotiated and how they circulate it is possible "to follow simultaneously the co-production of design reality and the designers as professionals". (Yaneva, 2005a, p. 871)

Inside Kengo Kuma's office

For her part, anthropologist Sophie Houdart, in her ethnographic work Kengo Kuma's studio (Houdart & Minato, 2009), focused on analysing encounters between architects, engineers and clients. Together with Chihiro Minato, Houdart illustrated how architects employ concept boards, architectural renderings, and models to convert the meeting space into a "visual medium", facilitating negotiation (Houdart & Minato, 2009, pp. 121-122). As they argue, it is precisely the coordination of these devices that allows participants to discuss with each other, despite their respective differences. The role of models is emphasised to reflect on issues such as formal proportions, and the location of the building or materials. Houdart also followed architects and computer designers in the creation and use of renderings. As she notes, these drawings are crucial tools in the architectural process, as they constitute the moment when architects incorporate various non-architectural elements like prospective users, foliage, and greenery, the sky, cars, sunlight and more intangible things like atmosphere, into their more abstract graphic products. These virtual images feature as "cosmologies in the making", as "architects, while designing, digitalizing, copying, and cutting and pasting images, manipulate social spheres and give birth to new ones1 by testing and submitting new social configurations" (Houdart, 2008, p. 48).

In her account, architects in Kuma's studio, to compose their virtual images and make a new universe come alive, resort to ready-made people and other elements from catalogues – which Houdart calls "cosmologies" or "lists of things" (2008, p. 55) – available on the web. There is no ontological difference between things, which are all context-free and intended "to emphasise the 'effect of reality'" (Houdart, 2008, p. 56) when imported into images. In particular, Houdart engaged in an ethnographic account of the development of a proposal for the Japan's World Expo 2005 *Beyond Development: Rediscovering Nature's Wisdom*, whose "proposal (...) was to take advantage of the geographical conditions of a forest in order to invite the world to develop new relationships with nature for the century to come" (Houdart, 2008, p. 50). As she notes, since the project was supposed to stage a utopia, the renderings produced by the architects played a crucial role in this process. It is no coincidence that the first step for the realisation of Expo 2005 was an *in situ* visualisation, which did not intend to cut the territory as architects usually do with site plans, but rather to maintain the original landscape. According to Kuma, this was meant to generate "'an anti-architectural expression' aimed at 'erasing' architecture itself [...], dissolving it or making it as invisible as possible" (Houdart, 2008, p. 57). The utopian dimension of this world was further emphasized by another image showing people walking in the forest, which seemed to abolish hierarchy among beings and "to promise, once again, not to pollute nature with buildings or pavilions, but move into the 21st century without the modernist cortege of objects and imageries" (Houdart, 2008, p. 58).

In short, through her analysis, Houdart aimed to demonstrate how virtual images created by architects "make a whole world come alive and, at the same time, act to convince multiple audiences (in particular the clients) of its ability to function" (Houdart, 2008, p. 47). As she writes, "these drawings provide architects and designers with an opportunity to redefine the nature of beings and act on the peculiarity of their relationships and constitute an interesting support to consider the projection of new cosmologies, anticipating the cohabitation of such diverse things as human beings, buildings, roads, trees, skies, cars and their respective ways of existing" (Houdart, 2008, p. 47).

The connection between architectural tools, technics and the user is also analysed in the recently published book *Design Technics. Archaeologies of Architectural Practice* (Çelik Alexander & May, 2020), which brings together a series of contributions that trace the genealogies of certain techniques used by architects, through a series of investigations into the historical conditions that made them possible. These are contributions that "propose a more capacious meaning for the term *technics*, which is used here to denote a constellation of interrelated practical, artifactual, and procedural material conditions" (Çelik Alexander & May, 2020, p. ix). Specifically, different authors analyse this relationship between architects and technics – "rendering, modeling, scanning, equipping, specifying, positioning, and – last but not least – repeating" (Çelik Alexander & May, 2020, p. x) – in some of their current work practices from a historical

perspective. Zeynep Çelik Alexander, in her introductory essay – *Architecture and Technics* (2020) – insists on the role that habit plays in shaping who we are. Looking at the historical trajectories that the book proposes, Çelik Alexander underlines that

> the human appears not simply as the master of material conditions but rather as a figure who owes its very existence to those material conditions. This way of thinking upsets the long-standing trope of defining artifactual technologies as an extension of the human body [...] and Marshall McLuhan's formulation (1964) that media are extensions of the human sensorium. By this logic, the hand does not precede the instrument that it holds but is dialectically reconfigured by it. (Çelik Alexander, 2020, p. xi)

The essays in the book "insist not on historical breaks and paradigm shifts, as so much literature on the technical developments of the last few decades tends to do, but rather on historical continuities" (Çelik Alexander, 2020, p. xviii). In addition to the ethnographic perspective seen in the work of Yaneva and Houdart, they make it possible to place techniques and tools in a perspective that shows their persistence, their role, and the hierarchical relationships that they historically determine in the production of architecture.

These studies, therefore, show that tools and techniques are active participants in design processes. They play a constitutive role in the cognitive activities of architects and have real world-making effects. As seen through the eyes of Yaneva and Houdart, architects in Rem Koolhaas's studio think through cutting foam and scale models; in Kengo Kuma's studio, they think through computer renderings or models. Far from preceding or simply controlling them, architects are made and remade through the different techniques and tools they use. In this light, the master architect doesn't appear as the powerful creator, or the genius portrayed in books and monographs produced by critics. Designing, Yaneva argues, is not about projecting, and thus producing and throwing forward a new design idea. Rather, a careful observation of "architecture in the making" (Yaneva, 2009b; 2012; 2017) sheds light upon the different yet rarely recounted settings across which design is distributed[15].

15. Similar reflections are contained in *Teoria del progetto architettonico. Dai disegni agli effetti* by Alessandro Armando and Giovanni Durbiano (2017). By shifting the focus from the subject (their intentions) to the object (design products), the book offers an analytical and verifiable examination of design practices; and in the second issue of the Italian magazine *Ardeth*, entitled *Bottega* – of which Yaneva herself is guest editor – which emphasises the relevance of thinking *from* the design activity of architects. Various architects who have contributed to the magazine have found themselves in the dual position of observed objects and researchers. Indeed, this collection of essays "is dedicated to the *bottega* of architectural design, and it aims at investigating the factual work of architects, starting from the tangible dimension of material production to the larger implication of practice" (Frassoldati et al. 2018, p. 5).

Buildings-to-be reveal themselves to be things, contested gatherings of heterogeneous and contradictory issues. A building "comes from many requirements, issues, claims, considerations and potentials. [...] The building is an assembly of assemblages, pluralistically constituted, genuinely additive, marked by manyness. The building is a 'multiverse'" (Yaneva, 2005b, p. 535). In this sense, the political dimension of architecture is no longer to be found in external factors such as class divisions, economic constraints, or market forces. Rather, it can be explored and generated at the level of architectural practice, and seen as integral to many features of planning, building, construction, and renovation processes. "It *emerges* and can be witnessed as we trace the transformation of objects, sites, urban publics, and the multiple realities of a city" (Yaneva, 2017, p. 6).

Addressing the city as an "ecological process"

In addition to this focus on the politics within architectural artefacts and practices, other scholars have productively used some reflections from STS and, in particular, ANT to investigate the urban dimension and its processes[16]. Indeed, in recent years an interest has emerged among urban studies scholars to move beyond conventional understandings of the city and explore relational, symmetrical, and flat perspectives to inquire about its phenomena and transformations (Farías & Bender, 2009). Urban politics itself, as explored through the lens of ANT and assemblage thinking[17], is no

16. Anyway, a full-blown overview of the multiple and productive impacts of STS on the understanding of the city and its construction is beyond the interest of this book. Here, I will only dwell on some of the interesting insights that ANT and assemblage thinking have offered in this field of study. For a more comprehensive survey of these issues see: Farías & Bender, 2009; Farías & Blok, 2016b.

17. The term assemblage is a somewhat imprecise translation of Deleuze and Guattari's notion of *agencement* (1981), a common French term denoting the arrangement or assembly of different elements. Philosopher Manuel DeLanda used the concept to critically explore the complexity of society and explicitly proposed to examine cities as "assemblages of people, networks, organisations, as well as a variety of infrastructural components, from buildings and roads to conduits for flows of

longer just about humans and their discourses, but about things, complex interweaving of contested issues.

According to geographers Ash Amin and Nigel Thrift, the "city's boundaries have become far too permeable and stretched, both geographically and socially, for it to be theorized as a whole" (2002, p.8).

Not unlike objects and buildings, the city itself, rather than as one unified entity, began to be seen as "an amalgam of often disjointed processes and social heterogeneity, a place of near and far connections, a concatenation of rhythms; always edging in new directions" (Amin & Thrift, 2002, p. 8) or as "a multiplicity of processes of becoming, affixing sociotechnical networks, hybrid collectives and alternative topologies [...] a difficult and decentred object" (Farías & Bender, 2009, p. 2). Against any reductive or essentialist reading, the urban began to be analysed "into the intermesh between flesh and stone, humans and non-humans, fixtures and flows, emotions and practices" (Amin & Thrift, 2002, p. 9).

Notably, highlighting the limits of Marxist critical urban study, which mostly emerged in the 1970s, Ignacio Farías (2009; 2011; Farías & Blok, 2016a), stressed how the ANT perspective, with its "fervent anti-structuralist position" (Farías, 2009, p. 6), proposes an "engagement with the world and research" (Farías, 2009, p. 3), and therefore an empirical investigation into the ontological status of cities. Where Marxist-inspired critical urban studies look at the city as a "spatial formation", "economic unit" or "cultural formation" (Farías, 2009, p. 9), ANT-informed inquiries use the lens of radical relationality, generalized symmetry, and association. They promote "a more open and explorative form of engagement with the world; in a word, inquiry, not critique" (Farías, 2011, p. 366). The logic of capitalism – that critical urban studies use to frame any urban process – is not simply ignored or passively accepted. Rather, it is explored "as a form of life, (...) as a concrete process assuming multiple forms even within a city". In this approach, the city is addressed as an "ecological process" (Farías, 2011, p. 368), with attention given to the various human and non-human entities that contribute to its construction and evolution.

A cosmopolitical perspective, in particular, reveals how multiple urban worlds are constantly "in the process of being subtly transformed, destabilized, decentred, questioned, criticized or even destroyed" (Farías & Blok, 2016b, p. 2). In the same way, as for urban assemblages, the function of cosmopolitics is not merely descriptive – hence, theoretical and ideological, from *above* – but actively committed to inquiring from *within*.

matter and energy" (DeLanda, 2006, p. 5).

THE CHALLENGE OF TECHNICAL DEMOCRACY

By redistributing agency between human and non-human actors, ANT-driven scholars have challenged the cultural authority of experts, showing a commitment towards the democratisation of technical knowledge, particularly in response to the growing uncertainties and controversies surrounding scientific and technological issues.

An important contribution on this issue, which goes far beyond the field of architecture and urban studies, has been offered by Michel Callon, together with his colleagues Pierre Lascoumes and Yannick Barthe, through their programme of "technical democracy" (Callon et al. 2009). Their aim was to articulate a concept of dialogical democracy as opposed to what they termed delegative democracy, with the latter referring to contemporary liberal models of government **[BOX 3]**. The core concept of such programme is that of "*hybrid forums*" (Callon et al., 2009, p. 9), which are spaces where boundaries of expertise are removed and lay participation is included in knowledge production and validation. In a world characterized by growing uncertainties, new open spaces are needed for debate and collective experimentation. "Science and technology cannot be managed by the political institutions currently available to us [...] They must be enriched, expanded, extended, and improved so as to bring about what some call technical democracy, or more precisely in order to make our democracies more able to absorb the debates and controversies aroused by science and technology" (Callon et al. 2009, p. 9).

Liberal modes of government are based on two divides: one between scientists – confined in laboratories – and the rest of society, and one between political representatives – in parliaments – and citizens. These divides produce particular forms of delegation. As Callon et al. observe, "the definition of the common world, in which each is called upon to live and means to find their place, cannot be left to spokespersons who are no longer in tune with the moving reality of the *demos*" (Callon et al. 2009, p. 118). Hybrid forums "demonstrate in practice [...] a desire for public debate, a demand that groups which are ignored, excluded, and often reduced to silence, or whose voice is disqualified, have the right to express themselves, to be heard, to be listened to, and to take part in the

BOX 3 > PARTICIPATION IN TECHNO-SCIENTIFIC CONTROVERSIES. As well as Latour, Callon and his collaborators question the role of experts and technicians in uncertain situations. However, unlike Latour's philosophical and metaphysical approach, their language sounds more familiar to political theorists. The idea of democratizing techno-science is a widely discussed issue in STS and reflects a longstanding ethical-political commitment among scholars in the field. As discussed earlier in this chapter, STS emerged in the 1960s and 1970s with a critique of technocracy, questioning various constructions of expert authority in science and technology. A direct outcome of these critiques was a heightened interest among STS researchers in promoting lay participation in knowledge production and validation. Their goal was to expand and redistribute the boundaries of legitimate knowledge and techno-scientific authority (Farías & Blok, 2016a; Sismondo, 2004). According to these authors, technoscience no longer maintains a socially detached stance but is increasingly integrated into society. These concerns gained momentum in the late 1990s and early 2000s when a "crisis of confidence vis-à-vis science and technology" became notably apparent (Callon, 1999, p. 81). Interestingly, the social constructivist approach in STS questioned the traditional division between scientific experts and non-experts. Indeed, in a seminal article written in 1999, Callon notes that, in the face of the numerous unexpected and negative effects of science and technology on issues concerning the environment, public health, or food safety, non-specialists took

> a rational decision not to trust the researchers and engineers who are unable to deal with the risks endangering society as a whole. Modern societies thus enter into the age of suspicion because the political and economic institutions guaranteeing the validity and legitimacy of science have been found to be in the wrong. (Callon, 1999, pp. 81-82)[a]

In an effort to understand this crisis, Callon explored various ways non-experts could participate in scientific and technological debates, identifying three distinct models. He suggested moving the critical analysis of the expert/non-expert divide beyond the "Public Education Model (M1)" (p. 82) and the "Public Debate Model (M2)" (p. 84). Instead, Callon highlighted the importance of a "Co-production of Knowledge Model" (p. 89).

> In Model 1 the priority is on the education of a scientifically illiterate public. In Model 2 the right to discussion comes first because lay people have knowledge and competencies which enhance and complete those of scientists and specialists. Yet, beyond their differences, these two models share a common obsession: that of demarcation. [They] deny lay people any competence for participating in the production of the only knowledge of any value: that which warrants the term "scientific". In Model 1 the exclusion is total; in Model 2 it is negotiated, but in both cases the fear is that laboratories will be taken up by hordes of non-specialists. The co-production of knowledge model, Model 3, tends to overcome these limits by actively involving lay people in the creation of knowledge concerning them. (Callon, 1999, p. 89)

Therefore, Callon's Model 3, centered on the involvement of non-experts in knowledge creation, diverges from established norms and conventional scientific practices. Specifically, Callon constructs his argument using instances of cohorts of patients afflicted by rare diseases, commonly known as "orphan diseases", who, disregarded by institutional medicine, "organise themselves in order to exist in the face of powerless specialists who sometimes go as far as depriving them of the right to survive" (p. 90). In short, such groups realised that the only way to assert their voice was to participate in the production of scientific knowledge. For that reason, they engaged in researching and identifying diseases, actively participated in DNA collection and evaluated the clinical developments following certain treatments. As Callon notes, "knowledge, from the most universal and general (e.g., on genes) to the most specific (e.g., the art and ways of dealing with a tracheotomy patient) is appropriated, discussed, and adapted by a hybrid collective composed of patients and specialists" (pp. 90-91).

Notes

a. See also: Beck 1992.

discussion" (Callon et al. 2009, p. 118). In other words, they are intended to facilitate processes in which what counts as knowledge or expertise is opened up for discussion and re-definition.

An issue-oriented and material perspective on technical democracy

An important contribution to Callon et al.'s programme has been offered by Noortje Marres (2007). Particularly, Marres had been critical of the procedural nature of the model of public involvement in politics outlined by Callon et al., as well as of the one initially proposed by Latour in *Politics of Nature*[18]. According to her, these models tend to favour a not well-discussed democratic ideal, implemented as a procedural norm regardless of the specific issue being addressed (Sánchez Criado & Cereceda Otárola, 2016). As she writes:

18. Both Callon at al. and Latour's books were originally published in French at the turn of the 2000s, when Latour's political thinking had not yet been influenced by Marres' arguments (Latour, 1999b; Callon et al., 2001b).

> When [Latour and Callon and their colleagues] describe democratic processes in terms of "the composition of the common world", they commit themselves to a republican conception of democracy: they adopt a sociologized and ontologized notion of the common good. The problem is that, by drawing upon this ideal, the French sociologists do not sufficiently account for the fact that particular, contingent entities that science and technology introduce into the world differ in crucial respects from the abstract, general entity – the common good – celebrated in classic and modern republican theories. (Marres, 2007, p. 764)

In other words, Callon and his colleagues' hybrid forums and Latour's non-modern Constitution – or "Parliament of Things" (1993) –, despite their respective attempts to move away from ordinary assemblies or traditional institutions, still appear to be rather orderly spaces for dialogue, oriented towards a shared search for an abstract common good. Hybrid forums, in particular, are based on procedural criteria identifying a good hybrid form, defined "in terms of its degree of dialogism, that is to say, in terms of its greater or lesser ability to facilitate and organize an intense, open, high-quality public debate" (Callon et al., 2009, p. 178). Rather, Marres considers it necessary to analyse what forms of the political and democracy might emerge about specific techno-scientific issues[19]. The political, in other words, is unlikely to take the clear, stable and legible form of Callon et al.'s hybrid forums.

Furthermore, what also matters is the materiality and technicality of the various objects of contestation. And this is why it is necessary to "recognize the recalcitrance, contingency and indeterminacy of urban materialities, and the way this shapes and conditions urban-political conflict" (Farías & Blok, 2016a, p. 545). Democratization, in this light, does not mean following a predefined, legible, and stable scheme that can guarantee the achievement of a common good. Instead, it consists of minor and situated actions of tinkering and infrastructural alteration.

19. Following Marres' insights, Latour himself later stated: "'political' is not an adjective that defines a profession, a sphere, an activity, a calling, a site, or a procedure, but it is what qualifies a *type of situation*". In Dewey's work, "we find a Copernican Revolution of radical proportions: to finally make publics turn around topics that generate a public around them instead of trying to define politics *in the absence* of any issue" (Latour, 2007b, pp. 814-815).

The vision of a "distinctively and irreducibly material" politics is further emphasized by Marres in another text co-written with Javier Lezaun (2011, p. 497). As the authors stress, "the idea that language is the central vehicle of politics [...] is so deeply ingrained in our preconceptions of the political that it is almost impossible to imagine a public, particularly a democratic one, not constituted primarily by acts of discursive deliberation" (Marres & Lezaun, 2011, p. 492)[20]. Material perspectives, instead, challenge this vision, revealing that democratization "is rather performed [...] in settings and through objects that do not belong to a distinct sphere of action, but rather co-articulate public political activity with other domains of everyday practice" (Marres & Lezaun, 2011, p. 496). For this reason, Marres and Lezaun invite to pay attention to "how objects, devices, settings and materials, not just subjects, acquire explicit political capacities, capacities that are themselves the object of public struggle and contestation, and serve to enact distinctive ideals of citizenship and participation" (Marres & Lezaun, 2011, p. 491).

Particularly, they declare their interest in going beyond "the idiom of 'sub-political' or 'constitutive' materiality", i.e. beyond post-Foucauldian perspectives which focus on matter as "'latent' force" that silently partake in the constitution of political subjects and forms[21], considering it more productive to focus on "how material things, technologies and settings themselves become invested with more or less *explicit* political and moral capacities" (Marres & Lezaun, 2011, p. 495).

Design *objects*

This argument was taken up and applied to the field of architectural design by Domínguez Rubio and Fogué, who reflected precisely on the shift from sub-political modes of design – which they refer to as its enfolding capacity – to modes of practising design as a form of cosmopolitics – or, in their terms, "'the unfolding capacity' of design" (Domínguez Rubio & Fogué, 2015, p. 143). If conceived in terms of its capacity to enfold the political,

20. See also: López Gómez & Sánchez Criado, 2021.

21. As seen earlier in this chapter, such a sub-political understanding had also permeated the analytical strategy of ANT before the 2000s. Here, as Latour's analysis of speed bumps (1999a) shows, for example, materiality is not simply considered to operate latently and tacitly, but in virtually sub-legal ways.

> design [...] emerges as a *sui generis* form of "material politics", that is, as a form of doing politics through things, which offers the possibility, or at least the promise, of rendering power tacit, invisible and therefore unchallengeable by controlling that vast 'sub-political' world of physical and technological elements that silently shape our actions and thoughts, but which typically remain outside the sphere of formal politics and institutions. (Domínguez Rubio & Fogué, 2015, p. 144)[22]

Urban and architectural design provide many examples of how such enfolding capabilities allow for the articulation of different political agendas. The development of the modern city itself (as discussed in chapter II) was based on this logic. Following social historian Patrick Joyce's arguments[23], for instance, Domínguez Rubio and Fogué mention the work of nineteenth-century reformers like Haussmann and Cerdà, who viewed their urban restructuring projects, with wide streets, public parks, and concealed underground infrastructure, as a means to establish a novel citizenship model rooted in principles like security, morality, and unhindered mobility. Other examples include Ebenezer Howard's *Garden Cities* in Britain, which sought to optimise citizens' relations with nature, and Le Corbusier's *Ville Radieuse*, in whose form he sought to inscribe the principles of rationality and productivity.

Drawing on Marres and Lezaun argument, the authors reflect on the "unfolding" – or cosmopolitical – capacity of design, that is its capacity "to extend, interrogate and speculate about the kinds of things, sites, and bodies that constitute the cosmos of the political" (Domínguez Rubio & Fogué, 2015, p. 159). From such perspective, design is seen as a way to "'propose' new kinds of bodies, entities, and sites *as political*" (Domínguez Rubio & Fogué, 2015, p. 148). Through the creation of specific material configurations, design can articulate and enable distinctive modes of public participation. To provide concrete examples of this unfolding capacity, Domínguez Rubio and Fogué describe a series of participatory design attempts, such as *el Campo de la Cebada*, a place born in 2010 in Madrid. In this project, the Spanish architectural collective *Zuloark* worked together with activists and residents of *La Latina* neighbourhood to appropriate an area that had remained empty after the burst of Spain's real-estate bubble, to transform it into a cultural and political hub. The idea was to create an "under-defined space", furnished with a set of open-source, mobile urban furniture which would enable various configurations. Since then, *el Campo* has been re-interpreted and used in multiple ways, such as an educational space hosting workshops and seminars, an open-air summer university, a political site for local associations, a sports and cultural facility, and a urban garden (Domínguez Rubio & Fogué, 2015, pp. 151-152). As anthropologist Alberto Corsín Jiménez would say, the political value of this place lies in its being "in beta" (Corsín Jiménez, 2013, p. 385), namely a space for possibilities, that can be endlessly re-interpreted, transformed and adapted. In this sense, "*el Campo* emerges as a powerful urban machine, a city-making machine in which it is possible to explore, imagine, and experiment with other ways of being in the city, other forms of building urban communities, other forms of creating material and emotional attachments, and also other forms of political participation" (Domínguez Rubio & Fogué, 2015, p. 151). Other examples include the occupy movements, such as the popular assemblies of Madrid's *May 15 movement* and other similar initiatives across the world. According to the authors, despite their different motivations and trajectories, all these movements share the aim to appropriate urban spaces in which hegemonic political and economic programmes were enfolded. Beyond the transformation of such places into political sites, these initiatives transformed them into sites of "'political speculation', on which it became possible to think, explore and test other possible forms of politics" (Domínguez Rubio & Fogué, 2015, p. 151). Among them, *Acampada sol* in Madrid, in May 2012, is described as an open-ended design object that grew organically without any predetermined programme, as new ideas and opportunities came to light and were openly debated during its participatory gatherings and events. The square, featuring a library, nursery, community gardens, a radio station, an internet hub, and various themed working groups, was transformed into a "lively life-size political laboratory [...], a collective machine for thinking in which it became possible to experiment with and test miniaturized forms of direct democracy" (Domínguez Rubio & Fogué, 2015, p. 154).

22. See also: Domínguez Rubio & Fogué, 2017.

23. Together with other scholars, Patrick Joyce yelded new insights into the nature of liberal governance by linking a socio-material perspective to Foucauldian studies of governmentality. According to Joyce, a focus on the very history of how cities have been constructed and transformed and, more precisely, on the history of humble things – statistical charts, maps, water closets and streetlights, to take a few of his examples – can enable us to gain a sense of liberalism as a *material phenomenon*. Understanding the state and governmentality to these techniques, Joyce explains, "means that different sorts of knowledge, competency and agency are, as it were, 'engineered' into material objects and the material world" (Joyce, 2003, p. 41).

In sum, far from being programmatic, these initiatives take the form of experiments aimed at arranging alternative and more democratic urban techno-political infrastructures. Rather than understanding technical democracy as a prescriptive project, seeking to overcome once and for all the divide between experts and lay people employing stable and iterative dialogue procedures, also other authors, such as Ignacio Farías and Anders Blok, emphasise the "open-ended" and "fragile" nature of what they call "moments of *democratization*" (Farías & Blok, 2016a, p. 546), resulting from specific material disruptive actions in always emerging socio-technical assemblages[24].

Design *processes*

This issue-oriented and material perspective on participation has also been welcomed in the field of design by Pelle Ehn and his colleagues Erling Björgvinsson and Per-Anders Hillgren (Björgvinsson et al., 2012a; 2012b)[25]. Where Domínguez Rubio and Fogué's analysis focuses more on the political capacities of design *objects*, i.e. particular architectures and material arrangements, the focus here shifts more specifically to design *processes*. Ehn and his colleagues, who have long been active in the field of Scandinavian participatory design[26], have turned to STS to rethink its conventional methods and principles. As they note, since recent years participatory design has welcomed design thinking approaches – or design for social innovation (Murray et al., 2010; Jégou & Manzini, 2008) – which, beyond the "economic bottom line" (Björgvinsson et al., 2012a, p. 101), is focused on creating the conditions for long-term collaborations between designers, citizens, researchers, and even municipalities, rather than on the production of marketable objects.

24. In this regard, anthropologist Corsín Jiménez replaces Henri's Lefebvre's notion of a "right to the city" (1996) with what he calls the "right to infrastructure" (Corsín Jiménez, 2014, p. 342). Indeed, where Lefebvre's notion has been embraced by many post-Marxist theory-informed urban social movements as the revolutionary right to an all-encompassing and universally just city, a right to infrastructure rather entails the right for engaging in the experimental tinkering and in rearranging the fragmentary, unstable and always emerging socio-technical assemblages composing the urban (Corsín Jiménez, 2013; Corsín Jiménez, 2014).

25. A thorough analysis of the fruitful encounters between STS and the field of design is beyond the scope of this book. For an interesting overview, see: Varga, 2018.

26. Notably, Participatory Design has quite a long tradition in Scandinavian countries, and its origins date back to the 1960s. In short, it emerged as a result of the introduction of new technologies in the workplace, and its basic idea was that those impacted by the design's outcome should be allowed to have a say and participate in the design process of workplaces (Asaro, 2000).

Here, Marres' position on controversial issues and Latour's notion of thing became conceptual tools for Ehn and his collaborators to reconfigure the role of the designer and rethink participation in design processes. As they put it, they sought "to move from designing 'things' (objects) to designing Things (socio-material assemblies)" (Björgvinsson et al., 2012a, p. 102). For this reason, the designers proposed a "thinging" approach (Björgvinsson et al., 2012a, p. 104) that consists in moving from "projecting" to one of "infrastructuring" design activities (Björgvinsson et al., 2012a, p. 102). Rather than focusing on projects, which implies that the activities of design are temporally circumscribed, infrastructuring here means setting up a stage while designing and for the aftermath when design activities have ended. This approach, they note, also implies a shift from "use-before-use" – which means knowing who users are before designing for them – to "design-after-design" (Björgvinsson et al., 2012a, p. 104), that is, the design doesn't end when designers present a closed product but continues unfolding.

In such a scenario, the role of the designer changes radically: in the thing, understood as a more-than-human assembly, rather than creating useful products and services, the designer participates only temporarily, helping to continue or create other collaborations[27]. Unlike the solutionist approach, the open-endedness of a thing and the absence of predetermined sets of partners, do not imply the use of once-and-for-all procedures but require dealing with emerging uncertainties and conflicting interests. The role of non-humans in participatory practices is further emphasized by Ehn and his collaborators: design devices, in the form of prototypes, mock-ups, design games, models, and sketches are participants to all intents and purposes. Where in the conventional design work

> a strong focus is placed on "representations" of the object of design [...] as gradually more refined descriptions of the designed object-to-be [...] the suggestion here instead is to focus on these devices as material

27. An example of how these designers enact participation in things can be drawn from their involvement in the Malmö's *Living Labs* project, which started in 2007 as a collaborative platform to explore how to enhance the city's subcultures with new media. Here, the designers describe their role as the one of conducting continuous match-making processes. Their main task was to develop different constellations aligning humans, environments, objects, and devices, such as an art and performance centre and a grassroots hip-hop community with an interaction design company. In short, they created an infrastructure in the present for a thing that might be continued and even transformed in the future (Björgvinsson et al., 2012a, pp. 110-125).

> "presenters" of the evolving object of design supporting communication or participation in the design process. (Björgvinsson et al., 2012a, p. 106)

Each of these non-human elements is a political element, it has "powers of engagement" (Marres & Lezaun, 2011, p. 495), and can thus become an element of the participatory transformation of the process, allowing it to be opened up to other actors and issues.

CARE FOR NEGLECTED "THINGS" IN ARCHITECTURE

Further interesting insights for rearticulating the relationship between architectural practice and politics, and reframing participation, emerged from the encounter between STS and the feminist ethics of care.

As mentioned above, Marres was critical of both Callon et al. and Latour's models of democratic politics, which adopt procedural criteria and "a sociologized and ontologized notion of the common good" (Marres, 2007, p. 764). This critique, in many ways, resonates with a broader critical debate in STS, which targets the compositional approach underlying Latour's *Dingpolitik* and Callon Lascoumes and Barthe's dialogical democracy. Particularly, as Mario Blaser notes, for Latour, in contrast to the meaning Stengers attributes to cosmopolitics,

> the only requirement for things to legitimately be part of the political task of building the common world is that they be an issue, a matter of concern that gathers a public, an assembly. But this rather quick equivalence between cosmopolitics and the progressive composition of the common world seems to rest on Latour's formulation being inspired primarily by scientific controversies; in these cases the multiplicity at stake in a matter of concern that gathers an assembly is already visible and legible, so to speak. (Blaser, 2016, p. 553)

Unlike this view, Stengers takes on a more radical task: in proposing to destabilise existent propositions of the cosmos, she aims to enable situations in which the unknown, "that which does not have, cannot have or does not want to have a political voice" (Stengers, 2005, p. 3), may become visible, problematic. In her rendering, cosmopolitics entails an ethical-political commitment not to lose sight of potential victims. As feminist STS philosopher María Puig de la Bellacasa notes, "for Stengers, this triggers not only processes of inclusion/exclusion but a more *cosmic* concern, a

hesitation, a permanent question that challenges the collective by always having as open an unknown: *How many are 'we'?*" (2017, pp. 46-47).

Particularly, drawing on Stengers' reflections, Puig de la Bellacasa offers a powerful prolongation to Latour's matters of concerns, that she calls "matters of care" (2017). At the center of this notion is the recognition that

> in strongly stratified technoscientific worlds "erased" concerns do not just become visible by following the articulated and assembled concerns and participants composing a thing. Generating caring might mean counting in participants and issues that have not managed or are not likely to succeed, or even do not want to voice their concerns, or whose voices are less or not perceptible – as agencies of a politics that remains "imperceptible". (Puig de la Bellacasa, 2017, p. 57)

In Puig de la Bellacasa's rendering, care doesn't replace the meaning of concern – which already denotes trouble, worry, and thoughtfulness about an issue – but rather brings something else:

> One can make oneself concerned, but "to care" contains a notion of *doing* that concern lacks. This is because understanding caring as something we do materializes it as an ethically and politically charged practice [...]. In this vision, to care joins together an affective state, a material vital doing, and an ethico-political obligation. (Puig de la Bellacasa, 2017, p. 42)

Care entails an active commitment to give voice to "those who can be harmed by an assemblage but might be unable to voice their concern and need for care – for example, trees and flowers, babies in prams whose noses stroll at the level of SUV's exhaust pipes, or whose voice is less heard – cyclists, older people" (Puig de la Bellacasa, 2017, p. 52).

Further articulating the feminist perspectives on architecture already encountered in this book (see chapter I), care becomes here a speculative practice. Against any ready-made formulas and clear-cut assumption of what should be done and how, it implies a constant commitment to inquire what different ways of doing and undoing imply, and to set up new and more balanced arrangements. In other words, a constant commitment to open up other possible worlds[28].

28. On the different ways in which the notion of care can be understood and

RE-THINKING PARTICIPATION IN "THINGS"

Unlike the reflections and experiences on participation examined in chapter I, STS – and particularly ANT – allow for a much more radical problematisation of expert knowledge and broaden the range of entities that should be taken into account. Design practice is no longer understood as the task of an expert human who shapes passive worlds, but as an activity involving human and non-human entities. In this sense, it is an inherently participatory practice. In the turn to things, the role of architects (and designers) changes radically: in the unfolding of things, or more-than-human assemblies, they no longer appear as expert providers of solutions manipulating inert matter, but rather as co-participants in open-ended processes with a variety of agents. Furthermore, such a focus on distributed agency in design implies considering the role of objects, tools and materials in articulating different modes of participation (Marres & Lezaun, 2011; Björgvinsson et al., 2012a; Domínguez Rubio & Fogué, 2015).

Some STS scholars also emphasise the need to engage in processes of suspension and exploration of our understanding of how many parties are at stake and how to live together, inviting consideration of those human and non-human actors who may have different capacities and difficulties in expressing their needs and concerns (Stengers, 2005; Puig de la Bellacasa, 2017). If we consider, for instance, that liberal notions of political participation tend to be premised on an agential subject, capable of expressing concerns through what is considered an articulate language, what happens when other modes of expression are at stake? What happens to those entities that, to use Puig de la Bellacasa's words again, "might be unable to voice their concern and need for care – for example, trees and flowers, babies in prams whose noses stroll at the level of SUV's exhaust pipes, or whose voice is less heard – cyclists, older people"? (Puig de la Bellacasa, 2017, p. 52) That is, the numerous – human and non-human – parties that do not express *I want*, *I need*, or *I wish*, like the modern Kantian subjectivity?

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practiced in architecture, see also Rispoli 2021.

IV. TRANSFORMING AND RE-LEARNING ARCHITECTURE

As seen in chapter III, STS contribution has been crucial in revealing the more-than-human politics of design. Particularly, following Latour, Yaneva suggests that architects should engage in operations aimed at making every actor, connection, and controversy visible in both artefacts and architectural practices. Drawing inspiration from the ANT educational version developed by Latour, which aimed to educate students in the exploration and mapping of contemporary socio-technical issues[1], Yaneva elaborated and taught her educational programme called *Mapping Controversies in Architecture* at the University of Manchester since 2008/2009[2]. Paraphrasing her words, the course aimed at teaching students how to draw, map, visualize controversies rather than objects, and, therefore, how to unveil the complex ecologies that hold together architectural, cultural, economic, and political issues. Against the traditional approaches of critical architectural theory – which, still grounded in divides such as society/architecture, nature/culture, reality/rationality, "consisted in *unveiling* the hidden mechanisms [...] *behind*" architecture

1. The cartography of controversies was developed by Latour as a didactic version of ANT at the *École des Mines* of Paris, and then adopted and developed as a full research method in several European and American universities. The aim of this programme is precisely to provide students with a set of techniques to explore and visualize issues, that is, the complexity of collective existence. STS-trained sociologists Tommaso Venturini and Anders Kristian Munk, in particular, examine the potential of digital technologies to render such complexity visible. Indeed, the controversy website has been developed as a multilayered toolkit to track and compile information regarding public discussions (Venturini & Munk, 2021; Venturini, 2010; Venturini, 2012; Seurat & Tari, 2021).

