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Inviting atmospheres to the architecture table

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1. Building the Social

Within STS (Science, Technology and Society) and feminist studies of technoscience much has been discussed about the ways in which the social can be redefined by expanding it to more-than-humans, from an inclusive invitation to a parliament of things (Latour, 1993), to messier and more entangled modes of co-habitation (Haraway, 2003, 1991). In this context, this chapter asks if and how other disciplines, such as architecture in this case, can contribute to this debate by discussing an attempt to build the social from air. Architecture is a discipline that manifests expertise in managing inert more-than-humans while, at the same time, it is deeply intertwined with the social. The question I want to explore here concerns the ways in which architecture articulates this relationship. Can, for example, architecture invent, construct or design the social or is it 'just' its container with no agency? Moreover, can architecture, as a practice, *design* the socialities needed *for a good life* (e.g.: Braidotti, 2012)?

Architects have long thought about how to invent the social through buildings. There are, however, some problems with this approach. In order to unfold them let us take as a reference those utopian projects that intended to create socialist and communist societies, such as residential communities of the 19th century or communal housing at the beginning of the 20th. They assumed a direct causal relationship between spatial organization and the social, where a certain material configuration could enhance a specific human behaviour, and even construct complex social organizations such as socialism, for instance (e.g. Buchli, 1998). Crucially, however, both architecture and the social were conceived as static materials: architecture as that which concerned buildings as finished and stable entities, and the social as a unified and immutable set of social relations.

Studies of architecture have demonstrated that this causal and static way of inventing the social through buildings did not succeed; in part because it did not take into consideration the fluidity of the social (e.g. Guggenheim, 2014; Vanderburgh and Russell Ellis, 2001) and in part because it had a narrow understanding of what architecture is, limiting it to the built environment. So one way to move away from this framework is to reduce the expectations of architecture and shift from *constructing the social* to *facilitating socialities*. Another path is to learn about a more processual and experimental understanding of inventing socialities with/through buildings where architectural

practice can learn from STS and feminist research.

French sociologist of science and philosopher Bruno Latour (2005) developed the notion of 'sociotechnical assemblages' to highlight that things are not only a material assemblage, but are also composed of the social entities that use, produce, or represent them, as well as institutions, contracts, humans, more-than-humans, etc., distributed in space and time. Thinking about the built environment as a sociotechnical assemblage expands the amount of actors involved in what those buildings are, the social entities to which they are already connected, and necessarily implies associated temporalities. Furthermore, recent work in STS and inspired by ANT (Actor-Network Theory) provides accounts of material participation (Marres, 2012; Marres and Lezaun, 2011), that acknowledge the agency of the built environment i.e. what buildings can 'do' in relation to the social. In this view, things (and therefore buildings) acquire their agency and political capacities depending on how they are deployed, which implies that the socialities facilitated by buildings cannot be completely predetermined, by architecture design for instance, and are necessarily experimental.

In order to test this shift to the processual as well as architectural practice's ability to design socialities, in this chapter I propose to think and work with a dynamic and seemingly intangible material: air. Although ignored throughout architectural history (Banham, 1969) during the 1960's and 1970's there was a proliferation of inflatable structures that used air to explore the lightness, ephemerality, transparency and transportability of new plastics to propose new ways of living closer to the everyday, popular culture and political resistance (Dessauce, 1999; Topham, 2002). The project I discuss here, although sharing certain aesthetic qualities, was conceived differently. On the one hand, the Polivagina was not conceived as addressing air through its structural capacity, but on how its invisibility and dynamism destabilise architectural practice, requiring a transformation of methods, techniques, materials and social organizations. On the other hand, it acknowledges that the social is not the result of the inhabitation of inflatable structures; the air is already social. German philosoper and cultural theorist Peter Sloterdijk in his work on social foams (2005) proposes that sociality is not only about human exchanges of information (Wakeford, 2011), but is a foam that includes humans, structures, and the air and climate that brings them together. Then, taking the air into account in architecture shifts the attention beyond boundaries, such as walls and roofs, to what is in between them, working with humidity, pressure, smell, toxicity, and breath.