2. See chapters: "Visualizing Controversies, Tracing Networks" and "Mapping Controversies" in Yaneva, 2012. The course is presented on web-based platforms, namely: http://www.mappingcontroversies.co.uk, or http://www.msa.ac.uk/mac.

and "held the concept of society to be fixed" (Yaneva, 2012, pp. 41-42) – the course was inspired by her already mentioned pragmatist mode of engaging with architecture. As she writes,

> follow how architecture *happens*, watch how matter acts, witness how actors attribute meaning to their actions, track design processes as they unfold [...] and you will witness buildings that are not made by powerful minds; that are not meant to symbolize, but architecture that emerges as it traces many intricate relationships with slate, steel, glass, with materials and technologies. (Yaneva, 2012, p. 44)

Further emphasizing the need to abandon abstract Euclidean representations of space that view buildings as static objects, Yaneva explains how ANT-based controversy mapping techniques are oriented towards seeing buildings as things. "Rather than merely adding external concerns to objective entities" (Yaneva, 2012, p. 79), this approach is aimed at following "all the actors involved in the making of architecture" (Yaneva, 2012, p. 44) and exploring the performativity of buildings in their use. Particularly, to further articulate her teaching philosophy, Yaneva discussed the differences between an ANT-based pedagogical approach to design and a studio-based approach, the latter being the focus of reflections by philosopher and urban planning professor Donald Schön (1983). In contrast to Schön's reflective studio-based approach (discussed further later in this chapter), which involves the creation of situations to learn what it means to design, thus for "learning *to* design", Yaneva argues that a controversy-based approach rather implies situations aimed at "learning *about* design", which is a "an out-of-the-studio [...] mode of questioning the multifarious connections of architecture, society, economics, culture and politics" (Yaneva, 2012, p. 68)[3]. According to her, by mapping controversies students become "surfing practitioners", capable of collecting huge amounts of heterogeneous data about a project, such as "design precedents, image retrieval, actors' statements, archival materials, government papers and data about the architects in charge" (Yaneva, 2012, p. 71). In turn, this acquired knowledge would raise students' awareness "about *what design does* – what kind of effects it can trigger, how it can affect the observer, divide communities and provoke disagreements"

3. See also: Yaneva, 2011.

(Yaneva, 2012, p. 70). As an example, in the mapping endeavor conducted to gather the controversies surrounding the proposed expansion of London's Heathrow Airport, her students:

> immerse themselves in complex datasets that allow them to reflect not only on the design of the third runway and the sixth terminal to Heathrow Airport but on all those issues design is related to. How will the new terminal affect climate change? How many surrounding homes will the expanded airport destroy? How will the new design affect the residents of Sipson? Will the campaigns against Heathrow's expansion change any of the design plans? (Yaneva, 2012, pp. 69-70)[4]

ANT-based controversy mapping, however, seems to imply a one-way relationship between STS and architecture, in which architects somehow become social scientists (Gisbert Alemany, 2018). Indeed, as Yaneva points out, they develop extensive knowledge "*about* design" (Yaneva, 2012, p. 68). The idea is that, according to this "inspiration-based model", these "sts – or anthropology – based exploration of design projects might arouse a different design practice" (Farías & Sánchez Criado, 2018a, p. 26). But what is left of architects' design skills?

This chapter focuses on both the design experiences of a series of architects (*More-than-human architectural interventions*), and on particular pedagogical experiments in design studio courses by some architects and STS-trained anthropologists (*More-than-human architectural pedagogies*). These endeavors follow a different approach that, to put it in Ignacio Farías and Tomás Sánchez Criado's words, instead aims to make "STS and anthropology work *within* and *through*" design practice[5], implying its transformation or "re-learning" (2018a, p. 27)[6], also contributing to an

4. Particularly, according to Yaneva, architectural techniques such as parametric modelling and post-parametric computational tools would allow students "to remain *in* the world of the controversy while also having an overview of it" (2012, p. 100) and simultaneously present a space were controversies are not static objects but moving and changing networks of heterogeneous actors.

5. Farías and Sánchez Criado, in their text (2018a), refer exclusively to pedagogical experiences in design studios. However, I believe that their reflections can also be extended to experiences of practitioners who have drawn from STS to transform their design practice.

6. On this topic, see also: Rispoli, 2023.

extension of STS registers[7]. What follows is an attempt to offer a partial and temporary overview of this evolving scenario.

MORE-THAN-HUMAN ARCHITECTURAL INTERVENTIONS

Revealing what is hidden

Architectural practice, at least in its modernist interpretation, tends to simplify, purify, cutting out complexities, disagreements and multiple, heterogeneous ontologies. The following design experiences aim, in different ways, to make the socio-political dimension of architecture visible, i.e. its hidden multiple relationships, mediations, dependencies and controversies, in order to allow a redistribution of agency.

In many of their works, the Madrid/New York based practice *Office for Political Innovation*[8] seems to be particularly concerned with the staging of the multifarious more-than-human agencies that gather to compose the architectural thing. In this sense, Latour's notions of *Dingpolitik* and cosmopolitics seem to become an inspiration to reconfigure architectural politics and practice. Andrés Jaque, architect and founder of the *Office*, argues that they aim to find ways to escape conventional approaches to design practice "based on the idea that there is first a phase of design, followed by one of realization, ending with one of occupation and use" and to replace them "by a successive-attempts-based design process" (Yaneva & Zaera-Polo, 2015, p. 58). The role of architectural design "is to intervene in existing situations, to be able to read and mobilize the critical mass that is already embedded in its materiality, and reenact it in a way that power can be reduced, redistributed, or dissented through building" (Jaque, 2018b).

7. It is important to point out that the relationship between STS and the various design disciplines has also triggered a redefinition of social and cultural theory. Previously, social scientists and anthropologists considered design merely as a research object, providing designers with more accurate information about potential or actual users. In contrast, STS scholars have turned designers into interlocutors and begun experimenting with their methodological inventiveness. See, for instance: Marres et al., 2018; Sánchez Criado & Estalella, 2018.
8. https://officeforpoliticalinnovation.com.

***PHANTOM. Mies as Rendered Society* (2012-2013)**[9], is an intervention at the Barcelona Pavilion based on a two-year ethnography carried out to unfold the role played by the so-far-unnoticed basement included in the 1986 reconstruction. When the 1929 German National Pavilion was reconstructed in Barcelona, the team in charge of the project – architects Cristian Cirici, Fernando Ramos and Ignasi de Solà-Morales – also built a large basement to facilitate control, maintenance and service. However, the access to the basement was purposely made difficult to avoid its potential future use as an exhibition space where visitors could get to know more about the original Pavilion, its reconstruction and Mies himself. The aim was to preserve the "'original experience' of the building" (Jaque, 2015, p. 126) and its autonomy from any kind of socio-political contingency, which implied the omission of all the things that might subvert this illusion. As Jaque states, these hidden items, such as broken travertine slabs, faded velvet curtains, and broken sheets of glass

> are the architectural equivalents of the eponymous picture in Oscar Wilde's *Portrait of Dorian Gray*. In the eyes of the people in charge of maintaining the building, it is as though the dilapidated pieces of velvet, glass or travertine, by virtue of having once been part of the Pavilion's material substance, somehow magically retain the structure's soul: in other words, the essence of Mies van der Rohe's critical programme. (Jaque, 2015, p. 124)[10]

The space also hides everything that is needed to understand the Pavilion's broader and controversial socio-political context, such as the flags of Barcelona, Catalonia, Europe, Germany, and Spain, props and equipment for events, and the kitchen where the Pavilion's staff has lunch. As Jaque notes, "there is much to be learnt from the role architecture plays in making parts of daily life visible or invisible, calculable or non-calculable, prestigious or non-prestigious, accounted or unaccounted for" (Jaque, 2015, p. 277). Indeed, "for the upper floor to seem metaphysical, the basement needs to accommodate the Pavilion's 'phantom public,' the well-known notion about politics developed by Walter Lippmann [The Phantom Public (New York: Harcourt, Brace, 1925)] that Mies, in 1955, declared to have been

9. https://officeforpoliticalinnovation.com/work/phantom-mies-as-rendered-society/.
10. See also: Jaque, 2018a.

the origin of his architectural insight"[11]. The two stories of the building reflect two competing notions of politics: the well-lit upper floor revives foundational concepts of the political, while the dark lower one embodies its mundane version, made of contracts, agreements, and disputes that lie behind the Pavilion's construction. Drawing on this analysis, *PHANTOM. Mies as Rendered Society* was meant to rearticulate these two spheres and create space for thought and debate on controversial issues. Whereas the focus is usually placed on style and authors' enunciations, often removing the ordinary from view, this new act of composition aims to highlight the role of all the heterogeneous and conflicting elements involved in design processes and their presumed outputs. Mies' Pavilion is rendered as a thing, a contested site made public. In a later account, Jaque included *Niebla*, a cat that spent most of her life inside the Pavilion's basement. *Niebla* took part in another cosmopolitical project: her role was to kill rats that could potentially enter the building. The name *Niebla*, which means fog in English, comes from her eyes: the darkness of the space had caused irreversible damage to her sight, which in turn gave her a peculiar foggy look. *Niebla* entered the Pavilion's space to modify a certain ecosystem, and the Pavilion itself transformed her (Jaque, 2019). **[1, 2, 3]**

[1, 2, 3] PHANTOM. Mies as Rendered Society. Andrés Jaque / Office for Political Innovation, Barcelona. Fundació Mies van der Rohe / Arts Institute of Chicago Permanent Collection

***12 Actions to Make Peter Eisenman Transparent* (2004)**[12] carries out a similar operation. The project consisted in a series of actions aimed at facilitating the residents of Santiago de Compostela and its visitors to comprehend and engage in discussions regarding the construction process of Peter Eisenman's *Ciudade da Cultura* (later inaugurated in 2011). As

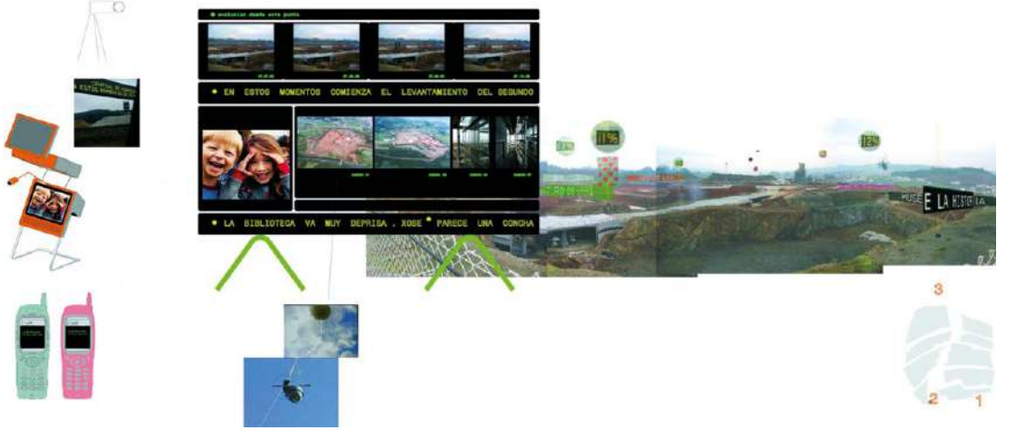
11. https://officeforpoliticalinnovation.com/work/phantom-mies-as-rendered-society/.

12. https://officeforpoliticalinnovation.com/work/12-actions-to-make-peter-eisenman-transparent/.

all architects in the Western world know very well, Eisenman has always been one of the biggest advocates for the autonomy of architecture, considering design practice as detached from social engagements and politics in general. By contrast, this intervention is meant to render the construction process "politically transparent" (Jaque, 2018b). Certain measures were implemented to enable people to explore the construction site as if it were a public park, such as: a free bus service connecting the site to various parts of the city, facilities such as restrooms and vending machines at stations, guided tours and open-house events. Other measures included assigning distinct color codes to the equipment of various construction companies, making them easily recognizable to the public; allowing people to leave opinions, which, together with the different tasks executed and time schedules of the construction process, were rendered public both inside the building site and throughout the city through the installation of LED screens; using balloons to visually represent the amount of money expended; and stickers on each truck entering or exiting the construction site to denote its origin, destination, and cargo. The idea was to demonstrate how the construction process is socially connected and to provide the public with an open space to discuss the many issues involved. Again, where the role of design is traditionally understood as the production of buildings as black boxes, here it is seen, on the contrary, as the unveiling of the socio-political dimensions of architecture, which can enable the redistribution of agency and knowledge. **[4, 5]**

***COSMO MoMA PS1* (2015)**[13], which was the winner of the 2015 Young Architects Program, also moves in this direction. Designed as a movable artefact, it aimed to make New York's so-far-hidden urbanism visible. The result is a collection of ecosystems employing sophisticated environmental design principles, engineered to filter and cleanse 3.000 gallons of water by removing suspended particles and nitrates, adjusting pH levels, and enhancing dissolved oxygen levels. *COSMO* functions as both an offline and online prototype, with the goal of increasing awareness and enabling individuals to monitor the water purification process within the device. It also provides the necessary knowledge for effortless replication, ensuring access to clean drinking water. Additionally, it was conceived as an inviting and climatically agreeable garden intended to

[4, 5] 12 Actions to Make Peter Eisenman Transparent. Andrés Jaque / Office for Political Innovation, Cidade da Cultura, Santiago de Compostela. Photo: Miguel de Guzmán



13. https://officeforpoliticalinnovation.com/work/cosmo-moma-ps1/.

bring people together, while also serving as an art installation. Thanks to its complex biochemical design, the stretched plastic mesh automatically illuminates once its water purification process is complete. **[6,7,8]**

This concern for *revealing what is hidden* acquires an even more radical and speculative **[BOX 4]** nuance in the work of Nerea Calvillo, an architect and researcher who investigates the material, technological, political and social dimensions of environmental pollution. Founder of the Madrid/London based architecture office *C+ Arquitectas*[14] and the collaborative visualisation project *In the Air*[15], Calvillo focuses on issues such as "notions of toxicity, digital infrastructures of environmental monitoring, DIY and collaborative forms of production, smart cities, and feminist

[6, 7, 8] COSMO MoMA PS1. Andrés Jaque / Office for Political Innovation, New York. Young Architects Program, 2015; Tabacalera Madrid, 2017.

14. https://cmasarquitectas.net.

15. *In the Air* is a visualization project which aims to make visible the microscopic and invisible agents of Madrid's air (gases, particles, pollen, diseases, etc), to see how they perform, react and interact with the rest of the city: http://intheair.es/index.html.

BOX 4 > DESIGN AND *SPECULATION*

Concerning the fields of architecture and design, it's important to provide a more thorough discussion of the concept of speculation. This idea doesn't solely belong to the field of STS and is interpreted in diverse ways by different authors and designers. For instance, Dunne and Raby employ the expression "Speculative Design" to craft puzzling objects that create conditions of suspension of a certain way of understanding things. These artefacts intentionally disrupt norms and functionality, sparking inquiry instead of adhering to the practicality-focused approach of industrial design (Dunne & Raby, 2013). This approach is complemented, for instance, by what Matt Ratto terms "Critical Making" (2011), where the idea is to encourage designers' critical thinking in their material doings; and by what Carl DiSalvo terms "Adversarial Design" (2015), wherein designers use their craft to challenge prevailing beliefs, values, and accepted truths. In general, these approaches share a common objective: transitioning from *problem-solving* to *problem-making*. However, within the field of STS, influenced by these ideas as well as Whitehead's pragmatist philosophy and its influence on Stengers' thinking, the notion of speculation is not only meant to think about objects and what they trigger. It rather represents a way of characterising the investigations themselves: that is, the process of opening up to the possibilities that different ways of doing and undoing imply, and in general to manifold ontologies and possibilities. In the field of design, an interesting attempt to broaden Dunne and Raby's meaning of speculative design by incorporating STS's reflections is that of Alex Wilkie (Wilkie et al. 2017; Sengers & Gaver, 2006; Gaver et al. 2008).

approaches to sensing the environment"[16]. As she states: "One of the challenges that architecture has is understanding that it does not only deal with the interiors of the buildings, we actually also deal with what happens outside. I think what is very important is to think globally"[17].

The project ***Yellow Dust DIY Sensing Infrastructure* (2017)**[18], installed at the Seoul Biennale of Architecture and Urbanism 2017, aimed at facilitating new modes of sensing data, by building what she and anthropologist Emma Garnett define "data intimacies" (Calvillo & Garnett, 2019). The premise that generated this work was a reflection on the modalities generally adopted by governments and institutions to monitor the level of air pollution and establish the courses of action for environmental health. The visibility of the collected data concerning the different polluting particles is commonly conceived as crucial to the management of the citizens' health, and it is made possible through increasingly sophisticated applications and other forms of information. However, as Calvillo states, it does not seem to be at all clear how these adopted methods actually manage to raise awareness among citizens and make sure that they adopt more responsible behavior to limit air pollution. "In a similar manner to climate change, numbers become too abstract and detached from reality for people engage with them in meaningful ways" (Calvillo, 2018a). In such a scenario, *Yellow Dust* is a temporary urban installation, built to measure, make visible and partly remedy to fine dust pollution (PM 2.5) through a cloud of water vapour. Indeed, PM 2.5 particles represent the main and most controversial pollutant in Seoul because of *Hwangsa* (which means *Yellow Dust* in Korean), clouds of fine sand that originate in the Gobi desert and the northern areas of China. In spring these yellow clouds cover the city of Seoul making air unbreathable. *Yellow Dust*, to make this phenomenon visible, produced a colourful water vapour fog, whose density varied according to the concentration of polluting particles present in the air.

Interestingly, in another article, Garnett talks about the "elemental ambiguity" (Garnett, 2018) of atmospheric particulate matter and the consequent difficulty in estimating its levels of toxicity. Comprised of particles of different sizes, PM 2.5 encompasses ash and dust generated by both anthropogenic and non-anthropogenic activities, as well as gas-particle conversion. It originates from various sources, and its chemical makeup is constantly changing, making it impossible to single out or define its particles in a straightforward or deterministic manner. Although, as previously noted, numerical measurements are crucial, they "cannot alone tell us all we need to know about air pollution, or indeed inform an effective response without the consideration of other things, people and processes" (Garnett, 2018). *Yellow Dust*, therefore, represented an attempt to problematise, and open what we commonly call air pollution to speculation.

Particularly, while the data produced by technical and scientific approaches are usually considered capable of ensuring, through their visibility, an immediate social, political, and environmental change, this installation meant to allow an actual physical interaction with these data. The questions that guided this project were: "as numerical data only make sense for certain cultural practices (scientists, for instance), what if,

16. Excerpt from Calvillo's online bio.
17. Excerpt from an interview with Calvillo filmed within the *Innovation* lecture series, organized by Barcelona Building Construmat, May 2017: https://www.youtube.com/watch?v=I7Ff29FxeFM.
18. http://yellowdust.intheair.es.

instead of seeing the data produced by the sensors, we feel them? Would this change the ways in which we know and relate to air pollution, and open up new practices?" (Calvillo & Garnett, 2019, p. 341). The purpose, then, was that of favouring a public space that would allow an affective and embodied experience of pollution, a physical interaction with it, in much more radical ways than those provided by the mere act of viewing and interpreting numerical values. To quote the words of Calvillo and Garnett – who carried out an ethnographic study of the experience and observed, with her, people's numerous reactions to the installation – *Yellow Dust* "made sense of the data and made data sensible" (Calvillo & Garnett, 2019, p. 341), encouraging a form of collective physical survey. Producing an actual radical translation of data into a sensitive form, so that they could penetrate the skin, the installation is meant to activate "different 'categories' of knowledge, such as touch and feeling" (Calvillo & Garnett, 2019, p. 342), favouring a close encounter with them, which could stimulate, in a potentially more effective way, forms of collective commitment to pollution prevention. The installation, then, rather than simply making the problem (polluted air) visible through the fog, meant to allow people to "stay with" that very problem, like Donna Haraway would say (Haraway, 2016), and establish direct contact between pollution and bodies. "Molecular intimacy is shared between bodies, things and the climate: humans, benches, insects, particles, gases, bricks, wind, machines" (Calvillo & Garnett, 2019, p. 343). In this regard, the ethnographic observations made during the time of the installation focused on the various ways in which the visitors related to it and on the different reactions that derived from them. Particularly, one of the purposes of *Yellow Dust* was that of questioning media's conventional narratives, that often portray *Hwangsa* as an invasion by the states of China and Mongolia, and the social prejudice aroused by them. The exhibition panels of the installation linked the data collected by sensors with human bodies and with the emission sources existing in Seoul, such as in well-known restaurants and local steam rooms, revealing how the supposed alterity of the origins of pollution was fake. The basic idea, then, was that the collective construction of the problem allowed other modalities of political and environmental action. Like the authors, inspired by Stengers, state, "different entanglements emerge by including things, feelings, processes presumed to be 'outside' of science (and, perhaps, the making of 'good data')" (Calvillo & Garnett, 2019, p. 343). The production of "molecular intimacies" (Chen, 2012, p. 208, quoted in Calvillo & Garnett, 2019, p. 343) with data aimed, then, at changing the very conditions through which environmental justice can be pursued. Through a "structural reversal", that is the act of making invisible infrastructures visible, *Yellow Dust* encouraged to "'think with care,' or focus on what has been neglected or forgotten, left out through choices, histories, or policies" (Calvillo, 2018a). As a cosmopolitical and speculative operation, it aimed at rearticulating what emerged from this reversal in ways that may enable other possible narratives and modalities of action. **[9, 10, 11]**

[9] Yellow Dust DIY Sensing Infrastructure. In the Air / C+Arquitectas, Seoul Biennale of Architecture and Urbanism (KR), 2017. Photo: Daniel Ruiz

[10] Yellow Dust DIY Sensing Infrastructure. In the Air / C+Arquitectas, Seoul Biennale of Architecture and Urbanism (KR), 2017. Photo: Nerea Calvillo

[11] Yellow Dust DIY Sensing Infrastructure. In the Air / C+Arquitectas, Seoul Biennale of Architecture and Urbanism (KR), 2017. Photo: Daniel Ruiz

Among many other projects, the issue of raising environmental awareness by unveiling hidden agencies and issues has been addressed also in ***Las Respiradoras*** **(The Breathers, 2018)**[19], an installation that was developed for the *Voices of the GPS*, an experimental exhibition at the CentroCentro in Madrid where architects and choreographers collaborated to produce experimental and reflective works around cars. The idea was to stimulate reflection on breathing, taking the traffic jam – a disturbing yet evocative situation – as a reference. The traffic jam, the architects argue, is a space where breathing, which is usually taken for granted as an automatic bodily function, comes to the fore. The air inside the car gets saturated after a while, and when we open the car windows we breathe the warm and toxic air emitted by the exhaustion pipes. *Las Respiradoras* was an installation meant to invite to breathe together, through a social choreography, to generate a collective awareness of urgent environmental and political issues.

From problem-solving to problem-making

While traditional architectural practice aims to produce finished objects, some experiments seek to open up or *stage* the design process, generating questions to engage a broader network of actors and encourage participation, debate, and problematization.

RESET CA2M **(2016)**[20], a project by *Office for Political Innovation*, started in response to an invitation to renovate the *CA2M Centro de Arte Dos de Mayo* (Móstoles, Madrid). Rather than demolishing the old building and constructing a new one from scratch, the idea was that the museum should be remodeled in order not to endanger the social and cultural capital that it had gained during the years (indeed, people from the surrounding neighbourhood used to gather inside its spaces for activities such as watching movies). Furthermore, against the idea that architecture should produce finished projects, the *Office for Political Innovation* designed a protocol and master plan to start a slow remodeling of the building while at the same time keeping it open, to allow the public to observe and also participate in the process. “There was no intention of having any imposed aesthetics or style, or even to be original. We didn’t want to propose anything new. What we did was capture the voices that were around, within, and external to the museum, and inscribed them into the building itself” (Jaque, 2018b).

In this context, the operations consisted of removing some internal divisions to create a large, triple-height space for gatherings and multiple activities in the center of the building. Additionally, flags were

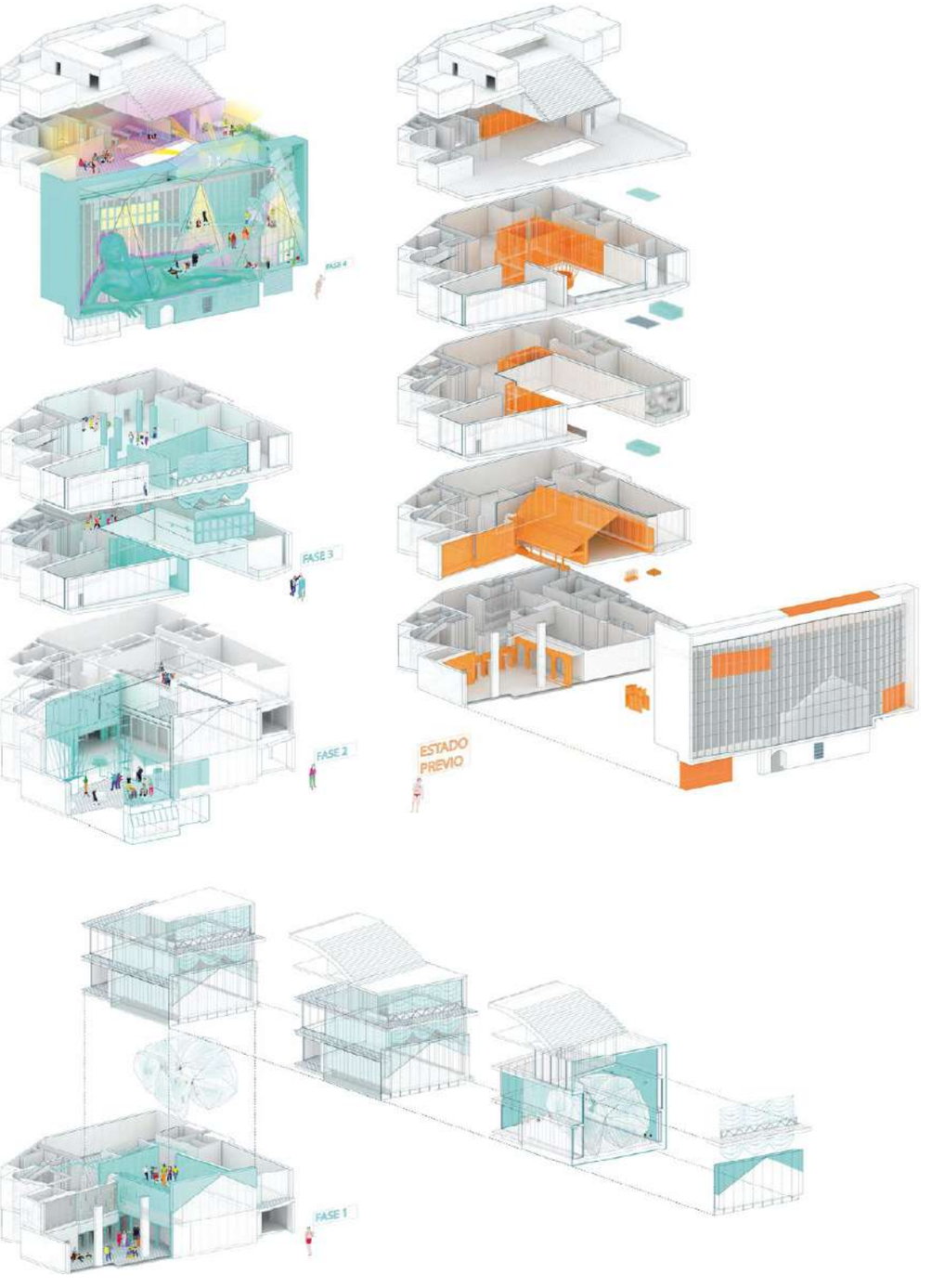
19. https://cmasarquitectas.net/projects/las-respiradoras-the-breathers/.

20. https://officeforpoliticalinnovation.com/work/reset-ca2m-integral-transformation-of-centro-de-arte-2-de-mayo/.

removed to make the building more accessible and welcoming – Móstoles is a residential, working-class district on the outskirts of Madrid, inhabited by many people from African and South American countries; removing the guards to make the space "unwatched", "a living room that is open to the street" (Jaque, 2018b), where a number of people who lack residence permits – and, as a consequence, also phones contracts – can access the building and use its open Wi-Fi. The building itself and its transformation, achieved through slow, sequential steps, became an exhibition, creating opportunities for each step to be experienced, discussed, and implemented by a broader network of affected actors. **[12, 13, 14, 15]**

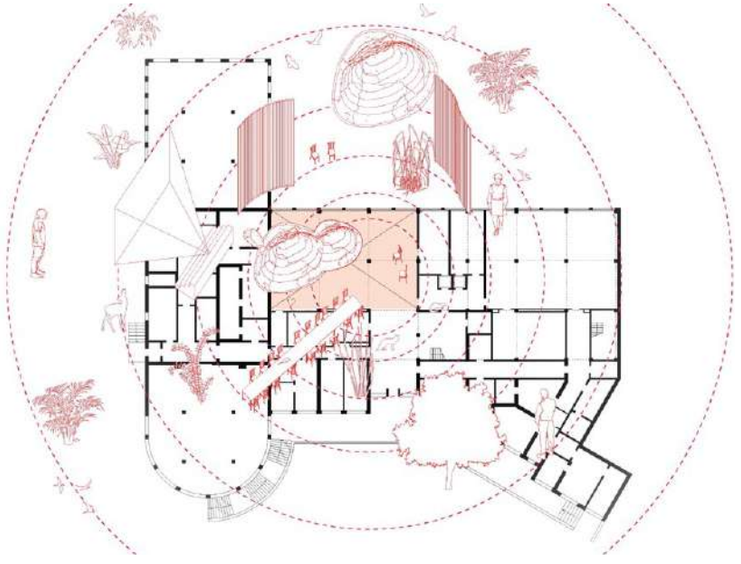
RESET CA2M somehow resonates with ***Almost Nothing – Babyn Yar Holocaust Memorial Center***[21], a project by *2050+*[22], an Italian interdisciplinary agency working across design, technology, the environment, and politics. *Almost Nothing* is a proposal for the renovation of building 26, a former psychiatric hospital for the Babyn Yar Holocaust Foundation in Kyiv, Ukraine. Babyn Yar is also known to have been the site of one of the largest mass shootings of Jews in history during the German occupation in the twentieth century. *2050+* was invited to imagine a new life for the abandoned building 26, formerly part of a psychiatric hospital. Their proposal, which is currently unrealised due to the outbreak of the Russian-Ukrainian war, fits into an ecological perspective and uses a comprehensive (archaeological, curatorial and environmental) approach. *Almost Nothing* considers the traces of various traumas embedded in that place, and imagines for the local human and non-human communities a new congregation space to perceive, process, and reflect on the complex history and legacy of the place. Interestingly, the project highlights how abstinence, inaction, or minimal intervention can be included in the architect's repertoire to maintain a degree of authenticity and complexity often overlooked in architecture. The building has been re-imagined as a large multi-species room, suitable for alternative forms of collective rituals such as a reading room, landscape, laboratory, meditation space, and performance venue, thereby multiplying the social potential of the building. **[16, 17]**

[12, 13, 14, 15] Reset CA2M. Museum of Contemporary Art CA2M. Andrés Jaque / Office for Political Innovation, Móstoles



21. https://2050.plus/projects/almost-nothing-babyn-yar/.
22. https://2050.plus/.

[16, 17] Almost Nothing – Babyn Yar Holocaust Memorial Center. 2050+, Kyiv, Ukraine, 2021. © 2050+, Babyn Yar Holocaust Memorial Center



The ***JF-Kit House* (2012-2013)**[23] was designed by the Madrid-based architecture firm *Elii*[24], initially built for the *Paysage in Progress* exposition of Brussels in 2012, and later rebuilt in 2013 for the *Forum of Asian Art Curators* in Guangzhou. The *Jane Fonda house*, to mention its full name, "was designed as a prototype of a 'house of the future'" (Domínguez Rubio & Fogué, 2015, p. 156), with a very different idea, though, from those traditionally conceived to present desirable models for the future, like the *Pavillon de l'Esprit Nouveau* by Le Corbusier (1922), the *House of the Future* by Jacobsen (1929) and the one by Alison+Peter Smithson (1955-56). In contrast to these models, the aim of the *JF-Kit House* was not to disclose what the future holds or to suggest particular technical solutions. Instead, it draws its inspiration from "some of the 'houses of the future' developed in comedy or science fiction films, such as the one featured in Buster Keaton's 1922 film *Electric House*" (Domínguez Rubio & Fogué, 2015, p. 156). Just like these models, which, instead of presenting solutions to potential future problems, aim to ironically radicalize the potentials and limits of technological promises, the *JF-Kit House* was designed to test and question hegemonic models of sustainability and ecological architecture in an ironic manner. Therefore, it presents an innovative vision for a sustainable future, envisioning a scenario where citizens generate their own domestic energy through physical activity. For daily activities, like turning on the light, cooking, and watching TV, different levels of physical activity are required, which are registered on exercise schedules and can be done either individually or collectively. Essentially, the aim of the house is to question those models that have seen sustainability merely as a technological problem to be solved through innovative and efficient devices and architectures, highlighting the aspects that they have overlooked. The idea is to show how sustainability also represents a cultural and political problem, which, apart from technological solutions, would require an open and shared debate on necessary practices and ways of coexistence to secure such sustainable future scenarios. Among the questions behind this project are: "What kinds of bodies and new practices are imagined to fulfill the promises of these sustainable futures? [...] What kinds of transformation of domestic spaces and rituals do these sustainable models demand? Which bodies and practices are excluded from participating in those sustainable futures and their promises? And how can design bring together different entities and actors?" (Domínguez Rubio & Fogué, 2015, p. 158). Rather than providing solutions to these inquiries and positioning itself as a problem-solving tool – incorporating technical and professional expertise – the *JF-Kit House* intends to explore and illuminate these questions, bringing them to the forefront and making them publicly visible. In this sense, architectural design goes beyond building construction; it constructs questions and controversy, generating opportunities for open debate.

Its political value lies in its ability to unfold a fictional scenario that operates as a polemic playfield in which sustainability emerges [...] as political

23. http://elii.es/en/portfolio/jf-kithouse-gz-2.
24. http://elii.es.

> problem requiring a new system of co-habitation, a new cosmopolitical regime which requires the production not only of new technologies but also of new bodies, a new set of cultural practices, and a new set of connections and attachments between all these elements. (Domínguez Rubio & Fogué, 2015, p. 158) **[18, 19]**

***Olla Gitana* (2014-2015)** is a transdisciplinary project by architect Miguel Mesa del Castillo Clavel, Jorge Martínez (communication), Juan Carlos Ruiz (gastronomy) and Joaquín García Vicente (architectural coordination). The Ministry of Culture and Tourism of the Region of Murcia, in Spain, had launched a project to elaborate a cartography that would make the creative capital of the region visible. In response to this, Mesa del Castillo Clavel and others proposed an unprecedented approach to mapping the territory and composing cartography, aiming to incorporate overlooked realities into the creative landscape of the region. In other words, *Olla Gitana* was meant to create a cartography of creativity that does not only belong to architects and designers. The project involved organizing a series of 24 dinners (also streamed online via YouTube) for groups of eight people with diverse socio-cultural backgrounds. These gatherings took place inside the Sala Verónicas in Murcia, where participants freely discussed various issues. The dining table – as well as architecture –, was seen as a socio-technical object, a "Parliament of Things" (Latour, 1993), an arena for discussion and political negotiation, around which different issues and heterogeneous participants gather (Mesa del Castillo Clavel, 2018). Furthermore, it constituted a way of staging the description of the region's territory: rather than simplifying and flattening it into a drawing or a two-dimensional map, it aimed to provide an embodied representation of this territory, also generating spaces of encounter and dialogue to appreciate it.

In the architectural visions of modernity, innovation was entrusted to experts, who produced models of the objects of study in their laboratories far from society. Instead, as Mesa del Castillo Clavel observes, "dining rooms encourage us to think of architecture as part of a permanently laboratoryised world and not as a place of application of what has already been tested, guaranteed, patented, and standardised, as the manuals have taught us" (2018, p. 188)[25]. In this project, architecture as a physical, defined object is only part of the assemblage of many other entities "connected in

[18, 19] JF-Kit House BR. Elii, CIVA – Centre International pour la Ville, l'Architecture et le Paysage, Bruxelles, 2012. Photo: Imagen Subliminal (Miguel de Guzmán + Rocío Romero)

heterogeneous and unstable performative ecologies" (Mesa del Castillo Clavel, 2018, p. 188)[26] that depend on changing contingencies. *Olla Gitana* can only be conceived in its unfolding, as an event: "what matters [...] is not

25. Author's translation.

26. Author's translation.

[20] Olla Gitana. Miguel Mesa del Castillo, Juan Carlos Ruiz, Jorge Martínez, Joaquín García Vicente. Picture of one of the dinners, Sala Verónicas, Murcia, 2014-2015. Photo: Alejandro Sánchez Zaragoza

only the phenomenological question, or the sensory experience assisted by different technologies: biochemical, acoustic, architectural, etc., but the co-existence of multiple cosmograms, in the sense attributed to such concept by Stengers, that is, of different ways of articulating entities and relations accepted as pacts of a common world" (Mesa del Castillo Clavel, 2018, p. 190[27]; Stengers, 2010). **[20]**

***CLIMAVORE* (2015-ongoing)**[28] is a long-term site-specific project started in 2015 by *Cooking Sections*[29] (Daniel Fernández Pascual & Alon Schwabe), a research-based practice exploring the spatial and territorial implications of food. In contrast to the outdated Eurocentric seasonal model, this new approach rethinks the creation of spaces and infrastructures by considering how climate change provide insights for adapting

27. Author's translation.
28. https://www.climavore.org/about/.
29. http://www.cooking-sections.com.

[21] CLIMAVORE: On Tidal Zones Oyster Table, Cooking Sections, 2017. Photo: Cooking Sections

our diets. The project not only examines the origins of ingredients but also their ability to drive spatial and infrastructural responses to human-induced climate changes. Placing our diet within a globally financialized framework, *CLIMAVORE* challenges the power of large agribusinesses that dictate production and consumption, and critically examines the geopolitical implications of climate change and the resulting pressures on humans and non-humans. *CLIMAVORE: On Tidal Zones*, in particular,

> explores the environmental effects of aquaculture and reacts to the changing shores of Portree, Isle of Skye. Each day at low tide the installation emerges above the sea and functions as a dining table for humans, with free tastings of recipes featuring ocean cleaners: seaweeds, oysters, clams and mussels. At high tide, the installation works as an underwater oyster table. The installation was activated by *Cooking Sections* in collaboration with local stakeholders, residents, politicians and researchers. Over breakfast, lunch, or dinner (according to the tides), performative meals featured a series of *CLIMAVORE* ingredients that respond to the environmental challenges of Scottish waters. The project also engaged with 10 local restaurants that removed farmed salmon off their menu and introduced a *CLIMAVORE* dish instead. The long-term project aims to look at *CLIMAVORE* forms of eating that address environmental regeneration and promote more responsive aqua-cultures in an era of man-induced environmental transformations[30]. **[21, 22]**

30. http://cooking-sections.com/CLIMAVORE-On-Tidal-Zones.

[22] CLIMAVORE: On Tidal Zones Oyster Table, Cooking Sections, 2017. Photo: Colin Hattersley

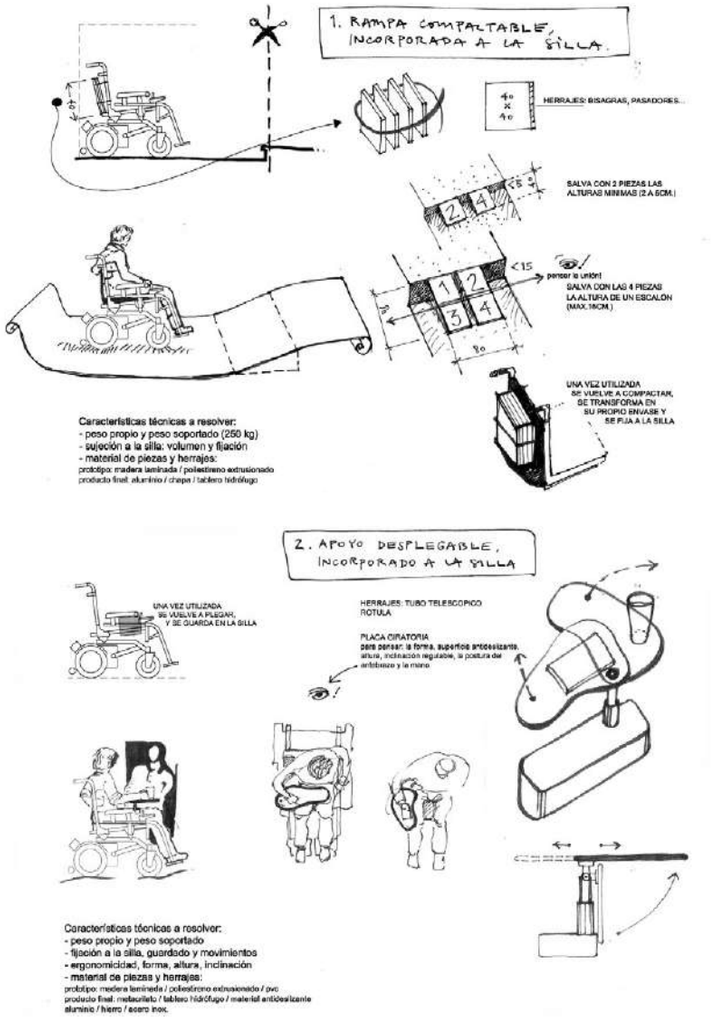
[23, 24] Urbanismos de remesas. Viviendas (re)productivas de la dispersión. Husos arquitecturas, 2017. Photo: Imagen Subliminal

***Urbanismos de remesas. Viviendas (re)productivas de la dispersión* (2017)** (Barajas & García, 2020), by the Colombian-Spanish office of architecture and urbanism *Husos Arquitecturas*[31], is part of an ongoing research project. This study focuses on urban developments funded by *remesas* – remittances in English –, which are small sums of money and goods that migrant workers send to their families in their home countries. These forms of urbanism, according to *Husos Arquitecturas*, "are not marginal realities, but advanced laboratories in which to test out new ways of city-making in a hyperconnected world" (Caniche Editorial 2024). The project aims to explore numerous overlooked political issues related to the capitalist market system, such as the lives of people compelled to leave their countries, the resulting care crisis in the global South, and new forms of belonging and displacement caused by international real estate operations. Furthermore, it represents an interesting way of staging research processes. Indeed, "designed as a *foto-realovela* (a rereading of the classic Latin American transverse photo story magazine)", also including a paper model, a sectional drawing and a report, "*Urbanismos de remesas* is intended to be a means of communication with multiple uses and users, one that establishes new lines of dialogue between theory and practice and the various communities involved" (Caniche Editorial 2024). **[23, 24]**

STS-trained anthropologist Tomás Sánchez Criado, in his ethnographic study of the Spanish activist collective ***En torno a la silla* (*ETS*)**[32], of which he was a member, tells how this speculative meaning was summed up in the expression "joint problem making" (Sánchez Criado & Rodríguez-Giralt, 2016; Sánchez Criado et al., 2016; Sánchez Criado, 2018; Sánchez Criado, 2019). Departing from "placatory" forms of participatory design criticized by Till (2005), this experience saw users and designers radically transforming their roles and sharing their knowledge for a collective material exploration of a wheelchair, in search of alternatives to market solutions. Central to their approach was challenging the limitations of conventional care technologies like technical aids, which often overlook individual user needs in favor of standardized solutions, embodying the designer's expertise. According to Antonio, a collective's member in need of a new wheelchair, "for the most

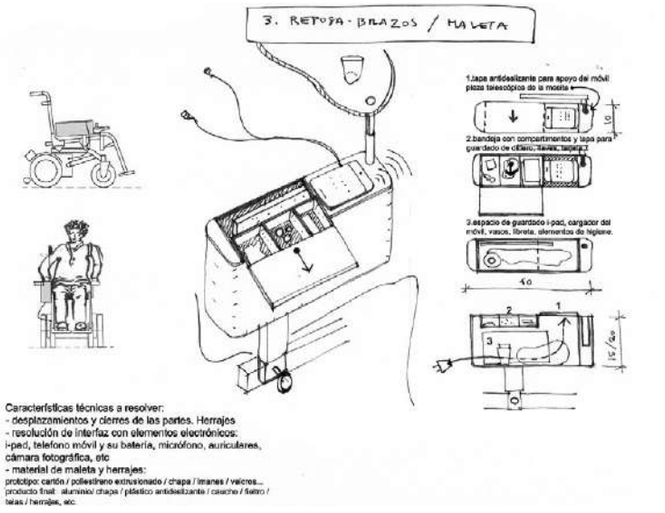
31. http://www.husos.info.

32. *En torno a la silla* (ETS), which in English means *around the wheelchair*, was mostly active in Barcelona between 2012 and 2016. The birth of the collective took place during the 15M movement in Spain. ETS' blog is available at: https://entornoalasilla.wordpress.com.



[25, 26, 27] First drafts of three accessories for Antonio's wheelchair (a portable ramp, a folding table, and an armrest/ briefcase), 2012. Photo: ETS collective

part you have to merely test what others have thought might be good for you, not the other way round" (Sánchez Criado & Rodríguez-Giralt, 2016, p. 200). From 2012 to 2013, *ETS* members participated in Medialab-Prado Madrid's *Funcionamientos* workshops, dedicated to reimagining urban accessibility and technical aids through open design practices. Their task was to create three accessories for Antonio's wheelchair – a portable ramp, a folding table, and an armrest/briefcase – forming a freely licensed kit intended to benefit both the user, seen neither as a mere recipient nor object, and his *friends*. The goal was to foster new alliances through collective experiments



aimed at hacking and rearranging social and technical scripts. Significant effort was devoted to thoroughly documenting the entire process, producing records that included technical specifications and various design iterations. This documentation was intended to support future project phases and operate on principles of open access, inspiring similar initiatives. As Sánchez Criado and Israel Rodríguez-Giralt note, this collaborative endeavor redefined care as the creation of what Mol defines as "the good in practice" (Mol et al., 2010, quoted in Sánchez Criado & Rodríguez-Giralt, 2016, p. 213). Namely, care was "shaped in different modes of experimenting and tinkering with how we might live better together" (Sánchez Criado & Rodríguez-Giralt, 2016, p. 213). Moreover, this approach represented a way of intervening in the expert-driven practices to include those who are usually neglected due to particular techno-scientific agreements, such as, for example, wheelchair users, who have to cope with the standardisation and commoditisation of technical aids (Martin et al., 2015, cited in Sánchez Criado & Rodríguez-Giralt, 2016, p. 213). Alida, the collective's architect, reflected on how this experience enabled her to "join a political space" (Sánchez Criado & Rodríguez-Giralt, 2016, p. 211), moving away from the conventional role of the sole decision-maker or *hero* architect. Without abandoning her technical expertise, she participated in an engaged and collaborative experimental material rearrangement, aiming not only to problematise and explore alternatives to standardized and commodified objects, but also to offer open access to their findings. **[25, 26, 27]**

Designing with more-than-humans

Rather than conceiving architectural practice as a human operation aimed at creating a certain form through the control and instrumental use of non-human elements, here design is thought of as a cosmopolitan practice, in which the architect participate in joint design endeavors *with* more-than-human entities in order to speculate on possible, more careful and balanced forms of coexistence.

The installation ***The Polivagina of Fan Riots***, or ***Polivagina* (2014)** (Calvillo, 2018), designed by *C+ Arquitectas* for the art event *Fan Riots* at the *SOS4.8* music festival in Murcia, was another interesting exploration of how to take non-human atmospheric agents such as air and helium seriously in architecture, as primary construction materials. More precisely, the project utilized the invisibility and dynamism of these non-human elements to disrupt conventional architectural practices, prompting a reconfiguration of methods, techniques, materials, and organizational forms. The basic idea – which also emerged through a critical dialogue with the reflections of the German philosopher Peter Sloterdijk[33], – was, once again, that "taking air into account in architecture shifts attention beyond boundaries, such as walls and roofs, to what is in between them, working with humidity, pressure, smell, toxicity and breath" (Calvillo, 2018b, p. 43). However, diverging from Sloterdijk's broader metaphorical interpretation of architecture as an enclosure, *Polivagina* employs his concept of "air design" (Sloterdijk, 2016) to conceptualize architecture as "not simply as creating envelopes for climate control, but as involving the actual design of atmospheres where the air is not only a conditioner of well-being but also a material for the construction of certain modes of sociality" (Calvillo, 2018b, p. 44). More specifically, *Polivagina* represented both an intellectual challenge and a response to the contingent situation,

33. Peter Sloterdijk, in his spherology, particularly in the volume on foams, extends sociality beyond human interactions. Sociality, like a foam, includes humans, non-humans, and the atmosphere that brings them together. Concerning architecture, however, he translates this perspective in a too-literal way: architecture becomes a foam, a set of spheres: variable containers from the micro to the macro scale, from housing and its parts to the city. In Sloterdijk's view, architectural objects have definite and stable forms and the atmospheres they creates have no place. Moreover, he has little appreciation of the fact that they, in their design and construction, generate socialities (Calvillo, 2018b, p. 43; Sloterdijk, 2016). For a more extensive survey of Sloterdijk's spherology, see also: Sloterdijk, 1998; 1999.

[28] The Polivagina of Fan Riots. C+Arquitectas, Murcia, 2014. Photo: Nerea Calvillo

i.e. the requirements of the curator, the pre-existing structure, building codes, and climatic conditions. These demands included, for example, the transformation of a 700 square-meter space without physically altering it; the necessity to utilize this space for art installations, performances, and panel discussions; the requirement to manage a limited budget and operate within a tightly constrained timeframe for both setup and dismantling; and the goal of attracting a diverse audience, including those attending the festival who may not typically be interested in art. Therefore, rather than bringing together and responding to these conditions by providing a lightweight structure or some sort of inflatable – the costs of which exceeded the budget –, the idea was to invite helium, a widely known atmospheric element famous for its lightness, as a "guest" (Calvillo, 2018b, p. 45) and to enclose it within everyday materials, namely polyamide balloons, creating a membrane of inflated micro-units. The decision to use elements so uncommon to traditional architecture obviously added a high level of complexity to the operation. *C+ Arquitectas* and the students who took part in the construction of the installation[34] had to gather stories, experiences and expertise on the use of helium from fields outside of the architectural one, for example by calling in experienced designers in the field of staging and decoration, or drawing on mundane

34. Also architect and professor Mesa del Castillo Clavel and a group of students from the University of Architecture of Alicante took part in the experiment.

[29] The Polivagina of Fan Riots. C+Arquitectas, Murcia, 2014. Photo: Imagen Subliminal

[30] The Polivagina of Fan Riots. C+Arquitectas, Murcia, 2014. Photo: Imagen Subliminal

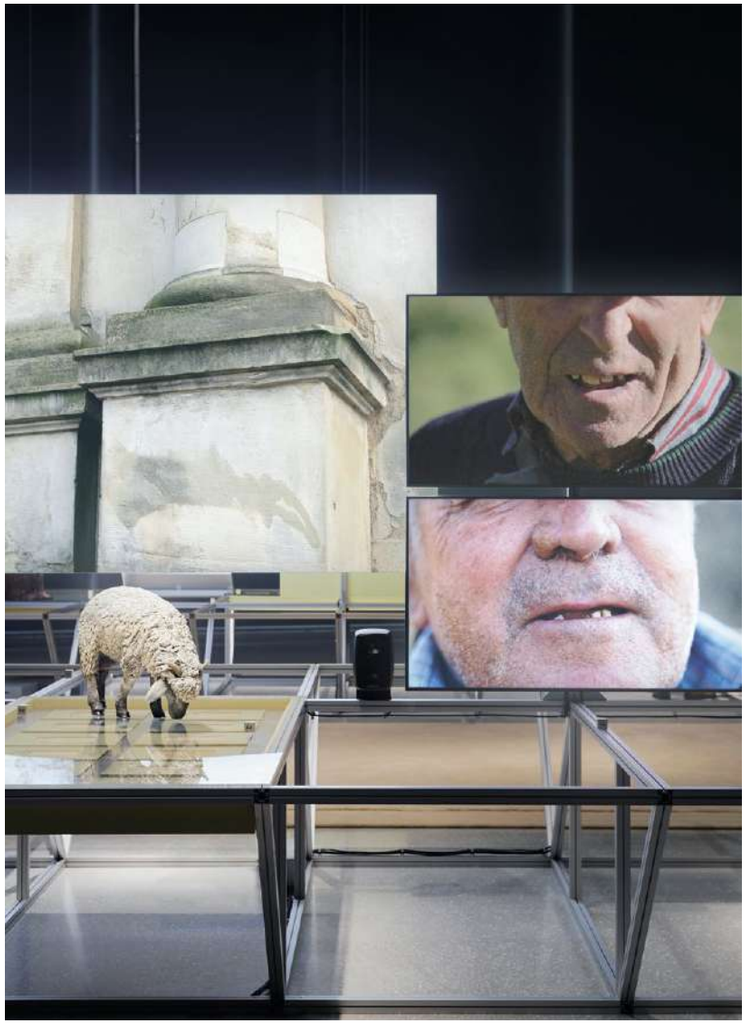
experiences such as birthday parties; and test a series of prototypes at home, trying to experimentally explore – and tune in – the dynamic properties of helium – a very light element with a very strong lifting capacity – and the effects of its combination with air, which is heavier than it. During the operation, the hierarchies between designers and manufacturers dissolved, as there were no experts. All the people involved gradually acquired knowledge, skills and experience through the process itself. This resulted in a reinterpretation of the concept of control in design, as participants had to navigate uncertainty and embrace failure as an integral aspect of the process.

In other words, design, rather than an operation aimed at creating a certain form, was rather conceived as an experimental and "queer" (Calvillo, 2018b, p. 60) process, or a "cosmopolitical experiment" (Calvillo, 2018b, p. 54). As Calvillo writes, "we co-designed *with* helium and air, by letting them speak as 'we' collectively adapted to one another" (Calvillo, 2018b, p. 50), thus giving rise to a "temporary co-habitation with more-than-humans" (Calvillo, 2018b, p. 60). In this sense, the operation aimed to explore how ways of engaging with more-than-humans could exist in architecture that differ from control and domestication, and instead activate processes of "mutual training" (Calvillo, 2018b, p. 60). Interestingly, human bodies had to "learn to be affected" (Latour, 2004b) by gases to become mediators, or "experimental instruments trained to measure, for instance, how much a 45 cm balloon lifts depending on its shape" (Calvillo, 2018b, p. 51), and to cope with the sudden changes or disintegration of the installation due to the unpredictable behavior of helium, its elevating force, its resistance to being confined and its general recalcitrance (Tironi & Calvillo, 2016). As Calvillo notes, following anthropologist Kathleen Stewart (2011), *Polivagina* has therefore favoured the production of socialities that can be defined as "atmospheric attunements" (Calvillo, 2018b, p. 54).

Also, the other materiality at stake, namely the balloon – understood as a "device for making atmospheric things" (Calvillo, 2018b, pp. 55-56; McCormack, 2015) – and, more specifically, its polyamide, facilitated particular and unexpected types of attunements. Its silver reflective finish, for example, "multiplied like a kaleidoscope throughout the space. It diffused its limits, reflected light, hid furtive hugs and distorted smiling faces; it multiplied Michael Jackson's fans to infinity, reminded someone of Warhol's Factory and made us desire Warhol's Silver Clouds" (Calvillo, 2018b, p. 56). In addition, also other unexpected atmospheric attunements emerged: "people feeling the joy of a surprise gift, sharing the balloons as a collective treat among their friends, and creatively transforming them into hats, t-shirts or masks. Some people even took them home, expanding the physical network of the festival to domestic spaces" (Calvillo, 2018b, p. 57-58). **[28, 29, 30]**

Another effort aimed at decentralizing the human is seen in the exhibition project ***Oltre Terra*** (2023)[35] by the design studio *Formafantasma*, which stems from research delving into ecological, historical, political, and social factors influencing contemporary design landscapes. *Oltre Terra*

35. The exhibition was commissioned by the National Museum in Oslo and curated by Hanne Eide. A complete description of the project is available at: https://formafantasma.com/work/oltre-terra.



[31, 32, 33] Oltre Terra. Formafantasma, National Museum of Oslo, 2023. Photo: Gregorio Gonella

[34] Oltre Terra. Formafantasma, National Museum of Oslo, 2023. Photo: Alessandro Celli

investigates the history, ecology, and global dynamics of wool extraction and production[36]. The name derives from the etymology of the word transhumance, formed by the Latin words *trans* (across, *oltre* in Italian) and *humus* (ground, *terra* in Italian), used to describe the seasonal migrations of livestock between mountainous and lowland areas based on nutrient availability. Rather than viewing wool solely as a material, *Oltre Terra* seeks to contextualize it within a broader ecological framework, exploring the complex co-evolutionary relationship between humans and animals, and blurring the boundaries between production processes and biological evolution, as well as between taming and domestication. Beyond the concept of human exceptionalism that has dominated Western philosophy for centuries, the project emphasizes processes of co-domestication – but we could also say *co-design* – between different species. Through processes of domestication and selective breeding, humans have significantly altered the biology of sheep. In return, sheep have profoundly influenced human history by providing resources such as wool and sustenance, and aiding in territorial exploration. This partnership has enabled humans to venture into and inhabit previously uninhabitable regions, facilitated by the warm clothing provided by sheep's wool. **[31, 32, 33, 34]**

36. A similar ecological framework underlies the exhibition project *Synthetic Cultures*, by studio *2050+*, that looks at cultured meat from a multitude of perspectives, dissecting its politics, ethics, spatial-environmental implications, and history, as well as envisioning the foreseeable impacts of its development. A complete description of the project is available at: https://2050.plus/projects/synthetic-cultures/.

[35, 36] Superpowers of Ten. Andrés Jaque / Office for Political Innovation. Lisbon Architecture Triennial 2013; Chicago Architecture Biennial 2015; Jumex Museum, Ciudad de México, 2016; ZKM Karlsruhe, 2016

Transforming and playing with architecture's tools and aesthetics

In revealing that the tools, techniques and aesthetics with which architecture operates have agency and a performative effect – that is, they actively participate in the design process and have world-making effects – ANT can offer an interesting stimulus to experimentally *play* with them, distort their use, generate interruptions and transformations.

Superpower of Ten **(2013-2016)**[37], by *Office for Political Innovation*, is a large-scale public performance that took place for the first time at the Lisbon Architecture Triennial 2013 and was later re-proposed at the Chicago Architecture Biennial (2015), the Jumex Museum in Ciudad de México (2016) and the ZKM Karlsruhe (2016). As described on the *Office for Political Innovation* website, the performance is based on the reinterpretation of *Powers of Ten: A Film Dealing with the Relative Size of Things in the Universe and the Effects of Adding Another Zero*, a famous movie directed by Ray and Charles Eames in 1977[38] which consisted in

> an exploration of the way daily life is produced in the collaboration of different scales – from the subatomic level or a human cell to the outer edges of the Milky Way. The selective framing and narrative of *Powers of Ten*, which centers on a heterosexual couple having a picnic on Chicago's lakefront, presents a progression that zooms between framed scenes in which abrupt jumps in scale and the conflicted interaction between genes, bodies, societies, and technologies appear smooth, frictionless, and apolitical. [...] The performance re-enacts the film, revealing alternative narratives, political conflicts, and forgotten historical events. New characters such as Kodak's "Shirley Card", polio, and the transgender pioneer Flawless Sabrina are invited to star together with the picnickers, clusters of galaxies, and human DNA that are featured in the Eames's original film.

Furthermore, this provocative intervention, playing with the size of things in the exhibition, breaks with the idea of proportionality of scale jumps in architecture. Suddenly what is large appears small, and vice versa. The goal is to create disruptions that question the notion of confining life within a predetermined and easily understandable universe, as well as challenging the idea of architectural scaling as a straightforward, linear process. **[35, 36]**

37. https://officeforpoliticalinnovation.com/work/superpowers-of-ten/.
38. Ray and Charles Eames' movie is available at: https://www.youtube.com/watch?v=0fKBhvDjuy0.

MORE-THAN-HUMAN ARCHITECTURAL PEDAGOGIES

This experimental *ethos* has also underpinned a series of pedagogical experiences at the intersection of architecture, STS and anthropology at the University of Architecture of Alicante[39] and the Technical University of Munich. Some of the approaches and experiments of the architects in Alicante are highlighted in *Posthuman emergences. Architectural and Pedagogical Challenges from a Disciplinary Margin* (Nieto Fernández, 2022). The book presents final degree projects that explore different posthuman approaches in architectural practice, involving collaboration with diverse human and non-human participants. The objective is to transcend the conventional emphasis on humans as the central subjects and beneficiaries of architectural practice, a focus that was predominant throughout the twentieth century. **[37, 38]** Other experiments are described in the issue n. 12 of the Chilean design journal *Diseña* (Farías & Sánchez Criado, 2018a)[40]. As STS-informed anthropologists Ignacio Farías and Tomás Sánchez Criado state in their introductory text, such experiments – in response to Yaneva's reflections (2011; 2012) – reconsider the importance of the design studio, enhancing its strong socio-political potential. Whereas Yaneva's approach, as previously mentioned, was aimed at enabling students to learn "*about* design" (Yaneva, 2012, p. 68) through "multidirectional inquiries into the actors and implications of building designs"

[37, 38] *Posthuman emergences. Architectural and Pedagogical Challenges from a Disciplinary Margin* (Nieto Fernández, 2022). Book covers and table of contents.

39. The Projects Area of the University of Alicante is an important place of pedagogical innovation at the intersection of architecture and STS. Since 1997, Professor José María Torres Nadal has fostered and enhanced teacher experimentation, liberated from conventional forms of authority and academic hierarchy, promoting the idea of *arquitectos ecologizantes* (ecologizing architects) (Nieto Fernández, 2012; Calvillo & Mesa del Castillo Clavel, 2018; Torres Nadal, 2019)

40. See also the first section of Rispoli & Rispoli, 2023.

(Farías & Sánchez Criado, 2018a, p. 26), the experiments featuring in this issue of *Diseña*, by vindicating the value of a studio-based approach, represent "attempts and experiments for 're-learning design' [by] making STS and anthropology work *within* and *through* the design studio practice" (Farías & Sánchez Criado, 2018a, p. 27). Using Schön's words, they highlight the design studio as a space with great potential, since, compared to modern educational practices, it entails "a throwback to an earlier mode of education and an earlier epistemology of practice" (Schön, 1985, p. 5, quoted in Farías & Sánchez Criado, 2018a, p. 23), carrying the potential for a distinct learning model rooted in "the maker's reflective conversation with his [or hers] materials" (Schön, 1985, p. 31, quoted in Farías & Sánchez Criado, 2018a, p. 23). According to Schön, "reflection-in-action was the core of 'professional artistry' – a concept he contrasted with the 'technical-rationality' demanded by the (still dominant) positivist paradigm whereby problems are solvable through the rigorous application of science" (Finlay, 2008, p. 3). In his words: "the reflective practitioner allows himself [or herself] to experience surprise, puzzlement, or confusion in a situation which he [or her] finds uncertain or unique. [...] He [or her] carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation" (Schön, 1983, p. 68). Each move that students make are experiments, for they can potentially create other problems that need to be understood and solved. Against the scientific, linear ways of teaching and learning, which understand education as the mere transmission of professional knowledge, the design studio approach allows both students and teachers to learn "by doing", by confronting themselves with uncertainty, complex and challenging situations (Farías & Sánchez Criado, 2018a, p. 23). In that sense, it resonates with certain emancipatory and democratising educational models developed during the twentieth century such as those of John Dewey (1897), Paulo Freire (2000) or Jacques Rancière (1991)[41], as well as with Michel Serres's (2007) understanding of the word pedagogy – "etymologically meaning 'the voyage of children'" (Sánchez Criado, 2021, p. 61), who learn to expose themselves "to the other" (Serres, 1997, p. 8)[42] – and Tim Ingold's perspective against learning as transmission (2017) and design as an hylomorphic activity (2013)[43].

41. In particular, as the authors state (Farías & Sánchez Criado, 2018a), the disciplinary transgressions implemented in these experiments are reminiscent of Rancière's *The Ignorant Schoolmaster* (1991) whose radical-democratic principle consisted in eliciting students' intelligence and avoiding asymmetrical relations between them and the teachers. In this sense, not only the students, but also the teachers themselves are faced with situations of uncertainty, not knowing what the eventual results of the work will be.

Experiments at the University of Architecture in Alicante

Exploring and experimenting with matters of care in design studio courses

The design studio courses *Tender Infrastructures*, developed between 2010 and 2013 by Nerea Calvillo and Miguel Mesa del Castillo Clavel (2018), aimed to reconceptualize architectural design and teaching as fields of speculation on the concept of care as politically conceived by Fisher and Tronto (1990) and Puig de la Bellacasa (2011; 2017). They proposed replacing the traditional notion of building with that of "infrastructural ecosystems" (Calvillo & Mesa del Castillo Clavel, 2018, pp. 175), emphasizing the intricate socio-material ecology of urban spaces. This expanded the scope of architectural users beyond standardized or idealized figures to encompass ecosystems, endangered species, and marginalized communities. The studios sought to position infrastructures as "matters of care" (Puig de la Bellacasa, 2011, 2017, quoted in Calvillo & Mesa del Castillo Clavel, 2018, p. 171), viewing design as a careful and situated intervention aimed at identifying and rendering visible entities often overlooked by dominant knowledge production practices. Indeed, drawing on Puig de la Bellacasa's reflections, they came to formulate the

42. According to Serres, the word pedagogue initially designated the slave who would walk a noble child to school: leaving their home, children became exposed. "Learning launches wandering [...] Depart. Go out. Allow yourself to be seduced one day. Become many, brave the outside world split off somewhere else. [...] For there is no learning without exposure, often dangerous, to the other. I will never again know what I am, where I am, from where I'm from, where I'm going, through where to pass" (Serres, 1997, p. 8).

43. In his book *Making: Anthropology, Archaeology, Art and Architecture*, analysing how architectural practice is traditionally understood, Ingold discusses the schism between the figure of the architect and that of the builder. Particularly, he dwells on the figure of Alberti, who, in his treatise *On the Art of Building in Ten Books* (1755), actually made a significant contribution to the process that has led to the professionalisation of architecture as a discipline exclusively dedicated to design as opposed to construction. This entails an understanding of design in hylomorphic terms, where shapes are designed in an abstract space, as mind's work, and only after that, they are imposed on matter, as hands' work. True knowledge, according to Ingold, cannot be achieved by extracting data from the world (Ingold, 2013, pp. 20-22), but by establishing a connection based on a "*correspondence*" with it (Ingold, 2013, p. 7).

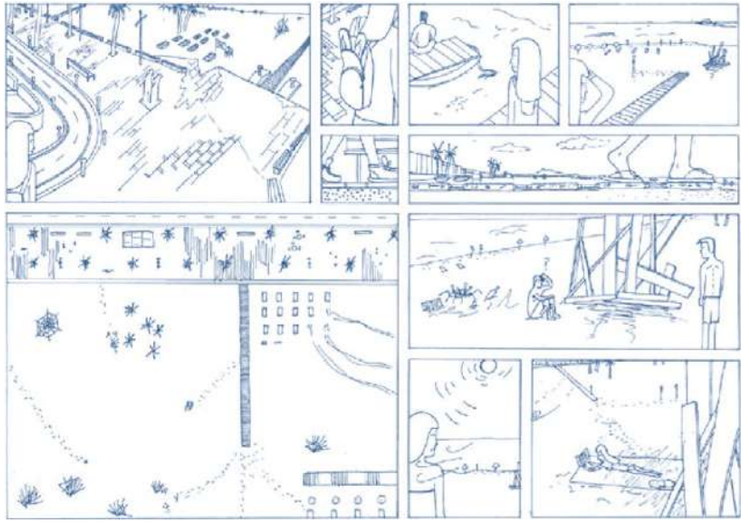
following question: "what happens if, in our case, we think of infrastructures not as matters of concern, but as matters of care?" (Calvillo & Mesa del Castillo Clavel, 2018, pp. 176). Their interest lay in exploring would have happened if they had intervened "in the articulation of ethically and politically demanding issues" (Puig de la Bellacasa, 2011, p. 94, quoted in Calvillo & Mesa del Castillo Clavel, 2018, pp. 176-177). "And, as a consequence, what implications does this 'intervention' have for the design studio? So, what does it mean to think about the design studio with care?" (Calvillo & Mesa del Castillo Clavel, 2018, pp. 176-177). Calvillo and Mesa del Castillo Clavel aimed to challenge solutionist agendas inherent in design by conceptualizing it as a "speculative machine" (Calvillo & Mesa del Castillo Clavel, 2018, p. 185), echoing Stengers' (2010) notion of speculation as uncovering diverse possibilities and ethical-political alternatives. In this sense, they viewed design as a situated practice and relational ontology, where entities derive meaning and form from their interdependencies rather than inherent characteristics (Barad, 2007; Haraway, 1998, cited in Calvillo & Mesa del Castillo Clavel, 2018, p. 180). The initial phase of the studio required students to visualize relationships, conflicts, and power distributions among the actants of the socio-material ecosystem, with a focus on neglected entities. Instead of producing traditional buildings, students were tasked with intervening through the installation of digital or analog architectural prostheses, or speculative machines, to redistribute agencies. This approach involved the use of unconventional and ephemeral materials, such as DIY technologies and household items, in contrast to the conventional practice of constructing buildings using materials like concrete, brick, or steel. In addition, the use of other analysis tools and techniques from other disciplines and non-academic areas, such as interviews and video DJ mash-ups, was also envisaged. Interestingly, as Calvillo and Mesa del Castillo Clavel note, the concepts of care and speculation, implying an epistemological shift, also required the production of new design tools. Therefore, the proposed formats aimed to function as relational machines: the first format, a graphic map or relational map, intended not only to describe a project and identify its actors, but also to speculate upon it. The second format, the speculative prosthesis, in its various evolving analog and digital versions, was designed not as a definitive solution but as a political tool. Once implemented, it was meant to expand options and articulate conflicting coexistences without neutralizing them. Going beyond the mapping of controversies, and reflecting Puig de la Bellacasa's perspective, the

experiments aimed "not only to expose or reveal invisible labors of care but also to generate care" (Puig de la Bellacasa, 2011, p. 94, quoted in Calvillo & Mesa del Castillo Clavel, 2018, p. 185). For instance, one proposal involved caring for a tangerine orchard in Denia through a coordination prototype facilitating fruit distribution to schools, workplaces, and local businesses. Another proposal focused on Thermomix and its associated network of women, aiming to unravel different agencies and reconfigure relationships within the market, domestic spaces, and healthy eating practices. It was "a product distribution system directly connected to the market, and an urban screen in which it is possible to consult the recipes and the price of the products needed to make them, the contents of which are updated every day" (Calvillo & Mesa del Castillo Clavel, 2018, p. 188).