However, when Sloterdijk discusses architecture he makes a direct translation of foam to physical enclosures, where architecture becomes a set of containers at different scales, from the cell to the

urban. In this direct translation three potentials of his specific proposal of how humans and more-than-humans are brought together are lost. Firstly, the atmospheres created by these architectures are hardly described, and so their involvement in the construction of socialities cannot be traced. Secondly, Sloterdijk focuses on architectural objects as finished and stable entities, and has little appreciation of the production of architecture itself as a space where socialities are generated. And lastly, the social effects of buildings are described in generic and representational terms. For example, Sloterdijk describes the apartment as a symbol of society's individualism, which is not very helpful in understanding the relationships between material assemblages and particular practices. In order to test the potentials of Sloterdijk's conceptual proposal this chapter addresses these absences by making three moves. First, instead of using Sloterdijk's metaphorical reading of architecture as an enclosure, it uses his notion of 'air design' (2005: 140) to think about architecture not simply as envelopes for climate control, but as the actual design of atmospheres where the air is not only a conditioner for well-being but also a construction material and a material for constructing certain modes of sociality. Second, it looks at the process of architectural design and construction as its main space of inquiry for the design of socialities. Finally, the chapter proposes a conceptual framework to describe (or sense) the after-effects of construction: the socialities that emerge during the inhabitation of an atmospheric space, which are spontaneous, fragile and in constant transformation.

What we gain shifting from architecture as objects to atmospheres (or atmospheric assemblages) is twofold. On the one hand, it destabilizes conventional ways of practising architecture, which, as when infrastructures break, makes visible their capacities and controversies (Star, 1999). Including air as a construction material and as an object of design transforms design from an attempt to control the capacities of a future building and regulate its inhabitants, to an experimental set-up that embraces uncertainty. Design, here, is no longer about deciding how to create a shape and assemble components, but rather it is conceived as a practice concerned with how to design the construction process as an experiment. On the other hand, it opens up spaces for experimenting with the design of socialities, which do not necessarily take place only after the project is finished, but which are in permanent development and transformation. As such, 'doing architecture' is no longer a process that ends with the construction of a building, but a constant re-assembly of materials, humans, ideas, and so on (Guggenheim 2009, Yaneva 2009). In other words, architecture is viewed as a continual three-dimensional material invention of the social. This approach, drawing on STS and Sloterdijk, can begin to describe how the social can be (in part) designed with matter and atmospheres.

2. Constructing with helium and air.

This speculative proposal is part of an on-going practice-based research project that will be illustrated in narrative and visual means through the The installation, The Polivagina of Fan Riots (Polivagina).[1] The project was designed by C+arquitectos, office directed by the author of this article, for the art event Fan Riots curated by Ivan Lopez Munuera for the SOS4.8 music festival, in Murcia[2]. The Polivagina became an exploration in how to take seriously the invitation of (atmospheric) more-than-humans to architecture, taking in this case air and helium as the main materials for construction. This decision was made as an intellectual challenge, but also because it helped to respond to many of the demands of the curator, the existing building, regulations or climate; like the need to completely transform a 700m2 space that could not be touched[3], to host art installations, performances and round-tables, to 'attract' party-goers whose main interest when in a festival may not be art, to deal with an extremely limited budget, with two set-up days and five hours to dismantle. These conditions, seeming almost contradictory, could only be brought together by means of a light structure or some sort of inflatable, but this would have driven the project over budget. So, we asked ourselves the following questions: "Does air design necessarily imply the creation of a controlled envelope (as those referred to by Sloterdijk)? What are the limits of atmospheres? Do they need continuous physical boundaries?"

Figure 1: Helium bottles used to inflate the balloons.

[1] The name Polivagina was given alluding to Pussy Riots, but also in reference to the reformulation of the idea of the vagina as a contested space developed by feminists in the '70s (see Munuera, 2014).
[2] It was designed at C+arquitectos by Nerea Calvillo with Marina Fernandez, and built with a group of students from Alicante University architecture school at a workshop directed by Miguel Mesa del Castillo.
[3] This is how "flexible" buildings were conceived and built in the 90's.

Due to all these constraints we invited helium, one of the gases with lifting capacities that compose the air, as our main guest, and contained it in an ordinary object: a polyamide balloon. This invitation was not a peaceful one, as helium was brought in gas bottles and forced with pressure into the balloons. Yet, it was only when enclosed when it could perform its structural capacity. Even when enclosed, compared with bricks, stone or concrete, gases – and in this case helium – have very different properties: they are gaseous; they have fluidity and can move, change, and react. Gases are, by nature, volatile, and for that reason difficult to control and architects, typically trained in mechanics, rather than in thermodynamics, are in most cases not prepared nor equipped for dealing with their properties. This, of course, does not mean that there are no previous references or existing centres of expertise, as the inflatable projects in architecture, arts and industry mentioned above show, architects have developed techniques to keep large membranes inflated. Polivagina, however, was a permeable membrane composed by micro inflated units rather than a capsule filled with structural conditioned air. The balloons-as-containers used in Polivagina therefore added an extra dimension of complexity and technical difficulty. As balloons are not used in architectural construction, manufacturers do not provide the required technical specifications stating how they perform (how much they lift, for example), there are no building codes or regulations covering their usage, and there is little or no expertise in how to assemble balloons in such circumstances.

Pushed by these uncertainties we framed the project as a *cosmopolitical experiment* (Hinchliffe et al., 2003), in order to explore other ways of knowing that may enable a different composition of the world. For this purpose, we wondered how we could bring those invisible agents to the project, in the same way as Hinchliffe et al. had to figure out how to encourage water voles to inhabit their urban site. We did so by taking helium's agency into account in material terms, learning about its materiality performance by engaging with the small differences of the gas' properties and attributes, because "this openness to difference, which is borne out of a looser kind of sense, a knowing around rather than a knowledge of, is a vital means to allow for nonhuman knowleageabilities" (Hinchliffe et al., 2003: 653). Given this, we collected stories, experiences, and expertise about helium from domains outside architectural construction, such as experts in corporate conference design and decoration, or drawing on our own experiences of childhood birthday parties or wedding catalogues. Having collated this knowledge, we then tested a number of small prototypes at home, counting weights, lifting times, trying out ways of sticking, attaching, gluing or tying them together; while beginning to understand how to attune three interrelated and processual aspects of aerostatic things: envelopment, inflation and buoyancy (McCormack, 2009). Attunement was gradually achieved as the architects became more sensitive to very small changes in the quantity of helium injected when feeling the tension of the stretching polyamide, or to the unexpected choreography

that the balloons initiated in response to subtle currents of breeze through, for example, an open door.

And yet, instead of trying to limit the balloons' capacities, we aimed to explore and exploit these: to create more entanglements, more means of addressing this gas, multiplying the agents involved not only to humans, like many festival volunteers who joined the construction, but also to other gases. Once on site we had to invite naturally occurring air to fill the balloons. Because air is heavier than helium, it could counteract the unpredictably strong lifting capacity of helium, in a dialogue where we, humans, became only mediators. The question now is whether these encounters with non-humans gave rise to new relations and modes of becoming between humans and more-than-humans. By observing what occurred in the design and construction process it could be argued that various changes occurred in how architecture is practised. Furthermore, the design process also gave rise to outcomes, or desired socialities, imagined and anticipated by the architects, whilst other socialites emerged unexpectedly.

3. Effects in the making of architecture

The first effect of taking atmospheric more-than-human agency into account is that it requires a conceptual and practical change in what architectural design means. Instead of being a process that defines how things get together prior to construction (or even during construction), taking the air into account forces the whole process to become an experimental one. The object of design is the experiment itself and no longer a formal configuration. Instead of having to define every construction detail (which is the tendency towards which architectural practice keeps moving), what has to be defined are the conditions of experimentation, moving from drawings to protocols, a similar shift to that of John Cage and his contemporaries in music in the 70s. In the Polivagina the design of the experimental setting implied the definition of fixed elements (a number of balloon arches) that meant random filling, distribution of time, labour and learning processes for the students with whom we built the installation, and the acceptance of failure, even though stressful and painful, as part of the process. This move towards the design of an experimental setting demands a redefinition of what control means in design, and pushes to deal with uncertainty, making design a performative and emergent practice that blurs the limits between design and construction by way of substituting drawings and models by embodied movements in space.