Experiments with the profession: developmentally embodied responsiveness and design as patterning

Ester Gisbert Alemany recounts that some of the pedagogical experiences she undertook at the University of Alicante[44] were based on this concern: "if the role of an ANT is only supposed to describe, how could an architect, whose job is to make proposals, follow ANT? The disenchantment I was feeling was the realization that I did not want to become a social researcher but rather to learn to design socially" (Gisbert Alemany, 2018, p. 260). Some of her courses have put these reflections into practice and expanded upon them by employing a specific expedient: recognizing that architecture students are less familiar with academic writing and reading, she (together with Enrique Nieto Fernández) have used evocative images to facilitate discussions in the classroom. Gisbert Alemany defines these images as "social insects" (Gisbert Alemany, 2018, p. 269). In addition to ANT, likened to a real ant due to Latour's emphasis on tracing connections akin to an ant's behavior, two other insects have been introduced, derived from anthropological and philosophical concepts. These included Ingold's SPIDER, which means "Skilled Practice involves developmentally Embodied Responsiveness" (Ingold, 2011, p. 94), and the WASP coined by design theorist and architect Lars Spuyborek (2016), interpreted by Gisbert Alemany as "Weaved Abstractions of Mutual Shaping Practices" (Gisbert Alemany, 2018, p. 282). In contrast to Latour's methodology, Ingold suggests a researcher who operates akin to a spider,

44. See also: Gisbert Alemany, 2022; 2023.



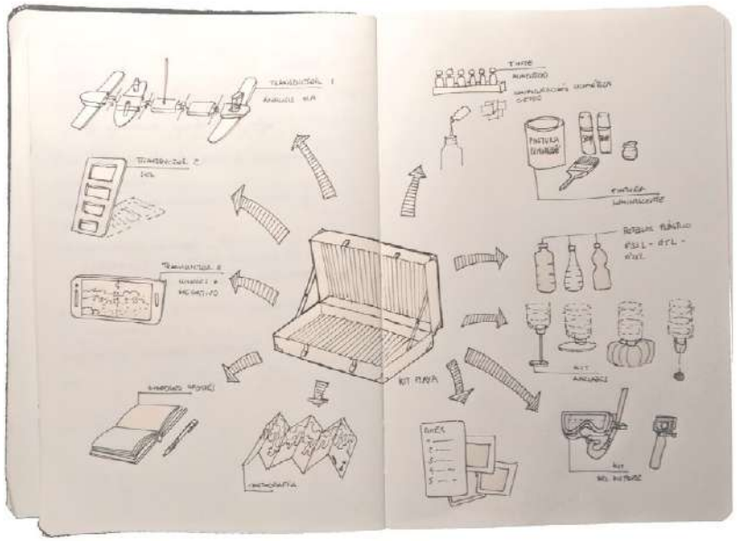
[39] Short stories drawn by students about the life their migrant hosts imagine in a new city. Drawing: Daniel López, 2015

emphasizing the perceptual nature of research. This approach views research as a means of honing skills in both crafting and perceiving. Rather than adopting the tracking approach of an ANT, students are encouraged, from this perspective, to cultivate their abilities and weave their own connections with the world, akin to a SPIDER. According to Gisbert Alemany, ANT has significantly contributed to understanding how architecture is intricately linked to a broad spectrum of contemporary issues and urgencies. It has revolutionized the very concept of a design object: viewed from this perspective, a single project is dispersed across a network of diverse elements, making it unpredictable. Anyway, "it does not guide (...) designers on the very job of putting together new ways of designing" (Gisbert Alemany, 2018, p. 262). The ANT approach "has had its role in making us think too much and become paralyzed". Anyaway, Gisbert Alemany's idea is that it can also act "as a guide on how to open up (...) the profession itself" (Gisbert Alemany, 2018, pp. 263-264). Building on these reflections, in her design studios, she proposed what she calls "experiments with the profession" (Gisbert Alemany, 2018, p. 263)[45] to encourage students to implement progressive transformations of architectural practice and its tools. In her words: "instead of taking the building as the thing that needs to be put in movement (Yaneva et al., 2008, p. 80) [...] we take the practice itself" (Gisbert Alemany, 2018, p. 263). The student, therefore, through this approach "is forced to reflect on the tools of design he uses and on what these tools are *doing* to his own practice in that concrete architectural experiment" (Gisbert Alemany, 2018, p. 263).

In particular, the Architecture Design Studio course held in 2014-15 and 2016-17, which centered around the themes of lifestyle migration in the Mediterranean and the resulting urbanization processes, followed these lines exactly. It was aimed at exploring how students can broaden their sensitivity and their "tools of the trade" (Gisbert Alemany, 2018, p. 265) by learning both from the migrants themselves and from the things and places with which they have built a new life. The final phase of the whole experience, therefore, involved the design and presentation of a "'kit' of tools and skills" (Gisbert Alemany, 2018, p. 266) that the students had acquired in their experience of re-learning and transformation of their practice. The first year of the course focused on learning the skills of migrant tourists, i.e. people who had come to the coast of south-eastern Spain and then settled there permanently. Without any predetermined brief, the aim of the experience was for students to learn about the ways migrants experience space, co-creating tools and prostheses that could facilitate this learning. The entire experience was based on the anthropological method of participant observation, which, as Ingold describes, is an "art of inquiry" (2013, p. 6) whose purpose goes beyond representation or description, encouraging learning from the people or things the anthropologist is working with. Amongst various things, students were required "to immerse themselves in the flows and changing mediums which their hosts enjoyed (sea breezes, undulatory movement of waves, etc.) and build tools that would allow them to learn" (Gisbert Alemany, 2018, p. 270); or to capture the migrants' "taskscape" (Ingold 1993; 2000; 2011)[46], by capturing various movements of people and objects within their surroundings on video, subsequently editing it into a short piece. Through this process, they discovered and reinterpreted the diverse rhythms of life and the correspondences between these agents. Afterward, the students started

45. See also: http://experimentosconeloficio.arrsa.org.

46. Ingold (1993; 2000; 2011) uses the term "taskscape" to describe how landscapes are continuously and dynamically produced by the activities of the people and things within them. He argues that landscapes are not static, abstract planes filled with objects, but rather dynamic "weather worlds" where we engage with and are influenced by the forces of nature (Ingold, 2011, pp. 117-120).



[40] Sketches of the transducer built by student Jorge de la Vega to design with the water currents. Photo: Jorge de la Venga, 2017

[41] Material prototipes of the intravention built by student Jorge de la Vega to learn light pollution patterns. Photo: Jorge de la Venga, 2017

to draw all the places inhabited by the migrants – who were called their "hosts" (Gisbert Alemany, 2018, p. 270) – while also endeavoring to redesign these spaces to better fulfill their life desires **[39]**. A series of operations, such as the construction of small models reproducing the patterned habits of their hosts, and the reproduction of these patterns ad infinitum by placing the models in a mirror box, allowed the students to produce short evocative graphic stories of immersion in the world, in which the central character could move and look around. "In these drawings, the mountains, flows, building materials, plants, animals and people drawn before formed the taskscape in which these quotidian stories can happen" (Gisbert Alemany, 2018, p. 273). In this way, graphic representation evolved from a descriptive tool into one capable of proposing alternative life scenarios. A subsequent phase involved direct immersion into the landscape to understand its constantly changing material nature. This experience aimed to produce what Alberto Altés Arlandis and Oren Lieberman call "intravention" (Altés Arlandis & Lieberman, 2013, cited in Gisbert Alemany, 2018, p. 275). An "intraventive approach" required students to have "an engaged understanding of the relations of things, materials, and people within a [design] situation [...], as well as improvisational and speculative skills" (Altés Arlandis & Lieberman, 2013, p. 116). Where previously students and teachers had worked together with their hosts, in this phase they worked to understand the coastline that attracts all these migrants and tourists. Among the intraventions collectively produced on the coast were tools and playful installations designed to facilitate both perceptual immersion and active engagement within these environments, such as objects that allowed them to understand the shapes and erosion of the cliffs, the undulation, the rhythm and height of the waves. Rather than understanding design as a hylomorphic operation, students learned to "intervene in worldly processes that are already going on" (Ingold, 2013, p. 21). They "felt their design abilities grow in time with their dwelling abilities just as every inhabitant's abilities grow, so they came to inhabit while designing" (Gisbert Alemany, 2018, p. 276). **[40, 41]**

Besides these experiments in direct perception, the subsequent steps aimed to explore more operational modes (Gisbert Alemany, 2018, pp. 276-280). The initial premise was to move beyond the conventional view of architecture as merely designing objects or products and urban planning as the top-down imposition of a master plan. Instead, the goal was to foster a more immersive and embodied experience. This approach was heavily influenced by the ideas of design theorist and architect Lars Spuybroek, particularly his notion of the "sympathy of things" (2016).

Spuybroek references a compelling metaphor from philosopher Henri Bergson involving a wasp (WASP), specifically an *Ammophila*, which can paralyze a caterpillar by targeting its nine nerve centers. As Spuybroek elaborates, the wasp does not create an external image of the caterpillar to comprehend it. Rather, it engages with the caterpillar in a manner akin to a dance, intuitively following its form, patterns, key points, and lines. Inspired by this evocative image, students were tasked with creating models of coastal landscapes using tangible materials, much like fashion designers drape fabric directly on models. This hands-on approach allowed them to abstract and develop a repertoire of forms and configurations. They then experimented with these designs using both digital and analog parametric tools. By incorporating the variational repetition of patterns, students were able to design innovative proposals for the landscape. Interestingly, as Gisbert Alemany writes, they "could feel what the material and the coast were doing to themselves as designers, expanding their abilities to relate to broader scales by *sympathy*" (Gisbert Alemany, 2018, p. 279). Sympathy, in Spuybroek's words, means "what things feel when they shape each other" (Spuybroek, 2016, p. xvii, quoted in Gisbert Alemany, 2018, p. 279). The ever-evolving coastal landscape was thus perceived as a dynamic force that necessitated the creation of adaptable design tools capable of matching its variability. Similar to the wasp's intuitive method, the aim was for students to develop the ability to internalize and work with forms without relying solely on direct encounters.

Experiments at the Technical University of Munich

Experiments for learning to be affected

Between 2015 and 2017, Ignacio Farías and Tomás Sánchez Criado conducted a series of design studio courses at the Department of Architecture at the Technical University of Munich (Farías & Sánchez Criado, 2018b). They began with the assumption that "a programmatic redefinition of design not only entails unlearning how to practice but also a commitment to re-educate future designers" (Farías & Sánchez Criado, 2018a, p. 19). Their experiments, focused on particular more-than-human challenges, aimed to explore the meaning and prospects of technical democracy in the education of future architects. In contrast to Callon, Lascoumes, and Barthe's (2011) idea, Farías and Sánchez Criado highlighted "the need to move from the 'expertization of laypersons' (...) to a 're-sensitization of experts'" (Farías & Sánchez Criado, 2018b, p. 236). A series of

public debates that they held in 2016 – under the name of *Partizipatorium* – which focused on concrete projects that could re-signify participation in architectural and urbanism practice, had the following premise:

> Democratization of technical decision making does not simply require citizens or lay people to become experts. More importantly, it needs professional experts in the private and public sector to become aware of the limits of their own expertise, to open themselves to other forms of sensing, knowing and valuing and ultimately, why not, to be trained differently. The relevance of these propositions for our teaching practice then became evident. We realized that the classroom, and, hence the training of future design professionals, was a largely unattended but critical aspect of the project of "technical democracy". (Farías & Sánchez Criado, 2018b, pp. 235-236)

In this light, they promoted technical democracy through challenging classroom briefs and situations, to collectively explore alternative modes of practicing architecture[47]. To this end, besides drawing inspiration from Rancière's radical-democratic approach, they chose to avoid conventional teaching methods relying on discursive concepts and readings to rather use more experiential modes. Challenging collective learning situations were created in which both the teachers and the students could become sensitized to what it might mean to design differently. More specifically, the core aim of the studio courses was to put the students' modes of design and understanding of participation in crisis – hence their umbrella name *Design in Crisis* – through a series of experiences that could allow them, as Sánchez Criado remarks quoting Latour, to "learn to be affected" (Latour, 2004), "meaning 'effectuated', moved, put into motion by other entities, humans or non-humans" (Latour, 2004, p. 205, quoted in Sánchez Criado, 2021, p. 61) **[BOX 5]**. This was meant to undermine hegemonic forms of expertise and, interestingly, to "explicitly block or undo the particular 'responsiveness' of architectural modes of reasoning" proper to a "humanitarian" approach to design practice (Sánchez Criado, 2021, p. 67). Rather than finding a solution, students were asked to articulate the problem accurately: thus, opening up the design process as a careful speculation aimed at shedding light on "what/

47. The idea of the sensitization of experts relates to the Foucauldian concept of "problematisation" (Foucault, 1990).

BOX 5 > ON "BECOMING AFFECTED"

Drawing on the work of Isabelle Stengers and Vinciane Despret, in a paper from 2004, Latour elaborates on the idea that learning to have a body requires inventing devices to articulate different experiences. Using "the training of 'noses' for the perfume industry through the use of '*malettes à odeurs*' (odour kits)" (Latour, 2004, p. 206) as an example, he explains how "starting with a dumb nose unable to differentiate much more than 'sweet' and 'fetid' odours, one ends up rather quickly becoming a 'nose' (*un nez*), that is, someone able to discriminate more and more subtle differences and able to tell them apart from one another, even when they are masked by or mixed with others" (Latour, 2004, pp. 206-207). Utilizing the kit and this operation, the teacher makes his/her initially indifferent pupils attentive to increasingly subtle differences between the chemicals he/she has assembled.

More specifically, "He has not simply moved the trainees from inattention to attention, [...]. He has taught them to be affected, that is affected by the influence of the chemicals which, before the session, bombarded their nostrils to no avail" (Latour, 2004, pp. 206-207). In particular, as Latour emphasizes, becoming affected requires "the mediation of an artificially created set-up". In fact, "the pupil needs the one-week session and the kit; the professor benefits from his life-long expertise and the 2000-person test; the organic chemists are equipped with their chromatographs; the industrial chemical engineers possess their plants" (Latour, 2004, p. 209). Sensitization to increasingly nuanced layers of differences is what he refers to as "*articulation*" (Latour, 2004, p. 209). As he notes, "a subject only becomes interesting, deep, profound, worthwhile when it resonates with others, is effected, moved, put into motion by new entities whose differences are registered in new and unexpected ways" (Latour, 2004, p. 210).

From an ANT-inspired perspective, knowledge is not pre-existing but is mediated by specific devices that establish certain limits while simultaneously enabling the possibility of asking specific types of questions. In the sense of Despret and Stengers, "knowing interestingly" implies exposing oneself to a risk, which involves having "the questions you were raising requalified by the entities put to the test" (Latour, 2004, pp. 215-216). This necessitates rethinking and reshaping methods and approaches. The key point that Despret (2016) emphasizes is that various devices – whether comprised of significant objects or small gestures and approaches, such as avoiding the perception of animals as inferior or refraining from using vague anthropomorphic ideas – enable the posing of intriguing questions and create opportunities to articulate and expand knowledge to alternative perspectives. In her exploration of the relationships between humans and animals, as well as the distinctions among animals in specific situations, Despret interrogates both scientists and animal breeders or owners. The latter cultivate relationships with animals by posing questions to them, fostering experiential knowledge. Despret suggests that if academic professionals were to seriously consider this approach, it could expand the definitions of animal behavior in ethology and primatology to encompass multiple perspectives. These varied perspectives, in turn, might facilitate the implementation of alternative investigative methods to interact with animals and acquire more nuanced understanding about them. As Donna Haraway notes, Despret

> trains her whole being, not just her imagination, "to go visiting". Visiting is not an easy practice; it demands the ability to find others actively interesting, even or especially others most people already claim to know all too completely, to ask questions that one's interlocutors truly find interesting, to cultivate the wild virtue of curiosity, to retune one's ability to sense and respond – and to do all this politely! What is this sort of politeness? It sounds more than a little risky. Curiosity always leads its practitioners a bit too far off the path, and that way lie stories. (Haraway, 2015, pp. 5-6)

In the context of architecture, these considerations would prompt inquiries such as: what happens to architectural design if, besides ensuring that it includes a variety of human and non-human actors who are usually not taken into account, we open it up to experimental re-learnings from them? What would it become if we architects accepted to take on risks and learn to be affected, moved, and touched by what matters to other beings? What would different users of architecture say if we asked the right questions?

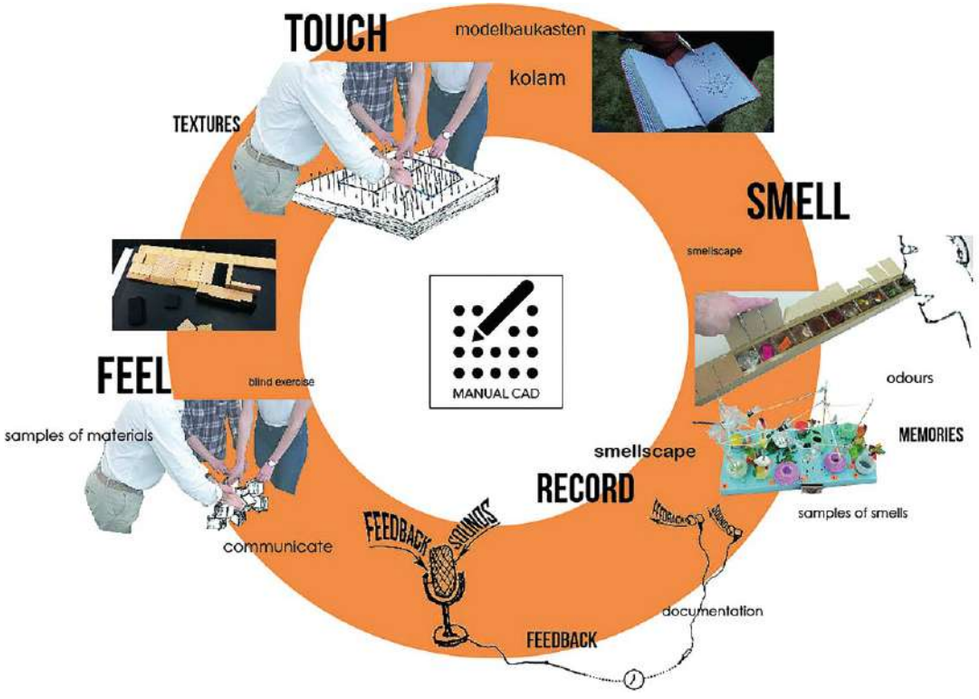
who was potentially being left aside or behind in the design process" (Sánchez Criado, 2021, p. 62). Basically, according to the teachers, this crisis could be generated through oxymoronic and paradoxical situations[48]. Indeed, the courses were intended to create obstacles or challenges that could prompt reflection and reveal different possible ways of practicing architecture.

Design in Crisis 1: Re-designing Emergency Design

The approach used by the two anthropologists in the studio course *Design in Crisis 1: Re-designing Emergency Design*, inspired by Corsín Jiménez' notion of "entrapment" (2018), was aimed at luring students into different ways of thinking and practicing architecture.

> Setting "traps" required us to try and think and act like them, blending ourselves into their environments, using their language and offering courses that, at first sight, fulfilled their expectations of a professional

48. The main source of inspiration for this oxymoronic method was Lars von Trier's film *The Five Obstructions*. In the film, the director meets his friend and teacher Jørgen Leth, and asks him to shoot five variations on one of his old hits from the past, *Det perfekte menneske* (1967): for each of these variations von Trier imposes obstructions, strict rules, generating increasing difficulty. (This was reported to me by Sánchez Criado during one of our work meetings in late 2019).



[42] Programme of Action. *Design in Crisis 2: Coming to Our Senses.* (photo: Sofia Ruiz, Irene Landa, Sophie Razaire, Emilie Charrier, Léo Godebout, Lambert Dra¬peau). Source: https://designincrisis.wixsite.com/designincrisis2017

[43] One of the students' attempts to translate the smells of a street into a three-dimensional model. *Design in Crisis 2: Coming to Our Senses.* (photo: Sofia Ruiz, Irene Landa, Sophie Razaire, Emilie Charrier, Léo Godebout, Lambert Dra¬peau). Source: https://designincrisis.wixsite.com/designincrisis2017

> practice, based on a clear-cut distinction between Architecture and Society [...]. However, halfway through, the situation would turn strange, confronting them with idiotic objections to their practice, and with requests to do something completely different. (Farías & Sánchez Criado, 2018b, p. 240)

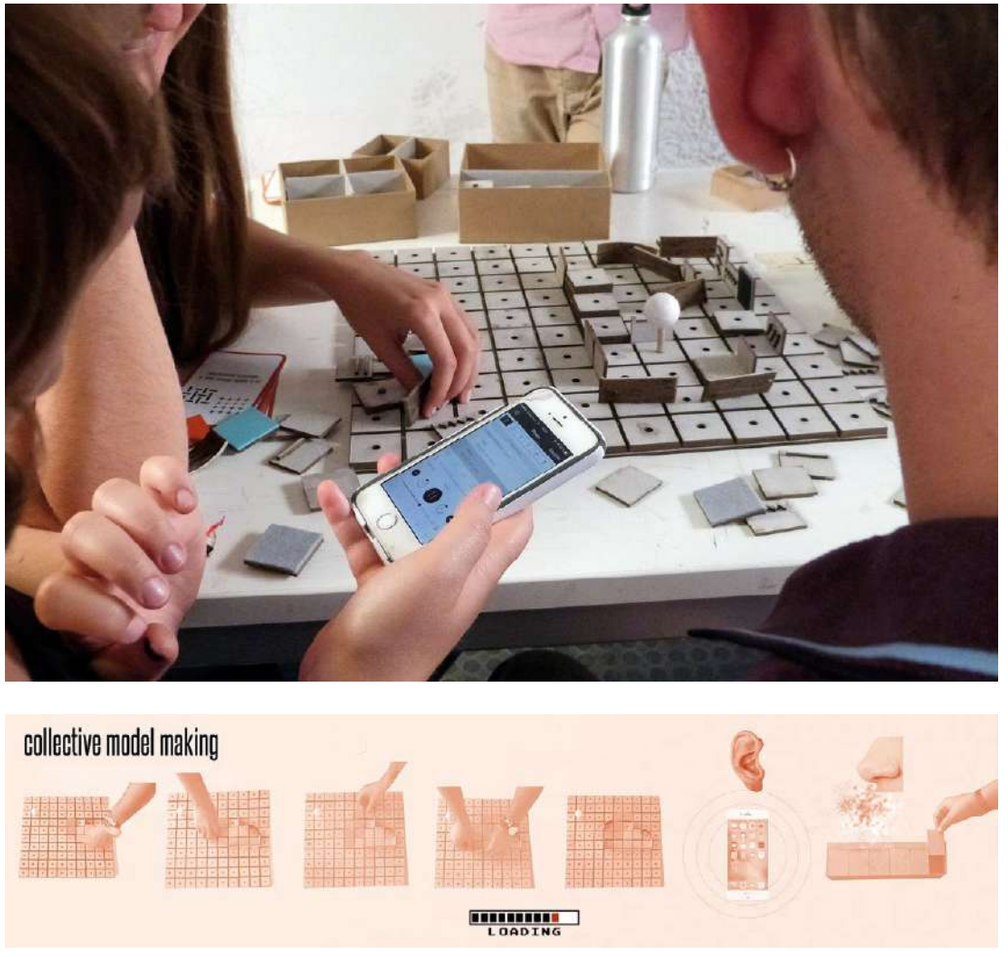
The assigned task was to design an architectural solution to address the Syrian refugee crisis in Germany. After developing their initial solution, students were required to conduct research by contacting and engaging with those directly affected. However, as they began interviewing real people, organizing discussion forums, and consulting public administrations and officials, teachers not only challenged their previous design solutions but also questioned the foundational principles of their "humanitarian" (Farías & Sánchez Criado, 2018b, p. 241) approach to design practice. The teachers encouraged students to move away from conventional architectural solutions and instead explore innovative methods for mapping the issue and directly engaging with people. Therefore, understanding the crisis required acknowledging "the embodied, partial, and non-representative nature of this knowledge" (Farías & Sánchez Criado, 2018b, pp. 243-244). Their final project culminated in a prototype for an information-giving and collecting booth equipped with an app, intended for placement in key urban sites for refugees. Reflecting on how their architectural practice had evolved, they noted that they "went from designing a thing based on our own presumptions to actually designing the process to gather information and stating facts, [...] directly including the actors involved" (Farías & Sánchez Criado, 2018b, p. 244).

Design in Crisis 2: Coming to Our Senses

Drawing inspiration from Sánchez Criado's engagement with accessibility activists, particularly the *Bayerische Blinden-und Sehbehindertenbund* (BBSB)[49], the studio course *Design in Crisis 2: Coming to Our Senses*[50] aimed to challenge the effects of exclusion generated by ocularcentric practices in architectural design. Following Gisbert Alemany, this course adopted an intraventive approach. The goal was to go beyond

49. BBSB is the Bavarian association for the blind and partially sighted, whose political work advocates "for 'their' inclusion, the fulfilment of existing regulations, and participation in newer ones" (Sánchez Criado, 2021, p. 53).

50. The students' documentation of the course and their project is available at: https://designincrisis.wixsite.com/designincrisis2017.



[44, 45] ManualCad. *Design in Crisis 2: Coming to Our Senses.* (photo: Sofia Ruiz, Irene Landa, Sophie Razaire, Emilie Charrier, Léo Godebout, Lambert Drapeau). Source: https://designincrisis.wixsite.com/designincrisis2017

conventional creative skills and tools used by students to find a solution: "to achieve this we needed not to operate as teachers creating the context or the mere setting of the design practice, as we had been attempting in previous courses, but to do so from the inside" (Farías & Sánchez Criado, 2018b, p. 246). In this context, the task was not to design something "for the blind" (Sánchez Criado, 2021, p. 63) or to encourage students to simulate blindness empathically, a practice criticized for potentially exaggerating the effects of impairment (Kullman, 2016). Instead, blindness was approached as a method to disrupt students' ocularcentric practices and techniques. The initial phase of the course involved sensory explorations aimed at developing multi-sensory understandings of space and "learning not to see" (Sánchez Criado, 2021, p. 58). Activities included blindfolded walks, followed by the representation of paths in non-Euclidean ways, and collective documentation of street smells translated into three-dimensional models. The final project tasked students with prototyping a toolkit[51] for a blind architect, aimed at training architects to engage with architecture through multiple senses and thereby cultivate sensitivity to diverse bodily experiences of space. Significant emphasis was placed on documenting the entire process to enable moments of self-reflection for students on the challenges encountered and the decisions made. Ultimately, the experiment aimed to enable students to "become sensitive through experience to what it means to inhabit space as diverse kinds of bodies" (Sánchez Criado, 2021, p. 59), starting from the recognition that accessibility training is rarely included in educational programs. The resulting toolkit, named *ManualCad*, was not intended as a definitive solution but rather as a tool for re-learning, promoting awareness of different and potentially neglected forms of knowledge. **[42, 43, 44, 45]**

Design in Crisis 3: Sensing like an Animal

The aim of the third and final course[52] (Farías et al., 2023a; Farías et al., 2023b) in the *Design in Crisis* series was to invite students to approach animals as epistemic partners to rethink architectural practice, thus taking their abilities seriously "in attempts at *designing with* (rather than 'for' or 'from') them" (Farías et al., 2023a, p. 93). The first part of the course, like the previous one, revolved around a series of sensory experiments, designed to allow students to understand and interact with the urban landscape "like an animal", focusing particularly on ants, dogs, and beavers as "guides" (Farías et al., 2023a, p. 94). The goal was not to replicate animal perception in an attempt to replace the architect's

51. The idea of the toolkit was borrowed from some artivist interventions (Zeiger, 2011; Bauch & Scott, 2012). Artist Sara Kanouse's *Post-Naturalist Field Kit*, for instance, draws on the legacy of twentieth century avantgarde movements like *Situationism* and *Fluxus*, as well as on contemporary projects promoting spatial exploration and other multidisciplinary methods developed at the intersections of art, architecture and urbanism (Kanouse, 2011).

52. The students' documentation of the course and their project, as well as their presentation, is available at: https://thedesignincrisis.wixsite.com/designincrisis and https://riverbiodiversity.wixsite.com/union.

[46, 47] A sensory experiment in which students tried to build a dam like beavers. *Design in Crisis 3: Sensing like an Animal*. Photo: Katharina Meenenga, Laura Krohn, Marie Van Tricht, Pedro Racha-Pacheco, Seppe Verhaegen, Victoria Schulz. Source: https://riverbiodiversity.wixsite.com/union/room

PROTOCOL N°3

CO-WORKER-SUIT

This document comprises the funtions, design and terms of use of the Co-Worker-Suit and becomes effective if signed by the River Biodiversity Union and approved by the beavers over a period of four days.

§1 Function
1) Participating in the construction of a beaver dam

§2 Design
1) Different sized insulated swimsuit
2) Different sized floating devices
3) Different sized footwear for protection and stabilisation in the water
4) Diving goggles
5) Snorkelling device
6) Head protection gear
7) Different sized gloves
8) Tool belt with smell container (PROTOCOL N°1), sound tubes and hammer (PROTOCOL N°2), camera, screwdriver and handbook

§3 Terms of Use
1) Worn by employees of the River Biodiversity Union (RBU)
2) When to use:
   a) During recruiting program of the RBU
   b) When participating in the construction of a beaver dam
   c) When installing a smell applicator (PROTOCOL N°2)
3) Location:
   a) Beaver-active areas
3) Instructions:
   a) Co-Worker-Suits can be obtained at the RBU headquarters
   b) Wear a suit according to your size
   c) All devices should be worn at the same time
   d) Before participating in any interventions, the entire suit needs to be checked by another member of the IRP
   e) After participation, the suit needs to be returned to the RBU

Agreed and accepted:
River Preservation Union

By: _____
An Authorized Signer

Federal I.D.
Number: _____

Date: _____

Beavers **agree** legally by:

Continuing the dam construction with the participation of the River Biodiversity Union over a period of four days

stamp here

Beavers **disagree** legally by:

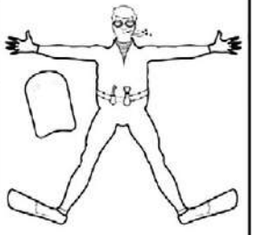
Abandoning the dam after the participation of the River Biodiversity Union within a period of four days

stamp here

PROTOCOL N°4

BEAVER SUIT

This document comprises the funtions, design and terms of use of the Beaver-Suit and becomes effective if signed by the River Biodiversity Union and approved by the beavers over a period of a year.



§1 Function
1) Experiencing the beaver's Umwelt

§2 Design
1) Different sized water resistent swimsuits
2) Different sized insulating air filled undergarments
2) Different sized floating devices
3) Different sized footwear to improve diving and swimming
4) Night vision simulating swimming goggles
5) Different sized gloves with nail prothesis
6) Water flow direction device
7) Adjustable tool belt which can hold at least 5 items
8) 2 cutting devices simulating beaver teeth

§3 Terms of Use
1) Worn by employees of the River Biodiversity Union (RBU) and visitors
2) When to use:
   a) During recruiting program of the RBU
   b) During events for visitors, supervised by the RBU
3) Location:
   a) In areas with a distance from beaver active areas of at least 500 m
3) Instructions:
   a) Beaver-Suit can be obtained at the RBU headquarters
   b) Wear a suit according to your size
   c) All devices should be worn at the same time
   d) Before participating in any activities, the entire suit needs to be checked by another member of the RBU
   e) After being used, the suit needs to be returned to the RBU

Agreed and accepted:
River Biodiversity Union

By: _____
An Authorized Signer

Federal I.D.
Number: _____

Date: _____

Beavers **agree** legally by:

Continuing their activities close to the area of the events where the suit was used within a period of one year

stamp here

Beavers **disagree** legally by:

Stopping their activities close to the area of the events where the suit was used within a period of a year

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[48, 49] Two of the protocols in the student-designed toolkit. *Design in Crisis 3: Sensing like an Animal*. Photo: Katharina Meenenga, Laura Krohn, Marie Van Tricht, Pedro Racha-Pacheco, Seppe Verhaegen, Victoria Schulz. Source: https://riverbiodiversity.wixsite.com/union/room

experience – recognizing the impossibility of such a substitution – "but rather to invent practices and artefacts that would challenge conventional sensory practices of architects, as well as better understand the speculative challenge of sensing like an animal" (Farías et al., 2023a, p. 94). In the following phase, the third animal studied, i.e. the beaver, was chosen to formulate the course brief, as it had recently been reintroduced to the Isar river basin in Munich and welcomed as a biodiversity expert, for its ability to intervene and materially build hospitable spaces for numerous other species. The brief called for the students to work on a late proposal for the public competition that took place in 2003 for the renaturation of the Isar river basin. Specifically, in this project they were to work *with* the beavers, so as to imagine a more-than-human or "multi-species architectural practice" (Farías et al., 2023a, p. 98). Following a series of discussions and misunderstandings, given the complexity of the oxymoronic brief and the objective difficulty of working with such an ontologically distant partner, the brief was reworded to require the students to consider the beaver as their "client", and in particular to "design a contract" authorising them "to design on behalf of the beaver" (Farías et al., 2023a, p. 95). This contract, however, rather than being a written document, could have been an object that established a material link between the various parties, humans and beavers, allowing them "to engage in a [...] co-design practice" (Farías et al., 2023a, p. 96). In formulating this request, the two anthropologists were inspired by Serres' reflections in his book *The Natural Contract* (1995, pp. 51-55), in which the philosopher investigates the material origins of the word contract focusing on "the Egyptian figure of the *harpedonaptai*: the royal official who after the ascents of the Nile visited the flooded lands and, with some ropes of cord, marked the territory and re-established the relations of property" (Farías et al., 2023a, p. 96). At that point, the course began to revolve around the design of a toolkit, i.e. a series of material devices that could function as a contract. Specifically, the devices designed by the students included: "a beaver 'experience' suit [...] designed for architects to de-learn the anthropocentric and ocularcentric approaches to design in experiencing other ways of relating to the environment", and "a co-worker suit [...] to collaborate with beavers in the renaturalisation of the basin of the river Isar" (Farías et al., 2023a, p. 97). These devices, along with other negotiation tools, aimed to facilitate collaboration with beavers in the construction of a dam. During the design process, what became apparent to both professors and students was that such a co-design contract could itself serve as their late proposal for the Isar renaturation competition. Therefore, the final part of the course focused on prototyping the procedures and institutional context for this project-contract: specifically, developing protocols for the use of each tool and designing the blueprint for a *River Biodiversity Union*, the co-management institution established to ensure the implementation of this multispecies collaboration and co-design plan (Farías et al., 2023a, pp. 97-98). **[46, 47, 48, 49]**

EXPERIMENTING WITH PARTICIPATION IN "THINGS"

In the last decades, a number of architects have been captivated by STS's conceptual and descriptive attentiveness to material processes and their politics. Moving beyond the modernist pact of social utility, which sees them responsible for creating solutions for the public good by designing objects, artefacts, and spaces, they are experimenting, both in their professional activity and in pedagogical spaces of architecture, with design approaches both inspired by and extending STS's conceptual repertoire. Some STS-trained anthropologists, for their part, have gone beyond teaching methods based on concepts and discursive readings (Farías & Sánchez Criado, 2018b), as well as beyond controversy-based approaches, trying to make "STS (...) work *within* and *through* the design studio practice", in "attempts and experiments for re-learning design" (Farías & Sánchez Criado, 2018a, p. 27).

Architectural practice is thus transformed and re-learned in various ways. Rather than closing down worlds through solutions, architects become inquirers, participating in more-than-human design assemblies and co-articulating their lively existence, in different attempts to foster more balanced compositions and evolutions. However, participating in things becomes much more challenging when there are parties that could exhibit different abilities and ways of articulating concerns and needs. This requires paying much more attention to what different ways of doing and undoing imply. Some of the experiences examined suggest that one way to meet this challenge may be for architects to actively design situations that allow them to be affected by these actors. This approach aims to disrupt conventional design practices and understandings of the world, as well as traditional methods of participatory engagement. It encourages exploration and learning from new design approaches that may emerge from these encounters.

V. PARTICIPATORY ARCHITECTURAL DESIGN BEYOND THE "CAPACITY CONTRACT"?[1]

This chapter covers the beginning of an experience, or rather a particular journey – in the sense that Serres (1997) gives to the term[2] – which I have undertaken. It all began when, motivated by my interest in the experimental agendas examined in the previous chapter, and particularly in Sánchez Criado and Farías' pedagogical experiences in Munich, I got in touch with them to conduct a doctoral research visit at the *Stadtlabor for Multimodal Anthropology*, a research platform at the Institute for European Ethnology of Humboldt-Universität zu Berlin. My initial goal was to take part in other teaching explorations of the two anthropologists, to understand them in a more direct way, which the mere reading of their account couldn't allow. Later on, I found out that the pedagogical experiences with architecture students had only been limited to the period in which they were working in Munich, and in Berlin they had gone back to teaching mostly social scientists.

After many discussions, Tomás Sánchez Criado and I agreed to undertake an auto-pedagogical experiment in which, with his assistance, I could undergo a similar sort of experience to the ones of the *Design in Crisis* courses: rather than teaching me what I should do, he would be acting again as a teacher of something he didn't know (Rancière, 1991) and only using the asymmetric position of being *the pedagogue* to help me start a journey abandoning the secure place of expertise and creating a space to sensitise myself to be another kind of practitioner of architecture. Again, the idea was to create the conditions for architecture to be challenged, i.e.

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1. The experience described in this chapter and the following section, along with some of the reflections that led to it and those that emerged, are also covered in the article: Rispoli & Criado, 2024.
2. See chapter IV, section *More-than-human architectural pedagogies,* pp. 164-165.

to work with actors who could put its conventional contractual and collaborative/participatory ways of working in crisis.

The brief for this joint experiment emerged from a particular contingency: while living in Berlin, I found accommodation with a family and gradually developed a deep emotional bond with them beyond our rental agreement. Particularly, the encounter with Moritz, a neurodivergent family member, had a profound impact on me. Our attempts to live together brought to light different interpretations of social distance and what may be an obstacle or a help within the home. This relationship inspired me to explore what I could learn from it *as an architect*. Given Tomás' long experience in urban accessibility activism and his interest in issues related to bodily diversity and its impact on architecture, we developed a shared concern. We were particularly motivated by questions such as: how might we engage in participatory design processes with neurodivergent individuals, without relying on biomedical categorizations? How to consider what these actors bring to architecture and the transformation of its practices and in particular, of participatory design's approaches (not only in terms of social relevance or ethical or humanitarian implication)? What alternative understandings of space and design can neurodivergent individuals invite architects to explore? What, in this case, could I learn from Moritz and his spatial practice?

As already mentioned in previous chapters, participatory design processes commonly rely on articulate language to explore needs and solutions. This was an issue that proved to be particularly puzzling for our exploration, for we wanted to pay attention to precisely those who tend to be discriminated or neglected by what political scientist Stacy C. Simplican calls "the capacity contract" (2015): a series of linguistic, cognitive, intellectual and mental conditions of legibility for a subject to be treated as a citizen, a person with rights and obligations. To put it in her words: "democracy entails that we imagine that the most important political duties are cognitive tasks, such as reasoning, reflection, judgment, and deliberation. For political decisions to be legitimate, we expect people to reason sufficiently about themselves, the world around them, and the political futures they desire" (Simplican, 2015, p. 3). As disability studies scholar James Berger (2019) points out, referring to Simplican's reflections, this links directly to a central feature of Enlightenment social contract theory, from Locke (1979; 2004) to – more recently – John Rawls (1967; 2005), according to which having political agency entails demonstrating or being recognized as possessing rational and linguistic capabilities, articulating one's thoughts, wishes and desires in a normative way to be legally permitted to enter into a contract. But what if this isn't the case? What should be done with other relevant neurodiverse forms of experience and expression?

Our brief emerged from these reflections. Against this capacity contract – which is at the source of many processes of disablement, reading certain bodies as unable to express their wishes or desires – we wanted to follow Simplican's inspiration, whose work attempts to explore what other meanings, practices, and contours of the political and of disability rights activism might be imagined in the close vicinity of these subjects. Indeed, "people with intellectual and developmental disabilities subvert [...] idealized cognitive expectations as well as the fictive political subject from which they emerge" (Simplican, 2015, p. 3).

Translating this into an architectural problem, we wanted to consider how non-speaking neurodivergent subjects might entail a particularly productive crisis, or deconstruction, of the architectural figure of the *client*, or the *participant*, as well as the means and ends of architectural practice and participatory design approaches.

Neurodiversity as a conceptual operator

Neurodiversity is a positive self-representational vocabulary invented by autistic activists[3] as opposed to the term neurotypicality, associated with the hegemonic idea of the human mind. Anyway, whereas an account of its socio-political framework will be provided below, here I will attempt to clarify the conceptual value we attributed to it in the specific context of our experience. Indeed, neurodiversity became for us the driver of an exploration and, instead of having a closed-down definition of it, we drew on philosopher Erin Manning's use of the term as a category of flight and movement, rather than identity and stasis. To put it in her words:

> [...] while I am certain that neurological difference is a formative effect in the variation designated by the term *neurodiversity*, my interest is in *the diversity in diversity*, locating the neurotypical not as the measure of an

3. More specifically, it was used for the first time in 1999 by Judy Singer, an Australian social scientist, herself autistic, as a reaction to the medical model of disability (Singer, 1999).

> individual diametrically opposed to the neurodiverse but as the (unspoken) baseline of existence. I see neurotypicality as akin to structural racism – as the infusion of white supremacy in the governing definition of what counts as human. The assumption that neurotypicality is the neutral ground from which difference asserts itself (an assumption everywhere supported by the neuroscientific literature) suggests that there is still an urgent conversation to be had about how the human, and knowledge as a defining category of the human, is organized and deployed in the image of neurotypicality[4]. (Manning, 2020, p. 2)

Or, as she stated in a previous book: "neurodiversity is the path I choose [...] to explore insurgent life. [...] I take [it] as a platform for political change that fundamentally alters how life is defined, and valued" (Manning, 2016, p. 5).

In short, because of its focus on neural variability, this vocabulary appeared interesting to us in suggesting the productivity of considering a plurality of ways of being, and a multiplicity of modes of perception and subjectivity opening up more livable spaces and political exploration beyond the Kantian neurotypical hegemony. Indeed, again in Manning's words, "neurodiversity's power is to feel the blur, the ambiguity, the fugitivity" (2020, p. 6). By revealing different connections with the built environment, neurodiversity represented for us an interesting conceptual operator thanks to which we could reconsider the conventional notions of space and the traditional modalities and tools through which architecture and participatory design operate.

In a STS context, this can be read in some ways as an attempt to design with an "idiotic methodology" (Michael, 2012). STS draw on the etymological roots of the term *idiot*. Its original meaning, in Ancient Greek, was *private person*, thus indicating an individual who would not participate in public affairs. Subsequently, these studies accepted the more radical emphasis placed on the term by Deleuze and Guattari, who conceived the *idiot* as a conceptual persona that "wants to turn the absurd into the highest power of thought – in other words, to create" (Deleuze & Guattari 1994, p. 62). More recently, in her *Cosmopolitical proposal*, drawing from the very use of Deleuze and Guattari's term, Stengers characterised the *idiot* as a character who "resists the consensual way in which the situation is presented and in which emergencies mobilize thought or action" (2005, p. 994). To put it another way, he/she is someone whose responses are nonsensical in the context of reality as it is usually understood, and thus forces us to think and proceed more slowly and carefully. As Stengers writes: "the idiot can neither reply nor discuss the issue [...] [the idiot] does not know [...] [he/she] demands that we slow down, that we don't consider ourselves authorized to believe we possess the meaning of what we know" (Stengers, 2005, p. 995). This character, then, quite stubbornly questions a reality and the way it is consensually understood, encouraging the inclusion of other voices and interpretations, preventing the closure and stabilization of the *cosmos* while evoking its opening to multiple and diverse possibilities[5].

This perspective is exactly what STS-trained sociologist Mike Michael refers to in outlining the contours of what he calls "idiotic methodology" (Michael, 2012). Particularly interested in exploring the implications of taking such an approach for the conceptual and practical actions of social scientific research, Michael notes that this methodology forms the basis of speculative design [see **BOX 4**], that is a particular field of design which, rather than focusing on the development of instrumental and utilitarian devices, is interested in producing "[probes and prototypes] that enable playfulness and exploration [...]. The aim is to throw up the peculiar, the unexpected, the troublesome, the incommensurable" (Michael, 2012, p. 173). Idiotic objects afford "an opportunity to engage in a process of [...] 'inventive problem making'" (Michael, 2012, p. 171)[6], namely, they "[occasion] a radical rethinking of the events in which they emerged" (Michael, 2012, p. 171). In short, then, an idiotic methodology implies the design of objects or situations that force one to slow down, to problematise, and to explore possible alternatives to the way a reality is usually understood.

However, the term *idiot*, which in STS is used metaphorically and instrumentally, can be problematic in itself. In fact, the meaning commonly attributed to it is extremely ableist: it is known that it has long been

4. Later in her book, Manning writes: "I use the adjective neurodiverse – to remind us that we need a concept for a diversity in diversity that isn't measured by the standard of typicality. A diversity in diversity is one that senses fully and differentially, that lives and participates in a world still defining itself according to measures not yet in place. It includes populations historically excluded from the matrix of the human. It includes modes of life-living that exceed the human, that feel the more-than-human world not as other but as with, in the being of relation" (2020, p. 263).

5. For a more complete analysis of the characterisation of the term idiot in STS, see: Michael, 2013.

6. Here Michael quotes Fraser, 2010.

and still is used to indicate autistic people or *madmen*, who are supposedly *idiots* because they get lost in their own *idioms* (their own singular, incomprehensible expressions)[7]. For this reason, rather than as an idiotic methodology, we used neurodiversity as a method. That is, the question around which our experimentation revolved was: what would we learn in the proximity of those subjects who have traditionally been treated as idiots? Another way of putting it is that the aim was to turn myself into a *neurodiverse apprentice*.

My relationship with Moritz was not instrumentally aimed at collecting information about him to design a certain type of object *for* him, which suited him. By attempting to come into Moritz's proximity, I could question and rethink my architectural knowledge. I could question the architectural culture within which I was educated and the tools which I used to operate, and experimentally access new possible ways of understanding space. In other words, neurodiversity was seen as a way of producing an "intravention" (Altés Arlandis & Lieberman, 2013, see chapter IV, p. 170), that is, an experimental operation that aims to bring within – or inside – architectural practice, spatial concepts that challenge its conventional and normative models.

BODILY DIVERSITY AND BUILT SPACE

As already seen, the human subject – and in this specific context the user of architecture –, has been often reduced to a generic type or even ignored in Western architectural theories and practices. Indeed, as Hamraie (2017) points out, there is a widespread tendency among architects to design according to technical and dimensional standards that revolve around a "normate template". As seen in chapter II, architectural handbooks themselves, such as Ernst Neufert's *Bauentwurfslehre*, have played a crucial role in reinforcing such attitude (Imrie, 1999). Furthermore, architectural training devotes little attention to issues concerning bodily diversity (Imrie & Hall, 2001; Imrie, 2003). As Imrie and others (Lifchez, 1987; Hayden, 1985; Weisman, 1992) note, ableist bodily conceptions underpin architectural discourses and practices, and architects often have a very generalist and reductionist understanding of bodily diversity. The stereotypical image of wheelchair users is usually emphasised, while there is no interest in investigating the complex ecologies of the *bodymind* **[BOX 6]**. There is often a tendency to provide a solution by following a simple regulation, which generally stipulates the obligation to include ramps and wheelchair toilets in the design of a space, respecting the standard slope and measurements. To put it otherwise, bodily diversity tends to be addressed in a merely technical way.

This attitude towards generalisation and reductionism becomes particularly problematic when we consider neurodivergent people, whose needs and peculiar ways of navigating space are generally neglected in the design of built space, even in places and buildings that are professed to be more democratic and inclusive. Autistic geographer Sara M. Judge, for instance, highlights the case of fluorescent lighting commonly found in institutional settings. This lighting choice is notorious for triggering sensory sensitivities in autistic individuals, disrupting their cognitive processing during lectures or group discussions. While it may seem like a minor issue, this environmental disturbance can have far-reaching consequences, leading to mental and physical exhaustion for autistic students and potentially excluding them from meaningful participation (Judge, 2018, p. 4)[8].

Besides, the subtle way in which the neurotypical focus on language affects the design of built space is striking. Erin Manning's vivid description of the case of different types of university classrooms deserves extensive quotation:

> A university classroom usually has a set of desks, and with that comes a directionality – desks pointed toward a board, or toward a podium, creating a posture hierarchically predetermined, everyone in their place. Attention is focused on what happens at the front, all eyes on the professor. The back rows can be a refuge, but an assumption reigns that sitting at the back is for the disinterested (and, by extension, the less engaged). "Paying" attention is prized, revealed usually through the use, by the student, of language. Smaller, more senior classes tend to be organized with less of a marked frontality. But to imagine that the ubiquitous seminar-style classroom with desks oriented in a square eschews a formation of power would be to underestimate how frontality-for-all reinforces another kind of dramaturgy that is, in some cases, even more challenging, especially

7. On this argument, for instance, see: Yergeau, 2018.

8. See also: Bogdashina, 2003; Coulter, 2009.

BOX 6 > THE BODY BEYOND CARTESIAN DUALISM

The expression *bodymind* is used here to indicate that mind and body are not considered separate entities. Natural and human sciences have traditionally reproduced, in various ways, a series of divisions. Among such divisions is that between mind and body, often recognised as Cartesian dualism. The mind is usually linked to what makes cognitive processes possible, i.e. thinking, arguing, reflecting, and so on[a]. These activities are often perceived as distinct from the internal bodily processes, typically viewed as involuntary, like breathing and digestion. According to this perspective, the mind governs thought and is under voluntary control, while the body comprises fixed and involuntary physiological functions. Throughout history, various efforts have been made to challenge this dualism. For instance, the philosophical tradition of phenomenology, as exemplified by Husserl's work (1913-1914), focuses on the concept of the *sentient body*. In contrast to Cartesian traditions, where the body and mind are seen as separate entities, in this perspective, the body is regarded as a *thinking body* that perceive its surroundings through lived and felt experiences. Perception is an entirely embodied experience[b]. Building on these insights, certain authors, like Simon J. Williams and Gillian Bendelow (1998), view the body as both biologically and socially incomplete, suggesting it is not static or predetermined. This perspective offers a redefinition of the body's biology or materiality in non-reductionist terms. From this viewpoint, there is no inherent *natural body*; rather, there exists a materiality willing to influence and be influenced.

However, as noted by some authors in the fields of STS and ANT, phenomenological approaches often concentrate solely on the human subject and their intentional actions. In particular, by challenging the idea of the *natural body* through the lens of *social influence*, the divide between the *subject* and the *social* (as an abstract entity) is perpetuated. However, within the framework of ANT, this perspective is replaced by a more inherently complex and relational one. In this view, the body is seen as an interface that is never singular, but always interconnected with and enacted by practices, entities – both human and non-human – and broader processes. Rather than centering on the intentionality and subjective experience of the human individual, the emphasis is placed on practices and the diverse array of entities that contribute to the actualization of a certain body[c]. In addition to Latour's illustration of the novice perfumers' body (2004), which portrays the body as an interface that defines itself through its interactions with various elements, scholars such as John Law and Anne-Marie Mol have further developed this perspective. Specifically, in their exploration of hypoglycemia, Law and Mol assert that "as part of our daily practices, we also do (our) bodies. In practice, we enact them" (Mol & Law, 2004, p. 45). They advocate for a shift in focus from understanding what hypoglycemia is to examining how it is done, performed, or enacted. From this viewpoint, the body is brought into existence through specific practices and relational arrangements.

Mol also introduces the concept of the "body multiple" (2002), suggesting that the body is not self-contained but rather continually extends and intertwines with other entities – both human and non-human – as well as with practices, techniques, technologies, and objects. These interactions generate diverse and specific modes of enacting what it means to be human. The body is no longer viewed as a substance or a finite and stable entity but is instead explored as a process, shaped by complex and more-than-human ecologies. This notion of radical relationality, and the consequent dissolution of understandings of the body rooted in singularity and separation, is also fundamental to the work of Vinciane Despret (2004) on the body. The Belgian philosopher introduces the concept of becoming or "becoming together" (Despret, 2004, p. 122), which blurs the distinction between the self and the other, as well as between the human and the non-human (in her case, between humans and animals).

Notes

a. My overview briefly summarises a much richer and interesting analysis made by Lisa Blackman in her book *The Body: The Key Concepts*, in which she highlights and analyses debates about the body and its centrality in current sociological, psychological, cultural and feminist thinking (Blackman, 2008).

b. The works that have investigated the relationship between architecture and phenomenology, as the architecture audience knows well, are countless. Among them are, for example: Norberg-Schulz, 1980; Pallasmaa, 1995; Pallasmaa, 2009; Pallasmaa, 2011; Zumthor, 2006. A significant contribution to phenomenology in Italy was made by Enzo Paci (1961). Furthermore, Paci long collaborated with Ernesto N. Rogers, the architect who more than any other had an impact on Italian architectural culture after World War II.

c. The branch of study that emerged from this intertwining of phenomenology and ANT is known as post-phenomenology. Particularly, among the numerous works that have announced and explored this perspective and its spatial implications are, for example: Thrift, 2008; Lea, 2009; Bryant, 2014; Ash & Simpson, 2019; McCormack, 2017; Engelmann & McCormack, 2018; McCormack, 2018; Harris, 2020.

> for the more neurodiverse among us. Indeed, the face-to-face setting imposed by desks facing each other can be torture, and the expectation that all should have something to say can keep those who struggle with the face-to-face from properly taking anything in. In this second case, there is a semblance of shared communication, but language continues to reign supreme as the prime modality of knowledge mobilization. In both types of classroom, shy, quiet, and sensorially overwhelmed students suffer, their modes of communication stifled. [...] For while the dramaturgies of power are different, they remain on a continuum, knowledge played out through the form of reporting. What does this reporting take for granted about how the environment presupposes commonality? How it defines togetherness? (Manning, 2020, pp. 145-146)

Below, I will first dwell on the wider historical-critical framework concerning accessibility in architecture and activist positions and struggles. Afterward, I will mention a few emblematic projects – which we analysed during our exploration – in an attempt to give an idea of the current way in which architects and designers relate to neurodivergent subjects in their practice and participatory design attempts, focusing on some problematic aspects.

Accessible design: stories and complexities

The genealogy of accessibility in architecture is intricate, weaving together multiple stories and claims. Most of the reflections in this field, as well as in the broader field of disability studies, problematize the way disability is traditionally understood, not conceiving it as a bodily characteristic but rather as an effect of ableist and stigmatizing categorizations and environmental constructions. Indeed, in line with the so-called "social model of disability", disability is understood "as a social and environmental construction, produced in the relationship between bodies and built environments, and thus not something innate to the body" (Hamraie, 2017, p. 99).

Broadly speaking, in the Euro-American context accessibility is usually traced back to a mode of social inclusion, through the expert production of regulations, objects and urban interventions (Sánchez Criado, 2019). Its different versions originated from the multiple claims of disability rights activists. In the late 1960s and early 1970s, in fact, in the context of humanitarian and civil rights movements in the US[9], communities of disabled activists compelled architects, designers and lawyers to accommodate the needs of a greater diversity of bodies. This demand for equality meant equal access to public buildings and services, and the consequent removal of physical barriers and addition of safety features. As Hamraie writes:

> Since the mid-twentieth century, supporters of more accessible, inclusive, and user-centered design have contended that design for the "mythic average user" shapes architects' default practices. [...] The related idea that "the world was not designed with disability in mind" is, in one sense, a statement about omission and ignorance as ways of knowing and thinking. In another sense, however, it is a statement about omission and ignorance as material arrangements, ways of making and unmaking the world's inhabitants through unintentional but accumulated practices. (Hamraie, 2017, p. 19)

The impact of these claims has led to a progressive and non-linear transition from rehabilitation approaches to design that produce "'special solutions for special needs' towards more 'inclusive' and 'universal' ones" (Sánchez Criado, 2019, p. 411)[10]. The former, by providing *ad hoc* (Pullin, 2009) design solutions, highlighted the difference of disabled bodies; the latter, instead, rather than targeting a limited group of people with identifiable disabilities, resulted in the integral re-design of urban spaces and buildings to ensure an indistinct possibility of access *for all*, regardless of disability or age (to know some of the main steps of this historical path, see **[BOX 7]**). Notably, this can be associated with the movement known as *Universal Design*, set up by a number of architects, designers and researchers in the late 1980s, who established a set of fundamental principles aimed at challenging society's disabling values and attitudes and calling for the design of places and objects accessible to all, without requiring specialised assistive technologies. Indeed, disabled architect Ronald Mace, who first used this expression publicly, defined universal design as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (Mace, 1998, p. 1). One of the starting assumption of such perspective was that all humans face varying degrees of physical disabilities throughout their lives, from childhood through the ageing process, and that these impairments are always exacerbated by poor design solutions. Along these lines, the proponents of universal design strongly criticized compensatory approaches to architecture, where accessibility is thought of as "additive design" (Imrie & Hall, 2001, p. 14), aimed at compensating disabled people for their functional limitations. Indeed, because it focuses on an individual's impairment, this additive approach has been seen as detrimental and potentially carrying stigma and social exclusion.

The problems with universal design

Since its first appearance in the 1980s, universal design has prompted many designers, educators, industrialists and politicians to develop ethical viewpoints and question their responsibility towards the rights of disabled people to equal access and autonomy of movement in the built environment. Its principles, therefore, might be considered as potentially valuable tools for reducing inequalities of access caused by poorly

9. The US was where the first official regulations on accessibility in the public urban environment appeared, thanks to these movements.

10. Here Sánchez Criado cites Imrie & Luck, 2014 and Winance, 2014. Hamraie's (2017) and Williamson's (2019) work also offer an interesting and detailed account of such a complex scenario. To retrace these historical steps from the design of the bathroom, see: Penner, 2013a; 2013b.

BOX 7 > FROM *REHABILITATION* TO *DESIGN FOR ALL*

The first important step in accessibility was taken in 1961, when the *American National Standards Institute* (ANSI) published the *A117.1. Accessible and Usable Buildings and Facilities*, the world's first accessibility standard, which established the principle that public buildings and facilities should be made accessible to people with physical disabilities. The A117.1 guidelines encompassed various aspects, including consideration for public sidewalks, parking lots, doorways, ramps, entrances, floors, restrooms, public telephones, elevators, and technological features. Among these there were sounds and flashing lights, designed to cater to the needs of visually and/or hearing-impaired individuals (Hamraie, 2017, p. 3). As architectural historian Barbara Penner points out: "prior to this, people with disabilities had to adapt to the environment, rather than the other way around" (2013, p. 215). However, a contentious aspect of this initial approach to accessibility is its origin within the rehabilitation profession. This field, through anthropometric studies aimed at establishing population averages, was primarily focused on "engineering more productive workers and citizens" (Hamraie, 2017, p. 12). As both Hamraie and Williamson signal, the term rehabilitation brought together a range of specialised medical practices which were carried out under the assumption that a body could be healed, or *fixed*, by simply finding the appropriate tool or technique. This approach became widespread in the US in the 1940s and 1950s to meet the needs of disabled veterans returning from World War II and to address the consequences of the polio epidemic. In particular, it showed close connections to regimes of scientific management: provisions for high-tech prosthetics, customised cars, and house renovations were part of rehabilitation programmes meant to bring these people back to a productive state. As Williamson notes, prosthetic limbs helped to "fine-tune the very definition of 'normal'" (2019, p. 21). Timothy Nugent, who crafted the *A117.1*, was director of the educational rehabilitation programme at the University of Illinois at Urbana-Champaign, an experimental regime partially funded by the *US Veterans Administration*, which trained people with disabilities to live independently. Nugent believed the best way to do this was to promote self-sufficiency and teach disabled students to cope in the same environments as able-bodied students (Penner, 2013).

Soon, the 1961 *National Standard* was strongly criticised by disability activists for its focus on rehabilitation and the related assumption that disability represented a failure of human performance, and thus a problem to be fixed and eliminated. Moreover, these activists argued that such standards and codes were insufficient in guaranteeing the construction of an accessible built environment. As part of an increasingly active political climate in the United States to ensure that discrimination against disabled people was eradicated, the 1961 *National Standard* was subsequently implemented by a series of laws, such as the *Architectural Barriers Act* of 1968, the *Rehabilitation Act* of 1973, and the *Americans with Disabilities Act* (ADA) in 1990. However, activists were sceptical of the ADA itself, finding its access solutions insufficient for three reasons: firstly, they consisted of providing *ad hoc* services and access routes for disabled people, causing them to be segregated, and specialised equipment that emphasised their difference and impairment; secondly, adaptations to buildings were too often poorly done, leading many architects to believe that designing for accessibility compromised the aesthetic quiality of buildings; thirdly, such solutions were mainly intended for wheelchair users, leaving aside a wider range of disabled people (Imrie, 2012a, p. 875). These observations were part of a wider spectrum of critical reflections on conventional approaches to design and marked the birth of *Universal Design*.

designed environments: by encouraging the design of flexible spaces and objects – such as adjustable furniture, designed to suit people of different heights and bodily characteristics – they invite designers to consider the different ways in which people relate to objects and spaces throughout their lives, taking their physical and emotional changes into account (Imrie, 2012; Imrie & Luck, 2014). Nonetheless, the way universal design is generally understood and applied is highly problematic and controversial.

As also a number of authors pointed out, unlike the very impulses that originally inspired it, universal design can produce a depoliticized perception of disability, or even remove disabled people from view (Hamraie, 2017; Williamson, 2019). Indeed, the overall aim of this project is "to integrate people with disabilities into the mainstream" (The Center for Universal Design, 2008, p. 1), but "such mainstreaming", as Rob Imrie and Peter Hall (2001), note:

> revolves around standards set by the dominant majority, or those allied to a definition of disability as "not-normal" or abnormal. In this sense, impairment, as far as universal design ideas are concerned, is regarded as something to be overcome or to be eradicated, rather than to be accepted as an intrinsic feature or part of a person and their identity. (Imrie & Hall, 2001, pp. 16-17)

Particularly, a certain vagueness is inherent in the notion of universalism and

> there is much debate as to its meaning, and different ways in which it can be used to shape practice. In universal design, what values are being universalised and what are the claims advanced in relation to the status of disabled people in society? One appeal of universalism is in shifting emphasis from a focus on disability, and differing capabilities, to what is held in common by people. But there is the danger that the definition of the universal is no more than the normate body. (Imrie & Luck, 2014, p. 1316)

Its underlying values and conceptual and theoretical content deserve to be analysed more carefully, as they seem to

> revolve around, primarily, a value-rationality that is rooted in Western, enlightenment, discourses, and characterized by: a belief in the power of technology to provide the tools and techniques to enable the design of accessible places; the propagation of professional expertise and systems of expert knowledge, albeit in consultation with users; the development and delivery of universally designed environments by recourse to market exchange and the commodification of accessible design. (Imrie, 2012a, p. 880)

In other words, universal design has mostly become a depoliticised and solutionist approach in the hands of technical experts, who rely on regulations and handbooks with ready-made charts for different types of populations, which can be easily translated into projects. As seen above, considering that most architects and designers do not receive adequate training on these topics before using these codes and measures, such potentially technocratic and asymmetrical actions run the risk of segregating the very groups they are targeted to (Imrie, 1996; Sánchez Criado & Cereceda Otárola, 2016). It is not clear, in fact, to what extent design technologies can achieve the desired results and how this project's principles, in pursuit of universal access, are translated into practices that can truly recognise and respond to diverse needs[11]. Furthermore, reflecting on another controversial aspect of such universalism, Imrie and Rachel Luck wonder: "if [it] is predicated on equality of status, how far is this realisable if a person's access to universally designed goods and services, and their subsequent uses of them, is shaped by, primarily, market exchange?" (2014, p. 1317).

11. As an example, consider the case of the so-called shared street, or shared space, a widely acclaimed and followed model for the re-design of many urban environments with the aim of eliminating physical barriers that segregate motor vehicles, pedestrians, and other road users, thereby promoting the shared use of street space. Despite its apparent democratic potential to liberalise the mobility and movement of individuals, providing them with equal opportunities, such space is defined by Imrie as "self-disabling", or "as 'disembodied urban design', that fails to capture the complexity of corporeal form and the manifold interactions of bodies-in-space" (Imrie, 2012, p. 2260). Vulnerable street users, such as visually impaired people, perceive shared space as potentially dangerous, as it brings them into more direct contact with motor vehicles. On this argument, see also: Sánchez Criado & Cereceda Otárola, 2016.

A constant tension between "universalization" and "particularisation"

In sum, these observations, as well as others (Hamraie, 2013; Gibson, 2014; Winance, 2014), insist that universal design cannot be regarded as a ready-made set of technical rules that experts can apply in relation to different contexts and users. In Imrie's words, it "cannot be universal unless it is embedded into the specificities of corporeality, and the differences that different bodies make in their everyday interactions with designed artefacts" (2012, p. 880). To put it another way, universal design is "a concept on the move" (Kullman, 2017, p. 133), which cannot disregard specific bodies and spaces. This issue becomes particularly evident in Kim Kullman's analysis of the activities and embodied experiences of disabled architect and professor Yoshihiko Kawauchi, who has been for many years personally involved in the development of universal design. Kullman here shows how such a project emerges from concomitant and frictional processes of universalisation, which are necessary for it to circulate and be applied, and "of *particularisation* [...], where ideas, materials and sites of universal design reveal themselves to be embedded within specific bodies and spaces, which travel only with difficulty and complicate attempts to generalise across corporeal, cultural and geographical differences" (Kullman, 2017, p. 132). Kawauchi's work demonstrates that the functioning of universal design cannot reside in the abstract space of neat, quantitative, predetermined guidelines. Rather, it is inextricably linked to a continuous, situated engagement with the built form. Indeed, his explorations reveal how the application of such guidelines by experts, who do not sufficiently question specific contexts and needs, often generates incoherent and problematic results. What about situations where there are different types of users, with conflicting needs? How can these needs be accommodated within the all-encompassing *ethos* propagated by universal design? (Imrie & Hall, 2001). The article in which Kullman (2019) describes the Ed Robert Campus, a building designed and operated by the disability community in Berkeley, California, is particularly emblematic. The campus is active since 2011 and was named after Ed Roberts, one of the pioneers of the disability rights movement and co-founder of the *Centre for Independent Living* (discussed further below). Interestingly, although it has been designed, following the principles of universal design, to accommodate "the broadest possible range of individuals with a whole variety of ability levels" (Kullman, 2019, p. 8), Kullman reveals that the campus is actually a "site of dissensus" (2019, p. 2), emphasising the inevitably conflicting needs of different bodies. Some of the occupants of the building, in fact,

criticised its "restricted form of universalism" (Rancière, 2016, p. 84, quoted in Kullman, 2019, p. 9), showing how certain details or materials – such as electromagnetic waves or chemical substances – have disabling effects on them. The case of young autistic people who take part in day programmes specifically conceived for them inside the building is particularly interesting. Their actions, in fact, are seen by Kullman "as moments of dissensus that intervene in the spatial and temporal order of the building" (2019, p. 7). Their "'messy' interactions" (Kullman, 2019, p. 12) with the building's environments lead these young people to disrupt and reconfigure the materiality of the campus: one of them avoids art class because of the noise and takes refuge in the adjacent warehouse; another has personalised his office space by removing the halogen lighting and installing screens on his desk to create a more isolated and protected environment, while overcoming the problem of communication through the use of coloured signal cards. As Kullman notes, since the way neurodivergent people engage with the environment varies from individual to individual – and therefore is not categorizable –, rather than confirming a particular group identity, they are emblematic of a plurality of – many times conflicting – ways of occupying the space of the building. Interestingly, he writes, neurodivergent young people "could be seen as evoking an 'unfinished' architecture, where buildings are co-evolving with bodies in various states of divergence, as occupants alter spaces to try out novel material arrangements that disrupt 'built' in behaviour patterns and other forced expectations" (Kullman, 2019, p. 8)[12]. Therefore, as Imrie further stressed together with Luck, "the challenge for universal design discourse is how to articulate a universal human ethic that is simultaneously responsive to the specific, situated, nature of human subjectivities" (Imrie & Luck, 2014, p. 1316). Or, to put it as Sánchez Criado stated in a text co-written with his colleague Marco Cereceda Otárola, what should be universal is rather the "will that singularities should be addressed, exploring different material, normative and knowledge repertoires to do so" (Sánchez Criado & Cereceda Otárola, 2016, p. 633).

In sum, the challenge of accommodating bodily diversity in built environment is not a matter of including predetermined identities in a consensual whole, to which technical experts can provide – using ready-made formulas – a certain material solution. Rather, it requires "constant verification in an open, experimental and non-teleological manner" (Bingham & Biesta, 2010, p. 84). As Kullman argues following Rancière, what should be pursued is an "active equality" (May, 2008, quoted in Kullman, 2019, p. 2), where equality is not a distant goal or principle for action, but an ongoing, experimental and situated process, "a dynamic process that interacts creatively with a shifting landscape of inequality by inventing ever-new ways of breaking its hold over the world" (Kullman, 2019, p. 2). This also resonates with the version of technical democracy that draws on Marres' arguments on the materiality of issues. In this perspective, the project of democratisation requires a constant commitment to investigating the political effects of the built form, and consists in situated and experimental actions of tinkering and alteration. Moreover, it requires architects to question the means and methods by which they operate and the generic idea of the user they are used to addressing, opening themselves to be affected by heterogeneous ways of inhabiting the world.

Asserting and re-imagining disabled people's political agency

Anyway, in the field of accessibility and disability in general, there have been, and continue to be, numerous attempts to challenge the dominant expert knowledge paradigms. In the following passage I will dwell on some of these attempts, analysing both their principles and criticalities.

Nothing about Us without Us

Despite the depoliticised and potentially technocratic drift of universal design, the concerns of the disabled activists that led to its birth embodied a completely different *ethos*. As already mentioned [see **BOX 7**], during the 1960s and 1970s in US, these activists strongly opposed rehabilitation professionals who produced "'special solutions for special needs'" (Sánchez Criado, 2019, p. 411) and their view that disability was "a failure of human performance, and thus a problem in need of elimination" (Hamraie, 2017, p. 12). In particular, the roots of the *Independent Living Movement* can be traced back to student activism at the University of California in Berkeley. However, its scope expanded significantly with the establishment of the Center for Independent Living (CIL) in 1972. This grassroots organization served as a pioneer in the inclusion of a broader spectrum of community members, evolving into a model for community-driven service agencies dedicated to and operated by disabled individuals (Williamson, 2019). Notably, these activists claimed "that their lived experiences made them better experts on the subject of disability" (Hamraie, 2017, p. 12): not by chance, in the 1990s their motto would be *Nothing about US without Us* (Charlton, 2004, pp. 3-4). This new disability epistemology,

12. Here Kullman quotes Lerup, 1977, pp. 144-152.

which Hamraie calls "crip technoscience" (2017, p. 99), focused on positioning users as experts[13], experimenting with new access technologies and combating the prejudice that a citizen must necessarily be *productive*:

> crip technoscience involved strategies of friction, disorientation, and nonconformity. Activists engaged in self-taught design practices, creating their own tools, curb cuts, and ramps with repurposed materials, learning to code and hack computers, and tinkering with the structures of everyday life. For crip technoscientists, disability was the basis of shared culture and identity, a valuable resource for environmental retooling, and hence not a de facto disqualified condition. (Hamraie, 2017, pp. 16-17)

In particular, the *Independent Living Movement* had its antecedents in widespread networks of disabled people and their families in the post-polio maker community of the 1940s and 1950s, who adopted a self-help and do-it-yourself *ethos* to access built environments (Williamson, 2019, pp. 69-95). Despite the title of the movement, these activists claimed the value of interdependence, emphasizing the mutual collaboration between disabled and non-disabled people and challenging the dominant norms of rehabilitation.

Interestingly, their perspectives strongly influenced UC Berkeley professor Raymond Lifchez, who put forward a pioneering teaching approach based on direct confrontation between students and disabled activists, whom he invited as expert consultants to his design studios. In 1979, together with Barbara Winslow, Lifchez wrote a book titled *Design for Independent Living: The Environment and Physically Disabled People*[14], which offers an extraordinary portrait of the lives of these people. Based on their teaching experiences, the two authors conducted ethnographic research, documenting the daily practices and living spaces of these consultants. The portraits of these people, and their singular lives, contrasted strongly with the rigid standardised drawings showing a wheelchair without a person and within an abstract architectural space. Moreover, the book was the first to claim the need to move away from rehabilitative cultural approaches in environmental design. In Lifchez and Winslow's words:

13. In the same years, a similar attempt in the UK was made by disabled architect Selwyn Goldsmith, who wrote an influential handbook titled *Designing for the Disabled*, which appeared in four editions in 1963, 1967, 1976 and 1997 (see: Goldsmith, 1997). To know more about Goldsmith's influential contribution, see: Penner, 2013a.
14. See also: Werner, 1998.

> Is the objective to assimilate the disabled person into the environment, or is it to accommodate the environment to the person? [...] Currently, the emphasis [in barrier-free design] is on assimilation, for this seems to assure that the disabled person, once "broken-in", will be able to operate in a society as a "regular person" and that the environment will not undermine his natural agenda to "improve" himself. [...] This assumption can be counterproductive when designing for accessibility. It may serve only to obscure the fact that the disabled person may have a point of view about the design that challenges what the designers would consider good design. Many designers have, in fact, expressed a certain fear that pressure to accommodate disabled people will jeopardize good design and weaken the design vocabulary. Though certain aspects of the contemporary design vocabulary may have to be reconsidered in making accessible environments, one must also look forward to new items in the vocabulary that will develop in response to these human needs – ultimately leading toward more humane concepts of what makes for good design. (Lifchez & Winslow, 1979, p. 150)

Another book by Lifchez, titled *Rethinking Architecture* and published in 1987, set out a truly new methodological direction for the architectural profession, based on the UC Berkeley experiments. Lifchez's teaching of architectural design, in fact, moved radically away from the professional way of working in which architects followed guidelines and standards for the design of accessible spaces. Rather, as mentioned above, by inviting members of the *Independent Living Movement* into his design studios, he encouraged his students to consider them as design consultants, rather than as end-users requiring specific adaptations. As Donlyn Lyndon wrote in the preface of the book:

> Codification can institutionalize the neglect of minority concerns. The contributors to this volume are passionately dedicated to moving beyond the limits of type. They hold that architecture is specific, that it serves the purposes of individual inhabitants, that those purposes vary and cannot be arrived at by deduction. People differ, their needs differ, and those differences are not to be lightly swept aside in the interests of expediency. [...] While disabilities may be categorized, the lived experiences of people cannot be reduced to generic types. (Lyndon in Lifchez, 1987, p. xiii)

Beyond the Anglo-American context, another more recent and noteworthy experience is that of the Spanish *Independent Living Forum* (*Foro de Vida Independiente y Divertad*)[15] which, particularly during the demonstrations of the already mentioned *15-M Movement* in Spain, also brought the issue of inaccessibility of urban spaces to the forefront. Interestingly, by adopting and, at the same time, readapting the *Independent living* philosophy, this activist collective coined the term *diversidad funcional* (functional diversity), in open contrast to the forms of identity politics that revolve around disability. From a point of view that aims at undermining ableist forms of expression and structures, this term opposes biomedical functionalist categorisation – which suggest the inclusion of *lacking bodies* – and reclaims the great variety of forms of body functioning beyond productive ones (Sánchez Criado, 2019, p. 412). Also the experience of the ETS (*En torno a la silla*) collective, of which Sánchez Criado was a member, is particular emblematic of this *ethos*, precisely because of its intention to question dominant expert paradigms and to give rise to an open process of "joint problem making" (Sánchez Criado & Rodríguez-Giralt, 2016), oriented towards finding alternatives to conventional and standardized market care technologies (in that case, more precisely, to the wheelchair of a member of the collective)[16].