Figure 2: Celebration of the construction of the first arch of the structure.

New socialities between humans emerged during the construction process. While designing the experimental setting, helium's unexpectedly strong lifting capacity destroyed our dome-like assemblages every night. Due to time constraints and our inability to govern the balloons, the social organization of the team had to be adjusted and a redistribution of power and decision-making took place. Architects were no longer the ones explaining what and how to build, not even coordinating tasks. The group dissolved into small self-organized and ever changing experimentation groups who would make decisions and share their findings on their own.

Figure 3: Assembling the different domes.

And yet although it may resonate with practices of collaborative design, participatory design or co-design, this architectural engagement was a different process: neither was there a shared understanding among the various stakeholders of what was taking place (e.g. Kvan, 2000), nor was there an awareness of the organizational contexts in which this form of cooperative design (e.g. Suchman et al., 2003) was enacted. Furthermore, neither were we designing with future users in mind, as in co-design or participatory design (e.g. Sanders and Stappers, 2008; Wilkie, 2011). In this cosmopolitical experiment decisions were not negotiated or agreed upon. It became a distributed, untraceable decision making process, with no time for agreements or discussions, and which included aggressive moments, tears and a lot of stress. The division of labour hierarchies between designers and producers dissolved and as there were no experts since those involved acquired appropriate knowledge, skills and experience through the process. Arguably, and if we think of this project in terms of involvement-in-design and human/more-than-human participation, we in fact co-designed *with* helium and air, by letting them speak as 'we' collectively adapted to one another.

Figure 4: Balloon assembling process.

The fact that the team became a group of ‘makers’ as well as mediators with the air affected not only the social structure of construction but also the construction technique itself. Instead of hitting, breaking and assembling materials with tools, the (human) body became the main instrument to build with through embodied practices of touching, holding, catching, lifting, hugging, and so on, with the help of domestic implements such as scissors, tape or string. If “the materiality of things becoming lighter than air is generative of distinctive modes of experiencing – or sensing – aerostatic space (McCormack, 2009, p. 27) relates to movement and a privileged point of view (Adey, 2010; McCormack, 2009), the sensing experience of being *with* air was a more intimate, non-representational and an embodied one. Echoing the specific movements that early 20th century skyscraper construction workers developed in order to construct when hanging in the air (McCormack, 2015a), we developed our own movements, not for being *in* the air, but for being *with* air: holding it with our arms, pushing it with our knees, displacing it with our chest. Practices of material assemblage were substituted by practices of soft material care.

Figure 5: Practices of embodied material care.

In this context, human bodies, as Hinchliffe et. al. (2003) propose in their cosmopolitical experiment, have to learn to be affected (Latour, 2004) by gases in order to become experimental instruments trained to measure, for instance, how much a 45cm balloon lifts depending on its shape, in a similar fashion as the bodies of the chemists of the 19th century became epistemic instruments that provided specific types of knowledge (Roberts, 1995). Indeed, since strength or agility, normally needed in other types of construction were not required, other types of bodies could participate in the assemblage of the installation, redistributing who can participate in a construction process.

The cosmopolitical experiment also had other effects, like expanding the agents involved and redistributing agencies and power relations, creating new socialities through this expansion. Again, the elevating force of helium, its resistance to being confined and its overall recalcitrance (Tironi and Calvillo, 2016), caused the biggest conflicts and controversies. The 90cm balloons were, very slowly, pulling the whole structure up, until the highest parts of the domes reached the point where they triggered a laser detector in the ceiling, activating the fire alarm. This incident, three hours before opening, initiated a whole institutional conflict, bringing together the building security guards, institutional representatives of the cultural complex, the 90cm balloons, the festival promoters, and ourselves. The city council technicians proposed technical solutions to lower the structure, but the balloons had won the equilibrium and we had lost control over them, so there was

no way of bringing them down without dismantling the overall structure. Another option, bursting the bigger balloons, although acceptable from our side, was rejected by the promoters of the festival, who prioritized the aesthetics and decided to push for an administrative solution. So after two hours of phone calls and meetings the issue scaled to the municipal authorities, and even to the regional ones, confronting security, aesthetics, budget and time.