The antipsychiatry movement of the 1960s and 1970s: the Italian case

Another important experience is that of the anti-psychiatry movement from the 1960s and 1970s. However, while the activist projects seen so far involved the groups of disabled people themselves – who wanted to claim their agency, expertise and self-representation – this movement rather featured a number of psychiatrists who strongly opposed the theoretical and practical psychiatry models that had been applied up to that time. Notably, anti-psychiatry, also known as radical psychiatry, encompassed a wide range of opinions and ideas, as well as international experiences. Very briefly, this movement conducted a radical critique of psychiatric institutions, which evolved into a broader critique of power, knowledge, and power relations. Radical psychiatrists generally viewed mental illness as a social construct, influenced by social forces both inside and outside the family unit (Foot, 2015).

A very important chapter in the history of this movement was the Italian experience, where psychiatrist Franco Basaglia played a crucial role. He led to the effective abolition of institutions where those considered mentally ill were segregated. Indeed, in Italy, since the 1960s, a law from 1904 was in force that mandated all citizens with mental illness to be admitted to an asylum, or *Manicomio* – a term which meant, literally, "place for the care or custody of the mad" – "when they are dangerous to themselves or others, or arouse public scandal and cannot be conveniently guarded and treated except in asylums" (Disposizioni sui manicomi e sugli alienati, 1904, February 14). The category of the *mad*, or *dangerous individual*, was very broad and included, for example, people with Down syndrome, alcoholics and people with epilepsy. Therapy, in asylums, mostly consisted of violent electroshock or insulin shock treatments. As British historian John Foot writes, inside such places "*custodia* (custody) was what mattered, not *cura* (cure)" (2015, p. 48). Indeed, "for the most part their objective was what Foucault described as to 'discipline and punish'" (Foot, 2015, pp. 53-54).

Together with many other authors, Basaglia strongly criticized such models, particularly the way psychiatry and neurology reduced the social and human complexity of mental illness to merely a *sick body*. As he stated in an interview from 1978, the institution of the asylum "destroys the individual, separating him from society and then dividing him into all the hierarchies and categories that exist in the 'order' of the asylum" (Basaglia & Fornari, 1978, p. 32). Hence, his entirely non-conformist experience at the psychiatric hospital of Gorizia, on the border with Slovenia, of which he became director in 1961. Drawing inspiration from the experiences of South-African-American-Scottish psychiatrist Maxwell Jones (1976) in the UK, he initiated the project of a therapeutic community. Descriptions by Foot and historian David Forgacs are useful in understanding the importance of this revolutionary approach:

> Under Basaglia's stewardship, democracy came to the mental asylum in Gorizia, a place that had never experienced any sense of free speech. From an institution which was the very essence of non-democracy and exclusion, where the mad were locked up and silenced, and became non-people, without an identity, a past or a future, Gorizia's asylum developed into a school for democracy, a place people would visit to see new forms of democracy in action. This was the "overturning", the "negation" that was discussed so often by the Basaglian équipe. Gorizia was a wonder of the

15. http://forovidaindependiente.org.
16. See also: Sánchez Criado et al., 2016; Sánchez Criado, 2018; 2019.

> 1968 world, something to visit and be amazed by, a vision of change that transformed people's lives: a kind of miracle. [...] Patients were taking back some control over their lives and over those of their fellow inmates. They were becoming people again, even citizens, with responsibilities and rights. (Foot, 2015, pp. 320-325)

> Wards were opened up, the wire perimeter fences were taken down, walls dismantled, and patients began to go back and forth between the hospital and the adjoining city. (Forgacs, 2014, p. 199)

Thanks to Basaglia's contribution[17], the following decade saw a significant push towards deinstitutionalization, decentralization, and political reform of the mental health field. In 1978, Law 180, also known as *Legge Basaglia* (Basaglia Law), emphasized respect for the patient's human and civil rights as essential. Over the following years, this led to the closure of most psychiatric asylums in Italy. Basaglia's experience at the psychiatric hospital in Trieste is particularly noteworthy. Between 1971 and 1974, the hospital was:

> transformed into an experimental space, hosting art and theatrical projects, exhibitions, plays, conferences, concerts, numerous debates and meetings and international congresses. Militants, students, intellectuals and practitioners flocked to Trieste. It was a time of extraordinary ferment. (Foot, 2015, pp. 744-745)

At the end of 1972, together with his cousin, the artist Vittorio Basaglia, theatre director, actor Giuliano Scabia, and four other artists, Basaglia organized a groundbreaking collective project involving the patients. In essence, the project was a form of "'wandering theatre' (*teatro vagante*)" (Forgacs, 2014, p. 221), featuring stories and performances centered around large puppets and a wooden, sky-blue-painted horse on wheels. On 25 February 1973 four hundred patients breached the wall of the hospital wheeling the wooden horse out and started marching through the streets of Trieste. *Marco Cavallo* (Marco the Horse) – as it was called – symbolized a process of liberation for all those suffering from life in asylums (Forgacs, 2014). As Forgacs notes, "the symbolism could be interpreted as that of the Trojan horse in reverse: wheeled from inside a walled compound to the outside, not to invade and capture a city but to free captives held on the edge of the city" (2014, p. 221).

Interestingly, in some of his recently published reflections (Minguzzi et al., 1967; Basaglia, estimated date 1976; Basaglia, 1980), Basaglia explicitly refers to architecture itself in its connection with psychiatry. He argues that the traditional notion of design as a prefiguration of physical reality must be questioned:

> Being traditional institutional psychiatry a pessimistic technique of corporeal manipulation of the ill man's body, it only allowed the exchange and transmission of ahistorical, "technical" instructions between the psychiatrist and the architect; hence the possibility of elaborating specific typologies, and progressively perfect them in a self-protective sense for society and the psychiatrist, and, therefore, sadistic and belittling (*existenzminimum*) for the mentally ill person. The result was symmetrical: to the maximum destruction of the "cured" subject corresponded the maximum material constructability of architecture [...] Instead, the negation of the institution seems to more decidedly undermine the professionalism of the architect as it consists in skills regarding the lasting human-environmental corporeal manipulation. In a psychiatric practice, which tends to the absolute problematization of the relationship between the psychiatrist and the ill subject, the margin for the typological rationalisation of needs, that is, for the transposition of needs in the blue print of the organisation chart, progressively reduces itself to its extinction. (Basaglia, estimated date 1976, p. 258)[18]

17. Basaglia's thinking was influenced and refined by his reading of the work of Marx, Sartre, Goffman, Fanon and Foucault. Goffman's *Asylums* (1961), for instance, criticised the perverse mechanisms of what the author called total institutions; for his part, Michel Foucault, in his *History of Madness* (2006) provided a theoretical and methodological basis for the study of madness. According to him, since the seventeenth and eighteenth centuries, madness had been detached from the continuum of human experience, objectified, medicalized, seen as *unreason*, and consequently treated in asylums by specialized doctors who saw themselves as embodying reason. Such ideas were embodied in *L'istituzione negata* (1968), *Morire di classe* (1969), *La maggioranza deviante* (1971) and *Crimini di pace* (1975), a series of books that Basaglia co-edited with his wife Franca Ongaro, in which the authors enlarged the scope of their arguments beyond psychiatry and made a more generalized critique of power, calling for collective action against capitalist exploitation and social injustice.

18. Author's translation.

Inside the Neurodiversity Movement

The significance of the anti-psychiatric movement, along with its intellectual vanguard, in our exploration lies in its role as a historical precursor to the emergence of the term neurodiversity and the associated movement. As observed earlier in this chapter, akin to functional diversity, activists employ the term neurodiversity to challenge the dominant notion of the human mind. Such hegemonic framework, in fact, in most cases requires people with mental and developmental disabilities to learn *to be in control* and "tame the exuberant body [...] limiting [their] potential to express beyond the stranglehold of neurotypical models of personhood" (Manning, 2020, p. 273)[19]. The concept of neurodiversity rather "highlights the vast differences between and within neurologies. Each individual experience of neurodiversity is unique and irreducible to a set, categorical assignment of symptoms and limitations" (Judge, 2018, p. 6)[20]. As autistic activist Steve Graby explains:

> Neurodiversity activists [...] seek social acceptance and equal opportunity for all individuals regardless of their neurology [...] believing that neurological diversity should be celebrated and appreciated [...]. People who experience difficulties in society due to their cognitive or behavioural differences from the norm [...] need to be recognised and accommodated, with an emphasis on the need to change society rather than the individual. (Graby, 2015, pp. 234-235)

In explaining that, Graby also makes a distinction on the use of the term when referring to groups or individuals:

> While a group or a society can be "neurodiverse", it is generally considered inaccurate to call an individual person "neurodiverse", as neurodiversity encompasses both the typical and the atypical; however, "neurodivergent" can be used as a generic adjective to refer to people of minority neurotypes. (Graby, 2015, p. 235)

Judge's words are particularly useful to understand the reasons for this struggle against biomedical categorisation: "clinical terminology like 'disorder' and 'syndrome' leave me feeling forcibly disabled and reduced to a condition that is only impaired. It leaves little room for recognition of, or pride in, the strengths and skills that I also possess as a consequence of the same neurological-differences" (Judge, 2018, p. 6). At the same time, the term also challenges the frequent tendency at labelling some of these people as "high-functioning". In fact, "an irksome discomfort exists around the dualism of 'high/low-functioning' labels that disregard the strengths and struggles of each individual, and strongly imply categorisation based on one's capacity to 'pass for normal' rather than a true assessment of individual capabilities" (Judge, 2018, p. 6)[21]. In general, this notion evokes civil rights claims, advocating for the acknowledgment of minorities rather than their classification within pathological frameworks. Their condition is not perceived as a disease or disorder requiring eradication, prevention, or cure. Anyway, the term does not always evoke positive responses. Some authors highlight that neurological differences can have profoundly negative impacts on quality of life, and the concept of neurodiversity might risk downplaying or concealing the suffering experienced by some individuals. (Judge, 2018; Fenton & Krahn, 2009; Jaarsma & Welin, 2012).

The limits of self-advocacy

Indeed, it's important to recognize that not all individuals categorized as intellectually disabled are equally able to articulate their thoughts. As observed by Simplican (2015) and Berger (2019), while some, such as some autistic individuals or those with cerebral palsy, may find ways to communicate within prevalent norms, others face more severe challenges in language and cognition. This raises the issue that even the disability movement, advocating *Nothing about Us without Us*, which emphasizes the importance of disabled individuals speaking for themselves, might unintentionally reinforce the Lockean/Rawlsian assumptions underlying the "capacity contract" (Simplican, 2015). As Simplican points out, in staking "inclusion on cognitive competence", the movement "unintentionally recasts exclusion and stigma on others who are more severely impaired" (2015, p. 5). Precisely for this reason, in contrast to Berger, she argues that other forms of political activism can be seen, for example, in non-verbal activities such as dance.

An experience that could be considered an interesting historical antecedent of what is expressed by Simplican's ideas is that of the French

19. See also: Yergeau, 2018.
20. See also: Davidson & Henderson, 2010; Jaarsma & Welin, 2012; Armstrong, 2011.
21. See also: Fenton & Krahn, 2009; Yergeau, 2009; Kim, 2013.

psychiatrist and educator Fernand Deligny[22] and his methods of mapping "autistic space" (Petrescu, 2007, p. 88). In France, as well as in Italy, the anti-psychiatry movement gained significant relevance, and an important subversion attempt was made at *La Borde clinic*, where Félix Guattari was among the staff. In 1965, when Deligny arrived at *La Borde*, he began establishing a network of facilities aimed at supporting children with autism and those considered "outside of speech" (*hors de parole*) (Hilton, 2015). In line with Basaglia and his colleagues in Italy, Deligny endeavored to promote an alternative to institutional psychiatry and also criticized the educational methods of the time, which reflected society's desire to suppress anything that deviated from the norm. Rather than attempting to teach non-speaking autistics, he aimed to learn from them. To achieve this, he spent time with them, living alongside them on a daily basis in the Cévennes Mountains in southern France (Petrescu, 2007; Dosse, 2011). At that time, this meant challenging the centrality of psychoanalysis and its emphasis on language.

As Manning observes, in contrast to this trend,

> Deligny refused to make language a central modality of existence for and with autistics. He refused to engage with any mode of representation that would seek to organize autistics outside of the in-act of their complex daily expressions, including how they move through the world, how they break down when the world becomes too much, how they make themselves understood, how they play, what they are concerned with, how they dream, how they create. (Manning, 2020, p. 159)[23]

In other words, rather than focusing on their deviation from the norm, he attempted to highlight the autistic individuals' own modes of expression. Alongside a network of people who chose to follow his methods, he developed a particular survey method which involved mapping the lines traced by autistic children during their walks and everyday activities. These lines represented the so-called wander lines (*lignes d'erre*), which

> need no translation they make felt through the force of the line and the thickness of multiple layers of tracings, one on top of the other, how subjectivity is produced in the moving. There is no question here of separating individual from movement, or individual from world. [...] What we see in the wander line palimpsests are bodies that resist organization: wander lines celebrate deviation, detour. (Manning, 2020, p. 159)

Deligny's approach, therefore, is particularly intriguing as it was one of the first attempts to explore more-than-verbal modes of expression and to view neurodiverse spatial experiences as exceeding conventional notions of space.

NEUROTYPICAL DESIGN APPROACHES TO NEURODIVERSITY

As noted, architectural approaches frequently reveal two main problems when dealing with bodily diversity in built environments. The first problem is a tendency toward solutionism, where architects portray themselves as solution-makers, treating needs and experiences as straightforward and easily understandable. This often involves the uncritical application of biomedical categorizations of the body found in regulations. The second problem is a reliance on standard spatial solutions, which are typically Euclidean. In this way, architects manage to design standardized and three-dimensional solutions that could aid people in wheelchairs, but remain unable to address the complex multisensory spatial practices of blind, Deaf/hard of hearing, or neurodivergent individuals (Manning, 2020).

These insights emerged from an analysis of various projects by architects and designers aimed at enhancing urban environments for neurodivergent individuals[24]. Many of these projects exhibit a functionalist view

22. A contemporary example illustrating a similar approach is the work of *Debajo del Sombrero*, a platform based in Madrid that concentrates on art creation, research, production, and dissemination. Their primary participants are individuals with intellectual disabilities, who are central to the initiative. The collective's workshops emphasize creating opportunities for learning and dialogue with other artists, as well as individual and collective projects. One notable project, *Some Things from Somewhere*, involved the Welsh artist Cai Tomos collaborating with the collective's artists to conduct creative research focusing on the body, its movement, and expression, aiming to understand these individuals' ways of relating to the world (Tomos, 2018).

23. See: Deligny, 1979.

24. However, it should be noted that due to the limited timeframe of this research, the selection of cases was not intended to comprehensively cover this specific area of design. Instead, it aimed to highlight recurring methodologies and approaches. I acknowledge that this approach inevitably overlooks a broader spectrum of experiences and perspectives, which could contribute significantly to a more thorough

of neurodiversity, assuming an understanding of issues based on clinical studies rather than engaging directly with individuals to understand their unique ways of living and dwelling. Most projects depend on biomedical categories and seek quick solutions. Furthermore, they often propose vague, solution-oriented, and volumetric guidelines and bullet points without referencing specific tangible outcomes from their implementation in real cases. The focus tends to be on the *help* – and sometimes *control* – that architects offer as experts through technological solutions to neurodivergent individuals.

For example, referring to other works (Rimland 1964; Delacato 1974), architect Magda Mostafa, author of the Autism ASPECTSSTM Design Index, writes that autism involves "repetitive behavior, limited communication skills, challenges in social interaction, and introversion—may be a result of a malfunction in sensory perception [...] leaving individuals with autism with an altered sensitivity to touch, sound, smell, light, color, texture, etc." (Mostafa, 2014, p. 144). She suggests several vague design principles or guidelines aimed at improving the habitability of built environments for individuals classified under autism. However, she neglects their individual uniqueness and portrays their behavior as a "malfunction" (Mostafa, 2014, p. 144) without considering their unique ways of experiencing the world. Drawing on what they refer to as the foundational theories of Autism Spectrum Disorder (ASD) – studies intersecting medicine, psychology, and psychiatry – the authors of *Designing for Autism Spectrum Disorders* (Gaines et al., 2016) provide solutionist recommendations for designing spaces suitable for autistic individuals, again viewed as *malfunctioning* and in need of assistance. For example, they highlight how this approach can help these individuals "overcome their 'mind-blindness,' the lack of ability to understand the way others think and behave, read body language, facial expressions, etc" (Gaines et al., 2016, p. 167). Their spatial representations remain Euclidean, ignoring other ways of experiencing space.

Despite aiming to involve neurodivergent individuals, other proposals often use tokenistic or language-centric tools, such as standardized questionnaires or surveys, sometimes relying on information from relatives or caregivers. By not considering more-than-verbal approaches to participation, these proposals appear to enforce the capacity contract. They overlook how participatory devices enact concrete subjectivities and fail to document the implementation process, including challenges, resistance, and potential opportunities, thus often turning collaborative practices into forms of designing *for*, rather than designing *with*. For instance, when inviting architects to design "spaces where different populations can co-exist" (Lo Chan, 2018, p. 1), the author of *Neurodivergent Themed Neighbourhoods as A Strategy to Enhance the Liveability of Cities: The Blueprint of an Autism Village, Its Benefits to Neurotypical Environments*, in addition to exploring existing design guidelines, emphasizes considering the opinions of autistic individuals through a pre-made questionnaire. However, such questionnaires are not particularly sensitive to more-than-verbal modes of expression. Moreover, the focus is often on the "autistic savant," defined as an "individual with autism who has extraordinary skills not exhibited by most persons" (Lo Chan, 2018, p. 6). As previously mentioned, Judge strongly criticizes the bias in labeling some individuals as high-functioning, which stigmatizes those considered low-functioning and reflects a "categorisation based on one's capacity to 'pass for normal' rather than a true assessment of individual capabilities" (Judge, 2018, p. 6). The *Autism Planning and Design Guidelines 1.0*, created by urban and regional planning students at The Ohio State University during a 2017-2018 design studio, followed a similar approach. While intending to *help* autistic individuals through solutionist bullet points, the students proposed a participatory approach to engage autistic individuals and their families in separate focus groups, aiming to gather "useful information that will contribute to the city planning profession for adults on the ASD spectrum" through "verbal consent" (Bann et al., 2018). Again, the designers aimed to use their technical skills to assist autistic individuals and improve "the built environment so that they can thrive" (Bann et al., 2018, p. 5). Furthermore, the images provided illustrate a spatiality that is Euclidean and volumetric.

Some designers adopt empathetic approaches, believing they can understand neurodivergent users' experiences through simulations. For example, Central Saint Martin's graduate Di Peng developed a *Dementia Simulator* headset to allow users to "experience symptoms of the disease [...] The helmet affects each of the senses, in an attempt to replicate many of

and accurate analysis of the issues at hand. Other works deserving attention include, for instance, analyses of references to built space in "auti-biographies": Baumers & Heylighen, 2010; Kinnaer, et al., 2016; interviews to autistic users: Nguyen, D'Auria & Heylinghen, 2020; Baumers & Heylighen, 2014; Eisazadeh et al., 2020; Heylighen, 2020; Nguyen et al., 2021; analysis of autistic people's approach to design: Baumers & Heylighen, 2015; co-analysis with autistic people: Baumers, 2012; Tackx, 2020; a design studio that include people with Down Syndrome, autism and intellectual disabilities: *La Casa de Carlota & friends*, https://www.lacasadecarlotaandfriends.com/en/the-studio. Other interesting works include: Matusiak, 2021; Bettarello et al., 2021.

the challenges faced by dementia sufferers" (Tucker, 2016). Similarly, the *Empathy Bridge for Autism*, created by Royal College of Art graduate Heeju Kim, includes items like candies that impede speech, an augmented reality headset altering perception, and headphones amplifying sounds to mimic the perceived *difficulties* of autistic individuals (Tucker, 2017). While these methods may directly engage more-than-verbal perceptions, design practices focused on empathy, as discussed by Kim Kullman (2016), present significant challenges and risks. The experiences of others, often staged and encountered in isolated moments (Ratcliffe, 2012), can be inevitably reduced or oversimplified. Moreover, many wearable simulations may lead to "over-identification" (LaCapra, 2001), amplifying the environmental impacts of impairment. This can result in designers perceiving themselves as "more representative of other people" than they truly are (Nickerson et al., 2011, p. 49). Other authors note that this approach in disability awareness training can be problematic (Burgstahler & Doe, 2004; French, 1996), often reinforcing stereotypes and disregarding actual, unique life experiences[25]. In short, so-called empathetic approaches frequently oscillate between two extremes: attributing to designers the ability to address and resolve issues based on their own occasional experiences; and categorizing the unique and unquantifiable nuances of individual disabled persons into narrow stereotypes. Furthermore, as Despret states: "empathy allows us to talk about what it is to be (like) the other, but does not raise the question 'what it is to be 'with' the other'. Empathy is more like 'filling up one self' than taking into account the attunement" (Despret, 2004, p. 128).

In summary, the examples we examined appear to reflect a neurotypical design approach to neurodiversity. By not exploring more-than-verbal approaches to participation, they inadvertently reinforce the capacity contract. Consequently, we recognized the need for a different approach to design, one that focuses on creating the pre-conditions for possible encounters with actors and their ways of being in the world **[BOX 8]**. This would disrupt existing approaches and open the path to transforming design practice.

BOX 8 > BEYOND *DISTANTISM*

During our exploration, the reflections of several authors have been a remarkable source of inspiration to better define the contours and implications of what could be considered a neurotypical way of understanding space, as well as to help us grasp the extraordinary value and potential of its existing and yet to be explored alternatives. John Lee Clark, an American deafblind poet and writer, describes neurotypical spatiality using the concept of "distantism": "[...] the English word 'distance' comes from 'distantia', Latin for 'a standing apart'. A point could be made that distantism refers to the privileging of the distance senses of hearing and vision" (2017). Following Clark's insights, Manning notes that even the usual accounts of spatial orientation reveal a propensity to perceive the world in terms of distance. The space results as a "large flat empty surface", and everything that happens in crossing the distance between different points loses any value. In the case of an airport, for example,

> paths are drawn point to point, tracing a line as though we were flying overhead, little or no mention of the trolleys, the children running, the spilled drink, the noisy lineup blocking the way, the suitcase. [...] To map the space of an airport withholding the buzz of the fluorescent lights, the glaring waxed surfaces of the floors, the loud PA system, the anxiety around security, the overlap of smells, the undercurrent of fear, is to radically underestimate how environments shape our ability to navigate them. (Manning, 2020, p. 7)

Besides, neurotypical's distantism "makes too strong a distinction between body and world" (Manning, 2020, p. 249), as it is grounded in the "executive function" (p. 3), or "capacity for subtraction" and "zeroing" (p. 5): Bodies are understood as separate from "the touch of the world" (pp. 248-249), or the ecology of their surroundings. Deaf-blind vision, instead, or what Clark calls "metatactile knowledge" (2017), dissolves any abstraction or subtraction. It "queers Euclidean angularity" (Manning, 2020, p. 262), as it "involves feeling being felt, being able to read people like open Braille books, and seeing through our hands and the antennae of and within our bodies" (Clark, 2017). The same happens with neurodiverse knowledge, which brings to the fore ways of sensing "in excess of form, in excess of geometry" (Clark, 2017, p. 247), and "a feeling-with that extends beyond the human and connects to all that edges into experience" (Clark, 2017, p. 254), opposing neurotypicality's tendency to close the world into categories and devaluate multiplicity over identity. Such more-than-human attunements and radical lack of self-centering resonate, for instance, in Judge's words: "The sound of water looks and feels similar to human and non-human voices according to

25. However, some experiences are worth mentioning. For instance, Patricia Moore, an industrial designer and leader in the *Universal Design* movement, in 1978 embarked on an peculiar adventure. Particularly interested in the field of design for the elderly, Moore recounts her radical empathic experimentation in her book *Disguised: A True Story* (1985). With the help of a professional make-up artist and friend, she disguised herself as an elderly woman, applying layers of latex to her face, wearing opaque glasses to blur her vision and earplugs to reduce her hearing. Disguised in this way, she tried to understand the everyday life of elderly people in the urban environment (Williamson, 2019, p. 171).

my senses, it has never occurred to me that a river is any less communicative than a bird or a human. [...] When I am seeing a bird, I sense that the bird is also seeing me. We are thus communicating through our mutual sensory presence in this moment" (2018, pp. 1111-1113)[a]; and in autistic poet and writer Tito Mukhopadhyay's writing (2010, quoted in Manning, 2020):

> The branches of the tree
> looked like a confused idea.
> It was as if they had nothing
> substantial to agree upon,
> now that their leaves were gone.
>
> So they hung as a jumbled mesh
> arguing their right or wrong
> confused through light or shade
> their branches slender and long
> about those leaves that were gone.

Notes

a. Notably, Judge delves into the significance of interacting with non-humans within the realm of neurodiverse autobiography, challenging conventional notions of what constitutes social interaction. For many of these authors, including Judge herself, comprehending places, organisms, and objects as having personalities and emotions often seems more logical than understanding human beings. For instance, autistic academic Temple Grandin can discern stimuli that provoke fear in cattle through sensory empathy; Greg Krueger, diagnosed with Asperger Syndrome, gained notoriety for his heightened sensitivity to cats, prompting him to make structural adjustments to his home to better accommodate them; autistic anthropologist Dawn Prince-Hughes demonstrates a remarkable ability to comprehend gorillas and their experiences in captivity. Judge, along with other authors, identifies a close association between the realms of more-than-human and neurodiversity research. Both fields engage with less-than-human entities, whose knowledge and sensory language systems are frequently "framed as something 'other', rather than being recognised as alternative ways of knowing and doing" (Judge, 2018, p. 5; Grandin, 1995; Grandin, 2012; Prince-Hughes, 2004).

DESIGN BEFORE DESIGN

In an effort to experiment with more-than-verbal and radically participatory approaches with neurodivergent individuals, we embarked on a series of explorations – detailed in the final section of this book: *Learning to Be Affected by Moritz's Spatial Practice* – foregrounding Moritz and his way of being in the world.

Reflections by STS-inspired scholars and designers have questioned the notion that design practice is the task of an expert human shaping

passive worlds, instead extending agency to other human and non-human entities. Ehn and his colleagues (Björgvinsson et al., 2012) have particularly explored how these reflections could impact participatory design beyond its conventional understanding as merely an instrumental operation aimed at achieving consensual closure. In their approach, participatory things are seen as unfolding assemblies, with various human and non-human entities participating in joint explorations.

Where Ehn and his colleagues conceptualise participation in things as a "design after design" (Björgvinsson et al., 2012, p. 104) – meaning designers step back from central roles to facilitate "infrastructuring" (Björgvinsson et al., 2012, p. 102), ensuring the design process continues even after they leave[26] – we reflected on the relevance of a pedagogy that addresses the pre-conditions required for this to occur. Indeed, we wanted to explore how designers can engage in these unfolding things, or more-than-human assemblies, especially when facing actors that might put their practices, tools, notions of space and understandings of the world in crisis. This requires designing pedagogical situations revolving around un-learning and re-learning operations, in which designers can become affected by the particular ways of being in the world of these actors. In other words, it requires designing processes aimed at exploring what types of participatory approaches and practices these actors could lead us to learn: an approach that could be called *design before design*.

In our experience we sought to explore how to engage in participatory things together with Moritz. Acknowledging that participation relies on a capacity contract – the liberal notion that parties can *voice* their needs and desires –, we aimed to find ways to consider the more-than-verbal experiences that tend to be excluded by this contract. Thus, rather than preparing us for the actual design phase that typically follows initial information gathering, our exploratory design operations led us to create situations and devices to learn to be more-than-verbally affected by Moritz's spatial practice.

26. See chapter III, section *The challenge of technical democracy*, pp. 118-120.

ANTI-ENDING: *AN ODE TO THE GUIDELINE*

During our auto-pedagogical experiment we also came to reconsider the potential of guidelines and recommendations we encountered in projects by architects and designers seeking to create more livable arenas for neurodivergent people. Historically, most of the critique in the field of accessibility has brought architects to conceive spatial solutions in terms of rigid standards, often Euclidean in nature: as observed, standards can easily work out three-dimensional or volumetric solutions that may be useful for wheelchair users, but cannot relate to multisensory or more complex-to-grasp spatial practices. The guidelines, instead, due to their more open nature, seemed to us potentially better suited to meet this challenge.

The guideline may be a gateway to other possible architectures.

Unlike a standard, the guideline does not dictate rigid measures, excluding bodies that do not fit in. If it not used as a normative bullet point defining the levels of what is possible, it can produce spaces of encounter and coexistence, making room for differences.

Rather than as a tool already defined and applicable in the abstract, the guideline should be regarded as a sort of *recipe* or open instruction. In this way, it may trigger a process, stimulating various situated design encounters, the documentation of which could enrich it, offering possibilities for comparison, revision and/or alteration. The guideline should be seen as a *generative regulation*, incorporating situated lived arrangements, as practices forging an in-between pedagogic atmosphere to other ways of doing space. From this perspective, an open and ever-evolving collection of guidelines can be a productive alternative to Neufert's handbook (1936) and its companions. Where such books represent exhaustive containers of regulations and standards, which exclude those who do not fit in "normate templates" (Hamraie, 2017), this alternative would be akin to an open *cookbook*. Incorporating documentation of various situated design encounters with differences.

> Generalization should be a vehicle for travelling through as many differences as possible – thus maximizing articulations – and not a way of *decreasing* the number of alternative versions of the same phenomena. (Latour, 2004, p. 221)

> *How* indicates activity, the unfolding of a process. [...] *How do you do that?* The question *how* is often coupled with the answer "like so". The sharing of process can be approached as the trade or swapping of techniques or ways of doing things, a form of skills transfer or knowledge exchange. [...] There is a pedagogical aspect to this modality of *how*: observe the imperative of the step-by-step guide or technical manual, united in a shared attempt to communicate and teach the procedural knowledge of *how-to*. In some disciplines, the principle of *how* is instilled through training, the perfection of a notionally correct way of doing things, whilst in other contexts *how* emerges through self-discovery [...]. How can be proper and improper, diligent or deviant. Act of revelation: the (s)*howing* of the how. [...] there are things that cannot be so easily explained, that refuse to be reduced to a map or guide. Beyond the *know-what* of the encyclopedia, consider the experiential, those embodied forms of tacit knowledge or even *know-how*; resistant to being shown or said, that only can be performed or practised. Indeed, how do we account for those processes in which not knowing, uncertainty, trial and error, feeling one's way and contingency perform a significant role. [...] *How* is less the destination, rather the journey travelled. (Gansterer et al., 2017, pp. 63-64)

The guideline can become a tool for more-than-human participatory design. Its openness to incorporate different declinations, additions and variations gives architects the possibility to engage in *design before design* experiences, so as to become affected by more-than-human, often neglected ways of being in the world, and bring forth other modes of participatory design practice.

> Approximation of proximity is a way of speaking about two divergent planes, not converging as though they could become one, but meeting at the differential of their potential for the approximate. For isn't sociality precisely that which sidles proximity differently, that which asks how else a coming-together-in-difference can be felt? Or [...] difference without separability? (Manning, 2020, p. 6)

The guideline may suggest a more careful design contract. That is, a contract that does not involve the mere service provision from architect to client, which ends when a certain design solution is produced. Rather, a contract that creates new obligations and involves constant commitment and care, in dialogue with a wide variety of epistemic partners in problematizing the ways in which design practice and built space might accommodate difference.

> Making a commitment is, essentially, letting oneself be committed [...]. This means breaking down the barriers of immunity [...]. This means letting oneself be affected, letting oneself be touched, letting oneself be addressed, knowing one is required, and seeing oneself as concerned. It means moving into spaces of life that we cannot aspire to totally control, getting involved in situations that are too much for us and that require us to come up with answers that perhaps we don't have and that, most probably, would make us different people of us. Any commitment is, perforce, a transformation, with no guaranteed results. [...] It lays bare what is, for the modern individual, the most disagreeable truth: to exist is to depend". (Garcés, 2013, p. 31)

> To care joins together an affective state, a material vital doing, and an ethico-political obligation. [...] [It is a] commitment because it is indeed attached to situated and positioned visions of what a livable and caring world could be; but one that remains speculative by not letting a situation or a position [...] define in advance what is or could be. (Puig de la Bellacasa, 2017, p. 42-60)

Beyond consensual narratives, ready-made formulas or clear-cut ideas of what should be done and how, the guideline can allow architects to slow down, learn to be affected by those who in most cases are not taken into account, and open up new and more careful forms of world-making.

INTERLUDE: DOCUMENTING AS A "FORM OF LOVING ONE ANOTHER"

This following section reports the entire *design before design* experience we engaged in to learn to be affected by Moritz and his social and material spaces. The decision to document this process stems from specific reasons. A common approach among architects, tied to a modernist tradition, is to work from a solutionist perspective. This perspective reduces the entire design process to a final *form-giving idea*, expressed through sketches, drawings, renders, and models. Design, in this sense, is conceived as an expert rearrangement of the world. Often, no trace remains of the complex series of steps, problems, and choices that made this idea possible. Disclosure of the process is usually seen as antithetical to the image of the architect as an *author* and creative *genius* who, through his/her expertise, provides answers and ensures the quality of a certain solution.

By documenting every step of this exploration, including mistakes, uncertainties, and doubts, the idea was to create a joint problem-making tool. This process also allowed me to pause and reflect – both during and after – on *my way of doing things*, the effects of the techniques and tools I used, and the implications and outcomes of my actions and decisions. Moreover, the aim was to make the various stages of the exploration with Moritz accessible to other architects. Those engaged in other situated design encounters with neurodivergent individuals may find it valuable to review and compare their experiences with ours.