Figure 6: Firefighters who replaced the smoke detectors and, who, in the process, took on the role of supervising the exhibition as well as taking selfies.

The solution adopted was to substitute the laser smoke detector by a whole crew of fire-fighters, who became the main supervisors of the building, the event and the installation. Interestingly enough, this did not only redistribute power relations, as now the fire-fighters could decide what would take place or not, but the air transformed the newly invested representatives of control and power into the public themselves, where fire-fighters were taking selfies, listening to the round-tables and watching the video art pieces themselves. So conflict can cause other forms of temporary sociality to emerge, expanding the agents involved by making people from different contexts come together and discuss issues such as public events regulations, institutional security protocols, fire-fighter budgets, etc. Throughout this process redistributions may take place and temporary publics constituted.

4. The after-effects: Atmospheric attunements.

In the above, we have discussed how the mediation between humans and more-than-humans through atmospheric elements in architecture induces the design and construction process into a cosmopolitical experiment, which has effects on how design is practised, and facilitates the design or emergence of certain socialities between humans and more-than-humans. Nevertheless, the design of socialities does not end in the production process, as the 'inhabitation' of the project also included the production of sociality. As such, we now turn to how the installation, once built and installed, had the capacity of stimulating and facilitating socialities. To do this we will look at the installation as an experimental device in itself, "because experimental devices are not instruments for normative intervention, they have important capacities in and of themselves" (Marres, 2012: 3).

To detect these capacities and following anthropologist Kathleen Stewart (Stewart, 2011) we can consider the socialities produced by Polivagina as *atmospheric attunements*. Kathleen Stewart's concept is useful because it accounts for temporary, sometimes conscious, and sometimes unconscious adaptations and transmissions of effects, not only between humans, but also with non-humans: "an intimate compositional process of dwelling in spaces that bears gestures, gestates, worlds. Here, things matter not because how they are represented, but because they have qualities, rhythms, forces, relations and movements" (*idem*: 445). Stewart's concept is also interesting because not only does it account for the production of affects, but it is some sort of mattering or worldmaking that involves the air, the space, humans and so on, and could be interpreted as socialities in a spatial foam.

Figure 7: Atmospheric attunements inside the Polivagina during a performance.

Within the Polivagina, due to the unstable equilibrium achieved with air and helium, the skin moved, crashed, unstitched; it was alive, producing strangeness and fragility, constructing an atmosphere of attention and a collective sensation of participating in something ephemeral or not fully finished, a space in transition, holding the tension of a structure just about to be disassembled on its own in front of the eyes of the spectators. Yet this collective and indeterminate attunement (Anderson, 2009) with gases is precisely why "proliferating little worlds of all kinds that form up around conditions, practices, manias, pacings, scenes of absorption, styles of living, forms of attachment (or detachment), identities, and imaginaries" (*ibid*: 446) could be sensed.

My attention to the liveliness and world-making capacity of the air has, until now, left another materiality unattended: the balloon as a *device for making atmospheric things* (McCormack, 2015b), and more specifically, its polyamide. Here, I want to argue that an attunement to this light film with mechanical strength, barrier properties and reflective silver finish facilitated the

constitution of publics around specific issues. Evoking Kathleen Stewart's account of the different ways in which the colour red played a role in the material, affective and symbolic New England (Stewart, 2015), the reflectivity of the silver-coloured material multiplied like a kaleidoscope throughout the space. It diffused its limits, reflected light, hid furtive hugs, distorted smiling faces; it multiplied Michael Jackson's fans to infinity, reminded someone of Warhol's Factory, made us desire Warhol's Silver Clouds – the unexpected effects of this silver-coloured material. People who attend music festivals mostly go to listen to concerts, and yet this colour seemed to attract the music fans. The installation was identified as a 'cool' selfie location for self-representation and collectiveness, spreading word of mouth and bringing people in. Visitors took pictures of themselves in different locations, identifying preferred spots due to the intensity and colour of the light, the openness of the mesh or the accessibility to take the picture. This effect was designed and planned, as a sort of *practical aesthetics*, "engaged in thinking about and devising modes of sensory and affective apprehensions of the world" (McCormack, 2015b, p. 105), and as "possible sites for experimenting with experience" (ibid, 106). The intention was that, once inside, visitors would engage with the art pieces and join round-tables and performances. All of which happened. Visitors who had never been exposed to such contexts not only listened, but also engaged in the debate. The strangeness of the space and the fact that they inhabited it in their own ways empowered them, as one of the visitors mentioned, to ask, question and speak their minds. So the visitors, including festival-goers as well as cleaners, firemen, technicians or guards, thanks to some extent to the polyamide, engaged with various issues including, but not limited to fan emancipation and queer politics, producing "new collaborative spacetimes of experimental togetherness, new forms of association" (ibid. 105). However, and it is important to point out, this did not result in the constitution of a new parliament. This attunement took place at specific moments, without possible control, and through temporary and fragile engagements.

Figure 8: Visitors attuning to the balloons and art installations.

And yet other than human publics participated in Fan Riots. It can be argued that part of the success of this emergence of publics was in opening architecture to the ordinary and the banal. First of all, through the presence of the balloons (see Topham, 2002), but playfulness also entered with people's transitions through the space, transforming the way in which art is usually engaged with: dancing in front of art pieces or kissing while watching videos about transgender experiences. Playful practices became re-contextualized, hybridizing institutionalised formats of cultural exchange. These hybridization practices also took place the other way around: the displacement of the installation to the main scenarios produced the emergence of creative practices. While dismantling the installation, the balloons recovered their usual condition and were taken outside tied to a string and given out to the passionate fans dancing at the main stage. Unexpected (for an architectural installation) atmospheric attunements emerged here: 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.

Figure 9: Music fan posing with balloons repurposed as a dress.

5. Conclusions

Working with air is an exercise in empirical speculation where STS is put to work in architectural practice and which involves developing a more processual way of understanding how socialities can be designed *with* buildings. By focusing on the material, technical and symbolic properties of gases, the design and construction process of the Polivagina and the socialities that emerged during its use, we have been able to identify how architecture is not only about buildings, but about all the various processes that constitute sociotechnical assemblages in permanent transformation, as well as what the installation could do in relation to the social. The movement, instability and flow of the air distributed hierarchical roles and created a collective affect of attention. The lightness of air enabled other bodies (such as weak bodies) and practices to participate in the construction. The lack of history or technical specifications of balloons transformed the design process into a laboratory. It also enabled other publics to participate through a collective affect of celebration, introducing banality and the everyday into artistic and academic contexts.[4] Last, but not least, the resistance of helium to be confined, or domesticated, brought about a controversy that increased the amount of actors involved in the process, from a design and production context to institutional and political ones.

All these socialities were not facilitated by a specific shape or spatial organisation, as other

[4] Which will demand, in fact, other ethical and aesthetic modes of evaluating architecture.

architectural projects have attempted, but by working with atmospheric materials. Even though in accounts of material participation it has been demonstrated how more-than-humans do not have political and social agency inherent to themselves but that it is acquired in specific settings (Marres 2012), as we have seen in the case of the Polivagina, the agency of these gases became very active precisely because they were a dynamic, rare and unexpected guest.

As mentioned in the introduction, the advantage of shifting from architecture as an object to dynamic atmospheres is twofold. It destabilizes architectural practices, transforming them into cosmopolitical experiments. For some time, scholars interested in ANT have taken an experimental approach to buildings (Guggenheim, 2009; Marres, 2012). This chapter, however, exemplifies that atmospheric approaches to experimentation take buildings-in-the-making into consideration and acknowledge the lack of order in which ideas, materials and actors are assembled. In the case of Polivagina the agency of air demands not only different recombinations of matter, humans and ideas, but different practices to do so. Thus, it is not about changing the order of materials (as in other accounts of architecture), nor the order in which humans participate (as in practices of co-design, where users also participate in the initial design phases), but about finding new practices of construction and inhabitation, such as horizontal and self-organized construction teams or playful spectatorship. And yet this experimentation does not acquire its political capacities through variation, as Marres proposes for demonstrational devices (2012), but by embracing uncertainty, which has strong effects in architectural practice: where the project cannot be predicted or previously defined, but is performative and non-representational.