As scholars Antonio Lafuente, David Gómez and Juan Freire state: "to learn how to experiment is tantamount to making us tolerate uncertainty and to transforming failure into the engine of learning" (Sierra et al., 2018, p. 54)[1]. From this perspective,

> not only documentation makes re-learning visible, but it makes it shared: it socializes it, it formalizes and opens it. [...] Documenting represents another form of loving one another: it proves that we are interested in the community. Documentation makes [...] both the learning process and the community that supports it visible. Documenting, then, constitutes a mental aptitude, a way to live: both a culture and a tool. It represents a culture because it promotes a certain way of connecting with each other and describing what we experienced together. Documentation narrates the world and builds "us". One who documents these processes also records doubts, uncertainties, mistakes, crossroads and conflicts. And it is not always possible to talk about solutions, whether they are better ones or not. Revealing our indecision makes us aware of our vulnerability. By not hiding our vulnerability we are able to reach others in the most direct way [...]. Our vulnerability may reward us: it may lead us to drift unexpectedly or it may lead us to the open sea. This opening itself is capable of attracting and mobilize collective intelligence or, in other words, it can help us understand that our point of view, whether it is right or wrong, may not be the most suitable one[2]. (Sierra et al., 2018, pp. 47-48)

1. Author's translation.

2. Author's translation.

“We have a desperate need for other stories, not fairy tales in which everything is possible for the pure of heart, courageous souls, or the reuniting of goodwills, but stories recounting how situations can be transformed when thinking they can be, achieved together by those who undergo them. Not stories about morals but ‘technical’ stories about this kind of achievement, about the kinds of traps that each had to escape, constraints the importance of which had to be recognized. In short, histories that bear on thinking together as a work to be done. And we need these histories to affirm their plurality, because it is not a matter of constructing a model but of a practical experiment. Because it is not a matter of converting us but of repopulating the devastated desert of our imaginations”. (Stengers, 2015, p. 132)

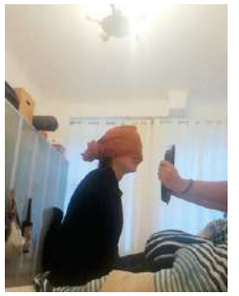
LEARNING TO BE AFFECTED BY MORITZ’S SPATIAL PRACTICE

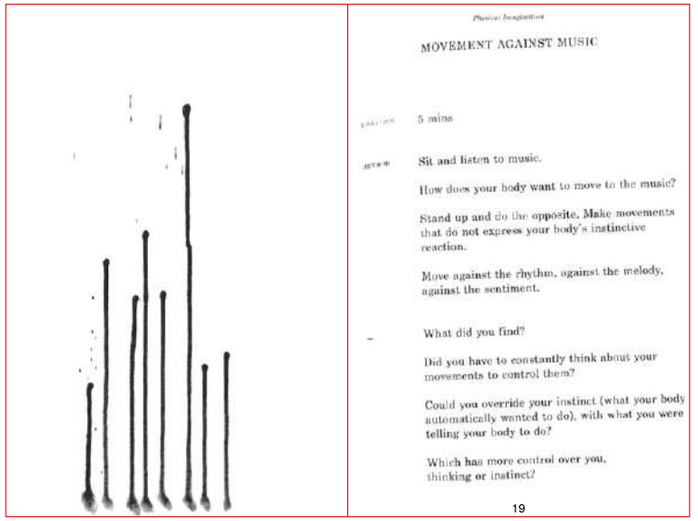
This auto-pedagogical experimentation, which lasted about four months, revolved around a series of concrete design operations. After developing some sensory experiments to explore space beyond a neurotypical understanding, we attempted to generate possibilities for activating what Manning would call an “approximation of proximity”: more-than-verbally coming into Moritz’ proximity, without erasing our differences. Indeed, as she puts it: “approximation of proximity is a way of speaking about two divergent planes, not converging as though they could become one, but meeting at the differential of their potential for the approximate” (Manning, 2020, p. 6). These attempts triggered the design of devices to learn to be affected by Moritz’s spatial practice, a pre-condition for being able to imagine designing *with* him.

OPERATION 1

Retraining the body of the architect. Going beyond neurotypical space

In the first phase of exploration, I sought to open myself up to other ways of being in the world by embracing alternative perceptions and understandings of space, aiming to transcend the neurotypical perspective. Our experience, perception, and knowledge are mediated and enacted by the devices we equip ourselves with. Providing an example from the perfume industry, where individuals are trained to identify scents using odor kits, Latour illustrates how tools, such as odor kits, help to articulate different bodily experiences (Latour, 2004). This led me to the idea of training, or sensitizing, my body to different ways of sensing and knowing, and the search for specific tools or devices that could facilitate this exploration. To accomplish this, I turned to artist Marcus Coates's *A Practical Guide to Unconscious Reasoning* (2014), a captivating collection of intriguing rule-based instructions that are crafted to guide readers in expanding the boundaries of their imagination, offering pathways to heighten awareness and playfully experiment with alternative ways of perception.





Physical Imagination

MOVEMENT AGAINST MUSIC

5 mins

Sit and listen to music.

How does your body want to move to the music?

Stand up and do the opposite. Make movements that do not express your body's instinctive reaction.

Move against the rhythm, against the melody, against the sentiment.

What did you find?

Did you have to constantly think about your movements to control them?

Could you override your instinct (what your body automatically wanted to do), with what you were telling your body to do?

Which has more control over you, thinking or instinct?

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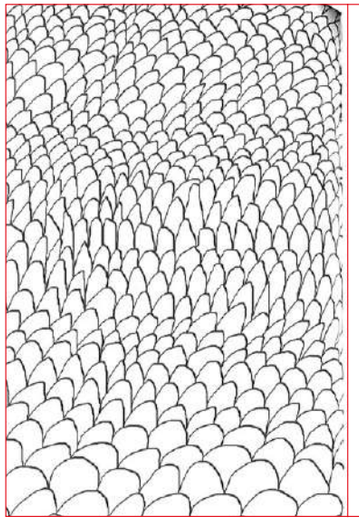

Physical Imagination

SOUND OF MIND

5 – 20 mins

Lie on your back on the floor/pavement/grass (somewhere you won't be stepped on or create an obstruction).

Close your eyes, or wear an eye mask, and listen to the sounds around you for approx 1 minute before you do anything.

Start to make movements for these sounds. Try to articulate their character with your body.

Start with small movements for the quieter sounds then gradually work up to larger movements for the louder sounds.

Think about the pitch, length, volume and texture of the sounds and how these might translate into actions.

Use all of your body from eyelids to toes.

Don't copy the sound, try to be it, act as if the sound was coming from you.

Go from moving to a single sound at a time, to moving to many sounds at once.

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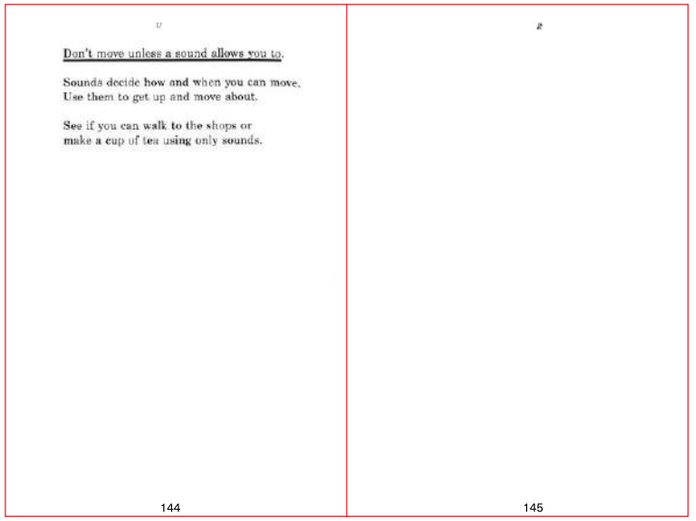

Don't move unless a sound allows you to.

Sounds decide how and when you can move. Use them to get up and move about.

See if you can walk to the shops or make a cup of tea using only sounds.

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Fieldnotes, 28 December 2019
Location: my bedroom, Berlin
Music track: Bowsprit, Balmorhea

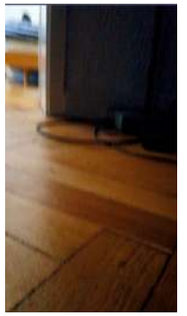
At the beginning, in the very first seconds, it seemed to be working but I really had to focus my attention on every single movement of my body.
Somehow I even forgot about music. That was pretty challenging and I didn't really know how to move 'against' my instinct. I struggled to keep control and found that quite exhausting. After a while my instinct took over and I just started following it. I found it very liberating. I couldn't tell my body what to do and how to move.

Fieldnotes, 29 December 2019
Location: my bedroom, Berlin

I had the feeling that the more isolated the place, the more complicated the exercise. I laid on my back on the carpet in my room, eyes closed. Is my breath a sound too? The sound that I heard more was that of passing cars. One of them (the louder sound) made me get up. The wooden floor of my room was cracking at every step so I couldn't stop my fingers, my neck, my head for awhile. I started blinking with the sound of some birds outside. The sound of a bell helped me to move on. I articulated every movement of my legs and feet according to its sound.







Becoming Something Else

CRAWLING

DURATION 5 mins – 60 mins

METHOD Instead of walking, crawl.

TIPS If you have hard floors or go outside you will need padded gloves and knee protectors.

All good builders merchants will sell these.

– Crawling is liberating.

You have the freedom to see the world from a new perspective, more like a child or an animal.

Changing the way you see can alter the way you think.

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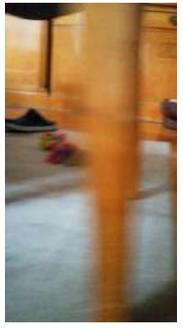
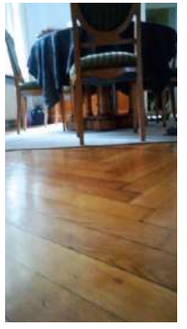
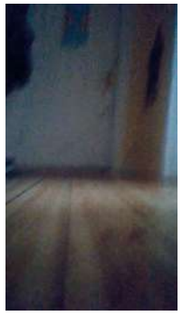




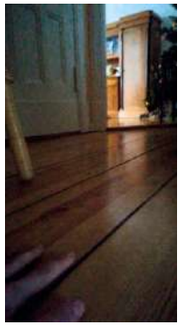



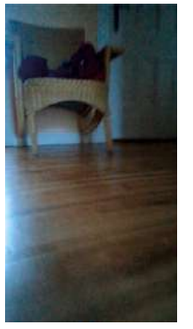

Fieldnotes, 29 December 2019

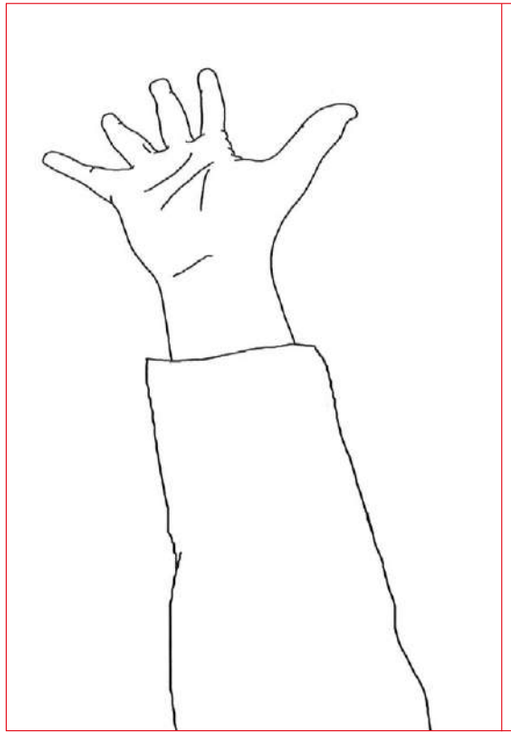
Location: my apartment, Berlin

As soon as I started doing it, I started noticing a lot of details (the lower part of Susanne's apartment) I usually don't pay attention to. Anyway, I cannot really say if it actually altered my perception. Maybe I felt weaker, a little bit more vulnerable. I did it for 10 minutes, should I have perhaps done it for longer?









Physical Imagination

NON-NORMAL

DURATION 1 min—2 hrs

METHOD Go outside in an area with a busy street.

Do as little to be non-normal as possible.

Adopt a gesture or behaviour that is just outside of what you consider normal—anything without a purpose seems to work.

Try these to help you start:

1 Keep your hand in the air.

2 Walk backwards.

3 Walk extremely slowly.

4 Point at something (not at anyone).

Sustain these for as long as you can.

Notice how you feel and how others perceive you.

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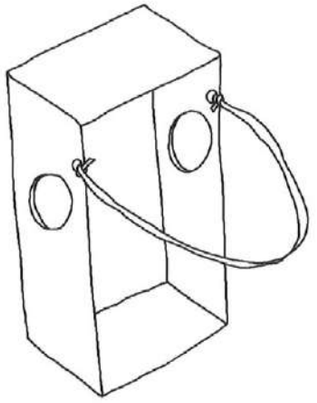
Fieldnotes, 2 January 2020

Location: on a bridge, somewhere near the Elbphilharmonie, Hamburg

I thought about it a lot before I decided to try out this exercise. At the beginning just the thought of it made me feel quite uncomfortable. For instance, I definitely wouldn't have been able to do this in the place where I was born. I would have been afraid of what people might have thought. Everybody knows me there. This feeling bothered me. No one knows me in Hamburg. Moreover, my partner was with me. We could talk about it before, I could express my discomfort and concerns, we could even laugh it off together. I could definitely say that, in a way, I remained in my comfort zone, even though doing it has been pretty challenging. On the bridge near the Elbphilharmonie, I put my hands ahead of me, palms outward, eyes fixed, and started walking backwards. After a few seconds I noticed that people were starting to turn around and look at me. Some of them were intrigued, others were laughing and making fun of me. I had the feeling that someone was starting to imitate me. Later on, my partner did confirm it to me. My heart was pounding, but still, I enjoyed it. I could have held out longer, because it was starting to get funny and very interesting. Anyway, I suddenly stopped as soon as I noticed that someone was about to take a video/photo of me. This made me mad, or at least annoyed me very much. Is he/she going to post this video/photo on facebook or Instagram? I just couldn't continue.



Becoming Something Else

BIRD BRAIN

DURATION 30 mins

YOU WILL NEED A box the size of your head, elastic, scissors.

METHOD Find a box that fits over your face comfortably.

Connect some elastic across the back so it will secure the box against your face like a mask.

Cut holes in the sides (not the front) of the box, at the same level as your eyes.

Wear it on your head.

You should just about be able to see out of the side holes.

Move around your house, don't stop.

TIP Most birds have eyes on the side of their heads, they have to move their heads to move their eyes. You will have to do this.

If you move and behave like a bird, are you more able to imagine what it is like to be one?

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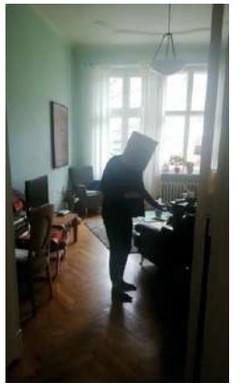
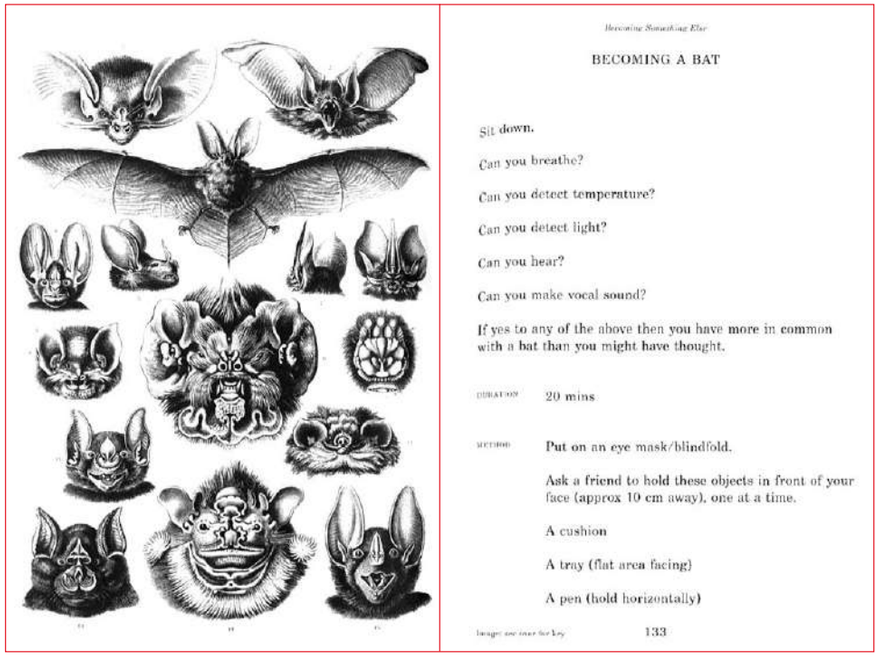


Fieldnotes, 2 January 2020

Location: on a bridge, somewhere near the Elbphilharmonie, Hamburg

I thought about it a lot before I decided to try out this exercise. At the beginning just the thought of it made me feel quite uncomfortable. For instance, I definitely wouldn't have been able to do this in the place where I was born. I would have been afraid of what people might have thought. Everybody knows me there. This feeling bothered me. No one knows me in Hamburg. Moreover, my partner was with me. We could talk about it before, I could express my discomfort and concerns, we could even laugh it off together. I could definitely say that, in a way, I remained in my comfort zone, even though doing it has been pretty challenging. On the bridge near the Elbphilharmonie, I put my hands ahead of me,



Becoming Something Else

BECOMING A BAT

Sit down.

Can you breathe?

Can you detect temperature?

Can you detect light?

Can you hear?

Can you make vocal sound?

If yes to any of the above then you have more in common with a bat than you might have thought.

DURATION 20 mins

METHOD Put on an eye mask/blindfold.

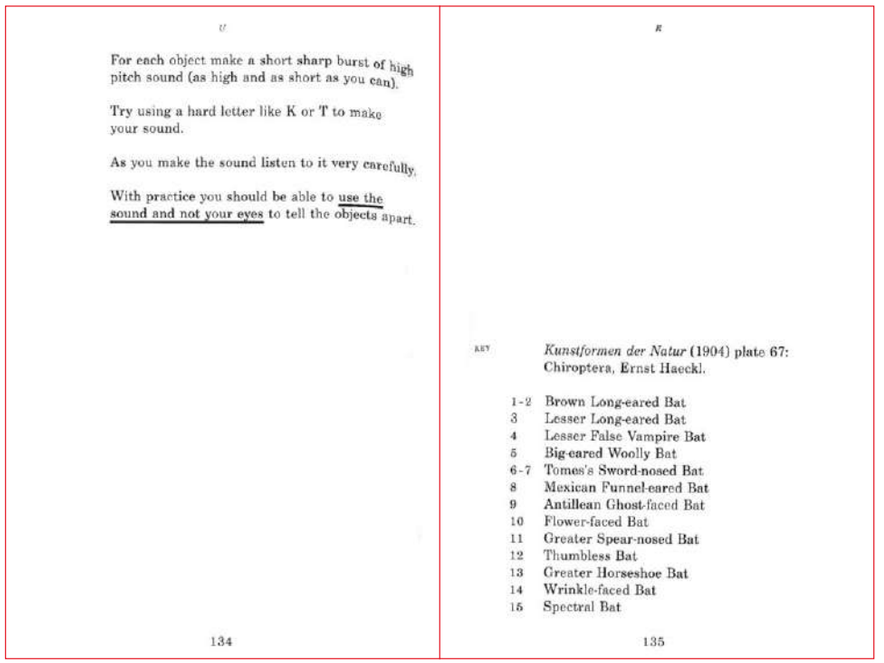
Ask a friend to hold these objects in front of your face (approx 10 cm away), one at a time.

A cushion

A tray (flat area facing)

A pen (hold horizontally)

Images see inner for key 133



U

For each object make a short sharp burst of high pitch sound (as high and as short as you can).

Try using a hard letter like K or T to make your sound.

As you make the sound listen to it very carefully.

With practice you should be able to use the sound and not your eyes to tell the objects apart.

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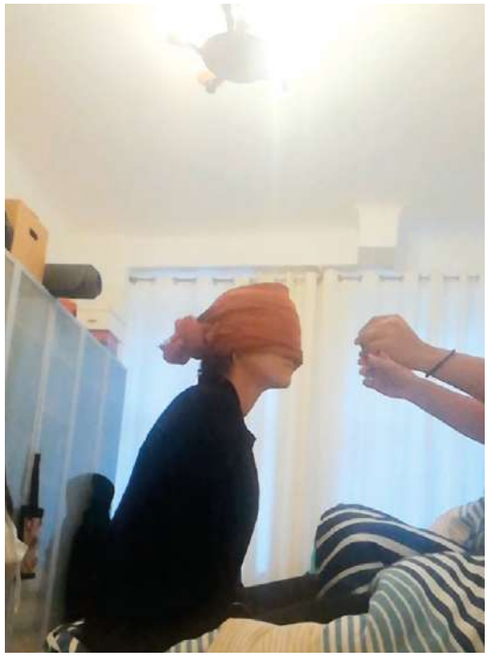
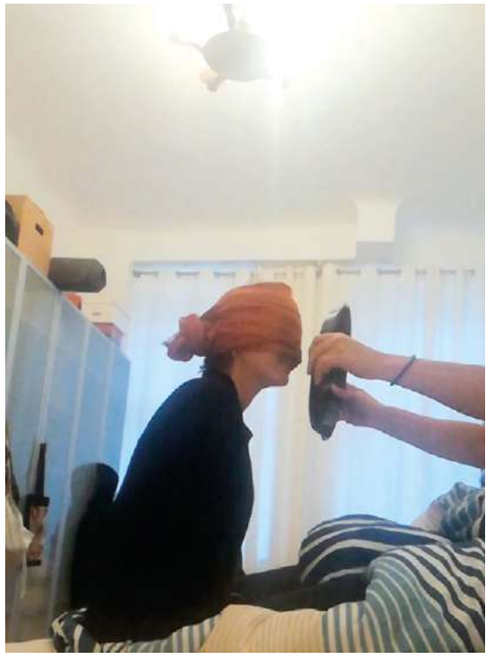
K

KEY *Kunstformen der Natur* (1904) plate 67: Chiroptera, Ernst Haeckl.

1-2 Brown Long-eared Bat
3 Lesser Long-eared Bat
4 Lesser False Vampire Bat
5 Big-eared Woolly Bat
6-7 Tomes's Sword-nosed Bat
8 Mexican Funnel-eared Bat
9 Antillean Ghost-faced Bat
10 Flower-faced Bat
11 Greater Spear-nosed Bat
12 Thumbless Bat
13 Greater Horseshoe Bat
14 Wrinkle-faced Bat
15 Spectral Bat

135





Fieldnotes, 4 January 2020
Location: my bedroom, Berlin

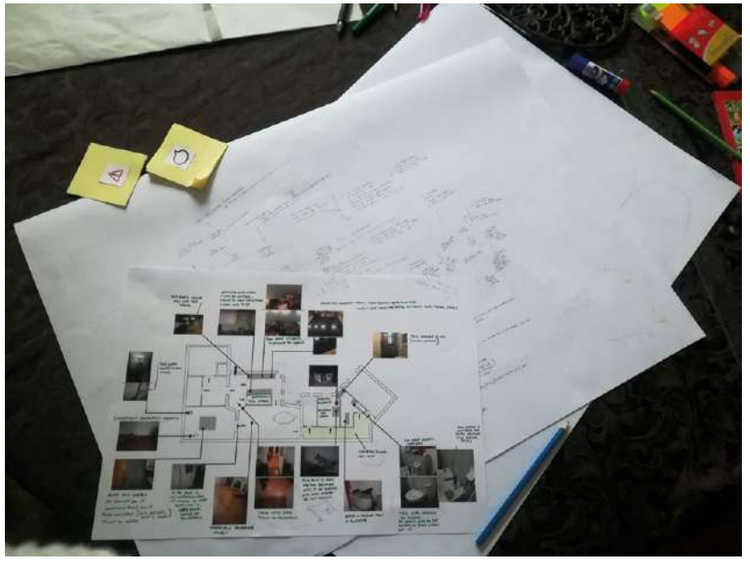
It should be done for more than 20 minutes to really make it work. At the beginning I wasn't able to tell any of the objects apart, although I was trying hard to focus on my sounds.
After the first attempts I discovered the trick. A cushion absorbs the sound (no echo, no vibration); a tray, especially a metal one, could even enhance the sound (some vibration; sound lasts a little longer); making a sound with a pen in front of my face it's like having no obstacle. The object is too small and if there's any difference in sound, it's really hard to notice it.

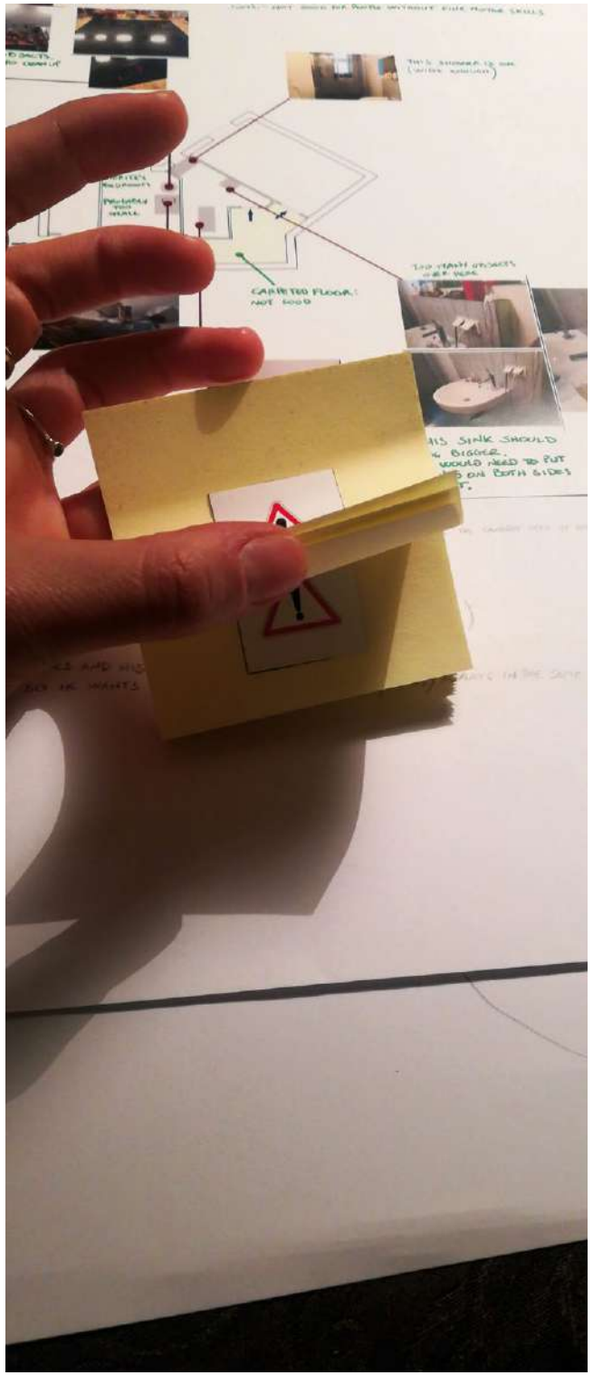
Once I could only distinguish it because I tried to compare that/its sound with others. Is it true? Or am I lying? maybe I was just lucky and it wasn't an actual intuition after all.

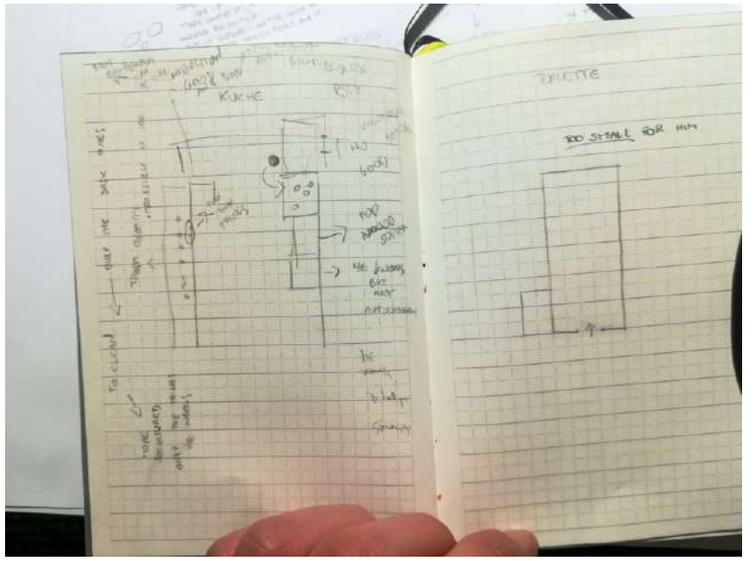
OPERATION 2

Thinking from (singular) uses. Generating affective encounters with Moritz's social and material spaces

The second operation involved an exploration of the way Moritz interacts with and navigates through space. The aim was not to design *for* him, but to observe and learn from his spatial practice, i.e. how he enabled certain spatial and relational arrangements, and how these arrangements influenced his surroundings. Hence, besides my direct relationship with him, the presence and help of his family members, who acted as epistemic partners, proved particularly relevant: compared to conventional service relationships, where designers call on relatives and ethnographers as information providers to offer design solutions, Susanne (Moritz's mother) and Julian (his brother) were rather collaborators. Because they were directly influenced by his spatial relationship arrangements, they did not speak on behalf of Moritz, but *from* their own direct, lively experience. They had to learn Moritz's spatial and relational arrangements and activate particular – material and behavioural – devices that facilitated and corresponded to them.
I started by recording the characteristics and uses of Susanne's apartment, where he lived for an extended period and often returns, in order to reconstruct ingrained habits and elicit more-than-verbal experiences. The space within a house or apartment is not akin to an Autocad layout or a render, where hypothetical users are either entirely absent or reduced to standardized figurines that can be downloaded from online catalogues. Instead, it constitutes a living fabric of complex and radically unique relationships and uses, and one must somehow become a part of these relationships to – at least provisionally – understand them.
Somewhat in line with Deligny, who, criticising the centrality of psychoanalysis and its reliance on language, would draw the movements that non-speaking autistic children traced on their walks in everyday activities (Deligny, 1979; Petrescu, 2007; Dosse, 2011), I also attempted to follow and learn from Moritz's movements and uses. Although Moritz actually spoke, mostly in German and a bit in English, the aim was to more-than-verbally explore his interactions with everyday spaces. As Gisbert Alemany, inspired by Ingold, suggests in her "experiments with the profession" (Gisbert Alemany, 2018, p. 263), I experimented with the "art of inquiry" (Ingold, 2013, p. 6). I placed myself at the center of the experience, rather than simply representing or describing it, and attempted to learn from the people, things, and spaces I worked with, reflecting on what my approaches and tools were doing in concrete situations, expanding and readapting them as I went. I showed photos, plans, and drawings to Susanne and Julian to initiate a conversation with them. At their request, I followed them as they moved from one room to another, taking notes – both written and in sketches – based on what they told me. I invited them to point out certain points of interest, such as particular objects and spaces that had proved problematic for Moritz or elicited specific memories. With an awareness of Moritz's perception and ways of moving, I then began to pay attention to these things during our interactions, documenting our encounters in text and sketches.




CARPETED FLOOR!
NOT GOOD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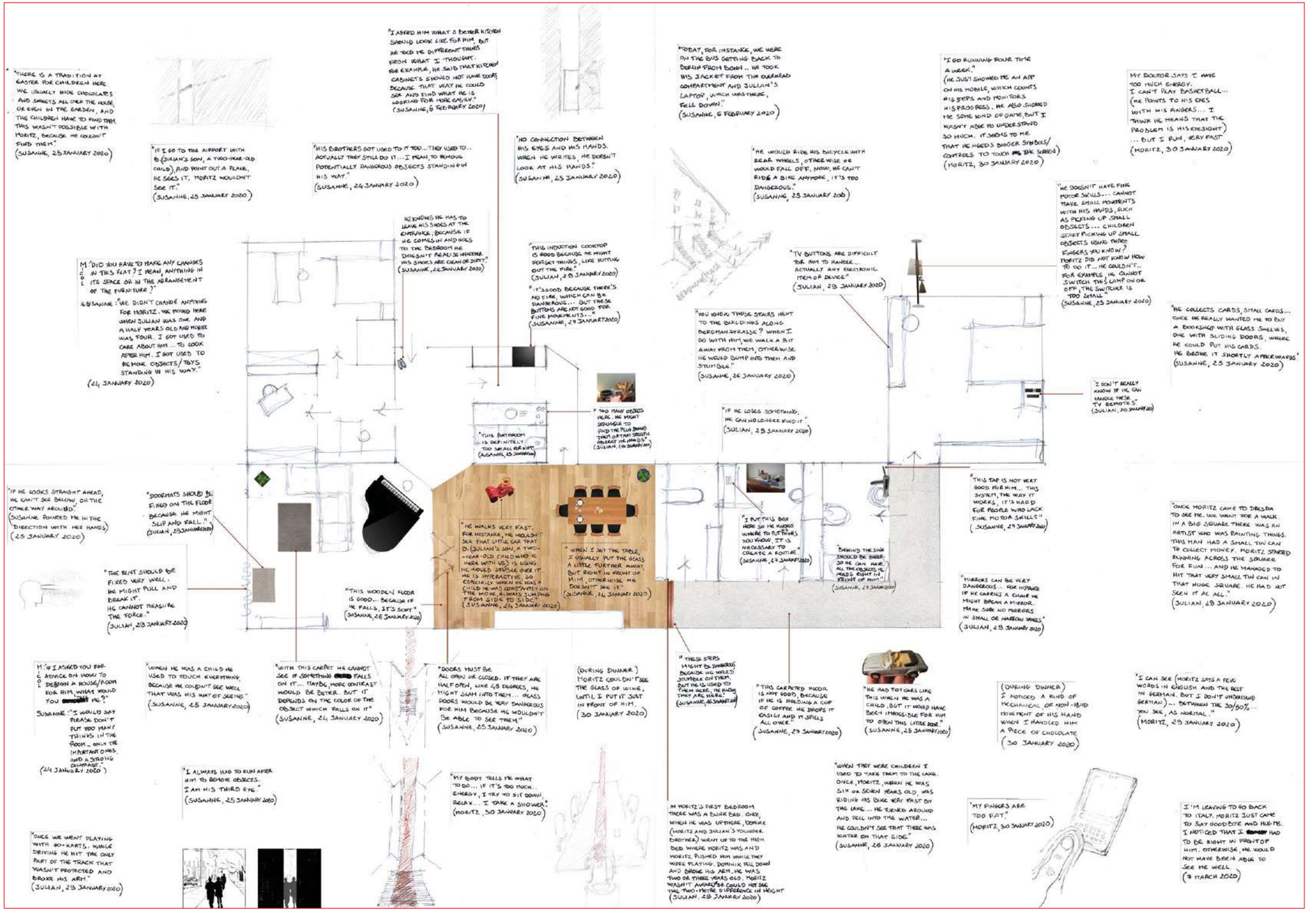
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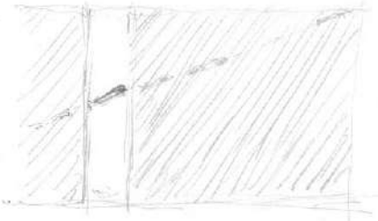

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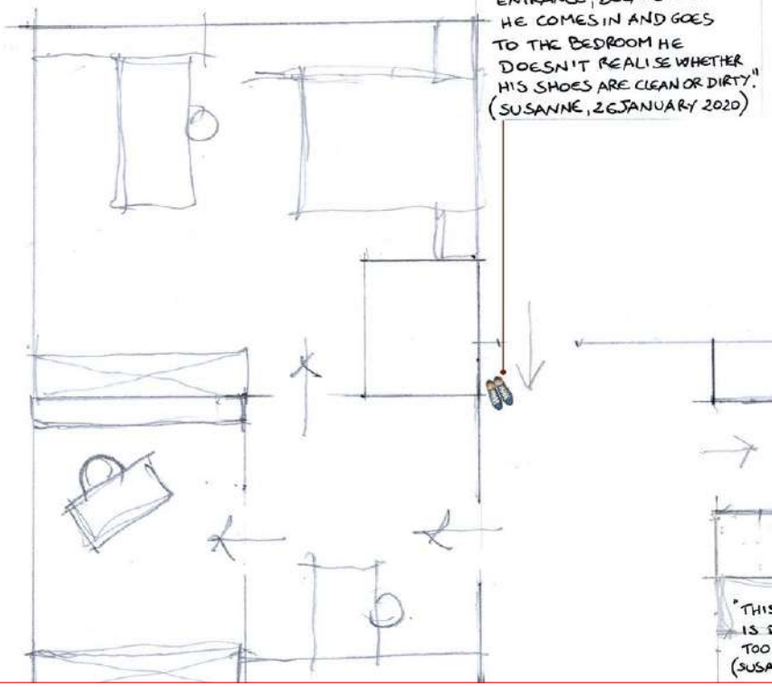

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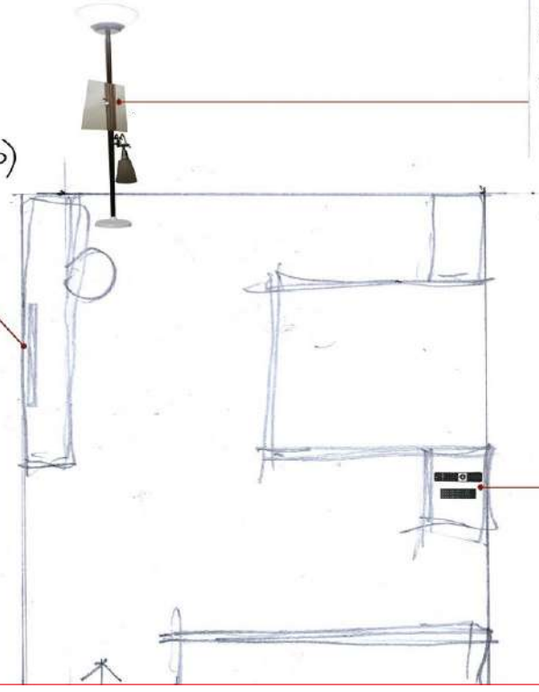

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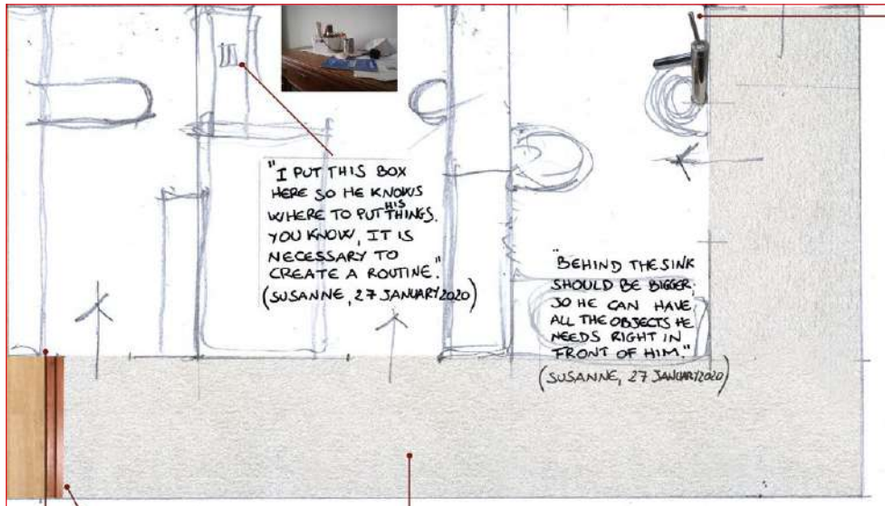

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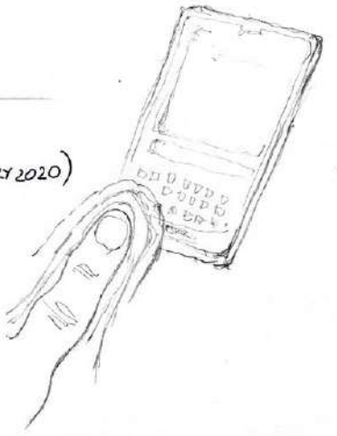

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(7 MARCH 2020)

OPERATION 3

Thinking from (multiple) singular uses.
Putting architecture tools, visual culture, and standards in crisis

After thoroughly investigating the uses of – and relationships with – the space of the house where Moritz resided for a long time, a next step was to extend this spatial analysis to the urban environment, prompting reflection the problems that would emerge. How does one navigate situations where an array of diverse needs and uses of space, sometimes conflicting, coexist? The focus on singular users and needs seems to clash with the need to make precise material choices in a public context. With these concerns in mind, Sánchez Criado and I sought the collaboration of another epistemic partner. This time, we invited Patrick Bieler, at the time PhD candidate at the Institute for European Ethnology of Humboldt-Universität zu Berlin, whose research investigates on how people with mental distress relate to social and material urban environments in everyday life. We specifically requested Bieler to guide us through a neighborhood in Berlin where he had conducted research, sharing stories of how various ethnographic counterparts experienced space in their daily lives. The idea was for me to act that day like a typical architect documenting a problem – carrying a map of the area, sketching, and taking pictures. The walk created an interesting frictional moment: whilst Patrick told stories to make us perceive the singularity of the ways of living and using spaces, I struggled to inscribe those stories with visual means. These stories described a complex topological spatiality, made up of singular experiences and emotions, which I was unable to account for with the tools I was used to working with. To say it otherwise, they proved hard to describe in the, rather neurotypical, *res extensa* of architectural practice. Furthermore, both during the walk and while taking a break at a nearby café, an extensive conversation unfolded in which we discussed how Patrick's ethnographic stories could be made into matter in approaching the design of these spaces.