The second advantage is that it opens up spaces for designing socialities (e.g. design and construction phases), and other types of affects with material entities (like atmospheric attunements). But most importantly, it offers the possibility of designing desirable socialities with political and/or transformative capacities. Building with air calls for feminist or queer construction practices where anybody can contribute and practices of assembly are substituted by practices of care. To better understand this relationship between more-than-humans and socialities I would like to propose one last speculation: that the cosmopolitical experiment may be better read as a process of conviviality, as a temporary co-habitation with more-than-humans. What if through Haraway's Companion Species manifesto (2003), we imagine that helium and air became our companion species?

Gases are not dogs or any other conventional companion species, but thinking about them from Haraway's framework may help us engage with two propositions. The first one is to think of our

relationship with the air – a composition of gases and particles (and any other material, for that matter) – not as something out there to be managed, but as material with which we have intimate bodily and affective attunements (Choy, 2010; Shapiro, 2015). The second one is to see how in architecture there can be other ways of engaging with more-than-humans other than control and domestication, but through processes of mutual training and learning to be affected, where the value of the interaction does not depend on an economy of affection. Because as Haraway claims in her dog-human co-habitation, "dog's value and life does not depend on the human's perception that the dogs love them. Rather, the dog has to do his or her job" (2003: 38), which is precisely what helium-balloons did. Even though we established some sort of physical and chemical affect, some sort of 'animacy' (Chen, 2012) with helium-balloons, they did not respond to our care, but carried on lifting, destroying the installation. And yet temporary, fragile and instant moments of equilibrium can be achieved by constantly looking at what emerges from the relationship, which can challenge modes of sociality precisely because we are not used to them. Everyone needs to learn how to engage, and in this process new relationships can emerge. The question, paraphrasing Haraway, is: "how might an ethics and politics committed to the flourishing of significant otherness be learned from taking *air-human* relationship seriously"? [5] (Haraway, 2003: 3).

So, inviting atmospheric more-than-humans to architecture's table may be a means to propose a different view of how socialities can be facilitated with atmospheres. It can also contribute to STS in showing how working with air can invent the social in ways not possible without intervening with specific materials, and how socialities can be designed not through discourse or human-only interactions, but through human and more-than-human atmospheres. The level of design and control of this process is still uncertain, and requires more experimentation.

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5 'Dog-human' in the original

References

Adey, P., *Aerial Life: Spaces, Mobilities, Affects*, (London:Wiley-Blackwell, 2010).

Anderson, B., 'Affective atmospheres', *Emotion, Space and Society*, 2 (2009): 77–81.

Braidotti, R., *Nomadic Theory: The Portable Rosi Braidotti*, (New York: Columbia University Press, 2012).

Buchli, V., 'Moisei Ginzburg's Narkomfin Communal House in Moscow: Contesting the Social and Material World', *Journal of the Society of Architectural Historians*, 57 (1998).

Chen, M.Y., *Animacies. Biopolitics, Racial Mattering and Queer Affect*. (Durham and London: Duke University Press, 2012).

Choy, T., *Air's Substantiations, in: Lively Capital: Biothechnologies, Ethics and Governance in Global Markets*, (Durham: Duke University Press, 2010).

Dessauce, M., *The Inflatable Moment. Pneumatics and protest in '68*, (New York: Princeton Architectural Press, 1999).

Farias, I., 'Planes Maestros como Cosmogramas: La Articulación de Fuerzas Oceánicas y Formas Urbanas Tras el Tsunami de 2010 en Chile', *Revista Pléyade* (2014):119–142.

Foucault, M., *Vigilar y castigar: Nacimiento de la prisión*, (Madrid: Siglo XXI, 2010).

Guggenheim, M., 'Building memory: Architecture, networks and users', *Memory Studies*, 2 (2009): 39–53.

Guggenheim, M., 'From Prototyping to Allotyping', *Journal of Cultural Economy*, 7:4 (2014): 411-433.

Haraway, D., *Simians, Cyborgs and Women: The reinvention of Nature*, (New York: Champman and Hall, 1990).

Haraway, D., *The companion species manifesto. Dogs, people and significant otherness*, (Chicago: Prickly Paradign Press, 2003).

Hinchliffe, S., Kearnes, M., Degen, M., Whatmore, S., 'Urban Wild things: A cosmopolitical experiment', *Environment and Urban Planning D: Society and Space*, 23 (2003): 643–658.

Kvan, T., 'Collaborative design: what is it?', *Automation in Construction*, 9 (2000): 409–415.

Latour, B., *We Have Never Been Modern*, (Cambridge: Harvard University Press, 1993).

Latour, B., 'How to Talk About the Body? The Normative Dimension of Science Studies', *Body & Society*, 10 (2004): 205–229.

Latour, B., *Reassembling the social. An introduction to Actor-Network-Theory*, (Oxford: Oxford University Press, 2005).

Lopez Munuera, I.,'Fan Riots', Arquitectura: Revista del Colegio Oficial de Arquitectos de Madrid (2014): 20–25.

Marres, N., *Material Participation: Technology, the Environment and Everyday Publics*, (London: Palgrave Macmillan, 2012).

Marres, N., Lezaun, J., 'Materials and devices of the public: an introduction', E*conomy and Society* 40 (2011): 489–509.

McCormack, D.P., 'Atmospheric coreographies and air-conditioned bodies', in Hunter, V. ed, *Moving Sites. Investigating Site-Specific Dance Performance*, (London, New York: Routledge, 2015a): 79–94.

McCormack, D.P., 'Devices for Doing Atmospheric Things', in Vanni, P. ed, *Non-Representational Methodologies*, (London, New York: Routledge, 2015b): 89–111.

McCormack, D.P., 'Aerostatic spacing: on things becoming lighter than air', *Transactions of the Institute of British Geographers,* 34 (2009): 25–41.

Roberts, L., 'The death of the sensuous chemist: The "new"chemistry and the transformation of sensuous technology', *Studies In History and Philosophy of Science*, Part A 26 (1995): 503–529.

Sanders, E.B.-N., Stappers, P.J., 'Co-creation and the new landscapes of design', *CoDesign*, 4, 5– (2008): 18.

Shapiro, N., 'Attuning to the Chemosphere: Domestic Formaldehyde, Bodily Reasoning, and the Chemical Sublime', *Cultural Anthropology,* 30 (2015): 368–393.

Sloterdijk, P., *Esferas III*, (Barcelona: Siruela, 2005).

Star, S.L., 'The Ethnography of Infrastructure', *American Behavioral Scientist*, 43 (1999): 377–391.

Stewart, K., 'Atmospheric Attunements', *Environment and Urban Planning D: Society and Space,* 29 (2011): 445–453.

Suchman, L., Blomberg, J., Trigg, R., 'Back to work: renewing old agentdas for cooperative design', in Kyng, M., Mathiassen, L. eds., *Computers and Desing in Context* (Cambridge: MIT Press, 2003): 267 – 287.

Tironi, M., Calvillo, N., 'Water and Air: Territories, tactics and the elemental textility of Urban Cosmopolitics', in Farias, I., Blok, A. eds., *Urban Cosmopolitics* (London, New York: Routledge, 2016): 207-224.

Topham, S., *Blow Up. Inflatable art, architecture and design*, (London: Prestel, 2002).

Vanderburgh, J., Russell, D. & Ellis, W., 'A Dialectics of Determination: Social Truth-Claims in Architectural Writing, 1970-1995', in A. Piotrowski & J. W. Robinson, eds. *The discipline of architecture*, (Minneapolis: University of Minnesota Press, 2001).

Wakeford, N., 'Beyond the individual. Replacing the Network society with social foam: a revolution for corporate ethnography?', *Ethnographic Praxis in Industry Conference Proceedings* (2011): 240–255.

Wilkie, A., ‘Regimes of Design, Logics of Users’, *Athenea Digital*, 11 (2011): 317–334.

Yaneva, A., *Made by the Office for Metropolitan Architecture: An Ethnography of Design*. (Rotterdam: 010 Publishers, 2009).