How can one weave together these myriad experiences and unique needs, each so diverse and contrasting? What choices should be made when designing a space? Architects, or urban planners, are used to approaching this problem by uncritically applying rigid standards and regulations, offering a specific solution through a one-size-fits-all approach, which is hypothetically able to end any conflict. In doing so, however, not only are singularities erased, but bodies that do not fit those standards are excluded. In light of these concerns, we reflected on how guidelines and bullet points – that is, some of the tools through which architects, according to what emerged from our joint analysis, are used to approach neurodivergent people – can be relevant, when not used as normative standpoints, but as *middle-ground* approaches to conceptualising these singular spatialities, perhaps allowing urban designers to capture other forms of doing space for their projects. In other words, while standards tend to enforce exclusionary rigidity by prescribing a specific and fixed version of the world and its various users, guidelines, with their more flexible nature, offer the opportunity to compose these singular experiences without understanding them as already given. If enriched by individual, situated, and material experiences, guidelines can serve as effective tools for fostering sharing and exploring new common ground, where the *common* is always open and evolving.

Location of the walk:
Kiezingen (Unterstadt, Berlin)*
Participants:
Patrick Bieler (ethnographer)
Micol Rispoli (architect)
Tomás Sánchez Criado (ethnographer)
Meeting point: Markus Square
Date: 8 February 2020
Time: 10 am – 1 pm
Excerpts from the recorded conversation and Tomás Sánchez Criado's notes

(During the walk. Patrick talks and I interrupt him from time to time. Tomás takes notes on what he says and on our conversations)

P: some of my informants usually walk as close as possible to the buildings

M: Why?

P: because they feel more protected from the street and the traffic. They also prefer to sit with the buildings at their back

M: here?

P: not here, in some streets there are benches, I will show you later on

(Patrick tells some stories about his informants)

M: This is very interesting…anyway I would need more spatial details

P: What do you mean? What are you trying to do?

M: I'm trying to make some sketches, but you're telling me stories about how these people feel in different places around here… it's hard for me to grasp and sketch the spatial details from these stories

P: so how would you like me to tell them?

M: I don't know, I would need more information about specific places, details, spatial references…

(Tomás intervenes to show me on the map I brought with me where we are exactly, so that I can better orient myself)

P: I couldn't tell you exactly, I can't tell you precisely "they sit here, or they walk there"...

(we keep walking and Patrick keeps telling us his stories)

P: for example in this street some of my informants, some women, feel uncomfortable. They prefer not to go through here because the street is too narrow and there are these stands and cafes right on the street. They feel like they are being watched by large groups of Arab men sitting in the cafés outside

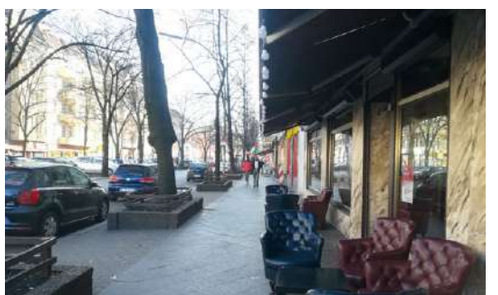
(...)

P: another informant, the bottle collector, comes here regularly (he indicates a café) because there are many bottles that people leave in these spaces (he indicates the spaces between the benches). People who frequent these bars and sit on these benches always leave their bottles

(I keep stopping him and asking him to point out spatial details. I don't know what notes to take, I don't know what to draw. I'm taking some pictures of the benches)

P: many of them feel intimidated by the rubbish (he points to a pile of rubbish)

(...)



P: one of my informants always carries her bicycle, she drags it by hand as a protective shield in the crowded streets...but another one prefers to walk in the crowded streets to feel more protected from the noise of the cars...

M: this is super interesting, everyone lives ad feels these places in completely different ways

P: yes, exactly, there isn't just one way, each of them does different things

(I take pictures of the street at random)

M: you know, I have no idea of what to focus on exactly, I don't know what notes to take, I mean, as an architect...

P: I think this is the problem with singular stories

P: here (we were inside a famous shopping mall in the neighbourhood), for example, she (one of his informants) would never go inside, it's too noisy...you see these escalators we just took? She told me she was afraid the floor would collapse under her feet

(...)

(we are approaching a bakery which is usually frequented by of one of his informants)

P: she sits outside, because inside it's too noisy and crowded

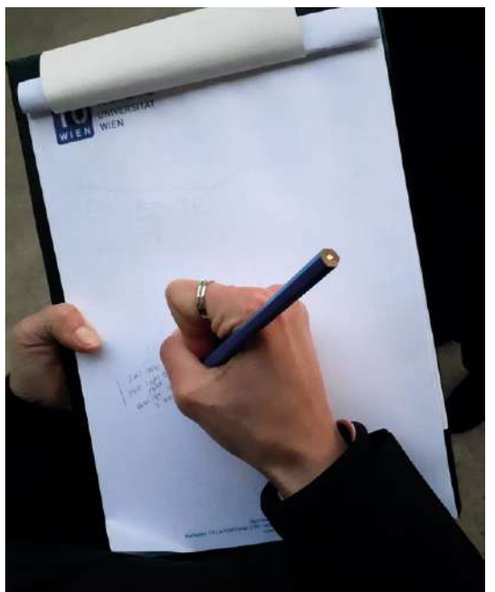
(We enter a café next to the bakery to take a break and sit at a table. Patrick keeps telling us his stories, I have stopped taking notes)

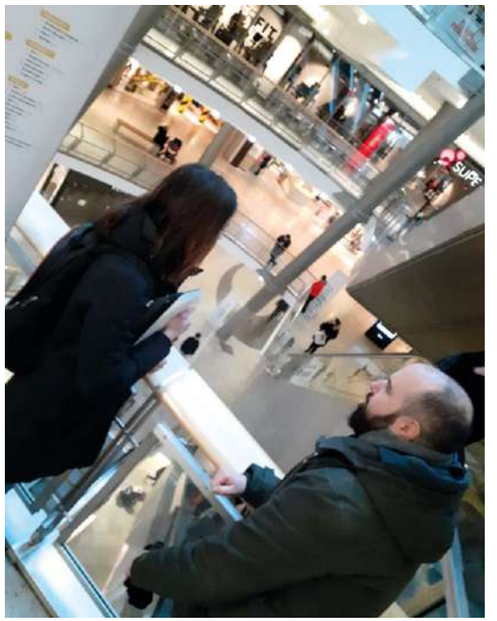
P: She (the same woman who frequents the bakery) would never come in here...during weekdays a lot of people come here to work with their laptops, they use this place as a kind of library, and they speak English and she doesn't, and she clearly notices this, and she says I'd never go there, simply because of this, she always goes to the bakery. The bakery, on the other hand, is frequented by locals, whom she meets every day and with whom she can converse, even briefly. Here you have also very selected kinds of music, in the other place they put radio music. For instance I have a fieldnote saying: once I went to the bakery with her and there was radio music playing and people would come in and talk about soccer, and then I came here to write my fieldnotes and they were playing this kind of Indian esoteric kind of music and it was exactly like she said, that everybody was speaking English, so she has good powers of observation

M: so she doesn't feel really comfortable in this neighbourhood...maybe because it has been gentrified for some years now, it became somehow cool and a lot of foreign people also came here to live

(...)

P: well, yes and no. She calls them "the English", she likes looking at people but she doesn't want to participate...she somewhat likes looking at people passing by and having fun. She likes it but at the same time it is a problem for her





(we step out of the cafè. Tomás proposes that we report on the experience and reflect on what has emerged from it)

T: it was a very short experience, anyway let's try to understand what came out of it. On the one hand, Patrick, you have been in a way creating some sort of a guided story-telling walk where you were showing sometimes conflating singular stories of different people... and then, Micol, at the very beginning you were obsessively trying to get to the spatial clues of these stories and you were also struggling with that, the walk sometimes was too fast with you not knowing how to collect anything from this

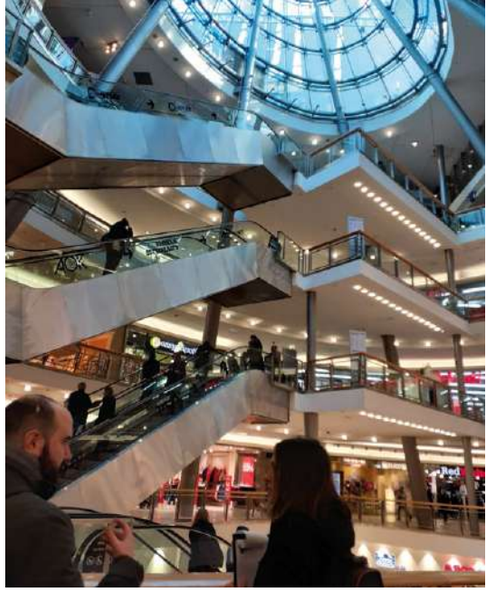
M: Yes, I didn't know how to represent this information. My tools, the way I was used to doing surveys, just didn't work. What is the spatial information here? There are too many stories, they're all different stories, and then they are all about feelings, sensations... peculiar perceptions of individual people. Patrick, in your stories you have used a myriad of psychological, phenomenological, subjective and atmospheric categories, which cannot be thought of easily in spatial terms or described in the res extensa. You know, in general architecture is obsessed with the material dimension...there is a difficulty in abolishing the subject/object binomial. And then what you told us are singular stories, particular trajectories that cannot be compiled one on top of the other...I mean, all of them were incredibly fascinating...but how do I choose one of many? Which story should I choose to design something?

T: it seems we are now trapped into the domain of the psychological, in the sense that it's all about the individual subject's features that we cannot access but that would be needed to be understood so that we could design a space...like each person is a world, right? and then, since each person is a world, how can you know?

M: yes, that's exactly what I was thinking, if each person is a world, how can I do something...maybe I should just stop...I mean, if each person is a world, how can I design or re-design? I think that in a way what you are saying, Patrick, is that we should be focusing more on people as such, being individuals with insurmountable or incommensurable needs or feelings...but anyway, maybe there are some patterns that could be taken into account...for instance, guidelines, principles, generic things, and that rather than being only about spatial design these patterns can also be about social design...they might be useful to think about how different people might live together in a space

P: I wouldn't design a place based on the needs or accounts of people with mental disabilities...I would definitely refrain from that, because it's not generalizable in any sense... what I find interesting is to have a space that allows very different usages and allows for interaction and meeting, and allows exclusions as well

M: you were telling us stories about how your informants live and feel in those particular spaces, so I, as an architect, was trying to focus on what they were struggling with, what



kind of spaces, objects, details, street furniture they would find most appropriate or not...and trying to collect this information in order to re-design a space by taking it into account...

T: so you were feeling the impulse to use these sort of data, so to speak...

M: Yes, or rather, this is what I am used to doing...information retrieval to know how and what to design

T: because this for you would be just adding difference, right? So one person, two people, three people...but all of them have differences, how can we compose them together and then...

M: yes, that is what I would do...or, rather, it's what I thought I would do...but, as I said, this is impossible

P: but this would mean...would you need more accounts of individuals using that same space?

M: but then how can I stop collecting data? If I keep collecting all the information about all these single worlds, how can I stop and start designing...that's why I thought that maybe some patterns are exactly what might be needed in this context. You know, Tomás and I, during a research we carried out, were paying some attention to the ways in which usually architects or urban designers approach these kinds of issues...most of the time, rather than heavily regulated spatial cues like 1.7 meters or like this kind of pavement or this kind of material, they propose very vague

guidelines, principles of design that would be extremely weird to consider without loads of interpretations...but at the same time I have the impression that you are suggesting that there is some interest in this kind of things because there is the appropriate level of generalization that would be needed not to get stuck into: “each person being an incommensurable being that has incommensurable needs that cannot be composed together”...

T: so then, there is some level of generalization either in between the ethnographic and urban design that is needed, right?

M: which can also be problematic somehow...

P: but why is it problematic for you?

M: I don’t know...at the same time I feel that somehow I would exclude many many voices, as it always happens with generalization

P: but why is that exclusion if it’s quite clear that you cannot design the neighborhood for everybody to use it in the perfect way...it is incommensurable...so why is it problematic to design something that necessarily excludes the one way or the other?

M: is it a matter of leaving a certain degree of openness?

T: yes, exactly...I mean, each person is bringing a very peculiar world, that first we don’t really know how to know...because for instance we have your accounts, Patrick, and your accounts are like secondary sources of experiences that maybe you recorded walking

along with them, they were the things that they said but, I mean, we don’t really know how it feels to be in that mall where we were before, climbing the escalator and thinking that the world is going to crumble under our feet...so perhaps that openness in design is needed, or an inscribed openness. Maybe instead of focusing on nitty-gritty material interventions here the task of any urban designer would be one of social composition...

M: I think that the guidelines, which during our analysis, Tomás, we criticised a little for their vague, too generic nature, could be re-evaluated... unlike rigid standards, which define the world materially in a precise way and exclude many subjects who have different ways of living, perhaps the guidelines provide us with that degree of openness we are talking about. But to prevent this level of generalisation from becoming problematic again, perhaps it would be useful to think about enriching these guidelines or patterns with many different singular stories, situated material interventions...no?

T: Yes, something that always remains open, on an appropriate and productive level of generalisation, which at the same time shows different singular situations, specific material interventions, which make it possible to compare, enrich, revise...I think this is a different idea of architecture and urban design...

*As in Patrick Bieler’s PhD thesis, the actual names of places have been intentionally replaced by pseudonyms. This is a common practice in ethnography based on ethical considerations to protect the identities of research subjects. For a detailed discussion of the meanings of the pseudonyms, see: Bieler, Patrick (2021): *BioÖkologien des Begegnens: Eine ethnografische Untersuchung der relationalen Konstitution psychischer Gesundheit und urbaner Umwelten.* Unveröffentlichte Dissertation, Berlin.

OPERATION 4

Retraining the body of the architect. Bodily interfaces to grasp Moritz's spatialities

Through everyday interactions in the apartment, recollections of stories from Susanne and Julian, as well as interactions with Moritz, I endeavored to somehow more-than-verbally come into the proximity of Moritz and become affected by his way of seeing, where the distinction between colors is less defined and his field of view narrower compared to mine; his way of hearing, where the contrast between different sounds also seems less pronounced than mine; his way of touching, where the medically labelled *lack of fine motor skills* makes his tactile experience different from mine. These explorations prompted us to ponder how to render these spatial singularities relevant to architects, enabling them to integrate them into any endeavor towards a possible more-than-verbal participatory practice. Drawing again on Latour and his example of the training of perfume makers with the *malettes à odeur* (2004), we started to discuss more specifically how to prototype material devices that would enable learning to be affected by Moritz's spatial practice. These devices would diverge from those typically found in traditional architectural visual culture, allowing me to explore space in ways that extend beyond neurotypical perception. Again, Latour (1986) emphasises that visual culture is not a metaphorical but a literal and material worldview[1], i.e. how a culture sees the world and makes it visible[2]. My sketchy attempts included binocular lenses that channel sight and diminish contrast, sound recordings – later combined and adjusted to soften the contrast between different sounds – and worker gloves to experience alternative tactile experiences. Anyway, these devices were in no way intended to promote and enable an empathetic approach, which would presuppose the accurate replication of real bodily characteristics through simulation, and the effortless access to the affective and sensory experiences of others, thereby reducing experience and the body itself to finite models (Kullman, 2016). Rather, starting from the assumption that our experience and perception of the world always pass through different – material and immaterial, simple or complex – mediators, which "shape what counts as 'real'" (Verbeek, 2006, quoted in Kullman, 2016), I intended to capture from – and attribute to – such devices a performative character. Rather than neutral tools, these glasses, sound, and gloves are to be understood as active and speculative tools. As Kullman would say, assuming that "access to others and the world is a fragile accomplishment" (2016, p. 77), they had both the purpose and effect of engaging me in "perceptual variation", i.e. expanding my modes of engagement with space, giving me the possibility to explore "different perceptual possibilities that a phenomenon can exhibit while viewed from different vantage points" (Selinger, 2006, p. 92, quoted in Kullman, 2016, p. 81)[3].

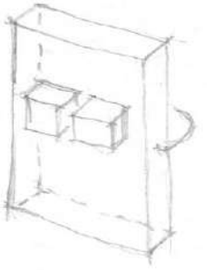
1. Here Latour cites Svetlana Alper's analysis of Dutch painting (1983). See also: Henderson, 1999.
2. What Ivins calls "the rationalization of sight" took place using very precise material instruments or techniques, such as Alberti's perspective scheme of 1435-1436, which "marked the effectual beginning of the substitution of visual for tactile space awareness, because its novel procedure of central projection and section not only automatically brought parallel lines together in logically determinable vanishing points, but provided a basis for the hitherto missing grammar or rules for securing both logical relations within the system of symbols employed and a reciprocal, or two-way, metrical correspondence between the pictorial representations of objects and the shapes of those objects as located in space" (Ivins, 1973, p. 10). This is also the case for descriptive geometry, which was created by Monge and developed "into a full-fledged mathematical discipline" (Ivins, 1973, p. 12) at the end of eighteen century (Ivins, 1973; Alberti, 1877; Alberti, 1565; Alberti, 1568; Alberti, 1868; Monge, 1798).
3. See also: Ihde, 2012.

[6 FEBRUARY 2020]

I BUILT A RUDIMENTARY OBJECT TO ALLOW ME TO "CHANNEL" MY VISION
I TOOK THE LID OF A SHOEBOX AND TIED A RUBBER BAND
TO IT TO MAKE A MASK.
THEN I CARVED A RECTANGULAR HOLE AT EYE LEVEL AND
INSERTED A PIECE OF SCRAP CARDBOARD, SHAPING IT TO
FIT THE PERIMETER OF THE CARVING AND CREATING AN
EXTRUSION TOWARDS THE OUTSIDE OF THE LID.
IT DOESN'T WORK.
THE VIEW ISN'T CHANNELLED ENOUGH.

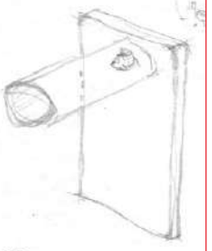
—

I GLUED A PIECE OF SCRAP CARDBOARD TO THE
CENTRE OF THE HOLE SO TO SPLIT IT IN TWO, AND
INSERTED SCRAP CARDS INTO THE TWO RESULTING
HOLES, SHAPING THEM AS I HAVE DONE BEFORE AND
CREATING TWO HOLLOWED-OUT PARALLELEPIPEDS OF SORT.



[8 FEBRUARY 2020]

I JUST SHOWED THE MASK TO SUSANNE. SHE TOLD ME
THAT MORITZ'S VISION IS NOT ONLY "CHANNELLED"
AND THEREFORE WITH A NARROW FIELD OF VIEW, BUT
ALSO MORE "BLURRED" THAN OURS. "LESS CONTRAST".
PERHAPS I COULD USE A FILTER TO DECREASE THE CONTRAST
BETWEEN DIFFERENT OBJECTS AND COLOURS...
SUSANNE PUT HER SUNGLASSES ON THE OPTICAL "CHANNELS"...
"MORE OR LESS LIKE THIS, BUT NOT QUITE"



1

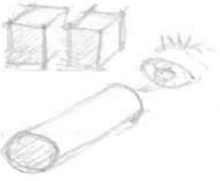
[10 FEBRUARY 2020]

I TRIED USING DIFFERENT TYPES OF FILTERS.
- TRACING PAPER
- PLASTIC BAGS (BLACK AND WHITE)
- NAYLON SOCKS
- A BLACK FABRIC

I TESTED THEM ON A CARDBOARD TUBE OF TOILET PAPER.
THEY DON'T WORK, THEY DON'T ALTER THE DIFFERENCE
BETWEEN OBJECTS AND COLOURS. THEY DON'T FLATTEN THE CONTRASTS.

— — — —

I TRIED PUTTING PIECES OF BROWN TAPE ON THE OPTICAL
CHANNELS... MAYBE IT WORKS.
I ALSO MADE A VIDEO WITH MY MOBILE PHONE, HOOKING
THE TOILET PAPER TUBE WITH THE FILTER ON THE MOBILE
PHONE'S CAMERA.
IT SEEMS TO WORK



SUSANNE THINKS IT WORKS AS WELL. SHE PUT ON THE MASK
AND TOLD ME THAT MAYBE IT WORKS, THE VISION IS MORE LIKE MORITZ'S.
"BUT NOW YOU SHOULD DO THE SAME FOR THE EARS, BECAUSE HE
CAN'T DISTINGUISH BETWEEN SOUNDS. HE DOESN'T KNOW WHICH
ONE IS MORE RELEVANT".

BUT THE MASK "DANCES" A BIT. IT'S NOT FIXED, AND I
CAN'T TURN MY HEAD DOWNWARDS.

2







[12 FEBRUARY 2020]

I TOOK THE MASK TO TOMÁS TO SHOW IT TO HIM.
HE SAYS HE FINDS IT OPPRESSIVE BECAUSE IT COVERS THE WHOLE FACE AND THE SMELL OF GLUE IS NAUSEATING.

[13 FEBRUARY 2020]

I HAVE TO EXPERIMENT WITH SOUND SPACE AS WELL. AND I ALSO NEED TO DO SOMETHING ABOUT HAND CONTRAST BECAUSE HE HAS DIFFICULTY IN HOLDING THINGS AND MANOEUVRING OR HANDLING SMALL THINGS. HE DOESN'T FEEL THE CONTRAST BETWEEN OBJECTS..

SOUND COLLECTION IN THE HOUSE AND AROUND THE CITY:

- DISHES
- COFFEE MACHINE
- TV SOUND
- THE SOUND OF KEYS ON MY MAC KEYBOARD
- MY SNEEZING AND COUGHING
- THE SOUND OF THE U-BAHN TRAIN
- AMBULANCE SIREN
- A JACKHAMMER
- PEOPLE TALKING
- MY FOOTSTEPS
- A DOOR SLAMMING
- THE INDUCTION COOKER

....

I PUT THEM ALL ON AUDACITY TO MODULATE THE FREQUENCY AND INTENSITY OF THE DIFFERENT SOUNDS.
I FLATTENED THEM, SET THEM ALL AT THE SAME FREQUENCY TO REMOVE THE CONTRASTS.
(I DON'T UNDERSTAND ANYTHING --- IT'S UNBEARABLE ---

3

[14 FEBRUARY 2020]

I WENT TO A SAFETY EQUIPMENT SHOP IN KREUZBERG, A SHOP THAT SELLS CLOTHING AND TOOLS AND SOME OTHER STUFF FOR MECHANICS, ELECTRICIANS AND OTHER PEOPLE WHO NEED THICK GLOVES TO AVOID INJURY.
I BOUGHT WORKER GLOVES TO LIMIT THE FINE MOVEMENTS OF MY HANDS.
I HAVE TRIED THEM, I CAN'T DO MANY THINGS ...
SUSANNE SUGGESTED I TRY TO COOK WITH THESE GLOVES, EVEN CUT VEGETABLES.
I TRIED TO DO IT, IT'S VERY DIFFICULT

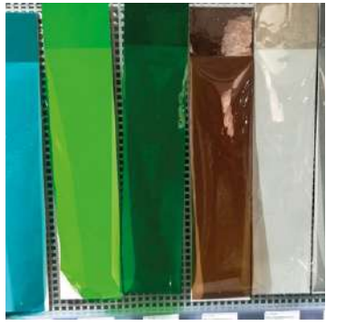
[15 FEBRUARY 2020]

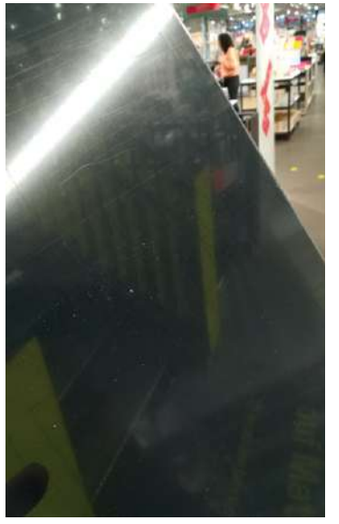
BACK TO WORK ON THE VISION TOOL/DEVICE. I HAVE TO MAKE SOMETHING THAT ONLY COVERS THE EYES, OTHERWISE IT'S OPPRESSIVE.
(I'M AT MODULOR, MAYBE I CAN FIND SOME USEFUL MATERIAL HERE).

- TRANSPARENT PROTECTIVE MASK FOR WELDING OPERATION (I HAVE TO REMOVE THE SINGLE LENS AND INSERT CYLINDERS TO CHANNEL THE SIGHT).
- BLACK CARDBOARD TO MAKE CYLINDERS

THERE IS NO PAPER OR OTHER MATERIAL (PLASTIC OR NOT) THAT IS USEFUL IN REDUCING CONTRAST.
I'VE TRIED DOZEN OF THEM.
THE MOST USEFUL ONE SEEMS TO BE BROWN TAPE, FOR COLOUR AND LEVEL OF TRANSPARENCY.

4





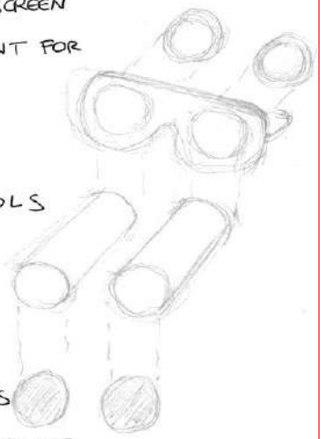
(AT HOME)

[CONSTRUCTION PHASE]

I TRIED TO CUT OR BREAK THE TRANSPARENT SCREEN OF THE MASK, BUT IT IS TOO HARD AND RESISTANT FOR THE CUTTER.

—

JULIAN HELPED ME IN HIS SHOP.
AFTER SEVERAL ATTEMPTS WITH DIFFERENT TOOLS HE MANAGED TO BREAK THE SCREEN.



—

THERE IS ONE PROBLEM.
IF I USE THE BROWN TAPE AS A FILTER, ITS ADHESIVE SIDE CORRESPONDS TO THE INNER SURFACE OF THE OPTICAL CHANNEL, OR LENS..
EVERY TIME A SPECK OF DUST OR SOME SCRAP FROM THE CARDS I'M USING FALLS OFF, IT STICKS TO THE ADHESIVE AND MAKES THE VIEW DIRTY.

MAYBE I NEED SOME TRANSPARENT PLASTIC DISCS...
(I CAN STICK THE ADHESIVE PART OF THE BROWN TAPE ON THEM)

— — —

IT DOESN'T WORK, AIR BUBBLES FORM WHEN I GLUE THE BROWN TAPE TO THE TRANSPARENT DISCS.
THE ANTI-CONTRAST FILTER DOESN'T WORK LIKE THAT.

[YOUTUBE TUTORIAL]

REMOVE THE GLUE FROM THE TAPE WITH SOAP AND WATER MIXTURE.
IT DOESN'T WORK.

5

I ALSO TRIED WITH OIL BUT IT DOESN'T WORK.
I CAN'T, I'LL LEAVE IT LIKE THAT.
(I HAD TO DISASSEMBLE AND ASSEMBLE THE VARIOUS PARTS SEVERAL TIMES, BECAUSE DUST OR REMNANTS OF PAPER EASILY ENTERED THE MASK AND SOILED THE FILTER).

—

JULIAN REMOVED THE WHOLE MASK SCREEN, I CAN'T SNAP IN THE CYLINDERS, THEIR DIAMETER IS SMALLER

I USED BLACK ELASTIC BANDS TO ATTACH THEM TO THE MASK AND STABILISE THEM.
I PUT THESE BANDS THROUGH SLITS THAT I CUT IN THE CYLINDERS.

I PUT THE MASK ON BUT THE TWO CYLINDERS DIVERGED OUTWARDS SO THAT THE MASK WOULD FIT MY FACE..
MORE BANDS TO MAKE THE CYLINDERS CONVERGE.

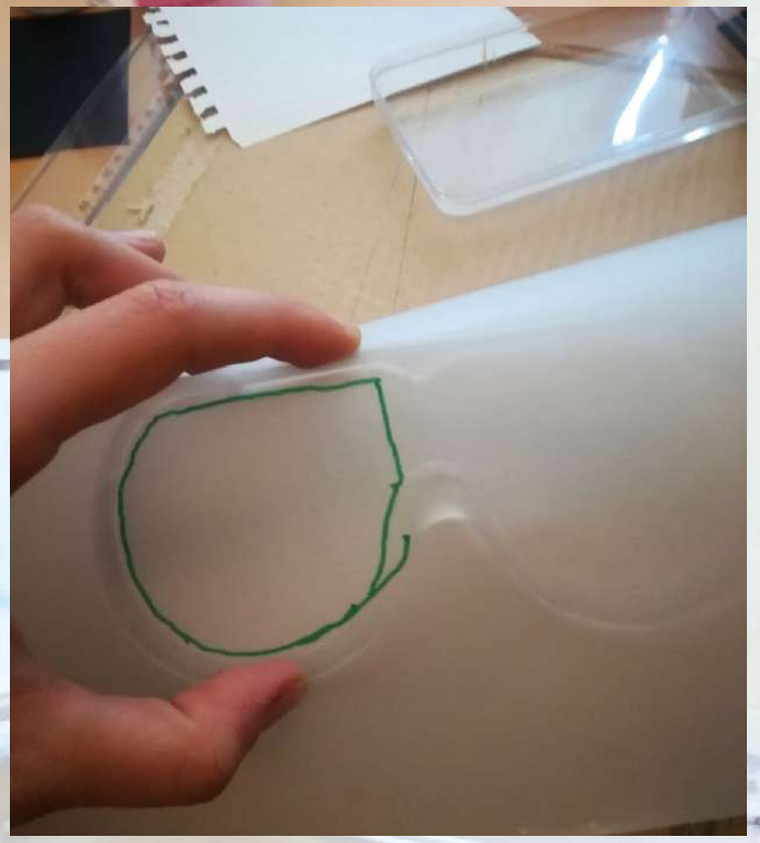
I PUT OTHER BLACK BANDS THROUGH OTHER SLITS THAT I CUT IN THE FRONT OF THE CYLINDERS, ON THE TWO OPPOSITE SIDES.
A RUBBER BAND FROM SIDE TO SIDE TO KEEP THEM IN A STRAIGHT LINE.

I PUT THE MASK ON BUT IT HURTS, THE TWO CYLINDERS PRESS TOO HARD ON MY FACE, IT FEELS LIKE TWO CIRCLES ARE CUTTING INTO MY SKIN.
I GLUED THE PERIMETER OF THE CYLINDERS WITH A SPONGE CLOTH I FOUND IN THE KITCHEN.

[16 FEBRUARY 2020]

I TRIED THIS HORRIBLE MASK AT HOME AND IN TEMPELHOF PARK.
IT SEEMS TO REDUCE CONTRASTS, BUT I DON'T KNOW

6




PROXXON

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* I should note here that I haven't always considered it relevant to include the original editions of the texts I consulted.

Micol Rispoli is an architect with a PhD in Philosophical Sciences from Università di Napoli Federico II. Working at the crossroads of architecture and science and technology studies (STS), she investigates the impact that the material-semiotic lines of insight of actor-network theory, feminist technoscience, and approaches to technical democracy can have for the transformation of design practice and its pedagogy. She currently works as a Postdoctoral Researcher at the Department of Environment, Land, and Infrastructure Engineering (DIATI) at Politecnico di Torino on a project that combines STS perspectives with multispecies ethnography in an attempt to move towards more-than-human design. Between 2019 and 2020, she spent a research period at the Stadtlabor for Multimodal Anthropology, a research platform at the Institute for European Ethnology at Humboldt-Universität zu Berlin. From 2022 to 2023, she taught at BAU, Centro Universitario de Artes y Diseño de Barcelona.

Questioning the architect-author paradigm and the rationalist ethos of modernity that still largely dominate design practice and Western academic curricula, this book examines various ways in which the democratization of design practice has been understood and approached. Contributions from Science and Technology Studies, particularly Actor-Network Theory, provide insights into design as a process involving both human and non-human entities. Rather than experts shaping passive worlds, architects become inquirers, participating in more-than-human design assemblies and co-articulating their existence. However, participating in these assemblies becomes more challenging when dealing with entities that have different capabilities and ways of articulating concerns and needs. One way to address this challenge could be for architects to design situations that enable them to learn to be affected by these entities, thereby putting conventional design practices and worldviews in crisis, and sensitizing themselves to practice their tricks of the trade otherwise. This way, they might open themselves to exploring new design pathways emerging from these encounters.

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